

## ILLEGAL LOGGING AND ITS IMPACT ON SUSTAINABLE FOREST RESOURCE MANAGEMENT

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### ABSTRACT

Forests are providing wood and wood products as well as ecological, social, religious and spiritual services. More than 11 million people are directly employed in forestry sector worldwide while over one billion poorest of the poor earn their livelihoods partially or fully from forests. Forest ecosystems sequester about 638 Giga ton carbons worldwide where Pakistan's share is about 0.05%. These silent friends of mankind, however, are diminishing at a rate of 13 million ha per annum worldwide, and contribution of illegal logging in it is about 27%. Apart from deforestation, the global timber trade illegalities and corrupt practices cause more than USD 10 billion losses in assets and revenues annually. In Pakistan, the deforestation rate of primary forest was 1.63% to 2.02% per annum between 1990 and 2005 despite official ban on harvesting of green trees during this period. The carbon stocks are depleting at a rate of approximately 1.78% due to burning of 31.6 million m<sup>3</sup> fuelwood annually which is adding considerable amount of greenhouse gases in the atmosphere. The deforestation, mostly due to illegal logging, is affecting multiple uses of forest resources, and equity and fairness within and between generations. It is increasing poverty directly in forest dependent communities by depriving them from their livelihoods. A great number of species are facing extinction due to deforestation. Based on these findings it is suggested that sustainable forest resource management may be resumed to keep the forest ecosystems viable and their socio-economic services intact.

**Key words:** Illegal logging, multiple uses, biodiversity, environment, livelihoods, sustainable forest management

### INTRODUCTION

Illegal logging has gained a great deal of attention in recent years due to its multifaceted effects worldwide. Countries both of north and south as well as developed and developing nations are facing this menace. The nations with significant forest cover are also suffering from high degree of illegal logging. Reliable estimates indicate that more than half of all logging activities especially in vulnerable regions (the Amazon Basin, Central Africa, Southeast Asia, the Russian Federation and some of the Baltic states) are illegal (Brack *et al.*, 2002; Smith, 2004). Illegal logging is incredibly complex phenomenon which involves a wide range of activities beginning in the forests and proceeding along the chain of transactions that delivers the forest products to the end users.

Recent estimates showed that approximately 15% of the global timber trade involves illegalities and corrupt practices (Kishor and Belle, 2004). The illegal logging in public and private forestlands causes losses in assets and revenues in excess of USD 10 billion annually (Baird, 2001). Apart from monetary losses, the illegal logging has posed a serious threat to sustainability of forest resources, ecosystems, biodiversity and sustained livelihoods of the forest dependent poor communities (Contrera, 2002; Thomas *et al.*, 2000).

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The Brundtland Commission, formally the World Commission on Environment and Development (WCED), known by the name of its Chair Gro Harlem Brundtland, was established by the United Nations in 1983 (Resolution 38/161). The commission was convened to address growing concern about the 'accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development' According to the commission's report '*Our Common Future*' (1987) sustainable development means meeting the requirements of present generation without compromising the ability of the future generations to meet their own needs. This definition was adopted in forestry sector for sustainable forest resource management. The first global policy on sustainable forest resource management was outlined at the Rio de Janeiro-Earth Summit (1992) and named as the Forest Principles. The Principles state that forest resources and forestlands should be managed on sustainable basis to meet the social, economic, cultural and spiritual human needs of present and future generations. These needs are for forest products and services such as wood and wood products, water, fodder, medicine, fuel, shelter, employment and recreation, habitats for wildlife, landscape biodiversity, and carbon sinks and reservoirs. Appropriate measures should be taken to protect forests against harmful effects of pollution including air-borne pollution, fires, pests and diseases in order to maintain their full multiple values (Forest Principles 2-b, Rio Declaration, UNCED 1992).

The sustainable forest resource management has given paramount importance to multiple uses of forests and led to a paradigm shift from forest management for timber only. The principles of sustainable forest resource management (SFRM) are (i) socially acceptable, (ii) economically feasible, and (iii) ecologically sound to sustain current and future productions. It maintains equity & fairness within and between generations as well as different strata of a society. SFRM recognizes the ecological and environmental services and their sustainability.

