

FOREST POLICY

Administration and Management

in Pakistan

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Abeed Ullah Jan

PN-ABW-185
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ABEED ULLAH JAN

**This book was produced by Winrock International Institute for Agricultural Development
with financial support provided through the
GOP-USAID Forestry Planning and Development Project.
Printed by Pictorial Printers (Pvt.) Ltd., Islamabad, Pakistan.**

October 1993. Quantity 1,000

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FOREWORD

Very little has been written on the subject of forestry in Pakistan despite the fact that there is no dearth of experienced and qualified professional foresters in the country. The reasons are many but lack of incentive, motivation and absence of a recognized market are the major causes.

2. Forestry has a narrow base in Pakistan. Historically, it has not existed outside the public sector which employs a few hundred professionals who have local and foreign degrees in forestry. The demand for forestry books is, therefore, limited and publishers are reluctant to support this discipline for fear of incurring financial losses.

3. This book on **Forest Policy, Administration and Management in Pakistan** has been written for use by M.Sc. and B.Sc (Forestry) students and to guide policy planners as they position forestry on the path of sustainable development.

4. If these objectives are fulfilled, even partially, the efforts, time and energy of the author will have been well spent and adequately rewarded.

Islamabad
December, 1992

(Abeed Ullah Jan)
Inspector General of Forests

P R E F A C E

Forestry has long been recognized as an important element in Pakistan's agro-industrial development, contributing not only to economic growth but also to environmental protection and the well-being of future generations. While the economic value of forests in terms of cash revenues is based upon its timber resources, there is growing awareness that their role cannot be viewed solely in terms of wood products. The important role which forests play in conserving soils, regulating flow of water for irrigation and power generation, reducing sedimentation, providing employment for labour and outdoor recreation opportunities, and maintaining an ecological balance far exceed their direct economic benefits from timber production. The valuable links between the forest and the rural community, although not measured quantitatively, should not be under-estimated.

2. During the last four decades, the professional forestry community has been trying to improve the overall performance of this sector but increasing population pressure on an already shrinking forest base has minimized its progress. Increased demand for wood brought about by an energy crises and the wood fabricating industries, the need to protect critical watersheds to safeguard downstream agricultural productivity, and the adoption of participatory approaches to forestry development have resulted in dramatic changes in the social and economic conditions which influence the utilization and conservation of forest resources. It is now realized that administrative authority reflected in conventional regulatory approaches is no longer an effective mechanism to stop over-exploitation and over-grazing. Participation of rural communities in the protection and management of forests and mobilization of private sector initiatives to develop additional forest resources are recognized as sine quo non for the sustained growth of the forestry sector.

3. This book on **Forest Policy, Administration and Management in Pakistan**, written by Abeerullah Jan, discusses the special responsibility of the government in promoting socio-economic infrastructure appropriate to forestry development. It emphasizes the need to modify the framework of forest policy and legislation so it is made compatible with new forest management priorities and practices. It also recognizes the need to involve village communities in the development and protection of public forests and private farm woodlots. This book, apart from helping the government re-orient its policies in the forestry sector and educate professional foresters, will be of great value to those engaged in sustainable forestry development in Pakistan.

4. I congratulate the author for undertaking this important work, and would encourage similar ventures for the benefits of those who are engaged in the pursuit of forestry in Pakistan.



(RANA NAZIR AHMAD KHAN)
Minister of State for Forests
Government of Pakistan

Islamabad
December, 1992.

CHAPTER NO. 1

FOREST RESOURCE BASE AND POLICY REQUIREMENTS.

INTRODUCTION

Pakistan is deficient in natural forest resources which adversely affects the economic growth and social well being of the country. In 1947, when India and Pakistan were carved out of the British Indian empire as two separate and sovereign independent states, Pakistan inherited a small forest resource comprised of coniferous forests in the north, irrigated plantations and riverain forests in the flood plain, and mangrove forests in the Indus River delta. After independence, irrigated plantations in the Punjab and Sindh, amenity plantations along roads, canals and railways, and watershed plantations on private and communal lands in the sub-mountainous region of Hazara, Malakand and Murree Hills have been raised, but the existing situation is still far from being satisfactory. With 5.2% of the area under forests, Pakistan is still trailing far behind its neighbours, i.e.India, Bangladesh, Nepal and Srilanka.

FOREST AREA

The classification of forest areas into administrative units, forest types and functions in Pakistan are shown in the tables 1 and 2.

TABLE NO. 1
FOREST COVERAGE IN PAKISTAN

(000 ha)

Province/ Territory	Total area	Forest Area	Percentage
N.W.F.P.	10170	1410	13.9
Punjab	20630	630	3.1
Sindh	14090	680	4.8
Balochistan	34720	720	2.1
Northern Areas	7040	770	11.0
Azad Kashmir	1330	360	27.0
Total:	87980	4570	5.2

Source: Pakistan Forest Institute.

TABLE NO. 2
**CLASSIFICATION OF FORESTS BY FUNCTIONS AND
FOREST TYPES**

(000 ha)

Forest Type	Productive forests	Protective (Conservation) forests	Total	(%)
Coniferous	867	1092	1959	42.8
Scrub	158	1568	1726	37.6
Riverain	158	138	296	6.5
Mangrove	--	347	347	7.6
Irrigated plantations	083	151	234	5.1
Linear plantations	--	17	17	0.4
Total:	1266	3313	4579	100.0
Area(%)	27.6	72.4		

Source: Pakistan Forest Institute

LEGAL CLASSIFICATION

On the basis of ownership, forests in Pakistan can be divided into two categories: *State Owned* and *Private Owned*.

State Owned Forests

State Owned forests are further divided into four classes on the basis of legal protection provided to them. These are *Reserved Forests*, *Protected Forests*, *Unclassed Forests* and *Resumed Lands*. The legal term used for the *Reserved Forests* in Balochistan is *State Forests*. Cantonment and Municipal forests are also state owned. Since they occupy small areas, they have been grouped with Reserved forests.

Reserved Forests

Reserved Forests were designated after settling their ownership and usage rights under Sections 4 to 26 of the Forest Act, 1927. These forests are generally free from rights and concessions and all acts are prohibited unless permitted specifically by the Government through notifications.

In Hazara and Murree Hills, control of some Reserved Forests was transferred from Forest Departments to Cantonment and Municipal authorities. Such forests are called Cantonment and Municipal forest respectively.

Protected Forests

Protected Forests are also State owned, but differ from Reserved Forests in two ways. Firstly, they have not passed through the lengthy process of admittance or extinction of rights or concessions of the local people, and secondly, in

contrast to Reserved Forests, all acts are permitted in Protected Forests unless prohibited by a notification of the Government.

Resumed Lands

Resumed Lands are the lands surrendered by big landlords when the ceiling on the ownership of land was fixed under the Land Reforms Act of 1959. In Hazara Civil Division, big landlords retained cultivated lands and surrendered the wooded lands previously owned by them which were in excess of the ceiling fixed by the Government. To differentiate them from Reserved and Protected Forests, these wooded lands are called Resumed Lands. Since this category of land was constituted after 1960, there is no mention of it in the Pakistan Forest Act, 1927 or in the Hazara Forest Act, 1936. Legal protection has, however, been provided to these lands by extending to them the provisions of "Protected Forests" under the Pakistan Forest Act, 1927.

Unclassed Forests

Unclassed Forests are those forests which are owned by the Government but they have neither been notified as reserved nor protected forests under Pakistan Forest Act, 1927.

PRIVATE OWNED FORESTS

Private Owned Forests is a broad category encompassing all forests held in private ownership. These are divided into five groups, namely Guzara Forests, Communal Forests, Chos Act Areas, Section 38 Areas and Farm Forest Areas. A brief description of each category is given below.

Guzara Forests

Guzara is a colloquial word which means subsistence. When forests were reserved for government ownership and management in Hazara at the time of first settlement of land ownership in 1872, sizeable patches of wooded lands close to

habitations were set aside to meet the bonafide domestic needs of the local communities. Such forests were designated as Guzara Forests. Their ownership is vested in local people either individual property or joint (communal) property called "village shamilat".

Communal Forests

Communal Forest is a sub-category of the Guzara Forest. There is no distinction between the two except that the Guzara Forests may be owned individually or jointly by a small family or a large village community where as a Communal Forest is essentially owned by the entire village. Communal forests are mostly found in Rawalpindi Civil Division of the Punjab Province.

Chos Act Area

Privately owned lands that are subjected to erosion hazard, which endanger vital public installations or structures, can be taken over by the government under the Chos Act, 1900. These are then called *Chos Act Areas*. These areas may be returned to the original owners after their treatment.

Section 38 Areas

Private owners can offer their lands to Forest Departments for afforestation and management for an agreed period ranging from 10 to 20 years under Section 38 of the Pakistan Forest Act, 1927. These are called *Section 38 Areas*. Section 38 states that:

"The owner of any land or, if there be more than one owner thereof, the owners of shares therein amounting in the aggregate to at least two-thirds thereof may, with a view to the formation or conservation of forests thereon, represent in writing to the Collector their desire that:-

- ▶ *such land be managed on their behalf by the Forest Officer as a Reserved or a Protected Forest on such terms as may be mutually agreed upon; or*
- ▶ *all or any of the provisions of this Act be applied to such land.*

In either case, the Provincial Government may, by notification in the official Gazette, apply to such land such provisions of this Act as it thinks suitable to the circumstances thereof and as may be desired by the applicants."

Farm Forest Areas

Farm Forests are linear or compact plantings of trees on private farm lands. These trees are owned individually or jointly by a family. These forests are found throughout the barani and irrigated farming areas of Pakistan.

An abstract of the legal classification of forest areas in Pakistan along with their size is given in Table-3.

TABLE NO. 3
FOREST AREA BY LEGAL CLASSES

(000 ha)

Category	Punjab	Sindh	NWFP	Balochistan	Pakistan
State Owned Forests					
1. Reserved	329	172	94	1087	1682
2. Protected	646	344	4	--	994
3. Unclassed	23	--	20	--	43
4. Municipal/ Cantonment	116	--	92	--	208
5. Resumed Lands	8	57	35	--	100
Private Owned Forests					
6. Guzara Forests	37	--	585	--	622
7. Chos Act Areas	3	--	--	--	3
8. Section 38 Areas	6	--	42	--	48
9. Communal Forests	69	--	809	--	878
10. Farm Forests*	--	--	--	--	--
Total:	1237	573	1681	1087	4578

Source: 1. Punjab Forest Department Annual Report 1986-87
2. Pakistan Forest Institute, "Forests and Forestry in Pakistan", 1987.

IMPACT OF LAND TENURE SYSTEM ON FORESTS

The land tenure system in Pakistan is both complicated and complex. It is identified as one of the major causes of low productivity in agriculture; the gradual disappearance of trees from wastelands (unclassified government lands) and common village wood lots; and the degradation of pastures on account of excessive and unrestricted grazing. This practice is deep rooted in history, tradition, religion and laws.

According to the Muslim Family Laws, a property is inherited by sons and daughters in ratio of 2:1 in physically divided holdings. For instance, if an owner of 100 ha of land

* Farm forest is not a recognized legal category nor it is taken into account while computing forest area in Pakistan.

leaves behind four sons and two daughters, each son will get 20 ha and each daughter 10 ha. Thus, a block of 100 ha is divided and reduced to blocks of 20 ha and 10 ha over night. The process continues until the holding becomes uneconomical or the owner loses interest in the land. Consequently, degradation of land and its components (i.e. trees, bushes, grasses, etc.) takes place.

The process of fragmentation of holdings was speeded up with land reforms in 1959 and again in 1971. The officially proclaimed benefits of land reforms of 1959 were described in the following words;

"to devise a rational land tenure policy which would satisfy the social need for greater equality of opportunity and social status, the economic need of increasing agriculture production and improving the standard of rural living through a more equitable distribution of income from land with a view to creating an economically viable, socially free and politically stable and progressive society".

Under the 1959 Act, a ceiling was fixed on the size of holdings, i.e. a maximum individual ownership of 500 acres of irrigated or 1000 acres of unirrigated land. About a million ha of land was resumed and tenants were given the first choice of purchase. Jagirdari was abolished and a degree of security was provided to the tenants. Fragmentation of holdings below the defined subsistence and economic landholding units was legally prohibited. However, the 1959 Act has not been effectively enforced, due to the contrary provisions of the Muslim Family Law which is still in vogue.

The real motive of the 1959 Act, was to break the power of feudal lords. It is questionable if this objective was achieved, but as a result of the Act the land was certainly fragmented.

Another wave of land reforms was initiated in March 1971. The land holdings ceiling was reduced by 70 percent, i.e. a maximum ownership of 150 acres of irrigated or 300 acres of unirrigated land, or an area equivalent to 12,000 produce index units (PIUs), whichever was greater, was allowed. The owner of a tubewell or tractor was allowed an additional 2000 PIUs. In addition, the reforms provided extra security to tenants; prohibited arbitrary ejection of tenants; defined cost and crop sharing relations between landowners and tenants; and, laid down a policy for the distribution of resumed lands.

Other aspects of land tenure systems will be discussed in the section on the regulation of rights and concessions (Chapter No.2).

IMPACT OF RELIGION ON FOREST MANAGEMENT

With the exception of the Reserved Forests (which are properly demarcated with boundary pillars and wherein all rights and concessions are either extinguished or well defined and regulated) all other categories of forests are generally considered *no man's land* or *everybody's property*. This belief and attitude is said to be rooted in religion. An incident during the period of the Holy Prophet, Hazrat Mohammad (PBUH) is narrated in this connection:

"A man was found begging in the holy city of Mecca. He was brought to the presence of the Holy Prophet (PBUH). On learning from him that he had only a cup and a kettle, the Holy Prophet (PBUH) advised him to sell these articles and purchase an axe and a rope, and suggested he make his living by cutting trees from a nearby mountain and sell the wood in the market."

The muslim society, at least, in Pakistan considers the cutting of trees from woodlots, held as common property, for heating, cooking or selling to supplement family income, fully

justified. Consequently, forest conservation, particularly in the case of loosely held public property and jointly held village wood lots has suffered. In northern Pakistan where life is unbearable without heating due to the severe cold and long winters, this attitude is reinforced. Similarly, expanding deserts and the accelerated pace of desertification in the Sindh and Balochistan are the result of excessive cutting of trees and other vegetation to meet domestic energy needs and livestock fodder requirements.

PRINCIPLES OF POLICY FORMULATION

The 1973 Constitution of Pakistan in Chapter 2 Sub Section (1) enumerates the Principles of Policy as reproduced below:-

"The Principles set out in this Chapter shall be known as the Principles of Policy, and it is the responsibility of each organ and authority of the State, and of each person performing functions on behalf of an organ or authority of the State, to act in accordance with those Principles in so far as they relate to the functions of the organ or authority".

All policies of the Government including Forest Policy draw strength and authority from these Principles of Policy as enshrined in the Constitution.

GENERAL PRINCIPLES OF A NATIONAL FOREST POLICY

The purpose of a national forest policy is to enumerate basic principles and goals for the conservation and development of forests resources in the country in order that it meets its social, economic and ecological needs. These needs could include raw materials for commercial use, goods and services for the

society, or environmental benefits. The policy statement is necessary to:

- (a) Obtain maximum benefits from the forest resource on a sustainable basis;
- (b) Fix short and long term goals and identify strategies to achieve those goals; and
- (c) Promote and ensure cooperation between government and private agencies having land-use responsibilities that affect forestry activities directly or indirectly.

Needs and Principles of National Forest Policy for Pakistan.

The national forest policy is guided and influenced by social, economic and environmental needs of a country, both present and future. These needs and principles in case of Pakistan are:-

- (a) Pakistan's mainstay is agriculture which is dependent on canal irrigation. Sound management of watersheds should, therefore, constitute the basic objective of forest policy.
- (b) Because of inadequate forest resources Pakistan must concentrate on developing new plantations. For this purpose, all internal and external sources should be mobilised to achieve tree planting goals.
- (c) The country is heavily populated and faces an energy crisis. Since there is little scope to increase the area of state forests, agroforestry programmes should be of vital concern to meet fuelwood requirements. An Integrated approach which

entails afforestation for fuelwood and fodder along with agriculture crops on farm lands, should constitute a cardinal principle.

- (d) Forest policy should be dynamic so it can adjust to changes in the pattern of wood consumption that takes place as a result of development in the country and advancement of technology. Promotion of industry must form an important component of present and future plans.

Objectives of Pakistan's Forest Policy

The objectives and goals of Pakistan's Forest Policy are identified as under:-

- (i) Increase public and private acreage under wooded forests to 20% of Pakistan's total area during the next 30 years.
- (ii) Increase sustainable production of fuelwood, timber, fodder and other forest produce from public and private forests through intensive management.
- (iii) Improve utilisation and marketing of forest produce from public and private forests.
- (iv) Involve farmers, masses and Government Departments in forest conservation and development activities.
- (v) Improve and manage rangelands for greater sustainable production of forage, fuelwood and water.

- (vi) Reserve areas of all natural and man made ecosystems and the species and genetic diversity in them.
- (vii) Manage unique ecosystems for nature - oriented tourism (eco-tourism).
- (viii) Strengthen forestry education, training and research.

Important documentation on Forest Policy of Pakistan

In the past, the heads of State and heads of Government in Pakistan including the Martial Law Administrators have issued important statements and directives related to forest policy from time to time. Many committees were set up, conferences held and reports prepared. All of these are listed chronologically:-

- ▶ National Forestry Conference, 1948
- ▶ Wildlife Enquiry Committee, 1969-1971
- ▶ National Forestry Committee, 1972
- ▶ National Range Management Committee, 1973
- ▶ Inter-Provincial Conference, 1974
- ▶ Agriculture Enquiry Committee, 1975
- ▶ Committee on Forest Preservation and Development, 1976
- ▶ National Commission on Agriculture, 1988
- ▶ Manifestoes of Political Parties issued from time to time

The outcomes of the aforementioned committees and conferences have resulted in formulation of following forest policy documents:-

- ▶ Forest Policy, 1955
- ▶ Policy Directive of 1962
- ▶ Policy on Forestry and Wildlife (as a part of the National Agriculture Policy) 1980
- ▶ Forest Policy, (as a part of the National Agriculture Policy) 1991

POLITICAL PARTY MANIFESTOES

It is of interest to note the views of Pakistan's political parties on the conservation, management and development of forest resources. The views of the *Pakistan People's Party* (PPP), *Pakistan Muslim League* (PML), and the *Islamic Jamhoori Ittehad* (IJI) as included in their manifestoes are reproduced below:-

Pakistan People's Party

Forest Management

The main object of forest management policy will be maximum public welfare rather than maximum yield. Short term profit will not be a parameter in determining forest management policy.

Pakistan Muslim League

(a) Rural Transformation

Encourage ecologically sound development policies to preserve and develop the country's natural land forest resources and provide incentives for farmers to adopt social forestry on a commercial basis, rather than depend on restrictive laws for this purpose particularly in border areas.

(b) Industrial Development

Provide the full energy needs of an expanding industrial sector.

Encourage the rapid development of small industries particularly agro-based industries in rural areas through fiscal and other incentives and an extended system of promotion and guidance.

(c) Energy

Evolve short, medium and long-term energy plans to ensure that there is adequate supply of energy in the country to support the required expansion in agriculture, industry and transport and to meet growing domestic requirements.

Islami Jamhoori Ittehad

Agriculture and Rural Development

- (a) A major programme of rural industrialisation to provide employment and higher incomes to the rural population.
- (b) A comprehensive programme of environmental protection to conserve and develop the country's land, water and forest resources.

Conclusion

Despite emphasis on afforestation and resource conservation in various policy statements as well as provisions made in manifestoes of the political parties, area under forest has not increased appreciably due to:

- i. harsh climate;

- ii. low priority assigned to forestry; and
- iii. inadequate allocation of funds made in the budget.

These factors have been discussed at greater detail in the subsequent Chapters.

CHAPTER NO. 2

FOREST ADMINISTRATION

FOREST OWNERSHIP

The detail of forest ownership together with legal classification, definitions of different categories, extent and distribution of private and public forests are given in Chapter No.1 and Table No.3.

RIGHTS AND CONCESSIONS

Forests, whether private or public, are heavily burdened with rights and concessions of all types and descriptions which are legally recognized or traditionally established. These rights were admitted at the time of land settlement in 18th and 19th centuries and are still being exercised by local residents, nomadic graziers and agro-pastoral communities.

These rights are recorded in the "Wajib-ul-Arz"* which is maintained by the Revenue Tehsildar and are guided by the over-riding principle that all acts are prohibited in a Reserved Forest unless specifically permitted and all acts are permitted in all other types of Forests (Protected, Resumed, Guzara etc) unless specifically prohibited. The following is a general list of rights and concessions;

- ▶ Share in royalty (from Guzara forests in Hazara).
- ▶ Trees for construction of houses, household furniture and agricultural implements in Hazara, Malakand, Rawalpindi, Murree Hills, Azad Kashmir and Northern Areas.

*Wajib-ul-Arz is a revenue document separately prepared for each village at the time of land settlement which indicates in detail the rights and concessions in forests.

- ▶ Timber at concessional rates in Malakand, Azad Kashmir and Northern Areas.
- ▶ Grazing of domestic animals either free or on payment of a nominal fee.
- ▶ Cutting of dry trees and collection of fuelwood, cones, needles, etc.
- ▶ Collection of grasses.
- ▶ Right of way

With increase in population, these rights and concessions have multiplied. Initially, these rights were granted to local people by the colonial lords for several reasons, three of these are worth mentioning;

- (i) The colonial masters wanted to enlist the co-operation of tribesmen living in settlements near forests and, therefore, generously granted rights in forests and the adjoining crown lands to them.
- (ii) Given limited human and livestock populations and extensive forest and range areas, the exercise of generous rights never posed a serious threat to forest conservancy.
- (iii) The economy of local people was and still is agropastoral. People keep large herds of goats, sheep, cattle and buffaloes and graze them freely wherever they wish. Restricting grazing or prescribing beats for them would amount to denying them their livelihood and this would have posed problems for the colonial lords and can still create an explosive situation if any measure of restriction is imposed on them.

LEGAL RECOGNITION & REGULATION

In all forest working plans, legal status of forests and the rights and concessions enjoyed by the local people are spelled out. For the sake of elucidation, relevant extracts from working plans are reproduced below. For this purpose, three typical working plans covering the following categories of ownership have been selected;

- (a) Government Reserved Forests.
- (b) Private (Guzara) Forests in settled districts.
- (c) Private (Communal) Forests in Provincially administered tribal areas (PATA)

GOVERNMENT RESERVED FORESTS.

The description of rights and concessions as recorded in the working plan for Cantonment Forests in Murree Hills. Scrub Forests in Rawalpindi District, Murree Kahuta Forests in Rawalpindi District, and Keran and Sharda Forests in Azad Kashmir are reproduced below:

- (i) Cantonment Forests in Murree Hills (1971-72 to 1980-81)

"In 1885, residents of Birgran Village were given rights to graze their unlimited cattle for free in Gharial forests, when first revenue settlement was completed.

Taking one cow equal to two sheep and one buffalo equal to four sheep, incidence of grazing over an area of 313 acres comes to 45 animals per acre which is extremely heavy compared to carrying capacity of the area".

(ii) Scrub Forests in Rawalpindi District (1966-67 to 1975-76)

"The Reserved Forests in Murree Tehsil are, in addition, open to free grazing of kine, horses and donkeys. The Divisional Forest Officer may, however, close 1/4th area at a time for regeneration. This concession was granted to ensure cooperation of local people in preventing incendiary fires".

(iii) Murree Kahuta Forests of Rawalpindi District. (1965-66 to 1984-85)

"According to Government Notification, all Reserved Forests shall be open to free grazing of kine, mules, horses and donkeys except such forests as the Divisional Forest Officer may consider necessary to close for the purposes of regeneration, provided that the area of the forest, closed at any one time, shall not exceed 1/4th of total area of the Reserved Forest."

(iv) Keran and Sharda Forests of Azad Kashmir. (1974-1983)

"No rights are recognized in the demarcated forests but Zamindars (land owners) residing within 3 miles of demarcated forests have been granted liberal concessions. The rules regulating the grant of these concessions are fully defined in Kashmir Forest Notice. These concessions are, however, revocable at the pleasure of Government. These are primarily for the bonafide domestic and agricultural use of Zamindars and cannot be sold, bartered or exchanged. All villagers in the presently constituted Keran and Sharda Forest Divisions are entitled to these concessions. The more important features of these concessions which influence

the forest management are given in the following subparagraphs:

- (i) Trees, except Deodar, are granted for construction of buildings and agricultural implements on very nominal payment. Zamindars residing within three miles of demarcated forests get timber at 1/6th of the Zamindari rates enforced and those living beyond this limit get at full Zamindari rates. The concession is further reduced to half of these rates in the Keran and Sharda Forest Divisions.
- (ii) The concessionists are also entitled to remove from forests, free of any charge, natural fallen dead trees or timber including broad leaved trees of any size. Deodar poles 3' in girth at the base or naturally broken pieces of it under 3' in length and of any girth can also be removed.
- (iii) The concessionists are granted Kail and Fir trees free of cost for their houses in case of natural calamities such as fire, avalanches, earth quakes, floods, etc. Timber including Deodar is also granted free of cost for construction of mosques, primary and middle School buildings.
- (iv) The concessionists can also utilize broad-leaved trees, other than special class trees, as defined in the Kashmir Forest Notice, free of charge. for their bonafide use and agricultural implements.

- (v) Grazing and grass cutting in all forests is free of charge. The grazing tax levied earlier on graziers was abolished by Azad Government of the State of Jammu and Kashmir soon after its inception through Government order No.84/1949. The grazing tax was suspended as a temporary measure in order to afford relief to the refugee graziers from Jammu Province".

PRIVATE (GUZARA) FORESTS

Working Plan Guzara Forests of Haripur Forest Division. (1984-85 to 1993-94)

According to the Hazara Forest Act 1936, and rules made thereunder and subject to the rights and powers of the government in respect of seignorage and forest conservancy as defined under the relevant Act, all wastelands are the property of individuals or are held jointly by the community. Such owners are entitled for free grant of trees for their bonafide needs. Brief account of rights and concessions in Guzara Forests, of Haripur Forest Division as recorded in the working plan is given below:-

Rights	Extent
▶ Grazing of domestic animals	Full rights.
▶ Grass cutting.	-do-
▶ Collection of dry wood for use as fuel.	-do-
▶ Timber for domestic requirement	This right is subject to prior sanction of the DFO and is restricted to actual requirement not exceeding the limit laid down in the Wajib-ul-Arz.

Rights	Extent
▶ Sale proceeds.	The owners as recorded in Wajib-ul-Arz are entitled to the sale proceed less 20% departmental charges in addition to any seignorage fee leviabale under Hazara Forest Act 1936.

PRIVATE (COMMUNAL) FORESTS

Working Plan Khandia-Uthor Forests of Kohistan Forest Division. (1985-86 to 1999-2000)

Since rights in private (commercial) forests have not been settled administratively, the extent of lawful rights and concessions enjoyed by the local people have, therefore, not been properly defined. However, the rights practised by local people at present are substantial. Examples are mentioned below:

- ▶ Unrestricted grazing by domestic animals, grass cutting and lopping for fodder and firewood.
- ▶ Villagers can obtain construction timber and firewood for domestic purposes from all kinds of trees without any restriction.
- ▶ Right-holders realise a fee called kalang from the Gujar (nomads grazier's community) for grazing cattle, sheep and goats in the high lying pastures. The Government does not share this fee.

