

**COMPARATIVE STUDY ON EFFECT OF THE WORKING SYSTEM
ON PRODUCTION, PROCESSING, AND MARKETING OF MAZRI
PALM (*NANNORHOPS RITCHIEANA* (GRIFF.) AITCHISON)
IN KOHAT FOREST DIVISION AND PANIALA,
DERA ISMAIL KHAN, PAKISTAN**

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ABSTRACT

To find best sustainable management systems for Mazri (local name) Palm resource, a comparative study was conducted in the two-major Dwarf Palm growing areas i.e. Kohat Forest Division (Govt. controlled) and Paniala, Dera Ismail Khan (D. I. Khan) (Privately controlled), to elaborate the best sustainable management system for Mazri resource. In Kohat, Forest Department manage the Mazri Palm, while in Paniala D. I. Khan; the communities do it with their own ways. Review of secondary information, meetings, and discussions; transect walks and market surveys were used to get the required results. The results revealed that Mazri Palm is growing on about 24000 hectares area on communal lands of Kohat, Hangu and Karak districts and the average annual production is 39376 mounds (40 kg per mound), while production in Paniala D. I. Khan for the year 2003 was estimated to be 12000 mounds. The main Mazri Palm growing tract in Kohat is being denuded. While on other hand the Mazri Palm's resource is increasing in Paniala D. I. Khan with the passage of time. Therefore it is concluded that sound and timely steps are needed for effective conservation and rehabilitation of the Mazri Palm resource in Kohat and The Forest Department should encourage the involvement of general public/communities in the protection, management, processing and marketing of Mazri Palm resource.

INTRODUCTION

Dwarf Palm (*Nannorhops ritchieana*) is monocotyledonous plant species belonging to family Arecaceae. Arecaceae is a large family of 200 - 210 genera and 2800 - 3000 species distributed mainly in the tropical and sub-tropical regions of the world (Malik, 1984). This species is native to South Europe, North Africa and Western Asia, distributed in Pakistan, Afghanistan and S. Persia in the mediterranean arid regions (Latif *et al.*, 2004). In Khyber Pakhtunkhwa, it is found in Kohat, Karak and Hangu Districts, Kurram, Orakzai, North and South Waziristan Agencies. Its cultivation has also been started in sandy lands in Paniala (D.I.Khan).

According to Forestry Sector Master Plan (FSMP) 1992, the Khyber Pakhtunkhwa is rich in forest area and has 16.6% of the area under forest which is 40% of the total area of the Pakistan, managed primarily for the production of timber and also yield a variety of non-timber forest products (NTFPs). These

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products are designated as minor forest products. NTFPs include medicinal plants, fodders, gums, resins, Mazri leaves, honey etc. Among these Mazri plays an important role in economic stability of people of its growing areas like Kohat and Paniala (D.I.Khan). The Mazri fibers are widely used for preparation of mats, ropes, bannas, ornamental products, different commodities for mosques, baskets, brooms, trays, hand fans, grain bins and cordage, cupboards and decoration pieces etc. (Latif *et al.*, 2003).

The NTFPs originating from natural forest tracts play an important role in economic uplift of the human societies. Average annual production of raw Mazri leaves in the country is 37, 315 tonnes. Boluchistan is the biggest producer of Mazri in Pakistan with average annual production 27,265 tonnes. About 3,400 tonnes of Mazri was produced in 1999-00 (Agriculture Statistic of Pakistan, 1999-00). Average sale price of Mazri leaves in the Kohat district is Rs. 100 per kg (Abbas, 2002). But in other areas like Kalpani, its price was Rs. 210-220 per kg. There was total export of 126 millions rupees in 1991 from various products of Mazri by the rural people (Iqbal, 1991). Their most immediate users are the people living in or near to the forest resources. Whereby these NTFPs are a source of income for poor families. Numerous small enterprises and cottage industries are related to these non-timber forest products, providing a source of livelihood for people. Their utilization for food for animals and human beings (grasses, wild fruits etc), traditional medicine (medicinal plants), use in other industries (gums and resins) are common practices. Mazri collection and processing of raw material into useful products are major source of income for poor and especially for rural women who are mostly landless families. Its processing is the only source of personal income for women (Khattak, 2002).

Mazri palm grows naturally on either side of Sulaiman Mountain Range. It can grow on well-drained soil and sunny exposure; upto 1600 meters elevation above mean sea level. It can tolerate hot and dry climate and even extremely cold temperatures. The Mazri palm can grow to 20 feet height with a crown of stiff, blue-gray Costa palmate leaves. It's worth a try in colder areas with the proper climate, chiefly on sandy soils in depressions, but also extending over adjoining slopes.

As a matter of fact, history on state control on Mazri and its products dates back to 1882, when Mr. Tucker D.C. Kohat discussed the question regarding Mazri control with the leading lambardars of the Mazri tracts, and mutually they agreed rules for effective Mazri control.

In Kohat, production, processing, transportation and marketing of Mazri leaves and its products were controlled under the provision of an elaborate Kohat (Mazri Controlled Act, 1953 Act No.III of 1954 and rules made there under, namely, Mazri Control Rules, 1955, for management. These rules have now

revised as per provision of Forest Ordinance 2002 (NWFP Ord. No.XIX of 2002 and are called the North West Frontier Province Mazri Control Rules, 2003).

