
SOME MULTIPLE-PURPOSE TREE SPECIES IN PAKISTAN

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ABSTRACT

Choice of tree species with the objective of their multiple use is essential to increase the economic and ecological benefits of afforestation programmes. The multiple use of trees is defined as the array of goods and services which they produce for direct and indirect human use. On this criterion, 42 species of trees both exotic and indigenous have been identified and discussed for their multiple uses in this paper.

INTRODUCTION

Multiple-purpose tree species, besides their main objective of planting also yield other products of economic value. On this account these offer a high option both for planting on farms as well as afforestation of wastelands and special sites. The role of multiple-purpose tree species on farms is very crucial, because the products of these trees find a ready use in the rural areas and have a direct impact on the socio-economic aspects of village life. Moreover, farm lands are a potential source of timber and fuelwood supply in Pakistan, producing more than 46% of timber and 90 % of fuelwood needs of the country (Amjad, et al, 1996), therefore, proper choice of tree species with the objective of their multiple-use can greatly enhance the productive potential and range of benefits from farm lands.

MULTIPLE-USES OF TREES

In this paper more than forty tree species both exotic and indigenous have been identified as of multiple-use (see Appendix) with their suitability for planting under different ecological conditions, special sites and the variety of products which they produce. The criteria of multiple-use are the production of goods like fodder, nectar, fruits, gums, tannin, drugs, fuelwood, timber and services as aesthetic

value, soil protection and improvement. In the following paragraphs the species producing these products and services are discussed.

1. Fodder

Fodder value of different tree species is important because they serve as browse for goats and camels or lopped to feed other types of livestock at the time of forage scarcity. Some tree species are evergreen and serve as a source of fodder all the year round while others are deciduous and provide forage during the growing season only. However, the species vary greatly with respect to their palatability towards different kinds of animals. Some are highly palatable to livestock such as sirin (*Albizzia lebbek*), kachnar (*Bauhinia variegata*), batkar (*Celtis australis*), dhamman (*Grewia oppositifolia*), iple iple (*Leucaena leucocephala*), bakain (*Melia azedarach*), mulberry (*Morus alba*), kao (*Olea ferruginea*), Robinia (*Robinia pseudo-acacia*), oaks (*Quercus spp.*), bed (*Salix species*), plum, peach, apricot (*Prunus spp.*) and apple (*Pyrus malus*).

Others with selective palatable to camels and goats are *Acacia* species, ber (*Zizyphus spp.*), jhand/ kandi (*Prosopis cineraria*) and farash/loa (*Tamarix aphylla*). Remaining show varying palatability towards different kinds of animals, while *Citrus* and *Eucalyptus* species are not liked by livestock of any kind.

2. Nectar

Nectar from the plants is collected by honey bees and forms a product of much economic importance. Nectar/honey is used as nutritious human food. Many plants produce nectar in their flowers and among them the tree species

constitute a substantial number. Like other plants trees also vary in the quantity, quality and time of nectar production. The best and rich tree sources of nectar in Pakistan are phulai (*Acacia modesta*), Sirin, *Citrus* spp., Shisham, (*Dalbergia sissoo*), loquat (*Eriobotrya Japonica*), *Eucalyptus* spp. and *Robinia*. Others have varying importance and potential of nectar production, such as *Acacia* spp., Kachnar, semul (*Bombax ceiba*), amaltas (*Cassia fistula*), Dhamman, Am (*Mangifera indica*), Apple, Bakain, Mulberry, Plum/Alucha, Apricot/Khubani, Peach/Aro, Pear/Nashpati (*Prunus* and *Pyrus* spp.) and amrud (*Psidium guajava*). The remaining have no well defined value as nectar sources.

3. Sericulture

Sericulture beside providing silk fibre of high economic importance in textile manufacture also supports a cottage industry, providing supplementary income for village folks. Leaves of Mulberry are extensively used for rearing of silkworm (*Bombyx mori*) for production of silk. Leaves of jaman (*Eugenia jambolana*) and ber (*Zizyphus mauritiana*) are fed to "tassar" silkworm for the production of "tassar", a coarse type of silk for textile.

