THE WORLD BANK ENVIRONMENT AND NATURAL RESOURCES GLOBAL PRACTICE SOUTH ASIA REGION

FORESTS FOR GREEN PAKISTAN:
FOREST POLICY NOTE

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ACRONYMS

ADB	Asian Development Bank
AJK	Azad Jammu and Kashmir
BTTAP	Billion Tree Tsunami Afforestation Program
DFO	Divisional Forest Officer
FAO	Food and Agriculture Organization
FATA	Federally Administered Tribal Areas
FCPF	Forest Carbon Partnership Facility
FSMP	Forestry Sector Master Plan
GB	Gilgit-Baltistan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GPP	Green Pakistan Program
ICIMOD	International Centre for Integrated Mountain Development
IUCN	International Union for Conservation of Nature
KP	Khyber Pakhtunkhwa
MoCC	Ministry of Climate Change
MoE	Ministry of Environment
NDC	Nationally Determined Contribution
NGO	Nongovernmental Organization
NTFP	Non-Timber Forest Product
OIGF	Office of Inspector General of Forests
PES	Payment for Environmental Services
PFI	Pakistan Forest Institute
REDD+	Reducing Emissions from Deforestation and Forest Degradation, and Foster Conservation, Sustainable Management of Forests, and Enhancement of Forest Carbon Stocks
UNDP	United Nations Development Programme
WAPDA	Water and Power Development Authority
WWF	World Wildlife Fund

All dollar amounts are U.S. dollars unless otherwise indicated.

EXECUTIVE SUMMARY

The forest cover in Pakistan is low. The latest forest assessment from 2011 estimates 4.47 million ha of total forest area in the country, or 5.1 percent of the total land area (Bukhari, Laeeq, and Ali 2012). Distribution of forests varies by province and other administrative area; it is highest in Khyber Pakhtunkhwa (32.7 percent), followed by Sindh (14.8 percent), Punjab (12.4 percent), Federally Administered Tribal Areas (11.9 percent), Balochistan (11.1 percent), Azad Jammu and Kashmir (9.6 percent), and Gilgit-Baltistan (7 percent).

Pakistan does not have a system for regularly and consistently assessing, monitoring, and sharing data on forest cover, growing stock, and supply and demand of forest products. Limited data show that Pakistan's forest resources have been decreasing and degrading over the last few decades due to unsustainable management and exploitation of available forest resources. Deforestation in natural forests is taking place at the rate of 0.75 percent, or 27,000 ha per year (FAO 2009). The limited forest resources have been unable to meet the demand for forest products in the country, which far exceeds the current level of sustainable domestic supplies.

The forestry sector contributes to Pakistan's national economy by creating employment opportunities and generating taxes and revenues. However, such benefits are yet to be studied thoroughly and evaluated quantitively. Qualitatively, the sector provides forest products and related employment opportunities that are key to rural livelihoods and economic development. For example, according to the Food and Agriculture Organization (FAO 2009), 68 percent of the country's population depends on firewood as a major source of household energy and about 100,000 people are involved in the fuelwood trade, generating about PKR 11.3 billion ($113 million) annually. In addition, more than 500,000 workers are employed by forest industries and about 80 percent of the people living in rural areas depend on non-timber forest products to supplement their incomes. Ecologically, forests provide critical ecosystem services (e.g., water regulation, sediment control, and biodiversity conservation) that are fundamental to the sustainability and resilience of Pakistan's future development. Socially, forests are closely linked to gender issues in rural Pakistan.

Pakistan's forests are in the domain of provincial governments. With the promulgation of the 18th Amendment to the Constitution in 2010, large sets of responsibilities were transferred from the federal Ministry of Environment to the local level. Provincial forest departments, with their varying capacities, strengths, and priorities, now have the key role in managing forest resources.

Pakistan's forest policies and legal frameworks are outdated, however, both at the national and provincial levels. The Pakistan Forest Act 1927 is the principal piece of forestry legislation, and forest management departments continue to prioritize timber production. In principle, production forests are managed according to the working plans, which are developed under approved working plan codes from the 1930s; in practice, not all production forests have working plans. In addition, no management plans are prepared for non-production forests.

The federal Ministry of Climate Change promulgated the National Forest Policy of 2015, which is a positive development. The policy aims at serving as an umbrella forest policy to support provincial forest policies. Its adoption at the provincial level, however, is yet to happen.

Historically, the forestry sector has been a low development priority and has received limited investments. Budget allocations for this important sector is normally less than one percent of most provincial budgets. The launching of the ambitious Billion Tree Tsunami Afforestation Program ($150 million) in Khyber Pakhtunkhwa and the Green Pakistan Program ($36 million), however, shows the government's recognition of the importance of the forestry sector. This is also hopefully the beginning of needed policy shifts for the sector.

The World Bank supported Pakistan's forestry sector until 2000, and then remained disengaged until 2015. Few other donors—primarily the United Nations Development Programme, the Food and Agriculture Organization, and international non governmental organizations such as World Wildlife Fund, International Union for Conservation of Nature, and International Centre for Integrated Mountain Development—maintained support on a small scale.

Since 2015, the World Bank has been supporting Pakistan with $7.4 million to help the country prepare for reducing emissions from deforestation and forest degradation through technical studies, consultations, and capacity-building activities.

Long-term forest investments are required to harness the huge potential of forest contributions to resilient ecosystems, rural livelihoods, the national economy, and the global environment. In recent years the government has augmented its attention to forests, as demonstrated by the nationally determined contribution, the Green Pakistan Program, and the Billion Tree Tsunami Afforestation Program. Future support is needed to enhance and scale up these new and important initiatives in order to strengthen landscape management, reduce poverty and improve livelihoods, and foster private sector development.

The following three broad areas have been identified for future support to address current challenges in the sector:

- **Policy Interventions**
  - o Support to implement the National Forest Policy 2015, to devise and implement participatory policies in the provinces
  - o Strengthen the coordination mechanism among the provincial and federal institutions for effective management and coordination
  - o Create a conducive policy environment for private sector participation in the forestry sector
- **Technical and Institutional Capacity Building**
  - o Continue supporting the Forest Management Information System
  - o Support forestry research, education, knowledge sharing, and capacity building
- **Investments**
  - o Increase forest cover for socioeconomic and environmental benefits through afforestation, agroforestry, and plantations
  - o Promote forest-based entrepreneurship and livelihood support
  - o Improve forest management practices and sustainable management of existing forests

The significant role of the forestry sector in Pakistan's national economy, and in supporting rural livelihoods, poverty reduction, sustainable development, climate change mitigation and adaptation, and resilience to vulnerabilities related to climate change and natural disasters, warrants support from the donor community, including the World Bank. The potential forest investment can build on the enabling environment that the ongoing REDD+ Readiness Project is creating.

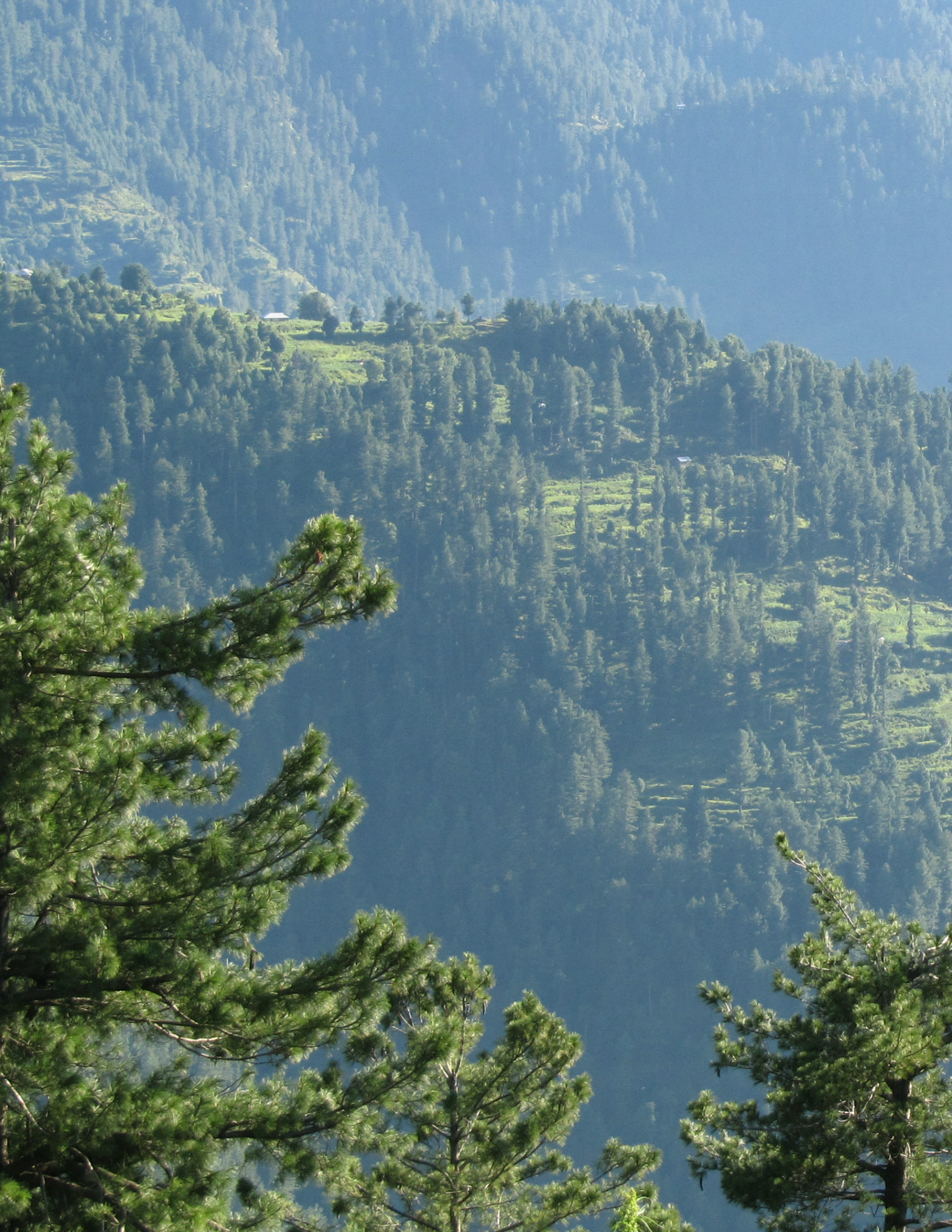
Given the institutional and regulatory complexity of forest management issues in Pakistan, initial engagements should focus on relatively simpler tasks (such as increasing the forest cover for multiple benefits) and gradually move to more challenging tasks (such as sustainable management of existing forests and addressing such issues as land tenure, human-wildlife conflict, and conservation management).

