# Mapping and economic evaluation of traditional wicker willow in the plains of Kashmir Himalaya, India

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**Wicker willow craft, locally known as keani keam, is a handicraft from the Kashmir Valley, Jammu and Kashmir, India, involving weaving using willow reeds. Willow weaving is an indigenous industry of the Valley. The speciality of this craft lies in the fact that a willow product serves both as a decor and a household utility item to store and carry edible items during special occasions. Considering the importance of wicker willow in the Kashmir Valley, the present study aimed to assess the plantation area under wicker willow, identify the potential wicker-growing areas, evaluate the profitability associated with wicker cultivation and analyse the factors affecting the productivity of wicker. The central zone of Kashmir Valley was selected on the basis of purposive sampling as bulk of the wicker-based industry is concentrated in the central zone of Kashmir Valley, particularly in the districts of Srinagar and Ganderbal. Similarly, the villages/districts were selected based on their dependence on the wicker industry. Data were collected using multistage sampling with 153 households randomly selected for the survey. Data were subjected to analysis, viz. descriptive statistics, Cobb–Douglas-type production function and profitability analysis. The net present value and benefit–cost ratio were Rs 43,837.43 and 2.23 respectively, ensuring that investment in wicker cultivation is economically viable. The wicker cultivation was also profitable as the internal rate of return was 32.52%. The functional analysis revealed that the per kanal (20 kanal is equal to 1 ha) yield was significantly positively affected by the age of the plantation, number of plants sown/kanal and the amount of fertilizer applied.**

**Keywords:** Economic evaluation, handicrafts, mapping, sampling, wicker willow.

WILLOWS have been growing in the Kashmir Valley, Jammu and Kashmir (J&K), India, since time immemorial. According to Palaeobotanists, willows were found in Kashmir Valley even in the Pleistocene, as evident from a few leaf impressions found as fossil deposits in Karewa clays and coal deposits in the dwellings of cave-dwellers of Burzehama and Guf-kral near Srinagar[1]. The willow (*Salix* L.) species belongs to family Salicaceae, and Order Malpighiales and comprises deciduous and dioecious trees and shrubs. The word 'Salix' is derived from Celtic *Sal* meaning near and *lis* meaning water. There are about 450–520 species of *Salix* known from all around the world and distributed mostly in the Northern Hemisphere[1,2]. There are about 33 *Salix* species in India which have majorly been categorized as shrubs, except *Salix alba*, *Salix babylonica*, *Salix fragilis*, *Salis elegas* and *Salix tetrasperma*[3]. In the Kashmir Valley, J&K, the genus *Salix* is represented by 23 species, of which 15 reach alpine/subalpine limits[4]. The primary factors which control the native distribution and abundance of this species include 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 can be 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 groups, willows form relatively stable succession stages[5]. However, the most commonly grown species in the Valley is *Salix triandra*, known as Almond willow. Two more species are grown in the Valley, i.e. *Salix dickymat* and *Salix rubra* in the Srinagar and Ganderbal districts respectively[6]. The Ganderbal district provides the best soil and climatic conditions for the cultivation of this crop[7]. The wicker willow is preferred over the staple crop of the Valley, i.e. paddy owing to its fast growth, easy rooting, recurrent harvest and high commercial value in the market. The public utility of willows along with their fast-growing nature have made this species an indispensable component of many farming systems in Kashmir. Handicrafts made from wicker are traditionally known as 'Shaakhsaazi'. The wicker handicraft being labour-intensive involves a reasonably large number of people and is thus considered a prominent, small-scale, forest-based cottage industry playing a vital role in the livelihood, socio-culture, employment, poverty alleviation and economy of

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stakeholders involved in this trade[8]. Craft made of wicker/willow is unique. Wicker art is widespread and commercialized for its aesthetic and functional appeal. Decorative wicker handicrafts are present in various shapes and sizes. Wicker baskets and containers are used to store chapatis, vegetables, ornaments, clothing, etc. Kangri is a special basket consisting of a pot made of mud, used by the Kashmiris to protect them from severe winter cold. Wicker sieves are widely used to separate dust particles from seeds and condiments. Other wicker crafts play an important role in the social, economic and cultural life of people in the Kashmir Valley. To promote and sustain wicker industry, some immediate measures need to be taken in the region[9].