- ▶ Villagers can hunt wild animals and birds without regard for restrictions on species, sex, size or breeding period.
- ▶ Villagers can fish using nets and dynamite.
- ▶ Villagers can cut trees, burn stumps and use logs for watbandi (field boundaries) to prepare land of any extent for agricultural purposes.

FORESTRY ADMINISTRATION*

Forestry organizations are functioning at three levels;

- (a) Federal,
- (b) Provincial, and
- (c) Local

Federal

Forestry is a provincial subject according to the Constitution of the Islamic Republic of Pakistan. As such, the role of the Federal Government is limited to:

- ▶ Forest Policy.
- ▶ Foreign assistance and training.
- ▶ Research and education.
- ▶ Provincial co-ordination.
- ▶ Import and Export (wood and wildlife).

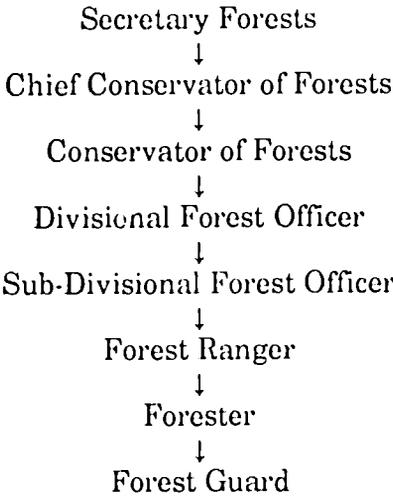
For performing these functions, there is an administrative unit in the Ministry of Food, Agriculture and Cooperatives

* Organization charts of Forestry Administration at Federal and Provincial levels are given in the book on "Review and Analysis of Forest Policies of Pakistan", pages 116-124.

headed by the Inspector General of Forests (IGF) with the status of an Additional Secretary to the Federal Government. The IGF is assisted by two Deputy IGFs, one Assistant IGF, three Section Officers, one Statistical Officer and their complementary staff.

Provincial.

Pakistan is a Federation comprising four Provinces, namely Punjab, Sindh, NWFP and Balochistan, and two areas having special status, Azad Kashmir and Northern Areas. The Provincial Governments own and manage forests and exercise legal powers over them. The Provincial Forest Departments are structured in the following fashion:



Local

Local level institutions dealing with Forestry are few in number and are generally less important than federal and provincial organizations. For example, the Capital Development Authority (CDA) has a Directorate of Environment to protect existing vegetation, plant new areas and improve general environment of the Federal Capital

Territory. Similarly, the Civil Aviation Authority (CAA) is responsible for landscape horticulture at airports. It has a small group of trained and specialized staff which are augmented by staff on secondment from the Provincial Forest Departments or retired forest officers on contract.

Army and cantonment authorities look after and improve the vegetational landscape in their areas, mainly drawing on expertise and facilities of the Provincial Forest Departments for planting material and technical know-how since they do not have their own separate and specialized staff.

MANAGERIAL RESPONSIBILITIES

Managerial responsibilities are well defined in the Provincial Forest Departments and are spelled out in a series of manuals. The manuals provide guidance to the departments' managerial and complementary staff. These include:

- (a) West Pakistan Forest Manual, Volume-I, dealing with forest administration, Forest Acts and the Rules made under the Forest Acts.
- (b) West Pakistan Forest Manual, Volume-II, dealing with Establishment, Accounts and Budget.
- (c) West Pakistan Forest Manual, Volume-III, dealing with Procedure and Preparation of Working Plans, etc.

In these documents, powers, functions and responsibility for all tiers of forests officers are clearly laid down. The aim is decentralization, but in actual practice the forest officers are not allowed to use their administrative powers. For example, the Provincial Chief Conservator of Forests has full powers to transfer DFOs on completion of their normal tenure of office, but these and similar other powers are frequently assumed by the concerned Secretary and the Minister.

PERIODIC REVIEWS

Periodic review of forestry activities and programmes is accomplished through the vehicle of an Annual Development Programme (ADP), Five Year Plans and Special Purpose Sector Reviews. The preparation and revision of working plans are useful in setting and changing the objectives of management.

POLICY AND LEGISLATION DECISIONS

Policy decisions are made by the Federal and Provincial Cabinets. Legislation is framed and updated by the Legislative Assemblies.

CONSULTATION PROCESS

Consultation process is specifically provided to reserve forest land. For other actions, it is not established by legal mandate but takes place formally or informally through;

- i. People voicing concern either directly or through elected representatives.
- ii. Meetings and seminars arranged by Governments and aid agencies and attended by all interest groups including forest owners and wood users.
- iii. Federal Forest and Wildlife Advisory Boards which include public representatives.
- iv. Interviews and enquiries conducted by special bodies set up by Governments for specific issues, e.g.
 - ▶ National Agriculture Commission.
 - ▶ National Conservation Strategy.
 - ▶ Forest and Wildlife Inquiry Committees.
 - ▶ Central Board of Forestry.

The NCS's national development goals are a recent example of the types of policies that can flow from consultative process.

LEGAL AND POLITICAL CONSTRAINTS

Successful implementation of Forest Policy has three pre-requisites:

- (a) Adequate legislative coverage.
- (b) Appropriate organizational structures.
- (c) Adequate provision of funds.

LEGISLATION

Good legislation is one which promotes values based on local customs and traditions, and is backed by a strong enforcement agency. The existing forest legislation is examined in light of this criteria.

1. PUNJAB

1. The Pakistan Forest Act 1927 (Act No.XVI of 1927)
2. The Punjab Forest (Sale of Timber) Act 1913
3. The Cattle Trespass Act 1871
4. The Punjab Land Preservation (Chos) Act 1900
5. The West Pakistan Fisheries Act 1961
6. The Bahawalpur State Cattle Trespass Act 1944.
7. Guzara Rules of Rawalpindi District.
8. The Punjab Wildlife (Protection, Preservation, Conservation and Management) Act 1974
9. The Cutting of Tree (Prohibition) Act 1975.

2. SINDH

1. The Pakistan Forest Act 1927
2. Sindh Grazing Rules.
3. The Sindh Wildlife Protection Ordinance, 1972.
4. The Cutting of Tree (Prohibition) Act 1975.
5. The West Pakistan Fisheries Act 1961.

3. NWFP

1. The Pakistan Forest Act 1927
2. The NWFP Hazara Forest Act, 1936
3. The NWFP Protection of Trees & Brushwood Act 1949
4. The Kohat Mazri Control Act 1954
5. NWFP Forest Produce Transport Rules 1975
6. Hazara District Protected Forest Rules 1973
7. The North West Frontier Province Wildlife (Protection, Preservation, Conservation and Management) Act, 1975.
8. NWFP Forest Development Corporation Ordinance 1980 (No.11 of 1980)
9. The Cutting of Tree Act 1975
10. The West Pakistan Fisheries Act 1961

4. BALOCHISTAN

1. The Pakistan Forest Act 1927
2. The Pakistani Balochistan Forest Regulation 1890
3. The Balochistan Wild Bird and Animals (Amendment) Regulation (Regulation 3 of 1942)
4. The Balochistan Wildlife Protection Act, 1974
5. The Juniper Reserve Trees Act
6. The Cutting of Tree Act 1975

7. The West Pakistan Fisheries Act 1961

5. **NORTHERN AREAS**

1. Gilgit Private Forest Regulation 1970
2. Gilgit Private Forest Rules 1970
3. Northern Areas Cattle Trespass Act 1975
4. Northern Areas Wildlife Preservation Act 1975
5. Northern Areas Fisheries Act 1975

6. **AZAD KASHMIR**

1. Forest Regulation No.2 of 1930 (as amended).
2. Protection of Forests and Timber Distribution Act,1985.
3. Azad Jammu & Kashmir Wildlife Act,1975.

The forest laws were enacted long ago. These were adequate at the time of their enactment because:

- (a) Population levels were low;
- (b) Living was simple and the needs of the local inhabitants were limited;
- (c) Markets for timber did not exist near the source of production, i.e. forests;
- (d) People were law abiding; and
- (e) Law enforcement was easy and effective.

This forest legislation is no longer effective under the changed conditions and circumstances. The reasons are numerous but a few deserve special mention. Human and livestock population have increased manifold, rights and concessions of individuals have multiplied and price of timber has appreciated so much that wood is now much more costlier than other items of daily use. Forests are exposed treasures, within the grasp of greedy and unscrupulous persons who have

scant respect for the law. The existing forest legislation is no longer adequate to protect and safeguard the forests and to promote expansion of forest resources.

ORGANIZATIONAL STRUCTURE

The present organizational structure is hierarchial in scope and practice. Given the present administrative work loads, it is not possible for staff to protect extensive forest areas and also execute developmental activities except under projects for which separate staff is provided. The territorial staff perform routine activities which do not contribute to the development of forests.

The comparison of existing territorial charges and those desirable for introducing proper management based on the experience gained in the Kaghan Valley project in Hazara executed with the German technical assistance is shown in the tables 4 and 5 to illucidate this problem.

TABLE NO. 4
EXISTING TERRITORIAL CHARGES

	Existing		
	Hazara	Malakand	Average
Forest circle	1,447,195	1,349,658	1,398,427
Forest Division	206,742	337,414	272,078
Forest Range	48,239	79,391	63,815
Forest Block	14,467	17,528	15,998
Forest Beat	2,756	3,957	3,356

TABLE NO. 5

MANAGEABLE (DESIRABLE) TERRITORIAL CHARGES.

(in acres)

	Desirable*
Forest Circle	48,000
Forest Division	12,000
Forest Range	3,000
Forest Block	750
Forest Beat	250

* Based on experience gained in Kughan Project.

FORESTRY BUDGET

The total allocation for the Forestry sub-sector in the Seventh Five Year Plan is Rs.2,393.147 million including foreign exchange which is distributed among provinces on the basis of approved development programmes. Table 6 shows the budget allocation for the 7th Plan (1987-88 to 1992-93);

TABLE NO. 6

ALLOCATION OF FUNDS IN 7TH PLAN

(Rs.in Millicn)

Province	Budget Provision in 7th Plan			Total
	Forests & Wildlife	Watershed	Range M/ment	
Punjab	551.410	31.330	43.860	626.600
Sindh	173.415	2.000	6.245	181.660
NWFP	307.382	646.493	43.001	996.876
Balochistan	41.651	4.600	29.998	76.249
Azad Kashmir	173.200	53.000	15.000	241.200
Northern Areas	99.086	36.131	-	135.217
Tribal Areas	167.124	-	-	167.124
<u>Federal</u>				
P.F.I	2.856	-	-	2.856
NCCW	0.670	-	-	0.670
ZSD	2.015	-	-	2.015
MINFA	97.897	-	-	97.897
Total:	1,616.706	773.554	138.104	2,528.364

Source: 7th Five Year Plan

With the budget allocations as mentioned above, the physical targets given in table 7 are expected to be achieved upto June, 1993:

TABLE NO. 7**PHYSICAL TARGETS FOR FORESTRY SUB-SECTOR
IN 7TH FIVE YEAR PLAN**

Product	1982-83 (Actual)	1987-88 (Actual)	1992-93 (Proj)	<u>Growth Rate</u>	
				1983-88	1988-93
Wood Production (000 CUM)	686	1,055	1,200	8.9	2.6
Fuel Wood (000 CUM)	476	645	745	6.3	2.9
Compact Planta- tion (Hectares)	8,500	33,000	40,000	31.1	3.9
Nursery raising (Hectares)	289	375	500	5.3	5.9
Linear plantation (Avenue Km)	2,700	2,000	3,500	(-)-5.8	11.8
Distribution of Plants (Million Nos)	35	180	500	38.8	22.7

Source: 7th Five Year Plan.

DEVELOPMENT PROGRAMMES

Development programmes are in line with the National Forest Policy, but generally the objectives set out in the National Forest Policy have not been achieved because of inadequate provision of funds as shown in Table No. 8.

TABLE NO. 8.

PROVISION OF FUNDS IN FIVE YEAR PLANS

(Rs.in million)

Plan	Plan Provision	Funds Released	Ratio between plan provision and funds released
1st (1955-59)	39	35	1:1
2nd (1960-65)	87	72	1:1
3rd (1965-70)	140	92	1.5:1
4th (1970-78)	216	212	1:1
5th (1978-83)	1223	629	2:1
6th (1983-88)	1623	749	2:1
7th (1988-93)	1927	1018	2:1

In the context of this table, three observations are relevant;

- (a) The ratio between Plan provisions and actual releases have gradually declined from 1:1 to 2:1 over a period of time.
- (b) Although, in monetary terms, the funds released have increased, but if one considers the gradual increase in forest area due to the extension of scientific forest management to the former Princely States of Dir, Swat, Chitral and Amb in

NWFP, the escalation in labour cost, inflation, etc. there has been a gradual decrease in monetary resource per unit area.

- (c) Forestry claims about 10% of the total development budget that is allocated for the agriculture sector and less than 0.5% of the national Annual Development Programme. These provisions are not adequate to achieve the development goals as set forth in the Forest Policy and the National Conservation Strategy. The result in both the northern and southern portions of Pakistan is that natural resources are being depleted and desertification in the arid zones is increasing.

CHAPTER NO. 3

MONETARY POLICY AND FISCAL MEASURES

MONETARY POLICY

Monetary policy is an important tool used by States to regulate their economy through supply of money. Goals are achieved by taking various fiscal measures indicated in the following paragraphs.

TAXATION

National and provincial resource mobilisation is primarily achieved through direct and indirect taxes. However, low taxation or rebates in taxes may boost investments for development in a sector. Tax holidays for specific areas and specified periods may also promote industrialization. Tax holidays may cover one or more taxes such as income tax, corporate tax, sub tax, excise duty, cess, octroi charges, etc.

FOREIGN LOANS

Ideally, all the financial needs for industrial development in a country should be met by internal resource. However, this is not always possible. Therefore, states in developing countries may take loans from developed countries and international financial institutions to finance development projects which include establishment or widening of the industrial base. However, improper utilization of foreign loans can add to debt burden and weaken the economy rather than stimulating development.

SURPLUSES OF PUBLIC UNDERTAKINGS

The profits of corporations in the public sector can be a source of further investment if these corporations earn profits. Generally, the government owned industrial units are inefficient and unprofitable. Often, there is an attempt to make them profitable by eliminating competition or by increasing the price of their products. In addition, some public sector corporations are deliberately managed on nonprofit basis. Thus, there are numerous limitations associated with relying on public undertakings. Ideally, privatization of public undertakings will promote surpluses for reinvestment. A government should, ordinarily, involve itself in public undertakings only when private sector is not willing or making the investment because of risk, lack of technology, or where industry is non-profitable.

PRIVATE/DOMESTIC SAVINGS

Governments can regulate the size of domestic savings by adjusting interest rates and by providing incentives in its saving schemes. Such savings provide an effective instrument to generate resources for investment and industrial development.

DEFICIT FINANCING

Deficit financing is yet another process of resource mobilization. Deficit financing is achieved through the government printing of additional currency notes without having the necessary SDRs with the State Bank. This measure is taken under extreme situations when all other options and methods of resource mobilization such as taxes, loans and disinvestment have been exhausted. As this measure results in inflation and devaluation of currency, the percentage of deficit financing should, ordinarily, be kept low and be used only as a short term measure where immediate returns are foreseen.

IMPORT RESTRICTIONS

Restrictions on import of goods which are manufactured locally can protect indigenous and infant industries, but this measure is discouraged by the IMF. Direct measures such as higher import taxes and duties can also serve the same purpose. Since direct or indirect measures generally reduce competition and lower the quality of the indigenous products, quality control measures are necessary. Removing or reducing restrictions on the import of machinery and equipment can promote investment in the manufacturing sectors which is essential for establishing or expanding the industrial base.

SANCTION LIMITS

Upper limits/ceilings on investments in industrial units can be regulated by governments by sanctioning the installation of a unit or by prescribing the upper limit of loans in case of nationalized banking system. Listing of industries for sanctioning procedures, or eliminating or elevating the limits on the size of capital and loaning facilities can boost industrialization process.

FISCAL MEASURES AND DEVELOPMENT/ INDUSTRIALIZATION

The State Bank of Pakistan regulates the supply of money of which a part is used for development and industrialization. Specific measures taken to achieve this are indicated in the following paragraphs.

ALLOCATION OF CREDIT

Credit extended by nationalized commercial banks and development financial institutions is allocated to sectors like agriculture, housing, industry, etc. through a National Credit Consultative Council (NCCC) under the guidance of the

Government. Sensible allocation of credit to sectors can promote balanced growth in all sectors of economy.

(a) **Credit Budget:** NCCC decides credit budgeting based on an evaluation of the needs of all sectors.

(b) **Credit Ceiling:** Usually, a limit is fixed for credit allocated to sectors. The limit may however, be raised or reduced to counter investment and development in a sector. The State Bank controls the credit ceiling.

STATUTORY RESERVE RATIO

The State Bank of Pakistan requires that a portion (currently 35%) of all commercial banks reserves be deposited with it. This limits the ability of commercial banks to issue credit. The government can lower the ratio for deposit to enable commercial banks to issue more credit for investment in development and industrialization. However, this increases the financial risk for commercial banks.

INTEREST RATE

Interest rate is a very powerful tool for mobilizing sources for debt. High rates of interest attract deposits and, thereby, increases a bank's reserves and enables them to give more loans. Conversely, lower rates of interest are an incentive to industrialists and entrepreneurs to borrow capital for development.

FISCAL MEASURES AND FORESTS

The extent and success of the fiscal measures listed above are discussed below in terms of their use for the development of forests and the establishment and expansion of wood based industries.

PRIVATE FORESTS

Historically, forests in Pakistan, whether public or private (guzaras) were either managed or controlled by the Provincial forest departments. As such, these were treated alike in the monetary policy and fiscal measures decided annually by the Federal Government for socio-economic development.

Forestry has contributed very little, to the Gross National Product (GNP) since only tangible benefits are recognised. Their environmental role is great, but is not assessed because of its intangible nature. As such, consideration for forests is given little priority in our socio-economic policies. No doubt, some incentives are provided for forestry but, generally, these are channelled through specific development projects either for promoting export, discouraging imports or for developing a particular region.

To understand fiscal mechanisms that have been used, it is worthwhile to look into different segments of private forests and forestry, e.g:-

- (a) management of existing private forests;
- (b) harvesting through public sector corporations;
- (c) management of forests by owner's cooperatives;
- (d) raising new plantations on private lands:
 - (i) on hills slopes in mountains
 - (ii) on farm lands, irrigated or rainfed, in plains.
- (e) tree planting campaigns;
- (f) establishment of wood based industry in private sector; and
- (g) export of finished products, i.e. furniture, veneer, sport's goods.

MANAGEMENT OF EXISTING PRIVATE FORESTS:

There are large acreages of private forests in the Himalayas, Karakoram and Hindu Kush mountains which

were, and still are, managed by the Forest Department on behalf of their owners. The owners, therefore, feel alienated and disinterested so much so that protection of these forests has become a real problem for the Forest Department. It was, therefore, decided to associate forest owners in management of these forests on an experimental basis by setting up multipurpose Forest Co-operative Societies in the Manshira District of Hazara and Forest Harvesting Societies in the Kohistan District of Hazara (NWFP).

OWNERS CO-OPERATIVES FOR MANAGEMENT:

Owners co-operatives have been set up in Hazara for management of private (Guzara) forests after transferring their control from the Forest Department to the Cooperatives by amending Rule 6, of the Hazara Management of Wastelands (Guzara) Rules, 1950. The government notification issued on the 24th June 1981 reads as follows:

"In exercise of the powers conferred by Section 53 of the Hazara Forest Act, 1936 (NWFP Act VI of 1937) the Government of NWFP is pleased to direct that in the Hazara Management of wastelands (Guzara) Rules, 1950, the following further amendments shall be made:

AMENDMENT

After rule 6, the following new rule shall be inserted, namely:-

"6A. (1) The conservator may, with the prior approval of the provincial Government transfer on leases on such terms and conditions as may be specified, the management of any wasteland, for a specified period or periods, to a Forest Production and Multi-purpose Cooperative Society, registered as such under the Cooperative Societies Act, 1925.

(2) Where any wasteland is transferred under sub-rule (1), the provisions of rules 7 to 24 of these rules, or any other rule that may be specified by the Conservator shall not apply to the area or areas so transferred during the currency of lease period".

After this amendment in the law, the Multipurpose Forest Co-operative Societies were established with the following short, medium and long term objectives:

Short Term Objectives

- (i) Organize 15-18 cooperative societies of forest owners in three years;
- (ii) Make inventories of 10,000 - 12,000 acres of forests in 3 years and prepare management plans for each area;
- (iii) Train 10 - 12 key-members of the forest cooperatives each year at the Pakistan Academy/Cooperative Training College; and,
- (iv) Transfer management of 10,000 - 12,000 acres of Guzara forests to the Forest Cooperatives in three years.

Medium Term Objectives

- (i) Exploit forests on an intensive management system to provide optimum financial benefits to the owners in the shortest possible time; and
- (ii) Manage Guzara forests on a co-operative basis to:
 - (a) create a sense of ownership among the Guzara owners,

- (b) reduce illicit cutting in Guzara forests,
- (c) simplify procedures to eliminate corruption, and
- (d) promote meaningful cooperation among the like minded people for their mutual advantage.

Long Term Objectives

- (i) Increase production of timber, firewood and forage from forests and range-lands and raise productivity of agricultural lands;
- (ii) Create a spirit of self reliance in the farming community and to assist in developing local infrastructure;
- (iii) Obtain the voluntary involvement of the masses in development activities;
- (iv) Motivate the rural communities to develop mutual trust and spirit of self help; and
- (v) Evolve an operational strategy for the management of all wastelands in Hazara through cooperative institutions of land owners and in consonance with the accepted principles of forest conservancy.

The Co-operative Societies established under the Co-operative Act, are governed by their own bye-laws, and are entitled to receive funds from Co-operative Banks and other financial institutions for financing their various operations and activities.

A Co-operative Federation has also been set up to supervise and oversee the activities of co-operative societies.

The societies are obliged under bye-laws to pay 1% of their total timber sales revenue to the federation. The co-operative societies are engaged in development activities such as construction of roads, raising of nurseries, re-afforestation of felled areas, and planting of non forested areas. Total timber sale proceeds are apportioned in the following manner to earmark funds for development activities.

(a)	Owner's share	60%
(b)	Exploitation cost	20%
(c)	Development fund	20%

If exploitation cost exceeds 20%, the excess is adjusted from the owner's share and the balance amount is distributed among the owners according to the revenue record. Management in these forests has been intensified. Greater harvest volume per unit area has become available which provides more money to the owners. The sales process is quicker and returns are obtained earlier than was the case previously. The financial benefit to the local communities is far greater than the government provided in the past.

Forest Harvesting Societies

Forest Harvesting Societies are concerned only with harvesting activities like felling, conversion of logs or sleepers (scants), and carriage from forest to road side and from road side to market where timber is distributed according to the shares of the Government and owners in ratio 20:80 or 40:60. Thereafter, the owners and the Government separately arrange the sale of their share of the timber. Each party pays for the cost of extraction of their share of timber. This cost is fixed by the Government on the basis of location of a forest and its distance from road side. If cost is in excess of the cost fixed by the

government, the extra cost is paid for by the harvesting societies.

Forty-six Societies were registered in Kohistan District out of which 19 have completed harvesting operations and 27 are still actively working.

Public sector corporations

Public sector corporations have been established for the development of forestry mainly in NWFP & Azad Kashmir. These are the NWFP Forest Development Corporation (FDC) and the Azad Kashmir Logging and Saw Milling Corporation (AKLASC). They perform the following functions according to the statute:

- (i) Economic and scientific exploitation of forests;
- (ii) Sale of forest produce;
- (iii) Establishment of primary wood processing units;
- (iv) Regeneration of areas to be specified by Government; and
- (v) Performance of such other functions as may be assigned to it by Government.

These corporations were provided operating capital and additional facilities to retain 10-20% profit on the cost of harvesting; to borrow money from local & foreign banks against Government sureties; and to secure grants from donor organizations in the form of equipment, logging machinery and foreign experts.

With the assistance from government and donors, FDC and AKLASC have established the industries shown in Table No. 9.

TABLE NO. 9
PUBLIC SECTOR CORPORATIONS OF FDC
AND AKLASC

<u>Name of the Industry</u>	<u>Location</u>	<u>Type of operation</u>
1. FDC Saw Mill	Mansehra (Hazara)	Sawing and sale of logs at negotiated prices for specified types of materials to Pakistan Railways, Telephone Industry of Pakistan, and wood based industries.
2. Rosin and Turpentine Factory.	Haripur (Hazara)	Distillation of resin into different grades of turpentine oil and rosin.
3. Hazara Doors.	Hawalian (Hazara)	All types of construction material, house-hold furniture including materials for schools, colleges, Government offices, etc.
4. Workshop	Main workshop at Mansehra with field units at Malkandi (Hazara), Shringle (Dir) and Madian (Swat)	To train labour in repair and maintenance of heavy equipment and to support development projects related to mechanization of forestry operations.
5. AKLASC Saw Mill	Mirpur, Azad Kashmir	Logs are sawn into different sizes which are sold through open auction or supplied to the AKLASC Furniture Factory.
6. AKLASC Furniture Factory	Mirpur (Azad Kashmir)	All articles of furniture are made for houses, offices & educational institutions.
7. AKLASC Sale Depot.	Islamabad (Federal Capital)	Converted wood in three grades (A, B & C) is sold to small consumers at fixed price.

These units have been given many concessions by the governments through monetary policy and fiscal measures.

Small Industries Development Board (S.I.D.B)

All provinces have formed Small Industrial Development Boards to encourage the establishment of small industrial units by preparing feasibility studies, imparting training and providing assistance in many other ways.

Centres for training have been opened. The German Wood Working Centre, Peshawar and the Wood Carving Centre, Muzaffarabad are good examples where interested persons, in particular young persons, are trained in furniture making and wood carving. This training enables them to open their own carpentry shops at the village level or to obtain employment in the fast growing and rapidly expanding furniture industry in the country.

Raising new plantations on hill slopes

Planting of barren hill slopes has been started in Hazara, Malakand and Azad Kashmir under watershed management programmes for which commodity assistance is provided by the World Food Programme (WFP) of UNDP. Under this programme, farmers are motivated to terrace land, plant fruit and forest trees, construct check dams and silt traps, and improve pasture lands for which they are paid 50% wages in cash and 50% in kind, i.e. ration of sugar, tea, powdered milk, wheat, butter oil and pulses. Since this programme has been extremely useful, the WFP authorities are prepared to expand the programme and increase donor input to 80% provided the Government of Pakistan provides 20% of the projects. The GOP costs include staff, the raising of nurseries and the storage and distribution of food commodities. The programme has been well received by the poor hill farmers because it provides them better yield from agriculture, fruit trees, employment, and enough food for them and for their livestock. The project is serving the national interest by increasing the area under forests, preventing soil erosion,

regulating stream flow, improving wildlife habitat, stabilizing the environment and providing a food ration to residents in remote areas which are food deficit.

Raising trees on farmlands in plains

Planting of waste lands and field boundaries has been started in the plains of Punjab and Sindh with the technical assistance and financial support of USAID. In this programme, nurseries are raised in all four Provinces by farmers on their lands with the assurance that the planting stock will be purchased at a pre-determined price by the Social Forestry Wings of the Forest Departments. Seedlings are distributed free among farmers interested in planting trees. Labour for planting and after-care is arranged by the farmers themselves. Forest Department staff members motivate farmers and provide them technical assistance.