CHAPTER 01
INTRODUCTION TO THE COUNTRY

Pakistan is the 33rd largest country in the world, spanning 79.6 million ha (Government of Pakistan 2016). It is also the sixth most populous country with 207 million people, of which 61 percent reside in rural areas and 39 percent in urban areas. It is a middle-income country with a per capita gross domestic product of $1,468 in 2016. Pakistan is mainly a dry land, with 80 percent of its land in arid and semiarid zones. It has a continental type of climate characterized by extreme variations of temperature seasonally and daily.

Pakistan is a federation that comprises four provinces and three administrative areas. The provinces are Punjab, Sindh, Khyber Pakhtunkhwa (KP), and Balochistan, and administrative areas are the Federally Administered Tribal Areas (FATA), Gilgit-Baltistan (GB), and Azad Jammu & Kashmir (AJK). The 18th Constitutional Amendment in 2010 enhanced provincial autonomy; as a result, 43 departments in 18 ministries were devolved to the provinces.

Pakistan is one of the countries that is most vulnerable to climate change. The Global Climate Risk Index from 1996 to 2015 prepared by German watch found Pakistan the seventh most affected country in the world. The National Disaster Management Authority reports that extreme climate events (1994–2013) caused $4 billion per year in economic losses (Government of Pakistan 2016). The last five floods (2010–2014) resulted in monetary losses of over $18 billion, with 38.12 million people affected, 3.45 million houses damaged, and 10.63 million acres of crops destroyed (Government of Pakistan 2016).



CHAPTER 02
STATUS OF FOREST RESOURCES IN PAKISTAN

The forest cover in Pakistan is extremely low as a percentage of total land area. In absolute terms, however, Pakistan has more forest area than Afghanistan, Bangladesh, or Maldives. Pakistan does not have a system of regularly and consistently assessing, monitoring, and sharing data on forest cover, growing stock, and supply and demand for forest products. Limited data show that Pakistan's forest resources have been decreasing and degrading over the last few decades due to unsustainable management and use of available forest resources.

The latest forest assessment, from 2011, estimates 4.47 million ha of total forest area in the country (5.1 percent of the total land area) (Bukhari, Laeeq, and Ali 2012). Distribution of forests varies by province and other administrative area. In absolute terms (that is, the percentage of forest area to total forests in the country), KP is the richest (32.7 percent), followed by Sindh (14.8 percent) and Punjab (12.4 percent) (see Table 1 for details). In relative terms (that is, the percentage of forest area to total area of the respective province or administrative area), however, the top three provinces or other administrative areas are AJK (35.1 percent), KP (19.6 percent), and FATA (19.2 percent). See Annex A for a comparison of province by province forest area estimates from various studies.

There is discrepancy between the forest cover information in the national and international data. According to FAO (2010), Pakistan had 1.68 million ha of forests in 2010; 1.9 million ha in 2005; 2.1 million ha in 2000, and 2.5 million ha in 1990. Including other wooden land, the forest area in 2010 became 3.1 million ha, still much lower than the figures reported by national sources. According to Global Forest Watch (Hansen et al. 2013), Pakistan had 0.979 million ha of tree cover in 2000. Between 2000– 2016, about 9,267 ha was lost (618 ha per year).

Box 1: Comparison of Forest Areas in South Asia

Country	Forest Area (1,000 ha)	% Forests	Contribution of Sector to GDP
Afghanistan	1,350	2	—
Pakistan	1,687[a]	2	0.43% (2012-13)
India	68,434	21	0.67%(2007-08)
Nepal	3,636	25	9.45% (2008)
Bhutan	3,249	69	3.13% (2012)
Bangladesh	1,442	10	1.73% (2012)
Sri Lanka	1,860	27	0.83% (2012)
Maldives	1	3	—

Source: Global Forest Resource Assessment, FAO 2010.
Note: a. The national source indicates 4.47 million ha (5.1%) forest area in Pakistan.

[1] https://data.worldbank.org/country/pakistan.
[2] Other wooden land: land not classified as "forest," spanning more than 0.5 ha; with trees higher than 5 m and a canopy cover of 5–10 percent or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes, and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.

There are two main types of forests—natural forests (conifers, scrub, riverine, and mangrove forests) and plantations (farmland plantations, roadside plantations and canal-side plantations). According to Bukhari, Laeeq, and Ali (2012), the majority, about 4.28 million ha (4.8 percent of the total land area), is natural forest. Irrigated plantations have been raised mainly in Punjab and Sindh Provinces. The plantations make up 4.4 percent of total forest area and 0.3 percent of the total area of the country. From a tenure point of view, there are two main categories of forests: state owned and private (see Annex B for details on legal and ecological classification of forests). Among these, 2.4 percent of forests are managed under the protected area system (FAO 2014), which covers 11 percent of the area of Pakistan and comprises game reserves, wildlife sanctuaries, and national parks (Government of Pakistan 2015).

During the last two decades, Pakistan lost 25 percent of its natural forests (FAO 2009). Forest resources continue to deteriorate both qualitatively and quantitatively because of increasing pressure from a rising population and associated needs. shows how forest wealth, in proportion to natural capital and total wealth in Pakistan, is declining over time. Significant areas of forest lands have been transferred to non-forestry and commercial purposes, including agriculture, infrastructure, defense, and tourism (FAO 2009). The coniferous forests are the most fragile and are rapidly declining because of their high-value timber. Because of overexploitation, deforestation in natural forests is taking place at the rate of 0.75 percent, or 27,000 ha per year (FAO 2009). In the Readiness Preparation Proposal, the Government of Pakistan identified three categories of direct drivers which, in order of decreasing severity, are demand and consumption of forest products, land use change, and natural or manmade hazards (Government of Pakistan 2013). Under the World Bank supported REDD+ Readiness, the government is assessing causes and drivers of deforestation and forest degradation in each province and other administrative area and REDD+ strategies are being developed.

Table 1 : Distribution of Forests in Various Provinces and Other Administrative Areas

Provinces and other Administrative Areas	Total Area (ha)	Natural Forests (ha)	Plantations (ha)	Total Forests (ha)	Forests to Total Area %	Forests to Total Forests %	Natural Forests to Total Area %	Plantations to Total Forests %
Punjab	20,540,449	464,561	89,309	553,862	2.7	12.4	2.3	16.1
Sindh	14,263,918	589,398	71,186	660,584	4.6	14.8	4.1	10.8
KP	7,448,636	1,459,872	4,190	1,464,062	19.7	32.7	19.6	0.3
Balochistan	35,194,796	498,906	0	498,906	1.4	11.1	1.4	0.0
FATA	2,733,268	524,040	10,539	534,579	19.6	11.9	19.2	2.0
GB	6,981,387	313,812	0	313,812	4.5	7.0	4.5	0.0
AJK	1,178,038	413,025	18,747	431,772	36.7	9.6	35.1	4.3
Total **	**88,430,442**	**4,281,322**	**196,598**	**4,477,920**	**5.1**	**100.0**	**4.8**	**4.4**

Source: Bukhari, Laeeq, and Ali (2012).
***In the total, Bukhari, Laeeq, and Ali (2012) have also included Islamabad Capital Territory's area (89,950 ha), Natural Forests (17,708 ha), plantations (2,635 ha), and Total Forests (20,343).*

Table 2 : Changing Wealth of Pakistan in US$, millions (1995–2014)

Years	1995	2000	2005	2010	2014
Total wealth	1,838,762	2,585,815	2,987,716	3,462,695	4,104,589
Natural capital	712,444	804,082	796,451	938,344	1,106,989
Total forest (timber + non-timber)	2,648	2,072	1,996	2,158	2,237
% of forest to total wealth	0.14	0.08	0.07	0.06	0.05
% of forest to natural capital	0.37	0.26	0.25	0.23	0.20

Source: Glenn-Marie, Wodon, and Carey (2018).

The limited and decreasing forest resources have been insufficient to meet the demand for forest products in the country, which far exceeds the current level of sustainable domestic supplies. The available data show that in 2002–2003, the country's total wood demand was 43.76 million m^3, including 12.23 million m^3 for timber and 31.52 million m^3 for fuelwood, whereas the sustainable supply of timber and fuelwood combined was only 14.40 million m^3. The gap of 29.36 million m^3 in supply and demand was fulfilled mainly by overexploiting forest resources and partly through importing paper products and timber (FAO 2009) and an increase in planted trees on farmlands. In 2004, there were 331 million trees (6 percent annual increase over 1992) in the farmlands, with standing volume of 70 million m^3 (3.8 percent annual increase over 1992) (FAO 2009). The State of Forestry in Pakistan reports an annual production of 8.83 million m^3 of wood from farmland—5.38 million m^3 of timber and 3.45 million m^3 of fuelwood (Shah and Mohammad 2016). Farm forestry is an important alternative to meet the growing demands for fuelwood and timber. This helps decrease pressure on natural forests and thereby contributes to reducing deforestation and forest degradation of natural forests.

The major forest-based industries include paper, furniture, construction material, matches, sports goods, packing cases, and wooden articles. The full potential of small and medium forest-based enterprises has not been realized due to the unavailability of sufficient and quality raw materials (FAO 2009). There are thus far no exclusive industrial plantations on either public or private lands, and private sector engagement in the overall forestry production sector is negligible.

[3] Forest loss of 27,000 ha per year is also reported in the NDC submitted to the United Nations Framework Convention on Climate Change (UNFCCC) by the Government of Pakistan (2016).

[4] REDD+ refers to reducing emissions from deforestation and forest degradation and fostering conservation, sustainable management of forests, and enhancement of forest carbon stocks.

[5] The same source mentions very high levels of supply in 2012–2013 from farm forests: 39.87 million woods (5.38 million m^3 timber and 34.49 million m^3 firewood) (Shah and Mohammad 2016).

CHAPTER 03
CONTRIBUTION OF FORESTS TO THE NATIONAL ECONOMY

The contribution of forests to the national economy and to the livelihoods of forest-dependent communities is significant; however, robust, up-to-date data and adequate valuation of both the direct and indirect contributions of forests are lacking. This lack of evidence might have prevented the government from considering forestry as a priority in the past.

