

Discussion Paper

Tropical Forest Deforestation

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Introduction

Tropical Forests can vary widely in type, structure, function and productivity because of the diversity of climates, soil types and conditions where they grow. The term Tropical Forest incorporates the rainforest, remote cloud forest, dry forest, pine savannah many other forest types. They are made up of millions of irreplaceable ecosystems (Rainforest Alliance, 2012). This paper will examine the importance of Tropical Forests, the causes of deforestation and finally the role of REDD+ programs in mitigating Tropical Forest deforestation.

The Significance of Tropical Forests

Tropical Forests have evolved over between sixty and one hundred million and they provide life supporting ecosystem services and are rich in biodiversity (Rainforest Concern). They are home to approximately seventy-five per cent of all terrestrial biodiversity with the Amazon rainforest alone housing about a quarter of the world's terrestrial species (Secretariat of the Convention on Biological Diversity, 2011). They are also home to approximately sixty million human beings and deforestation poses many risks for these indigenous people who have been living in the rainforest for thousands of years, depending on it for their food, shelter and medicines. In addition, an estimated 1.6 billion people worldwide rely on forests for their livelihoods. (United Nation Environment Program).

Forests provide a steady supply of wood, plants and animals, and they supply many of the fruits, fibres, grains, medicines and other materials which we rely on (Rainforest Alliance, 2012). The loss of biodiversity and habitats due to deforestation poses significant risk to the livelihoods of those people who depend on them. The loss of vital ecosystem services caused by deforestation also threatens human societies worldwide, and not just in the regions where deforestation occurs. (Rainforest Concern).

It can often be difficult for people to grasp the significance of these forests, as they can seem far removed from our everyday lives, however they provide a range of goods and services which are vital for human wellbeing. For example, forests are very important to our global food supply as they regularly offer new, disease-resistant crops as well as providing forest-derived drugs and basic needs such as regular rain and clean air (Rainforest Alliance, 2012).

Tropical Forests are rich in Natural Capital which is the collective term for Earth's natural assets and the Ecosystem Services resulting from them, which make human life possible (Natural Capital Declaration, 2012). Ecosystem Services which result from Natural Capital form the foundation for all human economic activity and include food, water, energy, climate security and other essential services. In addition to the production of goods, Ecosystem Services include life support functions.

The Millennium Ecosystem Assessment (2005), divided Ecosystem Services into four categories:

1. Provisioning services

This refers to the source of goods which are of direct benefit to people. Tropical Forests offer many goods which are very important for human economic activity and also human health. These include foods such as nuts and fruits, and medicinal plants. More than twenty-five per cent of our modern medicines originate from Tropical Forest plants (Rainforest Concern). Medicines derived from rainforest plants are used to treat a number of diseases, such as cancer, malaria, heart disease, bronchitis, dysentery and tuberculosis (The Rainforest Foundation). Although a quarter of common medicines originate in the rainforest, there is still great scope for further medicines to be derived from rainforests plants, as there are many plant species whose medicinal properties remain unexplored.

Many foods we consume today such as nuts, bananas, coffee and spices originated in Tropical Forests. There are also many important industrial products such as rubber, resins and fibres which were originally sourced from tropical rainforests (Rainforest Concern).

2. Regulating services

This includes the regulation of the global climate through the storing of carbon and control of local rainfall and mitigation of floods and droughts.

Rainforests store and recycle large amounts of water. It is believed that the Amazon Rainforest alone stores over half of the Earth's rainwater. Rainforests recycle water, feeding rivers, lakes and

irrigation systems. Without them, droughts would become more common, increasing the risks of widespread famine (Rainforest Concern).

Plants and trees are a natural sink as they absorb and store Carbon Dioxide (CO₂), however land use, land-use change and forestry activities, have a detrimental effect on these natural sinks. The world's forests present a significant global carbon sink. The Global Forest Resources Assessment 2010 revealed that the world's forests store more than 289 gigatonnes (1 Gt=1 billion tonnes) (FAO, 2010).

When forests are destroyed or degraded they release large quantities of CO₂ into the atmosphere, and become a significant contributor to Climate Change. Ninety-seven per cent of all emissions from deforestation occur in the tropics and sub-tropics (Secretariat of the Convention on Biological Diversity, 2011).

3. Cultural services

This includes the contribution made by forests to the wider needs of society. Tropical Forests are very important to society. They are increasingly popular destinations for recreation and eco-tourism, and they hold considerable educational and scientific value. For indigenous people and forest communities, they are spiritually and culturally significant. They are also some of the most unique and beautiful landscapes on the planet.

4. Supporting Services

As mentioned above, Tropical Forests are home to millions of complex ecosystems, which are often complex and inextricably linked to the forests. The forests provide a range of supporting services which allow these systems to exist and thrive, for example the purification of air and water.

Deforestation

Deforestation has occurred all over the world for thousands of years. Direct causes of deforestation are agricultural expansion, wood extraction, and infrastructure expansion such as road building and urbanization. Deforestation often occurs as a result of several of these factors, and they are often linked to one another. The deforestation of tropical forests continues globally, despite decreases in some countries. Forests cover 31% of the Earth's total land area, just over 4 billion hectares (FAO, 2010). The five most forest-rich countries (the Russian Federation, Brazil, Canada, the United States of America and China) account for more than half of the total forest area (FAO, 2010).

The most common cause of deforestation is conversion to agricultural land. This can often be linked to road building which can make areas which were previously inaccessible more suitable for conversion to agricultural land. This is also true of logging, with more accessibility; both illegal and legal logging can increase. Subsistence farming has been a common cause of deforestation in the past but more recently; large scale commercial farming is playing an increasingly important role in deforestation. This trend is evident in the Amazon where industrial-scale cattle ranching and soybean production are increasingly common (NASA Observatory).

