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Analysis of Fuel Wood Position in Balochistan, Pakistan

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Abstract

By analysing the chemical composition of wood, the paper attempts to present the contemporary environmental conservation scenario of traditional source of energy, fuelwood in Balochishan, Pakistan, which has experienced rapid deforestation in the last decades owing to a growing wood trade. The paper notes the lag between the demand for and supply of fuel wood in the region, where 5 per cent of the total income of the residents is spent on fuel wood. The analysis of fuel wood has been supported by important diagrams.

1. Introduction

Wood is primarily composed of cellulose, together with gums, resins, inorganic matter and a variable amount of moisture, the amount depending on the kind of wood, the season in which it is cut and extent to which it has been allowed to dry. The approximate proportions by weight of the main elements present in wood are: carbon 50%, hydrogen 6%, oxygen 44% plus a trace of nitrogen.

The simplest way of obtaining forest energy is from the combustion of wood. Fuel wood can be obtained from any tree whether occurring naturally or planted, either directly from the forest or from waste material produced at saw mills and wood using units or industries. It is very simple to prepare and is the raw material for the more sophisticated secondary forest energy source such as charcoal, methyl alcohol (CH_3OH), producer gas (CO), water gas (COH_2), hydrogen (H_2) and electricity

The most important controllable factor influencing the efficiency of wood as a fuel is the moisture content: Moisture in very fresh wood may amount to more than 100% of the dry weight substance which reduces its value as fuel because of the absorption of heat required in the evaporation of water. It is customary in the timber trade to estimate moisture as a percentage of the dry material.

The reduction of moisture content in wood to be used as fuel is desirable for two main reasons:
- to reduce handling and transport cost
- to increase its fuel value.

In order that the moisture content of the wood is reduced to 25-30 percent resulting in an increase in the calorific value by a faclot between 3.5 to 4, wood used as a primary fuel is usually cut 3-4 months before use in the tropics and 6-12 months in temperate zones.

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2. Characteristics of Fuel Wood

In many developing countries, fuel wood is the cheapest fuel available. When properly dried it burns safely and easily. It requires no special storage facilities apart from open space and it is perfectly safe to store for long periods. However, without properly organized management, forests get swiftly depleted.

Besides, its calorific value is lower than that of fossil fuels. Apart from general domestic purposes, wood is also used to provide heat in many industries, like brick klin, etc etc.

2.1 General Characteristics of Wood in Balochistan

Balochistan has hyper arid to dry climate and is therefore only suitable for natural forest at high altitudes. In Balochistan, woods were most extensive in the past. The deforestation process is presumably millennia old, but has accelerated regionally in the last decades. Forests in the legal sense, including 70 to 80% non-wood, cover 3% (1 million ha) of Balochistan and only some parts of woods enjoy legal protection.

There are no commercial forests in Balochistan, and the main value of forests is for the environmental protection and natural conservation (Khattak, 1974).

The forests in Balochistan cover almost all the agro-ecological zones. However, the distribution of forest under the control of forest department is given by types and districts in Table-1;

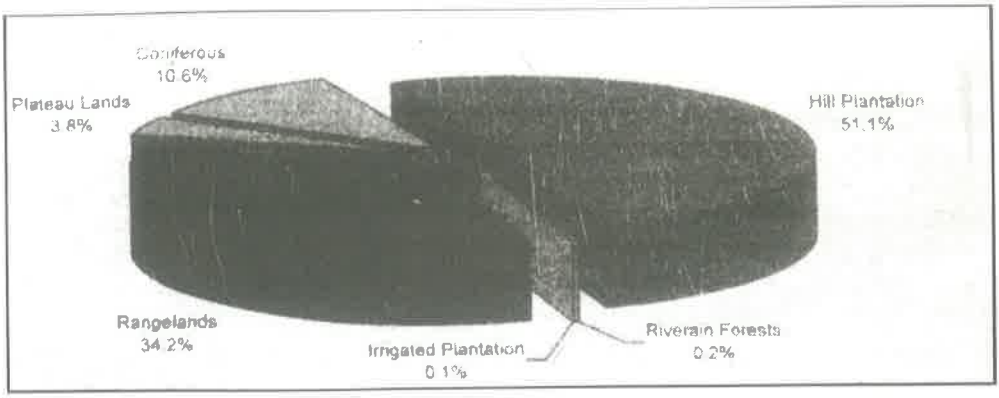
Table l State and protected forest area under the control of Balochistan Forest Department (area in ha)