But it is surprising to note that despite marvelously elaborate legal framework for regulation of Mazri production, transportation, marketing and export, the resource has been drastically depleted, thus providing a classical example of conflict arising out of tenurial insecurity. Genuine owners of the waste lands bearing the Mazri plants have been declared as "right holders". Obviously as a result of tenurial insecurity coupled with complicated, cumbersome and rather exploitative rules and procedures, the owners lost interest in conservation of this resource and were left with no option except to uproot the plants and to change the land use altogether into agriculture. Thus, the legislative measures aiming at conservation through strict departmental control could not help to achieve the primary objective of saving the Mazri forests. The North West Frontier Province (NWFP) Mazri Control Rules, 2003 that has been extended to Hangu and Karak but no major change has been added such as participation of communities in management of Mazri

In contrast to above experience of more than 60 years of managing Mazri forest through departmental controls under the authority of elaborate and strict legal instruments; rising of Mazri plantation on farm lands in Paniala (D.I.Khan) under local initiatives without any involvement of the Forest Department is a unique and encouraging experience. Where there are was no natural forest of Mazri in Paniala. About 15-20 years ago, people started planting Mazri palms in their waste-lands along with agricultural crops. Now most of these plantations are well established and are yielding an estimated quantity of 1000 tones of Mazri leaves and products per year (Iqbal, 1991). The production is expected to increase further, as more, plantations are being raised. This provides an expounding example of impact of tenurial security on sustainability of natural resources. Therefore, it is imperative to analyze and under stand two models of a natural resource management in Kohat and Paniala.

To find best sustainable management system for the Mazri Palm, the study titled "Comparative study on effect of the working system on production, processing, and marketing of Mazri in Kohat Forest Division and Paniala (D.I. Khan)" has been conducted so that the people may know to utilize these valuable NTFPs, sustainably with scientific management and avail maximum benefits.

DESCRIPTION OF THE STUDY AREA

This study was carried out in the areas described below:

Kohat

Climate

The climate is generally erratic and of extreme nature. The average

monthly maximum temperature occurs in June and touches as high as 43 °C. The average monthly minimum temperature occurs in January. It goes as low as 2.7 DC. Sometimes it falls to zero in Hangu during January due to western wind known as “Hangu Breeze”. Rainfall is received throughout the year. The monsoon rain is received from July to September. August is the rainiest month with average rainfall of about 79 mm. The winter rain occurs from December to April. Humidity is lowest in the tract during May and June.

Forests

Climatically, the area falls in sub-tropical dry zone where scrub forest (subtropical dry deciduous forests) exists. The representative species of the region are *Acacia modesta* (Phulai), *Dodonaea viscosa* (Sanatha), *Olea ferruginea* (Olive).

Table 1. Area under different categories of forests

Districts	Reserved forests (acres)	Protected forests (acres)	Resumed lands (acres)	Section 38 areas (acres)	Communal/private forest (acres)	Mazri area (Private lands) (acres)
Hangu	18254	158	26	4672	243742	29000
Kohat	5000	--	18989	5561	--	100

Paniala (D. I. Khan)

Climate

Paniala is situated in District Dera Ismail Khan. The climate of the area is dry and hot in summer season. June is the hottest month with mean maximum and minimum temperature of about 42°C and 27°C respectively. The humidity is the lowest during May and June. During these months, the area is under periodic dust storms. December, January and February are the cold months. The weather is cold with severe frost. The mean maximum and minimum temperatures in January and February are recorded as 20°C and 4°C respectively. Rainfall generally occurs in July and August. Annual rainfall is about 260 mm.

Forests

The climate of Paniala is of extreme nature, which favors little growth of forest. The area is classified under Tropical Thorn forest. This forest consists of trees, which are usually thorny, stunted and dominated by *Acacia* spp. The usual species are *Acacia modesta*, *Acacia nilotica*, *Salvadora oleoides*, *Prosopis cineraria*, *Tamarix aphylla*, *Zizyphus* sp., *Capparis decidua*, *Tecoma undulate*, *Calatoropis procera* etc.

METHODOLOGY

Mazri is managed under two different systems in the two main regions i.e. Kohat and Paniala (D.I.Khan). Forest Department is managing the Mazri crop in Kohat under Mazri control rules 2003, whereas in Paniala (D.I.Khan) the people are managing it by themselves without any involvement of Forest Department. The study was conducted to know about the best and sustainable management system of the two managements. Objective of the study is to improve the management of Mazri palm in NWFP to ensure the sustainability of the resource base. Keeping in view the objective of the study, the strategy adopted for data collection is grouped into the following methods.

Meeting and discussion with forest department and other line agencies/ NGO's etc

A detailed meeting was held with the Range Forest Officer Kohat, Hangu & Tern Forest Range and the secondary data as well as other relevant information were recorded. Next meeting was held with Sarhad Rural Support Programme (SRSP) Kohat and the available data was collected.

