

Willow industries in Kashmir valley: Present dynamics and future prospects

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Willow (*Salix* spp.) is one of the most interesting group of botanical specimens belonging to Genus *Salix* (derived from Celtic 'Sal' meaning near and 'lis' meaning water) and Order Malpighiales. The Salicate comprises about 350 species of trees and shrubs which are principally found in the northern hemisphere and extensively distributed in tropical, alpine, arctic and temperate climates. Willows form pioneering vegetation communities on disturbed sites in lowlands. While some of the willow species are aggressive colonists, the others need to develop competitive adaptations that allow them to thrive in these specific habitations. The primary factors which control the native distribution and abundance of species include the availability of moisture for seed germination and seedling establishment, absence of early competitors and availability of full sunlight. On the basis of these factors, willows are divided into two major ecological groups viz., alluvial or riparian willows growing along rivers, stream banks and point bars and wetland willows growing on saturated soils. In both the situations willows form relatively stable successional stages (Kowalchik, 2001).

Important characteristics of willows :

- Willows exhibit superior growth and productivity due to their highest capacity to convert solar radiation into chemical energy (Wilkinson, 1999).
- Willows have extensive fibrous root system with the majority of fine-roots found in the upper 40–45 cm of the soil profile (Rytter and Hansson, 1996).
- The species exhibits high rates of evapotranspiration during the growing season (Heijden and Kuyper, 2003).
- Formation of symbiotic associations with mycorrhizal fungi which provide an additional supply of nutrients for plant growth. *Salix* spp. benefit from vesicular-arbuscular endo-mycorrhizae that utilize phosphorus, as well as ecto-mycorrhiza that use organic nitrogen (Heijden and Kuyper, 2003).
- Willows are tolerant to flooding and flourish in saturated soils with oxygen shortage in the root zone; some

species are tolerant to increased concentration of carbon dioxide and methane (Maurice *et al.*, 1999).

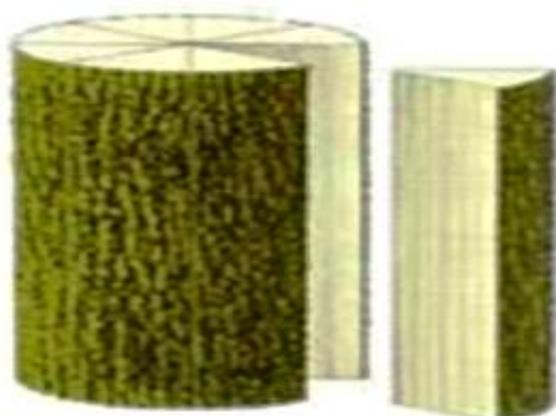
- All *Salix* spp. are well adapted to light and moderate fire regimes, re-sprouting from roots or root crowns; some willows are considered drought tolerant and resistant to moderate salinity (Kowalchik, 2001).
- Willows have high annual seed production and an effective system of seed dispersal which increases the chances of finding an opening for germination and establishment.
- Willows are easy to propagate due to preformed root primordia on the stems and possibility of vegetative reproduction from horizontally lain rods (Gray and Sotir, 1996) and vigorous re-establishment from coppiced stumps (Philippot, 1996).
- Willows exhibit efficient ability to accumulate high levels of toxic metals, especially Cd (Klang-Westin and Eriksson, 2003).

Willow industries in Kashmir : Willows have been growing in Kashmir valley since time immemorial. Pale botanists claim that willows in Kashmir were growing even in Pleistocene period as is evident from few leaf impressions found as fossil deposits in *Karewa* clays and coal deposits in the dwellings of cave dwellers of Burzehama and Gufkral near Srinagar. Dara Shikoh- the famous Mughal Prince in 17th century, has also mentioned about willow trees, their habitat and use of willow wood in Kashmir. The large scale and commercial plantation of this species around the Wular Lake was undertaken by Forest Department during the year 1917. Thereafter, other wetlands located at Harran, Hygam, Hokur-sur, Mirgund, Mamandangi, Gund Jehangir and Shahgund were brought under the willow plantation and at present some 1,400 km² of land is under its cultivation. These plantations were primarily meant to cater the needs of fuel wood requirements of people of Kashmir. The estimates have revealed that about 5 million trees of willow are existing which comprising about 16 per cent of total broad leaf tree plantation of Kashmir valley (Masoodi *et al.*, 2004).

