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# Operation Khejri (*Prosopis cineraria*): Beneficial for environment and Earnings

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#### ABSTRACT

Khejri (Prosopis cineraria) is the state tree of Rajasthan. It is a multi annual and native tree of the desert area. It is a holy tree and useful for traditional and medicinal purpose. The paper is based on an intense survey on present status and beneficiary aspects of Khejri (Prosopis cineraria), in Dharasar Ka Tala, in Barmer district (Rajasthan) in the year 2018-2019. 50 farmers of this village were randomly selected for personal interview and group discussion. All the information was collected through open ended questionnaire and extensive use of probing technique and funnel technique for data collection. The data were quantified by using frequency and percentage analysis. The result shows that Khejri trees are beneficial for the environment and make a basic source of income for the farmers. It is a leguminous, xerophyte tree which holds environmental nitrogen and makes the soil fertile. It binds sandy soil in its long penetrating roots thus help in preventing desertification. The tree provides natural habitat for many animals and birds. Its pods "Sangri" is used both fresh as well as dry for vegetable and sell in market on high costs. The pods are enriched in fibre content and protein and famous in the international market as an ingredient of "Panchkoota". It fulfils nutritional requirements of the people in the region. Its bi-pinnate leaves are used as fodder for pet animals. Thus the tree is beneficial for environment as well as a source of income to the farmers in the area. Ganoderma fungus, termites and farming through tractors are the main challenges for its existence.

*Keywords:* Prosopis cineraria, multipurpose tree, environmental benefits, nutritional value, source of income, challenges for the tree.

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#### INTRODUCTION

Prosopis cineraria (L.) (Khejri) belongs to family Leguminosae is native to arid portions of the Indian subcontinent including Afghanistan, Bahrain, Iran, India, Oman, Pakistan, Saudi Arabia, The United Arab Emirates and Yemen [1]. It is a desert tree having height of nearly 10-25 Ft. Leaves are scattered and stripy along its branches. This tree is also known as the state tree of Rajasthan or "king of Desert" [2] or "the Golden tree of Indian Thar Desert" [3]. Flowering occurs in racemose pattern during February - March and the fruits "legumes" during April-May. In Rajasthan there is a common practice to harvest the green pods [4]. Dry pods helps in preventing protein calorie malnutrition and Iron Calcium deficiency in blood [3]. All communities residing in the Thar Desert worships *Prosopis cineraria* (L.) (Khejri) as holy tree. Nearly 250 years ago 363 Bishnoi people sacrifice for saving this tree in Jodhpur district of the Western Rajasthan. Now-a-days too Bishnoi villages in Barmer district can be easily identified by presence of numerous Khejri tree in their fields [5] (Plate 1). Leaves of *Prosopis cineraria* are widely used as fodder for domestic and wild ungulates. Due to high calorific values of leaves and pods animals in the early morning can be seen in herds under this tree for getting their food. Pods due to having high nutritional value [6] collected by local people in unripe stage. They consume it as traditional diet. They use the pods either in fresh form or boil and dry in sunlight and then use it for making vegetable "Panchkoota" or keep it for selling purpose. Dry pods on the tree are also collected and consumed directly as "Khokha" [7]. Its bark and twigs are used for holy purpose "Hawan" for keeping the environment pure. Its bark was found useful in making chapattis during the long famine periods in the Desert area [8, 9], consumed by poor people to keep them alive. So the tree is worship as a holy tree in Rajasthan and attach with many folk songs and stories. Thus it has become immense significance of the cultural, social and traditional lives of the local people [10]. The tree also provides resting and nesting sites to many organisms [11]. The tree holds the loose sandy soil and hence prevents desertification. It is also helpful for growing other plants under and near it thus it improves soil

fertility [12]. Main challenges responsible for the mortality of Khejri tree are root borers in Rajasthan [13]<sup>J</sup>. The purpose of the present study was to access the environmental impacts, economic benefits and challenges for Khejri, *Prosopis cineraria* in the Thar Desert of Rajasthan.

## **MATERIAL AND METHODS**

**Study site:** Dharasar ka Tala is 50 Km away from the Barmer district headquarter (Figure 1). It is situated on state highway No. 40 and was chosen for this study. The study site is located between 25°51'N to 71°41'E having total geographical area of 5.94 Km<sup>2</sup>. Human populations according to 2011 Indian census was 879. **Method:** The present study was conducted during the year 2018-2019 with the objective of accessing the environmental and economic benefits of *Prosopis cineraria* and challenges. 50 farmers from the study site were randomly selected for personal interview and group discussion. All the information was collected through open ended questionnaire and extensive use of probing technique and funnel technique for data collection. The data were quantified by using frequency and percentage analysis.



