

Report

Significance of Billion Tree Tsunami Afforestation Project and Legal Developments in Forest Sector of Pakistan

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Abstract: The impact of ‘Billion Trees Tsunami Afforestation Project’ (launched by Pakistan Tehreek-e-Insaf (PTI) led Government of Khyber Pakhtunkhwa, Pakistan 2014) on climate change and accordingly the rules, laws and by laws are discussed and evaluated in this paper. The development of immense organic system of the earth, industrialization and deforestation has a fundamental effect on climate which in turn influences the Socio-Economic life of world population. Plantation and forestation has a significant role in controlling the effect of toxic gases which ultimately contribute in controlling global warming. Additionally, laws and bylaws are mandatory for sustainable forestation. The billion tree tsunami afforestation project (BTTAP) is designed in all ecological zones of Khyber Pakhtunkhwa province under the Pakistan Environmental Protection Act (PEPA) 1997 and Khyber Pakhtunkhwa (KP) Environmental Protection Act 2014. The present study is designed to evaluate the national and International efforts for countering the rapidly growing threat of climate change, legal obligations and development in forest sector. This study reveals that BTTAP has a considerable contribution to the Bonn challenge with a pledge of 348,400 hectares with an addition of 252,000 totaling 0.6 million hectares forest cover. After successful maturity, the BTTAP is going to sequester 0.04 Gigatonnes of carbon dioxide by 2020 with an economic benefit of 120 million USD.

Keywords: Climate Change, Global Warming, Plantation, Pakistan Environmental Protection Act (PEPA), Ecological Zones, Billion Tree Tsunami Afforestation Project (BTTAP), Khyber Pakhtunkhwa (KP), Pakistan

1. Introduction

Forest plantations have a significant role in climate change adaptation and mitigation measures [1]. Release of carbon dioxide (CO₂) leads to destruction and degradation of forests, yet forest plantation contributes to mitigation against climate change by removing CO₂ from the atmosphere. Through the process of photosynthesis, the captured carbon is stored in plants and trees. It is stored in this "biomass" until being returned back into the atmosphere, whether through natural processes or human interference, thus completing the carbon cycle. On the other hand, forest is a home for thousands of animal species and different kinds of plants, this species and plant will fade away if the forests are shattered [2].

In public and private sectors plantation of forests and

planting trees are well established. According to recent report FAO 2016, up to 2010 the global forest area covered by plantation forests is 7%. These plantation forests were mostly established in areas that were not under forest cover before, at least in the last three years. Planting trees has a greater contribution towards increasing forested agriculture land and pastures [3].

The growth of plantations under specific conditions is relatively fast thus having more capacity of absorbing CO₂ than natural forests. In undisturbed environment, newly planted or regenerating forests bear the capacity to keep absorbing carbon for 20-50 years or more. In comparison to preventing the loss of natural forests, tree plantation has a limited yet considerable contribution in reducing CO₂ levels in the atmosphere. The tree-planting can remove approximately

101-106 GT of CO₂ per year, That compares to total global greenhouse gas emissions equivalent to 50 GT of CO₂ in 2004 [4].

Recently, different countries all over the world have initiated forest tree plantation in their respective regions to mitigate the impact global warming. For example, the Government of China has allegedly reassigned more than 60,000 arms men to plant trees in an offer to battle contamination by expanding the nation's forests inclusion. It comes as a feature of China's intend to plant somewhere around 84,000 square kilometers of trees before the year 2018 is over, which is generally proportional to the area of Ireland [5]. The main objective of the campaign is to expand the nation's forest inclusion from 21 percent of its aggregate landmass to 23 percent by 2020. Zhang Jianlong, the head officer of China's State Forestry Administration stated that, by 2035 they are trying to put the figure as high as 26 percent [6].

In 2017; volunteers in India planted 66 million trees in only 12 hours in a record-breaking natural drive. Around 1.5 million individuals took part in the big trees planting battle; in that campaign the saplings were set by the side of the Narmada River in Madhya Pradesh province. India submitted in the Paris agreement, to expand its woodland or forest through five million hectares up to 2030 to combat environmental and climate change. Shivraj Singh Chouhan, the chief minister of Madhya Pradesh said, "By planting trees we are serving Madhya Pradesh as well as the world at all [7].

Recently in year 2018, Bangladesh has propelled an across the country super tree planting effort went for tending to combat with environmental changes in the region. The government has reported to plant 3 million trees throughout the country over on the event of National Tree Plantation Campaign and Tree Fair-2018 [8].