Forest Division	Coniferous	Hill Ptantation	Riverrain Forests	Irrigated lands	Rangeland	Plateau Lands	Total
Quetta/ Chaghi	44,428	336,054	0	25	83,646	0	494,153
Sibi	51,313	939	2,102	940	7,080	29,687	92,061
Loralai	18,520	22,679	0	0	23,363	0	64,562
Zohb	1,424	20,737	0	0	0	11,I37	33,298
Kalat	0	131,295	0	0	97,562	0	228,857
Lasbela/ Mekran	0	14,504	0	0	160,088	0	174,592
Total	**115,685**	**556,208**	**2,102**	**965**	**371,739**	**40 824**	**1,087,523**

Source: Balochistan Forest Department

While the area under different types of forests is shown in Figure-1. The province is inherently not suitable for fuel wood plantations, unless irrigated. Whereas, modes of irrigation continue to be underdeveloped.

Area of Different Forest Types under Balochistan Forest Department



Source: Balochistan Forest Department

There are three types of forests in term of their legal status, i.e. State Forests, Protected Forests and Guzara Forests or Community Forests.

3. State Forests (SFs)

In Balochistan, only some parts of the woods enjoy legal protection, about 3 % of the province (around 1 million ha) has been gazetted as State Forest (SFs) according to the Balochistan Forest Regulation 1890.

For the major part (70-80%) the SFs constitute grass and shrubs. Even the remaining 300,000 ha SFs, all in the northern half of Balochistan, are entirely sparse to open coniferous wood (+ 100,000 ha), riverine forest (5,000 ha) in Sibi - Katchi plain and widely scattered 140,000 ha "Shurb".

In SFs, green trees and wildlife are protected completely, exploitation rights (fuel wood, grazing, fruit collection) and as well as employment rights are specifically included in notification of each state forest. However, in most areas the prohibition on cutting green trees cannot be enforced in practice. Consequently, even SFs are degrading although often at a slower rate than adjacent wood. Several SFs have been destroyed completely due to settlement of Afghan refugees in the woods. e .g. The Popalzai SF has been disappeared almost completely.

4. Protected Forests (PFs)

In Protected Forest, every thing except cutting of green trees and wildlife hunting is

allowed unless specifically prohibited. This marks the distinction between state forests and protected forests.

Typically, in Kalat district, more than 90,000 ha of forests which are partly Juniper, partly Pistachio and olive wood are gazetted as Protected Forest under the Forest Act of 1927. Statistics and estimates in respect of protected forests are not available.

PFs status has also been given to the princely states that were under the indirect rule of British colonial rulers of which the Khanat of Kalat was the most important. Others areas were Mekran, Kharan and Lasbela.

5. Guzara Forests (or Community Forests)

Guzara forest status has been declared for 20,000 ha by an administrative decision of the Board of Revenue. The legitimacy of this decision is disputed by nearby villages implying that no effective protection is possible. The Guzara and other woods have been protected by Reserved Tree Rules. Cutting of green trees is prohibited unless for subsistence. Transport by truck of fuelwood or timber for commercial purposes is not allowed.

Tree plantations was established in irrigated public lands in canal irrigated low land Balochistan (Nasirabad District). Both timber and fuel wood is produced by private contractors. So far, 900 ha of such forest has been established alongside the Pat feeder and Kirthar irrigation canals and further 1000 ha is planned over the next 3-4 years. The forest department has planted trees in about 400 km of trees along 300 km of roads.