Sampling techniques

A list of those villages where Mazri resource is grown and auctioned every year by the department was obtained from office of the Kohat Forest Division. Local Mazri growers and traders were interviewed for identification of potential villages and sites in D.I.Khan. In the identified villages, 15% villages were selected randomly. Within each selected village, 5 to 10 persons belonging to different socioeconomic status were randomly selected for interview.

Field survey

Since this is the 1st study and therefore a questionnaire was developed under the guidance of Dr. Iqbal Sail the former Director R&D and was after pre-testing in Kohat, Karak, Hangu and Paniala (D.I.Khan). Questionnaire was designed for data collection on the status, production, management, processing and trade of Mazri plant. Some questions were structured while the others were non-structured. Market survey of Kohat, Karak, Hangu and Kurram Agency was carried out. For this purpose shopkeepers dealing with Mazri plant and Mazri products, producer, and middlemen were interviewed at their houses, field, and at market.

Each of the respondents was introduced to the objectives of the study and their feelings and response were recorded. All the respondents willingly participated; however, a few hesitated in answering the questions especially

those, who were concerned with their earnings, fearing from taxation. Some were very anxious and wanted to know what this study meant to them and what benefits they can get from it.

Data analysis and report writing

The field data was entered in the Microsoft Work spreadsheet and was analyzed with the help of Mini tab, Set-stat and Excel involving the following steps.

- a. Entry of data from questionnaires on Excel Work Sheet
- b. Analysis of data by using the following formulae:

i.	Formula for maximum	=	Max (Address)
ii.	Transfer value formula	=	Mid (Address, 1,1)
iii.	Lookup formula	=	Lookup (Address, Lookup table address, 2, false, true)
iv.	Average formula	=	Average (Address)
v.	Sum formula	=	Sum (Address)
vi.	Count Value's formula	=	Count if (Address, "Value")
	Address	=	(Data required from work book sheet)
vii.	Standard deviation formula	=	STDEVA (Address)
viii.	Coefficient of variation	=	$\frac{\text{Standard deviation}}{\text{Mean of values}} \times 100$

Other functions used during the analysis are sort, auto filter, subtotals etc. Microsoft Work program was used in preparation of diagrams and formulation of tables from raw data. The data was compiled and conclusions were drawn. Suggestions were also made.

RESULTS AND DISCUSSION

Production, processing, management and marketing

Production, management and marketing in Kohat

Production

The main Mazri production areas in Kohat Forest Division are; Tern, Hangu, Thall, Alizai and Khadizai. The annual production is based on the annual auction of Mazri leaves. The annual production in Kohat Forest Division during the year 2002-2003 was more than 1700 tones. The figure shows annual production of Mazri in Kohat from 1990 to 2003 is given in figure below.

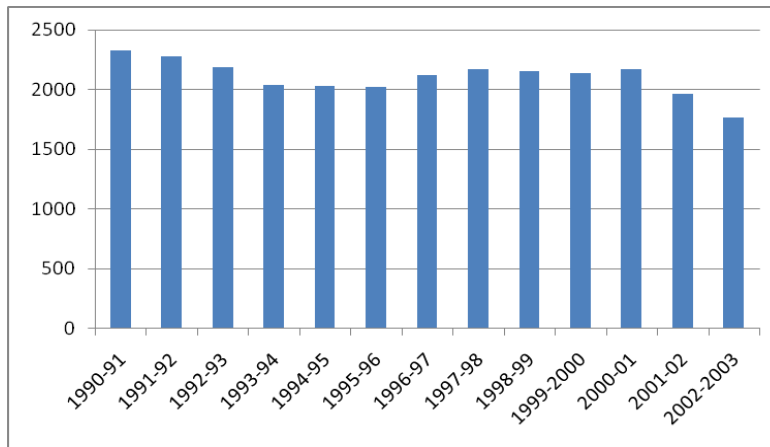


Fig. 1. Annual production (Tones) of Mazri in Kohat

The figure shows that in 1990-91 the production was at highest limits i.e. 2326.500 tones and the production started reducing in Kohat due to unknown reasons it falls to its lowest limit i.e. 1767 tones recorded in 2002-03. The table 2 given bellows shows year wise annual Mazri leaves production.

Table 2. Annual production of Mazri leaves from areas managed by the forest department In Kohat

Year	Production (Tones)
1990-91	2326.500
1991-92	2276.500
1992-93	2184.250
1993-94	2034.500
1994-95	2032.500
1995-96	2022.500
1996-97	2117.500
1997-98	2168.500
1998-99	2156.000
1999-2000	2136.000
2000-01	2173.500
2001-02	1966.000
2002-2003	1767.000

Management

Past system of management

Till 1882 every one, whether a resident or an outsider, seems to have enjoyed a promiscuous right of cutting Mazri, which the villagers could do very little to stop. Mr. Tucker, the British Deputy- Commissioner of District Kohat discussed the question in 1882 with the leading Lambardars of the Mazri tracts, when the following rules were agreed to:

- Mazri was not to be harvested between April and September inclusive, except by the resident villagers for their own immediate needs. This is the growing season. During the rest of the months no Mazri has to be cut less than two feet long.
- Outsiders were not allowed to cut Mazri indiscriminately, but were restricted to the tracts where it was abundant, which may not affect the supply base. In villages, where the plant has suffered from over harvesting, outsiders were excluded altogether. Outsiders who were cutting Mazri within village boundaries were to pay four Annas a bullock-load to the proprietors. Collection to be made by the Lambardars and realization to be credited to the village fund. The objective of this provision was to give the people a direct interest in preserving Mazri. Provision was also made for fining person guilty of breach of these rules. Such fines were collected in the village fund.