In 2014 the KP forest department launched billion tree tsunami afforestation project (BTTAP) and completed in November 2017, under the guide lines of KP forest policy and forest ordinance 2002. It was designed in order to contribute to the Green Growth initiative in the forestry sector of Khyber Pakhtunkhwa Province [9]. The aim of BTTAP is to make contribution in controlling the effects of global warming in Pakistan which ranks seventh on the list of countries most likely to be affected by climate change. The southern and central region, Malakand and Hazara divisions being forest regions of the province, are mostly benefited under this project. The Billion tree tsunami Afforestation project being implemented in the entire province covers its three forest regions including Southern and Central Region, Malakand region and Hazara. Phase 1 of the project costing a total sum of Rs. 1912.0 million was implemented during 2014-15; while Phase 2 was successfully completed during 2015-2017 with a total cost of Rs.2422.72 million. the KP government will allocate an additional Rs.1200million to maintain the project through June 2020 [10]. The details of total release and expenditures are given in table I and II.

The initiative at the same time helped the KP province to fulfill its hectare commitment to the Bonn Challenge an effort to bring 150 million hectares of deforested and degraded land

into restoration by 2020 and 350 million hectares by 2030. This marks the first Bonn Challenge pledge to reach its restoration goal [11].

"The project is naturally restoring a previously deforested landscape, which will assist in meeting present and future needs and offers multiple benefits for climate adaptation and mitigation in a very climate-vulnerable province "The Project Director.

According to official sources the project has successfully achieved its restoration target by a combination of protected natural regeneration (60%) and planned afforestation (40%) [3]. The planted trees are reinforcing riparian embankments in important catchment areas, including along the banks of the Indus, Kunhar and Swat rivers. The project has also added tree resources to agricultural lands currently engaged in farm forestry, improved biodiversity by restoring wildlife shelters, and will contribute to CO₂ sequestration through new tree plantations [13].

According to United Nation Food and Agriculture Organization report 2015 [14], the billion tree tsunami afforestation project aims to turn around deforestation and increase the province forested area by at least 2pc. Years of tree felling have reduced Pakistan's forests to under 2pc of its land area, one of the lowest levels in the region. The KP province is comprised of the remaining 40% forests, and the claim of hitting billion trees goal has successfully achieved recently at the end of 2017 duly confirmed by secretary forest KP, Nazar Hussain Shah during an interview with Ajj news TV channel on 23rd February 2018 [15].

1.1. Objectives of BTTAP

According to the official site of the project [16] instant program's objectives directly contribute to the following sectorial and developmental objectives of the government:

1. Contribution to carbon sequestration leading to control the ongoing global warming and rapid climate change.
2. Forest Conservation and development in addition to other natural resources to meet the needs of local communities for timber, firewood and fodder production.
3. To enhance the income of community from the sales of forest products and services and to create employment opportunities for forest dwelling people with addition of improving of the quality of environment.
4. To increase forest lands productivity in terms of timber, firewood and other multipurpose tree species and increase the rangeland/pastures productivity and other related services and functions contributing towards meeting Pakistan's needs for timber, non-timber forest products.
5. Enhance the protective functions of watersheds for regulating their water regimes, retarding soil erosion and siltation of reservoirs, and protecting downstream agriculture and infrastructure from flood damages.
6. To meet the obligation of related agreements, treaties and conventions at international level including the Climate Change Convention, the Desertification

Convention, Convention on Biodiversity and Agenda 21.

7. Conservation of biological diversity.

1.2. Outcomes of the Project

According to the official site [16] the project has successfully achieved the following outcomes:

1. The government and community owned lands between the natural forests and farmlands have been planted with numerous fast growing tree species. Similarly, under the departmental plantation program, ecologically conducive species have been planted in completely blank designated forests and state lands over 130000 ha.
2. Besides improving and protecting already established closures by 650 VDCs, further closure has been implemented in designated forests at 450 compartments. Consequently 1100 closures get established to improve density of existing degraded forests through inducing and protecting natural regeneration.
3. 30500 hectares (ha) land has been planted through owners on woodlots.
4. Over 2000 ha land along roads, canals and railway tract including motorways have been covered with plantation.
5. Reclamation of 1000 ha saline and water logged areas.
6. 10 degraded watersheds have been planted and rehabilitated.
7. Through soil and water conservation techniques,

bioengineering structures and plantation of drought resistant species a total of 950 ha bad sites (slips, gullies and vulnerable erodible sites) have been rehabilitated.

8. Ten sites of rangelands and pastures have been planted and improved accordingly.
9. Plantation of 70 million seedlings under farm forestry and agro-forestry.
10. Establishment of 365 ha Departmental Nurseries.
11. Establishment of 4000 private forest nurseries through Youths, Women, senior citizens and progressive nursery growers.
12. Establishment of 200 private Forest nurseries through leading interested Non-Government Organizations NGOs.
13. Installation of Shallow water bores along stream systems for watering in Southern Region.
14. Purchase of 280000 fruit plants.
15. Sowing and Dibbling over an area 15000 Ha. In Dibbling special emphasis will be laid on dibbling walnuts in temperate divisions.
16. Purchase of walnut seed and it's dibbling over land in Kohistan, Chitral, Kaghan and other suitable temperate forests in closures especially along riparian systems.
17. 1000 ha collection, and sowing of seed of hard species in hyper dry areas.
18. Installation of donkey pump along the stream in Chitral forest division.