The objectives of this manuscript are to (i) elaborate spectrum of illegal logging, (ii) impact of illegal logging on multiple uses of forests and other forests' services' envisaged in UNCED (1992), and (iii) effect of ban on harvesting green trees on deforestation in Pakistan.

## 1. Illegal Logging

The term 'illegal logging' is often used to refer to a range of illegal activities affecting the forests and the people who depend on it. It starts from actual felling of trees without authorization or without meeting required operating standards to the transportation, processing and export of products. There are, however, several challenges in developing a definition of legality such as drawing a line between a significant offence and a minor transgression and conflicts between customary and formal laws (Dykstra *et al.*, 2002). In general, acts of violation of forest management regulations and other contractual agreements either in public or private forestlands are referred illegal. In the simplest of means illegal logging is the felling of trees in violation of laws and regulations (Ravenel and Granoff, 2004). According to Tacconi *et al.* (2004) these violations may include all or any one of the followings:

- Violations of forest management regulations and other contractual agreements in either public or private forestlands are acts against forest legislation. This is the category that includes most of the acts that may be most appropriately referred to as 'illegal logging'. The acts include:
  - i. logging without authorization and required plans;
  - ii. logging in excess of permitted cut;
  - iii. logging unauthorized volumes, sizes, species (including protected ones);
  - iv. logging in prohibited areas, such as, steep slopes, riverbanks and water catchments;
  - v. girdling or ring-barking to kill trees so that they can be legally logged;
  - vi. logging in protected areas;
  - vii. arson to force conversion of forestland to other uses; and
  - viii. entering pre-maturely in logged stands.
- Violations of indigenous peoples' rights and public or private ownership rights may involve acts against constitutional, civil, criminal or administrative law (s).
- Violations of transport and trade regulations including acts that violate forest legislation but may be related to legally or illegally harvested forest products. This category is referred to as 'illegal forest trade'.
- Violations of financial, account and tax regulations may involve acts related to legally and / or illegally harvested and traded timber. This category is referred to as 'illegal financial activities'.
- Timber processing activities may be regulated by industry and trade related legislations, as well as, forest legislations. In this category, a violation directly linked to illegal logging is the use of illegal harvested logs.

There are several causes of illegal logging, i.e. political (weak governance, corruption, weak forest institutions), absence of proper legislations (property right spheres) and distortions in timber trade. Absence of clear cut government policies and financial constrains to implement legislations also provide important niche to illegal logging (Callister, 1999; Glastra, 1999; Palmer, 2001; Tacconi, 2007). Impacts of illegal logging may be classified as long term or short term and direct or indirect. The short term and direct effects of illegal logging are obstacles in forest management operations like lack of growing stock, reduction in rotation period and low commercial viabilities. The long term and indirect effects are deforestation and destruction of habitat. Some of the changes brought about by illegal logging are irreversible. The non-wood forests' services are directly influenced by illegal logging both on short and long term basis. The effects of illegal logging by all means are contradictory to fundamental principles of sustainable forest resource management.

## **2. Effect of Illegal Logging on Multiple Uses of Forests**

Forests are serving humanity in multiple ways. In addition to wood and wood products, they are providing social, ecological, religious, and spiritually services. Some of the forests' contributions are quantifiable while others are intangible (Panayotou and Ashton, 1992). The role of forests in sustainable livelihoods as has been recognized recently changed the meanings of forests. In this perspective Arnold (1998) included all

resources in forests that can produce forest products (woodland, scrubland, bush fallow and farm bush, and trees on farm as well as forests). The focus is not on tenure or tree cover as the basis for defining a forest but on the potential for producing products.

The timber and fuel wood are important sources of building materials, energy, industrial raw materials as well as foreign exchange. The non-wood forests' services, however, are comparable or even of higher values than that of timber (Panayotou and Ashton, 1992). In general, these non-wood products are referred as minor forest products or Non-Wood Forest Products (NWFPs). These include gums, resins, latex, rattan, edible nuts, fruits, vegetables, meat, by products from game animals including mammals, fowl, reptiles, fish, insects, fodder, and bio-chemically active plant compounds. The major non-wood forest products produced in Pakistan are presented in Table 1. Apart from these, the socio-economic and environmental services provided by forests are most vital for stability of economy and ecosystems.