Present System of management

Forest department is responsible for the management of Mazri forests. Every year before Mazri auction the responsible Range Forest Officer of the area go to the field to have an ocular estimate of harvestable Mazri volume. Tenders are given against this estimated volume.

The cutting of leaves is allowed from mid October to mid April. Mostly rural women carry the harvesting in a traditional manner. They use the traditional agricultural tools like Suckle or Dranti. The local contractor supervises it. Local people carry out harvesting and the contractor purchase the finished Mazri products from the people. It is pertinent to note that only that contractor can purchase processed items; who has the contract of that area.

Mazri Control Act 1954 and Revised Rules of 2003 (Forest Ordinance 2002)

Mazri Act was introduced in 1954. Mazri Controlled Act, 1953 Act No. III of 1954 and rules made there under, namely, Mazri Control Rules, 1955, were introduced. Recently it was felt that for best management these rules need

revision. Therefore these rules were revised as per provision of Forest Ordinance 2002 N-W.F.P. Ord. No. XIX of 2002 and are called the North West Frontier Province Mazri Control Rules, 2003, to protect the Mazri plantation and to legalize the trade associated with Mazri and its produce. Mazri grows on shamilat area and the Act is enforced against all type of land in Kohat, Karak and Hangu (Communal, private, govt.) where Mazri grows.

In both rules only licensee or permit holder can harvest Mazri leaves (from 15 October to 15 April). The royalty generated from contract or permit is distributed as 80% goes to the community while 20 % goes to forest department as service charges.

Rights and concessions

According to both rules local people have the rights in these Mazri forests. Local people can cut leaves for immediate personal and domestic use in harvesting season not more than 5 Kilograms. In harvesting season local community is allowed to cut leaves for emergency use such as repair of house or mosques. During the harvesting season of agricultural crop, people are allowed to cut Mazri leaves to fasten bundles. Only contractor or his permit holder is allowed to trade Mazri and its produce. He can sell the Mazri products in markets and can export it to other cities.

Marketing

Market is a vital element in the sustainable utilization of forests and its Miner Forest Products. It assists in directing raw materials from forests to the most rewarding uses in the market place, where benefits are distributed among the beneficiaries.

Padoch (1992-93) confirms, "Studies of local marketing are indispensable for sound conservation and development planning. The survey was conducted in the Mazri markets of Kohat, Karak and Hangu.

Mazri items are marketed through train and road. Local Forest Department Office issue transit passes for road transportation. Only permit holders are entitled for transit pass. The transit pass for transportation by road is usually for six days while for train the pass is issued for one month. In Hangu transit pass are issued to trader against tender. For example if a trader have tender of 1000 mounds, the department will issue transit pass or passes which collectively will not exceed from that value. The pass are also issued against the Mazri transported from Balochistan and tribal agencies.

There are two main and active market players:

a. Producer (Processor)

Producers are those market players who produce, manage and harvest the Mazri crop. Kohat area is lacking this player because of the departmental management of the crop. The local people of the growing area do harvesting of the crop. On the other hand this market player play its active role in Paniala. They themselves produce, manage and harvest the Mazri crop. They are fully acquainted with management techniques of Mazri palm:

The middleman is the person who collects the finished products and brings it to the market. The middlemen are the shareholders (in Kohat region only) of the market. They further export these products to different parts of the country. The main Mazri finished products of the area are, Rope, Pozakey, Musalah, Shkor, Pachay, Tokray, Pezar, Jaru, Kate, Bozi.

b. Middleman (Also exporter)

Main Mazri Markets

Khadizai is the main Mazri production area in Kohat Forest Range. There are three markets, two in Kohat city, (Terra Bazaar & Chargo Bazaar) and the other is Billitang Bazaar, where both Mazri fiber and Mazri products are marketed. Billitang market is unique for the reason of marketing raw Mazri as well as the finished products. These markets are discussed in detail as follows:-

Billitang market

Khalezai is the only Mazri producing village in Kohat Forest Range. Billitang is the main market of Mazri raw material in Kohat. It is situated at a distance of 14 km East of Kohat on Rawalpindi Road. It is a very old market. In 1945, a British Commissioner of Kohat regularized Mazri business and a Cooperative Society of the Traders "Victory Cooperative Mazri Mandi Limited" was established. There are 537 shareholders in the Mazri Mandi. The market is spread over an area of 25 Kanal and almost 15 persons have a claim of ownership on this area. Billitang was selected as a Mazri market for the following reasons:

- It was near to the railway station (Babri Banda Railway Station), which reduced the transportation cost of raw material.
- The local people of this area had a skill of making different products from Mazri leaves.
- Luxuriant growth of Mazri in the adjoining areas also favored in selection of Billitang as a Mazri market.

