

SECURING PASTORAL LIVELIHOODS IN ARID JUNIPER FOREST ZONE OF BALOCHISTAN, PAKISTAN

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Abstract

Juniper (*Juniperus excelsa*) forests of Balochistan, Pakistan are one of the largest remnants of their kind on earth. Subsistence oriented pastoral livelihood of around two million people depends on these forests. This paper gives an analysis of the communities inhabiting the juniper zone and their livelihood sources; and suggestions for resource base improvement. These communities consist of settled/sedentary pastoralists, transhumant pastoralists and nomadic pastoralists. The sedentary community has shifted from pastoral livelihood to agra-pastoral, however, livestock still remains major component of its household economy. Water shortage has emerged as major problem for this community due to prolonged drought conditions and excessive mining of ground water for agriculture. The highest concern of transhumant community is the scarcity of forage and fuel wood at the winter stations. Animal health, prolonged droughts and feed shortage on migratory routes were the major problems of nomadic community. Poor marketing opportunities, high fodder prices, social intolerance and disease incidences are the other important issues. Multipurpose plant species like seabuckthorn and fourwing saltbush together with improved irrigation system and urea molasses blocks as supplemental feed have been identified as viable interventions for livelihood improvement. A policy dialogue is needed to resolve the problems of nomadic community.

Key Words: Pastoralists, livelihood, Juniper Forest, Balochistan, Pakistan.

Introduction

Juniper forests of Ziarat and Loralai districts of Balochistan (25° to 32° N latitude and 60° to 72° E longitude), Pakistan are one of the largest remnants of their kind in the world (GOP, 1992). Historically, these forests extending from the Afghanistan border area and once spread over many districts (Akhtar and Mirza, 2006) have gradually shrunken to 0.140 million ha with approximately 0.1 million ha in Ziarat district and patches in adjoining districts (UNDP 2005). The Juniper forests ecosystem is unique due to its topography, climate and geology and regarded as relic forests and invaluable cultural heritage of Pakistan (Govt. of Pakistan, 2002). It is characterized by steep, rugged ridges (upto 3350 m), arid conditions (annual rainfall 250-328 mm) and high summer and low winter temperatures (UNDP, 2005). Juniper (*Juniperus excelsa*) is extremely slow growing, taking 60 years for a tree to grow 1.0 m in height and 2.5 cm in diameter (PARC, 2002). Despite its enormous resilience, the Juniper ecosystem in Balochistan has naturally degraded over the past decades. Further, the detrimental impact of overwhelming odds such as heavy uncontrolled grazing and removal of wood by the local communities for use as fuel and timber (Govt. of Pakistan, 2002) has been the reduction in the extent of these forests (UNDP, 2005), decline in the population of associated endemic plant species (Akhtar and Mirza, 2006) and poor quality of the vegetation, soil and water within the overall ecosystem (UNDP, 2005).

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In Juniper zone, the livelihoods of around two million people (PARC, 2002) are mainly subsistence oriented and pastoral where pastoralists are fiercely independent and strong willed (Mirza *et al.*, 1996). Traditionally the local economy is based on raising small ruminants mainly sheep and goats whereas agriculture is seen as alternative to pastoralism (Ahmed *et al.*, 2001). The pastoral society is composed of local pastoralists and nomadic pastoralists of Afghanistan with traditional grazing rights. As a matter of fact temporary access rights granted to Afghan refugees (UNDP, 2005) for grazing and fuel wood collection increased pressure on local rangelands. This complexity in socio-economic set up in conjunction with prolonged drought had led to negative consequences for pastoral livelihoods as well as rangeland resource conservation making it a challenging job (Akbar, 1995). For securing their livelihoods under the given scenario, it is imperative to involve the pastoralists in the conservation and sustainable rangeland resource use in Juniper zone. While opting for a particular approach, an understanding of issues of the ultimate stakeholders i.e. pastoralists would highly be useful to devise innovative strategies for diversifying their livelihoods within local socio-cultural bounds. Thus the objective of this study was to identify key issues of pastoral communities of Juniper forest zone in Balochistan.

Materials and Method

This study was conducted in collaboration with the International Centre for Integrated Mountain Development (ICIMOD), Nepal, Arid Zone Research Centre (AZRC), Quetta and local Forest as well as Livestock Departments. Participatory Rural Appraisal (PRA) tools (The World Bank, 1996) were used to highlight the issues and possible solutions of various pastoral groups in the Juniper zone in arid mountains of Balochistan. Major tools used were semi-structured interviews, village and resource maps, historical profile, daily activity profile, problem ranking and observations through transect walks.