Other highlights of this programme are the observance of farmers' days, the award of certificates and cash prizes to outstanding farmers and staff members, and inter-provincial tours by farmers and staff members to observe and document success stories. Meetings between private tree growers and industrial wood users are also arranged under the aegis of this project to promote an understanding and to over-come problems relating to marketing and quality standards of the different wood using industries.

In a Social Forestry Project launched by the Government of Punjab, incentives of cash prizes and air tickets for Umra (pilgrimage to Makkah) are given to farmers who plant more than a specified number of trees in compact blocks on their farmlands.

Tree plantation campaigns

Tree planting campaigns are launched twice each year, in spring (February) and monsoon (August), to induce farmers

and to motivate general public to plant trees. Planting stock raised in departmental nurseries is sold to the general public at a subsidized rate of ten paisa per plant (1/10 of the actual cost).

Every year, Presidential awards of cash and certificates are given to educational institutions showing the best tree planting results. These cash awards totalling about Rs. 620,000/-, are distributed and given in a special ceremony which is presided over by the President or the Prime Minister.

Category	No.of Institutions	Each Cash Award (Rs.)	Amount (Rs.)
Schools	18	20,000	360,000
Colleges	8	20,000	160,000
University	1	100,000	100,000
		Total	620,000

Setting up of Wood Based Industries in Private Sector

Fiscal incentives have been provided to certain industries including wood based industry to promote industrialization in the country. Concessions have been given by the Federal Government under Section 19 of the Customs Act, 1969 (IV of 1969), and sub-section (1) and (2) of section 7 of the Sales Tax Act, 1951 (III of 1951). These concessions allow for import of machinery, not manufactured locally, before 30th June, 1993, for initial installation or to balance, modernize, replace or extend approved projects for certain areas mentioned in Table 10.

TABLE NO. 10

**IMPORT CONCESSIONS FOR WOOD BASED
INDUSTRY**

<u>S.No.</u>	<u>Area</u>	<u>Extent of prevailing duties</u>
1.	Province of Balochistan excluding the areas outside the Industrial Trading Estate in Hub Tehsil;	NIL
	North West Frontier Province;	NIL
	Federally Administered Tribal Areas;	NIL
	Northern Areas administered by Administrator;	NIL
	Azad Kashmir;	NIL
	Administrative divisions of Bahawalpur and Dera Ghazi Khan and all approved industrial estates in the districts of Mianwali and Bhakkar and tehsil of Khushab in the province of Punjab.	NIL
	Administrative divisions of Sukkur and Larkana and all approved industrial estates in the districts of Tharparkar and Dadu (excluding Taluka of Kotri) in the province of Sind;	NIL
2.	All approved industrial estates located in the areas other than those excluded at S.No.3(a) below.	One quarter (1/4) of the customs duties

<u>S.No.</u>	<u>Area</u>	<u>Extent of prevailing duties</u>
3.(a)	The whole of Pakistan excluding: <ol style="list-style-type: none"> 1. Islamabad Capital Territory; 2. Karachi Division; 3. Lahore District; 4. Tehsil of Ferozwala; 5. Tehsil of Gujranwala; 6. Tehsil of Sialkot; 7. Tehsil of Faisalabad; 8. Tehsil of Multan; 9. Tehsil of Rawalpindi; 10. Taluka of Kotri; 11. Taluka of Hyderabad; 12. Such areas adjoining Karachi Division and Lahore District as may be specified by the Central Board of Revenue; and 	One half (1/2) of the leviable customs duties.
3.(b)	All approved industrial estates in the areas referred to at (a) above, excluding Karachi Division.	One half(1/2) of the leviable customs duties.

The Government has recently approved a new package for Rural Industrialization. Under this package, the following incentives apply to all industries including the agro-based industries:

- (i) Five year income tax holiday for all industries established in rural areas provided such industries are set up between 1st December, 1990 and 30th June, 1995.
- (ii) Imported machinery for rural industries is totally exempted from payment of customs duty, sales tax and import surcharge provided such machinery is not manufactured locally. The import licence fee has also been reduced from 6 per cent to 2 per cent for all such industries established in the rural areas.

- (iii) No questions will be asked about the source of investment provided letters of credit are established or contracts for local plant and machinery are signed by 30th June, 1992.
- (iv) Debt equity ratio for all industrial units has been fixed at 70:30 instead of 60:40 for projects based on imported machinery and 80:20 for projects involving local machinery.

Financial Institutions

To establish all types of industry including wood based industry, loans are given both in local currency and foreign exchange. The leading financial institutions providing such loans are listed below:

1. Pakistan Industrial Credit and Investment Corporation (PICIC)
2. National Development Finance Corporation (NDFC)
3. Regional Development Finance Corporation (RDFC)
4. Bankers Equity Limited (BEL)
5. Investment Corporation of Pakistan (ICP)
6. Industrial Development Bank of Pakistan (IDBP)
7. Agriculture Development Bank of Pakistan (ADBP)
8. All Commercial Banks.
9. Federal and Provincial Co-operative Banks (mainly for co-operative oriented projects)

Export of Finished Products

Pakistan does not export wood because of its shortage in the country. However, Pakistan encourages export of finished products such as furniture, veneer and sport's goods to earn much needed foreign exchange. For this purpose, certain concessions have been given to all export oriented industries including those exporting wood products.

COMPATIBILITY OF FOREST POLICY AND MONETARY POLICY

Forest and agricultural policy is prepared and announced once each decade or so where as monetary policy and fiscal measures are changed, modified and announced every year. Considering the amount of wheat & fertilizer that is imported and the amount of cotton and rice exported in the agriculture sector, the import of wood and the export of wood products is small and, thus, does not find a special place in the monetary policy and fiscal measures. However, in the forest policy to be announced shortly, following provisions have been made:

- (i) build financial support for the forestry sector by emphasising the concrete economic benefits of the forestry sector to all other segments of society;
- (ii) identify innovative ways to fund forestry, watershed, wildlife and rangeland programmes for their successful completion; and
- (iii) promote recognition of the forestry sector's direct and indirect contributions to Pakistan's gross national product(GDP).

If successful, these provisions will result in annual monetary policy and fiscal measures which helps strengthen the development of forests and expansion of the Forestry Sector.

CHAPTER NO. 4

FOREST MANAGEMENT AND PROTECTION

LAND USE POLICY

There is neither a well defined land use policy nor development planning control in Pakistan but there are Government forests, communal forests and private forests whose management and protection responsibilities devolve on Provincial Forest Departments.

The Pakistan National Conservation Strategy (NCS) has, listed 12 conservation goals which can serve as guidelines for those who are concerned with use and management of Pakistan's natural resources. These goals are:

- ▶ Increase industrial and agricultural production on a sustainable basis, to meet the needs of a growing population and leave surplus for export.
- ▶ Conserve and develop renewable resources - water, land, forests, fisheries, range, mountains and wildlife - in a manner leading to sustainability.
- ▶ Reduce the rate of population growth to about 2% per year.
- ▶ Promote human resource development with the objectives of universal education and training.
- ▶ Increase the awareness of conservation and development issues among the general public using both education and the media.

- ▶ Promote greater participation in sustainable development by local communities and NGOs and develop a two-way flow of communication between government and local institutions.
- ▶ Strengthen the research and data base for conservation and development initiatives.
- ▶ Develop biological alternatives where Pakistan has the advantage of high temperature and long hours of sunshine instead of banking on capital and energy intensive solutions developed in Western countries.
- ▶ Introduce effective and operational legislation to control pollution and toxic substances and for resource protection and management.
- ▶ Make the economic planning and development agencies directly responsible for the quality of the environment and the sustainability of natural resources.
- ▶ Recycle or treat all wastes including sewage and toxic wastes.
- ▶ Improve efficiency in energy use and increase renewable, alternative and small-scale forms of energy.

Different Government organizations, owning and using land for production, have separate policies for management and development of natural resources, e.g. there are policies for agriculture, forests, and livestock which aim at:

- (a) ensuring the sustainable use of Pakistan's natural resources, including irrigated land, forests, fisheries, wildlife, agricultural and grazing lands and natural landscape.

- (b) preserving the genetic diversity for improving the yields and quality of crops and livestock, as well for conserving the rich diversity of wild species and their habitats.
- (c) maintaining essential ecological processes including soil protection, nutrient recycling and conservation of moisture.

FOREST MANAGEMENT PLANNING DOCUMENTS

The intensity of forest management depend on many factors, some are policy based and others are programme oriented. Basic documents influencing forest management are;

- a) Forest Policy
- b) Five Year Plans
- c) Annual Development Programme (ADP)
- d) Development Projects
- e) Working Plans

The principles and guidelines contained in these documents for long term, mid term, and short term planning horizons are providing directions at macro and micro levels.

FOREST POLICY 1980

Given the low percentage of forest area in Pakistan, the limited scope for forestry development on the State-owned forest lands, and financial and other constraints, need to extend tree plantation outside forest boundaries was recognized in the policy statement of 1980. It includes:-

- " a bigger thrust on the establishment of tree plantations of fast-growing species in areas outside forests;

- ▶ development of compact fuelwood plantations in areas of wood scarcity and watersheds through public motivation and incentives;
- ▶ creation of effective motivational arrangements to involve the public in mass scale tree plantation and nature conservation activities;
- ▶ management of wildlands in accordance with their potential for the optimum utilization of their resources, including recreation and wildlife;
- ▶ forest harvesting on scientific lines departmentally or through the public sector corporations to avoid waste and to improve utilization;
- ▶ increased production of industrial wood to meet, gradually, the full requirements of wood-based industries;
- ▶ coordinated and integrated development of forestry and wood-based industries;
- ▶ a well-planned, integrated and coordinated forestry development at provincial and national levels;
- ▶ wildlife conservation consistent with other land uses and to ensuring that wildlife values are preserved and enhanced;
- ▶ involvement of a scientific approach for the management of wildlife through wildlife surveys, research and management plans;
- ▶ encouragement for the creation and development of national parks with a view to preserve an example of each of the country's major eco-systems with its

endemic fauna and flora intact, and to develop those areas for public recreation and education; and

- ▶ production of medicinal herbs in wildlands."

In light of these policy guidelines a comprehensive programme has been prepared and launched for afforestation, watershed management, range management and resource conservation to improve and conserve land and water resources. Social forestry and energy plantations on private lands are part of that programme.

PERIODIC PLANS

Development programmes that evolve from Forest Policy objectives require financial investments. These programmes are realized by the preparation of projects for which financial allocations are made in the Five Year Plans and Annual Development Programme. These documents have objectives, strategies and guiding criteria. The objectives and strategies listed in the 7th Five Year Plan (1988-1993) are reproduced below for the benefit of forestry students:

Objectives of 7th Plan

"Evolve an integrated programme for developing barani, riverain and mountainous areas as a part of a long-term programme to arrest environmental degradation and to conserve the country's physical resources of forest, land and water".

Strategy of 7th Plan

"A comprehensive programme will be launched for afforestation, watershed management, range management and resource conservation to improve and conserve land and water resources. Social forestry and energy plantation will be

promoted on private lands. This will be done by adopting the following measures:

- ▶ Institutional facilities for research, education and planning in forestry will be strengthened;
- ▶ Management of irrigated plantations will be improved to increase productivity from the present low levels. It will be necessary to increase water supplies for irrigated plantations by installation of tubewells and clearance of blocked channels;
- ▶ Improved logging and forest harvesting practices for efficient utilization of existing wood resources will be introduced;
- ▶ Intensive forest management will be extended to all coniferous forests with extraction limited to public sector only;
- ▶ Plantations along the roads, railways and canals will be increased. Blanks in the existing plantations will be filled;
- ▶ Managerial experience and the equipment necessary for the collection of seed from superior trees and for seed storage and distribution will be developed by the Forest Departments;
- ▶ Riverain forests will be rehabilitated through the 'bela technique' (digging katcha surface wells for hand watering), or on flow irrigation by lifting water from creeks;
- ▶ Measures will be taken to rehabilitate mangrove forests;

- ▶ A comprehensive long-term master plan will be prepared for forestry and range management;
- ▶ Programmes will be implemented for improvement in the collection of forestry statistics; and
- ▶ National parks, wildlife sanctuaries and game reserves will be maintained for wildlife conservation."

DEVELOPMENT PROJECTS

A development project is the mechanism which is used to evaluate a change in the system of forest management. The new system is financed on a pilot scale and is tested for 5-10 years. If it is successful, keeping in view social acceptability and economic viability, it is adopted on a large scale. This is a standard procedure having the dual advantages of ensuring adequate inputs, i.e. funds, staff, etc and avoiding risks and pitfalls inherent in switching from one system to another. For example, before an intensive system of forest management was adopted as a standard practice of management in the high hill forests in Hazara, the technique was tested, modified and perfected in three phases, over a 13 year period, in Kaghan Valley. The same is true of the integrated mountain development concept which was launched in Kalam forest of Malakand Civil Division and has been in operation for the last 10 years.

WORKING PLANS

All productive forests, whether public or privately owned, shall be covered by and managed in accordance with the prescriptions embodied in the working plan. The working plan contains general and specific objects of management which differ in emphasis depending on the goals to be achieved. In private forests, the emphasis is on meeting the requirements of the owners and right holders. In case of public forests, the

emphasis is on soil and water conservation to regulate flow of water in streams and rivers or on the production of forest products to regulate flow of wood to the market. The general and specific objectives of management in case of private and public forests are discussed in Chapters 2 & 5.

PROTECTION OF FOREST RESOURCES

Protection of forests is a serious problem in Pakistan. Most of the damage is done directly or indirectly by people living inside and in the vicinity of forests who depend on them for their fuelwood, timber and grazing needs. Often, these people consider forests as a common property. Traditional management systems are breaking down under the pressure of poverty and mounting human and cattle population. This is resulting in greater incidence of illicit damage.

Generally speaking, forest damage can be grouped into three categories, namely:

- a) damage done by people living in the vicinity of forests during activities they perform to meet their domestic needs and to keep their body and soul together;
- b) damage done by both local people and outsiders to derive financial benefits and acquire riches overnight;
- c) damage from natural causes such as fire, pests etc.

Damage to meet domestic needs

The damage, though heavy and wide spread, is understandable given humanitarian considerations. For example, the mountain climate is cold and the dwellers are forced to keep their houses warm round the clock during the

winter. The poor cook, eat and sleep around fire places. Heating consumes large quantities of firewood which is cut and collected from the adjacent forests. Collection of fuelwood from the forest is their only alternative due to the harsh climate, their poor purchasing power and the absence of alternate energy sources for heating and cooking.

The same is true in the case of their wood requirements for construction and repair of houses necessitated by damage due to torrential rains in summer and heavy snow in winter.

Another factor contributing to the damage of forests is shifting agriculture. People are by and large poor and their living is much below subsistence level. Land suitable for agriculture is limited, yields are low and their means of earning, other than agriculture and livestock husbandry, are scarce. People are, therefore, tempted to clear forests and burn trees to develop land for cultivation and to graze animals in forests to earn their living. Other contributing factors include excessive plucking of leaves of Mulberry trees in irrigated plantation to feed silk worms (sericulture), and heavy lopping in Mangrove (coastal) forests in Sindh and Balochistan to feed camels and to thatch roofs. All of these actions are a result of poverty and subsistence living.

Damage by habitual offenders

The second type of damage is caused by a section of society who are notorious and habitual forest offenders. They indulge in illicit cutting of trees and un-authorized transport of wood to earn easy money while bribing law enforcement agencies in the process. Some forest contractors and influential local politicians are included in this group and they manage to inflict damage on forests with impunity.

To control damage of this type, sale of standing trees to forest contractors has been stopped. Harvest of forests are now

carried out through semi autonomous organizations like the Forest Development Corporation (FDC) in NWFP, Azad Kashmir Logging and Saw Milling Corporation (AKLASC) in Azad Kashmir, and forest logging wings set up in the Punjab & Sindh Forest Departments. The only exception where forest contractors are still operating in public forests is in the Northern Areas.

Another step taken to reduce illicit damage at the hands of habitual offenders is the deployment of armed personal of the Frontier Constabulary (Civil armed force) who are permanently stationed at vulnerable places in the interior and at less frequented routes and exit points. Some sections of the same force are also patrolling the areas and are on constant move. Due to these two actions, forest damage by habitual offenders is now manageable.

Damage from natural causes(Pests)

There are numerous forest pests, some are occasionally devastating and others are continuously damaging. Most important of these, are foliage feeders, shoot and stem borers and despoilers of nurseries and forest-produce. They are enumerated category-wise in Table-11.

TABLE NO. 11
MAJOR FOREST PESTS

A. In Natural Forests

Sl. No.	Tree species, (family)	Insect pest (family, order)	Nature of damage	Extent of Damage
1	2	3	4	5
1.	<u>Pinus wallichiana</u> (Pinaceae)	<u>Biston regalis</u> (Geometridae, Lepidop.)	Defoliation, kills trees.	4,000 ha.
2.	<u>Pinus roxburghii</u> (Pinaceae)	<u>Cryptothelea crameri</u> (Psychidae, Lepidop.)	-do-	50,000 ha.
3.	-do-	<u>Elkneria</u> (Dasychira) aff. <u>Mulleri</u> (Lymantriidae, Lepidop.)	-do-	15,000 ha.
4.	<u>Quercus dilatata</u> (Fagaceae)	<u>Gazalina chrysolopha</u> (Lymantriidae, Lepidop.)	-do-	4,500 ha.
5.	<u>Platanus orientalis</u> (Platanaceae) <u>Alnus nidita</u> (Betulaceae)	<u>Anomala</u> spp. (Rutelidae, Coleo.)	Defoliation cause growth losses.	Widely spread in hilly areas

B. In Plantations

1.	<u>Dalbergia sissoo</u> (Papilionaceae)	<u>Plecoptera reflexa</u> (Noctuidae, Lepidop.)	Defoliation, growth loss upto 60%	0.14 million ha.
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1	2	3	4	5
2.	<u>Populus</u> spp. (salicaceae)	<u>Apriona</u> <u>cinerea</u> , <u>Aeolesthes</u> <u>sarta</u> (Cerambyc- idae, Coleo.)	Stem borer cause 40-50% wood loss.	Large linear and compact blocks on farmland and state forests.
3.	-do-	<u>Melanophila</u> <u>picta</u> (Buprestidae, Coleop)	Bark borer cause upto 35% tree mortality.	-do-
4.	<u>Populus</u> spp. (Salicaceae)	<u>Ichthyura</u> <u>anastomosis</u> (Notodontidae, Lepidop.)	Defoliation 30-50% growth loss.	-do-
5.	<u>Acacia</u> <u>nilotica</u> (Mimosaceae)	<u>Euproctis</u> <u>lunata</u> (Lymantriidae, Lepidop.)	Defoliation cause growth loss and young plants mortality.	0.25 million ha.
6.	<u>Salmalia</u> <u>malabarica</u> (Bombacaceae)	<u>Tonica</u> <u>niviferana</u> (Oecophoridae, Lepidop.)	Shoot borer cause forking and growth loss.	1000 ha

C. Forest Produce Pests

1.	Fuelwood	<u>Sinoxylon</u> spp. (Bost- richidae, Coleop.)	Destroy 40-50% fuelwood produced.	16 M m ³ stacked
2.	All woods in use and storage	Termites	Destroy 10-50% wood used in buildings.	All over Pakistan
3.	<u>Pinus</u> <u>gerardiana</u> (Pinaceae)	<u>Diorvctria</u> <u>abietella</u> (Pyralidae, Lepidop.)	Edible Chalgoza seed is destroyed	Zohb Agency

1	2	3	4	5
4.	<u>Pinus</u> spp. wood.	Buprestids Scolytids.	Wood borer	—
5.	Almost all woods	Cerambycids.	Borer of wood in use and in storage.	—

D. Nursery Pests

Sl. No.	Name, Family & Order of Pests	Host Plants	Nature of Damage
1.	Cock chafer grubs, Spp. of <u>Anomala</u> , <u>Adoretus</u> , <u>Melolontha</u> , <u>Oryctes</u> , <u>Popillia</u> .	Seedlings of all forest trees in nurseries.	Grubs feed on rootlets, kill seedlings in patches.
2.	Cutworms, Spp. of <u>Agrotis</u> , <u>Euxoa</u> , <u>Prodenia</u> of Noctuidae, Lepidoptera.	Seedlings of all forest trees.	Caterpillars, mostly nocturnal, feed on seedlings by cutting them.
3.	Field crickets, members of family Gryllidae, Orthoptera.	Seedlings of all forestry and agricultural crops.	Nocturnal, cut seedlings, young plants and low shoots. Mole cricket feeds on roots in seed beds.
4.	Grasshoppers, members of family Acridiidae, Orthoptera.	All young plants and seedlings.	Nymphs and adults feed on foliage. Very destructive in nurseries when in large populations.
5.	Land snails, Gastropoda	Polyphagous, mostly on seedlings, flowers and vegetables.	Crawl on to plants and feed on foliage in damp situations, destroying seedlings and young plants.
6.	Porcupine, <u>Hystria indica</u> (Rodentia)	Seedlings, sapling, poles of forest trees and agricultural crops.	Cut seedlings, Saplings, debark trees, uproot tuber crops.

Sl. No.	Name, Family & Order of Pests	Host Plants	Nature of Damage
7.	Field rats (Rodentia)	Roots, seedlings, saplings, bushes, crops.	Cut roots, kill plants.

Damage from natural causes (Diseases)

In addition to pests, trees are effected by a large number of diseases which cause large scale growth losses and mortality, and result in deterioration of timber and low forest productivity. The nature, type and magnitude of losses covered by these diseases and protection measures used against diseases of nursery plants, young and mature trees and converted timber are given in Table 12.

TABLE NO. 12
MAJOR FOREST DISEASES
A. Nursery Diseases

Sl. No.	Disease	Hosts	Type and extent of damage	Magnitude of loss
SEEDLING DISEASE				
1.	Damping-off. <u>Pythium debaryanum</u> , <u>Rhizoctonia solani</u> , <u>Eusarium solani</u>	Conifers	Decay of germinating seed and seedlings (10-50%)	100% loss of individual plants adversely affecting afforestation programmes.
FOLIAGE DISEASES				
2.	Needle-cast/blight <u>Lophodermium pinastri</u> <u>Dothistroma pini</u>	Blue pine, Chilghoza pine and Chir pine.	Pre-mature fall of needles (upto 100%)	Kills needles and trans-plants.

Sl. No.	Disease	Hosts	Type and extent of damage	Magnitude of loss
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LEAF SPOTS

3.	Species of Genera: <u>Cercospora</u> <u>Alternaria</u> <u>Septogloeum</u> <u>Septoria</u>	Broadleaved trees	Pre-mature leaf fall in early spring (10-15%)	Affect photosynthesis and growth by 1-2%.
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POWDERY MILDEWS

4.	Members of Erysiphales	Oaks, Mulberry, Shisham, Willows.	Affects aerial parts of plants and causes death of 30-50% affected parts.	Mortality in 15-20% seedlings
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RUSTS

5.	<u>Melampsora epitea</u>	Willows	Complete death of 10-100% leaves.	Mortality in 10% plants.
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B. Diseases of young crops.

ROOT DISEASES

6.	Vascular wilts <u>Eusarium solani</u>	Shisham	Discolouration in sapwood and death of 1-2% plants.	Mortality in affected plants.
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ROOT ROT

7.	<u>Ganoderma lucidum</u>	Shisham	Root-butt decay. 5-30% trees die.	Timber loss 3%
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ROOT ROT

8.	<u>Fomes annosus</u>	Conifers	Root and butt-rot 6-10%.	5% volume loss
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C. Diseases of mature crops

Sl. No.	Disease	Hosts	Type and extent of damage	Magnitude of loss
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ROOT AND BUTT-ROT

9.	<u>Polyporus schweinitzii</u>	Conifers (Fir, spruce)	5% root and butt-rot	1% volume loss
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HEART-ROTS

10.	<u>Fomes pini</u> (red-ring-rot) <u>Pyro-fomes demoidoffii</u> (Juniper heart-rot)	Conifers	Rearing root (20%) Juniper heart-rot (85%)	Volume loss (blue pine 10%, Juniper 31%)
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HEART ROTS

11.	<u>Fomes badius</u> <u>Fomes fomentarius</u>	Leguminous trees Walnut	Decay (Acacias 15-30%) Decay 40-45%	2% volume loss 4% volume loss.
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DWARF MISTLETOES

12.	Himalayan dwarf mistletoe <u>Arceuthobium minutissium</u> Juniper dwarf mistletoe <u>A. oxycedri</u>	Blue pine and chilghoza pine. Juniper	Death of host plants, reduced vigour and pre-disposition to other diseases and insects. Affect vigour, cause death (20-50 in blue pine, 30-36% in Junipers)	5-6% mortality. 13% mortality.
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D. Diseases of Felled wood

BROWN CUBICAL ROT

13.	<u>Lenzites spp.</u>	Conifers and broad-leaved trees	Decay of 10-15% timber.	3-5% loss in volume
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Damage from Forest Fires

Accidental and intentional forest fires occur in Pakistan but they do not pose a serious problem. They are mostly confined to the chir pine zone (Pinus roxburghii) between 2500 and 5000 feet elevation and are wide spread during the month of June which is the hottest and driest month. Chir pine leaves and cones contain resinous material which is inflammable. The leaf fall is heaviest in the months of April and May when the hot dry season begins and grasses and other herbaceous vegetation is dry. Thus, sufficient combustible material becomes available.

Provincial Forest Departments make contingency plans for fire prevention and control including employment of fire watchers, and the sweeping of roads and paths to keep them clear of chir needles. Constant vigil, early fire detection and prompt action are prevention devices. These arrangements are made for two month i.e from 15th May to 15th July. With the start of monsoon rains in July, fire hazard is reduced, if not eliminated altogether.

IRRIGATED FOREST PLANTATION

Irrigated plantations are a major forest type in Pakistan consisting of 234,000 ha. in the Punjab and Sindh. They provide shisham timber for the flourishing furniture industry, mulberry wood for the sports industry, poplar wood for the match industry, and fuelwood for consumption locally, in big towns like Lahore, Multan, Faisalabad, etc. and for the tobacco leaf curing industry in NWFP.

The management of irrigated plantations is simple because of the compact nature of the plantations, time tested management techniques and comparatively fewer number of species involved.

Protection is not a serious problem. The major concerns are theft of mulberry leaves for sericulture, damage to nurseries and young trees by wild boar, mortality in mature trees due to rising water table and poor water management, influx of kai (Sacrum munja) grass, and theft of trees left for prized timber (mother trees).

Major problems faced by irrigated plantation and the measures suggested to improve the conditions are discussed in Chapter No.5.

AGRO FORESTRY

Pakistan is fortunate to have a large and elaborate irrigation network. According to land use data, 16.31 million ha. of land are under irrigation and 4.59 million ha. are suitable for rainfed agriculture. This vast, fertile and comparatively flat land mass offers good prospects for raising fast growing trees to meet Pakistan's fuel wood needs and raw material needs of wood based industry.