In this market raw Mazri is mainly imported from Balochistan, which contributes 95% to the market. The remaining 5% is brought from North and South Waziristan, Hangu and Tall areas. Production from Balochistan lies within the range of 55000 mounds to 75000 mounds per year, while 2750 — 3750 mounds per year is imported from the other areas. In Balochistan, mostly women collect it to a selected place, from where it is transported to a common market. The wholesalers go to Balochistan individually and purchase the required quantity of Mazri leaves from Loralai and Berkan and then send it through trucks to Mehmood kot Railway station. From there! it is brought to Billitang market through Railway.

Ten percent reduction is made in the weight of raw Mazri imported from Balochistan for the reason of moisture contents. The reduction is 20% if the stalks of raw Mazri plant are not removed. The imported raw Mazri is then sold to the locals who process it for different products and again sell to the middlemen. The middlemen collect these products and either sells it to the exporter or they themselves export it by taking export permit (if they are shareholders) from the Forest Department. These products are exported mainly to Peshawar, Mardan, Mansehra, Havelian, Lahore, Sargodha, Rawalpindi and Hyderabad etc. It is note worthy that only permits holders/shareholders are entitled to carry out Mazri business in the market.

The sale price of raw Mazri was recorded as Rs.200-250/- per mound. The respondent hesitated to disclose its purchase price. According to the SRSP Mazri report (Nov.2002), the purchase price of Mazri fiber was Rs.110/- which rose to Rs.130/- per mound (40 Kg) after including all expenses like transportation cost, loading and unloading cost and taxes of the market.

Table 3. Purchase and sale price of Mazri products at retailer shop at Khalezai

Name of Products	Rates of Products (Rupees per item)					
	Grade-1		Grade-2		Grade-3	
	P/P	S/P	P/P	S/P	P/P	S/P
Rope per Charpai	70	80	60	70	50	60
Pozakey	31	35	23	25	12	15
Musalah	26	30	23	25	12	15
Pachay	90	100	50	55-60	30	45-50
Thrangan	110	120	50	60	-	-
Tokray	25	30	12	15	-	-
Hand Fan	5	6	-	-	-	-

P/P= Purchase Price S/S= Sale Price
Rope in Single Charpai = 6 Kg

Table 4. Purchase and sale price of Mazri products at exporter's shop at Khalezai

S.No	Items	Export/Year	Purchase Price	Sale Price
1	Rope	60000 mounds	-	-
2	Pozakey-I	6000 bundle	Rs.455/-	Rs.470-500/-
3	Pozakey-II	6000 bundle	Rs.385/-	Rs.400/-
4	Groom	2000 bundle	Rs.525/-	Rs.600/-

Units

Rope one mound = 48 Kg.

Pozakey one bundle = 35 No.

Pozakey-II one bundle = 50 No.

Groom one bundle = 200 grooms.

Gumbat market

Gumbat is another small market like that of Billitang, which is collectively, controlled by a proper Association and Kohat Forest Department. Only shareholders (which are 380 in number) can purchase and export finished products in this market.

Raw Mazri is mainly brought from Balochistan. It is estimated that an average of 19000 mounds per year Mazri leaves are imported to Gumbat market. Out of this total 70% comes from Balochistan and 30% from North and South Waziristan. Purchase price of raw Mazri of Balochistan is Rs. 130/- per mound (40 Kg) and that of North and South Waziristan is Rs. 160 per 40 mounds. Supply from Balochistan is extremely reduced during the months of June and July. Rope is the only and main product of this area. According to a respondent, a women who process one mound raw Mazri for rope gets Rs.120/- as net return.

Hangu Market

There are three main markets of Mazri products in Hangu District. These are Hangu, Kahi and Doaba. Kahi is more productive than the other two. There is another market called Shahoo market, where Rope is imported from Orakzai Agency through permit issued by Political Agent. Main products of Mazri plant in these markets are Rope, Shkor & Pozakey. Rope is the main trading product table 6 shows purchase and sale prices. Like other regions, mostly female are involved in harvesting and processing of Mazri leaves.

Middlemen are always involved in marketing of these items and take the major portion of income. The real producer or processor gets a meager portion of

income, which hardly suffices its production cost. Mazri production areas of Hangu are; Hangu Shamilat, Baber Mela, Hangu R/F, Baber Mela Hangu W/L, Hangu Chapper, Sarki Phela sharnilat, Darband, Wrasta Shinawari, Bilyamina, Tangi Banda, Kahi, Shinawari, Chappri, Gholochina, Shamsudin Banda, Doaba, Torawari, Kotki Bala, Wish GiderwanIKotki, Kulali, Kotki Payan, Hira Banda, Barbas Khel, Togh Sarai, Mohammad Khoja, Karabogha, Dashi, Ibrahimzai, Raisan, Naryab and Sarozai.

Other Mazri production areas in Teri Forest Range are Ghurzandi, Umar Khan Kalay, Chashmai, Sandaki, Shawaki Ganda, Khari Banda, Gurguri, Trikhsun and Aman kot. In Thall Forest Range, Mazri production areas are Darsamand, Dallan, Gandari, Thall and Nianji Khel.

