

Usage of Wild Trees on Private Farm Land in Spate Irrigated Areas



Practical Note



Flood-Based Livelihoods
Network Foundation



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Introduction

The biodiversity of flora varies with different ecological, climate zones, weather zones and altitudinal differences from one place to another hence the green cover like bushes, trees and grasses also differs in different topographies. This practical note generally deals with the wild trees on private lands in spate irrigated areas of Pakistan, with a particular focus on spate irrigation in Kachi Plain. It has been observed that spate irrigated areas in Pakistan are alike in nature e.g. crops, birds, trees, and grasses. Animal rearing is the same though with differences in species. All spate irrigated areas in Pakistan are arid and depend on seasonal rains and floods. These are semi-tribal areas occupied by different Baloch and Pashtoon tribes, start from the city Dera Ismail Khan in Khyber Pakhtunkhwa to Dadu city in Sindh Province and Balochistan.



Figure 1: Approximate area of Kachi Plain in Balochistan, Pakistan (source: Seshat Bata Browser)

A large part of South-western Balochistan is dependent on spate irrigation. The useable tree species that grow here include Bair (Zezophus), Kikar (acacia), Kandi (prosopis cineraria), but they have no significant economic value. Most of these trees are used locally to make doors, windows, animal sheds, domestic fuels or sold partially and transported to cold areas, where it can be used to make firewood for heating purposes. All trees in spate irrigated area are naturally grown and rather purposeful agro-forestry. Bushy trees also grows in the spate ecologies, of which tamarisk and mesquite are most common, which protect land from flood erosion. Tamarisk is a riverine plant that grows mostly along rivers, natural depressions, and irrigation canals.

Trees that grow on private land are owned by the individual households and they households have the rights to use, cut and sell the trees. The leaves of the trees are mostly fed to goat and camels. All spate trees contribute to the protection of soil from flood and wind erosion as well.

This practical note provides an overview of the trees that can commonly be found in the spate irrigated areas in Pakistan, providing an overview of their characteristics and uses.

1 Acacia

Acacia (Albizia lebbek) locally called Kikar or Babool is a wild tree that usually germinates after the monsoon rains from the scattered seeds that are carried by the floods during water applications to the lands. This is contrary to the Sindh Province where farmers grows acacia on the farmland, which is not suitable for the seasonal crops like wheat, barley, cotton, sugarcane and fruit gardens. In Kachi plain (Balochistan), farmers do not like this tree on the assumption that it decreases the fertility of soil and prevents other crops from growing in its neighbourhoods. Premature acacia plant are thorny, possibly to protect themselves from the animals. When the tree matures, it has no thorns. The leaves and twigs are only consumed by goats and camels but not with greater likeness.



Figure 2: Acacia Trees in the Spate Irrigation areas of Kachi plain (Picture: Allah Bakhsh)

In farm land, the acacia trees take about 7 to 10 years to mature and are then sold to traders from other places. The stems and branches are black in colour and it bears yellow flowers in the month of October every year. Large trees make Rs:5000-10,000 (\$25 – \$50) each depending on age, size and net wood yield. The traders cut it in

to different sizes for use in various purposes, for example, making fire wood and beams. The acacia beams are considered to be strong enough to bear structural weight in the coal mines that protects them from collapsing. Other parts of this tree are cut into the pieces and used as fuel wood. At local level, low quality furniture in cheaper rates is made from the wooden planks of this tree, utilized by the rural communities. In addition, another use of this tree can be seen around villages, and inside household premises where during intense heat of summer it provides cool shade for animal and human.

Cutting of this tree around the places near the village is not appreciated and people keep them for the purpose. From the far view, the group of trees is the sign of presence of human settlements nearby. The tree shed leaves in June-July and turns green after seasonal rains. The dry pods of this tree are eaten by the animals in rangelands. Honey of the acacia flowers is also famous in the flowering season. The exudate gum of this tree is referred to as gum Arabic and gathering of this gum has been practiced from the paranoiac times for the manufacture of medications, dyes, and paints. National Highway Authority, Government of Pakistan also plant this tree along the main and link roads to keep them green and to reduce temperature in summer seasons.