In terms of area available for tree culture in Pakistan, the greatest potential lies, not in the 2.819 million ha. of state forests, but on the 19.06 million ha. of farmland comprised of 4.07 million individual farms which average 4.7 ha. in size. This potential is illustrated by the calculation that 150 million trees could be raised if just one line of trees spaced 6 meters apart was planted along one edge of these farms. Several projects of agro-forestry have been launched in the country. To measure the degree of success, Pakistan Forest Institute has surveyed tree growth on farmlands in NWFP. The results of the survey are summarized below:

- i. The average number of trees per ha. on irrigated farm is 72 as against 27 on non-irrigated farms;

- ii. The total number of trees on farmlands in NWFP are 80 million of which 67% grow on irrigated and 33% grow on non-irrigated farms;
- iii. Two thirds of the tree stock, both on irrigated and non irrigated farms consist of trees having diameter less than 15 cm. This suggests that:
 - a) efforts by the Forest Department to induce farmers to plant trees have started to yield dividends.
 - b) Bigger trees are harvested to meet the growing demand of wood for local use and of raw material for industry.
- iv. The volume of standing trees on irrigated farmlands totals 14 million m³ (76%) and 3.6 million m³ (24%) on non-irrigated farms.
- v. Per ha. growing stock on irrigated farms (138 m³) is about 4 times larger than the growing stock on non-irrigated farms (3.5 m³)
- vi. The distribution of growing stock by species on irrigated farms is:

▶ Date Palm (Khajoor)	27%
▶ Shisham	19%
▶ Mulberry	13%
▶ Poplar	12%
▶ Willow	5%
▶ Ailanthus	3%
▶ Others	17%

The distribution by species on non-irrigated farms is:-

▶ Ailanthus	21%
▶ Ber (<i>Zizyphus</i> spp.)	15%
▶ Fig	9%
▶ Mulberry	9%
▶ Bakain	6%
▶ Robinia	6%
▶ Kikar (<i>Acacia nilatica</i>)	3%
▶ Poplar	3%
▶ Shisham	3%
▶ Celtes	3%
▶ Tamarix	3%
▶ Others	19%
	<hr/>
	100

- vii. Farmers felled about 11 million trees (13.5% of the total growing stock) and removed 2.9 million m³ (21% of the total growing stock) during 1989 to meet their own requirements and the needs of wood based industries.

The Punjab Economic Research Institute (PERI) has conducted an evaluation study of the Agro-forestry projects in the Punjab (1990) to provide guidelines for future policy on farm forestry in that Province. The results obtained are listed below:

- i. Number of trees per farm increased significantly in the project area with an increase in the size of holdings.
- ii. Farm forestry was popular among those farmers who get small rental return or whose soils were inferior. There is a need to promote farm forestry on such lands.

- iii. Farmer's participation in tree planting increases with an increase in their level of education.
- iv. The tree species of industrial value such as Semal, Eucalyptus and Poplar were in great demand as compared to conventional species.
- v. 10.4, 11.6, 2.5 and 57.2 percent waterlogged/saline, sandy, unlevelled and uncultivated areas respectively, of the sampled farmers improved as a result of tree planting. Significant improvement throughout the overall project area in land utilization achieved in un-cultivated area (field banks, water course edges and road side) was due to tree planting.
- vi. During the project period 6.74 million trees were distributed out of which 5.19 million survived giving a survival of 77% against the target of 8 million with an 80% estimated survival rate.
- vii. Internal Rate of Return was calculated at 30 per cent. This shows that the projects were very profitable because IRR is two times the opportunity cost of capital (15 per cent).
- viii. Annual return per acre from trees was higher than from many crop growing activities. The highest monetary return per acre was from poplar trees.

ARID LAND DEVELOPMENT

Generally, Pakistan is an arid country where desertification affects productivity and drifting sands cause substantial damage to life, property and communication systems. Taking cognizance of this situation, the National Commission on Agriculture had recommended the establishment of the Watershed and Arid Land Development Authority (WALDA).

The recommendation ' was approved in principle by the Government but the implementation was held in abeyance until the formulation of a Forestry Sector Master Plan, on which work has already commenced with the financial support of ADB and UNDP. According to the draft resolution, on establishment, following functions and responsibilities will be assigned to the WALDA:

- ▶ evolve a long range policy for conserving the country's land, water, and forest resources;
- ▶ undertake or promote appropriate research activities in cooperation with the federal and provincial agencies in the fields of watershed management, range development, and development of arid areas; and
- ▶ coordinate and financially support, to the extent possible, the activities of all federal and provincial agencies dealing with the subjects entrusted to the Authority.

RESPONSIBLE INSTITUTES

Arid regions and rainfed areas in Pakistan are neglected and are likely to remain so until WALDA is established. Given adequate funds and a strong mandate for preparing and implementing detailed programmes, WALDA will significantly address desertification control and sand dune fixation. Until WALDA is established, federal, provincial and semi-autonomous institutions will treat the menace of desertification and shifting sand through an inadequate project approach. Research and promotional activities on high yielding and drought tolerant varieties of cereals, fodder and xerophytic vegetation (trees) are being continued by the following research institutes.

Federal

The institutes, concerned with arid land research are:

1. Pakistan Forest Institute with sub-stations at:
 - ▶ Ratta Kulachi, D.I. Khan (NWFP)
 - ▶ Dagar Kotli, Thal (Punjab)
 - ▶ Kharian, Jhelum (Punjab)
 - ▶ Miani, Hyderabad (Sindh)
 - ▶ Dera Murad Jamali (Balochistan)

2. Pakistan Agricultural Research Council(PARC) with its implementation arm known as National Agriculture Research Centre (NARC) and supported by:
 - ▶ Rangeland Research Institute, Islamabad.
 - ▶ Southern Zone Agriculture Research Centre, Sujawal (Sindh)
 - ▶ Hill Agriculture Research Station, Kaghan (NWFP).
 - ▶ Arid Zone Research Institute (AZRI) Quetta, (Balochistan) with regional sub-stations:
 - ▶ Arid Zone Research sub-station, D.I.Khan (NWFP)
 - ▶ Arid Zone Research sub-station, Bahawalpur (Punjab)
 - ▶ Arid Zone Research sub-station, Umarkot (Sindh)

3. Watershed & Arid Land Development Authority (WALDA) with Headquarters at Islamabad (proposed).

Provincial

Agency for Barani (Rain) Area Development (ABAD)	Serving Punjab with Headquarters at Rawalpindi.
Sindh Arid Zone Development Authority (SAZDA)	Serving Sindh with Headquarters at Mirpur Khas.
Barani Agriculture Development Project (BADP) of the Dept. of Agriculture, Extension NWFP.	Serving NWFP with Headquarters at Peshawar.
Barani Agriculture Research Institute (BARI)	Serving Punjab with Headquarters at Chakwal.
Cholistan Development Authority (CDA).	Serving, South-eastern desert of the Punjab province with Headquarters at Bahawalpur.
Barani (Rain) Development Authority in NWFP	Proposed.

Semi Autonomous Institutes.

Agriculture Universities at:

- ▶ Peshawar in NWFP
- ▶ Faisalabad in Punjab
- ▶ Tando Jam in Sindh

RANGE MANAGEMENT

Range management is an important land use because three quarters of Pakistan's total geographical area of 87.98 million ha. consists of mountains, watersheds, deserts, pleatues and uncultivable waste land of which 58 percent constitutes

rangelands. These rangelands provide one-third of the total digestible nutrients (TDN) for 92 million livestock (54 million units).

Livestock is an essential component of the farming system. In rural settings, domestic animals are rated as the most valuable possession of farmers. They provide a reliable source of income, food supplies, industrial raw material, and fertilizer through the application of farm-yard manure. In addition, they contribute to the country's foreign exchange earnings and GNP growth.

Out of a total rangeland area of 51.00 million ha. only 12 % is under the control of Provincial Forest Departments. The remaining area (88 %) is used as a common property resource.

Range lands are divided into 10 range types as shown below:

<u>Rangeland Types</u>	<u>Area</u> (m.ha)
Alpine pastures	1.70
Trans-Himalayan grazing lands.	3.50
Himalayan forest grazing lands.	0.70
Pothwar scrub ranges	1.70
Desert rangelands.	8.00
Kohistan ranges	2.40
Central Balochistan ranges	8.00
Eastern Balochistan ranges	5.00
Western Balochistan ranges	18.50
Sulaiman mountain ranges	1.50
	<hr/>
Total:	51.00
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Because 51 million ha. of rangeland is supporting 54 million animal units explains why the health of the animals is

poor and the depleted conditions of pastures. The situation is not likely to improve because of inadequate trained staff, very few on-going development projects and the low priority assigned to range management in the 7th Five Year Plan. That plan allocated a meager Rs.50 million to rangeland programmes which amounts to one rupee per ha.

NATIONAL POLICIES ON PROTECTED AREAS

Protected areas are an important component of the overall eco-system and biodiversity conservation scheme. A seminar was held in March 1991 on the theme of "Nature Conservation and Environmental Protection". The President of Pakistan, in his inaugural address said, while quoting from the book "Down to Earth":

"Noah started it all umpteen thousand years ago. He was commanded to build an ark and to take into it a pair of every living creature to save them from a disaster deliberately organized by the Almighty against the unruly and souffle human population."

While elaborating his point further, the President of Pakistan continued.

"If we want to save life on the planet earth, we have to build our own ark and row God's endangered creation to safety, for no new Noah is to descend from the heavens to salvage the situation".

This brief quotation from the President of Pakistan's speech sums up the need for and urgency of making strenuous efforts to save wildlife and protect flora and fauna. This effort will benefit the present generation while, at the same time, maintaining its potential as a God given Amanat (trust) to meet people's needs for posterity.

It is with this over-riding consideration that the protected areas, i.e national parks, game reserves and wildlife sanctuaries, are considered an important part of the over all

wildlife management strategy. The idea is to constitute *reserves* for wild animals where animals are totally protected within their boundaries. As their numbers increase, they may expand into adjacent buffer zones which form an important part of a multiple use network in which controlled utilization of the wildlife is practised. Ideally, A well managed wildlife resource will have good numbers of all species both in protected areas and in zones under various forms of multiple use management. The objectives of protected and multiple use areas will go hand in hand to conserve the wildlife which is an important resource to be used for the socio-economic benefit of the country. This overall aim includes *non-consumptive* utilization such as scientific study and recreation, as well as *consumptive* use such as hunting for trophies or meat, and captive propagation in order to harvest a valuable product like skins, fur or musk.

To realise these management objectives, the Provincial wildlife organizations, in consultation with the National Council for Conservation of Wildlife (NCCW), have constituted the 10 national parks, 84 wildlife sanctuaries and 76 game reserves identified in Tables 13, 14 and 15.

TABLE NO. 13

LIST OF NATIONAL PARKS

Province	No.	Name	Area (ha.)
Punjab	2	▶ Lal Sohanra	37,426
		▶ Chinji	6,095
Sindh	1	▶ Kirthar	308,733
NWFP	2	▶ Ayubia	1,684
		▶ Chitral Gol	7,750
Balochistan	3	▶ Hazarganji - Chiltan	15,555
		▶ Hingol	165,004
		▶ Dhrun	167,700
Northern Areas	1	▶ Khunjerab	226,913
Capitai Territory	1	▶ Margalla	17,386
Total:	10		954,246

TABLE NO. 14

WILDLIFE SANCTUARIES

Province	No. of the Sanctuaries.	Area (ha.)
Punjab	23	815,378
Sindh	33	738,628
NWFP	5	50,467
Balochistan	14	951,235
Azad Kashmir	1	810
Northern Areas	5	185,521
Capital Territory	1	7,000
Total:	82	2,749,039

TABLE NO. 15

GAME RESERVES

Province	No. of game reserves	Area (ha.)
Punjab	19	Punjab
Sindh	13	212,364
NWFP	27	312,317
Balochistan	6	235,813
Azad Kashmir	8	50,953
Northern Areas	9	238,640
Capital Territory	1	69,800
Total:	83	3,535,287

The number and the extent of these protected areas are quite impressive considering they represent 9% of Pakistan's total land surface. This is a greater area than that contained in

other countries in the SAARC Region. However, the problem is not of expanse but of quality. Our protected areas do not cover a full range of species, habitats and ecosystems occurring in Pakistan. Because this field of management is new to Pakistan, conservation efforts suffer from non availability of expertise to undertake wildlife surveys and research, and to implement protection methodology, planning skills and management techniques. The result is that out of ten national parks, not a single one is managed under a scientific management plan.

In order to improve the deteriorating situation, the Federal Cabinet has continued ban on hunting, netting, capturing and export of all wild mammals, reptiles and native protected birds, their parts, products and derivatives, (except wild boar and its skins) for a further period of three years effective from 1st September, 1990. Such a ban was initially imposed w.e.f. 1st September, 1981.

The Prime Minister issued a separate directive on Margalla Hills National Park in April 1991 which inter alia requires that;

- i) CDA should physically and clearly demarcate the boundaries of the National Park and strictly enforce the laws for preservation of the National Park.
- ii) CDA should immediately initiate steps to terminate all licenses granted for quarrying of stones for aggregate and should ban such activity within the limits of the National Park.
- iii) Governments of NWFP and Punjab should examine the possibility of integrating in the National Park the areas adjoining Margalla Hills National Park which fall in NWFP and Punjab.

- iv) Ministry of Food, Agriculture and Cooperatives should expedite preparation of a scientific management plan for the Margalla Hills National Park with the help of appropriate competent agencies. Assistance from international agencies and friendly countries may also be sought if necessary.

INSTITUTIONS RESPONSIBLE

Wildlife, like forestry, is a provincial subject under the Constitution of the Islamic Republic of Pakistan. All provincial Governments, Azad Kashmir (AJK), Northern Area (N.A) and Islamabad Capital Territory (ICT) have separate organizations who look after wildlife in their respective jurisdictions. Punjab, Sindh, NWFP and Balochistan have Wildlife Management Boards headed by the Provincial Chief Ministers.

In Azad Kashmir and Northern Areas, wildlife is the responsibility of the Wildlife and Forest staff, respectively. In Islamabad Capital Territory, Deputy Director Forest in the Environment Directorate is incharge.

At the Federal level, coordination is through the National Council for Conservation of Wildlife (NCCW) with the I.G.Forests as its Member Secretary, and is under the overall control of the Ministry of Food, Agriculture and Cooperatives.

Survey and research is conducted by the Zoological Survey Department (ZSD) headquartered at Karachi (Sindh) and through its regional offices in Multan (Punjab), Peshawar (NWFP), and Quetta (Balochistan), and by the Pakistan Forest Institute (PFI). Since staff, funds and resources available for this purpose are scarce, the impact of wildlife survey and research work currently being conducted is limited.

Pakistan is a party to the international conservation conventions, namely CITES, Ramsar Convention, Bonn Convention, World Heritage Convention, a participant in the Man and Biosphere Reserve Programme of UNESCO, and a member of international conservation organizations, e.g. IUCN, WWF, IWRB, AWB.

The details on wildlife legislation is given in Chapter No. 3

DEVELOPMENT OF MOUNTAIN ECONOMY

Pakistan is predominantly a mountainous country. There are more than a dozen important mountain ranges forming a great barrier along its western border with Iran and Afghanistan and in the north with China. Access to these neighbouring countries is difficult except through a dozen historical passes including:-

- ▶ Dalbandin - Nok kundi pass on the border of Balochistan with Iran.
- ▶ Bolan pass on the border of Balochistan with Afghanistan.
- ▶ Gomal pass on the border of NWFP with Afghanistan.
- ▶ Tochi pass on the border of NWFP with Afghanistan.
- ▶ Kurram pass on the border of NWFP with Afghanistan.
- ▶ Khyber pass on the border of NWFP with Afghanistan.
- ▶ Khunjerab pass on the border of Northern Areas with China.

Areas along all these mountain passes are in the tribal belt where Federal, Provincial and Local Governments have little control and the local economy is dependent on;

- ▶ free trade across the border.
- ▶ Poppy cultivation.
- ▶ Arm manufacture & sale.
- ▶ Transport ownership (Trucks); and
- ▶ Generous grants from the Government of Pakistan

The only mountainous area which is under normal administrative control and where authority of the Government of Pakistan is fully enforceable is Hazara Civil Division in NWFP and Rawalpindi Civil Division in Punjab. These areas are extremely important for forestry, range management, horticulture and tourism because of their landscape, moderate climate and abundant rainfall. Hence, hill stations and summer resorts are located in this region.

Major programmes aimed at the development of a mountain economy in the region are briefly discussed in the following paragraphs.

Tourism

The Ministry of Tourism and Culture of the Government of Pakistan and Tourism Development Corporations of Punjab and NWFP are engaged in creating infrastructure and tourist facilities, e.g. roads, rest houses, tourist villages, youth hostels, children parks, wildlife parks, chairlifts, ski resorts, safari parks, national parks, etc. These new developments are providing increased economic opportunities for local people and recreational facilities for visitors in particular during summer months when temperatures in the plains rises to 125⁰F.

Watershed Management

The Himalayan - Karakoram region provides good opportunities for undertaking forestry and horticultural practices.

About 25% of the area in the active monsoon region is already under natural tree growth, but an equal area is suitable for tree culture which is currently being used as grass lands or grazing grounds. Such areas are being afforested through watershed management programmes which are funded by World Food Programme under the "food for work" programme which has the following advantages:

- a) The land is used according to its capability. Steep and comparatively dry sites are brought under tree cover. Orchards are raised on easy slopes. Agricultural land is levelled, and then supported with retaining walls to increase its productivity and to reduce soil erosion.
- b) Jobs are provided to farmers at their door steps thus preventing population shifts from rural areas to urban centres.
- c) Area under forests increases. More than 500,000 acres of privately owned, steep & marginal land have been converted into productive young plantations. This speaks well for the future of forestry in the region.
- d) The programme has a beneficial effect on soil and water conservation which will prolongate the life span of the Mangla and Tarbela reservoirs.

Reforestation

As a consequence of successful pilot projects in Kaghan valley in Hazara and Kalam Valley in Malakand, forest management has been intensified entailing complete restocking of harvested areas with artificial regeneration that is produced from the seeds collected from plus (elite) trees, i.e. of good quality, straight bole and well developed crown. Young

plantations are protected against grazing with barbed wire fences and the young crops are properly managed to produce a productive forest cover. This change from reliance on natural regeneration to reliance on artificial systems has generated job opportunities for local people and forest management has improved.

Water Conservation and Harvesting

Pakistan is predominantly an arid country. Except for the moist Himalayan region all other areas in the country are either arid or semi-arid. Moisture conservation is, therefore, a major concern and water, both surface and under ground, is in great demand for agriculture, industry and for drinking purposes. Several development projects aiming at moisture conservation and water recharge have been launched in the Punjab, Balochistan and NWFP. The programme includes construction of check dams, contour trenches, silt traps, and mini small dams for improving the micro-ecology and for rehabilitating vegetation in addition to achieving the main objective of improving ground water resources.

CHAPTER NO. 5

FOREST PRODUCTION AND UTILIZATION

FOREST PRODUCTION

Yield

Productive forests, of all types, are covered by regular management plans. The areas and assessed yield taken from these plans for coniferous, tribal area, irrigated and riverain forests are described below.

Coniferous Forests

Coniferous forests are located in the Himalayas, Karakoram and Hindu Kush mountain ranges in the north. The areas of such forests by administrative units along with prescribed timber and fuelwood yields are shown in Table No.16.

TABLE NO. 16

CONIFEROUS FORESTS

(Million cft)

Administrative Unit	Area	<u>Prescribed yield</u>		
		<u>Commercial</u>	<u>Domestic</u>	<u>Total</u>
Hazara (NWFP)	0.916	9.285	1.521	10.806
Malakand (NWFP)	0.829	7.848	1.217	9.065
Murree hills (Punjab)	0.112	0.687	*	0.687
Azad Kashmir	1.043	5.541	0.848	6.389
Northern Areas.	0.246	4.170	*	4.170
Total:	3.146	27.531	3.586	31.117

* Not fixed.

Tribal Area

Pakistan has a sizeable belt along its border with Afghanistan which was given special status by the British Colonial Government to act a buffer zone between British India and the hostile Afghan Government. This zone was called Tribal Area or Tribal Territory. It was given semi independent status and that status continues today. This zone has sizeable areas of hardwood forests (Olea, Quercus & walnut) and softwood (coniferous) forests. Since the Forest Act of 1927 is not extended to these areas and forest staff has not been posted there, the forests are not properly managed and/or harvested.

Substantial quantities of timber are, however, removed from these forests under tribal customs. This timber is brought to settled areas on the authority of transport passes (permits) issued by Political Agents.

The NWFP Provincial Forest Department charges duty on this timber. On the basis of revenue collected by the Forest Department, the yearly flow of timber to settled Districts has been computed and the results are given in Table No.17.

TABLE NO. 17

Agency	Revenue collected (Rs.in million)	Quantity of timber (Million cft)
South Waziristan	0.841	0.75
North Waziristan	2.632	2.10
Kurram Agency	4.493	3.75
Khyber Agency	0.575	0.40
	8.541	7.00

Irrigated Plantation

The canal irrigation system in Punjab and Sindh along both sides of the Indus river and its five major tributaries, the Sutlej, Bias, Ravi, Chenab and Jhelum, is more than 100 years old. When the areas were first colonized, tracts were set aside to raise broad leaved species to provide steam energy for running railways, and to meet the fuelwood needs of big cities like Lahore, Multan, Hyderabad, etc.

These plantations also produce raw material for the furniture and sport good industries. Areas of these plantations along with their assessed yield are shown separately by province in Tables No.18, 19, 20 & 21.

TABLE NO. 18

AREA OF IRRIGATED PLANTATIONS IN PUNJAB

Circle	Area Planted (ha)	Plantable Blanks (ha.)	Uplantable Blanks (ha.)	Total Area (ha.)
Lahore	8,355	522	1,424	10,301
Sargodha	19,066	11,933	2,909	33,908
Multan	14,434	410	1,536	16,430
Bahawalpur	10,083	2,052	28,626	40,761
L.S.Nat'l Park	2,672	2,429	--	5,101
D.G.Khan	15,845	12,289	14,032	42,164
Total:	70,455	29,635	48,577	148,665

TABLE NO. 19

**ACTUAL, PRESCRIBED AND POTENTIAL YIELD OF
IRRIGATED PLANTATIONS IN PUNJAB**

(1989)	Total Areas (ha.)	Actual Yield		Prescribed Yield		Potential	
		Timber m ³	F.Wood m ³	Timber m ³	F.Wood m ³	Timber m ³	F.Wood m ³
Planted	70,455	36,346	184,200	43,505	221,118	348,044	87,011
Plantable Blanks	29,633	—	—	—	—	—	36,596
Unplantable Blanks(drip irrigation)	48,577	—	—	—	—	—	59,992
Total:	148,665	36,346	184,200	43,505	221,118	348,044	183,599

TABLE NO. 20

AREA OF IRRIGATED PLANTATIONS IN SINDH

Barrage	Hectares	Acres
Guddu	18,413	45,481
Sukkur	34,662	85,615
Kotri	29,234	72,208
Total	82,309	203,304

TABLE NO. 21

**ACTUAL, PRESCRIBED AND POTENTIAL YIELD OF
IRRIGATED PLANTATIONS IN SINDH**

(1989)	Total Area (Acres)	Actual Yield		Prescribed Yield		Potential	
		Timber	F.Wood	Timber	F.Wood	Timber	F.Wood
Planted	60,000	40,162	149,861	15,000	-	120,000	30,000
Plantable Blanks	125,000	-	-	31,250	-	250,000	62,500
Unplantable Blanks by drip irrigattion	18,304	-	-	-	-	-	-
Total:	203,304	40,162	149,861	46,250	-	370,000	92,500

Riverain Forests

The watersheds of the Indus river and its tributaries are located in the Himalayas, Karakoram and Hindu Kush mountains. The Himalayas are considered the roof of the world and are known for their permanent snow cover as well as being the region with the largest glaciers outside the polar caps. The eastern and southern parts of these mountains receive heavy monsoon rains and consequently the rivers originating from these mountains carry heavy loads of silt. When the rivers enter the plains, the flow of water is reduced and consequently the debris is deposited in the river bottom. The century old process of gradual deposition of silt has resulted in raising the level of the riverbeds. In the rainy season, the rivers over-flow their banks and cause damage to life and property. Consequently, flood embankments have been constructed on both sides of Indus river in lower Punjab and upper Sindh. The areas in between the embankments, all along the Indus river, support dense plantation of Kikar (Acacia Nilotica) which are popularly called Riverain Forests. The areas of these forests

together with their assessed and prescribed yield province-wise are indicated in the Table No.22.

TABLE NO. 22

Province	Total Area (ha.)	Riverain Forests		Prescribed yield	
		Area covered under W. Plan (ha.)	Commercial (ha.)	Timber m ³	Firewood m ³
Punjab	51,305.0	31,803.0	27,071.0	6087	13139
Sindh	231,595.6	231,595.6	135,403.6	2864	3976
Total:	282,900.6	263,398.6	162,474.6	8951	17115

FOREST UTILIZATION

Guidelines for Harvest Activities

Forests, whether public or private, are classified into either a productive or a protective category. In protective forests, no harvesting operations are allowed except for felling on a very limited basis, and the conversion of dead, dry and wind fallen trees. There are no hard and fast rules for such operations. They are carried out as and when needed or when they are economically viable. Ordinarily, in private forests, dead, dry and wind fallen trees are not used for commercial purposes. Such trees are utilised for domestic purpose by the owners and right holders to meet their fuelwood, small wood and timber requirements.

Productive forests are covered by management plans which specify guidelines and the sequence of harvest operations. The guidelines vary depending upon locality, type of forests and intensity of management.

Principals & objectives

The management practices related to harvesting operations are based on the principal of sustained yield and maximum financial benefits to the owners of forests. This principle holds whether the forests are owned by individuals or in joint ownership by the village community or a public property. The principal objectives and the management criteria are specified in the working plans for each of these categories. Two examples, one for a public Reserve Forest and one for a private Guzara Forest are reproduced below:

General Objectives of Management for a Reserved Forest

The general objectives of management are:-

- i) To create a normal forest by obtaining normal regeneration, normal distribution of age classes and normal density of growing stock.
- ii) To maintain a sustained yield of timber and resin.
- iii) To meet as far as possible the bonafide requirements of the right holders with respect to timber, grazing, grass cutting and firewood needs.
- iv) To maintain and to improve the watershed values of the forests by providing effective vegetative cover and by carrying out soil and water conservation measures.
- v) To save the forests from destruction by fires.

Objectives of management for a Guzara Forests

Conditioned by special factors and without minimizing the importance of these forests for forest products and their water catchment value, the objectives of management are:

- i) to introduce sound forest management for the maintenance and improvement of existing renewable natural forest resources with emphasis on timber production without minimising their protective roles;
- ii) to manage the forests as a commercial enterprise to meet the genuine monetary and domestic requirements of the local people for timber, firewood and grazing without ignoring the watershed values of the site to reduce soil and water erosion;
- iii) to protect, preserve and manage the wildlife of the area as a valuable resource, keeping in view the commercial importance of game species like Markhoor, Musk deer, and Himalayan ibex;
- iv) to restore the forests to their maximum productivity by removing the old growth to obtain normal ingrowth, balanced sized class distribution adequate regeneration and normal stocking;
- v) to rehabilitate the blank, understocked and depleted forest areas through reforestation activities such as planting, sowing and other site improvement practices; and
- vi) to develop the range, fish and recreational potentials of the area as an integral part of the renewable natural forest resource system.

Because of watershed and other considerations, the felling in guzara forests are light and harvesting operations are conservative as compared to reserved forests.