Table 1. Total releases and expenditures Phase-I [17].

| DDOs/Code | Division | Total Released of Phase-I | Phase-I Release 2014-15 | Phase-I Release 2015-16 | Phase-I Exp 2015-16 | Deviations |
|----------------------------|-----------------------------|---------------------------|-------------------------|-------------------------|---------------------|-------------|
| DFO Mardan, MR5112 | Mardan | 115,473,000 | 43,550,000 | 71,923,000 | 71,923,000 | - |
| DFO Nowshera, NR5083 | Peshawar | 153,225,000 | 50,500,000 | 102,725,000 | 102,725,000 | - |
| DFO Kohat, KT5076 | Kohat | 75,964,716 | 48,000,000 | 27,964,716 | 27,964,716 | - |
| DFO Bannu, BU5076 | Bannu | 80,572,000 | 47,820,000 | 32,752,000 | 32,752,000 | - |
| DFO D. I. Khan, DI5098 | D. I. Khan | 104,214,000 | 48,820,000 | 55,394,000 | 55,394,000 | - |
| DFO Haripur, HR5076 | Haripur | 40,004,500 | 16,497,500 | 23,507,000 | 23,506,974 | 26 |
| DFO Galies, AD5088 | Galies | 54,782,500 | 21,462,500 | 33,320,000 | 32,000,000 | 1,320,000 |
| | Daur W/Shed | 72,055,750 | 17,641,750 | 54,414,000 | 55,734,000 | (1,320,000) |
| | Siran | 42,752,000 | 21,504,000 | 21,248,000 | 21,248,000 | - |
| DFO Mansehra, MA5262 | Kaghan | 50,789,750 | 20,999,750 | 29,790,000 | 29,790,000 | - |
| | AgrorTanawal | 51,488,000 | 13,830,000 | 37,658,000 | 37,658,000 | - |
| | Unhar W/Shed | 52,520,750 | 19,764,750 | 32,756,000 | 32,756,000 | - |
| DFO Torghar, TG5041 | Kunhar W/Shed | 70,930,750 | 27,536,750 | 43,394,000 | 43,394,000 | - |
| | Torghar | 31,975,000 | 15,151,000 | 16,824,000 | 16,821,999 | 2,001 |
| DFO Batagram, BM5059 | Hazara Tribal | 40,308,000 | 12,884,000 | 27,424,000 | 27,424,000 | - |
| DFO Lower Kohistan, KD5024 | Lower Kohistan | 6,730,000 | 4,550,000 | 2,180,000 | 2,180,000 | - |
| | Upper Kohistan | 9,360,000 | 7,360,000 | 2,000,000 | 2,000,000 | - |
| DFO Swat, SW5101 | Swat Forest Division | 93,687,000 | 30,850,000 | 62,837,000 | 62,837,000 | - |
| | Kalam Forest Division | 46,688,000 | 11,350,000 | 35,338,000 | 35,338,000 | - |
| DFO Batkhela, MD5062 | Malakand Forest Division | 94,237,000 | 16,050,000 | 78,187,000 | 78,187,000 | - |
| | Buner Forest Division | 43,888,000 | 15,900,000 | 27,988,000 | 27,988,000 | - |
| DFO Buner, BD5015 | Buner W/Shed | 51,959,030 | 21,790,750 | 30,168,280 | 30,168,186 | 94 |
| | Alpuri Forest Division | 44,286,000 | 12,570,000 | 31,716,000 | 31,716,000 | - |
| DFO Alpuri, SH5021 | Kohistan W/Shed | 54,114,750 | 19,243,750 | 34,871,000 | 34,871,000 | - |
| | DirKohistan Forest Division | 35,184,000 | 19,125,000 | 16,059,000 | 16,059,000 | - |
| DFO Upper Dir, DP5072 | Upper Dir Forest Division | 52,827,000 | 27,386,000 | 25,441,000 | 25,441,000 | - |
| | Lower Dir Forest Division | 98,802,000 | 27,649,000 | 71,153,000 | 71,153,000 | - |
| DFO Chitral, CL5030 | Chitral Forest Division | 61,068,943 | 21,287,943 | 39,781,000 | 39,781,000 | - |
| PMU PR-5279 | PMU Office | 85,295,557 | 55,295,557 | 30,000,000 | 30,000,000 | - |
| | Total Rs. | 1,815,182,996 | 716,370,000 | 1,098,812,996 | 1,098,810,875 | 2,121 |