The forestry sector contributes to Pakistan's national economy by creating employment opportunities and generating taxes and revenues. However, such benefits are yet to be carefully studied and evaluated quantitively. Qualitatively, the sector provides a suite of forest products and related employment opportunities that are key to rural livelihoods and economic development. Ecologically, forests provide critical ecosystem services such as water regulation, sediment control, and biodiversity conservation that are fundamental to the sustainability and resilience of Pakistan's future development. Socially, forests are closely linked to gender issues in rural Pakistan.

Timber and Fuelwood. Timber has a broad range of uses in Pakistan as construction material for buildings, bridges, and railways. Many household articles (such as furniture, sports goods, and musical instruments) are made of wood. Other uses include railway sleepers; fencing poles; electric poles; gates; and body works of buses, lorries, trains, and boats. Lack of sufficient wood to meet the demand would mean additional costs for replacing domestic supplies with more expensive and less accessible imported materials. In addition, about 68 percent of the country's population, mostly those living in rural areas, depend on firewood as a major source of household energy (FAO 2009). About 100,000 people are involved in the fuelwood trade in Pakistan, and this business generates about PKR 11.3 billion ($113 million) annually (FAO 2009).

Employment. Besides official employment in forest departments, a large number of laborers are engaged in either year-round or seasonal forest management activities. Examples include raising and maintaining nurseries, preparing sites for planting, protecting planted stocks, weeding, cleaning, thinning, firefighting, and harvesting. In addition, a large number of people draw their livelihoods from farm forestry, processing of forest-based products, and eco-tourism. In addition to the 100,000 people involved in the fuelwood trade, more than 500,000 workers are employed by forest-products industries such as furniture, village carpentry, matches, particle board, plywood, fiberboard, boats, crates, boxes, paper, pulp, and chip board (FAO 2009).

Non-Timber Forest Products. Pakistan's forests are home to many non-timber forest products (NTFPs).

Box 2: Some Latest but Outdated Statistics on Forest-based Industry

The industrial sector consumed 12.238 million m^3 of roundwood in 2003. Forest-based exports rose from PKR 3.5 billion ($35 million) in 1992–1993 to PKR 21.314 billion ($213 million) in 2002–2003 with an average annual growth of 1.78 percent. The imports increased from PKR 4.25 billion (US$42.5 million) in 1992–1993 to PKR 13.716 billion (US$137 million) in 2002–2003 with an average annual increase of 0.95 percent.

About 80 percent of the people living in rural areas are dependent on NTFPs to supplement their incomes (FAO 2009). Important NTFPs include medicinal, aromatic, and culinary herbs; forage and fodder; resin; gums; mazri leaves; honey; silk; mushrooms; wild fruits; chilgoza nuts; pistachio nuts; wild almonds; and wild pomegranate. These NTFPs are the foundation of certain industries and professions. For example, Pakistan has about 30 large herbal medicinal manufacturing companies and hundreds of other small manufacturers (FAO 2017). The annual sale of herbal medicines is estimated to be around PKR 6 billion ($60 million) (UNDP 2010). The annual revenue of some large herbal manufacturers is comparable to multinational companies in Pakistan. Another example is traditional healers (around 100,000 in number) using medicinal herbs to serve about 60 percent of the population, especially those living in rural areas (UNDP 2010).

Biodiversity. Pakistan's diverse forest landscapes provide habitats for 174 species of mammals, 668 species of birds, over 177 species of reptiles, 198 species of freshwater fish, over 5,000 species of insects, and about 5,721 species of plants (FAO 2009). Of those plants, about 400 species, or 7.1 percent, are endemic (FAO 2009). Some of the endangered mammals found in Pakistan's forests are markhor, urial, goitred gazelles, marco polo sheep, snow leopards, and brown and Balochistan black bears. Chilgoza, juniper, mangrove, and riverine forests are among the endangered ecosystems in Pakistan (FAO 2017).

Tourism. Pakistan's forests are critical for tourism. The Tourism Department reports that on average one million foreign tourists have visited Pakistan since 2009. The number of domestic tourists visiting is much larger (38.3 million in 2016) (FAO 2009). According to World Data Atlas, the travel and tourism sector contributed $19.4 billion to Pakistan's gross domestic product (GDP) in 2016. In 2013, the tourism industry contributed 3.1 percent to the GDP and employed 6.4 percent of the workforce (FAO 2017). In Pakistan, 21 percent of the tourists come for nature-based tourism, including visits to scenic landscapes and wildlife viewing (FAO 2017). It is expected that earnings from nature-based tourism will continue to increase in the future.

Agriculture. Pakistan is primarily an agrarian country, and its agriculture sector is dependent on forests for fodder, mulch, pollination, sustained water supplies, and protection from erosion. The forests provide fodder and grazing lands to about 130 million livestock (FAO 2009). The Forestry Sector Master Plan (FSMP) reports that livestock get around 70 percent of their

Box 3: Value of NTFP: The Chilgoza Nut Example

A single standing Chilgoza pine tree is estimated to produce nuts worth PKR 4,500 per year, which makes it an important income source for many poor households. Pakistan exported 1,461 tons of nuts generating $13.56 million in 2012 and 1,738 tons generating around $20 million in 2013 (FAO 2017).

Box 4: Role of Forests in Resilience of Infrastructure: The case of Mangla Dam

With an area of 125 square miles, Mangla dam is the largest dam in Pakistan. At the time of its design in 1960, sediment yield from surrounding watersheds to the dam was estimated to be 42,000 acre-feet per square mile per year, and the life of the dam was expected to be 100–110 years.

To control sediment inflow into Mangla reservoir and thereby maintain the water storage capacity of the reservoir, the Water and Power Development Authority (WAPDA) of Pakistan has been implementing a Mangla Watershed Management Project in a catchment area of 3,433 square miles since the beginning of the project. Under this project, WAPDA has undertakena number of bioengineering measures, including afforestation in 172,896 acres and raising of over 135 million plants. As a result, the average sediment inflow reported to the dam from 1967 to 2014 has been only 27,747 acre-feet per square mile per year. Due to the reduced sediment flow, the dam is now expected to last up to 212 years.

Source: A powerpoint presented by WAPDA Officials in Islamabad in November 2017.

required feed from forests (FAO 2009). FAO (2017) estimates demand for 260 million tons of dry matter forage with a sustainable supply of only 27.3 million tons. This unmet demand has created heavy pressure on forests, causing both forest degradation and environmental deterioration (FAO 2017).

Resilience of Landscapes and Infrastructures. Forests contribute to slope stabilization, water regulation, and erosion control. These are important ecological functions for resilience of landscapes and infrastructures (such as roads, railways, irrigation canals, and dams). The loss of vegetation in watersheds will increase the risk of landslides and flash floods, causing damages to infrastructure, settlements, and loss of human lives and livestock. For example, large-scale deforestation and forest degradation in the mountains was attributed to the catastrophic floods of 1992 in northern Pakistan (FAO 2009). Because Pakistan is highly vulnerable to climate-change-induced hazards, more frequent, severe, and costly damages to infrastructure are very likely to occur. Investment in forest restoration for a more-resilient landscape is a cost-efficient and effective approach to mitigate such risks.

In the south of Pakistan, the mangroves in the Indus Delta provide important but yet-to-be-quantified benefits: protection of the coast from wind and sea currents and the coastal villages from tides, cyclones, and erosion. The mangroves also serve as breeding grounds for prawns and fish. It is estimated that 29 million tons of shrimp and 2.4 million tons of fish are harvested from mangrove forests in the Indus Delta (FAO 2009).

Water. Pakistan is already one of the most water-stressed countries in the world, and the situation is getting worse due to climate change. According to the Pakistan Council of Research in Water Resources, Pakistan hit the "water stress line" in 1990, the "water scarcity line" in 2005, and will reach the "absolute scarcity" level by 2025. As hydrological functions of forests help groundwater to recharge and regulate water supply, restoration and improvement of forest landscapes may improve Pakistan's capacity to mitigate the expected water crisis.

Climate Mitigation. Another important ecological function of forests is carbon sequestration, which contributes to climate change mitigation. Total carbon stock in Pakistan's forests, including the rate of absorption and emission, is being assessed under the World Bank supported REDD+ Readiness Project, but the information is available for Khyber Pakhtunkhwa and Gilgit-Baltistan. In the KP forests, the total carbon stock and annual sequestration rate are 153.3 million tons of CO_2 and 6 million tons of CO_2, respectively (Ali 2017). In the GB forests, the total carbon stock and annual sequestration rate are 16.95 million tons of CO_2 and 1.3 million tons of CO_2, respectively (Ali, Hussain, and Ismail 2017). One of the high-priority mitigation options identified in Pakistan's nationally determined contribution is the implementation of agroforestry practices through the planting of multipurpose and fast-growing tree species. Investment in forestry is expected not only to help avoid emissions from this sector but also to compensate for emissions occurring in other sectors. This proposal is consistent with global practices as the forestry sector has been identified as a

Box 5: Pakistan's NDC

Total greenhouse gas (GHG) emissions from Pakistan in 2015 was estimated to be 405 million tons CO_2-equivalent, which is projected to be 1,603 million tons CO_2-equivalent in 2030. The GHG inventory quantifies the emissions from five key sectors: energy, agriculture, industrial processes, land use and forestry, and waste. The share of land use change and forestry in 2015 was 10.39 million tons of CO_2 (2.6 percent) and is projected to increase by about 180 percent. Through the NDC, Pakistan commits to reduce up to 20 percent of its 2030 projected GHG emissions (Government of Pakistan 2016). Forestry is one of the high-priority sectors both for mitigation and adaptation, especially planting of multipurpose and fast-growing tree species.

[6] https://knoema.com/atlas/Pakistan/topics/Tourism/Travel-and-Tourism-Total-Contribution-to-GDP/Contribution-of-travel-and-tourism-to-GDP.

cost-effective solution to global climate change mitigation.

Gender. Improving forest governance will create opportunities to empower women and poor communities. Women are more dependent than men on collecting food, fuel, and fodder; grazing animals; and fetching water. However, their access to decision making on forest management and benefit sharing is limited. On both the Gender Development Index and the Gender Inequality Index, Pakistan ranked 147 out of 188 countries in 2015, which is the second lowest in South Asia after Afghanistan (UNDP 2016). As Pakistan has committed to "achieve gender equality and empower all women and girls" as one of the goals of the United Nations' 2030 Agenda for Sustainable Development, Pakistan can take actions to reverse this situation and address gender inequality, particularly in rural areas.