Harvesting

Forest contractors, known as Lessees, were the main group responsible for harvesting, extracting and marketing of forests produce prior to 1980. This practice was discontinued because;

- i) The contractors were operating on the basis of short leases and were, therefore, neither interested nor willing to invest in development activities like road construction and mechanisation.
- ii) Most of the contractors did not have adequate financial resources to complete harvesting operations during the scheduled time periods. Consequently, re-forestation and other improvement activities were delayed.
- iii) The contractors indulged in malpractices which caused damage to forest resources.
- v) The contractors used out dated and primitive methods which resulted in slow harvesting operations, and inefficient and wasteful practices which produced losses of enormous magnitude.

For these and other reasons, the contract system was abolished except in the Northern Areas. The contractor's were replaced by establishing a Forest Development Corporation (FDC) in NWFP and Logging and Sawmilling Corporation (AKLASC) in Azad Kashmir. Separate extraction cells have been set up in the Forest Departments of Punjab and Sindh. In Balochistan there is no systematic harvesting of forests. These arrangements have improved the management of forests.

Harvest Efficiency and Utilization

The flow of timber from forests to the market is considerable but except for the FDC and to some extent the AKLASC organizations involved in harvesting of forests have not taken steps to improve their harvesting techniques, increase the quality of harvested timber or reduce waste. Actions taken by the FDC and AKLASC in this regard include:

- ▶ Working plans have been revised to allow for sequential fellings in a pre-planned manner. This change has facilitated construction of roads which in turn has permitted extraction of logs instead of sleepers. This practice has reduced waste and increased recovery per unit area by 100% without any other change in the system of management.
- ▶ The areas felled are replanted with good quality seedlings raised in centralised nurseries from known seed source. This action will produce good quality and better stocked forests during the next rotation.
- ▶ The planted areas are fenced, protected against grazing and fire and the young saplings are protected against unfavourable competition from brushwood.
- ▶ Logs are taken to markets/saw mills where they are processed according to end use requirements thereby ensuring better quality and a maximum quantity of useable wood.

A programme of this type covers only 10% of the gross forest area in two small valleys, i.e. Kaghan Valley in Hazara and Kalam Valley in Swat. Elsewhere harvesting practices are slow, inefficient and wasteful.

Development of the National Wood Industry

Industrialization including the wood based industries is a matter of priority with the present Government. Policy documents, including manifestoes of the Political Parties, Annual Development Programmes, Five Years Plans, Import and Export Policies and fiscal and monetary policies place special emphasis on establishing Industries to generate jobs, produce manufactured goods and reduce imports. Although forestry has a narrow base in Pakistan, there is an opportunity for major initiatives in the field of wood industry. Presently the wood based industries constitute 2% of the total industrial base of Pakistan. The pattern of wood use in Pakistan follows here-in-after.

Fuelwood Production

Seventy percent of Pakistan's population lives in rural areas and is entirely dependent on biomass as a source of energy for cooking and heating. According to a World Bank estimate, per capita consumption of fuelwood in Pakistan is 0.213 m³. On this basis, 24.3 million m³ fuelwood weighing 13 million tonnes is, presently, consumed annually in Pakistan (Table No. 23).

TABLE NO. 23

FUELWOOD CONSUMPTION IN PAKISTAN

Province/Units	Estimated Population in 1990 (in million)	Total wood required/yr. (million m ³)
Punjab	60.108	12.80
Sindh	26.161	5.57
N.W.F.P.	14.815	3.16
Balochistan	6.720	1.43
Azad Kashmir	2.515	0.54
Northern Areas	0.714	0.15
Tribal Areas	2.514	0.54
Islamabad	0.505	0.11
Total	114.052	24.30

Constructional Timber

According to information collected from the Ministry of Housing and Works, 300,000 residential houses are constructed every year. Using an annual increase in construction of building for industrial and commercial purposes as 10% of residential buildings and for community and other purposes as 1% of residential buildings, the total wood used in this sector, assuming 100 cft sawn timber per unit, is given in Table No. 24.

TABLE NO. 24
WOOD USED IN CONSTRUCTION OF BUILDINGS
PER YEAR

Type of Building	Approximate Number (in million)	Total wood used (million cft)
Residential	0.300	30.0
Industrial	0.030	3.0
Commercial	0.030	3.0
Community	0.003	0.3
Others	0.003	0.3
Total	0.366	36.6

This construction timber is obtained from forests in Hazara, Malakand, Azad Kashmir, Murree Hills and Northern Areas in the quantities specified below.

<u>Region</u>	<u>Volume(Log form)</u> (Million cft)
Hazara	10.807
Malakand	9.065
Azad Kashmir	6.389
Northern Areas	4.170
Murree Hills	0.687
Tribal Area	7.000
Total:	38.118*

Furniture Industry

There are a large number of medium and small manufacturing units engaged in the production of furniture items of all types and descriptions. In order to get some idea

*This is standing log volume prescribed for felling. Actual converted and sawn volume is less and coincides with the sawn volume given in Table No. 24.

about the size of this industry, a survey was conducted in 12 cities in four provinces. As a result, 1664 manufacturing units were identified out of which 63 were visited. The distribution of the sample by city is given in Table No. 25.

TABLE NO. 25

**MANUFACTURING UNITS SURVEYED IN
DIFFERENT CITIES**

Sl.No	Cities	Total Units	Units surveyed
1.	Peshawar	31	5
2.	Dera Ismail Khan	29	5
3.	Mardan	34	5
4.	Lahore	463	5
5.	Chiniot	295	5
6.	Gujrat	164	5
7.	Rawalpindi	65	5
8.	Quetta	35	5
9.	Sibi	5	3
10.	Hyderabad	105	5
11.	Sukkur	60	5
12.	Karachi	378	10
	Total:	1664	63

WOOD CONSUMPTION:

The 63 units used 383,993 cft of timber annually to construct 77000 items of furniture. Table No. 26 gives the consumption of wood by species and raw material category. The percentage of the six most important woods are shisham 84.1%, deodar 3.8%, mulberry 3.5%, poplar 2.9%, Kikar 2.6% and Encalyptus 1.6%.

TABLE NO. 26

**SPECIES WISE CONSUMPTION OF WOOD FOR
FURNITURE IN 1989**

Units in Cft.

S.No.	Wood Species	Logs	Branch wood	Lumber	Scant	Total	
						Volume	%age
1.	Shisham	187,880	101,710	50,305	3,299	323,194	84.1
2.	Deodar	9,000	1,400	3,500	500	14,400	3.8
3.	Kail (Pine)	900	..	500	..	1,100	0.3
4.	Mulberry	3,750	9,000	805	..	13,555	3.5
5.	Poplar	..	9,000	2,000	..	11,000	2.9
6.	Kikar	..	8,020	2,000	..	10,020	2.6
7.	Frash	..	4,500	..	..	4,500	1.2
8.	Eucalyptus	..	6,000	..	..	6,000	1.6
9.	Partial	224	..	..	..	224	..
	Total:	181,464	139,630	69,110	3,799	383,993	100

The total number of furniture units in the country are not known but on the basis of new houses constructed and number of marriages solemnized each year and keeping in view other relevant factors, an intelligent guess is that about 30 million cft of wood is used per annum in the manufacture of furniture items.

Chipboard Industry

Chipboard is manufactured in Pakistan from wood as well as from bagasse. The latter is mainly used by the units installed as components of sugar mills. The wood using units, generally, use inferior quality or waste wood in the form of branches and lops and tops of trees. The species mainly used in chipboard manufacture are mango and poplar.

There are 16 units in the country (5 in Punjab, 10 in Sindh and 1 in NWFP). These have a production capacity of 131,500 tonnes of chipboard annually as shown in Table No. 27.

Presently nearly 90,000 tonnes of wood are used annually in the production of chipboard by 11 of the 16 units.

TABLE NO. 27
CHIPBOARD UNITS AND THEIR WOOD
CONSUMPTION

(In tonnes)

Sl.No	Name of Units	Location	Quantity used
1.*	Pakistan Chipboard Ltd. Main G.T. Road, Jhelum.	Punjab	4,000
2.*	Sadiq Wood Industries (Pvt) Ltd., Kala Shah Kaku.	"	4'500
3.*	KDC Board & Plywood (Pvt) Ltd., Head Office G.T.Road, P.O Box 13, Jhelum.	"	4'500
4.*	Bombay Plywood Industries Peshawar Road, Rawalpindi.	"	4'500
5.	Crescent Boards Ltd., Faisalabad(Nishatabad)	"	20'000
6.	Balochistan Particle Board Ltd., 2nd Floor Imperial Court, Dr. Ziauddin Road, Karachi.	Sindh	19'000
7.*	Pakitex Boards Plot 24 & 25, Sector 29, Korangi Industrial Area, Karachi.	"	5'000
8.*	Anchor Boards (Pvt) Ltd., Korangi Industrial Area, Karachi.	"	7'500
9.	Sind Particle Board Mills Ltd., S.I.T.E. Kotri (Factory) Tibet Square M A Jinnah Karachi.	"	8'000
10	Garib Sons (Pvt) Ltd., E-23 S.I.T.E Karachi.	"	8'000
11.*	Hercules Board Ltd., Jubilee Insurance House I.I. Chundrigar Road, Karachi.	"	4'500
12.*	Dir Forest Industries Complex Head Office: P.I.D.C House M.T. Khan Road, Karachi.	"	15'000
13.*	National Particle (Pvt) Ltd., Korangi Industrial Area, Karachi.	"	9'000
14.*	Pakistan Superwood Industries (Pvt) Ltd., 31, Landhi Industrial Area, Karachi.	"	11'000
15.	Partico (Pvt) Ltd., 4th Floor, UBL Building I.I. Chundrigar Road, Karachi.	"	2'500
16.*	Islamabad Board Mills (Pvt) Ltd., Plot No.15, Hatter Industrial Estate, Hatter, NWFP. Punjab	NWFP	4'500
Total			131'500

* Use wood in the production of chipboard.

Hardboard Factories

There are five factories which produce hardboard in the Country. Their combined production capacity is 84,000 tonnes per annum. Of these, two units are using wood as the basic raw material and three are using bagasse. The species and volume of wood consumed per annum by the wood using units are shown in Table No. 28.

TABLE NO. 28

WOOD USED IN HARDBOARD UNITS DURING 1989

Name of Unit	Species	Quantity (in tons)	% of total
Asia Board Industries	Acacia nilotica (Kikar)	33,895	96.7
Crescent Boards Limited	Eucalyptus	1,166	3.3
Fibretext Industries Limited*	--	--	--
Oosman Brothers Hardboard Inds.*	--	--	--
Pak Hardboard Industries Ltd.,*	--	--	--
Total Wood Used		35,061	100

* Using bagasse as raw material.

Veneer and Plywood

There are 17 plywood factories in the country (10 in Punjab, 6 in Sindh and 1 in NWFP). Currently, these are using 22776 cubic meters of wood of different species annually. Two factories, Bombay Plywood and M/s Central Forest Products Ltd., did not divulge information about their wood consumption. The details provided by the remaining units are given in Table No. 29.

TABLE NO. 29

USE OF WOOD IN VENEER AND PLYWOOD UNITS

Sl. No.	Name	Location	(Cubic meters)		
			86-87	87-88	88-89
1.	M/S K.D.C.Plywood Factory Jhelum.	Punjab	2121	1845	2873
2.	M/S Bombay Plywood Industry, Rawalpindi.	"	"	"	"
3.	M/S National Wood Industry, Laha Musa.	"	385	320	420
4.	M/S Sadiq Plywood Industry, Sheikhpura.	"	1200	1550	1750
5.	M/S Green Wood Working Industry Kot Lakhpat, Lahore.	"	1845	1870	2060
6.	M/S Premier Plywood Industry, Kot Lakh-Pat, Lahore.	"	1000	1000	1062
7.	M/S Shalimar Plywood Industry, Faisalabad.	"	743	1471	1614
8.	M/S Lyalpur Plywood Industry, Faisalabad.	"	599	672	810
9.	M/S Timber Centre, Plywood Factory, Rawalpindi.	"	715	857	1143
10.	M/S Mughal Plywood Factory, Rawalpindi.	"	571	715	1150
11.	M/S Hittar Plywood Factory, Abbottabad.	NWFP	"	571	787
12.	M/S Sunlight Wood Products(Pvt) Industrial Area, Karachi.	Sindh	4285	4285	4285
13.	M/S Osman Brothers, Plywood Industry, Industrial Area, Karachi.	"	1034	1200	1950
14.	M/S Aman Wood Working Industry, Industrial Area, Karachi.	"	601	660	850
15.	M/S Tropical Wood Working Industry Industrial Area, Karachi.	"	944	966	1160
16.	M/S Central Forest Products Ltd., Haji Camp, Karachi.	"	"	"	"
17.	M/S Fancy Veneer and Plywood Industry, Industrial Area, Karachi	"	1000	1000	1062
		Total	17043	18982	22776

Pulp and Paper Industry.

Out of 49 pulp, paper and paper board mills, 34 are in production, 8 are in different stages of planning and installation and the remaining 7 are, currently, closed. Their distribution in the Provinces is shown in Table No. 30.

TABLE NO. 30

UNITS PRODUCING PAPER & PULP IN PAKISTAN

No. of Units

Products	Punjab	Sindh	NWFP	Baloch	Islamabad	Total
Pulp & Paper	2	3	1	..	..	6
Paper Board	5	3	1	..	..	9
Pulp, Paper and Board Articles	4	8	3	2	1	18
Other Paper Products	2	9	1	4	..	16
Total:	13	23	6	6	1	49

Mills Surveyed:

Out of the 34 mills which are in operation, 16 were surveyed to identify the type of raw materials they currently use. The results of the survey are given in Table No. 31.

TABLE NO. 31

RAW MATERIAL USED IN 16 MILLS SURVEYED

Quantity of raw material used (000 tonnes)

Provinces	No. of mills surveyed	Wheat straw	Bagasse	Grass	Waste Cotton	Waste paper
Punjab	7	213.3	--	24.8	--	100.7
Sindh	7	16.6	16.8	--	3.6	23.0
NWFP	2	--	47.9	17.5	4.0	19.0
Total:	16	229.9	63.8	42.3	7.6	142.7

Due to the shortage of wood in the country, all existing mills are using agricultural wastes as raw material. As the result of a successful tree planting programme under the Federal Forestry Planning and Development Project, the availability of wood is likely to increase and managements of the seven mills listed in Table No. 32 indicated their interest in using wood, when available, to get a better quality pulp.

TABLE NO. 32

**PAPER/PULP MILLS WHICH ARE READY
TO USE WOOD**

(Tonnes/Years)

S. No.	Name	Location	Capacity
1.	Adamjee (Nowshera)	NWFP	100
2.	Flying Paper Industry Lahore	Punjab	20,000
3.	Jubilee Paper Mill Kamoke	Punjab	1,500
4.	Packages Limited Lahore.	Punjab	42,500
5.	Premier Paper Mills Ltd., 7.5 KM. Lahore Road, Sheikhpura	Punjab	10,500
6.	Sampak Paper and Board Mills Ltd., Sheikhpura.	Punjab	14,000
7.	Century Paper and Board Mills, Bhai Pheru, Kasur.	Punjab	30,000

Match Industry.

Twelve match factories are operating in the country, 11 of these were established after cessation of East Pakistan in 1970. These units are using 163,770 tonnes of poplar wood, 90% of which is produced on NWFP farm lands in the districts of Peshawar and Mardan. The location of factories and the quantity of wood used by these units are shown in Table No. 33.

TABLE NO. 33**WOOD USED IN MATCH INDUSTRY**

(Tonnes)

Sl. No.	Name of the Unit	Location	Wood consumption		
			86-87	87-88	88-89
1.	M/S Ujala Match Factory (Pvt) Ltd., Chiniot. Jhang Road, Chiniot.	Punjab	2,000	2,000	2,000
2.	M/S Orient Match Co.Ltd., Shahdara, Lahore.	"	18,168	18,000	16,667
3.	M/S Fazal Sons Match Industries Ltd., Sheikhpura.	"	600	808	1,017
4.	M/S Burney's Industrial and Commercial Co. Karachi.	Sindh	7,500	9,168	10,350
5.	M/S Sind Match Works(Pvt) Ltd., Karachi.	"	11,885	11,778	12,512
6.	M/S Popular Match Industries, Tando Adam, Hyderabad.	"	10,667	10,667	11,333
7.	M/S Jugno Match Industries, Tando Adam, Hyderabad.	"	5,333	5,333	5,500
8.	M/S Mohsin Match Factory (Pvt) Ltd., Poshwar.	NWFP	600	800	1,000
9.	M/S Noor Match Factory Ltd., Poshwar.	"	6,212	8,004	7,188
10.	M/S New Fazal Match (Pvt) Ltd., Par Hote, Mardan.	"	1,017	1,035	1,037
11.	M/S Syed Match Company Ltd., Sursi Saleh, Haripur.	"	70,000	75,000	94,333
12.	M/S Channar Match Factory, Mirpur (Azad Kashmir).	Azad Kashmir	500	583	667
		Total	132,480	141,176	163,605

Saw Milling

A large number of saw mills, small, medium and large, have been established throughout the length and breadth of the country. A survey of Sawmills in 11 cities (3 each in Sindh, Punjab and NWFP and 2 in Balochistan) was undertaken. There are 1016 units in these cities out of which 60 were visited. The distribution of the sample by city is shown in Table No. 34.

TABLE NO. 34

SAW MILLS AND SAMPLE SIZE IN 11 CITIES

Sl. No.	City	Total Units	Samples selected for survey
1.	Karachi	58	5
2.	Hyderabad	38	5
3.	Sukkur	12	4
4.	Sargodha	128	5
5.	Multan	334	5
6.	Lahore	363	9
7.	Quetta	36	5
8.	Sibi	4	2
9.	Haripur	14	7
10.	Mardan	9	8
11.	Peshawar	20	5
	Total:	1016	60

WOOD CONSUMPTION:

The data from the 60 saw mills have revealed total consumption of 1.2 million cft of wood by these units. Table No. 35 given the consumption of wood by species and raw material category.

TABLE NO. 35**SPECIES AND QUANTITY OF WOOD USED IN 1989**

(in Cft)

S.No.	Wood Species	Logwood	Branch Wood	Lumber	Scant	Total
1.	Shisham	249,480.00	258,800.00	..	144,500.00	652,580.00
2.	Dayar	58,500.00	125,500.00	9,000.00	130,000.00	323,200.00
3.	Partal	21,200.00	..	5,000.00	1,000.00	27,200.00
4.	Kikar	21,300.00	2,900.00	13,000.00	7,000.00	44,200.00
5.	Poplar	8,800.00	20,000.00	..	..	28,800.00
6.	Safida	32,000.00	50,000.00	..	..	82,000.00
7.	Chaur	13,200.00	..	..	300.00	13,500.00
8.	Mango	7,300.00	2,500.00	..	6000.00	14,800.00
9.	Toot	..	..	..	6100.00	6,100.00
	Total:	411,880.00	459,500.00	27,000.00	294,100.00	1,192,480.00

PRODUCTS:

The 1.2 million cft of wood sawn in the 60 saw mills has been utilised for the manufacturer of different items of daily use as given below:

<u>Item</u>	<u>Number</u>
Fruit boxes	1,346,000
Crates	840,400
Lumber	183,500
Planks	105,050
Cross arms	45,000
Doors	500
Total:	<u>2,520,450</u>

Tobacco Industry

Tobacco is a very profitable industry. It is generating 9.7 billion rupees annually in the form of duties and taxes for the Government. A few facts about this industry and its consumption of wood for curing of tobacco leaves are given below:

General

No. of tobacco companies	▶ 12
Area under tobacco crop.	▶ 11,700 ha.
Production	▶ 24.8 million kg.
Yield per ha.	▶ 2118 Kg
No. of registered farmers	▶ 9915
No. of tobacco barns	▶ 11000

Wood Consumption for tobacco curing in 11000 barns.

(i) **Fuelwood**

Size of a barn.	▶ 16'x16'x16'
Fuelwood consumption per barn.	▶ 6986 Kg.
Total annual Fuelwood consumed.	▶ 77000 tonnes.

(ii) **Sticks**

Number of sticks used per barn	▶ 1000
Total number of sticks.	▶ 11 million
(Average life of stick is 2 years)	

(iii) **Rafters**

Rafters per barn	▶ 20
Total number of rafters.	▶ 220,000
(Average life of rafter is 5 years)	

Sport's Goods Industry

Sialkot is known for Dr. Mohammad Allama Iqbal and for the sport's goods industry. According to a survey conducted recently, 306 units are engaged in the manufacture of all kinds of wood and non-wood sport's equipment. Of these, about 110 units (big and small) are manufacturing goods from wood; 30-40 are making hockey sticks, 40-50 are making cricket bats and 15-20 are racket makers. Forty-two firms produce quality products for sale with 80 - 90% of their production sold to foreign markets.

In addition, about 1000 families living in Sialkot city and its suburbs are engaged in making cricket bats, wickets (Stumps) and different kinds of low quality rackets. They sell their products to firms and manufacturing units for marketing.

Wood Consumption: Of the 110 firms engaged in the manufacture of sport's items made from wood, 18 units were sampled for collection of annual production and consumption of wood data. The results of the survey with respect to three major items are shown in Table No. 36.

TABLE NO. 36

PRODUCTION, EXPORT AND WOOD CONSUMPTION IN 18 UNITS

Item	Production (Number)	Exported (Number)	Wood Consumption
Hockey Sticks	1,000,000	800,000	7,000 m ³
Rackets	2,000,000	872,000	5,560 m ³
Cricket Bats	2,500,000	496,000	28,300 m ³

It has been estimated that the total annual consumption of wood for sport's goods in Sialkot is approximately 1,450,000 cft (41000m³). Wood consumption by species is given in Table No. 37

TABLE NO. 37

**QUANTITY OF WOOD CONSUMED IN
SPORT'S GOODS INDUSTRY**

Sl.No.	Species	Quantity of Wood	
		(cft)	(m ³)
1.	Mulberry	250,000	7075
2.	Poplar	800,000	22640
3.	Willow	200,000	5660
4.	Others	200,000	5660
	Total:	1,450,000	41035

Brick Kilns.

There are 3041 brick kilns in Pakistan out of which 2610 are trench type and 431 are clamp type. The latter type are locally known as "Bhatti". They use agriculture wastes, rice husk, saw dust, cow dung, or roots of trees as fuel.

The trench type of brick kiln is locally known as "Bhatta". This type is more popular because of its bigger size and its economics. Coal, firewood, furnace oil or natural gas are used. Out of 2610 Bhattas, 79 only use firewood and 2529 use coal, firewood and saw dust in different combinations and proportions.

Province-wise distribution of brick kilns is shown in Table No. 38.

TABLE NO. 38
BRICK KILNS IN PAKISTAN

Sl. No.	Province	Brick Kilns on Coal & Fire Wood	Clamps (Avis)	Total
1.	Punjab	1,555	166	1,721
2.	Sindh	380	244	624
3.	NWFP	558	--	558
4.	Balochistan	117	21	138
	Total:	2,610	431	3,041

Use of Wood:

According to information collected in a survey, 7.2 m³ of firewood (Stacked) and 271 tonnes of coal is consumed to make one million bricks. On this basis, 99,486 m³ (Stacked) of firewood is consumed during the manufacture of the 12500 million bricks and tiles shown in Table No. 39.

TABLE NO. 39
FUELWOOD CONSUMPTION IN BRICK KILNS.

Sl.No.	Provinces	Brick & Tiles (in million)	Wood used per million bricks (m ³)	Total wood consumed (m ³)
1.	Punjab	7,171	9.97	71,494
2.	Sindh	1,815	6.72	12,196
3.	NWFP	2,885	4.30	12,405
4.	Balochistan	474	7.15	3,389
	Total	12,345	28.14	99,484

Vehicle Body Building Industry

Truck, bus, tractor trolley and boat building units were surveyed. As a result, 297 units were identified in 9 cities. Of these, 55 were visited. The distribution of the sample by city is shown in Table No. 40.

TABLE NO. 40

DISTRIBUTION OF VEHICLE BODY BUILDING INDUSTRY

Sl. No.	City	List of Manufacturing Units.	Sample size
1.	Peshawar	38	10
2.	Bannu	15	7
3.	D.I.Khan	13	6
4.	Lahore	75	5
5.	Chiniot	57	5
6.	Rawalpindi	45	5
7.	Hyderabad	6	5
8.	Karachi	16 *	5
		24 **	5
9.	Sukkur	8	2
	Total	297	55

* Truck/Bus

** Boat

The primary products produced by these 55 units, during 1989, are shown in Table No. 41.

TABLE NO. 41
PRIMARY PRODUCTS

Sl.No	Bodies of	Number
1.	Bus	276
2.	Truck	309
3.	Trolley	18
4.	Boat	15
5.	Ambulance	47
6.	Mazda Mini Bus/ Wagon	55
7.	Repairing Work	44

WOOD CONSUMPTION:

During 1989 these units consumed 44,509 cft of timber which includes 10,500 cft for boat bodies. The consumption of wood by species, type of body and raw material category is shown in Table No.42 below.

TABLE NO. 42
WOOD CONSUMED IN 1989

(Units cft)

Sl. No.	Species	<u>Body Building Industry</u>				Boat	Total
		Log	Branches	Lumber	Scants		
1.	Shisham	7,318	700	14,777	126	3,200	22,920
2.	Pantak(Fir)	1,708	298	5,700	1,762	--	12,668
3.	Deodar	200	376	--	--	4,100	676
4.	Kikar	398	--	460	--	600	4,948
5.	Chilghaza	--	100	--	--	--	100
6.	Chir	--	--	3,300	--	--	3,300
7.	Teak	--	--	--	--	2,700	2,700
	Total	9,622	1,473	24,227	1,887	10,600	47,209

Mining Industry

There are 39 salt and coal mines in Pakistan which use wood for planks and props for support. Of these, 25 are in Punjab, 4 are in Sindh, 8 are in Balochistan and 2 are in NWFP. Salt and phosphate mines use insignificant quantities of wood and, thus, were, ignored in a recent survey. Out of the 39 mines, 15 (Punjab 6, Sindh 3, Balochistan 4 and NWFP 2) were surveyed. This survey identified 29 firms (Punjab 10, Sindh 9, Balochistan 9 and NWFP 1) which manage these 15 mines. Data was collected from the 29 firms on their present and future wood requirements. Wood consumption by these mines is reported in Table No. 43.

TABLE NO. 43

**PRESENT AND PROJECTED CONSUMPTION OF
WOOD IN COAL MINES**

(cubic meters)

Province	1988	1989	1990	1991	1992
Balochistan	71137	91537	92449	103097	112802
Punjab	29083	32897	36506	40670	44531
NWFP	918	1000	1076	1196	1315
Sindh	37024	37490	44953	50100	54869
Total:	138162	162924	174984	195063	213517

The most popular mining timber is Kikar or Babul (Acacia nilotica) although Jand (Prosopis cineraria), Chir (Pinus roxburgii) and Kail (Pinus wallichiana) are also used. Wood prices for mine timbers vary from Rs.500/- per m³ in the Punjab to Rs.1600/- per m³ in Balochistan. The expenditure on wood is 10% of the total mining cost in NWFP, 25% in Balochistan, 13% in Sindh and 15% in Punjab.

Railway Industry

Currently, Pakistan Railways require 20,000 m³ (18000 m³ of deodar and 2000 m³ of shisham) of timber in round form annually to maintain 12,600 kilometer of railway track and two carriage factories at Lahore and Islamabad as per the detail given in Table No. 44.

