

Juniper Forest in Balochistan, A National Heritage At The Verge Of Elimination Due To Urbanization Is In Need Of Sustainable Development

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Abstract:

Ziarat, a beautiful valley with the Juniperous excelsa forest is unique being the 2nd largest Juniper forest throughout the world, the first largest is in California. This is the only compact forested area in province of Balochistan, Pakistan which is otherwise a forest deficient area. The juniper evergreen trees are one of the slowest growing trees in the world and are often called 'living fossils' for having trees as old as 2500-3000 years. In the current study extensive survey of five different densely populated areas of the forest were made. The impact of urban population of the area assessed through collection of data on the intensity and percentage of different forms of injuries (stem cutting, debarking, branch cutting, lopping, pruning, burning etc.). A Participatory rural appraisal (PRA) study was also conducted to draw conclusions on the living standards of the local population. The study revealed extensive anthropogenic injuries to the juniper forest and direct deforestation in densely populated areas. These injuries are responsible for not only death of trees due to weakening but also renders the trees vulnerable to fungal, insect and other parasite attacks which ultimately result in the death of the trees especially older mature trees and reducing the chances of regeneration of the young trees. On the basis of the findings of the current study it is concluded that there is a great need for training of population on the subject of sustainable development and regulation from line agencies for sustainability of the unique juniper forest of Ziarat.

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KEYWORDS

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Introduction:

Today 500,000 hectares forest vanishes in a single week, there is no one easy answer as there are many causes at the root of deforestation. One is overpopulation in cities and developing countries. Population is continually growing in the third world. Some had land until increases in population forced them off it and they became landless peasants that are forced to look for land in the untouched forests. [Population growth](#) and [urbanization](#) are amongst the root causes of deforestation (Anonymous, 1998).

Since centuries the local communities are dependent on forests for fuel wood, shelter, grazing, and collection of medicinal plants. The other additional values of the forest like; xeric nature, very long life, survival mainly due to vegetative multiplication, monumental and heritage significance, watershed, scientific, educational and recreational (Musakhil *et al.*, 2007).

The impact of browsing on vegetation depends on the relative density and species composition of browsers. Herbivore density and plant damage can be either site-specific or change seasonally and spatially. It has been assumed that plant damage investigated at different temporal and spatial scales would reflect selective herbivory (Gábor, *et al.*, 2008).

Juniper is a large genus of about 25 species, four of which are found in Pakistan and India in the Himalayan Mountains including the one spreading down south to Balochistan. The only species found in Balochistan province is *Juniperous excelsa* (Himalayan Pencil Ceder). It is a small or medium sized tree with reddish brown fibrous, vertically fissured bark, exfoliating in fibrous strips (Champion *et al.*, 1965).

Junipers are found in Ziarat, Loralai, Pishin, Killa Saifullah, Kalat, Quetta and Mustang Districts of the province covering approximately an area of about 121457 hectares., Rao (1991). The largest component block

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of Juniper lies in Ziarat district covering an area of about 100,000 hectares. The associated flora and fauna in these forests are unique in certain ways. The area falls under dry temperate climatic zone with an average snow and rainfall of 328-mm/ year and is characterized by extreme cold during winter. Temperature ranges from -16°C to 20°C . Snow falls from December to March but due to continuous drought prevailing in the area as well as in the province since last five years, the snowfall is almost vanished and the summer season is very pleasant in the area. The elevation of the juniper forest ranges from 1980- 3350 meters. Horticulture practices not only resulted in deforestation, it also led to excavation of ground water. The heart rot fungus attacked Juniper forest. Partially decomposed litter is found only under trees and bushes. Therefore, anthropogenic activities appear to play an important role in shaping the vegetation of the area (Bazai *et al.*, 2006).

The current study conducted in District Ziarat gets a hold to investigate the cultural aspects, local myths, livelihood pattern and people's behavior towards plants by the use of different tools like Questionnaires, Semi Structured Interviews (SSI), Focus Group Discussions (FGDs) etc. of Participatory Rural Appraisal (PRA). The methodology is interacting with the community, understanding them and learning from them. It involves a set of principles, a process of communication and a means of methods for seeking village women's participation in putting forward their points of view about any issue enabling them do their own analysis with a view to make use of such learning (Mukherjee, 1994).

The current study is also multidimensional in results that comprise conducting a scientific based study to know the anthropogenic impact on natural resource in consideration of socioeconomic conditions within their traditional value and norms of dealing with it.