Table 1. Non-Wood Forest Products (NWFPs) extracted in Pakistan (2005)

Non-Wood Product	Quantity (tons)
Food	47,842
Fodder	39,00,000
Raw material for medicine and aromatic products	616
Raw material for colourants and dyes	43,000
Raw material for utensils, crafts, constructions	34,450
Exudates	3,184
Others	235

(Source: *Global Forest Resources Assessment, FAO 2005*)

To manage a forest for 'multiple uses' means that all the renewable surface resources of the forests are used in a combination that will best meet the needs of the people (US Multiple Use-Sustained Yield Act 1976). Obviously, this can be interpreted in many different ways. Multiple-use management does not mean that every tract of forest must be managed for all the goods and services it provides. It is rather an approach encompassing a strategy which optimizes the overall benefits. There are different types of multiple uses, such as, concurrent use (all the uses at the same time), sequential use (one use at a time) and dominant use (one use is given greater focus than the others).

Presently dominant use type of multiple uses of forests is being practiced wherein sustained wood yield management is preferred. For example, 34.1%, 9.3%, 11.2%, 3.7%, 33.8% and 7.8% forests are managed for timber production, protection of soil and water, conservation of biodiversity, social services, multiple purposes and no or unknown function, respectively (FAO, 2005). In Pakistan, the designated function of forests as multiple uses is significantly greater (51%) as compared to that of the world (Figure 1), while the other functions of forests nearly follow the global trends. Primarily the multiple uses are consisted of production of fuelwood and timber, soil and water

protection, and non-wood forest products.

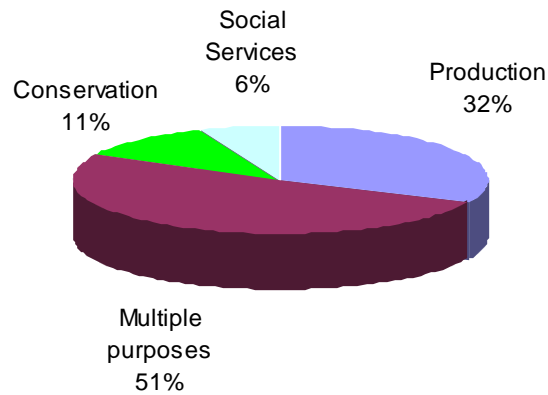


Fig. 1. Designated functions of forests in Pakistan  
(Source: *Global Forest Resources Assessment, FAO 2005*)

Though economic valuation is conducted in dominant type of use of forests but timber is over valued intentionally while the other resources are undervalued. Thus timber harvesting is justified. For instance, the value of soil and water protection, essential for two hydroelectric dams of Pakistan (Tarbella and Mangla), is not properly estimated when forests are valued in their catchments. The undervaluation of non-wood uses of forests is supported by national or regional governments too for income generation. There are no explicit criteria and indicators for valuation of environmental and social services of forests, and the situation is advantageously manipulated for management of forests only for production of timber. The multiple uses of forests, moreover, has dilemma that most of the uses are incompatible with each other. The situation provides a working space for illegal logging and subsequently leads to unsustainable forest resource management.

### 3. Impact of Illegal Logging on Equity and Fairness

There are about 4 billion ha forests (30% of the land) worldwide which are diminishing at a rate of 13 million ha per year. The main cause of this deforestation is the conversion of forestlands into agriculture land. Apart from forestland conversion, approximately 27% deforestation is assigned to illegal logging (FAO, 2005). The conversion of forestlands into agriculture land is carried out in violation of forest regulations and other contractual agreements. Its status, however, is still to be decided as illegal or otherwise. Illegal conversion of forestlands to other uses is a serious threat to ecological, social and economical services of forests. In general, the conversion of forestlands is preceded by illegal harvesting of forest resources. To cover illegal activities argument is built that the benefits from maintaining forest stands is less as compared to other land uses. Simply this is a cover up of illegal activities.