CHAPTER 04
POLICY AND INSTITUTIONAL CONTEXT

Pakistan's forest policies and legal frameworks need to be updated at both the national and provincial levels. As forests are on the provincial agenda in Pakistan, the federal agency has a limited role in coordination. Provincial forest departments, meanwhile, have varying capacities, strengths, and priorities in managing forest resources. With historically low investments in the sector, forest management continues to prioritize timber production. The more recent promulgation of the National Forest Policy 2015 and the launching of the ambitious Billion Tree Tsunami and Green Pakistan Program show the beginning of policy shifts that are needed for the sector.

Policy. The Pakistan Forest Act 1927 is the principal piece of forestry legislation. In Gilgit-Baltistan, Punjab, and Sindh, forests are managed under the Forest Act 1927; in Khyber Pakhtunkhwa under the KP Forest Ordinance 2002; in Balochistan under the Balochistan Forest Regulation 1890 (amended in 1974) as well as the Forest Act 1927; and in Azad Jammu and Kashmir under the Jammu and Kashmir Forest Regulation No. 2 of 1930. There are no provincial forest policies in Sindh, Balochistan, and FATA; draft forest policies exist in AJK and GB. KP and Punjab have promulgated provincial forest policies in 1999 (Punjab revised its in 2016).

Pakistan does not have a long-term plan or strategy for its forestry sector. The Office of Inspector General of Forests (OIGF) developed the Forestry Sector Master Plan (FSMP) in 1992 with support from the Asian Development Bank (ADB) and the United Nations Development Programme (UNDP). Under the FSMP, Pakistan for the first time assessed its forest areas through satellite images and conducted a survey of farm forest resources. The FSMP presented quantitative figures of annual growth, supply, and demand, and worked out the gap between supply and demand. Although the FSMP was implemented with donor support, that support could not be continued after 1998 due to discontinuation of external investments caused by changes in the political environment (FAO 2017).

The latest positive development is the promulgation of the National Forest Policy 2015 by the federal Ministry of Climate Change (MoCC). The policy aims to serve as an umbrella forest policy to support provincial forest policies. The policy includes three approaches: (a) conserving the existing forests by curbing deforestation and promoting conservation; (b) increasing tree cover within and outside forests through mass afforestation involving all sections of society; and (c) meeting International obligations and opportunities. The policy also emphasizes applying Payment for Environmental Services (PES) and an integrated approach of forests, wildlife, and biodiversity management. Box 6 provides details on the goal, objectives, and some key strategic interventions outlined in the National Forest Policy 2015. However, because forestry is a provincial responsibility, adoption of this policy still needs to happen at the provincial level.

Institutions. Before the promulgation of the 18th Amendment to the Constitution in 2010, the federal Ministry of Environment (MoE) had responsibility for policy making, inter-provincial coordination, planning, monitoring, research, and project development for the overall management of forests in the country. Subnational governments were mainly

functioning as the implementers of the national policies, primarily by way of devising projects and programs within their respective development plans and jurisdictions. With the 18th Amendment coming into effect and the abolishment of concurrent lists, large sets of responsibilities, including forestry, were devolved fully to provincial governments. At the national level, the OIGF, under the newly created MoCC, is responsible for inter-provincial coordination on matters related to forests, the import and export of wood across borders, and the inter-provincial trade of wood and non-wood products.

Box 6: National Forest Policy 2015: Goal, Objectives, and Key Strategic Interventions

Goal: Expansion, protection, and sustainable use of national forests, protected areas, natural habitats, and watersheds for restoring ecological functions and improving livelihoods and human health in line with national priorities and international agreements.

Objectives:

- Promoting ecological, social, and, cultural unctions of forests through sustainable management and use of forest products, including wood and non-wood forest products
- Implementing a national-level mass afforestation program to expand and maintain optimum forest cover
- Maximizing forest areas by investing in available communal lands/shamlat and Guzara forests and urban forestry
- Facilitating and harmonizing inter-provincial movement, trade, and commerce of wood and non-wood forest products through the Federal Forestry Board
- Interlinking natural forests, protected areas, wetlands, and wildlife habitats to reduce fragmentation
- Enhancing the role and contribution of forests in reducing carbon emissions and enhancing forest carbon pools
- Facilitating implementation of international conventions and agreements related to forestry, wetlands, biodiversity, and climate change
- Promoting standardized and harmonized scientific forest planning, research, and education, including for community-based management

Selected Key Strategic Interventions

- Integrate forestry with economic sector development policies and programs at the planning, programming, and implementation levels
- Undertake a long-term mass afforestation program by the Federal Government in collaboration with all provinces and other administrative areas through concerned national organizations
- Establish a transboundary ecological corridor with activities of protection, restoration, and regeneration of native species along both sides of the envisioned Pakistan-China economic corridor (which may be extended to Afghanistan and Central Asia)
- Regulate inter-provincial timber movement, commerce, and trade by establishing a Federal Forestry Board
- Promote an integrated approach of forest, wildlife, and biodiversity management
- Adopt scientific forest management planning, implementation, and policy or legal reform
- Strengthen national institutions for research, education, training, and monitoring

At the provincial level, provincial governments formulate their own strategies and action plans to achieve the goals and objectives of their own forest policies. The Provincial Secretary of Forests has the overall responsibility for managing forest resources. Each provincial forest department has its forestry planning and monitoring unit with a mandate to carry out forest inventories, prepare forest working/management plans, and monitor the implementation of these plans as well as other projects. In other words, forest departments have mandates for planning, implementing, and monitoring functions. There has been no assessment, however, of how provincial forest departments have performed these functions. In addition, questions such as whether the same institution should retain all these functions or share with other agencies (at least for implementation and monitoring and evaluation) for efficiency and effectiveness are yet to be examined.

Within a province, the forest department is divided into Regions, Circles, Divisions, Ranges, Blocks, and Beats, headed, respectively, by the Chief Conservator of Forests, Conservator of Forests, Divisional Forest Officer (DFO), Range Officer, Forester, and Forest Guard. The number of units depends on the size and complexity of the province. For example, Punjab and KP have three regions, Baluchistan has two, and Sindh has one.

At the federal level, there are no forestry-related research institutions. At the provincial level, there are two research institutions: the Pakistan Forest Institute (PFI) at Peshawar and the Punjab Forest Research Institute (PFRI) at Gatwala. PFI was a national institute that was transferred to KP after the devolution, although it still serves the entire country on forestry issues. In addition, Pakistan has seven universities that offer bachelor- and master-level education in forestry, range management, wildlife, and forestry extension. There are six forest schools, managed by the respective provincial forestry departments, where the forest guards are trained. There is a general understanding that these agencies are insufficient to address the challenges in the forestry sector (FAO 2017), but comprehensive analyses are needed to identify capacity gaps of existing institutions, what new institutions are needed, their required operational modalities, and associated financing plans.

In terms of forestry production, there are two semiautonomous harvesting corporations: KP Forest Development Corporation in KP and Azad Kashmir Logging and Sawmilling Corporation in AJK. In Punjab, the Murree Kahuta Development Authority (MKDA) is responsible for managing forests in Murree, while the South Punjab Forest Company has been established to foster public-private partnerships for investment in riverine forests. These arrangements have been made for timber production.

Management. In principle, production forests are managed according to the working plans, which are developed under approved working plan codes from the 1930s. No management plans are prepared for non-production forests. According to Shah and Mohammad (2016), all forests in Balochistan and federally administered tribal areas (FATA) are managed without management plans, as are 72 percent of forests in GB, 57.5 percent of forests in KP, and 61.5 percent of forests in Punjab. The majority of the working plans in Sindh, AJK, KP, and Punjab have also become outdated (FAO 2017).

Before preparation of a new working plan or revision of an existing one, a preliminary working plan report is developed by the respective Chief Conservator of Forests or Conservator of Forests, as the case may be.

The working plan is then developed, based on the preliminary working plan report, by a working plan officer of the rank of divisional forestry officer (DFO). The working plans are normally developed for a period of 10 years. The working plan officer, after undertaking forest inventories, assesses the total number of trees, stock, and annual increment along with other relevant data, based on which the officer prescribes the annual volume to be harvested on a sustainable basis along with other management prescriptions essential for sustainable forest management. The working plan is then approved by the provincial government through its Secretary of Forests. In Punjab, Sindh, and KP, there are independent forestry planning circles; elsewhere, DFOs are posted to develop the management plans as and when required.

Financing. Historically, the forestry sector has received low investment and low priority. Budget allocation for this important sector is normally less than one percent of the budget of the respective province/region. The investment is made through the recurrent budget, the development budget, and endowments. See Annex C for more detailed information about investment in the forestry sector.

In 2016, a total of PKR 11,354 million ($113 million) was invested for forestry development in the country. Of this, 60 percent was under the recurrent budget and 40 percent was under the development budget (FAO 2017).

The two most recent investments—the BTTAP ($150 million) in KP and the GPP ($36 million)—show the government's recognition in recent years of the environmental importance of the forestry sector (see Box 7).

Box 7: Billion Tree Tsunami and Green Pakistan Programs

Billion Tree Tsunami: Launched in 2014 by the Government of Khyber Pakhtunkhwa as a part of the "Green Growth Initiative" to meet the Bonn Challenge, the Billion Tree Tsunami Afforestation Program (BTTAP) planted 1,000,000,000 seedlings in less than three years. According to the International Union for Conservation of Nature, 350,000 ha of forest and degraded lands are being restored under this initiative, surpassing KP's commitment to the Bonn Challenge of restoring 348,000 ha. According to the World Wildlife Fund, which carried out independent monitoring of the initiative in 2015, the average survival rates were 86 percent in block plantations, 79 percent in roads and canal-side plantations, 72 percent in saline and waterlogged plantations, and 65 percent in farm forestry.

Green Pakistan Program: Learning from the successful implementation of this project, the Federal Government has launched the largest national-level afforestation program—the Green Pakistan Program (GPP)—in 2016. The GPP, coordinated by the MoCC at the federal level and implemented by the provincial forest departments and federating entities, aims at planting 100 million trees over five years (2016–2021) to make the country greener.

[7] Inherited from Indian Forest Act, 1927, that was under implementation at the time of independence. It was adopted by the National Assembly of Pakistan in 1947 and named Pakistan Forest Act 1927.