4. Lac culture

Lac is a product which has many commercial uses. On the young branches of bor (*Ficus bengalensis*), pipal (*F. religiosa*) and Ber, lac insect (*Lacifera lacca*) is reared for the production of lac of very high economic value.

5. Fruits

A variety of fruit trees are raised in different parts of Pakistan either as orchards or in combination with agricultural crops. Apple, Loquat, *Citrus* species, Am and Amrud are mainly cultivated for their edible fruits of very high value. Nuts of walnut/akhrot (*Juglans regia*)

are also very much in demand. Amluk (*Diospyros lotus*), Mulberry, anjir (*Ficus carica*) and Ber produce edible fruits of commercial value.

6. Tannin & Drugs

Tannin are important plant products for use in tanning and dyeing industry and as astringent in native medicine. The stem bark of babul/kikar (*Acacia nilotica*), sharol (*Alnus nitida*), Kachnar, Amaltas, Jaman, rin (*Quercus incana*), Bed, and Farash/Loa; root bark of Ber; wood of kher (*Acacia catechu*); leaf galls of kangar (*Pistacia integerrima*), Farash/Loa and fruits of Amla (*Embllica officinalis*) produce tannin.

Leaves of Bor, Pipal, Akhrot, Amla, fruits of Amaltas, Bakain, neem (*Azadirachta indica*), Amla; bark of Babul/Kikar, Jaman, Bor, Pipal, Akhrot, Neem, bahan (*Populus euphratica*), Amla, Bed; seeds of Sirin and ritha (*Sapindus mukorossi*) are used in native medicine. Leaves of *Eucalyptus* species produce oil of medicinal value.

7. Timber & Fuelwood

Production of timber and fuelwood is the major use of most of the tree species. However, their timber value is quite variable. Species like Shisham, Akhrot, Babul/Kikar and Sirin produce timbers of very high price. *Eucalyptus* species, Poplar (*Populus* spp.), Semul, Mulberry and Bakain produce timbers for a wide variety of wood based industries. Rest of the species provide timbers only of local importance, used in rural constructions and for agricultural implements.

Defective, undersize pieces and branches of all the species and wood of *Citrus* species, Amrud, Plum, Peach, Apricot, Apple and Loquat are used as fuelwood. The excellent fuelwood is produced by *Acacia* species, Amaltas, Shisham, Dhamman, *Robinia*, *Zizyphus* species, Kao and oaks (*Quercus* spp.)

8. Ornamental

Some tree species are planted as ornamental for aesthetic purposes, because of their stem form, crown shape, foliage and flowers. The important ones for this purpose are Kachnar, Semul, Amaltas, Loquat, Kangar and Robinia.

9. Miscellaneous Use:

Gums obtained from the stem of *Acacia* species, Semul and Neem have economic and medicinal uses.

Twigs of Dhamman, Mulberry, Farash/Loa and Bed are used for basket making. Branches and young stems of Bor, Pipal and Dhamman produce fibers for making ropes. Plants and young thorny branches of Phulai and *Zizyphus* species are used as live fences and hedges around the fields.

Fruits of Ritha produce saponin for washing hair, silk and wool. Capsules of Semul produce floss for stuffing purposes.

Babul/Kikar, Shisham, *Populus* species, Jhand/Kandi and Iple Iple are planted as shelterbelts. The trees of Kher, Ailanthus species, Sharol, Iple Iple, *Populus* species, Robinia and *Salix* species have high soil protection and conservation value, therefore, are used in erosion and landslide control. *Eucalyptus (Eucalyptus camaldulensis)* has emerged as an important tree species for the reclamation of waterlogged and saline areas. Ber (*Zizyphus* spp.), Farash/Loa, Jhand/Kandi and *Acacia* spp. are reputed for their drought and high temperature tolerance and are therefore, ideal for afforestation in dry zones.

Leguminous tree species like *Acacia* spp., Shisham, Jhand/Kandi, Sirin, Kachnar, Iple Iple and Robinia improve the soil fertility through nitrogen fixation.

Robinia, Ailanthus spp., Sharol, Dhamman, Poplar spp., *Eucalyptus* spp., Mulberry, Shisham, Iple Iple, Babul/Kikar, Jhand/Kandi and Semul are one of the best species for agroforestry.