Table 2. Releases and expenditures of Phase-II [18].

| DDOs/Code | Division | DDO | Release Division | Phase-II Exp 2015-16 | Releases 2016-17 |
|----------------------------|------------------------------|---------------|------------------|----------------------|------------------|
| DFO Mardan, MR5112 | Mardan | 64,913,000 | 64,913,000 | 64,913,000 | 102,000,000 |
| DFO Nowshera, NR5083 | Peshawar | 60,618,000 | 60,618,000 | 60,618,000 | 100,000,000 |
| DFO Kohat, KT5076 | Kohat | 120,665,000 | 120,665,000 | 120,665,000 | 120,000,000 |
| DFO Bannu, BU5076 | Bannu | 121,450,000 | 121,450,000 | 121,450,000 | 135,000,000 |
| DFO D. I. Khan, DI5098 | D. I. Khan | 198,417,000 | 198,417,000 | 198,417,000 | 201,000,000 |
| DFO Haripur, HR5076 | Haripur | 89,817,000 | 89,817,000 | 89,816,000 | 61,000,000 |
| DFO Galies, AD5088 | Galies | 241,363,000 | 136,363,000 | 136,003,000 | 24,910,000 |
| | Daur W/Shed | | 105,000,000 | 105,000,000 | 45,000,000 |
| | Siran | 488,249,000 | 88,189,000 | 88,168,000 | 32,000,000 |
| | Kaghan | | 71,060,000 | 71,060,000 | 23,000,000 |
| DFO Mansehra, MA5262 | Agror Tanawal | | 68,000,000 | 68,000,000 | 32,980,000 |
| | Unhar W/Shed | | 133,000,000 | 114,106,830 | 53,000,000 |
| | Kunhar W/Shed | | 128,000,000 | 146,893,170 | 45,000,000 |
| DFO Torghar, TG5041 | Torghar | 76,394,000 | 76,394,000 | 76,487,000 | 16,850,000 |
| DFO Batagram, BM5059 | Hazara Tribal | 68,000,000 | 68,000,000 | 70,058,000 | 17,960,000 |
| DFO Lower Kohistan, KD5024 | Lower Kohistan | 14,641,000 | 5,281,000 | 5,281,000 | 14,000,000 |
| | Upper Kohistan | | 9,360,000 | 9,360,000 | 16,000,000 |
| DFO Swat, SW5101 | Swat Forest Division | 201,541,712 | 118,292,712 | 118,293,000 | 46,577,000 |
| | Kalam Forest Division | | 83,249,000 | 83,249,000 | 22,470,000 |
| DFO Batkhela, MD5062 | Malakand Forest Division | 146,000,000 | 146,000,000 | 146,000,000 | 69,640,000 |
| DFO Buner, BD5015 | Buner Forest Division | 146,590,000 | 46,590,000 | 46,589,960 | 61,040,000 |
| | Buner W/Shed | | 100,000,000 | 100,000,000 | 45,000,000 |
| DFO Alpuri, SH5021 | Alpuri Forest Division | 223,132,000 | 89,132,000 | 89,132,500 | 28,480,000 |
| | Kohistan W/Shed | | 134,000,000 | 134,000,000 | 45,000,000 |
| DFO Upper Dir, DP5072 | Dir Kohistan Forest Division | 111,000,000 | 55,000,000 | 55,000,000 | 39,540,000 |
| | Upper Dir Forest Division | | 56,000,000 | 53,000,000 | 41,600,000 |
| DFO Lower Dir, DA5031 | Lower Dir Forest Division | 48,437,500 | 48,437,500 | 48,437,500 | 49,760,000 |
| DFO Chitral, CL5030 | Chitral Forest Division | 45,305,000 | 45,305,000 | 45,304,700 | 35,280,000 |
| PMU PR-5279 | PMU Office | 96,132,500 | 96,132,500 | 96,132,500 | 37,363,000 |
| | Total RS. | 2,562,665,712 | 2,562,665,712 | 2,561,435,160 | 1,561,450,000 |

Table 2. Continued.