[8] These universities are (1) Benazir Bhutto University, Sheringal, KP; (2) Haripur University, Haripur, KP; (3) Allama Iqbal Open University, Islamabad; (4) Arid Agriculture University, Rawalpindi, Punjab; (5) Agriculture University, Faisalabad, Punjab; (6) Bahaudin Zaqaria University, Multan, Punjab; and (7) Sindh Agriculture University, Tandojam, Sindh.

CHAPTER 05
DEVELOPMENT PARTNER ENGAGEMENT IN THE FORESTRY SECTOR

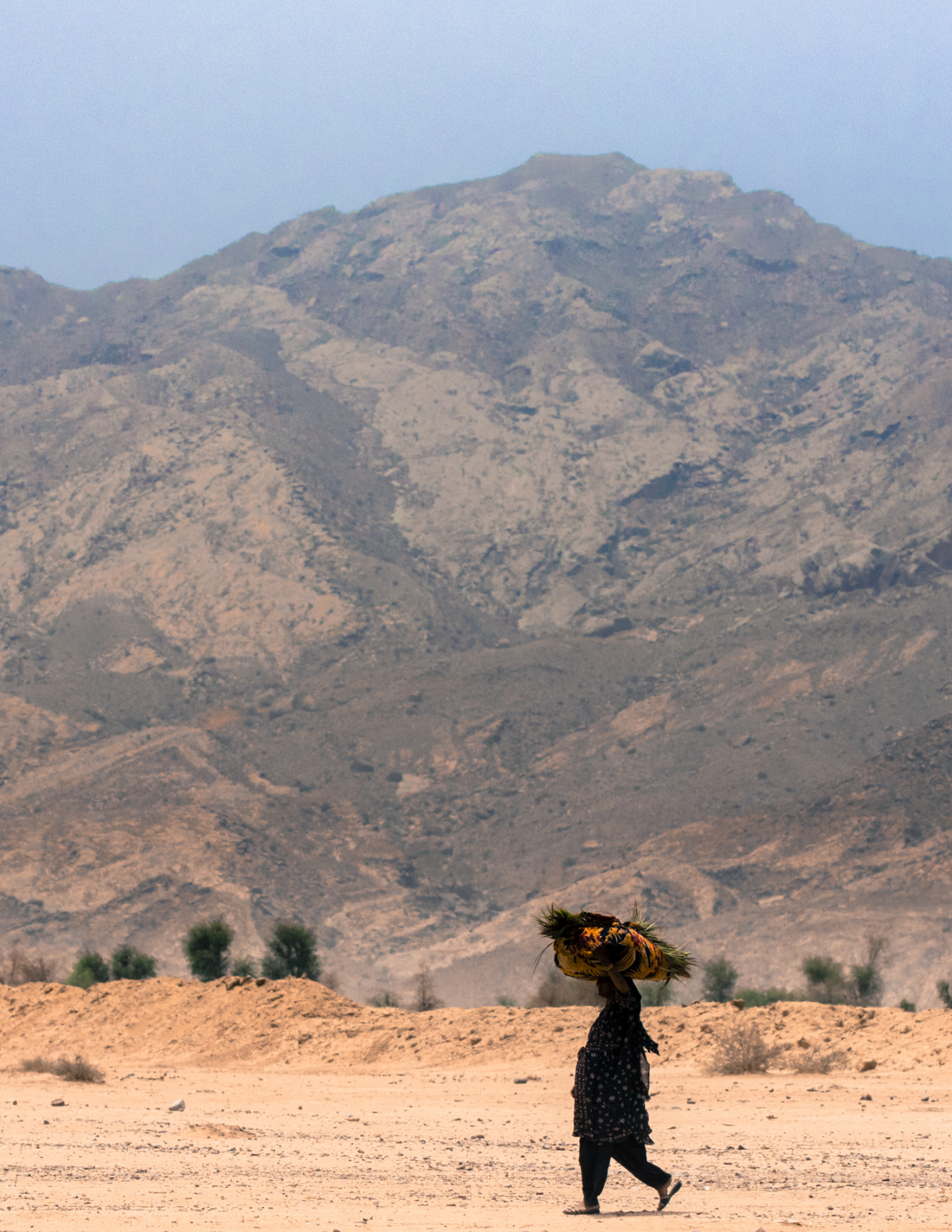
The World Bank supported Pakistan's forestry sector until 2000 and then disengaged until 2015. Few other donors—mainly the UN Development Programme, the Food and Agriculture Organization, and international nongovernmental organizations (NGOs) such as World Wildlife Fund (WWF), International Union for Conservation of Nature (IUCN), and International Centre for Integrated Mountain Development (ICIMOD)—maintained support on a small scale. Multilateral donors (e.g., Asian Development Bank) and bilateral donors (Australia, Canada, Germany, Norway, the United Kingdom, and the United States) have a presence in the country but do not have current programs in the forestry sector.

The World Bank, with funding from the Forest Carbon Partnership Facility (FCPF), signed a REDD+ Readiness Preparation Grant Agreement of $3.4 million in 2015 with the Government of Pakistan to help the country get ready for REDD+ through technical studies, consultations, and capacity-building activities. The REDD+ Preparation Project (P152465) intends to help Pakistan (a) assess drivers of deforestation and forest degradation; (b) develop a National REDD+ strategy and its implementation framework; (c) assess the social and environmental impacts of REDD+; (d) establish forest reference emission levels and monitoring systems for REDD+; and (e) improve technical capacity building and raise stakeholder awareness.

In January 2018, the FCPF approved Pakistan's request for additional funding of $4.014 million to support Pakistan in expanding its REDD+ readiness activities to the provincial level. The additional financing is expected to be completed by mid-2020.

Projects supported by donors have so far had mixed results, with some successes and challenges from which lessons can be drawn for future engagement. A summary of donor-supported important projects is shown in Annex D, and here are some key lessons learned:

- Beneficiaries, communities, community-based organizations, and NGOs should be engaged from early in the project design stage and the engagements should be maintained throughout project implementation.
- Both the technical and financial capacity of implementing agencies should be carefully reviewed, and measures to address gaps should be put in place.
- The need for frequent supervision should not be underestimated.
- Local communities are interested and capable of contributing to forest management if training, inputs, and opportunities are provided.
- Participatory processes are initially slow and expensive; in the long run, however, they pay off through reduced costs of forest management, improved governance, and social change.
- Moving away from traditional timber-based forest management requires a change in attitude and behaviour on the part of both forest institutions and technicians.
- Change happens gradually, which requires both sufficient patience and sustained investment.



CHAPTER 06
OPPORTUNITIES TO SUPPORT GREEN GROWTH THROUGH SUSTAINABLE FOREST SECTOR DEVELOPMENT

Long-term forest investments are required to harness the huge potential of forest contributions to resilient ecosystems, the rural livelihood, the national economy, and the global environment. In recent years, the government has augmented its attention on forests, as demonstrated by the nationally determined contribution (where forests are prominent for both mitigation and adaptation), the GPP at the national level, and the impressive provincial initiative BTTAP in KP. The case for future support is to enhance and scale up these new important initiatives in terms of strengthening landscape management, achieving poverty reduction and livelihood improvements, and fostering private sector development.

The following three broad areas have been identified for future support to address the current challenges in the sector.

6.1 Policy Interventions

I. Support to Implement the National Forest Policy 2015, to Devise and Implement Participatory Policies in the Provinces

Forestry being a provincial responsibility, the National Forest Policy 2015 can be effectively implemented only if all the provinces fully accept and own it. This is not yet the case. To achieve this, broad consultations with provincial stakeholders around the policy would help, especially on the development of an action plan with clearly defined responsibilities and time-bound targets. In addition, the current forest laws and regulations at the provincial level are mostly outdated and have yet to incorporate modern management requirements for changing scenarios in the forestry sector, such as community participation, benefit sharing with forest-dependent communities, biodiversity conservation, payment for ecosystem services, climate change adaptation, and buffer zone management around protected areas. The provinces will need support to revise the policies and effectively implement them.

II. Strengthen the Coordination Mechanism among the Provincial and Federal Institutions for Effective Management and Coordination

As noted earlier, there is limited coordination between provincial and federal institutions. It is important to make sure that the interventions at the provincial level are consistent with an overall structure at the national level. A system for sharing experiences, problems, successes, and failures among the provinces and the Office of Inspector General of Forests should be strengthened. Various studies and inventories conducted in the country by different organizations/provinces could also be harmonized in terms of forest definition, land use classification, methodology, interpretation, and final results. In addition, inter-provincial issues of law enforcement and illegal timber trade require strong inter-provincial coordination.

III. Create a Conducive Policy Environment for Private Sector Participation in the Forestry Sector

Because of the significant commercial value of forest resources, the private sector can be an important source of forestry financing, as has been the case in many other countries. Private sector investment in forest products could generate revenue that can contribute to funding public sector research, conservation, and law enforcement. Such investments

need to be safeguarded by a conducive regulatory framework. Effective policies and regulations can promote responsible private sector investments for sustainable forest management and corporate social responsibility through community-company partnerships.

6.2 Technical and Institutional Capacity Building

IV. Continue Supporting the Forest Management Information System

To support effective forest investments, the most urgent thing required in the country is to set up a system for collecting and analyzing data using consistent methods throughout the country. Equally important is the mechanism to share data and coordinate among provinces and federal entities. The current situation of data scarcity could be addressed starting with a national-level forest resource assessment and putting a system in place for continuous inventory and monitoring of overall parameters, such as forest cover, growing stocks, forest carbon stocks, forest health, biodiversity, protected area management system, and the socioeconomic and environmental functions of the forests.

The World Bank is already supporting the development of a forest management information system through the REDD+ Preparation Grant. Given the magnitude of the challenge, continuous support is essential to strengthen and sustain the efforts undertaken through the REDD+ project.

V. Support Forestry Research, Education, Knowledge Sharing, and Capacity Building

The current capacity, both at the provincial and federal levels, appears to be inadequate to address the issues faced by the sector. Continuous research, training, knowledge sharing, and capacity building is needed in such areas as the impact of improved varieties of trees on drought conditions, seed collection, tissue culture, planting techniques, participatory forest management, and climate change impact. Equally important is conducting regular socioeconomic research and surveys. Policy makers need regularly updated answers to such questions as: what are the socioeconomic benefits that forests provide, and what is their role in poverty alleviation? Tools such as the World Bank's Living Standards Measurement Study on Forests can be applied to get a comprehensive understanding of the impact of forests on rural livelihoods and the national economy.