Robinia, Ailanthus, Sharol, Poplars, Willows and Iple Iple are the best species for soil conservation and stabilization.

REFERENCES

Amjad, M., N. Khan and H. Shah (1996). Forestry Statistics of Pakistan. Forest Economics Branch, Pakistan Forest Institute, Peshawar, 1991

Gamble, J.S. (1902). A manual of Indian timber. Samson Low, Marston and Company, London.

Pathak, B.S., A.K. Jain and A. Singh (1987). Characteristics of *Leucaena leucocephala* and *Sesbania grandiflora* woods. Punjab Agricultural University, Ludhiana (India).

Pearson, R. S. and H.P. Brown (1932). Commercial timbers of India. Vol.I & II, Government of India, Central Publication Branch, Calcutta.

Rahman, W. and M.I. Chaudhry (1985). Bee-Foraging plants at Peshawar. The Pak. Jour. For., Vol.35, No.2.

Sheikh, M.I., K.M. Siddiqui and S.Rehman (1988). Ipil Ipil (*Leucaena leucocephala*) (Lam.) de.Wit in Pakistan. Pakistan Forest Institute, Peshawar (Unpublished)

Tejwani, K.G. (1987). Small farmers, multipurpose trees and research in India. Proceedings of an International Workshop on Multipurpose tree species for Small Farm Use, held in Pattya, Nov. 2-5, 1987.

APPENDIX

Tree species	Climatic Zone	TREE PARTS USED						
		Leaves	Flowers	Fruits	Branches	Bark	Wood	Others
1. <i>Acacia catechu</i> (Kher)	Sub-tropical	Fodder for camels and goats	-	-	-	-	Rural constructions, agricultural implements, tool handles, fuelwood and charcoal	Soil protection and improvement through nitrogen fixation. Gum used in medicine
2. <i>Acacia modesta</i> (Phulai)	Sub-tropical	Fodder for camels and goats	A rich source of nectar	Fodder for livestock	Used for fencing	-	Rural construction, agricultural implements, tool handles, fuelwood and charcoal	Soil protection and improvement through nitrogen fixation. Gum used in medicine and industry
3. <i>Acacia nilotica</i> (Babul/Kikar)	Dry to moist tropical	Fodder for camels and goats	Produce nectar	Fodder for livestock, rich source of tannin	-	Rich source of commercial tannin	Rural construction, agricultural implements, carts, boats and mine timber	Soil improvement through nitrogen fixation. Agroforestry Gum used in native medicine and industry
4. <i>Acacia senegal</i> (Khor)	Dry tropical	Fodder for camels and goats	Produce nectar	Fodder for livestock	Used for fencing	-	Rural construction, agricultural implements, fuelwood	Soil conservation and improvement through nitrogen fixation. Gum used in medicine
5. <i>Albizia altissima</i> <i>A. excelsa</i> Maharakh	Dry to moist sub-tropical	Fodder for livestock	-	-	-	-	Packing cases and crates, tool handles, sports goods and fuelwood	Soil protection and conservation. Agroforestry.
6. <i>Albizia lebbek</i> (Sirin)	Dry to moist tropical	Fodder for livestock	Rich source of nectar	Seeds used in native medicine	-	-	Excellent furniture and cabinet work, fuelwood	Soil improvement through nitrogen fixation
7. <i>Alnus nitida</i> (Sharol)	Moist Sub-tropical	Fodder for livestock	-	-	Ropes making	Dyeing and tanning	Crates, shoe heels, bobbins and fuelwood	Protection of banks of streams and water courses. Agroforestry.
8. <i>Bauhinia variegata</i> (Kachnar)	Moist tropical	Vegetable, fodder for livestock	Ornamental, buds as vegetable	-	-	Dyeing and tanning	Agricultural implements and fuelwood	Ornamental
9. <i>Bombax ceiba</i> (Santal)	Moist tropical	-	Ornamental	Flows used for stuffing	-	-	Crates, insulation boards, match boxes and plywood	Ornamental. Agroforestry. Produce "Kairi" gum of medicinal and commercial use
10. <i>Cassia fistula</i> (Amaltas)	Moist tropical, Sub-tropical	-	Orna-mental	Native medicine	-	Tannin	Agricultural implements, rural constructions, boat's spars and fuelwood	Ornamental
11. <i>Celtis australis</i> (Bakur)	Moist tropical Sub-tropical	Fodder for livestock	-	Edible	-	-	Agricultural implements, tool handles and fuelwood	Ornamental
12. <i>Citrus</i> spp. (Oranges)	Moist tropical Sub-tropical	-	Rich source of nectar	Edible, rich in Vitamin-C	-	-	Fuelwood	Ornamental