In Pakistan, the deforestation rate is the highest in the world. The primary forests depleted at a rate of 1.63% annually between 1990 and 2000, while the deforestation rate was escalated to 2.02% between 2000 and 2005. Overall there was 24.7% decrease in primary forests between 1990 and 2005 (FAO, 2005). This deforestation rate is considerably high as compared to worldwide rate of 0.18%. Illegal logging is the main cause of this deforestation because harvesting of green trees during this period was not allowed legally as Government of Pakistan imposed a countrywide ban on harvesting of green trees in 1993. Aim of the ban was to stop deforestation for protection of environmental and socio-economic services of forests as well as non-wood forest products. Alarming rate of siltation of Tarbella dam and Mangla dam and fast vanishing rate of forests ushered to take this decision. After more than one and a half decade of ban data show that the ban failed to achieve its objectives. The deforestation is increasing unabated; it was 1.63% in 1990s while jumped to 2.02% after 2000. Furthermore, the ban was against the settled principle of sustainable forest management, i.e., ecologically sound to sustain current and future productions. The ban on harvesting green trees is affecting forests by (i) converting productive forests into non-productive and (ii) intensifying timber mafia activities to cut readily available mature trees. It is essential to keep forests in productive state for managing them on sustainable basis.

Conversion of forestlands in this context or other is denting forest resources and compromising needs of next generations. Next generation will be unable to enjoy what present generation has. Similarly dwindling forest resources show absence of sustainability. These gruesome activities result in uneven distribution of forest resources and revenues among different strata of a society. The people involved in illegal logging and subsequent trade get all the financial benefits and deprive the genuine stakeholders. These illegal activities are siphoning out considerable revenues from budgetary documentations which otherwise may have been utilized for the betterment of the society at large and poor forest dependent communities in specific.

#### **4. Impact of Illegal Logging on Biodiversity**

Illegal logging in protected areas is something of *a coup de grace* for biodiversity conservation. Illegal logging affects biodiversity on immediate as well as delayed action basis. In case of immediate effect high value species already tagged endangered status are targeted. This type of harvesting is not executed according to log books, and non-prescribed tools are used. The logged wood is extracted through unspecified routes and subsequently a lot of collateral damage is incurred to non-target species and habitat.

On long term bases protected forestlands are becoming increasingly islands-like due to lack of surrounding matrix of forests. Indeed the matrix has flipped. Previously, clearings were holes in a vast matrix of forest cover while forests are increasingly islands now in a matrix of non-forestlands. Island biogeography theory suggests that islands tend to feature higher species extinction rates than continents as well as smaller islands support fewer species. With protected areas squeezing into smaller islands due to deforestation there is a serious threat to the viability and sustainability of plant and animal communities and integrity of their ecosystems.

## 5. Impact of Illegal Logging on Environmental Services

Environmental services such as regulation of droughts, floods, control of soil erosion and sedimentation of downstream water bodies, amelioration of climate, barriers against weather damage and ground water recharge are involuntary actions of forest ecosystems. There is no substitute of these services. Sometimes benefits derived from the rich biological diversity and gene pools found in forests are also counted among the important environmental services. Apart from this, forests play a critical role in global carbon cycles. Globally forests sequester about 283 Giga ton (GT) of carbon while an additional 38 GT carbon is sequestered in dead wood. The total carbon content of forest ecosystems worldwide is approximately 638 GT (FAO, 2005). In Pakistan, the forest ecosystems stock more than 291 million ton carbon. The carbon stocks are depleting at about 1.78% annually. The lion's share of carbon stocks are consumed in the form of fuelwood; about 90% wood extracted from forests in Swat and Mansehra districts is used as fuelwood (Tanvir, *et al.*, 2006). Presently the fuelwood consumption in the country is more than 31.6 million m<sup>3</sup> which is cut from forests and forest/farmland plantations. Burning of this wood is not only decreasing carbon stocks but also increasing greenhouse gases in atmosphere.