Table 1: Characteristics and Usage of Acacia

| Description | Characteristic |
|----------------------------|--|
| Soil Fertility | Negative |
| Cultivation in Kachi Plain | Natural |
| Growth | Natural with water flood water |
| Maturity Period | 7-10 years and above |
| | |
| Description | Usage |
| Leaf | Sheep and Goat food |
| Pods | Sheep and Goats |
| Dry Branches | Fuel Wood |
| Dry Thick Branches | Rafters in mines and roofing material & sale |
| Skin | Dying leather |
| Stem | Local Furniture and beddings and sale |
| Gum | Collected for different use |

2 Kandi/Jand

Kandi (*Prosopis cineraria*) is common and native bush that transforms into a tree in dry ecologies in Pakistan, Arab Countries like Iran and Rajasthan, India. Thar and Cholistan deserts, Kirther, Suleman Ranges and Makran Arid areas in Pakistan also host large number of these trees. In Kachi Plain, a spate area, it grows in millions after the flood season. This tree is tolerant to high temperatures, it can survive up to 50 degrees Celsius. It germinates in moist land in millions but farmers weed them out every year to clean the farm land before cultivating new crop. Trees along the field embankments and some trees inside the farmlands are retained and farmers do not prefer to cut or sell them because these are crops friendly and enhances the soil fertility by shedding leaves. It can grow to the height of 5-20ft and bears leguminous pods in the month of May having medicinal characteristics. It is preferred to be used as fire wood as it does not release thick smoke and it burns for a longer period of time. Its thatch branches are used for fencing of household compounds, making animal sheds while wooden beams are used on the roof tops of the adobe houses in villages.

Kandi wood has no significant economic value other than converting it to the fuel wood. Selling of this tree in Kachi plain is not common. Every year in the month of April-May, the leaves are fed to the goats. The cut branches are taken by the local population for use as firewood. The Kandi trees which are in the farm fields are trimmed before cultivating wheat crop on the pretext that they attract birds that look for the grains.

Cutting of kandi trees or its branches on private farm land is prohibited. Normally, land owners keep small ruminants at home as second economic activity, these animals are fed on the leaves and branches of this tree in the months of April and May. After rains and floods, the leaves regrow which are bitter in taste and animals does like to eat them at this time of year. Occasionally, the nomads purchase the rights of tree leaves to feed them to their animals. The branches dried under the sun are collected and used as fire wood.

In Tharparkar desert, Sindh Province, the Kandi tree grows in abundance. For the locals and their animals, it not only provides shade from the scorching sun, but also its fallen leaves keep the surrounding sandy area fertile. Reportedly in Thar desert Kandi tree has 18 usages including religious importance as well.

The Kandi tree can survive for about 300 years. Its trunk wood is used to make frames for construction of wells. Kandi is a drought resistant tree that can last up to 150 years only on annual rains, without additional supply of water through irrigation.



Figure 3: Kandi (*Prosopis cineraria*) trees used for fencing private property (Picture: Allah Bakhsh)



Figure 4: Singhrian ji Bhaaji, prepared from the leaves of the Kandi (source Vikram Nankani)

Table 2: Characteristics and Usage of Kandi

| Description | Characteristic |
|-----------------------------|---|
| Cultivation | Natural |
| Growth | 5 – 20 ft |
| Effect on Soil Fertility | Highly positive |
| Maturity period | 10 - 20 years |
| Germination in project area | Abundant |
| | |
| Description | Usage |
| Animal Feeding time | Oct-Nov |
| Fresh Leaves | Sheep/Goat food |
| In wheat field | Branches are removed as tree attract birds |
| Dry Branches | Used as fire wood |
| Stem | Used as a rafter in local adobe houses and animal sheds |
| Sale | Not Common |
| Beans | Cooked as fresh vegetable (Not in project area). |