Tree species	Climatic Zone	TREE PARTS USED						
		Leaves	Flowers	Fruits	Branches	Bark	Wood	Others
13. <i>Dalbergia sissoo</i> (Shisham)	Moist tropical Sub-tropical	-	Rich source of nectar	-	-	-	High class furniture and decorative veneer, Agricultural implements, house construction and fuelwood	Wind breaks and shelter belts. Soil improvement through nitrogen fixation. Agroforestry.
14. <i>Diopryos lous</i> (Amlik),	Moist temperate	-	-	Edible	-	-	Agricultural implements, recommended for textile accessories, fuelwood	-
15. <i>Emblica officinalis</i> (Amli)	Dry and moist tropical	Tannin, native medicine	-	Tannin, native medicine	-	Tannin, native medicine	Used for poles, rural construction, agricultural implements, furniture and fuelwood	Soil protection
16. <i>Eriobotrya japonica</i> (Loquat)	Moist Sub-tropical	-	Rich source of nectar	Edible	-	-	Fuelwood	Ornamental
17. <i>Eucalyptus camaldulensis</i> , (<i>Lachi</i>) <i>E. tereticornis</i>	Moist and dry sub-tropical and tropical	Produce medicinal oil	Rich source of nectar	-	-	-	Rural constructions, cheap furniture, plywood, pulp and paper, fuelwood and charcoal	Dry zone afforestation & soil conservation. <i>E. camaldulensis</i> used for reclamation of waterlogged and saline areas. Agroforestry.
18. <i>Eugenia jambolana</i> (Jamban)	Moist tropical	Feed for "tassar" Silk moth	Source of nectar	Edible	-	Dyeing, Tanning and native medicine	Rural constructions, agricultural implements, carts, boats, packing cases and crates, railway sleepers and fuelwood	-
19. <i>Ficus bengalensis</i> (Bor)	Sub-tropical, Tropical	Native medicine, fodder for goats	-	Edible	Lac culture	Fibers, native medicine	Crates, door panels, cheap furniture and fuelwood	-
20. <i>Ficus religiosa</i> (Pipal)	Moist tropical	Native medicine	-	Native medicine	Lac culture	Native medicine	Crates, fuelwood and charcoal	-
21. <i>Ficus carica</i> (Anjur)	Moist Sub-tropical & temperate	Fodder for livestock	-	Edible	-	-	Fuelwood	-
22. <i>Grewia oppositifolia</i> (Dhamman)	Moist sub-tropical	Fodder for livestock	source of nectar	-	Baskets	Fiber	Oars, tool handles, bows and fuelwood	Soil conservation. Agroforestry.
23. <i>Juglans regia</i> (Akhnor)	Temperate	Native medicine	-	Edible	-	Native medicine, tooth cleaning	High class furniture and cabinet work. Excellent timber for gun-stock	-
24. <i>Laucarna leucocephala</i> (Iple Iple)	Sub-tropical to tropical	Fodder for livestock	-	Fodder for livestock	-	-	Rural constructions, pulp and paper, fuelwood and charcoal	Soil protection and stabilization. Soil improvement through nitrogen fixation. Agroforestry.
25. <i>Malus sylvestris</i> (Apple)	Temperate	Fodder	Produce nectar	Edible	-	-	Fuelwood	-