These willows have now rolled into many national and international trades like cricket bat industry, package case industry, ply board industry, paper and pulp industry, furniture and wicker works, soil conservation and phytoremediation etc. The public utility nature of willows along with its fast growing nature has made this species an indispensable component of many farming systems in Kashmir. Survey by Dhar and Kachroo (1983) has revealed that *Salix* is represented in Jammu and Kashmir by 23 species namely, *Salix alba*, *S. amygdaliana*, *S. babylonica*, *S. caprea*, *S. coesia*, *S. daphnoides*, *S. denticulate*, *S. dickymat*, *S. flabellaris*, *S. fragilis*, *S. fruticulosa*, *S. furcata*, *S. iliensis*, *S. julcea*, *S. karelinii*, *S. lindleyana*, *S. mutsudana*, *S. pupurra*, *S. pycnostachya*, *S. seriocarpa*, *S. triandra*, *S. viminalis*, *S. wallichiana* of which 15 reach to alpine and sub alpine limits.

Cricket bat industry : The history of producing cricket bats in Kashmir dates back to 19th century when an

industrialist namely Allah Baksh from Pakistan established his sub-unit at Halmulla, Bijbehara for conversion of willow logs into clefts for onward finishing at Sailkot. The willow (*Salix alba* var. *caerulea*) used in making these bats was brought to Kashmir in the 19th century by the British after being recommended by Sir Walter R. Lawrence and J.C. Mac Donell, the first chief of Forest Department in J&K. Initially the material was planted at Kitreteng and Shalbagh. The adaptation of this species in the agro-climatological niche of Kashmir resulted in further extension of its cultivation. The bats made from the wood are not only popular in India, but also in Pakistan, Bangladesh and Sri Lanka. The expansion of this indigenous wood based industry came into being with the registration of around 195 functional manufacturing units established at various places in District Anantnag and Pulwama with annual turnover of Rs. 10 crore. The cricket bat industry is a major source of equipment for India's voracious sporting goods market and an important source



Cleft making



Cleft stacking



Cricket bat making



Finished bat

of income for the economy of the state of Kashmir. Further, with projected demand of cricket bats expected to increase to 4 million per annum in the global market by the year 2020 (Masoodi *et al.*, 2004), the future of this industry looks very promising as the Kashmir willow comprises about 60 per cent of the total bats manufactured in India. Additionally, with a compound growth rate of about 8.4 per cent, the potential turn over from the export of this commodity is projected to increase to 100 corers per annum in the year 2020.

Cricket bat industry of Kashmir is presently under resource crunch. The report presented by Directorate of Industries and Commerce reveals that around 8 and 4.3 lakh willow clefts were exported to Jammu, Jalandhar and Meerut based cricket industries in the year 2003 and 2004. However, local unit holders are of firm belief that around 2.5 million cricket bat clefts were exported to Meerut and Jalandhar under the garb of quota system, tent amounting to tremendous loss of the precious raw

material. The supply of quality timber from white willow has thus decreased due to a whopping removal of millions of trees and as such the variety caerulea (female counterpart of white willow) is near extermination in Kashmir. To sustain the industry, the clefts are now being procured from inferior trees. Even if the clefts are sold @ Rs. 500/ piece, a farmer will get at least Rs. 15000 per tree with an increased margin for industrialists as well. Similarly, the cricket bats produced in Kashmir fetch a maximum of Rs. 1000/ bat as against English willow bats which retails between \$220 to 450 each in the global market. Realizing the fact that the precious raw material is being exploited unsustainably and sold at cheaper rates outside the valley, the Govt. of J&K has imposed a ban on the export of raw clefts in 1998. It was felt that the need of the hour is to add value to the clefts by producing quality finished product so as to get maximum returns from this indigenous industry. This law is regularly being flouted, and will continue to be defied unless above said measures



Packing case



Packing of fruits in cases



Packing of fruits in cases



Fruit packed cases

are not arranged to bump up the local bat manufacturing industry to the international standards.

