



# Review on drivers of deforestation and associated socio-economic and ecological impacts

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**Received:** 19-Jun-2023, Manuscript No. AAFSF-23-103123; **Editor assigned:** 21-Jun-2023, PreQC No. AAFSF-23-103123 (PQ); **Reviewed:** 05-Jul-2023, QC No. AAFSF-23-103123; **Revised:** 21-Aug-2023, Manuscript No. AAFSF-23-103123 (R); **Published:** 28-Aug-2023, DOI: 10.51268/2736-1799.23.11.098.

## Abstract

Deforestation is one of the most challenging environmental problems that the world is facing currently. Deforestation arises when a land subject to naturally occurring plant is converted to provide certain services in response to the human demand. The main objective of this review is identify the driver of deforestation and associated socioeconomic and ecological impact. The non-static nature of global ecosystems makes environmental changes inevitable; these environmental changes are caused by human made and natural causes. Economic activity and the rate of population increment have now increased to the point where the effects of humanity on the environment can no longer be viewed in isolation. The quality of many of the basic elements of the natural resource base (air, water, soil) is deteriorating, in particular due to the widespread depletion of forest resources. The other concern is emission of pollutants which have long-term and potentially irreversible effects such as climatic modification Ecosystem services provide various materials and non-material benefits to human beings. Deforestation is mainly a concern for the developing countries because of its negative contributions which include the loss of biodiversity and the increase of greenhouse effect. Ways to reducing deforestation must go hand in hand with improving the welfare of cultivators at the forest border. There are no general solutions and strategies since these will differ with region and will change through timer.

**Keywords:** Deforestation, Impact, Drivers of deforestation, Ecosystem, Forest border

## INTRODUCTION

Deforestation constitutes one of the threatening global development challenges and also a thoughtful long term environmental problem facing the world today. The forest is often professed as a stock resource, a free good, with the land as something freely available for conversion to other uses without recognition of the consequences on its role of delivery of environmental amenities, hence various forest ecosystems has been degraded into less varied and stable ones (Aruofor, 1999). The economic and social impact of deforestation has triggered the transformation of forested lands and

represents the great forces in global environmental change and great drivers of biodiversity loss. The effect of people has been and continues to be profound. Forests are removed degraded and fragmented for timber harvest, converted to agriculture, road construction, human-caused fire, and in myriad other ways. The effort to use and subdue the forest has been a constant theme in the transformation of the earth, in many lands, and at most times within the international, states and local government/communities circles (Sambe, et al., 2018).

Deforestation is one of the most powerful factors at work in emerging and re-emerging infectious diseases (Patz, et al., 2004). Through the process of clearing forests and subsequent agricultural growth, deforestation changes every element of local ecosystems such as microclimate, soil, and aquatic conditions, and most significantly, the ecology of local fauna and flora with human disease vectors. The impact of deforestation on ecosystems and human health are diverse and have taken place for many decades, though both the rate and geographic range have increased markedly over the last 30 years (Walsh et al., 1993). Deforestation is driven by a different form of human activities, including agricultural development, transmigration programs, logging, road construction, mining, and hydropower development activity (Patz, et al., 2000). According to Ogunwale, human activities on the environment in this mission for growth have resulted in a continuous and severe degradation of the ecosystem (Ogunwale, 2015), thus pose a threat to both this current and future living. By abolishing the forests, we risk our own quality of life, gamble with the stability of climate and local weather, threaten the life of other species and undermine the valuable services provided by biological diversity.

Deforestation is any activity that interrupts the natural ecology of the forest as a consequence of agricultural, social and economic activities carried out in the name of development (Ibrahim, et al., 2015). It also affects activities of economic and threatens the livelihood and cultural integrity of forest dependent people by decreasing the supply of forest products and causes, erosion, siltation, desertification, drought and flooding (Annan, 2013). For many developing countries in particular, forests represent a significant resource base for economic development.