Material and Methods:

Tools of Participatory Rapid Appraisal/Assessment (PRA)

- Reconnaissance was conducted of five study areas named Zangoon Jangle (ZJ), Warkai Zazri (WZ), Nishpa (N), Ambaar Zawar Sar (AZS), and Salih Sakhobi (SS) in district Ziarat to consult the notables and head of the villages where research was planned. Subsequently to find out the existing socio-economic conditions of residents of area given Participatory Rural Appraisal (PRA) qualitative tools were employed for information collection:

- Interviews and Discussions:

- Individual Interviews
- Key Informant Interview
- Group Interviews
- Social map
- Focus Group Discussion
- - Direct Observation
 - Questionnaire Survey

- An extensive survey of the area conducted to find the community's impact on trees with physical damage
- The collected information analysed both theoretically and statistically subjected to the statistical analysis for better interpretation by calculating means and standard deviation (Steel & Torrie, 1980) and SPSS, one way ANNOVA.

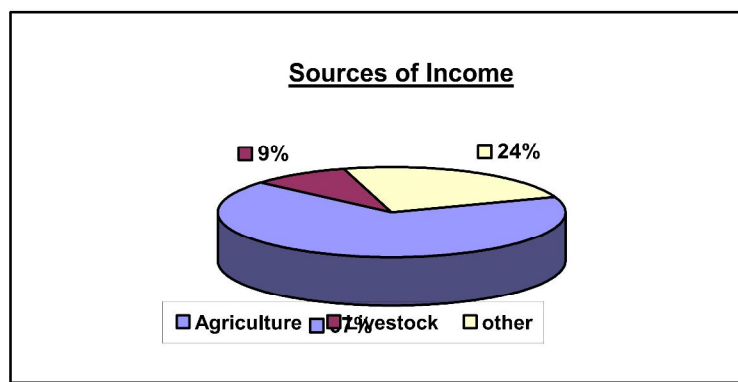
Results and Discussions:

The socio-economic conditions of the area and dependency on Juniper forest was assessed by using different tools of PRA and survey of the area. Results showed that the community is deprived of the basic requirements of life like, clean drinking water, gas for energy in winter, health facilities, telephone, educational institutes etc. The community is totally dependent on the forest for their different needs. Clean drinking water is only a dream for the inhabitants of the villages the females of the community fetch water for household purposes.

The community is mostly dependant on the medicinal plants and berries of juniper for treatment of diseases as the allopathic medicines are mostly unavailable and poor communities are not capable of taking patients to

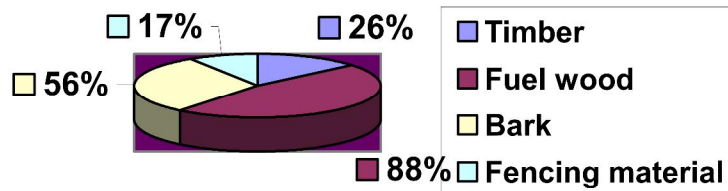
other cities for proper medical treatment. The estimated population growth rate in the area is about 5.7% per annum which is alarmingly high and the lack of education and other factors indicate the rate of population growth would increase in the coming years.

“Figure1: Average Income sources of the community in percentage”



The major source of income is agriculture but only a few people are land owners most of the farmers are tenants. On Average in the five villages 67% of the income is earned from the fruit orchards (forest land converted to agriculture) and nearly 9% income source is from Livestock rearing, while the rest of 24% income sources are trade, services and labor.

“Figure 2: Showing Percentage of Different Uses of Juniper Tree’s Wood by the Community”



The data clearly indicate that community consumption of the wood products is way too much than the regeneration capacity of the forest and the situation is further aggravated by the smuggling of the juniper wood and natural and other anthropogenic changes in the environment.

The data on forest wood products was collected by using PRA technique of Focal Group discussion (FGDs) and a group of 20 persons from each village were selected and a discussion was generated separately in each village on the consumption of wood. 26% of community on an average used 20 logs per year. A large proportion of community population i.e. 88% used forest wood for fuel, and it is obtained in different forms for instance; by cutting the stems or branches. The consumption of fuel wood per person in a year is near 356 Kg. Moreover 56 % of the local population vowed to use the tree bark of the Juniper trees that make the trees vulnerable to diseases and death ultimately. Another use of Juniper trees is for making the fencing material around the cultivated area and 17% of the population (farmers) used 57 poles per year.

The data clearly show the dependency of the poor community on the forest resources which are over-exploited by the communities as the

poor and uneducated communities of the area are unaware of the importance of the forest for their own livelihood in future.