Tree species	Climatic Zone	TREE PARTS USED						
		Leaves	Flowers	Fruits	Bran-ches	Bark	Wood	Others
26. <i>Mangifera indica</i> (Am)	Moist tropical	-	Produce nectar	Edible, seeds contain gallic acid	-	Produce gum of use in native medicine	Planking, doors and windows, boxes, crates, boats, canoes and plywood	-
27. <i>Melia azedarach</i> (Bakani)	Moist sub-tropical & tropical	Fodder	Produce nectar	Produce oil used in native medicine	-	-	Furniture, agricultural implements, sports goods and fuelwood	-
28. <i>Acacia indica</i> (Necan)	Moist to dry tropical	Native medicine	Native medicine	Used as hair wash and insecticide	-	Bitter and febrifuge	Rural constructions, agricultural implements, carts, boats, furniture and fuelwood	Ornamental. Gum from stem has medicinal value
29. <i>Morus alba</i> (Mulberry)	Moist tropical sub-tropical and temperate	Feed for silkworms, Fodder for livestock	-	Edible	For making baskets	-	Rural constructions, agricultural implements, tool handles, sports goods and fuelwood	Agroforestry
30. <i>Olea ferruginea</i> (Kao)	Sub-tropical to temperate	Fodder for livestock	-	-	-	-	Agricultural implements, tool handles, turnery, combs and fuelwood	-
31. <i>Pistacia integerrima</i> (Kangan)	Sub-tropical	Fodder, tannin from leaf galls and native medicine	-	-	-	-	Furniture, turned wood articles, decorative work and fuelwood	Ornamental
32. <i>Populus euro-america</i> , <i>P. deltoides</i> (Poplars)	Moist sub-tropical to temperate	Fodder	-	-	-	-	Rural constructions, packing cases and crates, chipboard, plywood, match manufacture pulp and paper.	Wind breaks and shelterbelts. Land slide and erosion control. Agroforestry.
33. <i>Populus euphratica</i> (Bhan)	Moist tropical to sub-tropical	Fodder	-	-	-	Native medicine as vermifuge	Building, turnery articles, lacquer work, printing blocks, planking, crates, boats and fuelwood	-
34. <i>Prosopis cineraria</i> (Jhand/Kandi)	Dry tropical	Fodder for goats and camels	Produce nectar	Fodder for goats and camels	-	-	Rural constructions, agricultural implements, crates, fuelwood and charcoal	Dry zone Agroforestation.
35. <i>Prunus</i> Spp. (Alucha & Khubani)	Moist sub-tropical and temperate	Fodder	Produce nectar	Edible	-	-	Turned wood articles, mathematical instruments and fuelwood	-
36. <i>Psidium guajava</i> (Amrud)	Moist tropical to sub-tropical	-	Produce nectar	Edible	-	-	Fuelwood	-

Tree species	Climatic Zone	TREE PARTS USED						
		Leaves	Flowers	Fruits	Branches	Bark	Wood	Others
37. <i>Quercus</i> Spp. (Rin, Shabaloot)	Temperate to moist sub-tropical	Fodder for livestock	-	-	-	Tannin	Agricultural implements, tool handles, textile mill accessories, fuelwood and charcoal	-
38. <i>Robinia pseudo-acacia</i> (Robinia)	Moist temperate to Sub-tropical	Fodder for livestock	Rich source of nectar	-	-	-	Furniture, agricultural implements and tool handles	Ornamental. Soil protection and stabilization. Soil improvement through nitrogen fixation. Agroforestry.
39. <i>Salix tetrasperma</i> (Bod-laila)	Moist temperate to Sub-tropical	Fodder for livestock	-	-	Baskets	Tannin, febrifuge	Sports goods, packing, cases and crates	Land slide control, Stabilization of banks of stream and water courses
40. <i>Sapindus mukorossi</i> (Ritha)	Moist Sub-tropical	Fodder	-	Saponin, seeds in native medicine	-	-	Agricultural implements and fuelwood	-
41. <i>Tamarix aphylla</i> (Farnab/Loa)	Dry tropical to sub-tropical	Fodder, leaf galls contain tannin	-	-	-	Tannin	Agricultural implements, crates, Dry zone afforestation nursery, lacquer work, fuelwood and charcoal	-
42. <i>Zcyphus mauritiana</i> (Ber)	Dry tropical	Fodder for goats & camels, rearing "tassar" silk moth	-	Edible	-	Tannin	Rural constructions, agricultural implements, fuelwood and charcoal	Dry zone afforestation