Thirty percent of the earth's area or around 3.9 billion hectares is covered by forests. It was estimated that the original forest cover was approximately six billion hectares (Bryant, et al., 1997). The Russian federation, Brazil, Canada, the United States of America and China were the most forest rich nations accounting to 53% of the total forest area of the world. Another 64 countries having a combined population of two billion was reported to have forest on less than ten percent of their total land area and inappropriately ten of these nations have no forest at all. Between these countries 16 are which had relatively substantial forest areas of more than one million hectares each and three of these are Chad, the Islamic Republic of Iran and Mongolia each had more than ten million hectares of forest. The forest area remained fairly constant in North and Central America while it expanded in Europe during the past decade. Asian continent mainly in India and China due to their large scale afforestation programmer in the last decade registered a net gain in forest area. Deforestation has been

attributed to numerous damaging resulting to rising global costs (Uusivuori, et al., 2002). In micro level, deforestation is associated with fires, soil erosion, micro climate change and watershed deterioration. Internationally, deforestation may result negative consequences in timber supply, hydrological unbalance, biodiversity loss, global cycles of substantial elements and massive carbon emissions

### **Objective**

- To review the drivers of deforestation and associated socioeconomic and ecological impacts.

## **LITERATURE REVIEW**

### **Definition of forest**

The term "forest is assumed as a dense growth of trees and shrubs covering a large area" from its dictionary definition. However, defining a forest is not easy. The definition of Forest is as various as its variety in terms of types, species composition, goods and services it provides. Forest types vary widely, determined by factors including latitude, temperature, rainfall patterns, soil composition and human activity (Lund, 2012). How a forest is defined also based on who is defining it. Societies living in the British Isles or Scandinavia might recognize forests differently from people in Africa or Asia. Additionally, an economist may be defining and value a forest in a different way from a forester, agronomist or an ornithologist.

A recent study of the different definitions of forests around more than 800 different definitions for forests and wooded areas were in use round the world with certain countries adopting many such definitions at the same time!

According to MacDicken, forest can be described as land spanning greater than 0.5 hectares with trees higher than 5 meters and a crown cover of greater than 10% (MacDicken, 2015). It does not contain land that is predominantly under cultivated or urban land use.

### **Explanatory notes about forest definition:**

Forest is determined both by the existence of trees and the absence of other major land uses. The trees should be able to attain a minimum height of 5 meters. Includes areas with young trees that have not yet reached but which are probable to reach a crown cover of at least 10% and tree height of 5 meters or more. It furthermore comprises areas that are for the time being unstocked due to clear cutting as part of a forest management practice and which are probable to be regenerated within 5 years. Local situations might in exceptional cases, justify that a longer time frame is used Includes firebreaks forest roads and other small open parts; forest in national parks, nature reserves and other

protected areas those of specific environment, scientific, cultural, historical or spiritual interest and includes windbreaks, shelterbelts and corridors of trees with an area of greater than 0.5 hectares and width of greater than 20 meters.

### **Forest ecosystem service**

Forest ecosystems provide a wide range of amenities from which people benefit and upon which all life depends. Ecosystem services are characterized into four classes (provisioning, regulating, supporting and cultural). Provisioning services are products attained from ecosystems including food, fuel, building materials and fresh water; regulatory services are benefits attained through regulation of ecosystem processes such as climate regulation, flood control and pollination; supporting services are services essential for production of all other ecosystem services as nutrient cyclic, soil formation and waste management; and cultural services are non-material benefits obtained from ecosystem like spiritual area, aesthetic and tourism destination.

All of these benefits depend on the flow of ecosystem services and are non-existent if these services cease to flow. They offer significant economic benefits to nearby communities and contribute to spiritual, mental and physical well-being, help to fulfill an ethical responsibility to respect nature and afford opportunities to learn about nature and the biodiversity (IUCN, 2000). Ecosystem services are of huge value to human society. It was projected by Costanza, et al., that the annual value of these services was \$33 trillion, compared to global gross national product total at that time was around \$18 trillion per year. Although this figure has proved controversial, there is no doubt that ecosystem services represent an enormous contribution to the economic wellbeing of all societies.

Furthermore, many of the services are simply irreplaceable. For example, there is no way of providing food to the human population except through the use of natural systems involving soil organisms and crop plants, or of providing drinking water, excluding through the process of the water cycle which depends critically on the activities of organisms (Costanza, et al., 1997). The concept of ecosystem services has become important basing on the role of nature for maintaining human livelihoods especially in contributing substantial net gains and economic development. Generally, ecosystem services are little understood and too sophisticated but yet the important roles they play in household livelihood are not being recognized sufficiently in economic markets and government policies. Valuing benefits derived from ecosystem services contributes towards better decision making and highlighting much more clearly the implications for human well-being, while providing policy development

with new insights (DEFRA, 2007). Forest ecosystems and its beneficial services have been rapidly declining and becoming scarce, threatening future economic development and human wellbeing (Barbier, 2007). According to MA, 60% of ecosystem services including forests are being degraded or used unsustainably, often resulting in significant harm to human well-being.