For capacity building, South-South knowledge exchanges could be organized to help Pakistan learn new management models, such as community management, public-private partnerships, and payment for ecosystem services.

6.3 Investments

VI. Increase Forest Cover for Socioeconomic and Environmental Benefits through Afforestation, Agroforestry, and Plantations

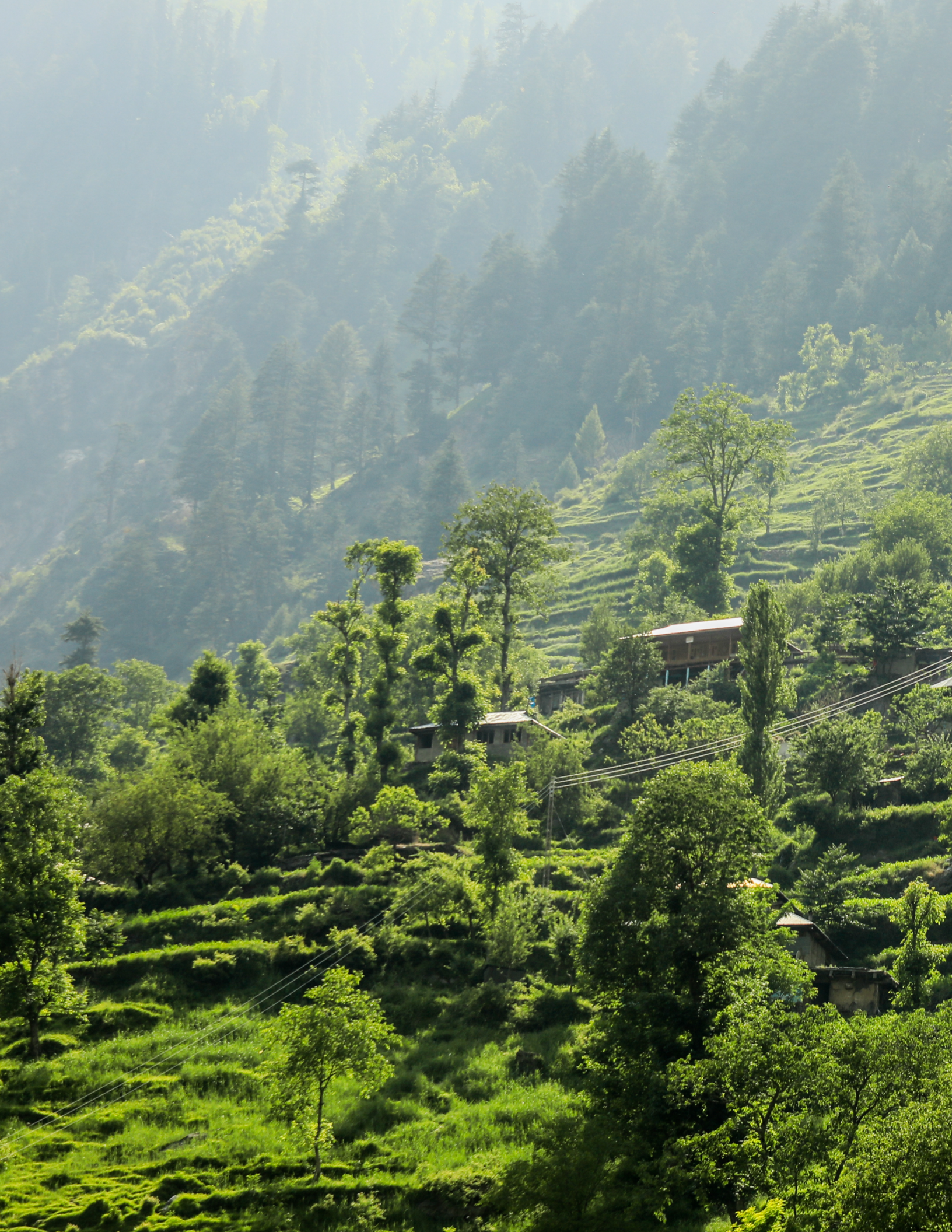
Because of the low forest cover, Pakistan should make concerted efforts to increase its forest areas through natural regeneration, reversal of land and forest degradation, agroforestry, afforestation, and reforestation. Such activities may include establishing more nurseries in each province; making high-quality seedlings available; and introducing improved techniques and sustainable business models for seed collection, planting, and maintenance. The afforestation should focus not only on timber production but also on the resilience of landscapes and infrastructures, including roads, railways, and irrigation canals.

VII. Promote Forest-based Entrepreneurship and Livelihood Support

There is a huge potential for forest investments to support an inclusive and green growth agenda. Non-timber forest products (NTFPs) such as chilgoza pine, walnuts, and wild honey are among the best in the world and possess very high economic values. However, a lack of effective production, processing, and marketing has prevented the materialization of such values. Forest-based entrepreneurship and livelihood opportunities can be enhanced by identifying high-value NTFP species, promoting their cultivation, developing a system of processing and value addition, and establishing a mechanism for fair revenue sharing to benefit local communities. In addition, communities that have medicinal plants and herbs could be linked with companies that require such plant products as their raw materials. Lastly, the tourism sector provides many opportunities for forest-based entrepreneurship and livelihood support.

VII. Improve Forest Management Practices and Sustainable Management of Existing Forests

The trends of deforestation and forest degradation of the natural forest should be reversed. Management plans should be prepared for all types of forests (not just for production forests) and protected areas and should be effectively implemented. Grazing should be regulated and controlled so that natural regeneration can be promoted in the degraded forests. The concept of payment for environmental services should be explored and applied to reward communities that are the custodians of forest resources and are providing services to other sectors and communities. Community-based forest management strategies should also be introduced and scaled up. In addition, developing the system of value addition of forest resources through new technologies and marketing could enhance revenue generation. Efficiency of wood utilization could also be enhanced through facilities for timber treatment, timber processing, and value addition.



CHAPTER 07
RECOMMENDATION FOR WORLD BANK ENGAGEMENT

The significant role of the forestry sector in Pakistan's national economy, rural livelihood, poverty reduction, sustainable development, climate change mitigation and adaptation, and resilience to vulnerabilities related to climate change and natural disasters warrants support from the donor community, including the World Bank. Potential forest investments can build on the enabling environment that the ongoing REDD+ Readiness Project is creating. Forest investments also complement investments in other key sectors, including agriculture and livestock, pollution management, infrastructure and hydropower development, and disaster risk management. Box 8 shows the alignment of proposed opportunities to support forest sector investments with the World Bank's Country Partnership Strategy.

Given the institutional and regulatory complexity of forest management issues in Pakistan, the initial engagements should focus on relatively simpler tasks (such as increasing the forest cover for multiple benefits) and gradually move to more challenging tasks (such as sustainable management of existing forests and addressing issues like land tenure, human-wildlife conflict, and conservation management).

Box 8: Alignment of Proposed Opportunities to Support Green Growth through Sustainable Forest Sector Development to the World Bank Country Partnership Strategy

1: Energy	2: Private Sector Development	3: Inclusion	4: Service Delivery	Cross-cutting Themes
• Alternative fuel sources to decrease deforestation-this could stimulate enterprise in renewable energy	• Promoting sustainable private sector investment in forest products • Promoting NTFP and ecotourism enterprises (particularly for women and youth)	• Community forest management • Community based eco-tourism • Increased resilience to disasters in targeted region	• Strengthening public forest management institutions • Promoting forest foods for nutrition • Improving data tracking and surveillance of forest resources	•Making the economic and public goods case for forest investment •Climate change mitigation and adaptation •Payment for environmental services

(Source: World Bank Staff)

These interventions at different stages would have to be focused at the provincial level. At the federal level, potential support should be on the softer side of investment, such as knowledge management, monitoring, coordination, and international reporting.

The forestry sector in Pakistan offers a myriad of opportunities to apply transformative technologies. An increasing demand for wood products and an increasing gap between supply and demand could be addressed through biotechnology, which can increase productivity, shorten rotation periods, and produce more desirable wood quality. Cellphones and social media have been used to fight illegal logging in some countries in Africa and could be helpful in Pakistan as well. Forest health, growth, and deforestation could be monitored using drones, geographic information systems, global positioning systems, and remote sensing techniques. Drones have also been used to do planting on a massive scale in relatively inaccessible areas. Forestry operations that are labor intensive and risky could be performed with machines (such as harvesters and forwarders). Finally, all parts of forest products (lignocellulosic material) could be used to produce renewable energy—fuels (for example, ethanol and biodiesel) and electricity—through a process called biorefinery.

Box 9: A Potential Forestry Project in Pakistan

The Government of Pakistan, through its Economic Affairs Division, requested in April 2017 that the World Bank explore financing support for the Green Pakistan Program. In response to the request, the World Bank reviewed the design and implementation of the program with the Ministry of Climate Change and its GPP team, and representatives of Punjab, Sindh, Balochistan, and Khyber Pakhtunkhwa provinces. The World Bank team and government officials have tentatively agreed to explore the following three areas of engagements:

(a) Forest investments for resilient land -scapes and infrastructure

(b) Forest investments for economic and livelihood development

(c) Capacity building, monitoring, evalua -tion, and knowledge management

In developing these engagements, the World Bank would identify specific activities consistent with the World Bank Group Forest Action Plan (FY16–20) and apply relevant tools, such as those of PROFOR for example, and PRIME (Productivity, Rights, Investments, Markets, Ecosystems). Gender mainstreaming and the potential application of new technologies would be emphasized in such engagements.