Most of the team members were already trained in PRA techniques by the ICIMOD. Since this study was conducted as a follow up of the findings of Jasra *et al.* (2001), the target pastoral communities were settled sedentary, transhumant and nomads. The sedentary pastoralists were located with in Juniper zone over following three districts; Villages of Dargai Zakhpail, Dargai Sargharah and Kuch Amakzai, district Loralai, Khatooka valley (Muslim Bagh), district Killa Saifullah and Chaotair, district Ziarat. The transhumant pastoralists were inhabitants of Chaotair, district Ziarat. The nomadic community comprised 14 tribes who traditionally migrate from Afghanistan to Balochistan during winter. Separate meetings were held with target groups from each community both at winter and summer stations.

Discussion and Conclusions

The largest block of *Juniperus excelsa* is found in districts Ziarat and Loralai. In addition to human threats, mistletoe infestation is advancing among Juniper trees (UNDP, 2005). General description of the ultimate stakeholders i.e. the pastoral communities in Juniper forest zone is as following:

a. Settled/sedentary Pastoral Community

The sample community is comprised total 946 households of various Pashtoon ethnic groups or sub-clause of main Kakar tribe who are permanently settled down with in Juniper zone. The community is the principal end user of community as well as state owned forests (> 53271 ha).

Livelihood Shifts

Livelihood profile of sedentary pastoralists is given in Fig.1. A review of their livelihood development reveals a very interesting scenario over the past 30 years or so. Their subsistence oriented livelihoods used to be entirely pastoral with a little or no focus on crop cultivation. The community engaged itself in rainfed crop production (i.e. wheat, barley and maize) about three decades ago probably for enhanced food and feed security. Later on with awareness, almond orchards were established and dominated the crop husbandry. Incidentally, high disease attacks on almond trees forced farmers to shift to high input apple and apricot orchards. A four year consecutive drought (i.e. 1997-2001) has killed 40 to 70% of apple trees. Eventually, farmers are going back to improved drought and disease resistant almond varieties like 'Talwar Phali' as a coping strategy.

Over the time, irrigation sources (karez and tubewells) were developed, which enabled the farmers to irrigate their orchards and produce vegetables. Farm-to-market roads access promoted commercial production of fruit and vegetables. Eventually, community produce was being marketed to other provinces like Punjab with a tremendous cash flow for previously subsistence based community.

Despite transformation of pastoral livelihoods into agro-pastoral, livestock remains a major component of sedentary household economy. However, the visible impact is on flock size per household (Fig.1), which is currently much smaller than the past. Moreover, dairy cattle is gradually becoming popular among farmers with the introduction of cultivated fodder. Flocks composition did not change and sheep used to dominate goats till the recent severe drought conditions for at least four years (i.e. 1997-2001) when heavy mortality losses mainly in sheep were experienced. Goats were able to survive through this spell because of their browsing ability. Hence a tendency among local pastoralists is emerging to keep higher number of goats in contrast to traditional preference for sheep because of local demand for sheep meat called 'Landhai' during winter. This alternative in flock composition might not sustain because farmers did complain about lower adaptability of goats to severe winter conditions in this region, coupled with lower market prices because of low dietary preference for goat meat by the local inhabitants.

Based on this study it is concluded that a shift from entirely pastoral economy to agro-pastoral economy should be viewed as a healthy transition of a primitive society into civic oriented society and that has by and large facilitated conservation of Juniper forest. This claim may be strengthened by the following arguments;

- a) Flock size per household remains smaller with relatively low grazing pressure mounting on adjoining rangelands.