### **Deforestation**

Deforestation is the conversion of forest to another permanent non-forested land use such as agriculture, urban or grazing development (van Kooten, et al., 2000). Deforestation is mostly a concern for the developing countries of the tropics (Myers, 1994). As it is decline areas of the tropical forests initiating loss of biodiversity and increasing the greenhouse effect (Angelsen, et al., 1999). Deforestation enhance as a proxy for the loss of critical ecosystems and biodiversity, as well as increased risk of soil erosion in steeply sloped areas. The current deforestation rate particularly in less developing countries is the worry of world Community because its impact is dangerous to all countries (Degeti, 2003).

In most cases developed nations are found in temperate domains and developing nations in tropical domains. However, deforestation was significantly less in tropical moist deciduous forest in 1990-2000 than 1980-1990 but by satellite imagery it was found that FAO overvalued deforestation of tropical rainforests by 23%. However, the definition of what is and what is not forest remains debated. The tropical rainforests capture most attention but 60% of the deforestation that happened in tropical forests during 1990-2010 was in moist deciduous and dry forests.

The FAO FRA 2001 and 2010 reports show considerable deforestation in the world in 1990-2010 but this was almost entirely confined to tropical regions (Anon, 2010). A summary of deforestation in the decades 1990-2010 is given in Table 1. These table show there was significant deforestation in the world during 1990-2010 but this was almost entirely limited to tropical regions. Rowe, et al., estimated that 15% of the world's forest was changed to other land uses among 1850 and 1980 (Rowe, 1992). Deforestation happened at the rate of 9.2 million hectares per annum from 1980-1990, 16 million hectares per annum from 1990-2000 and decreased to 13 million hectares per annum from 2000-2010. The net change in forest area during the last decade was estimated at -5.2 million hectares per year, the loss area equivalent to the area of Costa Rica or 140 km<sup>2</sup> of forest per day, was however lesser than that reported during 1990-2000 which was 8.3 million hectares per year equivalent to a loss of 0.20% of the remaining forest area each year. The present annual net loss is 37% lower than that in the 1990's and equals a loss of 0.13% of

the remaining forest area each year during this period. In another way some smaller countries have very high loses per year and they are in risk of almost losing all their forests within the next decade if current rates of deforestation are maintained. Indeed, some 31 countries do not

even make the list because they have already cleared most of their forests and even if that remain are seriously fragmented and degraded. The changes in area of forest by region and sub-region are shown in Table 1.

**Table 1:** Annual change in forest area by region and sub-region, 1990-2010.

Region/subregion	1990-2000		2000-2010	
	1000 ha/yr	%	1000 ha/yr	%
Eastern and Southern Africa	-1 841	-0.62	-1839	-0.66
Northern Africa	-590	-0.72	-41	-0.05
Western and Central Africa	-1 637	-0.46	-1 535	-0.46
Total Africa	-4 067	-0.56	-3414	-0.49
East Asia	1 762	0.81	2781	1.16
South and Southeast Asia	-2 428	-0.77	-677	-0.23
Western and Central Asia	72	0.17	1:31	0.31
Total Asia	-595	-0.10	2 235	0.39
Russian Federation	32	n.s.	-18	n.s.
Europe excl. Russian Federation	845	0.46	694	0.36
Total Europe	877	0.09	676	0.07
Caribbean	53	0.87	50	0.75
Central America	-374	-1.56	-248	-1.19
North America	32	n.s.	188	0.03
North and Central America	-289	-0.04	-10	-0.00
Total Oceania	-41	-0.02	-700	-0.36
Total South America	-4 213	-0.45	-3 997	-0.45
World	-8 327	-0.20	-5211	-0.13

## Drivers of deforestation

Understanding the drivers of deforestation is essential for the development of policies and measures that purpose to change the existing trends in forest activities towards a more climate and biodiversity friendly outcome Parties to the United Nations Framework Convention on Climate Change (UNFCCC) are developing a mechanism for decreasing emissions from deforestation and forest degradation, enhancing forest carbon stocks, sustainable management and conservation of forests (REDD+) in developing countries (UNFCCC, 2010). In addition to the argument on policy incentives and modalities for Measurements, Reporting and Verification (MRV), the issue of classifying drivers and activities causing forest carbon change on the national level for REDD+ monitoring and implementation has established developing attention in the REDD+ debate.