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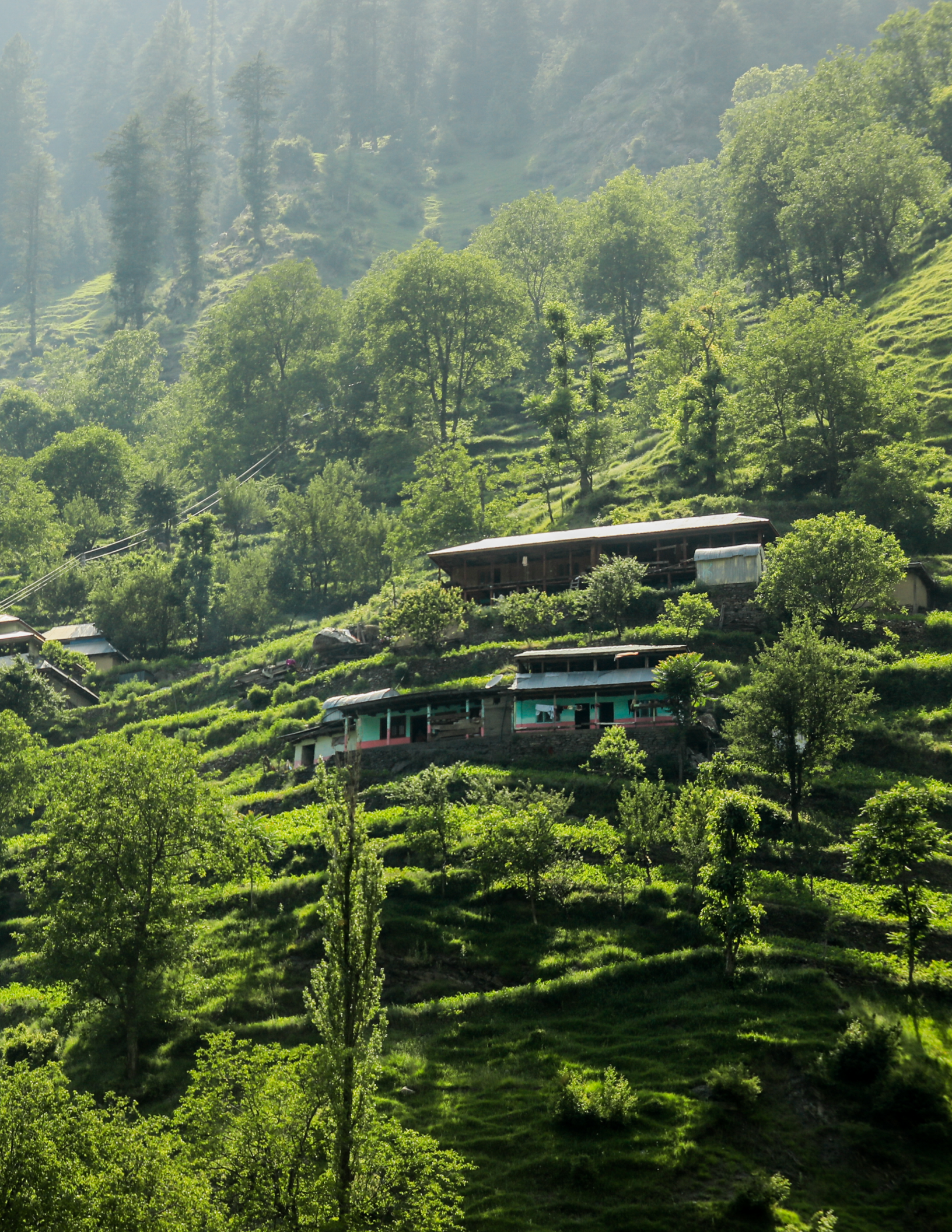


ANNEX A
COMPARISON OF PROVINCE-WISE FOREST AREA ESTIMATES THROUGH VARIOUS STUDIES

A number of additional regional studies have been carried out from time to time, including the Provincial Forest Resource Inventory (PFRI) in 2005, the Study on Timber Harvesting Ban (STHB) in 2010, and the district-wide natural resource database report of 2012. The Carbon Stock Assessment Report of KP and the Forest Carbon Inventory Report of GB, both in 2017, digitally assessed areas under forest cover in KP and GB, respectively. The Integrated Center for Integrated Mountain Development also carried out a study, Mapping Deforestation and Forest Degradation Patterns in Western Himalaya, Pakistan, 2016, which covers the hilly parts of AJK, GB, and KP. None of these studies, however, cover the entire resources of the country or all types of forests.

This table shows different sources of available data on the forest area in Pakistan.

Table A: Comparison of Province-wise Forest Area Estimates through Various Studies (million ha)

Province/ Administrative Areas	FSMP, 1992	NLUP, 1998–99	NFRRAS		Land cover Atlas 2012	Land cover Atlas, 2012	Forestry Statistics of Pakistan 2016
			1997	2001			
Punjab	0.608	0.855	o.460	0.440	0.554	0.554	0.67
Sindh	0.399	0.848	0.270	0.280	0.660	0.660	0.72
KP	1.684	2.311	1.520	1.490	1.508	1.464	1.85
Balochistan	0.592	0.508	0.710	0.450	0.499	0.499	0.50
FATA	Include d in KP	NR	NR	NR	0.534	0.534	Included in KP
GB	0.666	NR	0.310	0.320	0.337	0.314	0.35
AJK	0.275	NR	0.330	0.340	0.435	0.432	0.42
Total	4.224	4.523	3.600	3.320	4.549	4.478	4.51
Percentage	4.7	5.1	4.1	3.8	5.1	5.1	5.1

Sources: Bukhari, Laeeq, and Ali (2012); Shah and Mohammad (2016).
Notes, as presented in FAO (2017):

1. FSMP (1992): In 1992, to prepare the Forestry Sector Master Plan (FSMP), the Office of Inspector General of Forests digitally assessed the area under forests and rangelands for the first time. It used 54 scenes of Landsat satellite images (1990–91) of 30 m2 resolution. The assessment covered the entire country; however, estimates of Federally Administered Tribal Areas (FATA) were not disaggregated. FSMP reports include detailed estimates of growing stock and the growth, total standing volume of coniferous forests, total annual increment and growth, trees on farmlands, and demand for and supply of wood in the country. It has made projections to estimate wood supply and demand for the next 25 years and made recommendations to narrow down the gap between supply and demand. Although it was intended that forest resources would be assessed every five years and data be updated, this has not occurred.

2. The National Land Use Plan (NLUP) report was published by the Ministry of Environment (MoE), now renamed the Ministry of Climate Change (MoCC), based on Landsat-5 TM satellite images of 1989–99.

3. The National Forest and Range Resource Assessment Study (NFRRAS) was also published by the MoE in 2004. The study covers exactly the same area that was covered earlier by the FSMP. It used 1997 and 2001 Landsat Thematic Mapper (TM) images of 30 m2 resolution. The objective of this study was to detect changes in forest and rangeland areas. Ground truthing was done with the help of 2,000 stratified randomized sampling points.

4. Land cover Atlas of Pakistan (2012), prepared by the Pakistan Forest Institute (PFI), used SPOT-5 satellite images (2007–08) for KP and AJK; for Punjab, Sindh, Balochistan, and GB, images were downloaded from Google Earth. The visual interpretation of images was carried out using ERDAS Imagine and Arc GIS software. The results were validated through ground truthing at 1,957 sample points identified through a stratified randomized sampling technique. It assessed all forest types in detail and provided separate data on all provinces and regions, including FATA. It contains district-wide estimates of 131 districts in all provinces, Islamabad District, seven agencies, and six FATA frontier regions.

5. Forestry Statistics of Pakistan (Shah and Mohammad 2016) is a document of the PFI that is prepared based on departmental figures and secondary data. It contains estimates of forest area, annual harvesting, and wood supply and demand.

Here are the forest area estimates, based on the various studies referred above:

- Based on the results of the above studies, it is clear that the total forest area of the country increased by 0.979 million ha from 1992 to 2011. The forest areas of AJK, KP, Punjab, and Sindh increased during this period, while the forest areas of Balochistan and GB decreased.
- Coniferous forests in the country were reduced at a rate of 40,100 ha per year between 1992 and 2001. During the first five years, the rate of depletion of forest resource was 86,800 ha per year; from 1997 to 2001, however, a positive trend was seen in which coniferous forests started replenishing at a rate of 6,600 ha per year. Thus, there has been an overall increase of 0.296 million ha in coniferous forests from 1992 to 2011.
- Scrub forests showed an upward trend in area from 1992 to 1997, when the area increased from 1.191 million ha to 1.652 million ha. During the subsequent five years, however, the area under scrub forests decreased to 1.323 million ha. In a nutshell, the area under scrub forests slightly decreased from 1.191 million ha in 1992 to 1.323 million ha in 2011.
- Riverine forests decreased at a rate of 2,300 ha per year from 1992 to 2001. During the subsequent five years, however, the rate of degradation slowed and, subsequently, the area increased. While comparing data from 1992 and 2011, it becomes evident that the overall area of riverine forests has increased from 0.173 million ha to 0.216 million ha.
- Mangrove forests were degrading at a rate of 4,900 ha per year from 1992 to 2001. The area of mangrove forests has, however, shown an overall increase from 0.207 million ha in 1992 to 0.355 million ha in 2011.

[9] Area excluding alpine scrub.

ANNEX B
CLASSIFICATION OF FORESTS BASED ON LEGAL STATUS, TENURE TYPE, AND ECOLOGY

Forests Types Based on Legal and Tenure Type

- **State-owned Forests.** The state-owned forests comprise about 85 percent of Pakistan's total forest area. They contain the following four subclasses based on legal designation and protection:
  - o **Reserved Forests.** These are state-owned forests declared reserved under the Pakistan Forest Act, 1927. All activity is prohibited in these forests unless specifically allowed.
  - o **Protected Forests.** These forests are also state owned, but pending reservation and settlement of rights have been declared protected under the Forest Act. In these forests all acts are allowed unless specifically banned (like cutting of trees and quarrying). Local people have some rights and concessions for grazing, grass cutting, collection of dry wood, and so forth.
  - o **Unclassed Forests.** These are state-owned forested lands under the control of the Forest Department which have neither been declared reserved nor protected.
  - o **Resumed Lands.** These are lands surrendered by larger owners, following the fixing of a ceiling on the extent of land ownership under the Land Reforms Act of 1959. Affected landowners retained cultivated lands but surrendered wooded lands above the ceiling. These resumed lands are managed by the Forest Department.

Table B.1: Province-based Detail of Forest Area by Legal Classification (thousand ha)

Legal Category	Punjab	Sindh	KP	Balochistan	GB	AJK	Total
State (AJK)	—	48	—	707	—	567	1,322
Reserved	311	278	106	—	—	—	645
Protected	2,736	795	467	378	67	—	4,443
Unclassed	103	11	—	—	—	—	114
Resumed	9	5	33	—	—	—	47
Guzara	68	—	248	—	—	—	316
Communal	—	—	—	—	2,983	—	2,983
Section 38	19	—	26	1	—	—	46
Chos Act	1	—	—	—	—	—	1
Miscellaneous	21	—	432	239	—	—	692
Total	3,268	1,087	1,312	1,325	3,050	567	10,609

Source: Wani, B. A., Shah, and Khan (2004). Forestry Statistics of Pakistan. PFI, Peshawar

- **Privately Owned Forests:** Privately owned forests are forests held in private ownership. They include the following five categories:

  - **Guzara (subsistence) Forests.** These are sizeable patches of wooded lands close to habitations which were set aside in 1872 to meet the bona fide domestic needs of local communities during land settlements in Hazara, North West Frontier Province, and Murre Hills, Punjab. Ownership is vested in local people either individually or jointly as "village shamilat."