## Materials and methods

### Data collection

The primary data were collected from two districts of Kashmir Valley, namely Srinagar and Ganderbal, using the questionnaire method during July–August 2019. A pilot survey of Harran village in Ganderbal district was done for pretesting the questionnaire. Four towns from Srinagar district and five villages from Ganderbal district were purposively chosen for selecting the sample plantations. The reason for a purposive selection of the study areas is that in Kashmir, four clusters have been recognized under ART-X Kashmir (East Asia and Pacific), viz. papier-machie (Zadibal), wicker (Ganderbal), crewal (Noorbagh) and wool cluster (Bandipora). The Ganderbal district has the maximum number of households involved in wicker plantations. In Srinagar district, the Tailbal area is known for the cultivation of *Salix purpurea*, Omarhair area for maximum processors and Dargah area as a hub of wicker-item retailers. A total of 153 households/farmers were randomly selected for the study and surveyed. Figures 1 and 2 show the study area and the scheme of sampling used for this study respectively.

### Mapping

Using satellite imagery, we can separate planting lands with a low cost, high speed and precision[10]. Field visitation recorded 20 ground control points using GPS as features in various areas of the Srinagar and Ganderbal districts. Figure 3 refers to the spectrum of the wicker plantation in the generated maps. The methodology for wicker mapping is given below:

(i) Downloading of Sentinel data from USGS Earth Explorer. (ii) Top-of-atmospheric correction using QGIS (an open-source software). (iii) Layer stacking of all bands and clipping the desired area from the shape file. (iv) Mosaicking of Sentinel scenes and removing forest cover using forest canopy cover (FCC). (v) Determining the range of spectral reflectance values for wicker with the help of GPS points. (vi) Classification of images by applying knowledge classifier using reflectance values (minimum and maximum). (vii) Post-classification correction for removing incorrect areas. (viii) Area calculation, accuracy assessment and map generation.
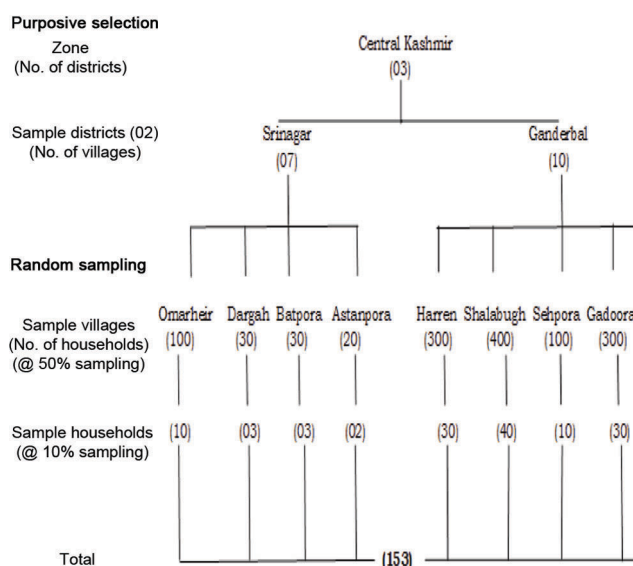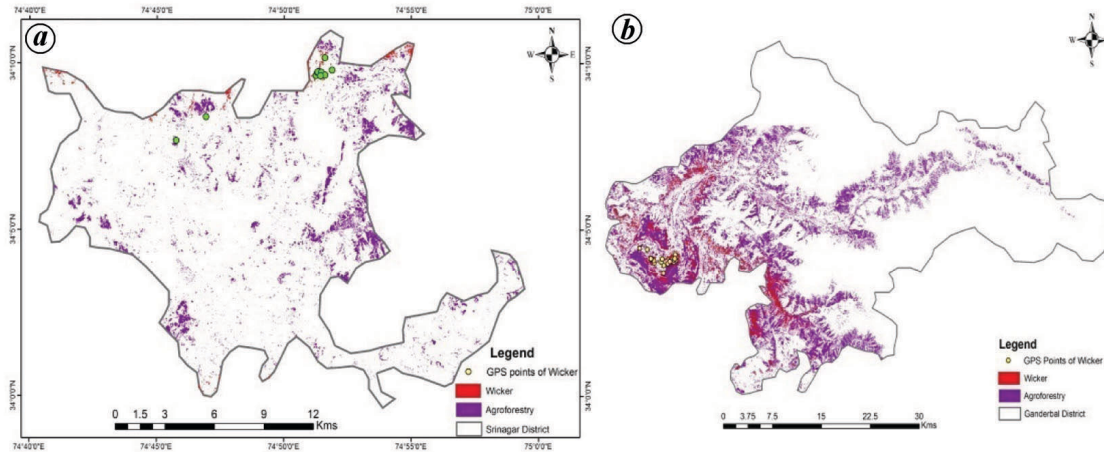
## Analytical techniques