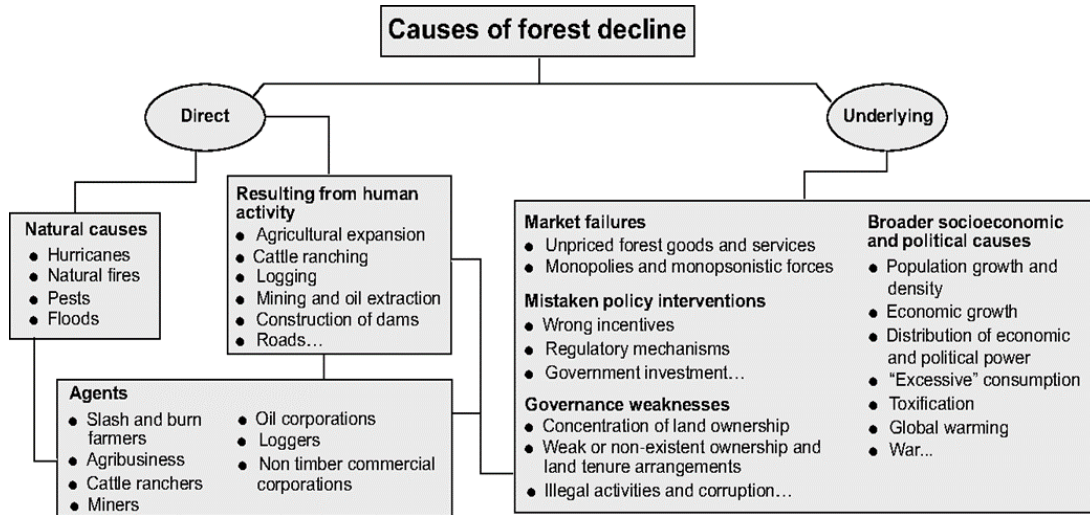
The UNFCCC negotiations (UNFCCC, 2009) have encouraged unindustrialized countries to identify forestry activities and land use, land use change in particular those that are related to the drivers

of deforestation and forest degradation, and to evaluate their potential contribution to the mitigation of climate change. Understanding is needed for measuring not only how much forests are changing but also how to define appropriate policies, and national REDD+ strategies and implementation plans (Boucher, 2011). Forecasts of expected growths, such as required for setting forest reference levels (UNFCCC, 2011), need to be based on knowledge of setting particular drivers and their underlying causes, and perhaps should be considered distinctly for deforestation and degradation processes (Huettnner, et al., 2009). Thus, in addition to the essential importance of national data on forest area change and associated changes in forest carbon stocks to estimate emissions and removals, the need for state documents on type and relative significance of deforestation and degradation drivers is increasing to an almost alike level of relevance to support national REDD+ activities. Although this relevance, quantitative national level information on drivers and activities initiating deforestation and forest degradation are usually unknown. For example, the question of how much or in what fraction of deforestation or emissions in a country

is caused by a particular driver (*i.e.*, the development of agriculture versus infrastructure) cannot be known for many developing countries. Scientific research in the past (Geist et al., 2001) has mainly been based on local scale or regional to global assessments (de Fries, et al., 2010).

Deforestation involves by various factors covering not only environmental aspect but also

demographic, socio-economic and political aspects. They are related to one another in such complex nonlinear interaction. Scholars have tried to understand that complexity by developing such classification of variables attributed to deforestation, which is commonly grouped/ categorized into two: The proximate/direct causes and the underlying/indirect causes describe below Figure 1.



**Figure 1:** Causes of forest decline.

**Direct drivers of deforestation**

Proximate drivers of deforestation are anthropogenic and natural activities that directly affect the forests and thus constitute proximate sources of change, that result from various interactions of underlying forces in social, political, technological, economic and cultural domains. Proximate drivers can be grouped into different categories such as agriculture expansion, expansion of infrastructure and wood extraction and so no. Even though agricultural expansion has been determined as the key driver of deforestation in the tropics (Gibbs, et al., 2010), drivers are differing from region to region and change over time (Rudel, et al., 2009).