Table 5. Purchase and sale prices of Mazri products at Hangu

S.No.	Items	Purchase rate by middleman	Sale rate by middleman
1	Rope-I	Rs. 75/-	Rs. 80/-
2	Rope-II	Rs. 65/-	Rs. 70/-
3	Rope-III	Rs. 55/-	Rs. 60/-
4	Rope-IV	Rs. 45/-	Rs. 50/-
5	Rope-V	Rs. 35/-	Rs. 40/-
6	Shkor	Rs. 20-35/-	Rs. 25-40/-
7	Pozakai (Mat)	Rs. 15/- per bed (3.5x6)	Rs. 15/- per bed

According to a female respondent raw Mazri of Rs.221- is processed for Rope of one Charpai (6 Kg) in a single day. The middleman further sells it for Rs.40-45.

Karak Market

As a matter of fact, there is no prominent market of raw Mazri and its products in Karak for the obvious reason of non-availability of the raw material. Although climatic conditions of Karak District favour the growth of Mazri leaves but it is not commonly found in this area. However, it can be found in some of the scattered places like Banda Daud Shah. People bring it from Tall, North and South Waziristan etc through legal and illegal means as well as some of the Mazri leaves locally collected from some of the small scattered patches.

The few skilled person purchases it in weekly Bazaar like Land Kamar (Ahmed Abad) Bazaar. Only women folk of this area process these Mazri leaves mainly for Shkor and Pachay. It is roughly estimated that a total of 6000-7000 Shkors are brought to the Ahmadabad weekly Bazaar, which are further exported

to different areas. Rope is also available which is smuggled from the nearby agencies. The prominent villages where finished products are prepared are Dhab, Palosa, Ghundi. Thabi Khwa, Jundary, Ghera Kala, Srekhwa, Turkhakai, Drab Kata, Sangrati, Mita Khel and Kunda Khel. According to a respondent an average of 200-300 mounds rope is smuggled every week. Raw Mazri also brought the market from the nearby tribal areas, which is roughly estimated to be 150 mounds per week. The peak months for raw Mazri production are June-August. During September and October, the raw Mazri production is extremely low due to engagement of the market players in their Agricultural activities.

Table 6. Purchase and sale price of different items at Karak

S.No.	Items	Purchase price by middleman	Sale price by middleman
1	Rope-I	Rs. 40/-	Rs. 50/-
2	Shkor-I	Rs. 30/-	Rs. 35/-
3	Shkor-II	Rs. 20/-	Rs. 25/-
4	Pachay	Rs. 70-110/-	Rs. 80-120/-

Distribution of royalty from auctioned Mazri

As per rules, eighty percent (80%) share of royalty goes to the community while 20% goes to the Forest Department as service charges. After collection of the royalty, Divisional Forest Officer (DFO) transfers 80% share to the Revenue Department, which they further distribute among the Maliks of each Khel. The Maliks of each Khel then distribute it among the individuals on the basis of their Berkha (Share/right in communal land).

But this is one side of the story. In reality most of the people are unaware about this share. The Maliks quoted the following reasons for non-distribution of this share.

- The Maliks pay irrigation fee on behalf of the people
- The Maliks utilize this money as a village fund for the welfare of the people.
- The share is too little to be distributed among a large number of people.

Production, management and marketing in Paniala (D.I. KHAN)

Production

Based on production. Paniala may be divided into two regions i.e. North

Paniala and South Paniala. The total production of Mazri leaves in Paniala, for the year 2003 is recorded as 12000 mounds (data collected from different producers and traders), which can be processed for 8600 mounds (50 kg per mound) rope. Out of this total production 7200 mounds comes from North Paniala and 1400 mounds is produced in South Paniala. The main regions of production in North Paniala are Abdul Khel, Kata Khel, Shal Hassan Khel, Badin Khel, Kathi Khel, Rehmani Khel, Shahbaz, Lalal, Tangai, Shero, Kotrian, Wanda Feroz and Wanda Borh. The Mazri production regions in South Paniala are Wanda Karim Khan, Wanda Madat, Wanda Naurogi, Wanda Umri, Wanda Jamal, Wanda Bahadri, Wanda Merabi and Wanda Moazzam.

Management

People themselves are engaged in production and management of Mazri crop in Paniala. Forest department has no control on its production and management. People are fully acquainted with the management techniques of the crop. Mazri is raised in association with agricultural crop (Channa).

The management techniques adopted by the people are very simple. They simply dig pits of 10" size at 20'x20' spacing and then 5 to 10 seeds are sown in the same pit. After 15 to 25 days, the seed germinates. Some times the seed germinates after a long period of 4 to 6 months. The crop attains harvestable size after a period of 3 years. Initially crop is harvested once a year, but at the age of 7 years, when the crop is fully mature, some farmers cut it twice a year. Leading shoots are always retained during harvesting. Sowing of Mazri is carried out in October and harvesting is done in November to April.