Juniper woods are often the only source of fuel wood in the cold winters and timber supply for house construction over vast areas with a poor and rapidly growing population. Effective protection under such circumstances requires an army rather than forest guards.

6. DISCUSSION

6.1 Wood Trade

Despite the fact that Quetta city enjoys the facility of natural gas, there are about 110 permanent talls (Retail Shops dealing with fuel wood), engaged in flourishing business, in the city. This is mainly because substitutes of fuel wood are not within the reach of majority of population who belong to lower middle- class and lower class. The retail shops get their supply from about six wholesalers, established at Quetta station only.

Besides, a large number of temporary rather than seasonal talls appear during summer along roadsides in the suburbs of the city. These talls are established by nomads from Sindh province who immigrate to the upland cold areas) of this province, i.e. Quetta, Pishin, Loralai etc, for an average period of five months. The nomads are primarily involved in fuel wood business in addition to stone and mud dealing (construction material). Paradoxically, these make-shift businessmen operate as wholesalers-cum retailers.

Ten per cent of these businesses are engaged in wholesale trade, while 90 Per cent are engaged in temporary fuel retailing business in the upland districts, during summer. With the inception of winters, they migrate towards warmer areas. Temporary talls are then established by the local businessmen in and around the villages of upland districts. Fuel wood supply mostly comes from Sindh and a little from Punjab-meeting the fuel wood requirements of upland Balochistan, i.e. Pishin, Loralai, including Quetta.

Lower Balochistan including Khuzdar and Kalat, especially coastal areas, is self sufficient in its fuel wood requirements. Demand is much higher in winter. Regular talls deal with fuel wood and coal during the whole year. But in summer, they are primarily engaged in timber trade.

According to a survey of eight representatives districts of Balochistan, an average of 8 to 10 trucks of fuel wood are consumed per household, during winters. This shows a consumption of 3,200 to 40,000 Kg of fuel wood. This is in addition to electricity and liquefied gas consumption.

6.2 Wood Supply

Domestic supply areas of fuel wood include Nasirabad District, Sibi District, Lasbela District, Mekran and Kharan Division / District, and Ziarat District (outside supply restricted).

While lower Balochistan is self sufficient in the supply of fuel wood, Sindh (Sukkar, Jacobabad, Larkana, Rahin Yar Khan, etc) and Punjab (Pano Aaqil, Sadiqabad, etc) are the major suppliers for upper areas including Quetta.

6.3 Demand for Fuel Wood by Category and Season:

Demand for fuel wood is much higher during winters as compared to summers. Especially in the areas where no substitute (natural gas, liquified gas, Kerosene oil and electricity) are available the only available source of fuel is wood. In upper Balochistan, 5% of total income of the residents of these areas is spent on fuel wood. Average requirement per household during winter is 40,000 - 60,000 Kg.

During winter, retail shops (talls) temporarily appear around the villages to meet the demands of upper Balochistan. In summer, requirements are met from regular talls located in main Bazaars.

The graph on the next page shows the percentage composition of sales of average household viz-a-viz commercial sectors likes bread manufacturing, soap making, ovens (tandoors), barbecue shops, tea stalls, etc. While households consume 80 % of fuel wood, demand remains at very low levels in industrial sector.

7. Cost Components

Transportation cost is also a function of other commodities. For instance, costs are lower during fruit picking and marketing seasons in upper-lands (Pishin, Loralai, etc.) and Quetta, whereas during off seasons transportation costs increase by more than 100%. Wood is therefore brought to these areas and stored before winter.

Like Khuzdar, Kalat, and Nasirabad districts, the coastal districts of Balochistan are self sufficient in fuel wood supply, but due to bad road conditions, fuel is mostly transported on camels. However, there are the areas where pick-ups are also used.

8. Region-wise Supply Position

Average prices of fuel wood in major marketing areas of Balochistan is shown in Table 2.