**Indirect drivers of deforestation**

The indirect drivers of deforestation are different interplay of many economic, institutional or governance, technological and cultural factors. They are mostly wide categories of global indirect deforestation drivers are, economic development and related pressures on natural resources: Global GDP increased from around US\$ 16 trillion in 1970 to US\$ 47 trillion in 2005 and is Underlying factors could be population growth, economic development, socio-cultural or technological change. Indirectly, this approach was useful to examine the case of deforestation in Southeast Asia (Kummer, et al., 1994). The underlying causes working in macro level looks to be

essential forces that promote the proximate causes through socio-economic processes. Angelsen and Kaimowitz, then, projected an additional layer in between, which is the immediate causes or termed as the intermediate causes (Basu, et al., 2011).

**Pressure**

For a long time, forest users, mostly farmers with low income levels, have been considered as exerting harmful forces on the forests. Pressures, like "clearing the forests to develop agricultural fields, overgrazing, illegal wood cutting, etc., (Ozdonmez, et al., 1996) damaging forest ecosystems and causing forests to decrease. To decrease harmful pressures on the forests, Turkish authorities even considered to rearrange forest users.

The overexploitation of non-timber forest products by local communities significantly drives huge deforestation in Ghana's forests and forest reserves, which leads to a sharp decline in forest biodiversity and ecosystem services (Mensah, et al., 2013). The designation of forest reserves in poverty dominated areas has been met with different challenges. This is primarily attributed to the dependent of the forest host communities on these reserves for the collection of non-timber forest products that contribute to their livelihood. In addition, the timber based commercial activities in and around these protected areas perceived it

as a risk to their economic gains. All these pose thoughtful challenges to fully harnessing and developing such areas as well as safeguarding biodiversity conservation.

### **Impact of deforestation**

Many developing countries are experiencing rapid ecological changes such as deforestation and shifting agricultural practices (Abdullah, et al., 2008). These ecological changes may have a significant consequence on vector borne disease transmission due to their effect on vector survival and reproduction (Afrane, et al., 2008). In Southeast Asia, including China and Myanmar, deforestation and cultivation of cash crops represent the most important environmental changes in rural areas (Chaves, et al., 2010).

Many forests were decreased through illegal logging, agricultural clearing, and land development for housing and hydroelectric projects activity. Deforestation has led to major changes in the environment and subsequently may affect the ecology of malaria vectors. Deforestation may provide more favourable conditions for the larval development of anopheles' species.

Deforestation is mainly a concern for the developing countries because of its negative contributions which include the loss of biodiversity and the increase of greenhouse effect (Angelsen, et al., 1999). Plants are the oldest, reliable, extremely useful and widely used raw materials that play a vital role in oxygen supply and sequestration of greenhouse gases. 30% of the earth's land area or around 3.9 billion hectares is covered by forests. It was expected that the original forest cover was around six billion hectares. Deforestation has leads the loss of 50 to 100 animal and plant species each day. Many of these species are now at the edge of extinction even with their significant importance to humans, principally in the area of medicine.

### **Impact of deforestation on socioeconomic**

The social and economic impact of deforestation has generated the transformation of forested lands and represents the great forces in global environmental change and great drivers of biodiversity loss. The effect of people has been continuing to be profound. Forests are removed, degraded and fragmented by timber product harvest, conversion to agriculture, human caused fire, and road construction and in many other ways. The effort to use and subdue the forest has been a constant theme in the change of the earth, in many citizens, in many lands, and at most times within the international, national, states and local government/communities circles. It also disturbs economic activity and threatens the livelihood and cultural integrity of forest dependent people by reducing the supply of forest

products and causes siltation, erosion, desertification, drought and flooding.

Forests provide to the world economy in terms of timber production and other forest produces. There is diverse way of forest contributions as a means of direct employment in forestry amenities and other value added contributions as aesthetics and recreation. The loss of tropical forest cover annually may account for about 45 billion US dollars (Hansen, 1997). The destruction of forest eliminates the sources of economic gain directly obtained and also eradicates the potential gain from the resources that the forest sustains as biodiversity, soil and water. Also, the destruction of forest increases the negative externalities in the form of increasing carbon dioxide concentration, risk of flood and human wildlife conflict (Gibson, et al, 1998).