| DDOs/Code | Division | Expenditure 2016-17 | Total Phase-II Releases during 2015-16 & 2016-17 | Total Phase-II Expenditure during 2015-16 & 2016-17 |
|----------------------------|------------------------------|---------------------|--|---|
| DFO Mardan, MR5112 | Mardan | 101,843,280 | 166,913,000 | 166,756,280 |
| DFO Nowshera, NR5083 | Peshawar | 99,802,180 | 160,618,000 | 160,420,180 |
| DFO Kohat, KT5076 | Kohat | 119,940,690 | 240,665,000 | 240,605,690 |
| DFO Bannu, BU5076 | Bannu | 134,987,800 | 256,450,000 | 256,437,800 |
| DFO D. I. Khan, DI5098 | D. I. Khan | 199,399,250 | 399,417,000 | 397,816,250 |
| DFO Haripur, HR5076 | Haripur | 39,788,891 | 150,817,000 | 129,604,891 |
| DFO Galies, AD5088 | Galies | 22,910,000 | 161,273,000 | 158,913,000 |
| | Daur W/Shed | 45,000,000 | 150,000,000 | 150,000,000 |
| | Siran | 20,350,263 | 120,189,000 | 108,518,263 |
| | Kaghan | 23,000,000 | 94,060,000 | 94,060,000 |
| DFO Mansehra, MA5262 | Agror Tanawal | 26,839,059 | 100,980,000 | 94,839,059 |
| | Unhar W/Shed | 33,006,869 | 186,000,000 | 147,113,699 |
| | Kunhar W/Shed | 45,000,000 | 173,000,000 | 191,893,170 |
| DFO Torghar, TG5041 | Torghar | 13,849,652 | 93,244,000 | 90,336,652 |
| DFO Batagram, BM5059 | Hazara Tribal | 14,960,000 | 85,960,000 | 85,018,000 |
| DFO Lower Kohistan, KD5024 | Lower Kohistan | 7,753,000 | 19,281,000 | 13,034,000 |
| | Upper Kohistan | 16,000,000 | 25,360,000 | 25,360,000 |
| DFO Swat, SW5101 | Swat Forest Division | 45,849,598 | 164,869,712 | 164,142,598 |
| | Kalam Forest Division | 22,470,000 | 105,719,000 | 105,719,000 |
| DFO Batkhela, MD5062 | Malakand Forest Division | 59,957,593 | 215,640,000 | 205,957,593 |
| DFO Buner, BD5015 | Buner Forest Division | 60,811,500 | 107,630,000 | 107,401,460 |
| | Buner W/Shed | 45,000,000 | 145,000,000 | 145,000,000 |
| DFO Alpuri, SH5021 | Alpuri Forest Division | 28,480,000 | 117,612,000 | 117,612,500 |
| | Kohistan W/Shed | 45,000,000 | 179,000,000 | 179,000,000 |
| DFO Upper Dir, DP5072 | Dir Kohistan Forest Division | 39,540,000 | 94,540,000 | 94,540,000 |
| | Upper Dir Forest Division | 29,766,788 | 97,600,000 | 82,766,788 |
| DFO Lower Dir, DA5031 | Lower Dir Forest Division | 34,035,473 | 98,197,500 | 82,472,973 |
| DFO Chitral, CL5030 | Chitral Forest Division | 34,806,519 | 80,585,000 | 80,111,219 |
| PMU PR-5279 | PMU Office | 28,726,435 | 133,495,500 | 124,858,935 |
| | Total RS. | 1,438,874,840 | 4,124,115,712 | 4,000,310,000 |

2. The Economic Benefits of BTTAP and Contribution in CO₂ Sequestration

Today's world is facing with serious climate change issues which is red alarm for the future generation, but Actually climate change is a dilemma of the environmental burden of Human being daily actions and movements [19]. Different countries have different programmes to combat climate change and global warming. Pakistan's province KP also struggle to control or slow down the pace of global warming by tree plantation project called BTTAP. The KP government finished its billion trees project in November 2017. BTTAP and Bonn Challenge, put together to replenish 350 million hectares worth of land within the next 12 years, is that much closer to completion.

According to the World Bank estimate, Rs. 365 billion a year cost is amounted to Pakistan economy because of the neglecting and degradation of environmental [20]. The BTTAP approaching goal to hit the 150-million mark "will create approximately \$84 billion per year in net benefits that could bring direct additional income opportunities for rural communities". according to the International Union for the Conservation of Nature (IUCN) "Achieving the 350 million hectare goal will generate about \$170 billion per year in net benefits from watershed protection, improved crop yields and forest products, and could sequester up to 1.7 gigatonnes of carbon dioxide equivalent annually [21].

The billion tree tsunami project will definitely contribute in sequestering a considerable amount of carbon dioxide. If the billion trees mature successfully, it could sequester 0.04 Gigatonnes of carbon dioxide by 2020 and economic benefit worth of 120 million USD [22]. Image by IUCN.

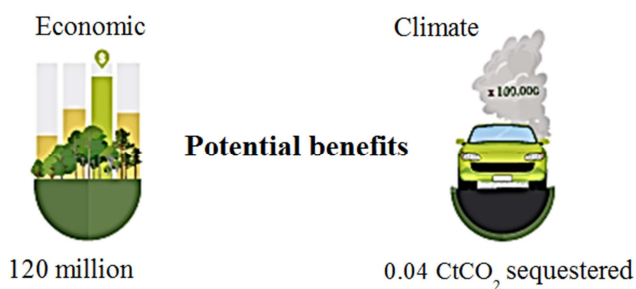


Figure 1. Economic and climate benefit of BTTAP.