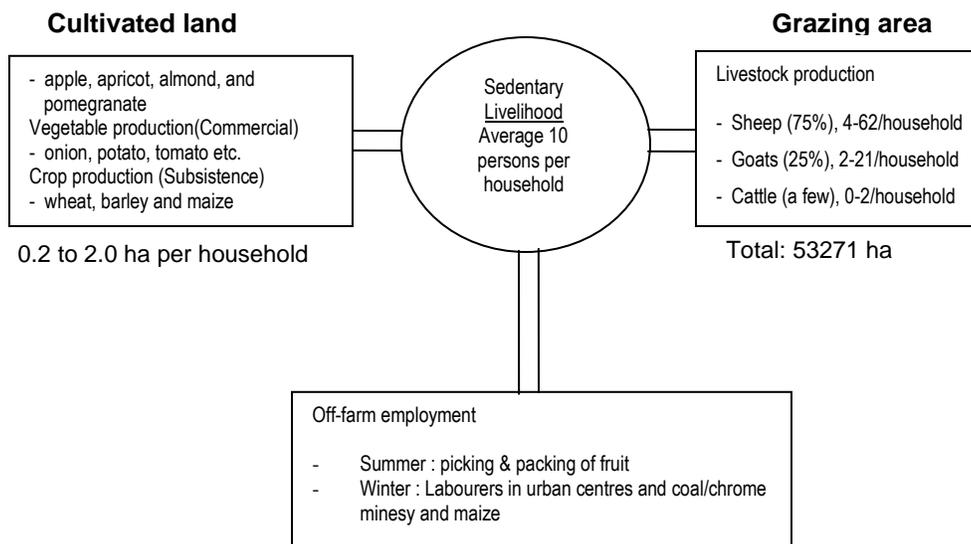


Fig. 1. Livelihood profile of sedentary pastoralists

- b) A very small size of cultivated land per household has not emerged as an encroachment threat to Juniper forest, because of limited water supply from available irrigation sources.
- c) This limited farm level irrigated cultivation is supplying fodder as well as crop residues for household livestock, hence helping to alleviate grazing pressure on Juniper zone.
- d) The cash addict farmers under the scenario of intensive commercial fruit (apple and apricot) and vegetable production would not return to pastoral livelihood, hence demanded loudly employment opportunities from government. Further more heavy flock losses during prolonged drought period asked for rebuilding of flocks with huge cash investment.

Although it was a quantum jump by the community from subsistence to commercial production but with little resilience. Puzzled minds due to endangered livelihoods were desperately looking for government jobs, another solo flight for securing livelihood. As a matter of fact, majority of sedentary pastoralists are illiterate and unskilled, hence they could be offered only labour jobs. Qureshi and Akhtar (2004) have also reported similar kind of perceptions of drought at household level, its impact on agriculture and coping strategies at household level in Balochistan.

Problem ranking

The community was invited to rank their problems (Table 1). Under post drought scenario water shortage was highest ranking problem. It was understandable because >

70% of their main irrigation sources (i.e. karezes, springs) had dried up and discharge from remaining was considerably reduced. Consequently, the household economy based mainly on fruit and vegetable production collapsed. It was common perception among community that their livelihood was strongly linked with sustainable water resources. Thus, the community unanimously demanded construction of delay action dams (DAD's) for enhanced underground water recharge and installation of tubewells under subsidy scheme. However, Altaf *et al.* (1999) reported silting up of majority of > 100 DAD's already constructed in Balochistan and alarming depletion of underground water resource due to multiplying number of tubewells in the province.

Table 1. Problem ranking by sedentary pastoralists

Problem/Issue	Ranking
Water shortage	1
Poor/No health services	2
No school (girls)	3
Other social services (electricity, roads etc.)	4
Poor rangelands	5

Poor health care facility was second biggest concern. It also included veterinary cover. Patients and sick animals were being treated with indigenous herbs with little recovery. In case of complications, farmers travel to city centers. Third demand put forward by the farmers was girls school alongwith up-gradation of boys schools. It indicated a promising shift in thinking of a primitive society where female education was almost prohibited. Similarly, the community was keen to avail other quality social sector facilities like good roads, uninterrupted power supply, telephone links and playgrounds for youngsters. Conclusively, there was great attraction for urban life style as generated due to frequent interaction with urban dwellers under commercial livelihood dealings.

Rangeland improvement was least priority of the community. Fuelwood collection from rangelands and juniper forest was no problem for the inhabitants. The radius of fuelwood collection for any settlement was 8 to 10 km. In general, the community owned ranges/forest are degraded, however, state forest is relatively in good condition where community grazing is conditional to a monthly fee/animal head. Local pastoralists mostly do not allow Afghan nomadic pastoralist to enter their ranges to prevent degradation as well as disease spread from migratory flocks.

b. Transhumant Pastoralists

Transhumant pastoralists are families from settled community who practice winter migration to relatively low lands due to harsh winter and shortage of animal forage. They would migrate from their summer station (i.e. Juniper forest zone) in October and come back from their winter station (Sibi and Harnai area) in March. Although transhumants own orchards in Juniper zone but their mainstay of livelihood is livestock (i.e. sheep and goats). They do keep camels and donkeys for transportation of fuelwood, water etc. Flock size is relatively larger than sedentary households.

Waraichi, saichi and Wuchwani tribes from district Ziarat are migratory. Four to five families would jointly hire a truck for transporting their luggage and family members to winter station. One or two members would stay back for look after of orchards. Whereas one or two male members would travel on foot alongwith livestock and graze their flocks along routes till they reach their final destination. Migratory routes of transhumant pastoralists is given in Fig. 2.