### Capital budgeting

This is a decision-making process by which an organization evaluates its capital investment. For proper evaluation,
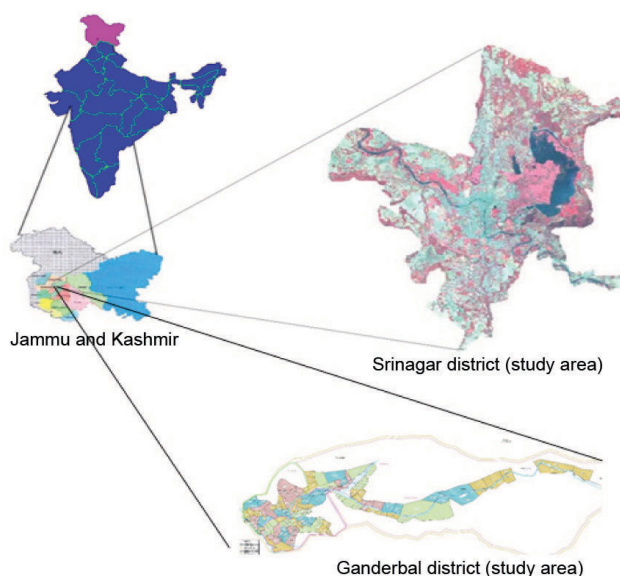


**Figure 1.** Map of the study area, Jammu and Kashmir (J&K), India.



**Figure 2.** Sampling methodology.

**Figure 3.** Wicker area (ha) in (*a*) Srinagar district and (*b*) in Ganderbal district, Jammu and Kashmir.

the time value of money is important. There are three capital-budgeting methods considering the time value of money, namely net present value (NPV), benefit cost ratio (BCR) and internal rate of return (IRR)[11].

NPV is the difference between the present value of cash flows and the present value of cash outflow. It is calculated as follows

$$\text{NPV} = \sum_{t=1}^{t=n} \frac{B_t - C_t}{(1+i)^n},$$

where $B_t$ is the benefit in each year, $C_t$ the cost in each year, $t$ the number of years and $i$ is the interest (discount rate).

BCR shows the relationship between the relative costs and benefits of a proposed project, expressed in monetary or qualitative terms.

$$\text{BCR} = \frac{\text{Present value of benefits}}{\text{Present value of costs}}.$$

Acceptance rule: BCR > 1, the investment is accepted; BCR < 1, the investment is rejected; BCR = 1, indifferent.

IRR reflects the income earning capacity of an investment. It is the discount rate that makes NPV of a particular project equal to zero.

$$\text{IRR} = \text{LDR} + \frac{\text{NPV}_\text{LDR}}{\text{NPV}_\text{LDR} - \text{NPV}_\text{HDR}} \times (\text{HDR} - \text{LDR}),$$

where LDR is lower discount rate (%) and HDR the higher discount rate (%).

Acceptance rule: If IRR > RRR (the required rate of return) the investment is accepted. If IRR < RRR, the investment is rejected. IRR = RRR, indifferent.

The discount rate or interest rate should be equal to the opportunity cost of the capital, i.e. the rate of interest which could be obtained in the best alternative investment on the rate of interest on borrowed capital. The discount rate was taken by assuming the opportunity cost of the capital which is 10% or 12% for most of the developing countries[12].

*Production function analysis*

The Cobb–Douglas production function was used to verify the factors influencing the yield of wicker. In order to estimate the function, the variables were considered on per kanal basis. The function form is as follows

$$\ln Y = \ln a_1 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \cdots + \beta_n \ln X_n + u_i,$$

where $Y$ is the yield (mann/kanal). The explanatory variables considered are age of the plantation, area under wicker plantation, number of plants, human labour, use of fertilizers and manures.

**Results and discussion**

*Village-level involvement and area under wicker cultivation*

Table 1 was compiled from the frequent surveys and data were collected from the various Tehsil offices in the region. From the data collected it was observed that Srinagar district had the maximum area under wicker plantation.