### **Impact of deforestation on ecology**

According to (Arild, et al., 1999), deforestation results in declines in biodiversity. The destruction of forest cover has resulted in a disturbed environment with reduced biodiversity. Forests help biodiversity, providing habitat for wildlife; furthermore, forests foster medicinal protection, with forest biotopes being irreplaceable source of new drugs, deforestation can destroy genetic variations (such as crop resistance) irretrievably (Hance, 2008). Since the tropical rain forests are the most various ecosystems on Earth and around 80% of the world's known biodiversity could be found in tropical rain forests, destruction of important areas of forest cover has resulted in a degraded environment with reduced biodiversity (Alain, 2000).

Forests especially those in the tropics serve as storehouses of biodiversity and consequently deforestation, fragmentation and degradation destroys the biodiversity as a whole and habitat for migratory species including the endangered ones, some of which have still to be classified. Tropical forests support about two thirds of all known species and comprise 65% of the world's 10,000 endangered species (Myers, et al., 2000). Maintaining the biodiversity of the forested areas is like maintaining a form of capital, until more research can establish the relative importance of different plants and animal species. According to the world health organization, around 80% of the world's population relies for the main health care at least partially on traditional medicine. The biodiversity loss and associated large changes in forest cover could trigger sudden, irreversible or permanent and harmful changes. These include regional climate change together with feedback effects that could theoretically shift rainforests to savanna and the occurrence of new pathogens as the growing trade in bush meat increases contact between humans and animals (Anon, 2005).

## State(s)

The joined effects of direct and indirect human activity and natural climatic factors have put the state of forests into severe deforestation and forest degradation. These factors have driven forest biodiversity and ecosystem services into depletion and loss. Forests resources in Ghana are nearing depletion and loss owing to widespread deforestation and forest degradation (Fagariba, et al., 2018). Growing populations need expanding food supplies, so forests are cleared by shifting cultivators for annual or permanent crops (Kartawinata, 1979, Powell, 1978, Ranganathan, 1979).

Other activities also outright clearing the forest. Marketable logging processes reduce forest stocks (Eckholm, 1976). Illegal mining activities have caused severe habitat and biodiversity loss in the off in shelterbelt of the forest reserve (Boadi, et al, 2016) while overexploitation and unsustainable and illegal forests resources extraction have caused flora and fauna depletion and habitat destruction in the forest.

## Response to reduce deforestation

Ways to reducing deforestation must go hand in hand with improving the welfare of cultivators at the forest border. There are no general solutions and strategies since these will differ with region and will change through time. All strategies need cooperation and goodwill. Effective implementation is important including stakeholder participation, development of management plans, enforcement and monitoring (Chomitz, et al, 2007). The strategies should be such that on one hand they should identify the critical roles of national, state and municipal governments and on other hand empower the civil society and the private sector to take a proactive role in decreasing deforestation, often working in together with government. For reducing deforestation, the welfare of the forest border cultivators also need to be improved. The strategies are unleashed below:

**Reducing emissions from deforestation and forest degradation:** Many worldwide organizations including the United Nations and the World Bank have begun to advance programmes to reduce deforestation mainly through reducing emissions from deforestation and forest degradation which use direct monetary or other incentives to encourage unindustrialized countries to limit deforestation. Significant work is underway on tools for use in monitoring unindustrialized country adherence to their decided REDDS targets.

**Increasing the management standard of protected areas:** The allocation of protected areas is fundamental in any attempt to conserve biodiversity. Protected areas alone, however, are

not enough to conserve biodiversity. They should be considered alongside, and as part of, a wider approach to conserve biodiversity. The minimum area of forest to be conserved is generally considered to be 10% of total forest area. It is reported that 12.4% of the world's forest are located within protected areas.

**Increasing forest permanent reserved area for timber production:** The most serious impediment to sustainable forest management is the lack of dedicated forests specifically set apart for timber production. If the forests not have a dedicated long term tenure for forest production, then there is no incentive to attention for the long term interests of the forest. FAO found that 89% of forests in developed countries were under some form of management but only about 6% were in developing countries (FAO, 2011). If 20% could be set aside, not only could for timber demand be sustainably met but buffer zones could be established to consolidate the protected areas. This would form a conservation estate that would be one of the largest and most significant in the world.