Marketing

There are two markets where Mazri products are collected by the middlemen and then distributed to other areas of Punjab and Khyber Pakhtunkhwa. These markets are Abdul Khel and Kata Khel. Ban is the main item of the markets with annual production of 86000 mounds per year. Tokray and Shkor are the other items that are exported to other regions. It is estimated that a total of 7000-10000 Shkors are exported each year. In preparation of Shkor, apart from kana Saccharam Spp), 98% share is constituted of palm leaves and 2% is constituted of Mazri leaves. Pozakai and Musalah are also prepared from palm leaves for local use. According to some respondents, a single mature Mazri plant earns Rs. 500 per six months if sold in raw form. If the leaves of the same plant are processed for rope, it earns Rs. 1000 to Rs. 1100.

Table 7. Purchase and sale price of Mazri (by middle man) products in Kohat Markets

S.No.	Items	Purchase price (Rs.)	Sale price (Rs.)
1	Ban-I	120	125
2	Ban-II	95	100
3	Ban-III	85	90
4	Ban-IV	75	80
5	Ban-V	65	70
6	Tokray-I	25	30
7	Tokray-II	20	25
8	Tokray-III	15	20

Processing in both production areas

Responsibility of processing Mazri leaves for different items in both areas mainly lies on the shoulders of female segment of the society. According to a rough estimate about 80% female and 20% old aged male are involved in processing of Mazri leaves for different items. This is the poor and least benefited player of the markets. They get a meager portion of income, which hardly suffices its production cost.

In Kohat the processors hardly earn Rs.20-25 per day by making finished goods from Mazri leaves (information collected from processors). The processors attributed the following reasons for such a desperate state of affairs. "Purchase price of Mazri leaves have been risen almost 30- 40% but that of the finished products has been increased to 25- 30% thus only 5-10% profit is enjoyed by the processors while the middle man enjoys approximately 15-20% profit as purchase price of processed items by the middleman remains stagnant. It is so because of the monopoly of the shareholders in the market." The main Mazri finished products of Kohat area are, Rope, Pozakey, Musalah, Shkor, Pachay, Tokray, Pezar, Jaru, Kate, Bozi.

In Paniala the processor comparatively earns more money than those in Kohat area for the reason of their open competition/non monopolistic market. The processors or producers are not bound to sell their commodities to particular group/shareholders. They sell their product to the contractors or shopkeepers who offer the desired price. Charpai rope is the main product of the area whereas other products like Shkor, Babozay (hand fans), caps, handicrafts and Musalah is also found in the area.

Table 8. Time required for processing of different items in Paniala

S.No	Item	Time required	Raw Mazri required (Kg)	Cost of raw Mazri (Rs. Per kg)	Waste product (Kg)
1	Rope	1 to ½ day per Charpai (6 kg rope)	10	5	4
2	Pozakey	1 Pozakey per day	4	5	1
3	Pachay	4-5 days per Pachay	11/2 + Kana	10	--
4	Shkor	2-4 days per Shkor	1-11/2 + Kana	--	--

The table 8 shows that the processing of the Mazri leaves cannot be main source of income but this could be a side business for females as in 1-1-1/2 day a female can earn only Rs 22/- by making 6 kg role for one Charpai which economically not feasible as one can earn Rs. 100-150 by doing labor.

Comparison of both working systems (Discussion)

Analysis of systems

In Kohat production, processing, transportation and marketing of Mazri leaves and its products are controlled under the provision of an elaborate Forest Ordinance 2002 and Mazri rules 2003. As a matter of fact, history on state control on Mazri and its products dates back to 1938, when Mazri control Act, 1938) was promulgated. It is however surprising to note that despite marvelously elaborate legal framework for regulation of Mazri production, transportation, marketing and export, the recourse has been drastically depleted, Thus, the legislative measures aiming at conservation through strict departmental control could not help to achieve the primary objective of protecting the Mazri forests.

Hundred percent respondents in Kohat area claimed that 95% Mazri has been depleted. Depletion of Mazri crop in Kohat area was mainly attributed to increase in population, Afghan refugees problem, grazing; encroachment of Shamilat for construction and agriculture purposes and ineffective control/management by the Forest Department. The other reasons quoted by 65 % respondents for its depletion were the removal of Mazri plant with its roots/grazing, 10% respondents blamed unscientific cuts during leaves cuffing by Labors hired by the contactor for out side especially Afghan and 25% respondents were of view that mainly reason for depletion is continues cutting of Mazri is practice and no mass scale plantations.

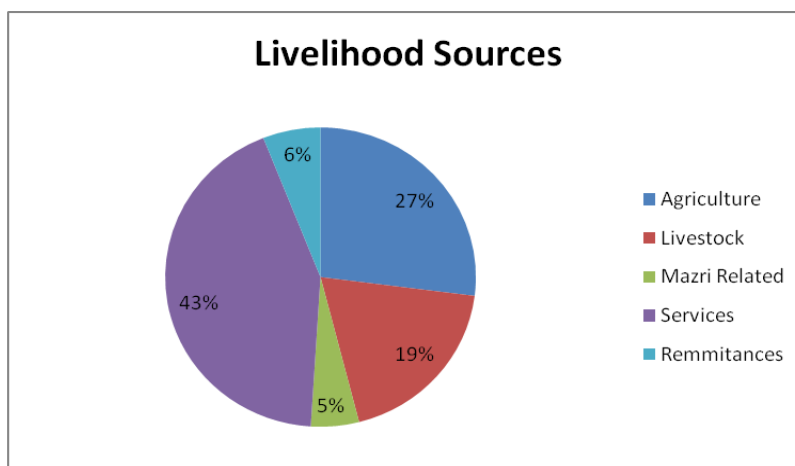


Fig. 2. Livelihood sources at Kohat

The local people of growing area fill the 95% gap between actual growth and the tendered Mazri of that area. They smuggle Mazri leaves from tribal areas i.e. Kurram agency and Orakzai agency either in raw form or in the form of finished product (rope). It is then sold to the contractor who hold tender of that area.