*Capital budgeting of wicker willow cultivation*

NPV was positive and greater than 0 (Rs 43,837.43; Table 2). The NPV value indicates that the wicker cultivation is an acceptable and profitable investment. It indicates that the owner was able to increase his income by Rs 43,837.43 per kanal of wicker cultivation for a 10-year-old plantation.

**Table 1.** Village-level involvement in wicker willow industry in Kashmir Valley, Jammu and Kashmir, India

| District | Villages involved | No. of households | Type of involvement | Area under wicker (ha) |
|---|---|---|---|---|
| Ganderbal | Shallabugh | 400 | Plantation + weaving | 20.00 |
| | Harren | 300 | Plantation + weaving + trading | 1.25 |
| | Kachhan | 250 | Weaving + trading + plantation | 1.00 |
| | Gadoora | 300 | Weaving + plantation | 0.50 |
| | Hakim gund | 100 | Weaving + plantation | 1.00 |
| | Pirpora | 150 | Weaving + plantation | 1.00 |
| | Sehpora | 100 | Plantation | 2.50 |
| | Gundi rehman | 100 | Weaving + plantation | 1.25 |
| | Gogji gund | 70 | Plantation + boiling + peeling | 3.00 |
| | Tulmulla | 80 | Plantation | 1.00 |
| Total | 10 | 1850 | | 32.50 |
| Srinagar | Umarhair (Buchpora) | 100 | Boiling + peeling + plantation + weaving | 0.1 |
| | Dargah | 30 | Trading + weaving | 0 |
| | Shanipora (Tailbal) | 60 | Plantation | 0.2 |
| | Astanpora (Tailbal) | 20 | Plantation | 10.00 |
| | Kaschipora (Tailbal) | 15 | Plantation | 7.50 |
| | Batpora (Tailbal) | 30 | Plantation | 5.00 |
| | Anchar | 25 | Plantation + trading | 62.5 |
| Total | 7 | 280 | | 85.3 |
| Budgam | Sundrabad | 50 | Plantation + weaving | 2.60 |
| | Narbal | 30 | Plantation | 1.25 |
| | Chak Kawoosa | 10 | Weaving | 0.00 |
| | Yarigund | 10 | Plantation + weaving | 1.00 |
| | Wadwan | 30 | Plantation | 0.8 |
| | Daharmuna | 14 | Plantation | 0.25 |
| | Chirpora | 20 | Plantation | 5 |
| | Rakhiarath | 50 | Plantation | 2.5 |
| Total | 8 | 214 | | 13.4 |
| Bandipora | Matipora (Hajin) | 10 | Weaving | |
| | Papchhan | 8 | Weaving | |
| Total | 2 | 18 | | |
| Kulgam | Chawalgam | 100 | Weaving | |
| | Wakaie | 50 | Weaving + processing | |
| | Liraw | 20 | Weaving | |
| | Hirgama | 10 | Weaving | |
| | Bumbrat | 25 | Weaving | |
| | Mahipora | 20 | Weaving | |
| Total | 6 | 225 | | |
| Pulwama | Padgampora | 15 | Weaving | |
| | Tokuen | 10 | Weaving | |
| | Gurpora | 50 | Weaving | |
| | Wandakpora | 50 | Weaving | |
| | Ludgama | 5 | Processing + trading | |
| Total | 5 | 130 | | |
| Kupwara | Kaentpora (lolab) | 50 | Weaving | |
| | Ramhal | 100 | Weaving | |
| Total | 2 | 150 | | |
| Shopian Baramulla Anantnag | No involvement found | | | |
| Grand total | 36 | 2857 | | |

BCR was found to be 2.23 (Table 3), which indicates that the farmers involved in wicker cultivation earned an extra of Rs 223 by investing Rs 100 per kanal of land. It shows that investment in wicker cultivation is economically justifiable.

The trial and error approach gave an IRR of 32.52% for wicker cultivation, which was much greater than the existing bank interest rate (Table 4). This assures that investing in wicker cultivation will ensure a satisfactory profit for the investors.