3 Bair (*Ziziphus mauritiana*)

It is called Bair in all Indus languages, in Balochi Khunur is the name of tree and its fruits. It is a drought resistant species that mostly grows in arid areas of Pakistan including Kachi Plain. It can also be found in Yemen and other Arab Countries. Kachi plain is dry arid waste with some pockets annually irrigated by floods. Kachi Plain has good green cover where flood water is temporarily retained for a few days. Occasionally upper areas of the Plain are greener than lower areas because high floods disperse over a larger stretch in the upper plains encouraging growth of various trees and bushes including Bair. Comparatively Bair and Kikar are less than Kandi in the project area and surroundings. Bair is grown near the local settlements where people and animals stay during the day time. The Bair tree bears a wild fruit also called bair, it is consumed fresh during fruiting season and also as a dried fruit. Although bair tree branches are useful, the sale of these branches is not common in the Project area. The seasonal honey bee colonies migrate to the area in the month of October every year because of water availability and crops flowering, including bair. Bair carries flowers with tiny sugar cubes, which is a favourite food of honey bees. Bair aroma makes good returns for some of the locals by attracting bees to the areas where bee hunting is source of livelihood for many shepherds and farmers.

Two major wild varieties of bair grow in Spate regions having difference in size of fruit. These mainly grow in mountainous areas and can also be found in piedmont lands as well. There is another

specie as well which is grown on commercial basis in Sindh and Punjab province. The sales of its fruit is common in both provinces. Consumption of all varieties of bair is common as it is considered an anti-oxidant and healthy for gastrointestinal problems. It contains potassium, phosphorus, manganese, iron, and zinc and vitamin A, B & D.



Figure 5: Fruits of the bair at various stages of ripenes (source: Noah Elhardt)

Bair trees are scarce in the project area but can be found around villages and inside the private compounds for their cool shadow in summer days where drinking water is stored underneath it. Meanwhile, women and children also take rest under the bair trees as it can protect them from the summer heats.

Hot winds start blowing from May every year locally called (lukh) and until June all trees shed leaves which are consumed by the animals. These trees get green again after the monsoon rains every year. Fresh and ripen red fruits are consumed by the human while immature and greens fruits and leaves are consumed by the goats and sheep. All trees on private lands are considered private ownership. Fruit collection by a third party is normally not allowed.



Figure 6: Typical Bair (ziziphus mauritiana) tree found in Balochistan, Pakistan



Figure 7: Bair Tree with fruits (picture Allah Bakhsh)

Table 3: Characteristics and Usage of Bair

| Description for Various Stacks | Characteristic |
|---------------------------------------|-----------------------------|
| Cultivation trend | Natural |
| Growth | Up to 15 meter for trees |
| Maturity period | 10 – 20 years |
| Watering | Natural |
| | |
| Description for Various Stacks | Usage |
| Fresh & Dry Fruits | Humans – sale |
| Fresh leaves | Sheep/Goat/Camel |
| Dry branches | Fuel Wood |
| Stem and Planks | Local Beds and roof rafters |
| Sale of Cut Branch for small ruminant | Local/Outsider-Flocks owner |
| Leaf Boiled in Mustered Oil | For stiff muscle relaxation |



Figure 8: Transport of fuel wood in Sindh, using camels

4 Tamarisk

Tamarisk, or Salt cedar has more than two dozen of varieties. It is a riverine and desert flowery bush which can takes up the shape of tree as well. This is considered a invasive species which germinates in good moisture. Its favourite soils are dry rivers, flood canals, natural fresh and salt waters lakes and sandy deserts where it grows naturally when the seeds are carried by the winds and floods.

In Kachi plain it grows along the banks of Bolan and Nari rivers and farmer's made flood canals. The ownership and rights of usage are owned by the neighbouring farmers whose lands are close to such places. Its germination occurring within the agricultural field is not liked and young plants are removed by the farmers before cultivation of seeds for grain crops.

Tamarisk does not produce wood for commercial and local use, it is only used as firewood which is least preferred as it makes a lot of smoke rather than burning. However, its fresh branches are used by the nomads for making seasonal animal huts. Local inhabitants mix its lengthy leaves in mud for making walls to avoid cracking.



Figure 9: Locally Produced Saag in Project Area (picture: picture: Allah Bakhsh and Abdul Salam)

Tamarisk is a fast growing specie which can be cultivated in the sandy desert to enhance greenery and control sand dunes movements during rainy seasons. Such kind of experiments were carried out by the forest department Government of Balochistan in late seventies and they have been successful to stabilize the sand movement near Mastung area in Balochistan to protect the agricultural lands in vicinity from the sands.