Figure-1. Barmer District map showing Dharasar ka Tala, intensive study site. Dharasar ka Tala and nearby villages. [NOT TO BE SCALE]

## RESULT

Operation Kheiri means plantation and protection of Kheiri. Responses of farmers (n=50) shows that Kheiri is a multi annum tree, once successfully grown it remains productive for a long time, as its average age is nearly 80 years. It is xerophytes, endemic to the Thar desert. Its roots penetrate to nearly 5 meters deep in the soils, it binds sandy soil particles thus help in preventing desertification. It is a leguminous tree, that traps atmospheric nitrogen, thus increases soil productivity. During questionnaire it was found true, as per discussion Rohira (Tecomella undulata) and Kumat (Acacia Senegal) checks the growth of other plants under and near the tree but Khejri tree helps to growth of other plants under the tree. 92% farmers responded to bird nesting on the Khejri positively whereas some added that Vilayati babool (Prosopis juliflora) is not suitable for bird nesting. 86% have seen Calotes, Varanus and other lizards on the tree either for food or for residence. Birds like parakeets, woodpeckers, owls were also noted in hollow parts of the stems. Various species of ants were noted (78%) below the Khejri tree. 98% farmers accepted that leaves and pods are the most favourable food for the wild mammals (Plate 1), as their herds can be seen in the early morning hours below the trees. 82% farmers informed that during famine period, their elders were remain alive during starvation by consuming bark of Khejri tree in the form of chapattis by mixing powder of it with Bajra flour. 56% farmers found termites as a challenge for growth of this tree. Although challenge from Ganoderma was not noticed by farmers but they found the highest challenge (98%) from farming with tractors. They added, as roots of the tree cuts from deep penetrating blades of tractors so its age go to decrease. They also suggested growing the tree on the boundaries of the fields (Table-1).



Plate 1 (A&B). Khejri, Prosopis cineraria tree in the field.



Plate 2. Khejri, Prosopis cineraria has flowers and fruits.

Character	Kind of response	Percentage
Average age of the tree	Nearly 80 years	70
Roots penetrates in the soil up to	frequency nearly 5 meters	82
Help in growth of other trees	Yes	100
Nest on the tree	Found often	92
Animals in the hollow stem	Reptiles and birds	86
Animals below the tree	Ants	78
Available food to wild animals	Most favorable food for wild animals in the form of legumes and leaves	98
Food to people during famine period	Bark of the tree was also used for making chapattis	82
Challenges from termites	yes	56
Challenges from Ganoderma mushroom	Not noticed	78
Challenges from farming through tractors	Highest	98

Table 1. Environmental benefits and challenges for Khejri, *Prosopis cineraria*. (n=50)

# Table 2. Economic benefits assessment for Khejri, Prosopis cineraria. (n=50)

Character	Kind of response	Percentage
Production of Sangri / fully grown tree	Nearly 100 kg /year	82
Production of fodder/ fully grown tree	frequency 1 quintal each time & 3 times in a	88
	year	
Uses of Sangri	Green & unripe, boiled & dried and riped &	100
	dry	
Estimated income from /annum from a fully	Rs. 20,000-30,000 /year	92
grown tree		

Economic benefits (Table-2) clearly shows that 100 kg Sangri and 300 kg fodder in the form of green and dry leaves may be collected from a fully grown tree in a year. Sangri was used by all farmers in the form of green and unripe (Plate 2), boiled and dried, ripped and dried. It is found rich in fiber and proteins. It is sold in market (Plate 3) on high price and found to be famous in international market as ingredient of "Panchkoota". Thus from a fully grown tree one may earns 20,000 to 30,000 per year, it can be a permanent source of income for farmers.



Plate 3. Marketing of Sangri.

# Future needs:

Plantation of Khejri.

- ➢ Conservation of Khejri.
- Research work on Kheri.

# **Recommendations:**

- Sovernment departments should encourage the farmers to plant Kheri.
- Sovernment departments should provide higher yielding variety of Khejri plants.
- > Bank loans should be provided to farmers for plantation and protection of Khejri.
- Government should encourage research work on beneficiary aspects of Khejri.

Gaps in research: Challenges for the Khejri tree *Prosopis cineraria* in the Thar Desert needs to further study.

## CONCLUSION

*Prosopis cineraria* is a endemic and multi annum tree in the Thar Desert of Rajasthan. It is the State tree of Rajasthan. Farmers use its dry leaves as fodder for their animals and also sell for commercial purpose. Its pods (sangri) are well known for making "Panchkoota" in the international market. It is also useful in sand dune stabilization as its roots penetrate deeper in the soil. Its dry branches and bark are used for holy purpose and fuel; it provides shadow and shelter to many animals. It is helpful in environment conservation as well as provides economic benefits to the people (farmers) in the Thar Desert of Rajasthan.

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#### CONCENT OF PUBLICATION

Not applicable.

# **COMPETING INTEREST**

The author has no competing interests.

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