Table 2. Average fuel wood price in major areas of Balochistan

(Price in Rupees)

Marketing Areas	Retail Price	Wholesale Price
Quetta	45-50	38-40
Pishin	45-50	38-40
Punjpai	45-50	38-40
Khuzdar	45-50	18-20
Punjgure	50-55	40-45
Gawadar	150-160	130-140
Turbat	30-35	25-30
Jiwani	50-55	40-45

For the location of these marketing areas —See the map in Appendix-A.

It is paradoxical that although Gawadar is in close proximity to Punjgure, yet prices in Punjgure are considerably lower than those of Gawadar. Although there exists tremendous scope for trading fuel wood from Punjgure to Gawadar as it involves a profit of Rs.125 per Kg, this may be because of marketing bottlenecks which are typical features of trade in this region. This may be due to lack of initiative and enterprise among local entrepreneurs plus precarious road conditions.

8. Region-wise Characteristics of Supply

(a) QUETTA :

The city gets 5 % of its supply from Balochistan and 95 % from other provinces. During winters, supply is very limited and stored fuel is mostly consumed.

(b) PISHIN:

Major supply areas are Sukkar and Jacobabad (Sindh), and Nasirabad, Dera Murad Jamali, Temple Dera and Thal (Balochistan).

(c) PUNJPAI:

In Punjpai, transport cost is lower during onion and potato harvest seasons. "Zozan", an abundantly available bush, is used as a fuel. One camel load of Zozan weighing about 80 Kg is available at a cost of Rs.2.50 - Rs.3.50 per Kg. Two camel loads are enough to meet the requirements of a household for one month. In winters, fuel wood is procured from Quetta's market.

(d) PANJGURE:

It is a land of wild and natural forests. Apart from wood, an important source of fuel is "Pees " (MAZRI) which is a wild shrub of 5 to 6 feet high bearing broad leaves like palm trees. It is abundantly available and is a multi-purpose item.

(e) GAWADAR:

This area is also self sufficient in fuel wood supply because it is blessed with many patches of natural forests including "Mazri". Even then the cost of procuring fuel is very high. Wood is brought in small units by consumers, majority of whom belong to low income groups. It is the most expensive district in the country in terms of fuel wood prices, although no commission agents are involved in its marketing. This is because purchases are made by the consumers in small quantities, like groceries.

Consequently, supply is also carried out in small quantities. Petrol and kerosene, being smuggled from Iran, are available at very low prices. But, due to general atmosphere of illiteracy, in this region, techniques and appliances have still not been developed whereby such fuels could be used productively. Wood continues to remain a primary source of fuel. Liquified gas is very expensive due to restricted supply, so its consumption is also very low.

(f) TURBAT:

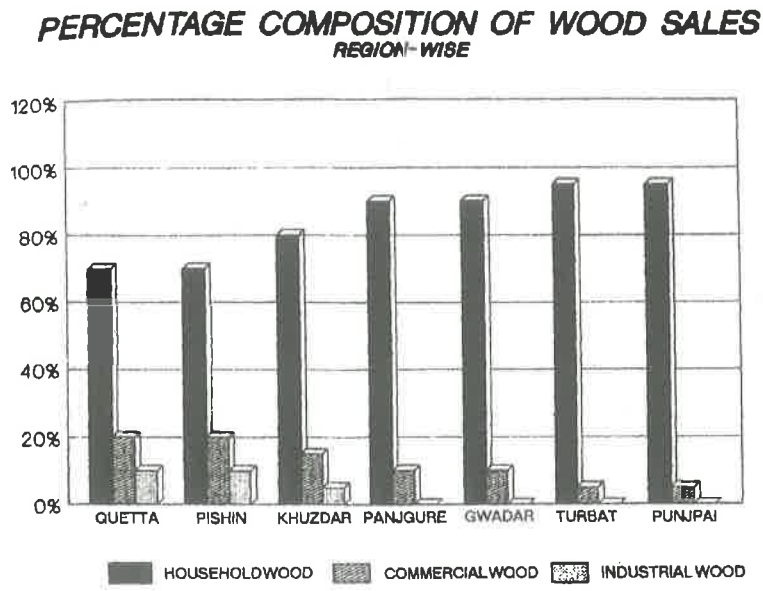
Supply of fuel wood is mostly from Dasht, Warkoob and Sarkohi areas. Eighty percent of the fuel wood is transported on camels. Abundantly available wood specie is "Chay-Gird" besides, Mazri is also used as fuel.