In Indus River delta, local farmer and gipsy communities craft several locally used items like Tokra, a type of basket, for shifting of collected potatoes, onions, tomatoes from the fields to the collection points before sending it to the market.



Figure 10: Tamarisk tree, bordering a Spate Irrigation plot, with embankment maintenance in the background

Knitted Thatches are also made from the flexible branches of Tamarisk young plants that are used for the making of roof covers on top of bamboos on adobe houses and rooms. Knitted Thatches and baskets are also sold in the adjoining settlements of delta areas as well (thatches are locally called Khera). These crafts are sold on unit price basis ranging from Rs:150-1000 (\$0,75 - \$2,00).

Table 4: Characteristic and Usage of Tamarisk

| Description for Various Stacks | Usage |
|---------------------------------|---|
| Cultivation trend | Natural |
| Growth | 1 – 18 meters height |
| Maturity Period | 50 – 100 years |
| Watering | Natural |
| | |
| Description for Various Stacks | Usage |
| Fruits | None fruit bush |
| Twigs and Flexible wet branches | Making Baskets and roofing material |
| Dry branches | Fuel Wood and animal sheds |
| Stem | Rafter and fuel wood |
| Skin of the Stem | Dying medieval leather water bags |
| Color of Skin | Red when young and blackish when mature |

5 Kirar or Kareta (*Capparis decidua*)

Kareta which is indigenous to the arid areas, is a tiny thorny tree or shrub that grows in plain lands, sandy deserts and mountains in South Asia, Arab

Regions and Africa that can survive even in long droughts. It is bitter in taste but its fruit when ripen turns red and are edible by human, birds and wild animal.

It is native to the arid lands and grow naturally. In many areas of dry ecologies of Pakistan this tree is diminishing now and reasons are unknown. It has apparently no leaves but straight and curvy branches. It carries red flower and later green fruit in the month of August are collected by the spate farmers. It is cooked as a vegetable and pickle is made from the unripened fruit. Its wood is used as a very high quality burning fuel at homes. Due to its bitter taste many people use it in tiny homemade crafts like wooden milk blowers, mortar and pestle as its natural bitter taste mixes up with grinding material which is considered good for the health.

It has also many medicinal uses. For example, in some of the rural areas when someone catches alternating fever they embrace healthy tree stem as it is a local belief that fever will disappear within a couple of days. The ash of its old wood mixed with a small piece of butter is used to treat the fractured bones. This tree is also considered a wish tree, it is believed that the wish will be fulfilled by wrapping the branches of this tree with colourful strips of cloth.

The rural people also get indications on the future climatic situation from this tree. In the opinion of dry land residents, if the Kirar Shrub or trees are excessively green in the month of May-June, it is a sign that remaining year will be dry.

Table 5: Kirar/Kareta Characteristics and Usage

| Description for Various Stacks | Usage |
|--------------------------------|---|
| Cultivation trend | Natural |
| Growth | Up to 5 meters |
| Maturity | |
| Watering | Natural |
| | |
| Description for Various Stacks | Usage |
| Fruits | Ripen are nutritious and edible |
| Unripen Fruit | Pickles making and cooked vegetable |
| Flowers | Cooked as vegetable |
| Dry branches | Fuel Wood |
| Stem | Animal sheds and fuel wood, tiny crafts |
| Color of Skin | Yellow wood |
| Ecology | Dry Arid Lands |



Figure 11: Vegetable dish known as Kairan ji Bhaaji prepared in Sindh (source Vikram Nankani)



Figure 12: Kirar or Kareta (Capparis decidua) tree

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Colophon

This practical note is prepared by Allah Bakhsh (SPO Pakistan) and edited by Zunaira Naab (MetaMeta) and Reinier Veldman (MetaMeta) for the Flood-Based Livelihoods Network (FBLN). The note has been written as part of the New Water Rights For Basin Management And Inclusivity In Spate Irrigated Areas Of Pakistan (Newarbi) project.

For more information on the project: <https://floodbased.org/projects/newarbi/>

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