3. REDD⁺ (Reducing Emissions from Deforestation and Forest Degradation)

In 2005 REDD⁺ was first discussed under the United Nations Framework Convention on Climate Change (UNFCCC) with the idea or plan of climate change mitigation through reducing the net discharge of greenhouse gases via improved and developed forest organization in developing nations. The majority decisions of REDD⁺ be accomplished in 2013, with the concluding parts of the rulebook completed in 2015 [23].

The government of KP is also in the course to set of laws for REDD⁺, a ground-breaking international monetary mechanism that aims to repeal deforestation through providing cashable carbon value for forests position. According to first round estimation and dependence on the universal carbon regime, the KP's forests can produce the amount of \$6-800 million throughout carbon credit from standing forests. Once again the idea to developed and increase the forest is not for timber purpose but for the better services of environment. A total ban on forest cutting and felling in the reserved forest of KP is already obligatory but the forest of community is subject for scientific supervision which is based on working plans.

4. Legal Developments in Forest Sector of Pakistan

In 1955 the first forest policy of Pakistan was announced, after that the forest policies of 1962, 1975, 1980, 1988, 1991 and 2002 were developed time to time. The current draft of "national forest policy 2005, ministry of environment, government of Pakistan" was announced in 2005 [24].

A significant development has been observed in the environmental law of Pakistan for the last twenty years. Management in the field of biological and other natural resources and countering pollution has developed to a greater extent. The practicing legal instruments related to environmental law in Pakistan is based on 125 years old legislation. The law has a wider domain ranging from species to sectors to activities. The forest sector of Pakistan governs the utilization or limitations of forest resources in order to contribute to the national security. Although having considerable legal developments still Pakistan is lacking a concrete federal law that could ensure management of forests as ecosystems or landscapes, conservation of flora and fauna of endangered species protection in forests.

The 1927 forest Act, was exercised throughout the country excluding northern Baluchistan (The Forest Regulation 1890 of Baluchistan being applicable) till 1991. The law was not applicable in all northern areas of Pakistan until and after passing a number of notifications in 1991 and consequently the law was extended to all northern parts of the country. But still the law is silent about the Federally Administered Tribal Areas which covers 2.76 million hectors of the land. Even the law is not applicable in KP province. The KP province passed its own Forest ordinance in 2002. Although in the provincial list of 1935 British Indian act and 1956 constitution included the forest subject but was not neither parts of the Central Legislative List of the 1962 the legislative lists of the 1973 Constitution. Consequently being part of provincial matters, the provincial assemblies have the legal authority for any amendment in the 1927 Forest Act or can develop new forestry laws for according to the need of respective provinces. In light of the aforementioned provincial jurisdiction the KP province has recently passed forest ordinance 2002 [21].

4.1. Indian Forest Act 1927

The Indian forest act 1927 [25] provides a wide range of legal instruments ranging from growing different kinds of forest and empowers provincial government to uphold the ownership of public or private forest land. The law does not allow any type human activities or animal involvement in the forest which could be a threat to the forest reserved land. The Government may declare reservation of the already existed public or private forests through notification in the official gazette. (Section 3)

The section 26 prohibits any type of cultivation in the reserved forest. Furthermore grazing, trespassing, land clearing, cutting trees and collecting forest products are strictly prohibited. Similarly the restriction of hunting and poisoning the water is also part of the section 26. Whoever found guilty in these activities would be punished with six months imprisonment and/or would be fined 500 rupees. Moreover the wrongdoers would be bound to compensate for the damages. Section 26 prohibits setting fires in forests and empowers the government to suspend all the rights in the affected area either the fire is set intentionally or unintentionally.

The section 28 extends rights to a village community in a reserved forest known as village forests; however government has full authority to develop rules and regulations for such forests. Section 29 declares the wasteland and public forests that are not declared as reserved protected forest.

Similarly declaration of trees or classes of trees, closing whole or any part of a forest and ban on mining, clearing and taking away of forest produce comes under section 30. The community rights may be suspended in such forests, provided the remainder of such forest is enough, and in the locality is convenient, for the due exercise of the rights suspended in the portion so closed section 30(b). This clarifies that government must take the rights holders into confidence before taking any decision regarding closure of private forests.

Besides public forests and wasteland, section 35 of the Act empowers the forest sector officials for regulation of privately owned forests in special circumstances including protection of forests from floods or landslides, soil conservation safeguarding infrastructure, preserving watersheds and maintaining public health facilities. Under the aforementioned conditions, the government has powers to regulate the affected forest land and may get hold on such lands for the utility of community (Section 37).

The forest and police departments enjoy the powers to arrest criminals without a warrant (Section 64). Similarly they have the powers to release the culprit on bond (Section 65) and can even put off a forest offense being committed (Section 66).