TABLE NO. 44

TIMBER REQUIREMENTS OF RAILWAY INDUSTRY

(Cubic meters)

Sl. No.	Section	Deodar (Round)	Shisham (Round)	Total
1.	Route and Track Department	14,164	--	14,164
2.	Moghulpura Carriage and Wagon Workshop.	2,300	1,900	4,200
3.	Islamabad Carriage Factory.	600	100	700
	Total:	17,064	2,000	19,064

Taxation

Taxes on forest produce are levied at various levels, i.e. local, Provincial and Federal. These taxes are particularly heavy in NWFP which is the main forested region in Pakistan.

Local Taxes in NWFP

before 1.7.1980

<u>District Council Mansehra</u>	(per cft) <u>Rs. 0.30</u>
----------------------------------	------------------------------

w.e.f. 1.7.1980

District Council Mansehra	Rs. 2.50
District Council A. Abad	Rs. 1.50
District Council Swat	Rs. 1.00
District Council Dir	Rs. 2.00
District Council Kohistan	Rs. 2.00

w.e.f. 1.7.1984

District Council Mansehra	Rs. 2.50
District Council A. Abad	Rs. 2.50
District Council Swat	Rs. 2.00
District Council Dir	Rs. 2.00
District Council Kohistan	Rs. 3.00
District Council Chitral	Rs. 10.00
Education cess (through NWFP)	12-1/2%

w.e.f. 1.7.1987

District Council Mansehra	Rs. 2.50
District Council A. Abad	Rs. 2.50
District Council Swat	Rs. 2.50
District Council Dir	Rs. 3.00
District Council Kohistan	Rs. 3.00
District Council Chitral	Rs. 10.00

Provincial Taxes in NWFP

before 1.7.1980 (per cft)

Forest Department Rs.1.75

w.e.f. 1.7.1980

Forest Department Rs.2.25

w.e.f. 1.7.1988

Forest Department Rs.3.50

Federal Taxes all over the country

Income Tax 3% flat rate on sale price.

Sale Tax 12-1/2% of the sale value w.e.f. 1.7.1988

All timber emanating from Tribal areas, Azad Kashmir and Northern Areas which is sold in any timber market located in NWFP is subject to the taxes leveyed above.

Taxes in Balochistan

DESCRIPTION	RATES		
	INTER PROVINCIAL	INTER DISTRICT	TOWN COMMITTEE
<u>FIREWOOD</u>			
- Camel load.	Rs. 24/-	Rs. 12/-	--
- Donkey load.	--	Rs. 2/-	--
- Head load.	--	Rs. 2/-	--
- Truck load.	Rs. 150/-	Rs. 60/-	Rs. 25/-
- Tractor load.			
6 wheeler	Rs. 500/-	Rs. 150/-	Rs. 75/-
10 wheeler	Rs. 650/-	--	--

TIMBER

10' long & 9" girth.	Rs. 8/-	Rs. 4/-	--
10' long & 12" girth	Rs. 10/-	Rs. 6/-	--
12' long & 15" girth	Rs. 14/-	Rs. 8/-	--

CHARCOAL

- 6 wheeler truck	Rs. 600/-	Rs. 300/-	Rs. 5 P.T
- 10 Wheeler truck.	Rs. 750/-	--	--

MAZARI

- 6 Wheeler truck	Rs. 1/50 per maund (Rs.350 per truck)	--	--
- 10 wheeler truck	Rs. 500 per truck	--	--

Taxes in Azad Kashmir

TIMBER CONVERTED

- Timber (AKLASC)	Rs. 2 per cft
- Timber (Forest Lessee)	Rs. 5 per cft

FOREST PRODUCE

- Gucchi	Rs.10 per Kg.
- Benafsha	Rs. 4 "
- Kuth	Rs. 4 "
- Akhrot (bark)	Rs. 4 "
- Bela Doona	Rs. 4 "
- Resin	Rs. 3 per tin
- Rosen	Re. 0.50 per kg.

Forestry and Wood Industry Relationship

Forestry and wood industries have not interacted with each other. Historically, their relationship has been through

middlemen who procure constructional and industrial wood from the Forest Departments or private wood producers and supply it to different wood based industries according to their end use needs, i.e. Shisham for furniture, Mulberry and Willow for sport industry, Poplar for match industry, Kikar (Acacia nilotica) for mining industry. A wood producers and users Seminar was held in Lahore from 13-15 May 1990 with a purpose to achieve the following objectives;

- ▶ Increase forest cover on state lands and tree wealth on farmlands in the country.
- ▶ Identify present imbalances between supply and demand and suggest measures to rectify the situation.
- ▶ Assess present and future demands of wood based industries in terms of species, quality and quantity of wood required and initiate programmes in Social Forestry to cater to these needs.
- ▶ Ensure fair prices to growers and a sustained supply of raw material to industries.
- ▶ Integrate industrial growth with expansion in tree growth on farmlands to avoid future imbalances in supply and demand.

The outcome of the Seminar was very encouraging. If the momentum already established is maintained and increased, it can produce useful results both for the producers of wood and the wood using industrial entrepreneurs.

Rationalization and Standardization

The wood industry in Pakistan is not well organised for various reasons. Wood working units, owned and managed by the public sector, are inefficient and over staffed. Dir Forest

Industries Complex is a good example. It has been closed for several years. Resin and Turpentine Factories owned by Forest Departments of Azad Kashmir and Punjab are no longer in operation. Paper and pulp industries in the public sector are also facing difficulties. Under these conditions, improvement in equipment, products and trade practices deserve special attention. If a comparison is made between units established in the public and private sectors, the later are better managed and earn profits.

Promotion of Wood Industry

The steps taken and the incentives provided for promotion of Industry in private sector also apply to the wood based industries. There is no preferential treatment given to wood based industries in particular. As far as the public sector is concerned, FDC in NWFP and AKLASC in Azad Kashmir have been given a mandate to establish wood based industries in their respective jurisdictions. So far, FDC has established the following industrial units.

- i. Wood working centre at Havalian Hazara
- ii. FDC Saw mill at Mansehra.
- iii. Rozen & Turpentine Factory, Haripur.

A proposal is under active consideration to transfer the ownership and control of the Dir Forest Industries Complex from PIDC to the FDC.

AKLASC has established the following wood working units;

- i. Sale depot and saw mill at Islamabad.
- ii. Sale depot & Saw mill at Muzaffarabad.
- iii. Sale Depot, Saw mill and wood working centre at Mirpur.

iv. Season plant at Mirpur.

Establishment of other units to manufacture polythene bags, treatment transmission poles and the like are under active consideration by the Forest Development Corporation. Incentives for promotion of wood based industries in the private sector have been discussed in Chapter No. 3.

CHAPTER NO. 6

POLICY ON LOCAL AND INTERNATIONAL TRADE

INTRODUCTION

Pakistan has relatively little forest land. Out of the 4.5 million ha. of public forests covering only 5.4% of the land surface, two-thirds are non-commercial. These are managed for soil and water conservation objectives. The public forest lands in the arid areas of Punjab, Sindh and Balochistan are largely used as open grazing grounds for livestock as rainfall is scanty and other climatic and edaphic conditions are unfavourable for tree growth.

The remaining one-third of public forests are productive but since they are mostly growing on steep and unstable slopes in the Himalayan and Karakoram regions they are vulnerable to natural hazards. Thus, their management is quite primitive, in particular harvests are extremely conservative, and management lacks essential inputs which results in low yield from these forests. Pakistan's goals of creating new forests in the public and private sectors are ambitious. Currently, efforts are directed at launching tree plantation campaigns twice a year, in the Spring and Monsoon periods, to induce farmers and the general public to plant trees on farm lands and elsewhere to meet their fuel wood needs for energy and timber needs for houses, agriculture implementing and supplement income through sale of wood.

Since the country wide demand for timber far exceeds the supply, there is almost no export of unprocessed wood resources.

Forest Policy and Timber Trade

There is no policy on local trade of timber in Pakistan and there is no separate policy for its import and export. In the existing forest policy, as well as the one which is being finalised, there is no direct reference to local and international trade of timber. The following rationale explains the reason for this oversight.

The limited availability of timber, as a result of the small forest acreage base and its primary management for conservation and environmental protection does not warrant special mention of export objectives in the forest policy. However, local trade and import are two areas which need to be considered.

Only the following indirect references to timber trade are contained in the existing forest policy. These are:

- ▶ meeting the country's needs for wood and wood products
- ▶ conserving the resource through sustainable utilization
- ▶ increasing productivity to meet domestic and industrial demand and reduce reliance on imports
- ▶ limiting responsibility for extraction of coniferous forests to public sector organizations
- ▶ increasing road density to facilitate timber extraction in log form
- ▶ mechanizing forest operations in localities where road construction is difficult, costly or undesirable due to likely erosion and environmental damage

Import of timber and wood products, e.g. paper and pulp, is necessary. This is an important area for consideration in the forest policy, which has not been addressed. This topic is, however, included in Pakistan's import policy.

IMPORT:

Due to the shortage within the country, wood and wood products have been retained on the free list for import. However, excessive import of these items is controlled through tariff. The duties on log, timber and wood products range from 50 - 125 percent ad valorem. Such a high tariff restricts the import to high value timber products such as teak.

The detail of log and timber imports during the period 1975-76 to 1988-89 is given below:

Year	<u>LOGS</u>		<u>Sawn Wood</u>		Total (m ³)
	Cubic Meters (m ³)	Percent (%)	Cubic Meters (m ³)	Percent (%)	
1975-76	244,358	82	52,313	18	296,671
1976-77	322,077	84	61,353	16	383,430
1977-78	347,381	60	231,660	40	579,041
1978-79	307,817	87	44,424	13	352,241
1979-80	514,571	83	107,289	17	621,860
1980-81	116,355	29	279,017	71	395,372
1981-82	8,712	9	93,376	91	102,088
1982-83	22,714	12	172,492	88	195,206
1983-84	105,121	47	119,663	53	224,784
1984-85	17,009	17	82,331	83	99,340
1985-86	44,668	32	94,877	68	139,545
1986-87	35,839	32	76,980	68	112,819
1987-88	29,699	24	93,638	76	123,337
1988-89	32,993	21	122,412	79	155,405

EXPORTS:

The export of timber and many other forestry related items has been prohibited by including them on the list of essential items

in Schedule - 1 of the export policy or by making specific provisions for them as under:-

Item Nature of restriction

- | | | |
|----|--|---|
| 1. | Timber (Logs) | Export not allowed except as discussed below. |
| 2. | Charcoal and firewood | Export not allowed. |
| 3. | Empty wooden crates, assembled or unassembled. | Export not allowed. |
| 4. | Unfinished and semi-finished hockey sticks and blades. | Export not allowed. |
| 5. | Sports goods provided such goods are indelibly marked with the words Made in Pakistan. | Export allowed |
| 6. | Native wild animals, birds and reptiles. | Export not allowed except in the case of a few birds as explained in item No.7. |
| 7. | Export of endemic birds. | Export restricted to a few bird species and that too is subject to export quota, mandatory checking and Quarantine Certificate. |
| 8. | Export of wild boar, its meat and skins. | Export allowed only by non-muslim registered exporters. |
| 9. | Export of exotic captive bred birds and domesticated rabbits. | Allowed subject to mandatory checking by the National Council for Conser- |

vation of Wildlife (NCCW) at Islamabad and by the Provincial Wildlife Departments at other airports/exit points. The export consignments are also required to be accompanied with the Quarantine Certificate about health and caging by the Animal/Plant Quarantine Department.

10. Wild animal skins and garments made of such skins; products and derivatives of such skins; finished or tanned leather made of wild animal skins and stuffed mounted or preserved specimens of wild animals.

Export not allowed.

Ban on export of all wild mammals, reptiles and native protected birds, their parts, products and derivatives (except wild boar and its skins) has been imposed through a Cabinet decision with the following exceptions:

- (i) Limited number of trophies of big game animals which are not protected by the wildlife laws and whose hunting is allowed by the Provincial Wildlife Management Board/Chief Executive of the Provinces in areas other than national parks and wildlife sanctuaries.
- (ii) Annual export quota of 250 falcons (180 from NWFP and 70 from Punjab and none of Peregrine falcons) for dignitaries from the Gulf States and Saudi Arabia.

Despite restriction on the export of timber, the following limited quantities of Shisham (Dalbergia sissoo) timber have been exported to the Gulf States for special consideration:-

<u>Year</u>	<u>Quantity (Tons)</u>
1981	500
1983	1100
1984	500
1985	600
1987	800
1989	350
1990	100
1991	700
1992	1300

Table-45 indicates the value of sports goods, furniture, plywood and other wood products exported during the period 1987-88 to 1989-90.

TABLE NO. 45
EXPORTS

(Rs.in million)

	1987-88	1988-89	1989-90
-- Hockey sticks	68.30	68.59	79.62
-- Cricket sticks	14.18	11.25	0.16
-- Polo sticks	1.34	1.92	3.69
-- Tennis Rackets	41.57	19.58	26.03
-- Badminton Rackets	0.40	--	--
-- Squash Rackets	0.28	--	--
	126.07	101.34	109.50
-- Furniture and parts thereof	13.40	11.26	42.32
-- Cork/wood manufa.	13.32	9.20	37.81
-- Veneer, Plywood etc.	1.58	0.41	0.71

Harvesting and Marketing Timber in Public Sector

Prior to establishment of the Forest Development Corporation (FDC) in NWFP, the Azad Kashmir Logging and Sawmilling Corporation (AKLASC), and separate exploitation wings in Punjab and Sindh Forest Departments, trees were sold standing to contractors. Contractors were granted short term leases which did not require them to make any investment in developing permanent, less damaging infrastructure roads, to use skilled labour, to acquire mechanised equipment etc. Consequently, forestry operations were slow, inefficient and wasteful.

In order to prevent damage, reduce waste and improve harvesting operations, sale of standing trees to forest contractors was stopped. Contractors were replaced by the FDC in NWFP, AKLASC in Azad Kashmir and harvesting wings in Punjab and Sindh Forest Departments.

AIMS AND OBJECTIVES:

The forest development corporations were established with the following basic objectives:

- (i) Safeguard against theft and other malpractices in the felling coupes.
- (ii) Generate resources and reinvest them in forest development and expansion activities and thereby:
 - (a) embark upon an ambitious programme of forest development; and
 - (b) reduce waste in harvesting operations.
- (iii) Induce efficiency, speed and economy in forestry practices.

WORKING STRATEGY:

The performance of the Corporations has been better and they have earned increasingly higher net returns because of a development strategy which aimed at:

- (i) Preventing escalation of cost by:
 - (a) Reducing administrative charges.
 - (b) Adopting a system whereby work and carriage contractors are paid on the basis of a quarter girth formula instead of a basal area formula.
 - (c) Introducing mechanization in extraction, loading and unloading of timber in roadside depots and timber markets.
- (ii) Increasing yield by reducing waste.
- (iii) Constructing roads and thus increasing yield and reducing cost.
- (iv) Improving the quality of timber through better harvesting techniques.
- (v) Selling timber at higher rates through negotiation with POF Wah, TIP, GTS, Pakistan Army, etc.
- (vi) Enhancing sales by increasing sale points and timber markets.

REGULATIONS:

Corporations follow their own set of rules, some of which are mentioned below:

- ▶ Sale of Timber Act
- ▶ River Rules
- ▶ Transport Rules
- ▶ Lease Regulations

- ▶ Standing orders
- ▶ Tender notices
- ▶ Sale procedures
- ▶ Payment procedure

Standardization and Grading systems

Since timber is saleable in all shapes and forms, Forest Departments and Forest Development Corporations have not been keenly interested in the standardization of grades and sizes of timber during harvesting. However, the following procedures achieve grading to some extent:

- (i) logs and sleepers are stacked in lots separately by species and size;
- (ii) small lots of timber of the same size and quality are sold separately to fulfill different requirements and enhance competition; and
- (iii) Low quality, unattractive timber is some times mixed with other timber to facilitate its disposal and reduce congestion in timber depots.

Grading rules for coniferous and broad leaved timber have been prepared for Pakistan with FAO assistance. To date, these rules have not been implemented. Lack of policy focus on these types of issues results in tremendous reduction in revenues and increased in efficiency in the management of the natural resource. Viewing harvest as an exploitation activity rather than a management activity strongly reinforces the lack of focus on revenue generation and management efficiency.

CHAPTER NO. 7

EMPLOYMENT IN THE FORESTRY SECTOR

LEGISLATION

Currently, there is no separate legislation for workers of forestry and wood based industries in Pakistan. Different labour laws and industrial relations legislation have been enacted for industrial workers which are applicable to labour in the forestry sector and wood based industries. The following laws, rules and regulations framed for industrial labour in Pakistan are worth mentioning:

- ▶ Factories, Act, 1934.
- ▶ Hand Book of Workmen's Compensation.
- ▶ Mining Labour Code.
- ▶ Law of Industrial Relations.
- ▶ Labour code of Pakistan.

NATIONAL POLICY AND FORESTRY EMPLOYMENT

National policy encourages employment especially of lower income groups in rural areas, to check migration to urban centres. Since forestry is a labour intensive occupation, development and expansion of forestry activities is expected to generate job opportunities in rural areas. In addition, it will increase employment in urban areas through the further development of forest based industry, since these industries are mostly concentrated in towns and cities.

PROFESSIONAL AND OTHER GROUPS IN FORESTRY

The requirement of professionals, technicians, supporting staff and workers in the Provincial Forest Departments and wood based industries is an important issue which is discussed in the following paragraphs.

Provincial Forest Departments

The functions and responsibilities of the staff in the Provincial Forest Departments include the protection, management and development of forest and wildlife resources. The chain of hierarchy is long, forest guard being at the bottom and the chief conservator of forests at the top.

Professional Staff

The professionals in the forest departments are graduates or post graduates in forestry and allied disciplines. At different levels, they carry out policy, management, and research functions. Their province-wise distribution is given below:

Governments	<u>Professional Staff</u>		
	<u>Forestry</u>	<u>Wildlife</u>	<u>Total</u>
Provincial			
▶ Punjab	303	52	355
▶ Sindh	140	14	154
▶ NWFP	208	27	235
▶ Balochistan	65	7	72
▶ Azad Kashmir	85	3	88
▶ Northern Areas	38	5	43

<u>Federal</u>	<u>Professional Staff</u>		<u>Total</u>
	<u>Forestry</u>	<u>Wildlife</u>	
▶ MINFA	9	--	9
▶ PFI	113	--	113
▶ NCCW	--	4	4
▶ ZSD	14	--	14
▶ CDA	34	--	34
▶ PARC	48	--	48
▶ WAPDA (Watershed ▶ Wing)	11	--	11
▶ MKDA.	15	--	15
Total:	1083	112	1195

Forest Technicians:

All forest technicians in the Provincial Forest Departments undergo a 6 months to one year technical training in forest schools. They include forest guards, foresters, deputy rangers and those forest rangers who have attained their position through experience and performance. The strength of forestry technician staff is shown below:

<u>Governments</u>	<u>Technician Staff</u>		<u>Total</u>
	<u>Forestry</u>	<u>Wildlife</u>	
Provincial			
▶ Punjab	3481	886	4367
▶ Sindh	930	700	1630
▶ NWFP	3334	27	3361
▶ Balochistan	519	321	840
▶ Azad Kashmir	862	70	932
▶ Northern Areas	197	20	217

<u>Federal</u>	<u>Technician Staff</u>		<u>Total</u>
	<u>Forestry</u>	<u>Wildlife</u>	
▶ MINFA	--	--	--
▶ PFI	476	--	476
▶ NCCW	--	--	--
▶ ZSD	--	40	40
▶ CDA	215	--	215
▶ PARC	43	--	43
▶ WAPDA	46	--	46
▶ MKDA	335	--	335
Total:	10438	2064	12502

Ministerial Staff:

Large numbers of staff in the Forest Departments provide support services e.g. administrative, finance, accounts, etc. Province-wise distribution of ministerial staff is given below:

<u>Governments</u>	<u>Ministerial Staff</u>		<u>Total</u>
	<u>Forest</u>	<u>Wildlife</u>	
<u>Provincial</u>			
▶ Punjab	1127	116	1243
▶ Sindh	512	40	552
▶ NWFP	1493	439	1932
▶ Balochistan	131	--	131
▶ Azad Kashmir	878	16	894
▶ Northern Areas	85	7	92
<u>Federal</u>			
▶ Forestry Wing of MINFA	52	--	52
▶ Pakistan Forest			

	<u>Ministerial Staff</u>		<u>Total</u>
	<u>Forest</u>	<u>Wildlife</u>	
Institute	80	--	80
▶ NCCW	--	18	18
▶ ZSD	--	42	42
▶ CDA	40	--	40
▶ PARC	18	--	18
▶ WAPDA	40	--	40
▶ MKDA	37	--	37
Total:	4493	678	5171

Vocational Staff:

All other staff working in the Provincial Forest Departments is vocational. Such staff is not employed on a regular basis as the forest work is seasonal. Although forest workers lack vocational training they learn as they work. Generally, forest guards supervise their work.

Forest Development Corporations

Forest Development Corporations have been established in NWFP and Azad Kashmir. Their main responsibilities are felling, extraction, haulage and sale of timber and to some extent, its conversion and processing as well. These goals are accomplished partly through their own staff and partly through contractors. The detail of staff directly employed by these corporations is given below:

<u>Corporation</u>	<u>Professional</u>	<u>Technicians</u>	<u>Ministerial</u>	<u>Vocational</u>	<u>Total</u>
FDC (NWFP)	90	380	415	1558	2443
AKLASC (AJK)	22	523	243	56	844
Total:	112	903	658	1614	3287

Forest Contractors.

In Northern Areas, all felling operations are carried out by forest contractors who purchase standing trees from the Northern Areas Forest Department. The same is true of fellings and conversion in the forests of the tribal areas. As mentioned above, Forest Development Corporations and Provincial Forest Departments also carry out some works using contractors. The number of workers employed by the contractors has not been estimated.

Forest Labour

According to AMJAD and IQBAL (1982), over 600,000 workers are employed by the Provincial Forest Departments. For forestry operations on state forests and private farmlands 340,500 workers are employed, and about 290,000 carry out timber harvesting activities. Together, these total about 28,900,000 man days of work annually. Of the individual involved in timber harvesting, 19,000 work in state forests and 271,000 work on private farms.

Timber Harvesting activities

Timber harvesting is carried out either by the semi-autonomous provincial bodies, such as the Forest Development Corporation (FDC) in NWFP and the Azad Kashmir Logging and Saw-milling Corporation (AKLASC) in Azad Kashmir, or by the provincial forest departments themselves. The corporations harvest softwood species in the mountainous regions of Pakistan by purchasing standing trees from the forest departments at negotiated rates. Tenders are floated by these corporations which invite private contractors to carry out different operations such as felling, conversion of trees to logs or scants and transport of logs or scants to transit sites and sale depots. Contracted transport is supplemented with departmental trucks, if needed. From the sale depot, the logs and scants are sold to consumers through open auction.

Timber is harvested almost throughout the year. Exceptions include the months of May and June in the subtropical chir pine forests because of fire hazard, and when heavy snow restricts such activities in the months of December to March in the forests of the temperate region. In the irrigated forest plantations harvesting takes place from August to February as preparatory works for regeneration are to be completed before April. In the riverain forests, trees are felled and wood is removed before the onset of floods.

Forestry Operations

These activities include nursery, regeneration and tending operations, which are intensive but of a seasonal nature. The prime time for afforestation is during the spring and monsoon periods. Because of the technical and exacting nature of the operations, these are conducted by forest workers engaged on daily wage basis under the supervision of the technical staff of the forest departments.

All forest operations are manually carried out with the help of simple hand tools except in two project areas namely GTZ assisted Intensive Forest Management in Kaghan and Kalam Integrated Development Project assisted by the Swiss Government.

Types of Forest Labour

The following categories of forest labour are recognised by their skill, responsibility, numbers, domicile, time of availability and relationship with the forest administration.

Local Villagers:

This category of labour is seasonal, consisting of farmers living near the forests. As farmers, they know how to use axes, saws and soil working tools. They carry out a wide variety of operations, including timber harvesting, road construction and repair, and nursery, regeneration and tending operations. This

type of labour is conveniently available but its supply varies greatly depending on agricultural crop sowing, harvesting and tending seasons.

Nomadic Labour:

This type of labour consists of nomadic Afghans or persons from tribal areas along the Pakistan's border with Afghanistan. In winter months they move to the plains in the provinces of Punjab and Sindh along with their families and animals. While on the plain, they reside in irrigated forest plantations and riverain forests. Their lack of skill in forest operations is compensated for by their body strength. They work mostly during the winter months.

Forest Settlements:

There are small forest settlements, in particular, near the irrigated plantations, for forest labour known as "Beldars" who permanently live and work there. They enjoy certain concessions, like free accommodations, land for growing vegetables, firewood and a fixed number of cows. In return, they perform different forestry operations when asked and are paid for the days they work. Their history goes back to the time of establishment of the first irrigated plantation of Changa Manga in the year 1863. This type of arrangement proved very satisfactory for a long time to ensure a sustained labour supply for efficient execution of forest operations. Previously forest work was their only means of sustenance, but now a good deal of them prefer to work outside forest. However, they continue to enjoy all the earlier concessions. Some serious problems, e.g. excessive number of livestock devastating regeneration, extended crop cultivation, theft of timber and firewood, have occurred since the 1960's.

Mountain Forest Labour:

This category of workers belong to the northwest hilly country of Pakistan. They are employed by forest contractors to harvest conifer timber in the high hill forests. Comparatively, they are more highly skilled and, in addition to logging and short distance transport, carry out hand and machine conversion of timber into scants inside forests to facilitate their carriage by animals. They move from forest to forest. During winter season they work mainly in sub-tropical chir pine forests and during the summer months in temperate forests.

RECRUITMENT POLICIES AND PROCEDURES

In the Provincial Forest Departments, persons are recruited against the posts falling vacant or newly sanctioned according to the recruitment rules and procedures laid down by the provincial governments. The posts are filled either by promotion of suitable persons from the existing staff of the department or by directly recruited persons having the prescribed qualification and experience, and who fulfill other eligibility conditions. For initial recruitment, vacancies are advertised in newspapers having circulation in the target area. Posts in BPS-16 and above are filled through the Provincial or Federal Public Service Commissions as the case may be. Promotion against all categories of vacancies and recruitment against posts from BPS-1 to -15 are made by the Departmental Selection Committees/Department Promotion Committees constituted and notified by the respective Governments.

Forest workers are enrolled or engaged as a result of direct contact with forest officials. Considerations of past performance, working capability and experience are given preference. The labour agents (mait) arrange workers for a forest contractor. They also help negotiate the work rates between workers and contractors. Labour agents assure jobs and payments to the workers and also advance money to them.

For these services the labour agents charges a nominal fee on the earnings of the workers.

In forest industries, management has full authority for the recruitment of professional staff required by them and for their upgradation, etc. Interested persons may directly approach management for a job or management may announce through the print media, job opportunities. Usually salaries for higher level jobs are negotiable.

LABOUR RELATIONS AND ORGANISATIONS

Due to the seasonal nature of forestry operations, labour unions are usually non existent except in a few forests where labour is concentrated in permanent forest settlements, e.g. Changa Manga, Chichawatni, Pirowala, Daphar.