**Increasing and maintaining of forest value:** There are numerous ways of increasing and maintaining the actual value of forests. Governments can implement realistic prices on stumpage and forest rent and can invest in enhancing the sustainable productivity of the forest. Regional and global beneficiaries of the environmental services of forests have to pay for such services. There has been some success in devising systems to collect payments for environmental services like carbon sequestration, biodiversity conservation, catchment protection and ecotourism. This achievement can further be more realized by integrating participatory method of management with these collection systems to ensure rights and ownership with equity in resource and benefit sharing for enhancing the livelihood of the rural poor society who actually are the main stakeholders of conservation and management (Assessment, 2005).

## DISCUSSION

**Promotion of sustainable forest management:** In order to encourage sustainable forest management, it must be sustainable ecologically, economically and socially. Achieving ecological sustainability means that the ecological values of the forest not be degraded and if possible they should be improved. Nevertheless, management for environmental facilities alone is not economically and socially sustainable. It will not happen until or unless the developing nations have to reach a stage of development and affluence that they can accommodate the costs of doing so. Otherwise, the developed world must be prepared to meet all the costs. There are vast areas of unused land as discussed earlier some of which is degraded and low fertility. Technological



developments are being made to bring this land back into production. This should be a major priority since an important proportion of cleared tropical forest will eventually end up as degraded land of low fertility (Benndorf, et al., 2007).

**Reinforce government and non-government institutions and policies:** Strong and stable government is vital to decrease the rate of deforestation. Considered that half of the present tropical deforestation could be stopped if the governments of deforesting countries were determined to do so. Environmental NGO's contribution towards conservation management has been enormous. They have the gain over government organizations and large international organizations because they are not limited by government to government bureaucracy and inertia. They are better equipped to bypass corruption and they are very effective at getting to the people at the frontier who are in most need. Participatory forest management and rights in border areas much of the forest is nominally retained by the state, but the reach of government and the rule of law are weak and property rights insecure. In order for forest management to succeed at the forest boundary, all parties with an interest in the fate of the forest should be communally involved in planning, management and profit sharing (Myers, et al., 2000).

But forest tenure and management rights are almost always restricted and restrictions on ownership and use define alternative tenure systems. The balance of rights can be tilted strongly toward community in the form of publicly owned severely protected areas. State ownership and management can be reserved but with sustainable timber extraction allowed. As of now much of the world's tropical forest are state owned but community participation in forest ownership and management needs to be encouraged with limitations on extraction and conversion. A means must be found to reconcile conservation and development by involving local/indigenous populations more closely in the decision making process and by taking the interactions between 'societies' and forest resource more fully into account (Chakravarty, et al, 2008).

## CONCLUSION

Deforestation constitutes one of the threatening global developmental challenges and serious long term environmental snags facing the world today. The economic and social impact of deforestation has activated the transformation of forested lands and represents the great forces in global environmental change and great drivers of biodiversity loss; the impact of people has remained and continues to be profound.

Understanding the processes of deforestation is essential for informing forest management and conservation policy and for an efficiently targeting of interventions. This can be further addressed by community-based forest management which builds on political good will and strong community institutions. Deforestation is driven by a variety of human activities, such as agricultural development, timber logging, transmigration programs, road construction, mining and hydropower development activity. Forest ecosystems deliver a wide range of services from which people benefits and upon which all life depends. Ecosystem services are classified into four categories such as provisioning, regulating, supporting and cultural. Deforestation encompasses several factors covering not only environmental aspect but also socio-economic, demographic and political aspects. New challenges from climate change need urgent action to explore and protect the local value of forests for livelihood even more. This is particularly true in the case of emerging activities undertaken as part of REDD+ activities where extensive forest governance is aligned with it along with people's participation ensuring livelihood benefits of the people dependent on forests. These renewed activities will maintain traditional ways of life and the environmentally important forest ecosystems of the world.

## RECOMMENDATION

- To overcome the problems of deforestation legal actions should be taken on illegal users and public awareness strategy should be grounded in credible, up to date and based on appropriate information in order to change public perception and views of the community.
- To reduce deforestation, encourage tree planting. Furthermore, forestry-related information is better to promote through the formal and non-formal education stakeholder.
- Identifying alternative sources of energy under top priority by using local innovative methods like bio gas and wood saving stove.
- Aware the society about the potentials of forest through formal or informal.
- Establish different mechanism forest management with local community and different stakeholders (CBFM, COM, PFM.) for sustainable forest management.
- Create incentive for local population in different way such as through REDD+ to reduce pressure on forest.



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