Section 72 of the act gives extra powers for land survey, issuing search warrants, do inquire forest offences and force the turnout of witnesses and record evidence. A collective duty to provide evidences regarding forest offences in the relevant areas and to protect or extinguish fires comes under section 79 of the act.

4.2. Cutting of Trees (Prohibition) Act 1992

The act being related to security of borders prohibits cutting trees and defines demarcation zones near the international borders of Pakistan. Permission from the concerned authorities is mandatory for cutting trees in these areas. Under this act the provincial government holds all the powers including designing rules and demarcating zones in border areas. The Provincial government officers being authorized can enter survey and map the land [26].

4.3. Khyber Pakhtunkhwa (KP) Forest Ordinance 2002

BTTAP was implemented under the guidelines of KPK forest ordinance 2002 [27]. This ordinance replaces all the former acts including the 1927 one, and the separate Hazara regulation. It explains the procedures for demarcation of reserved and protected forests.

Para (1) (c) of the ordinance states that government has to appoint a Forest Settlement Board to enquire into and determine the existence, nature and extent of any rights, alleged to exist in favour of any person in or over any land comprised within such limits or forest produce there from, and to deal with the same.

According to Para (2) this board consists of (i) A Revenue Officer not below the rank of a Collector; Chairman (ii) the Divisional Forest Officer concerned; and (iii) two representatives of the community based organization or village based organization. (iv) the representatives of the community shall be selected by the concerned community."

Para (6) in the manner of 1927 Act describes the need to inform in vernacular language, the period of three months, etc. however as compared to the 1927 act it is somehow new in the context of extended reference to participation.

Para (3) specifies the guiding principles of the ordinance and describes among others; (1) (c) deals with the involvement of community and other interested groups in the forest management plans and formulation and implementation of forest policies, (2) (d) indicates effective involvement of communities in the sustainable development and secure their rights and duties. (e) The government's role in forest for sustainable development shall be focused on formulating management plans, identifying the objectives and criteria, evaluating progress, encouraging education and research, and granting instruction services, while interested parties shall be promoted to lead the developmental activities where people are the forest owners or where they have major rights in forests.

Para 101 also mentions that DFO may assign to any village forest community, village organization, Joint Forest Management Committee constituted in the prescribed manner all or any of its rights of management over any protected forest, Guzara forests, and protected wasteland, and may cancel such assignment, or such agreement, as the case may be, if he is of the opinion that such revocation is in the interest of forest conservancy. All forests so assigned shall be called community forest.

Para 102 Joint forest management (1) specifies the sections

98 and 99; the Forest Officer may manage all forests and their concerned organizations in accordance with certain procedures and on terms and conditions as may be appropriate and considered fit.(2) In the context of sub-section (1), the Forest Officer may enter into any agreements related to concerned organizations and staff of the forest department.(3) Forest Officer may cancel any such management or agreement if he considers such cancellation in the better interest of forest conservancy.

Thus a more forestry form of forest governance and a forest use that also caters for needs of local community is possible, *de jure*.

5. International Environmental Laws and Forests

In International law, a state has the right to apply their domestic laws on their forest to make it appropriate for a positive use, like dividing timber and land resources and without others use [28]. There are a considerable number of legal instruments which directly and indirectly relate to the forests of any one country. For example, Wisdom (2001) cites 144 international agreements relating to natural resources of which the USA is a signatory. International forest organizations such as the Food and Agriculture Organization (FAO) and collaborative partnership on forests recognize the need for closer collaboration between key international conventions related to forests, such as the UN framework convention on climate change, the convention on biological diversity, and the UN convention to combat desertification. This makes it all the more important for those involved with forest related issues and the law to have a comprehensive understanding of which articles of each convention relate to forests. But still drafting of forest laws or modifying the old ones, each country considers global experience. A systematic control in this context is difficult because of greater difference not only in nature, importance and role of the forest resources among the states but also variations in their legal and institutional settings. Consequently unlike other domains of law, forest law does not provide any legal instrument that can be easily adopted from state to state. Despite of many comparative existed comparative studies a direct practical guidance for evaluation and improvement of forest law is still lacking. Forest laws being remained non-isolated, their association with other laws has made them complex. The forest laws have been developed in aspiration with other types of laws which are increasingly imposed for management and use of forests. The connection between forest and environmental laws is significant because of the growing complexity in forest legislation [29].

Actual practices vary from country to country. In USA and Canada most of the woodland is owned by the states and is leased out to private producers in a systematic way. In India the forests were declared as “wasteland” and consequently people have no ownership. Similarly in Indonesia forests are declared as a state property but are dealt as private in practice

while community has no access to forest in Brazil due to lack of national government. Whatever the case maybe, public forests serve as natural national resource and are the sole property of state. In this context the protection and management of forests is closely related to the timber production and other commodities that create capital and jobs, and mostly the economy of large regions are entirely dependent on natural resources from these forests [30].