In cases where the relationship between workers and employers is of a permanent nature as in the Kaghan Intensive Forest Management Project in NWFP, in the forest-based industries owned by the semi-autonomous public corporations (FDC, SIDB, DFIC) in NWFP and (AKLASC) in Azad Kashmir and in the privately owned industries, workers have the right to make labour unions for safeguarding their interests. The relationship between labour unions and organisations are usually tense due to demands for higher wages and more facilities that are being continuously raised by workers.

PAY AND SOCIAL SECURITY POLICIES

Pay:

Forest and forest industry workers receive their wages either on a daily basis or as a fixed monthly salaries. Daily wage earners are usually forest workers or workers in forest-based cottage industries. In the major forest industries, e.g sawmills, composite wood products, sports goods, pencil,

furniture and match manufacture, the workers are almost permanent and are given salaries according to their skill, responsibilities and pay scales prevailing for compatible jobs in other industries. Forest workers employed by the forest departments for regeneration, afforestation and tending operations are paid daily wages at a rate periodically decided by the Commissioner for a Civil Division. It however, varies slightly depending upon the nature of work. In timber harvesting workers mostly work for forest contractors and their daily earnings are higher, i.e. Rs. 60 to 75/- day depending on performance.

Social security:

In large scale forest industries, permanent workers have social security benefits which include free medical treatment, compensation in case of injury, disability and death, group insurance and contributory provident fund facilities. In forest cottage industries workers are temporarily employed and are thus deprived of social security benefits. This is also the case for forest workers employed directly by the forest departments on a temporary or daily wages basis and for those engaged by forest contractors. In the strict legal sense it may be obligatory for these employers to implement social security schemes. In case of disease, accident, disability or death, contractor might make a payment to an employee on compassionate grounds or for goodwill. Such payments, even in case of death, do not exceed a few thousand rupees.

HEALTH AND SAFETY REGULATIONS

Forest workers mostly come from rural areas and they have the same general health status as is prevalent in rural areas. Parasitic diseases like malaria and dysentery are common because of poor hygienic conditions. At work, workers are exposed to adverse climatic conditions as well as to a hazardous work environment. Due to lack of safety regulations

and vocational training of workers, problems of insect bites and stings, and injuries caused by hitting, crushing, cutting, slipping and falling are quite common. Many of these injuries result in fractures and some in fatal accidents. Because of axe work, incidence of cuts to feet and legs is high among workers engaged in timber harvesting.

Risk of work injuries to forest industry workers is equally high but somewhat different in nature. In handling and operating machines the workers have a greater chance of injury caused by mechanical means and they are also exposed to other health hazards like high levels of noise and vibrations, which may result in psycho-somatic disorders. Saw dust causes eye, nasa-pharyngeal and chest complaints. The handling of poisonous chemicals, in particular without observing safety measures, causes many health problems among the forest industry workers.

The problem of health and safety becomes more serious in the case of workers providing casual labour or employed by forest contractors since the employer has no obligation for their safety and health.

Existing health and safety regulations do not address the working conditions in forestry and forest industries. In the Factory Act, 1934, clauses do address the health and safety of industry workers but this law needs to be amended and expanded to address the health and safety problems of forest workers and forest industry workers.

SPECIAL SCHEMES FOR REDUCTION OF UN-EMPLOYMENT

The forestry sector has a great potential to generate new job opportunities both by increasing the area under forest, as well as by increasing the intensity of management of existing forests. Forestry activities can readily provide employment to

low income groups in remote rural areas, where education facilities and job opportunities are scarce since nearly all traditional forestry practices are highly labour intensive. Specialised training can be met by imparting on the job skills as employment is initially expanded. However, for creating further employment opportunities, for intensive and scientific management of forest areas and for mechanising certain forest operations, vocationally trained manpower are needed.

1. Increase in Forest Area

From 1982 to 1990, the forest area in Pakistan increased from 4.9 to 5.4%. In 1982, the total number of workers employed in forestry and forest based industry were 0.593 million. Out of these, about 0.341 million were engaged in regeneration, afforestation and harvesting operations both in government forests and on private lands and the remaining 0.252 million worked in different forest industries. Assuming that the increase in forest area brings about a corresponding increase in employment, the present level of man-power engaged in forestry and forest industry is estimated to be 0.629 million. A programme of forestry development in the country which would lead to an increase in the forest area from the current 5.4% to a targeted 25% within the next 30 years will create about 0.100 million additional jobs in forestry and the forest industry sector - for skilled, semi-skilled and un-skilled workers on five yearly basis.

2. Intensive Forest Management and Mechanisation

The productive potential of existing and newly developed forests can be increased greatly by bringing them under intensive forest management. Forest roads play a major role in achieving this objective. Currently, forest road density in coniferous forests of Pakistan is about 3 m/ha. To increase the road density to 10 m/ha, considered optimum for himalayan conditions, an additional 14,000 km of forest roads, need to be

constructed. Further more, the existing forest roads in coniferous as well as hardwood forests require improvement. In intensive forest management timber harvesting and extraction could be improved through mechanisation. About 16,500 new job need to be created during the next 30 years for forest engineers and skilled and semi-skilled workers and jobs for 0.118 million unskilled forest workers are needed to increase forest road density, improve existing roads and mechanise forest operations.

Present strength of staff in the provincial forest departments is 14,000 - 15,000. The staff will increase correspondingly with the increase in forest area from 5.4 to 25%. It is estimated that additional job opportunities of 1,200 - 1,500 professional and sub-professional staff will be required to be created and trained to meet future needs for the trained manpower.

CHAPTER NO. 8

FORESTRY EDUCATION AND TRAINING

INTRODUCTION

Forestry education differs from general education in that the former can be acquired only in specialized institutions. These institutions enroll and educate a limited number of persons. Forestry education is comparatively expensive since it also involves practical training in the field through extensive touring. In the past, all expenses of the trainees including tuition fee, books and dress allowances, and subsistence money were borne by the sponsoring agencies. The system is, however, changing and students on self-financing basis are now enrolled in M.Sc. and B.Sc. Forestry Course.

Objectives

The purpose of Forest Education is to provide a steady flow of manpower trained in forestry and allied disciplines to the Forest Departments of the Provinces, Azad Kashmir, Northern Areas, local development authorities and Federal Agencies including the Pakistan Agriculture Research Council, Pakistan Forest Institute, Universities as well as to NGO's and private organisations such as AKRSP, IUCN, Forest Industries, etc.

Level of Forestry Education

Forestry education and training programmes are designed to produce professionals and technicians. There are four levels of training which correspond to the entry needs of forest departments and other organisations. The structure of these positions are shown in Table No.46 and responsibilities in Table No. 47.

TABLE NO. 46

STRUCTURE OF PROVINCIAL FOREST SERVICE

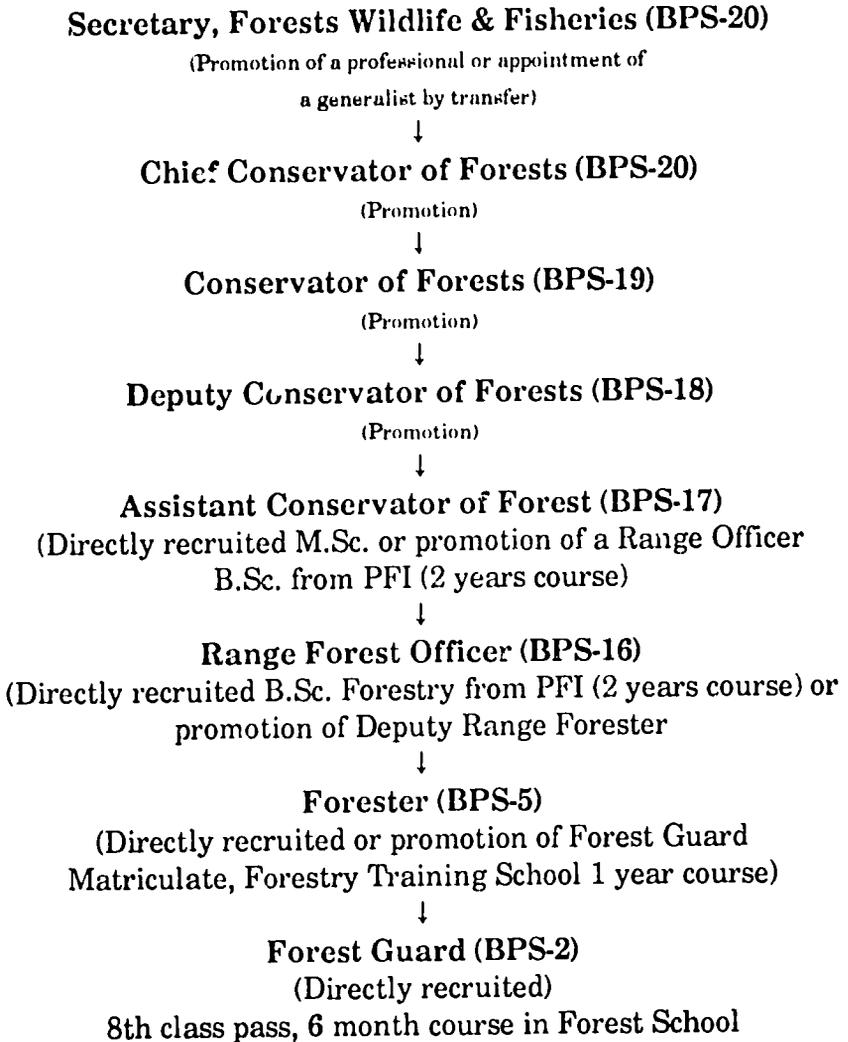


TABLE NO. 47

Title of Training Programme	Pre-requisite	Duration of Training	Level of Employment	Responsibility
<u>TECHNICIAN</u>				
Forest Guard	8-10 years of school education	Six months	Forest Guard (BPS-2)	Protection of smallest administrative unit of Forest i.e. Beat and direct supervision of labour.
Forester	10 years of school education	One year	Forester (BPS-5)	Protection of Forests in a Forest Block, comprising of 4-6 Beats and supervision of labour.
<u>MID LEVEL PROFESSIONAL</u>				
B.Sc. Forestry	12 years of school	Two years	Range Forest Officer (BPS-16)	Protection and management of forests in a Forest Range comprising of 4-6 Forest Blocks. Direct supervision of Foresters and Forest Guards.
<u>PROFESSIONAL</u>				
M.Sc. Forestry	Degree in Science (including B.Sc. Forestry)	Two year	Sub-Div/ Divisional Forest Officer (BPS-17)	Protection and management of a Forest Division, comprising of 4-6 Forest Ranges. Direct supervision of Range Forest Officers.

Technician's Training:

The education and training of Forest Guards and Foresters is conducted by the Provincial Forest Departments in the following forest schools established by them:

Name of School	Location	Province
Sarhad Forest School	Thai (Abbottabad)	N.W.F.P.
Punjab Forest School	Bahawalpur	Punjab (Southern)
Punjab Forest School	Ghoragali (Murree Hills)	Punjab (Northern)
Azad Kashmir Forest School.	Muzaffarabad	Azad Kashmir.
Miani Forest School	Hyderabad	Sindh.

Balochistan and Northern Areas do not have forest schools. Individuals from these Provinces are sent to forest schools in the other Provinces on a mutually agreed to basis.

Professional Education:

Formal degree courses are conducted at the Pakistan Forest Institute, Peshawar. This is a national institute maintained by the Federal Ministry of Food, Agriculture and Cooperatives. It was established in 1947 and since then has met the forestry training and research needs of the Provincial Governments and other organisations. The institute has five directorates including the Forest College. Other directorates are mainly engaged in forestry research, but provide valuable support to the Forest College.

The Forest College offers two courses of two years duration, i.e B.Sc. (Forestry) and M.Sc. (Forestry). Subject to

fulfilling prescribed qualification, admission in the courses is open to both genders, but it is restricted to the following categories of persons:

- i) those already in government forest service;
- ii) probationers nominated by the government and private agencies;
- iii) persons selected through competitive examinations by the Pakistan Forest Institute for its requirements;
- iv) social foresters trained under Forestry Planning and Development Project;
- v) nominees of foreign governments; and
- vi) Limited number of self financed individuals fulfilling the requirements as specified for Governments nominees.

The Forest College is affiliated to University of Peshawar for the purpose of conducting examinations and award of degrees. The officers, on successful completion of their education, are employed by their sponsoring organisations.

(A) Mid Level Professionals (B.Sc.Forestry)

Forest Rangers are middle level professionals. Their main responsibility is to assist the Professionals (Divisional Forest Officers) by rendering the following services;

- (i) Implement all standing orders and instructions with skill and foresight.
- (ii) Perform all technical, administrative, legal and financial functions required for scientific management of forests including marking & exploitation of forests, raising nurseries, regeneration and afforestation, construction of roads, etc.

- (iii) **Protect forests against thefts, fires, illegal grazing, insects, diseases and epidemics as well as regulate the rights and concessions of the people living in the vicinity of forests.**

(B) Professionals (M.Sc. Forestry)

- (i) **manage a forest resource of a known territorial jurisdiction or an enterprise;**
- (ii) **prepare and/or implement short, medium and long term strategies, plans and programmes leading to, or aiming at, scientific management of forests for sustained yield and income;**
- (iii) **prepare budget, regulate expenditure, supervise logging operations, regulate disposal of timber and other forest produce, regenerate and afforest forest lands and maintain them;**
- (iv) **update and maintain documentation of the forest resource, forestry operations, administration, finance and accounts; and**
- (v) **implement other aspects of Forest Policy, enforce Forest Laws, prepare and implement development projects.**

Forestry Training Programme (Course Work)

To impart forestry education and training, a large number of applied science and forestry subjects are offered in B.Sc. (Forestry) and M.Sc. (Forestry) Courses. Although most of the subjects are the same, they are taught in greater depth at the M.Sc. (Forestry) level.

Both courses have forestry subjects, subsidiary subjects and accessory subjects separately shown here-in-after.

FORESTRY SUBJECTS

M.Sc.(Forestry)	B.Sc. (Forestry)
1. General Silviculture.	1. General Silviculture.
2. Species Silviculture and Silvicultural Systems.	2. Species Silviculture and Silvicultural Systems.
3. Forest Management and Working Plans.	3. Forest Management and Working Plans.
4. Forest Mensuration.	4. —
5. Forest Economics and Valuation.	5. —
6. Forest Protection.	6. Forest Protection.
7. Silviculture Research.	7. —
8. Forest Utilization.	8. Forest Utilization.

SUBSIDIARY SUBJECTS

9. Forest Botany including Pathology.	9. Forest Botany including Pathology.
10. Forest Zoology and Entomology.	10. Forest Zoology and Entomology.
11. Forest Engineering.	11. Forest Engineering.
12. Survey and Drawing.	12. Survey and Drawing.

- | | |
|---|-------|
| 13. Soil Science. | 13. — |
| 14. Soil Conservation and
Land Management. | 14. — |

ACCESSORY SUBJECTS

- | | |
|--|--|
| 15. Forest Law and Policy. | 15. Forest Law only. |
| 16. Geology. | 16. Geology. |
| 17. First Aid, Public Health
and Hygiene. | 17. First Aid, Public Health
and Hygiene. |
| 18. — | 18. Forest Accounts and
Procedure. |

Forest Policy and Forestry Education

Forest policy is a basic document which guides and influences all aspects of forestry including education and research. With the shift from traditional protection forestry to the developmental and environmental forestry, forest education has undergone considerable changes.

In the past, estate management and law enforcement were the only concerns of forest departments. Therefore, forestry education dealt with forest protection in great detail and included basic silviculture and elementary forest management. In the policy statements of 1955, 1962 and 1980, the emphasis on technical forestry grew steadily and, therefore, new disciplines were gradually added to forestry education as well as to the responsibilities of forest departments. These included watershed management, range management, logging & engineering, social forestry, and a small course on wildlife, fisheries and countryside recreation.

The existing syllabi of the B.Sc. (Forestry) and M.Sc. (Forestry) courses reflect this change and include the following subjects:-

M.Sc. Forestry	B.Sc. Forestry
1. Forest Mathematics.	1. Forest Mathematics.
2. Forest Statistics and Research Methods.	2. Forest Statistics
3. Photogrametry and Photo-interpretation.	3. Photogrametry and Forest Mensuration.
4. Fish and Wildlife.	4. Fish and Wildlife.
5. Recreation and Park Management.	5. Recreation and Park Management.
6. Sociology and Public Administration.	6. Sociology and Public Administration.
7. Major subjects:-	7. Forest Economics.
i) Range Management.	8. Forest Policy.
ii) Watershed Management.	9. Islamiyat.
iii) Forest Management.	10. Pakistan Studies.
iv) Farm Forestry.	
v) Silviculture.	

Specialization.

Specialization in forestry education has been gradually introduced in the M.Sc. programme. Fields of specialization are:-

1. Logging Engineering;
2. Watershed management;
3. Social Forestry; and
4. Range Management (1993 onward)

Specialization in the subjects, listed above, requires that selected subjects in the M.Sc. (Forestry) programme be replaced by subjects related to the field of specialization. For example, in the case of specialization in Forest Products and Engineering, the subjects which are substituted in the M.Sc programme are listed below:

A. Forest Products and Engineering (since 1981)

Subjects included in the Specialization Course	Subjects omitted in lieu of Specialisation Courses
1. Wood working & Saw milling	1. Mycology and Forest Pathology.
2. Applied Mechanics	2. Forest Zoology & Entomology.
3. Work Study & Labour Science	3. Plant Taxonomy
4. Machinery in Forestry	4. Fish and Wildlife Management
5. Special Considerations in Road Design & Construction	5. Range Management
6. Tree Harvesting and Transportation	6. Watershed Management

- | | |
|--|-----------------------------------|
| 7. Wood Structure and Identification | 7. Forest Genetics |
| 8. Composite Wood Products and Adhesives | 8. Recreation and Park Management |
| 9. Wood Testing & Processing. | 9. Soil-Plant-Water Relationships |

When students specialize in one of the four areas, they are required as in the M.Sc. programme, to conduct a research study and write a short thesis in the field of their specialization, and prepare a management plan of a forest with emphasis on logging and forest road construction.

B. Watershed Management (since 1985)

Subjects included in the Specialization Course	Subject omitted in lieu of Specialisation Courses
1. Forest Meteorology.	1. Forest Genetics.
2. Forest and Range Hydrology.	2. Forest Protection-B.
3. Design of Soil Conservation Works.	3. Forest Protection-A.
4. Watershed Planning and Analysis.	4. Soil-Plant-Water Relationship.

C. Farm and Energy Forestry (since 1987)

- | | |
|---|--|
| 1. Energy as a Forest Product. | 1. Forest Recreation and Park Management. |
| 2. Agro-forestry systems. | 2. Fish & Wildlife Management. |
| 3. Farm and Energy Forestry Management. | 3. Photogrammetry & photo-Interpretations. |

Public Awareness of Forestry in General Education

Public awareness in forest conservation and development is limited, but this is rapidly changing. WWF-Pakistan, Margalla save the Hill Society, Pakistan Tobacco Company sign boards on tree planting along main highways show an increasing interest and public awareness but still we have to go a long way. Table No. 48 highlights the number of years in Pakistan's educational system with very little emphasis on environmental education, except in Pakistan Forest Institute, Peshawar.

TABLE NO. 48

**NUMBER OF SCHOOL YEARS IN PAKISTAN
EDUCATION SYSTEM**

Universities	M.Phil/Ph.D.
Universities	M.Sc. in Basic Sciences/Agriculture/ Engineering 2 years
Pakistan Forest Institute, Peshawar	M.Sc.in Forestry 2 years
Degree Colleges	B.Sc.in Basic Sciences/Agriculture 2 years
Professional Colleges	Medical degree (5 years) Engineering degree (4 years) B.Sc. Hons. Agriculture (4 years)
Pakistan Forest Institute, Peshawar	B.Sc.Forestry 2 years
Degree and Inter----- mediate College	Intermediate Examination Certificate (Science) HSSC 2 years
High School -----	Secondary School Certificate (Matriculation/SSC Class-10) 10 years

Class-1 (Admitted at the age of 6)
1 years

Prep. class(admitted at age 5)
1 year

The current syllabi and curricula of general education from primary to university levels have been examined. They include very little material on forestry as shown below:-

- a. Classes I-III The curricula has no material on forestry.
- b. Classes IV-VIII The curricula include articles of a descriptive nature on forestry but they don't stimulate the students interest.
- c. Classes IX-X The curricula include a large number of articles on forestry but they lack innovative thinking.
- d. College level Nothing on forestry.
- e. Basic sciences at Forest Types of Pakistan are included University level. in the M.Sc. course.

In order to create awareness, it would be useful to gradually introduce the following topics on forestry into general education curricula in schools;

- Class I What is a Forest?
- Class II How a Forest is established?
- Class III Useful things we get from forests.
- Class IV Environmental benefits of forests.
- Class VI Causes of Forest destruction and remedial measures.

With strong ecosystem focus.

- Class VII Forest conservation.
- Class VIII Forest Types of Pakistan.
- Class IX Forest Types of Asia.
- Class X Forest Types of World.

Focus on management(Animal & plant) and environmental issues. Ecology with a management thrust.

Role of Public/Private Sector in Forestry Education and Training

Except for the Government agencies mentioned earlier, few private or public organization are concerned with forestry education and training currently. This is compounded by fact that trained forestry manpower is no longer the exclusive concern of government as a large number of private and public organisations are directly or indirectly concerned with tree production, management, processing and disposal. These include:-

- (i) Agha Khan Rural Support Programme (AKRSP) Northern Areas and Chitral.
- (ii) Multipurpose Forest Co-operative Societies in the Mansehra district of NWFP.
- (iii) Forest Harvesting Societies in Hazara-Kohistan (NWFP)
- (iv) NWFP Forest Development Corporation (FDC)
- (v) Azad Kashmir Logging and Sawmilling Corporation (AKLASC)
- (vi) Mangla and Tarbela Watershed Wing of WAPDA.
- (vii) Social Forestry Projects for production of fuelwood & small timber.
- (viii) Social forestry projects for production of industrial raw material and mine props.

- (ix) Pakistan Agricultural Research Council (PARC)
- (x) Sindh Arid Zone Development Authority (SAZDA)
- (xi) Arid Zone Research Institute, Quetta (Balochistan)
- (xii) Paper & Pulp Industry.
- (xiii) Sports Goods industry.
- (ix) Notable projects of international agencies in forestry in Pakistan including:-
 - ▶ Kalam Integrated Development Project partially funded by the Swiss Government.
 - ▶ Kaghan Intensive Forest Management Project aided by the West German Government.
 - ▶ Farm and Energy Development Project assisted by USAID.
 - ▶ Malakand Social Forestry Project aided by the Dutch Government.
 - ▶ ICIMOD, IUCN, ILO and WFP.

All of these programmes include training as an important component. Through these projects existing training facilities in the Pakistan Forest Institute and the Provincial forest departments have been strengthened and expanded to meet specific requirements.

Trends & Prospects of Human Resource Development

Education and professional training within a sector are essentially influenced by;

- (i) tradition, i.e. the historic general education in the country; and
- (ii) the quantitative and qualitative demand of the sector for trained personnel which, in turn, depends on the sector's importance within the political and economic system in the country;
- (iii) labour availability and cost, and the organizational structure and its strength.

The importance of a sector can be assessed on the criteria of its economic role or social contribution to human subsistence and welfare or both. Forestry provides both these benefits.. The greater the importance of a sector, the higher is its requirements for trained personnel in general education as well as training in specialised areas.

Currently, forestry has a low priority in Pakistan, but the importance of forests and forestry is likely to increase in the future due to the increased recognition of the economic and ecological importance of the resource. Thus, the future scenario is of a rising need for better forestry education at all levels. This will require that Pakistan increase its use and dependence on universities to assist in the basic forestry education of its forestry professionals.

CHAPTER NO. 9

FORESTRY RESEARCH AND INFORMATION

RESEARCH OBJECTIVES

Globally, as in Pakistan, research is conducted in social, economic, political, administrative, managerial, environmental and natural resources areas to investigate problems, find solutions and introduce innovative approaches needed to achieve development goals. However, in Pakistan research is limited due to a scarcity of resources to support it.

The research objectives of the forestry sector are listed below in the order of their priority:-

1. develop management systems for natural forest resources including land, water, soils, trees, grasses and other vegetation and wildlife which will provide the maximum benefit for the greatest number of people on a sustained basis;
2. develop mechanical, biological and engineering systems to conserve soil and prevent the loss of its moisture for areas of the country which are prone to erosion due to wind, water, arid climate, elevation and steep slopes.
3. develop procedures and innovative management systems which will reduce management costs associated with the use of forest and other resources while effectively achieving objectives No. 1 & 2 above.

Research in Pakistan has helped field foresters manage and develop wildland resources efficiently for sustained utilization. Forestry research has been and continues to be helpful in:-

- ▶ introducing basic and adaptive methodologies for raising nurseries, establishing new plantations and undertaking tending operations.
- ▶ providing reliable forest growth statistics in the form of volume, stand and yield tables for planning purposes.
- ▶ improving timber harvesting, transportation and utilization practices which economise on the use of wood resource by reducing waste.
- ▶ increasing per unit area yield of wood and other forest produce from all types of forests and farm lands by introducing fast growing species such as poplars, eucalypti, acacias and pines, streamlining their management, and assessing their water requirements and responses to application of fertilizers.
- ▶ popularizing and encouraging tree growing on private lands by establishing agro-forestry and windbreak demonstration centres to study and provide advice on tree/crop interface and silvo-pastoral development.
- ▶ evaluating managed and un-managed watersheds by assessing the run-off and sediment loss and determining the impact of different management practices.
- ▶ improving rangelands through management, reseeding and fertilization programmes.
- ▶ inventoring population, status, trends and ecology of wildlife and forest populations and habitats.
- ▶ introducing improved technology in the harvesting, logging, conversion and transportation of wood.
- ▶ determining new uses of wood, especially of low quality; prolonging the life of wood and wood products with preservatives; and improving resin yields.

- ▶ controlling animal and insect pests and diseases to save standing trees and to minimise deterioration of converted wood as well as wood products.
- ▶ developing sericultural practices and improving moriculture by controlling diseases, segregating pure races, and developing disease-free F1 hybrid.
- ▶ identifying medicinal plants in the wild, determining their extent and distribution, and developing techniques to artificially propagate the important ones.
- ▶ developing a data base on wood sources, and present and future supply/demand relationships.
- ▶ publishing and circulating research results in the form of technical notes, scientific papers, journals, bulletins, books, etc.
- ▶ updating syllabi for M.Sc., B.Sc. and in-service training courses designed for students, technicians, and professionals from the provinces and foreign countries.

RESEARCH ORGANIZATIONS

PAKISTAN FOREST INSTITUTE (PFI)

Established in 1947, the Pakistan Forest Institute (PFI) is a federal organization functioning under the administrative control of the Federal Ministry of Food, Agriculture and Cooperatives. It services the needs of professional forestry education and research in forestry, watershed and range management for the whole of Pakistan and Azad Kashmir. It is headed by a Director General and contains a number of functional research divisions which comprised specialized branches as explained below:

i. Forestry Research Division:

This division carries out research on forest tree species, forestry practices and forestry operations. It also conducts

research on other wildland uses such as range and wildlife, as well as, forest economics.

ii. **Biological Sciences Division:**

This division conducts research in basic sciences including soils, biology, chemistry, entomology and pathology for tree crop protection and improvement as well as in medicinal plants.

iii. **Forest Products Research Division:**

This division conducts research on wood properties of trees and develops new uses for wood; minimising waste in harvesting, transportation and utilization of wood; and improving logging practices.

iv. **Forest Education Division:**

This division provides professional and technical training in M.Sc. and B.Sc. forestry. The trainees are nominated by the provincial forest departments and national wood based organisations. Some Asian and African countries also send their trainees to the M.Sc and B.Sc degree programmes. The Institute is affiliated with the University of Peshawar for the purpose of awarding M.Sc. and B.Sc. (forestry) degrees.