  - **Community Forests.** Community forests are a sub-category of Guzara forests that are essentially owned by the entire village. Community forests are mostly found in Rawalpindi in Punjab Province.

  - **Chos Act Areas.** These are privately owned lands subject to erosion hazard, endangering vital public installations or structures, that have been taken over by the government under the Chos Act, 1900. These areas may be returned to their original owners after stabilization.

  - **Section 38 Areas.** These are areas offered by private owners to the Forest Department for afforestation and management for an agreed-upon period ranging from 10 to 20 years under Section 38 of the Pakistan Forest Act 1927.

  - **Plantations and Farm Forest Areas.** These are plantations on private lands and farm tree resources on farm lands that are accounted for but not legally declared forests.

Forests Types based on Ecology

- **Himalayan Dry Temperate Forests:** Found between 1,525 m and 3,350 m.
- **Himalayan Moist Temperate Forests:** Occur between 1,375 and 3,050 m; contain blue pine (Pinus wallichiana), fir (Abies pindrow), and spruce (Picea smithiana), with some deodar.
- **Oak Forests:** Found mixed in conifer forests along riparian systems and as pure stands from 1,200 m to 1,500 m.
- **Subtropical Pine Forests:** The chir pine forests occur between 900 m and 1,700 m.

Table B.2: Distribution of Various Types of Forests in Different Provinces and other Administrative Areas

Forest Types	Punjab	Sindh	KP	Balochistan	FATA	GB	AJK	Total
Dry Temperate	0	0	532,591	125,485	317,924	254,961	48,013	1,278,974
Moist Temperate	17,249	0	391,668	0	1,648	0	162,647	573,212
Chir Pine	27,283	0	217,753	0	6,447	0	105,343	356,826
Scrub	345,374	0	222,373	294,636	135,313	0	93,538	1,108,942
Tropical Thorn	42,556	52,501	12,007	76,425	34,120	0	0	217,609
Riverain	32,099	183,835	0	0	0	0	0	215,934
Mangroves	0	353,062	0	2,360	0	0	0	355,422
Oak Forests	0	0	83,480	0	28,588	58,851	3,484	174,403
Subtotal (Natural)	464,561	589,398	1,459,872	498,906	524,040	313,812	413,025	4,281,322
Plantations	89,309	71,186	4,190	0	10,539	0	18,747	196,598
Subtotal (Forests)	553,862	660,584	1,464,062	498,906	534,579	313,812	431,772	4,477,920
Total Area	20,540,449	14,263,918	7,448,636	35,194,796	2,733,268	6,981,387	1,178,038	88,430,442
% of Natural Forests	2.3	4.1	19.6	1.4	19.2	4.5	35.1	4.8
% of Forests to Total Land	2.7	4.6	19.7	1.4	19.6	4.5	36.7	5.1

Source: Bukhari, Laeeq, and Ali (2012).

- **Subtropical Broadleaved Evergreen Forests:** Found between 400 m and 1,000 m.
- **Tropical Thorn Forests:** Found up to 400 m over the whole of the Indus Plain; mostly xerophytic trees such as Acacias.
- **Riverain Forests or Bela Forests:** Occur in flood plains along banks of major rivers, particularly the Indus and its tributaries.
- **Irrigated Plantations:** Major species are Dalbergia sissoo, Bombax ceba, Morus alba, Melia azedrechata, poplars, salix, and eucalyptus trees.
- **Mazri Palm Forests:** Dwarf palm forests of Mazri (Nannorrhops richiana) are found in degraded subtropical areas.
- **Linear Plantations:** Found along the roads, canals, and railways; the main species are Dalbergia sissoo and Acacia nilotica.
- **Coastal Littoral and Swamp Forests (Mangroves):** Found in the coastal zone.

ANNEX C
INVESTMENT IN PAKISTAN'S FORESTRY SECTOR

A total of PKR 11.354 billion has been allocated to the forestry sector in 2016–17.

There are five types of funding sources in Pakistan, also presented in the table above. These include:

1. **Recurrent Budget.** This is the routine budget adopted by the assembly of the concerned state to fulfill the administrative and routine functions of the department. It covers expenditures for routine works, such as establishment charges, consumables, operational and transport charges, felling, marking, and transportation of timber.

2. **Development Budget.** This is a budget for special investment and development activities, including the creation of resources and execution of conservancy and development works beyond the jurisdiction of routine works. The development budgets of the provinces are called Annual Development Programmes (ADP), while that of the Federal Government is called the Public Sector Development Programme (PSDP). The development funds are requested through a project document called PC-1.

3. **Endowment Funding.** Some provinces and other administrative areas have developed flexible funding sources to provide resources to departments to ensure timely availability of funds for seasonal activities without lengthy and cumbersome procedures for accessing funds. These funding sources include the Forestry Development Fund in KP, the Forest Regeneration Fund in GB, and the Forest Development Fund in FATA.

4. **Donor Funding.** Donors such as the World Bank and the Asian Development Bank provide grant and loan funding under bilateral and multilateral funding arrangements through the Economic Affairs Division. United Nations bodies and UNFCC frameworks, like GEF and Green Climate Fund, also support forestry work. The funding is project based and provided for specific time periods.

5. **Private Sector Funding.** Funding from forest companies and the private sector, including the Forest Development Corporation and company corporate social responsibility initiatives, is also available for forestry interventions.

Table C: Province-based forestry department 2016 expenditures in Pakistan (PKR million).

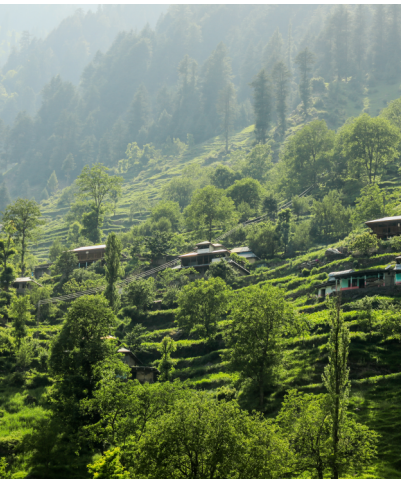
Funding Sources	Punjab	Sindh	KP	Balochistan	FATA	GB	AJK	Total
Recurrent Budget	3,303.828	400.000	1,138.594	563.70	262.44	272.38	597.667	6,538.609
ADP[a]	2,000.000	322.827	280.000	298.23	975.35	168.00	335.210	4,379.617
PSDP[b]	—	—	—	—	—	—	120.000	120.00
Donors	—	—	—	—	—	—	216.000	216.00
Others	—	—	100.000	—	—	—	—	100.00
Total	5,303.828	722.827	1,518.594	861.93	1,237.79	440.38	1,268.877	11,354.226

Source: FAO (2017).
Note: a. Annual Development Programme; b. Public Sector Development Programme.

ANNEX D
BRIEF OVERVIEW OF DONOR-FUNDED PROJECTS IN THE FORESTRY SECTOR

Project Name	Project Area	Project Period	Amount ($, millions)	Key Activity/Results
World Bank Supported Projects				
Balochistan Natural Resource Management Project	Balochistan	1994–2000	14.7	Created an independent Balochistan Environmental Protection Council (BEPC) and strengthened the Balochistan Environmental Protection Agency (BEPA)
Punjab Forest Sector Development Project	Punjab	1995–2001	24.87	Achieved policy reforms related to the tree seedling subsidy, initiated a shift from a "command and control" Forest Department to consultation with community members, and significantly increased private sector nurseries
REDD+ Readiness Preparation Project	National	2015–2018	3.8	Developed the National REDD+ Strategy, prepared a Strategic Environmental and Social Assessment/Environmental and Social Management Framework, and established national forest reference levels and a national forest monitoring system
Other Donor-funded Projects				
Pakistan: Forestry Sector Project (Funding: ADB)	KP	1996–2007	42.6 (7.4 by the closing)	Completed resource inventory and management planning, strengthened the legal framework, and enhanced institutional capacity on social forestry
Pakistan: Sind Forestry Development Project (Funding: ADB)	Sindh	1986	150	Promoted farm forestry and developed working plans for managing state forests sustainably

Project Name	Project Area	Project Period	Amount ($, millions)	Key Activity/Results
Forestry Planning and Development Project (Funding: USAID; Implementation: Winrock International)	National	1982–1994	—	Promoted farm forestry, agro-forestry, and community forestry, and established farmers' networks
Siran Kaghan Intensive Forest Management Project (SKIFMP) (Funding: GIZ)	Siran and Kaghan valleys	1980	—	Replaced a single-tree selection system with a group selection system, and worked on artificial restocking of the forest
Kalam Integrated Development Project (KIDP) (Funding: SDC)	KP	1981–1998	41.5 [Swiss franc]	Focused on improving forest management involving local communities, improving forest harvesting techniques through small contractors, and promoting village development programs
Mountains and Markets: Biodiversity and Business in Northern Areas (Funding: GEF; Implementation: UNDP)	KP and GB	2012–2017	7.793	Enabled communities for ecosystem-based enterprises to sustainably produce biodiversity goods and services in select conservation areas
Sustainable Land Management (SLM) Programme to Combat Desertification in Pakistan - Phase-II (Funding: GEF; Implementation: UNDP)	4 provinces		17.0	Conducting upscale climate-resilient SLM activities and implementing Land Use Planning and Decision Support System
Sustainable Forest Management (SFM) to Secure Multiple Benefits in Pakistan's High Conservation Value Forests (Funding: GEF; Implementation: UNDP)	Punjab, Sindh, and KP	2016–2020	8.34	Incorporating SFM in forest management planning, strengthening biodiversity conservation in the High Value Conservation Forests , and enhancing carbon storage
Scaling up of Glacial Lake Outburst Flood (GLOF) Risk Reduction in Northern Pakistan (Funding: Green Climate Fund; Implementation: UNDP)	15 districts of KP and GB	2017–2022	37	Empowering communities to manage risks associated with GLOFs and related impacts of climate change and strengthening public services to lower the risk of disasters related to GLOFs



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