9. Seasonal Variations of Fuel Supply: by Regions

Table 3 gives an account of seasonal variation in fuel wood supply in various regions. Values from 1 to 3 indicate the intensity of supply, i-e 1 for very low, 2 for moderate and 3 for intensive supply. It is evident that crucially in colder areas, fuel supply diminishes during winters. This is due to a host of factors including increase in transport costs, low activities in wood cutting process, etc.

Table 3 Monthly variations in fuel supply

	Quetta	Pishin	Panjpai	Khuzdar	Punjgure	Gawadar	Turbat
Jan	1	1	1	3	3	3	3
Feb	1	1	1	3	3	3	3
March	1	1	1	2	3	2	2
April	2	2	1	2	1	2	2
May	3	3	1	1	1	2	2
June	3	3	1	1	1	2	2
July	3	3	1	1	1	2	2
August	2	2	1	1	1	2	2
Sep	2	2	3	1	1	2	2
Oct	2	2	3	1	1	2	2
Nov	1	1	1	2	1	2	2
Dec	1	1	1	3	3	2	2



10. Comparative Energy Prices in Coastal Areas:

A comparative account of energy prices in coastal areas is given in Table 4. It is evident that fuel wood prices have no correlation with the prices of its substitutes.

Table 4. Energy Prices in Coastal Areas (In Rupees)

Localities	Fuel Wood* (Per 40 Kg Retail	Wsl	Kerosene Oil Per gallon	LPG Per 18 Kg Cylinder	Mazri Per 4.5 Kg
Turbat	38	28	12	120	3
Gawadar	155	135	15	140	3
Punjgure	53	43	25	120	3
Jiwani	53	43	25	N.A.	3

* Average retail and wholesale prices of all varieties of dried wood having moisture content ranging from 6-15 percent.

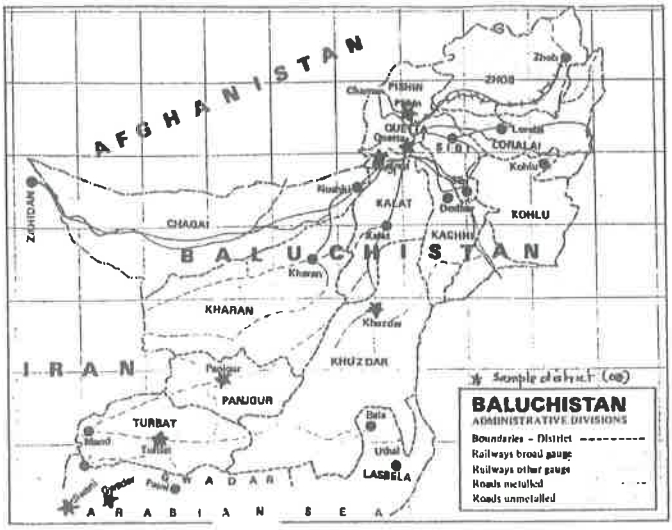
11. Suggestions

So far, no government has made any serious effort in developing the tremendous potential that exist in the field of forest energy. Extensive forestation coupled with restricted deforestation could boost up the supply of fuel wood besides contributing to environmental protection and maintenance.

Arragement for alternate sources of energy, at an accelerated pace, is of enduring significance in initiating efforts to forestall rapid depletion of this scarce resource. Alternatives includes development of biogas technology, wind mills, wave energy (in coastal areas), etc.

Forest conservation can be most effective through economic development. Besides, fuel wood substitution process can also be accelerated by subsidizing and increasing gas cylinder supply, especially for lower income-groups which consume most of the fuel wood.

Appendix-A



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