**Table 2.** Estimation of NPW for wicker cultivation (one kanal)

| Year | Costs (Rs) | Returns (Rs) | Discount factor at 12% | Net income (Rs) | Net present worth (Rs) | Year | Costs (Rs) | Returns (Rs) | Discount factor at 12% | Net income (Rs) | Net present worth (Rs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| First | 9,520.00 | 7,650.00 | 0.893 | −1,870.00 | −1,669.72 | Sixth | 5,000.00 | 16,500.00 | 0.507 | 11,500.00 | 5,830.50 |
| Second | 5,770.00 | 14,025.00 | 0.797 | 8,255.00 | 6,580.88 | Seventh | 5,000.00 | 14,500.00 | 0.452 | 9,500.00 | 4,294.00 |
| Third | 6,270.00 | 16,550.00 | 0.712 | 10,280.00 | 7,317.30 | Eighth | 5,000.00 | 13,000.00 | 0.404 | 8,000.00 | 3,232.00 |
| Fourth | 6,270.00 | 19,000.00 | 0.636 | 12,730.00 | 8,089.91 | Ninth | 5,000.00 | 10,550.00 | 0.361 | 5,550.00 | 2,003.55 |
| Fifth | 6,770.00 | 18,000.00 | 0.567 | 11,230.00 | 6,371.90 | Tenth | 5,000.00 | 10,550.00 | 0.322 | 5,550.00 | 1,787.10 |
| Total | | | | | 26,690.28(a) | | | | | | 17,147.15(b) |

NPW, Net present worth: (a) + (b) = 26,690.28 + 17,147.15 = 43,837.43. 1 kanal = 5442 sq ft.

**Table 3.** Benefit–cost ratio for wicker plantation (one kanal)

| Year | Costs (Rs) | Gross returns (Rs) | Discount factor at 12% | Present worth of costs (Rs) | Present worth of gross returns (Rs) | Year | Costs (Rs) | Gross returns (Rs) | Discount factor at 12% | Present worth of costs (Rs) | Present worth of gross returns (Rs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| First | 9,520.00 | 7,650.00 | 0.893 | 8,500.41 | 6,830.69 | Sixth | 5,000.00 | 16,500.00 | 0.507 | 2,535.00 | 8,365.50 |
| Second | 5,770.00 | 14,025.00 | 0.797 | 4,599.84 | 11,180.73 | Seventh | 5,000.00 | 14,500.00 | 0.452 | 2,260.00 | 6,554.00 |
| Third | 6,270.00 | 16,550.00 | 0.712 | 4,462.99 | 11,780.29 | Eighth | 5,000.00 | 13,000.00 | 0.404 | 2,020.00 | 5,252.00 |
| Fourth | 6,270.00 | 19,000.00 | 0.636 | 3,984.59 | 12,074.50 | Ninth | 5,000.00 | 10,550.00 | 0.361 | 1,805.00 | 3,808.55 |
| Fifth | 6,770.00 | 18,000.00 | 0.567 | 3,841.30 | 10,213.20 | Tenth | 5,000.00 | 10,550.00 | 0.322 | 1,610.00 | 3,397.10 |
| Total | | | | 25,389.12(a) | 52,079.41(b) | | | | | 10,230.00(c) | 27,377.15(d) |

Total present worth of costs in Rs (a + c) = 35,619.12 + 10,230.00 = 35,619.12. Total present worth of returns in Rs (b + d) = 52,079.41 + 27,377.15 = 79,456.56. Benefit–cost ratio = Present worth of gross returns/Present worth of costs = Rs 79,456.56/35,619.12 = 2.23.