In Eastern European countries, new forest laws are adopted in accordance with market transition which effect ownership and management of forests institutionally. Various countries in Western Europe have developed new forest legislation in accordance with changing economic conditions, new social demands and more political participation of interest group and citizens at local levels [31].

5.1. Socio-Economic Aspects

Forest laws in the European countries elaborate and formulate understanding for the sustainable utility of natural resources according to the socio-economic conditions of the region. Sustainable forest management depends upon the local conditions and their importance has considerably changed with the passage of time. At present, the forestry practices which value the natural potential of ecosystem and maintain forest diversity in their typical landscapes are understood as sustainable management. These provide numerous ways to enhance production of wood and protect the environment [32].

5.2. Uses of Forest Regulations

The Forests clearing rate that increased for the purpose of agriculture, export market logging, use as a fuel, timber and fiber are warning for the performance of forest in environmental purpose [33]. For more than one generation, the use of forests in terms of public provisions is perhaps among the oldest form of long-term environmental policies. In the 14th century the already codified customary law was utilized for regulation forest uses in accordance with the demands and options of various times. Numerous forest and timber ordinances are developed since the 16th century. Concrete better policies were at stake in order to fulfill local needs, access to raw materials and energy, and increased outputs. Requirement of continuous flow of wood production were established through legislation, which meant stopping exploration and development of available resources. The long lasting nature of forests and promotion for the association of several generations were recognized in forest activities. Furthermore it contributed to planning and management and measures for regeneration and reforestation. Forest laws gradually paved way to principles of renewable natural resources utilization for sustainability as we understand it today [34].

6. Conclusion

The Billion Tree Tsunami Afforestation Project is KP provincial government project being launched and implemented

under forest ordinance 2002 of KP forest policy and one billion trees have been planted successfully in november 2017. This project has a great contribution in restoration of forests as 2% of deforested land area will be recovered. After 40 years the new planted tress will contribute in controlling pollution locally and global warming. Economically 120 million US dollars will be generated as a revenue while the new planted trees will sequester 0.04 Gt CO₂ as a climate benefit. as climate change is a big threat to the future so the project has been recognized by bonn challenge the target of which is to grow 150 million hacters of the world degraded and deforested land by 2020 and 350 million hacters by 2030. The BTTAP would contribute to the bonn challenge with a pledge of 348400 hacters.

As we know the legal instruments are mendatory for the sustainable growth, restoration and protection of forests which changes from country to country. There is no concrete federal forest law in Pakistan had been excersising 1927 act of british India and then the 1992 act after independence. However the BTTAP was launched under the guidelines of KP forest ordinance 2002. The Forest ordinance 2002 passed by the provincial assembly of Khyber Pakhtunkhwa elaborates the demarcation of reserved and protected forests, management of forest department and nature and rights of people. Although the ordinance protect forests but still it has some flaws which needs to be adressed. Under this act the forest department is enjoying powers beyond their limits. Surprisingly the department has given the powers to directly arrest a person involved in timber smuggling. Even a local forest guard has the authority to shoot a person under harsh conditions, however it comes under the jurisdiction of police department to arrest a criminal after being informed by the forest department. Secondly the ordinance is rigid regarding the ownership of forests. Fourty percent of the total forests of the country are in the KP province and people were enjoying the ownership for many decades. All efforts for susutainable protection of forests seems to be useless without the involvement of local community. as most of the people use forests as their only source of income, the Government is supposed to give alternatives to the local community.

Keeping in view the aforementioned discussion on legal aspects of forests some recommendations are hereby proposed for sustainable growth and protection of forests.

7. Recommendations

1. The government should replace the KP forest ordinance 2002 with a reasonable forest policy which should be prepared in consultation with all stakeholders and forest owners to resolve all the issues amicably.
2. The royalty payment should be distributed equally in all districts of KP, as in some areas of malakand division , forest owners given 60 percent royalty but in majority of the areas it was 80 percent.
3. Awarness and advocacy campaign regarding forest protection and reservation are mandatory in the forest areas.
4. Reforms in forest department are necessary for transparent and corruption free management.
5. In the future forest policy, Provision for the coordination and cooperation of volunteer should be in corporate, which join hands with government in the forest management.
6. Pakistan is a federal state and forest department is a provincial matter, so the management, planning, execution and implementation of the forest are vested in provincial Forest department, but policy making is a federal responsibility. So there is a lot of misunderstanding among the province and state, it is therefore recommended that some steps should be taken to improve coordination between center and provinces.
7. There should be a flexible forest policy which to be adopted in a local level. It is therefore recommended there should be decentralized forest management at district level.

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