There are many indirect factors which contribute to deforestation. For example, policies aimed at encouraging economic development and infrastructure development, have caused significant, unintentional deforestation in the Amazon and Central America, as accessibility is a key factor. Other policies also indirectly affect deforestation, for example, incentives which encourage agriculture, have encouraged forest clearing as. Global economic factors also play role, for example, expanding global markets for timber and pulpwood. (NASA Observatory).

Fire also plays a major role in deforestation. On average, one percent of all forests were reported to be significantly affected by forest fires annually (Rainforest Conservation Fund). Although, some forest ecosystems depend on fire for their regeneration, forest fires can be devastating to others.

Pests and diseases, natural disasters and invasive species are also causing severe damage to forests in some regions. Outbreaks of forest pests damage approximately thirty-five million hectares of forest every year (Rainforest Conservation Fund). An increase in infectious diseases among rainforest biodiversity has been linked to climate change, since they are often affected by changes in humidity, temperature change, and rainfall (Rainforest Conservation Fund). As warming continues, causing accelerating plant growth, pathogens may spread more quickly and easily because of the increased availability of vegetation and because of increased humidity. In addition, pathogens may be able to survive in areas that they previous would not have due to climate moderations, allowing pathogens to find new, non-resistant hosts (Rainforest Conservation Fund).

Although the rate of deforestation is decreasing, it is still high. Deforestation, mainly through the conversion of tropical forests to agricultural land, shows signs of decreasing in several countries but continues at a high rate in others (FAO, 2010). Around 13 million hectares of forest were converted to other uses or lost through natural causes each year in the last decade compared to 16 million

hectares per year in the 1990s. South America and Africa continue to have the largest net loss of forest, as illustrated in Figure 1.

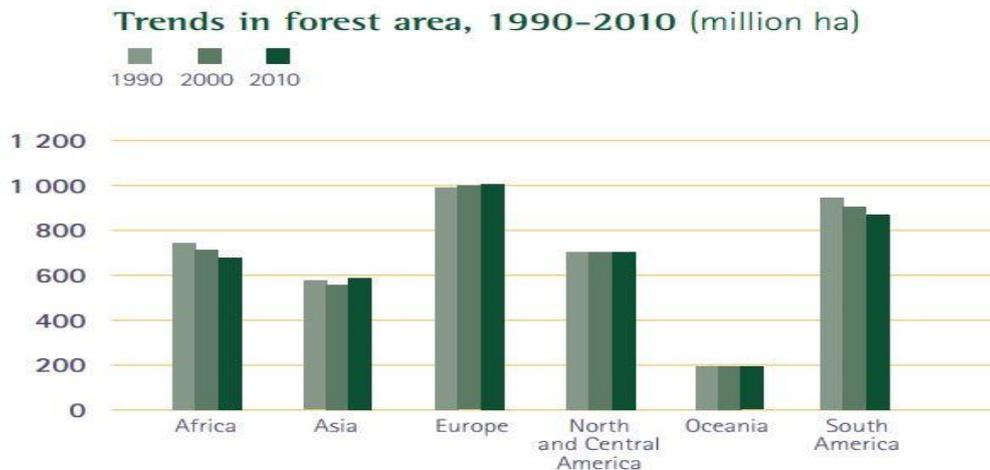


Figure 1: Trends in Forest Area. Source FAO, 2010.

Deforestation and forest degradation through agriculture, conversion to pasture, developing infrastructures, logging, fires etc., account for nearly 20 per cent of global greenhouse gas emissions (United Nation Environment Program)

REDD

Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce deforestation and degradation thereby lowering their associated carbon emissions. REDD+ has evolved from REDD and focuses on deforestation and degradation but also includes conservation, sustainable management of forests and improvement of forest carbon stocks.

REDD+ offers many co-benefits alongside lowering carbon emissions and improved forest management. Biodiversity protection is a major benefit associated with REDD. As Tropical Forests are so rich in biodiversity, conserving forests ultimately protects the biodiversity within them, and also offers opportunities to learn more about this biodiversity rich environment. Protecting the forests and protecting biodiversity go hand in hand but this also allows for the protection of those vital ecosystem services discussed above. The tropical forest is a complex and delicate system of interconnected relationships. Therefore protecting the forest ensures the protection of all the

associated systems. REDD+ can also offer many benefits for forest dependent communities. The incentives offered by REDD programs can help with poverty alleviation. Many Programs offer communities improved education systems and more sustainable livelihood options.

According to the United Nations Environment Program:

“Natural forests will be better able to withstand pressure from invasive alien species and other pests, and disturbances such as forest fires and storms, and will recover more quickly following such disturbances (2010).

They also note that natural forests, which are very rich in biodiversity, are generally the most carbon dense type of forest (United Nations Environment Program, 2010). As natural forests are more resilient, it is important to take measures to protect the biodiversity and ecosystem services of these forests in order to ensure they continue to thrive and store vast amounts of carbon.

Conclusion

Tropical Forests are made up of millions of unique ecosystems. They provide us with many useful products but also many life supporting ecosystem services, as highlighted above. They are also critical in the battle against climate change. These forests have extremely complex and diverse relationships with the biodiversity within them and also climate regulation. Despite the great importance of these forests, deforestation continues globally. This poses a great risk for the biodiversity and delicate ecosystems within them but also the global community. REDD offers a unique opportunity to preserve these forests and to manage them effectively in order to ensure their resilience to the effects of climate change.

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