**Table 4.** Estimation of internal rate of return (IRR) for wicker cultivation (one kanal)

| Year | Costs (Rs) | Returns (Rs) | Discount factor at 10% | Net income (Rs) | Net present worth (Rs) | Year | Costs (Rs) | Returns (Rs) | Discount factor at 12% | Net income (Rs) | Net present worth (Rs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| First | 9,520.00 | 7,650.00 | 0.909 | −1,870.00 | −1,700.00 | First | 9,520.00 | 7,650.00 | 0.893 | −1,870.00 | −1,669.64 |
| Second | 5,770.00 | 14,025.00 | 0.826 | 8,255.00 | 6,822.31 | Second | 5,770.00 | 14,025.00 | 0.797 | 8,255.00 | 6,580.835 |
| Third | 6,270.00 | 16,550.00 | 0.751 | 10,280.00 | 7,723.52 | Third | 6,270.00 | 16,550.00 | 0.712 | 10,280.00 | 7,317.101 |
| Fourth | 6,270.00 | 19,000.00 | 0.683 | 12,730.00 | 8,694.76 | Fourth | 6,270.00 | 19,000.00 | 0.636 | 12,730.00 | 8,090.145 |
| Fifth | 6,770.00 | 18,000.00 | 0.621 | 11,230.00 | 6,972.95 | Fifth | 6,770.00 | 18,000.00 | 0.567 | 11,230.00 | 6,372.204 |
| Sixth | 5,000.00 | 16,500.00 | 0.564 | 11,500.00 | 6,491.45 | Sixth | 5,000.00 | 16,500.00 | 0.507 | 11,500.00 | 5,826.258 |
| Seventh | 5,000.00 | 14,500.00 | 0.513 | 9,500.00 | 4,875.00 | Seventh | 5,000.00 | 14,500.00 | 0.452 | 9,500.00 | 4,297.318 |
| Eighth | 5,000.00 | 13,000.00 | 0.467 | 8,000.00 | 3,732.06 | Eighth | 5,000.00 | 13,000.00 | 0.404 | 8,000.00 | 3,231.066 |
| Ninth | 5,000.00 | 10,550.00 | 0.424 | 5,550.00 | 2,353.74 | Ninth | 5,000.00 | 10,550.00 | 0.361 | 5,550.00 | 2,001.386 |
| Tenth | 5,000.00 | 10,550.00 | 0.386 | 5,550.00 | 2,139.77 | Tenth | 5,000.00 | 10,550.00 | 0.322 | 5,550.00 | 1,786.951 |
| Total | | | | | 48,105.56 (a) | Total | | | | | 43,833.62 (b) |

IRR = Lower discount rate + difference between two discount rates × Present worth of cash flow at lower discount rate/absolute difference of the cash flows at the two discount rates. IRR = 10 + 2(48105.56/48105 − 43833.62) = 32.5%.

**Table 5.** Regression coefficients of log–linear function

| Input | Regression coefficients |
|---|---|
| Field management (weeding/cleaning) | −0.884 |
| Age | −0.274* |
| Fertilizer | 0.370* |
| Manure (Farm Yard Manure) | 0.590 |
| Planting material | 6.460* |
| Intercept | 12.169 |
| $R^2$ | 88.96 |
| Adjusted $R^2$ | 86.54 |

*Statistically significant at 5% level of significance.

### Functional analysis

In order to determine the effect of various inputs on the productivity of wicker, the log linear coefficients of the Cobb–Douglas function were estimated. The regression analysis of the said function was computed using R software. Table 5 provides a summary of the regression.

### Value addition

About 30–40 wicker handicraft items have been identified in the study area, of which nine major wicker handicrafts are produced throughout the year. These are decorative ducks, dryfruit bowl, round tokri (small), round cups, bucket with lid, round tokri (large), chapatti and kangri. The various costs involved in making them include boiling costs, debarking costs, drying costs, sorting costs, transportation costs and labour costs (Table 6).

**Table 6.** Value addition of major wicker handicrafts

| Product | Quantity for making the product (kg) | Boiling cost (Rs) | Debarking | Drying | Sorting | Transportation | Labour cost (Rs) | Retail value/ 100 pieces (Rs) | BC ratio |
|---|---|---|---|---|---|---|---|---|---|
| Swan | 110 | 280 | 300 | 85 | 95 | 65 | 1,500 | 10,000 | 4.11 |
| Dryfruit bowl | 135 | 310 | 405 | 115 | 130 | 90 | 1,750 | 10,500 | 3.58 |
| Round tokri (small) | 225 | 520 | 675 | 190 | 220 | 150 | 3,750 | 8,000 | 1.40 |
| Round cups | 30 | 75 | 75 | 21 | 25 | 20 | 750 | 17,500 | 17.57 |
| Bucket with lid | 150 | 350 | 450 | 130 | 140 | 100 | 2,500 | 35,000 | 9.16 |
| Round tokri (large) | 320 | 720 | 945 | 265 | 300 | 200 | 4,750 | 18,000 | 2.40 |
| Chapatti | 110 | 260 | 350 | 90 | 110 | 75 | 1,750 | 13,500 | 4.92 |
| Kangri | 200 | 440 | 570 | 150 | 190 | 125 | 3,150 | 35,500 | 7.36 |