Medicinal use:

The women have a major role in preserving the ethno-botanical knowledge about the local herbs and their usefulness which is useful knowledge and a cultural and historical heritage. But the alarming issue here is that the local communities of the area consider the plant resources as limitless and they use the plants beyond their natural regeneration capacity. Many plant species were found to face the threat of extinction in the particular locality which would be a loss to the people of the area and the entire world. The community and especially women who use the local wild herbs are uneducated. Thus they have no knowledge about the importance of conserving the plant species by growing them domestically or commercially.

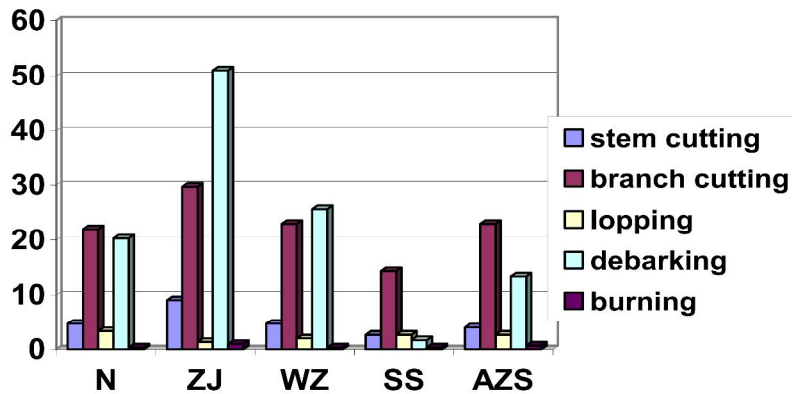
The community used the medicinal plants for treating some common illnesses like cough, cold, stomachache, pains etc in contrast some serious diseases like asthma , High Blood Pressure, Diabetes etc are also treated using the medicinal plants from the valley. Plant resources of Ziarat face rapid decline due

to their conventional uses by local people. These plants need ex-situ and in-situ conservation. The community must be trained regarding collection of medicinal plants and their marketing.

Anthropogenic impact on Juniper Forest: Physical injuries and Deforestation;

Data on different types of physical injuries i.e., tree cutting, branch cutting, removal of bark, lopping and burning injuries by fire were collected in three plots at each of the five study areas named Zangoon Jangle (ZJ), Warkai Zazri (WZ), Nishpa (N), Ambaar Zawar Sar (AZS), and Salih Sakhobi (SS). . The data were subjected to one way analysis of variance and statistically significant variance was found in different types of injuries in different areas.

“Figure 3: Different Anthropogenic impact on forest trees (Physical Injuries and Deforestation)”



N.	= Nishpa	ZJ. = Zangoon Jungle	WZ.
	=Warkai Zazri	SS.=SalihSakhobi	
AZS.	= Ambaar Zawar Sar		

It was difficult to calculate the individual injury of the juniper trees because most of the trees showed more than one type of injury at a time e.g. lopping, branching and debarking could be seen in the same tree. In the above graph it is indicated that the most trees suffer removal of bark and branch cutting injuries while lopping and burning injuries were found to be present in relatively small numbers of trees. The values presented in the above graph are average values calculated for each type of physical injury from three plots for each area. These physical injuries are a result of the community activities the tree bark is used for thatching the roofs of the huts and branches are cut for obtaining the fuel wood.

In addition to the community activities like direct cutting of tree damage by livestock can also be noticed which a major source of income

is for the poor communities of the area. People are dependent on the forest products not only themselves but also for the fodder of their livestock because the forest grasses and herbs are the only source of fodder for the livestock. All the above discussed types of physical injuries are responsible for the weakening of the trees and the trees which are very old cannot tolerate the changing harsh weather conditions of the area and ultimately die thus the deforestation rate can become much more than the already alarming rate of 8.9%. The injured trees become more vulnerable to parasite attacks. The seriousness of the situation can be predicted from the data presented.

Conclusions:

The above discussion clearly indicates the community's interruption with the juniper forest in Ziarat has a drastic impact due to dual threat of nature and human activities. Natural activities include biological agents including diseases and the prolonged drought plus human pressure. In addition to human and livestock pressure, the prolonged drought in the last 10 years has encouraged the parasitic plants and insects to further deteriorate the condition of the already fragile and vulnerable Juniper forests. The regeneration is very rare or almost nil due to the unfavorable natural environmental conditions as well removal of berries from the forest ground by the community. The very existence of the forest is threatened by no regeneration and degradation of the old trees.

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