Packing case industry : Temperate fruits are not grown for domestic consumption alone but also for export to other parts of the country. Horticulture has made tremendous stride during last five decades. While area under this sector has increased by 17 times, the production has gone up by about 65 times. Besides, strengthening food and nutritional security, it has potential to provide livelihood security to millions of people across the whole state of J&K. This sector provides direct and indirect employment to over 25.00 lakh people and generates revenue of over 1250 corer rupees annually. Fresh and dry fruits are exported in packing cases (boxes) made from willow or poplar. Introduction of cardboard boxes for packing apple, pear, cherry and other fresh fruits has not been accepted by fruit growers. On an average 60 per cent of timber required for this vast industry is fulfilled from willow. *S. fragilis* and *S. alba* are best suited for making packing cases.

The timber of these species being lightest (700 kg/ m³ when fresh) and tough with high wearing qualities is highly suitable for this trade.

Basketry and furniture industry: The term basket willow or wicker willow or osier willow locally known as *Veer kani* refers to a certain group of medium-sized willow shrubs that are pruned, coppiced or pollarded in such a way that they are stimulated to produce long, straight, flexible rods. The plantations of these wicker willows viz., *S. purpurea*, *S. viminalis*, *S. triandra* and *S. dephnoids* are now found in many places across the valley. The farmers cultivate these species in and around paddy lands where frequent irrigation is available. These willows are harvested annually and have little or no lateral branching. The whips/ rods collected from these plantations are used to make high quality multi-shaped and multi-purpose artifacts of furniture, baskets, *Kangries* (portable fire port) and containers for storing vegetables, food items and clothes, etc. Being labour intensive, basket



Wicker



Processed wicker



Wicker weaving



Wicker handicrafts

industry involves reasonably large number of local people which is significant for socio-economic upliftment of the rural masses. Production of elaborated willow products has been a productive alternative to supplement the family income of rural and urban people involved in this trade. The cost of willow plantation including land preparation, planting and protection etc. is about Rs. 96000 ha⁻¹. The average yield from these plantations ranges between 7-12 metric tons (dry) ha⁻¹ year⁻¹. *S. purpurea*, *S. triandra* and *S. daphnoids* produce about 7 metric tons (dry) ha⁻¹ year⁻¹, whereas *S. viminalis* crops yield about 12 metric tons (dry) ha⁻¹ year⁻¹. The dried and seasoned rods presently cost Rs. 14,500 to Rs. 16,000 per metric ton. Besides this, one hectare can produce about 4500 very high quality bolts of *S. viminalis*, 4000 bolts of *S. daphnoids* and *S. purpurea* and 3500 bolts of *S. triandra* under intensive management. These bolts fetch very high price ranging from Rs. 35-40/ kg (dry) for brown and buff willow to Rs. 75/ kg (dry) for white willow. The weaving of wicker handicrafts generates an income of Rs. 59534.70 annum⁻¹ with an employment of 366.61 person days annum⁻¹ in the households engaged in this profession (Islam, 2015).

Conclusion and recommendations : Kashmiri willow is known around the world and is second only to the famous English willow. The cricket bats manufactured in Kashmir are exported and also supplied to the domestic market of the country. Presently the industry provides employment to about 50,000 people directly or indirectly. Launching 'Kashmiri bat' as an international brand, the government needs to adopt a holistic approach. In addition to a comprehensive package of general investment incentives, the promoters of this business should be given special capital investment and subsidy, so that bigger units with state of the art machinery and scientific seasoning facilities for willow clefts could easily be set up. Secondly provisions should be made to give cost reduction incentives to the manufacturers so that they could have an advantageous initial leverage to face the competition of established brands from India and abroad. Thirdly emphasis should be laid on growing large scale scientifically managed plantations of *Salix alba* var. *caerulea* which is most suitable for crafting cricket bats of international standard. The life cycle of a commercially grown cricket bat willow is ideally fifteen to twenty years. For every tree that is felled, growers should be encouraged to replant at least five willow trees. This could help on long-term basis by ensuring a sustained supply of quality clefts to the manufacturers. Maintenance is of paramount

importance, trees neglected for one year only during their lifetime have little or no commercial value. These provisions also promote, develop and strengthen the packing case industries in the valley. Baskets made from willow fibre in Kashmir have both local and national demand due to high quality of art and architecture. Baskets woven from handmade willow reeds are able to command a much higher price than those made from machine-produced splints. By adding value to willow material, the finely crafted items would increase the economic value considerably. Items made with uncommon varieties and high standard quality and styling could fetch upto twice the price of a similar standard item. The baskets produced here are sold between Rs. 100 to 500 per basket or even more during a tourist season.

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