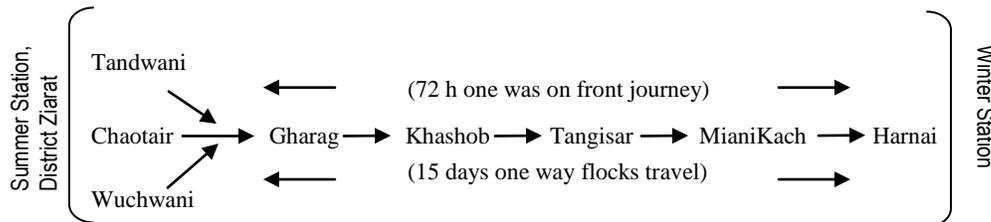


Fig. 2. Migratory route of transhumant pastoralists

Livestock is reserve bank for transhumants. They sell their animals as cash need. Drought had caused heavy mortality in their flocks. As a coping strategy, they had added lactating cattle in their livestock to enhance family income by sale of milk. At winter stations, transhumant labour force (both men and women) work as daily paid labourers on local agricultural fields to harvest/pack vegetables and weeding of crops fields. They would collect weeds and vegetable waste to feed their animals in lieu of daily wages. Daily labour wages supplement their income by not more than 10-15%.

Livelihood Issues

The biggest concern of transhumant was rapid depletion of forest and rangelands at winter stations. They complained that private land owners were cutting down trees and converting grazing lands into crop land. In their opinion, most of this activity has taken place during the last two decades. Alongwith forage shortage they were facing great difficulty to collect fuelwood for daily use. Consequently transhumant community was under pressure to reduce their flock size. A few of them had already shifted to fattening activity through stall feeding for opportunistic marketing like Eid-ul-Adha. They were buying forage trees for lopping @ Rs.50 - 60 per tree to feed their animals alongwith oat grains @ 500 g/day/ animal as feed supplement for certain period. These findings closely agree with the results as reported by Qureshi and Akhtar (2004).

c. Nomad Community

Nomadic pastoralism has been one of the great advances in the evaluation of human civilization. The Afghan nomads along with their flocks keep moving throughout a year. They pass through Juniper zone and graze along migratory routes during winter on their way to Sibi, Harnai etc. in search of forage for their livestock. During this study 14 nomad tribes were listed and included Aka Khai, Sulaiman Khail, Safai, Umer Zai, Daulat Zai, Shinwari, Kharotti, Dotanai, Jigai, Tarkai, Mir Zai, Maryani Lilizai, Mala Khail and Niaz Zai. All tribes have a separate identity and can be recognized by a distinct structure of house tent. They usually migrate in groups of same tribe. Average size of nomad

family would be 7 members. Literacy among nomads is negligible. Majority lives below poverty line.

Migration routes

Routes of migratory pastoralists have been outlined by Jasra *et al.* (1999) and Jasra *et al.* (2001). However, in this study nomads mentioned four different entry points from Afghanistan Balochistan, Pakistan i.e. Lashkarga, Hazarajat, Badeeni and Nakhas. They start migrating in August and arrive at their destination in Balochistan (i.e. Alambar, Harnai, Sibi etc.) by mid October where they spend almost five months. Backward migration takes place in March and the nomads reach their origin in Afghanistan with in a month and a half. The migration depends absolutely on rainfall and routes may be shorter or longer in some cases depending on availability of forage for their animals.

Livelihood

Nomads depend solely on livestock i.e. sheep, goats and chicken. Usually a nomadic flock comprises 200-500 sheep and goats. However, >50% mortality in flocks was reported due to prolonged drought. There were 5-10 chicken with a family to serve guests. It was revealed that about 60% of nomads were working as labourers on fields, at construction sites to earn family bread as a consequence of flock losses. A modest earning of Rs.2000/- per month per family from labour job was reported. This phenomenon may lead to permanent shift of livelihood among these nomads because rebuilding of flocks asks for huge cash investment. This motivation/scenario may cause a big blow to centuries old nomadic lifestyle. This information confirmed the findings of Jasra *et al.* (2001).

Usually nomads graze their flocks on open state/communal grazing lands under no tenure system. However, it was reported that since mid 70's, tenure system had been introduced in some previously open lands. Under this tenure system, a group of nomad pastoralists (6 to 8 families) would acquire a piece of grazing area on lease @ Rs.40-60 thousands for a period of four months as winter station. This practice is causing severe vegetal degradation (grazing plus fuelwood collection) leading to base ground situation, as observed by the survey team.