In past, almost ninety percent of the inhabitants of the Mazri growing villages of Kohat were dependent on Mazri and its products for their livelihood. But now the villagers perceive that due to denudation of the communal hillside and over exploitation of the Mazri resource and low price of Mazri products in market has reduce its number to less than 5% who depend on Mazri for their subsistence.

The pie-chart above shows that the locals dependency on different livelihood sources. In general mostly people are dependent on services (Private & govt.) and Agriculture having 43% and 27% respectively while 19% are engaged in livestock rearing. 6% people are dependent on remittances sent by the members of a family working abroad. Whereas 5% are engaged in Mazri related income generating activities and livestock management.

In contrast to above experience the Mazri is increasing in Paniala (D.I.Khan) under local initiatives without any support of the Forest Department, which is a unique, and encouraging experience. People are fully acquainted with the management techniques of the crop. Mazri is raised in association with agricultural crop (Channa). The inhabitants of the area were of the view that Mazri crop is more profitable than agricultural crop (Channa). Therefore, the practice of block plantation of Mazri on agricultural land is readily prevailing among the farmers.

RESULTS

There is a controlled marketing system operated by Forest Department under the Mazri control Rules 2003 in Kohat but still the Mazri is depleting due to the following reasons:

- In Kohat there are a number of shareholders in Mazri markets i.e. a) Contractor; b) Middle man and c) Processors/collectors. The Forest Department issues transit permit to those who export the finished products to other areas of Pakistan. These contactors are either outsiders or have less dependency on the Mazri while the real stakeholders are collectors or processors. They can neither export the finished products to other areas nor can they sell it to other than the shareholders thus the protection of the Mazri resource is not effective.
- The middlemen pay very low price to the real stakeholders (processors) for the Mazri products. They have no resources to get their own permit for export to outside markets thus ultimately the products go into the hands of shareholders through middleman. In this way the shareholders mainly control the price. The poor processors have no other way than to sell the products on the low price offered by the shareholders. So the shareholders/permit holders are the most benefited players of the market.
- Most of royalty is being purchased by the contactors/middleman and shareholders, therefore the processor gets no reward expect few rupees.
- Most of the people are no more interested in the protection of Mazri because they receive only few hundred rupees from the royalty due to increase in the population and family members.

On other hand there is no control of Forest Department on Mazri Trading in Paniala. Forest Department do not issue any permit for transport of Mazri products. Almost all the producers are the processors. There are some poor people who buy the Mazri leaves and process it for different products. They either themselves export these products or sell it to the big contractors who further export it to different areas. In this way the poor producers and processors control price themselves and they enjoy full benefits. Due to this reason the Mazri cover is improving in the Paniala day by day.

Suggestion for conservation of Mazri

- Rotational grazing should be implemented in the area on immediate bases.

- There is a strong need to educate the peoples and create awareness among the local communities about the intangible benefits of Mazri. Effective conservation and extension should be carried out at regional and national level. People should be trained in protection, conservation and rehabilitation of these resources on sustainable basis.
- The local People are the main stakeholders to protect their natural resources from illegal or unsustainable usage and to preserve their environment for a healthy life for coming generation. Therefore, government should support the local communities in conservation, protection and sustainable development of these forests.

CONCLUSION

Majority of the poor people particularly women living in study area are supplementing their household incomes by manufacturing different items from Mazri leaves at household level. Manufacturing of Mazri products is the main stay of these poor families. They get a meager portion of income, which sometimes hardly suffice its cost. The middlemen take the major portion of income. To eliminate the role of middleman, self-sustainable and two way linkages between producers and market players should be developed. Any action, which restricts production of Mazri leaves, will hamper the economy of the communities involved in manufacturing of Mazri products.

The study estimated that Mazri crop is growing over an area of about 24000 hectares of communal land in Kohat Forest Division. The average annual harvest of the area is 42183 mounds. The Forest Department sells this product in open auction and highest bidder is awarded the contract.

The Mazri growing tract including wasteland in Kohat is being shrinking over time because of so many reasons. The inhabitants of the area perceive that more than 95% Mazri resource is being depleted due to various reasons. On the other hand Mazri resource is increasing in Paniala as time passes. Here people are replacing Agricultural crop with the Mazri crop. The study concluded that Forest Department shall play a leading and key role in rehabilitation of the area. It is apprehended that if sound and timely steps are not taken for the rehabilitation of Mazri resource in Kohat, the resource of Kurram and Orakzai Agency will also be exhausted at the cost of filling the gape between auctioned Mazri and the actual resource.

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