The role of forests as carbon accumulators has already been noted by United Nations Framework Convention on Climate Change (UNFCCC) and subsequently a new term 'Carbon Sinks' was introduced for forests in Kyoto Protocol (1997). These environmental services are badly hampered with decreasing forestlands irrespective of geographical location and boundaries. Some effects of deforestation are becoming evident in terms of global warming, depletion of ozone layer, long droughts and erratic floods, change in seasons, siltation of hydro-electric dams and downstream water bodies, and accumulation of greenhouse gases. The rampant deforestation rate is badly aggravating these problems.

## 6. Impact of Illegal Logging on Socio-Economic Contributions

Social services of forests are hosting and protecting sites and landscapes of high cultural, spiritual and recreational values. Maintaining and enhancing these functions of forests is an integral part of sustainable forest resource management. The alarming illegal logging situation is making it difficult to maintain these social functions of forests.

Forests have great role in world economy especially in poverty reduction. Illegal logging, on the other hand, contributes directly to increased poverty when people lose their resources and indirectly as a result of reduction in government revenues. Approximately one quarter of the poorest of poor depends on forests for their livelihoods worldwide. Forests cater food, income and social assets (kinship, networks) to forest dwelling communities. Forests have also served as buffer zones for saving the human civilizations in brutal wars. Forests provide employment to over 11 million people around the world. People engaged in forest related industries are more than this figure. In Pakistan, forestry sector provides direct employment to 30,000 persons (circa 7.6% of the total civil servants).

Earnings from the non-wood forest products (NWFP), fuelwood and wildlife are many folds as compared to direct employment. Socially this NWFP and fuelwood collection is important because women and children mostly perform these activities (Panayotou and Ashton, 1992). In Pakistan, the contribution of NWFP in revenue is about 2.2% as compared to industrial roundwood and fuelwood, while it is 29.9% of the industrial roundwood (Figure 2). In case of supply of food and medicines different parts of trees like leaves, fruits, seeds, nuts and berries are used as food and medicines. The trees also provide protection during emergencies and internal and external shocks both to human beings and livestock; provide food and fodder during scarcity periods (Warner, 2000).

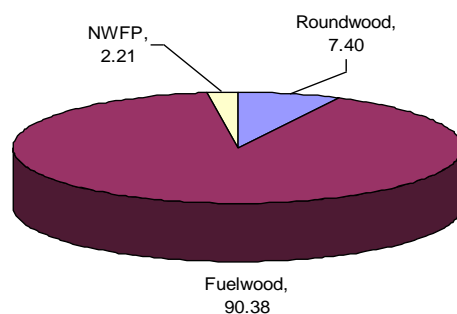


Fig. 2. Percent value of wood and non-wood forest products in Pakistan  
(Source: *Global Forest Resources Assessment, FAO 2005*)

Illegal logging reduces employment opportunities, source of food, other social services as well as government revenues collected through taxes. Tax evasion is a heinous act which affects a society as a whole. It fosters a vicious cycle of bad governance; corrupt individuals gain power through illegal revenues and then may support bad governance to grab revenues and acquire more power. Gresham's law explains this situation well; 'if counterfeit money is not controlled, it will supplant legal tender and lead to monetary anarchy consequently bad practices will likely drive away the good policies' (Johnston and Doig, 1999). The corrupt individuals also create law and order situation by funding national and regional conflicts to divert attention from their misdeeds. The social conflicts with indigenous and local populations lead to violence, crime and human rights abuses.

## CONCLUSION

Illegal logging is a serious issue which has a devastating impact on the world's forests. There are several reasons of illegal logging *inter alia* institutional problems, lack of government capacity to stop illegal logging, corruptive role of business and economics of forest resource management. In Pakistan, illegal logging is causing about 2.02% deforestation per annum and subsequently loss of biodiversity and environmental and



socio-economic services (FAO, 2005). The carbon stocks are depleting considerably while using 31.6 million m<sup>3</sup> of fuelwood is increasing greenhouse gases in the atmosphere. The official ban on harvesting of green trees could not curtail deforestation, contrarily it has increased illegal logging and associated activities, and caused loss to national exchequer. Based on these findings it is suggested that instead of ban on logging, scientific management of forest resources may be resumed to ensure sustainable development of this precious resource.

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