DIRECTORATES

In addition to the four divisions in PFI, there are three separate directorates which implement FAO/UNDP projects related to watershed management, range management and sericulture. The field stations and research units concerned with arid land research are given in Chapter No. 4. The remaining field stations/research units located in temperate region are mentioned below:

- ▶ Shinkiari, Mansehra (NWFP)

- ▶ Bhurban, Murree (Punjab)
- ▶ Chikar, Muzaffarabad(AJK)

**PUNJAB FOREST RESEARCH INSTITUTE,
FAISALABAD - GATWALA (PFRI)**

Punjab Forest Department has established a research Institute to conduct research on its priority problems and in areas which may not be emphasised by PFI. The institute concentrates on problem oriented research associated with development of nursery techniques and planting methods, management of natural and man-made forests; introduction of fast growing species; plant protection measures against animals, insects, pests and diseases; and improvement in agro-forestry techniques.

The institute's programmes cover popularising the growing of trees on private lands; training technicians; conducting refresher courses; holding seminars; and compiling and publishing research findings, and the annual administration report for the Punjab Forest Department.

SUB-CENTRES

The institute has three research sub centres in the three ecological zones of the Punjab, namely;

- (i) Ghoragali for the sub-humid mountain region in the north;
- (ii) Lahore for the semi-arid and extensively irrigated plain in central Punjab; and
- (iii) Bahawalpur for the arid desert areas in southern Punjab.

In addition to these three sub centres, there are several field research units. Research studies are being carried out in all major irrigated forest plantations in Punjab.

Pakistan Agriculture Research Council (PARC)

The Council is, primarily, responsible for coordinating and conducting research in agriculture. But since agriculture research in its broader sense includes forestry research, the council has initiated a few research studies in forestry. Gradually, a well staffed directorate of environment has been established in the Natural Resource Division headed by a Member of PARC. Two directors, one located in the PARC headquarters promotes and coordinates research in forestry watershed and range management, and one in the National Agricultural Research Centre (NARC) conducts research in forestry and related subjects. The staff at the headquarters in PARC:-

- ▶ coordinates research activities involving PARC which relate to forestry/range/watershed management and allied discipline projects in the field.
- ▶ formulates research proposals in these areas for implementation.
- ▶ scrutinises, monitors and evaluates progress of such proposals and projects.

PARC supports research through scientists, universities and sister research organizations in the country interested in forestry disciplines by providing them funds for conducting research on its behalf. These funds are used either by one scientist or by a number of scientists located at one or at several places. PARC also conducts research through its scientists working in the National Agriculture Research Centre

(NARC), Islamabad and in other federal centres and field stations.

In forestry, PARC depends mainly on scientists in the Pakistan Forest Institute. It has been supporting their research with funding under PL-480 or with funds from its block allocation for research projects.

Range Land Research Institute

In 1991, the Range Land Research Institute was established with technical and financial support from FAO/UNDP. The Institute is located in NARC and is headed by a Director and encompasses the following subjects and activities:

- ▶ Range Management.
- ▶ Watershed and Agro-Forestry.
- ▶ Ecology and Wildlife.
- ▶ National Herbarium.
- ▶ Forage and Pasture Unit, Thal, (Punjab).
- ▶ Forage and Pasture Unit, Dhabeji, (Sindh).
- ▶ Forage and Pasture Unit, Mastung, (Quetta).
- ▶ Forage and Pasture Unit, PFI, (Peshawar).
- ▶ Forage and Pasture Unit, Muzaffarabad (AJK).

Functions of the institute are to:

- ▶ plan and undertake rangeland resource inventories and analyses for the classification of rangelands in various photogeographic regions of Pakistan.
- ▶ generate knowledge, and evolve new technologies and seek their transfer, for sustainable utilization, development and management of diverse rangelands in various ecological zones of Pakistan.

- ▶ establish operational research and feasible range and range livestock improvement/management models in humid, sub-humid, semi-arid and arid regions of the country.
- ▶ improve primary productivity and boost livestock output, especially of small ruminants which depend heavily on range feed resources.
- ▶ arrest the degradation of rangeland resources through scientific range management and appropriate grazing systems and develop rangeland resources to their potential.

PROVINCIAL RESEARCH UNITS

Research units have also been established in the Forest Departments of the Provinces and Azad Kashmir. These units are generally manned by Divisional Forest Officers, silviculture who may not have the capability to conduct independent research because of inadequately training in research methods and/or lack of experience. They, therefore, work in close association with Pakistan Forest Institute scientists.

Consequently, the role of the Pakistan Forest Institute in forestry research is pivotal both in carrying out research and in supporting provincial research organizations.

HUMAN RESOURCES

Pakistan Forest Institute

Human resource has been gradually developed over a period of time. Starting with only a director, four branch officers and a few assistants in 1947, the strength of its scientists has significantly increased. The current strength of

persons by broad categories along with their placement in grades is:

<u>Designation/category</u>	<u>BPS(Grade)</u>	<u>Posts</u>
Director General	20	1
Directors	19	10
Senior Research Officers	18	28
Research Officers	17	52
Assistant Research Officers/ Forest Rangers	13	35
All others	1-15	<u>535</u>
	Total:	<u>661</u>

Academic qualifications of the scientists are:

▶ Ph.D.	11
▶ M.Sc.	45
▶ B.Sc.	13
▶ Diploma holder	4
▶ Others	<u>24</u>
Total :	<u>97</u>

Punjab Forest Research Institute

Fifty two scientists and professional foresters are engaged in forestry research and education in the Punjab province. These individuals are based in the Institute at Gatwala and in the three sub-centres, and are supported by a technical staff. The total staff strength is:

<u>Sl. No.</u>	<u>BPS (Grades).</u>	<u>No. of sanctioned posts</u>
1.	19	1
2.	18	8
3.	17	20

<u>Sl. No.</u>	<u>BPS (Grades).</u>	<u>No. of sanctioned posts</u>
4.	16	25
5.	12	8
6.	11	14
7.	10	4
8.	9	7
9.	8	14
10	7	11
11	6	26
12	5	21
13	1-4	104
	Total:	263

Pakistan Agricultural Research Council

The forestry related research is administered by Member Natural Resources Division. He is assisted by three directors, namely;

- i) Director Forestry & Environment at PARC (HQ).
- ii) Director Range and Watershed Management at PARC (HQ).
- iii) Director Rangeland Research Institute at NARC.

The First two Directors listed above are assisted by two Deputy Directors but have no technical staff whereas the Director Rangeland Research Institute is assisted by Deputy Directors and technical staff.

RESEARCH FUNDING

Funds for research are provided from the non-development budget and the development budget. The development budget also includes the technical support provided by FAO/UNDP and other donor organizations. The

budgets provided to PFI, PFRI and PARC during the recent past are given below:

PFI

(Rs.million)

Year	Non-development	Development	Total
1983-84	7.55	21.08	28.63
1984-85	8.82	14.80	23.62
1985-86	8.93	21.91	30.84
1986-87	9.57	23.79	33.36
1987-88	10.34	18.39	28.73
1988-89	10.00	16.15	26.15
1989-90	11.05	16.16	27.21
1990-91	11.22	11.83	23.05
Total:	77.48	144.11	221.59

PFRI

Year	Regular	Development	Total
1986-87	3.51	1.42	4.93
1987-88	6.46	2.91	9.37
1988-89	8.47	2.58	11.05
1989-90	8.60	3.46	12.06
1990-91	8.61	2.85	11.46
Total:	35.65	13.22	48.87

F & E D in PARC

Year	<u>Non-Development.</u>			<u>Pl-480 (Developments)</u>		Total
	NARC	Provinces	PFI	Provinces	PFI	
1988-89	2.634	1.188	0.525	0.630	0.631	5.608
1989-90	2.984	1.020	0.223	0.208	0.334	4.769
1990-91	4.180	0.999	0.413	0.584	0.847	7.023
Total:	9.798	3.207	1.161	1.422	1.812	17.400

INTERACTION WITH OTHER INSTITUTES

The two major research organizations with which the Pakistan Forest Institute has inter-action are the Pakistan Agricultural Research Council (PARC) and the Punjab Forestry Research Institute (PFRI). As mentioned earlier, the Pakistan Agriculture Research Council is dependent on PFI for research in forestry and provides funds to PFI under non-development and development budgets.

Interaction with the Punjab Forestry Research Institute is very intensive. The Pakistan Forest Institute has strengthened this sister organization by providing short and long term training for its staff. PFI has also provided the PFRI with equipment, books, journals and extension facilities. In the future, PFI will collaborate with the Punjab Forest Research Institute in the management of field studies as well.

The Pakistan Forest Institute has a strong inter-action with the Divisional Forest Officers for silviculture in the provinces. They depend on the Pakistan Forest Institute for seeds, plants, equipment, and the design and layout of research studies.

The research in the Pakistan Forest Institute is reviewed annually in October by the Research and Review Committee

headed by the Inspector General of Forests. The Chief Conservators of Forests of the Provinces and Azad Kashmir, the Conservator of Forests of Northern Areas, senior scientists of the Pakistan Agricultural Research Council, and the Punjab Forest Research Institute are members of the Committee. The committee evaluates research progress, the performance of scientists, and proposes a research programme for the next year. This is a very important forum to guide and direct forestry research in Pakistan.

INTERACTION WITH UNIVERSITIES

Pakistan Forest Institute is located on the campus of three universities, viz; the University of Peshawar, the University of Engineering and Technology and the University of Agriculture, the library, teaching staff and laboratories are shared on a reciprocal basis. The Director General, Pakistan Forest Institute is on the senate committee of the University of Agriculture. This enables him to encourage and promote agro-forestry research. The Nuclear Institute for Agriculture and Biology and the Ayub Agricultural Research Institute in Faisalabad, and the Botany Department of Karachi University have collaborated in forestry research under the Forestry Planning and Development Project.

COLLABORATION WITH THE INTERNATIONAL RESEARCH ORGANIZATIONS

The International Union of Forestry Research Organizations (IUFRO) is the most important international research organization with which PFI has a very close relationship. Almost all of its forest research disciplines participate in IUFRO activities and, through IUFRO, there is a continuous inter-action of Pakistani scientists with the international scientific community. The Institute has supported the establishment of INCOFORE to develop an international

network of scientists. Inter-action is also maintained with ICRAF(Kenya), ICAR (India) and BARC (Bangladesh).

OTHER INTERNATIONAL ORGANIZATIONS

The Pakistan Forest Institute has signed Memoranda of Understanding with several other international organizations which support research and education in forestry. These include FAO/UNDP, the Forestry Fuelwood Research and Development Project (F/FRED); and the International Development Research Centre (IDRC). These MOUs cover:-

1. Provision of funds by the Food and Agriculture Organization of the United Nations to the Ministry of Food, Agriculture and Cooperatives, Pakistan for seed collection and Evaluation of Arid/Semi Arid Arboreal Species.
2. Professional Services Agreement with Forestry/ Fuelwood Research and Development.

DISSEMINATION AND EXTENSION

Research results are expected to increase the existing scientific knowledge that is needed to manage resources and that is used in the educational and training programmes of the Institute. Consequently, forestry students have the most upto date information on research programmes. Specifically, the dissemination of research results and extension is done in a number of ways and for a variety of clientele. These include:-

- i) demonstration areas in State forests and on farm lands to show efficacy and benefits of new technologies to forestry practitioners and farmers.

- ii) technical papers in the Pakistan Journal of Forestry, international journals and other publications.
- iii) technical notes for practising foresters.
- iv) popular articles for the general public, especially farmers.
- v) arranged visits of farmers to the Institute.
- vi) inclusion of research results in curricula of M.Sc. and B.Sc. (forestry) courses.

Forestry research and education facilities are considered adequate for the country's needs but whether the research programmes are relevant to the present days requirements, this aspects is being considered in depth by the FAO experts who are conducting study under aegis of Forestry Sector Master Plan Project.

CHAPTER NO. 10

INTERNATIONAL CO-OPERATION

In Pakistan, like other developing countries, the financial and forestry resources are limited, whereas the demands are high and increasing. Thus, external inputs are needed for the development of forestry resources if they are to meet future needs while ensuring the sustainable utilisation of the existing base. In this context, the role of regional and international co-operation is pivotal. This chapter is, therefore, being devoted to this important area.

PAKISTAN AND INTERNATIONAL CO-OPERATION

Pakistan is committed to improving the economic, social and cultural well-being of her people by pursuing a viable programme of sustainable development. This requires maximum co-operation as well as proper co-ordination between the Federal and Provincial Governments, and national and international agencies. It is with this understanding and objective that Pakistan has joined or co-operated with many regional and international organisations. The most important among these are:

1. South Asian Association for Regional Co-operation (SAARC) (Bangladesh, Bhutan, India, Nepal, Sri Lanka, Maldives & Pakistan)
2. Economic Co-operation Organization. (ECO) (Pakistan, Iran & Turkey) Afghanistan and six Central Asian states have also joined ECO recently.
3. Organization of Islamic Conference (OIC).
4. Common Wealth of Nations.

5. Non Aligned Movement (NAM)
6. United Nations Organization (UNO).

Cooperation with international organisations is coordinated by the Ministry of Foreign Affairs in Pakistan. The Forestry wing in the Ministry of Food, Agriculture and Cooperatives has been assigned responsibility for programmes related to forestry and allied disciplines. These include watershed, range management, wildlife, desertification, and the environmental aspects of all these disciplines. The cooperative areas of focus with each of these organisations are briefly mentioned below.

COMMONWEALTH OF NATIONS

The Heads of States and Governments of the Commonwealth Nations, in their meeting in Kuala Lumpur, Malaysia, in October 1989, considered the global state of environment and issued a joint declaration of 10 points highlighting serious deterioration in the environment and threats to the well-being of the present and future generations. They resolved to:

- (i) participate in relevant international agreements relating to the environment and promote new and innovative instruments which will attract wide spread support for protecting the global environment;
- (ii) strengthen national, regional and international institutions responsible for environmental protection as well as the promotion of active programmes on environmental education to highlight public awareness and support; and
- (iii) take immediate and positive actions for achieving these goals and pledging their full support for the

convening of the 1992 UN Conference on Environment and Development (UNCED).

The Forestry Wing of the Ministry of Food, Agriculture and Cooperatives will contribute to the implementation of this resolution and include meaningful input in the U.N Conference on Environment and Development.

SAARC

The Heads of Governments and States of the SAARC Countries met in Mali, Maldives, in November 1989 and discussed the economic and political options for cooperation of the member states. They recognised that:

- (i) It has been proved more conclusively than at any other time in history that the welfare of mankind is inextricably linked to the state of the environment.
- (ii) There is now a broad scientific consensus that the global mean temperature could rise approximately by 1° to 2°C by the year 2030.
- (iii) Although the entire world would be adversely affected by these processes, low-lying, small, coastal and island states will face a decidedly greater predicament.

For these and similar other reasons, they decided to develop a programme of action within the member states for cooperation and exchange of information on strategies and policies in relation to anticipated change in climate, global warming and sea level rise which are common concerns of mankind. GOP is, currently, preparing a Forestry Sector Master Plan and a National Conservation Strategy which will address these concerns for Pakistan and explore the possibility of regional and international cooperation as well.

ECONOMIC CO-OPERATION ORGANIZATION (ECO)

The Regional Cooperation for Development (RCD) was established by Pakistan, Iran and Turkey in 1964. It consisted of a Ministerial Council, a Regional Planning Council and a Council of Deputies. Five Summit Conferences and 21 Sessions of the Ministerial Council have been held within the framework of the RCD.

After the change of Government in Iran in 1979, the RCD was disbanded. It was, however, replaced by the Economic Co-operation Organization (ECO) in 1985. Under the new arrangement, seven technical committees of the ECO have been set up including one on cooperation in the field of agriculture.

The objectives of the committee on agriculture state that:

- (i) In view of the importance attached to the agricultural sector within the member countries, it is necessary to exploit the commercial, industrial, and technical aspects of collaboration in the field of agriculture, animal husbandry, ground water technology and forestry.
- (ii) Other areas of collaboration including marketing within and outside of the region may also be identified by the experts of the Member Countries. Emphasis may also be placed on export oriented agro-industries.
- (iii) Extensive collaboration in the exchange of information and providing training facilities in various aspects of cooperation in agriculture.

In pursuance of these objectives, definite programmes have been formulated for co-operation in the field of forestry. These include a series of seminars, workshops, training sessions

and exchange visits covering the disciplines of intensive forest management (Pakistan), sand dune fixation (Iran) and Flood control Erosion (Turkey).

OIC

OIC does not have a strong forestry programme. However, a conference of experts was held in Pakistan in 1982 to identify areas of common interest and to recommend mechanisms for cooperation. Follow up has, however, been slow as a coordinating infrastructure for forestry does not exist within or outside the OIC Secretariat.

NAM

NAM is active in political, trade and commerce fields. It does not have a programme relating to forestry or environment at this stage.

INTERNATIONAL CO-OPERATION IN FORESTRY (FAO/UNDP)

Pakistan benefits from the technical co-operation among developing countries (TCDC). In the field of forestry, Pakistan has joined many international conventions as Party, is a co-operating member in regional and international projects, and is a member of many international organisations. A list of important conventions, organisations and projects is given below.

UNITED NATIONS ORGANIZATION(UNO)

- ▶ United Nations Development Programme (UNDP)
- ▶ Food & Agriculture Organization (FAO)
- ▶ World Food Programme (WFP)
- ▶ United Nation Education and Scientific Co-operation Organization (UNESCO)

- ▶ United Nations Environmental Programme (UNEP)

INTERNATIONAL CONSERVATION CONVENTIONS

- ▶ Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- ▶ World Heritage Convention
- ▶ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)
- ▶ Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- ▶ Membership in Regional & International Organisations
- ▶ World Wide Fund for Nature (WWF)
- ▶ World Conservation Union (IUCN)
- ▶ International Waterfowl and Wetland Research Bureau (IWRB)
- ▶ South Asian Co-operative Environmental Programme (SACEP)
- ▶ International Centre for Integrated Mountain Development (ICIMOD)
- ▶ Man and Biosphere Programme (MAB) of UNESCO
- ▶ Economic and Social Cooperation for Asia and Pacific (ESCAP)
- ▶ Technical Association of Pulp and Paper Industry, Atlanta, Georgia, U.S.A.(YSPPI)
- ▶ International Union of Forestry Research Organizations (IUFRO)
- ▶ Commonwealth Forestry Association, England (C.F.A)
- ▶ International Poplar Commission, FAO Rome, Italy (I.P.C)

REGIONAL FORESTRY PROJECTS

- ▶ Regional Wood Energy Development Programme in ASIA (FAO)GCP/RAS/131/NET - RAS/86/048

- ▶ Forest Industries Development Group (FAO) - RAS/86/048
- ▶ Himalayan Pasture and Fodder Research Network (FAO-RAS/79/121)
- ▶ Support to Watershed Management in Asia (FAO) - RAS/86/107 - GCP/RAS/129 WET.
- ▶ Research and its Applications to the Management of the Mangroves of Asia and the Pacific (UNDP/UNESCO) - RAS/86/120
- ▶ Forestry/Fuelwood Research and Development Project (F/FRED) - (USAID)
- ▶ Regional Community Forestry Training Centre, Bangkok, Thailand (RECOFTC)
- ▶ Agroforestry System Research and Development in Asia and the Pacific Region (FAO) - GCP/RAS/133/JPN
- ▶ Strengthening Forest Inventory Capabilities for Forest Management in Asia and the Pacific (FAO) - RAS/86/049

CHARACTERISTICS AND OBJECTIVES OF COOPERATION IN FORESTRY

Pakistan has joined the international conservation conventions, has become a member of international and regional organizations, and is associated with regional projects for:

- ▶ Sharing knowledge and benefitting from other's experiences.
- ▶ Drawing on the expertise of other countries in specific fields.
- ▶ Allowing scientists, researchers, extension specialists and field officers to gain an international exposure through meetings and other inter-actions with their counterparts from other countries and regions.

- ▶ Formulating policies and plans and co-ordinating efforts to deal with common problems of resource use and management.
- ▶ Securing technical and financial assistance from bilateral and multi-lateral donors for education, research and extension projects to perfect techniques and to develop and demonstrate new approaches.
- ▶ Promoting good will and generating international linkages by working with experts from other nations having identical problems or possessing expertise in specified fields.

FIELDS OF CO-OPERATION

Co-operation through conventions, memberships in organisations, regional projects, and arrangements with bilateral and multi-lateral donors extend to all fields of forestry including but not limited to:

- ▶ Forestry Education and Training
- ▶ Forestry Research
- ▶ Watershed Research and Management
- ▶ Integrated Mountain Development
- ▶ Intensification of Forest Management
- ▶ Social Forestry
- ▶ Development of Sericulture
- ▶ Forest Production and Logging Engineering
- ▶ Wildlife Conservation
- ▶ Range Management
- ▶ Forest Inventory

FINANCIAL RESOURCES

A great deal of financial resources have been invested in the aforementioned research, education and development programmes jointly implemented by donor countries and the government of Pakistan. Some projects have been continuing

for more than 10 years and have entered their third phase, with each phase varying in duration from 3 to 5 years. Total financial input can be judged from the following details.

(Million Rs.)

Name of the Project	Donor	Local	Cost	
			F.D.	Total
1. Development of Training and Research Facilities in Forest Products, Logging and Engineering at PFI, Peshawar. 1980-81 to 1990-91	GTZ	13.466	20.383	33.849
2. Development of Watershed Management Research and Education at PFI, Peshawar. 1980-81 to 1990-91.	UNDP	6.359	27.399	33.758
3. Development of Sericulture at PFI, Peshawar. 1985-86 to 1990-91	UNDP	7.150	10.920	18.070
4. Silk Seed Production at PFI, Peshawar. 1986-87 to 1990-91	UNDP	6.188	3.665	9.853
5. Paulownia Research at PFI, Peshawar. 1988-89 to 1991-92	IDRC	0.122	1.950	2.072
6. Tree Water Requirement at 3 Experimental Sites, Changa Manga, Bahawalpur, Miani. (PFI Peshawar) 1988-89 to 1991-92.	IDRC CIDA	0.331	2.967	3.298
7. Development of Range Management Research and Education at PFI, Peshawar. 1990 to 1995	FAO/ UNDP	10.192	45.343	55.535
8. Forestry Component in Integrated Hill Farming Development Project (Azad Kashmir)	World Bank	135.211	5.431	140.642
9. Sukattar Watershed Management Project Azad Kashmir. Pak/87/009.	WFP/ UNDP	22.863	37.122	59.985

(Million Rs.)

Name of the Project	Donor	Local	Cost	
			F.E.	Total
10. Forestry Sector Master Plan. 1990 to 1992	UNDP/ ADB/ SWISS DUTCH GERMAN	2.478	44.600	47.078
11. Forestry Planning and Development Project. 1985 to 1994	USAID	178.000	358.000	536.000
12. Watershed Management in Hazara (NWFP)	WFP USAID			
a) Pilot Project (385) 1972-73 to 1975-76		20.830		20.830
b) Expanded Project (385) 1976-77 to 1982-83		55.752	104.750	160.502
c) Tarbela-Mangla Watershed Management Project (2451) 1983-84 to 1990-91		168.586	243.502	412.088
13. Watershed Management Forest & Extension Project in Dir-Swat	WFP/ Nether- land/			
a) Phase-I. 79-80 to 86-87		38.706	47.800	86.506
b) Phase-II 87-88 to 91-92		26.794	148.375	175.169
14. Intensive Forest Management in Kaghan Valley (Hazara).	German			
a) Phase-I. 80-81 to 85-86		74.914	45.049	119.963
b) Phase-II. 85-86 to 90-91		100.624	47.425	148.049
15. Kalam Integrated Development Project, Kalam (NWFP)	SWISS			
a) Phase-I. 81-82 to 83-84		3.661	8.862	12.523
a) Phase-II. 84-85 to 86-87		6.239	10.259	16.498
b) Phase-III. 87-88 to 91-92		38.584	39.445	78.029

(Million Rs.)

Name of the Project	Donor	Local	Cost	
			F.E.	Total
16. Introduction of Social Forestry in NWFP, Malakand. 1986-87 to 1991-92	Netherland	2.431	51.182	53.613
17. Social Forestry Project in Peshawar. 1985-86 to 1990-91	USAID	22.960	42.730	65.690
18. Sindh Forestry Dev. Project (in Pipe line) 1991-92 to 1997-98	ADB	763.400	380.600	1144.000
19. Pakistan Environmental Protection and Resource Conservation Project (in Pipe line) 1991-92 to 1996-97	World Bank	1090.000	270.000	1360.000
20. Integrated Land Management in Azad Kashmir (2149) 1988 to 1991	WFP	52.379	35.461	87.840
Total:		2848.220	2033.220	4881.440

In addition to the above projects, there are also UNHCR projects in NWFP and Balochistan. Since these projects are focused at rehabilitation activities conducted by Afghan refugees, they have not been included.

INSTITUTIONS INVOLVED

The institutions involved in regional and international co-operation in Forestry and allied disciplines are:

- ▶ Ministry of Food, Agriculture and Cooperatives
- ▶ Pakistan Agricultural Research Council (PARC)
- ▶ Ministry of Science and Technology
- ▶ Ministry of Education
- ▶ National Council for Conservation of Wildlife (NCCW)

The following institutions not only cooperate with regional and international organisations but also directly benefit from that collaborations:

- ▶ Provincial Forest Departments of Punjab, Sindh, NWFP, Balochistan, Azad Kashmir, Northern Areas and Capital Development Authority
- ▶ Pakistan Forest Institute (PFI), Peshawar
- ▶ Punjab Forest Research Institute, Gatwala, (Faisalabad)
- ▶ Zoological Survey Department (ZSD)

The National Conservation Strategy (NCS) and the Forestry Sector Master Plan (FSMP) are, currently, under preparation with the technical and financial support of IUCN, ADB, UNDP, Swiss and German and Dutch Governments. This collaboration will provide portfolios of projects and identify areas of future cooperation for external technical and financial support in the field of forestry and allied disciplines.

About the Author

The author was born in Lakki Marwat, District Bannu in January 1936. He graduated from Government High School, Lakki, and received B.Sc. degree from Islamic College, Peshawar in 1958. He joined the West Pakistan Forest service in October 1961, after obtaining a Masters Degree in Forestry from the Pakistan Forest Institute, Peshawar. After serving as working plan officer in Haripur (1964-66) he attended the University of Minnesota, USA, and received a Masters Degree in 1967.

On return from the USA he served in the Aerial Forest Inventory Project (1968-69), as Section Officer (Forest) in Civil Secretariat, Peshawar (1970-72), Conservator of Forests, Malakand (1974), Member-NWFP Service Tribunal (1981-83), and as Managing Director, NWFP Forest Development Corporation (FDC) (1984-87). Since March 1987, he has served as Inspector General of Forests in the Ministry of Food, Agriculture and Cooperatives.

The author has written two dozen books and numerous papers on different aspects of Forestry, Wildlife and Range Management. He has chaired international committees dealing with mangrove forests, migratory birds and environmental degradation. In addition, the author serves on Forestry and Wildlife Boards of Directors for both public and private organizations in Pakistan.