Issues of Nomadic Pastoralists

Nomads listed their following issues;

- i) **Drought:** Drought had caused severe losses to their livelihood and lifestyle
- ii) **Tribal conflicts:** Nomads have developed conflicts with en-route local tribes. These conflicts have forced them to change their historical migratory routes with extra hardship.
- iii) **Animal theft:** Animal theft in lowlands is emerging as headache for nomads and they don't get any support from local administration in this regard.

- iv) **Poor marketing opportunities:** Forage used to be free for nomadic flocks. Under land tenure arrangements, invariably each nomadic pastoralist needs to spend heavy cash for buying forage for his flock. Whereas sheep get low market price in lowlands because of low preference for sheep meat among local people in Sibi and other lowland areas.
- v) **High fodder price:** Since grazing areas are badly degraded, nomads buy sorghum from local farmers who exploit the weaknesses and charge very high price.
- vi) **Social intolerance:** As compared to two decades ago, the local community is presently less accommodative and respectful to nomads. In case of any incidental trespassing of nomadic animals into local fields, the reaction of local farmers would be violent.
- vii) **Diseases:** Incidence of diseases in nomadic flocks at winter station was very high, mainly because animals become exhausted after a long journey and also become weaker due to low forage availability along historical migratory routes. Anthrax was reported as common disease of both nomadic sheep and goats. Moreover, local veterinary cover is negligible for nomads. They complained that their indigenous knowledge of herbal medicine had eroded as they became used to modern and expensive medicines.

Securing Pastoral Livelihoods

Vulnerability of pastoralists had been exposed by the prolonged drought. Any recurrence of drought would certainly subvert the pastoral livelihoods unless preventive measures are put in place. We need to reconstruct the resilience of pastoral economy mainly by conserving and sustaining the natural resources i.e. water and forage. For this purpose following set of integrated measures is being proposed for all three pastoral categories;

I. Sedentary and transhumant pastoralists

Issues

- ❖ Rapidly depleting water resources – threats to commercial fruit and vegetable production
- ❖ Chronic forage shortage – unstable pastoralism
- ❖ Fuelwood collection – endangering Juniper forest
- ❖ Raw and unskilled labour force

The above mentioned first three issues could be addressed in one go i.e. range/watershed improvement with only two wonder plant species i.e. seabuckthorn (*Hippophae rhamnoides*) and fourwing saltbush (*Atriplex canescens*). Seabuckthorn

should initially be introduced within riparian zones whereas large scale plantations of fourwing saltbush raised throughout Juniper forest zone. The Arid Zone Research Centre (AZRC), Quetta is already promoting both plant species among farmers. These species are known to handle water runoff by improving groundwater recharge, provide good palatable forage for all classes of livestock, withstand very high stocking rates and supply good fuelwood.

Water mining in Juniper zone should be checked by allowing tubewell irrigation only through drip and sprinkler irrigation systems and use of tubewells for flood irrigation should be banned. Availability of irrigation equipment on affordable rates should be ensured. On farm water management practice as being introduced by the provincial government should be made mandatory for any type of flood irrigation.

Currently available forage resources must be supplemented with the promotion of balanced and cheaper animal feeds among farmers. Urea-molasses blocks would be ideal technology to be promoted during winter.

Very well targeted sensitization regarding collection of fuelwood without damaging Juniper trees and other plants as first step of awareness campaign. As a parallel measure, fuel efficient cooking stoves/utensils, liquid petroleum gas cylinders, solar heating etc. as replacement of fuelwood must reach to farmers with all possible incentives.

Raw and unskilled labour force demands an immediate policy attention. A 'Vocational Training Centre' may be established in Juniper zone to train the youth in post harvest market preparation/value addition, ecotourism, veterinary paramedics, nursery development etc.

II. Nomads

The challenging issue is the current status of nomads. Nomads are very unlucky because they are not owned by any government as well as local people. They are viewed as natural resources destabilizing force and are virtually deprived of social sector development. They are blamed for disease spread in local flocks and severe depletion of grazing lands. On the other hand, administrative boundaries of various countries have no meaning to nomads because their profession and lifestyle is centuries old whereas regional governing laws and administrative rules have emerged as threats to their historical livelihood. These irritants on either side are leading socio-cultural intolerance and conflicts. Conclusively an undefined status of nomads is fostering all their issues. At this stage, a policy dialogue is needed to resolve this issue once for all, and should provide a platform for landing of the technical solutions to induce socio-economic development within nomadic community.

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