**Table 7.** Trade of wicker handicraft (Rs per 100 pieces)

| | Producers | | | Wholesalers | | | Retailers | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Product | SP | Expenses | Producer's margin | PP | Expenses | Wholesalers' Margin | PP | Expenses | CPP | Retailer's margin |
| Swan | 10,500 | 9,700 | 800 | 10,500 | 230 | 170 | 10,900 | 225 | 11,395 | 270 |
| Dryfruit bowl | 4,370 | 3,900 | 470 | 4,370 | 190 | 150 | 4,710 | 190 | 5,160 | 260 |
| Round tokri (small; 16 in) | 13,000 | 12,300 | 700 | 13,000 | 280 | 200 | 13,480 | 320 | 14,300 | 500 |
| Round cups | 1,500 | 1,350 | 150 | 1,500 | 180 | 110 | 1,790 | 200 | 2,180 | 190 |
| Bucket with lid | 12,000 | 10,500 | 1,500 | 12,000 | 275 | 190 | 12,465 | 290 | 13,155 | 400 |
| Round tokri (large; 18 in) | 22,500 | 21,200 | 1,300 | 22,500 | 320 | 340 | 23,160 | 550 | 24,510 | 800 |
| Heart-shaped tokri (12 in) | 10,500 | 7,500 | 3,000 | 10,500 | 500 | 260 | 11,260 | 320 | 11,980 | 400 |

**Table 8.** Producer's share in consumer's rupee

| Wicker handicraft | Price spread | Producer's share in consumer's rupee | Wholesaler's share in consumer's rupee |
|---|---|---|---|
| Swan | 895.00 | 92.15 | 95.66 |
| Dryfruit bowl | 790.00 | 84.69 | 91.28 |
| Round tokri (small; 16 in) | 1300.00 | 90.91 | 94.27 |
| Round cups | 680.00 | 68.81 | 82.11 |
| Bucket with lid | 1155.00 | 91.22 | 94.75 |
| Round tokri (large; 18 in) | 2010.00 | 91.80 | 94.49 |
| Heart-shaped tokri 12 in | 1480.00 | 87.65 | 93.99 |

## Marketing channels

Wicker-willow and handicrafts are produced by a large number of farmers. The marketing system of these products consists of different marketing channels for distribution of wicker willows and handicrafts in different markets. In each channel, several functionaries are involved, performing numerous business activities known as marketing functions. The following marketing channel has been commonly identified in the study area (Tables 7 and 8). Channel: Farmer – processor – artisan – wholesaler – retailer – consumer.

## Conclusion and recommendation

Wicker cultivation is profitable in the study area because it gives higher net returns. Based on the profitability indices NPV, IRR and BCR, it is ascertained that wicker cultivation has good potential in the Kashmir Valley. It is also found that among the various input variables, only age of the plantation significantly affects the yield. As wicker cultivation is a profitable enterprise, it can be a source of livelihood for uneducated and educated youth. Wicker crafts play an important role in the economic safety of farmers and entrepreneurs, and contribute considerably to the gross annual income, besides acting as a safety net in cases of exigency. In addition, wicker handicrafts strongly affect on the distribution of local incomes and reduce the socio-economic disparity among farmers. Thus wicker cultivation should be given due attention in rural development and industrial policies for socio-economic improvement, poverty reduction and livelihood security of the farmers. Wicker handicraft entrepreneurs have no advertising or promotion opportunities to expand their markets. Thus, marking and certification of wicker handicraft cooperatives and e-commerce must be considered to attract traders and reduce competition with large-scale industries. Furthermore, the potential opportunities for

income diversification by adding value to the weaving craft, improving marketing and commercialization should be explored and accordingly, skill development and capacity-building programmes must be organized for the farmers and entrepreneurs. The Government in collaboration with the State Agriculture University must expand the wicker plantations in the Valley and also formulate appropriate policies for its widespread cultivation. Proper measures need to be taken to disseminate information among the young entrepreneurs, so that they actively take up wicker cultivation as a source of livelihood and also the farmers involved in wicker cultivation, to sustain the yield of wicker plantations in the Kashmir Valley.

1. Argus, G. W., Infrageneric classification of *Salix* L. (Salicaceae) in the New World. *Syst. Bot. Monogr.*, 1997, **52**.
2. Skvortsov, A. K., *Willows of Russia and Adjacent Countries: Taxonomical and Geographical Revision*, No. 39, Faculty of Mathematics and Natural Science, University of Joensuu, Report Series, Joensuu, Finland, 1999.
3. Huse, S. A., Singh, N. B., Gupta, A. and Anand, R. K., Genetic improvement of tree willows in India. In *Exotics in Indian Forestry* (eds Chauhan, S. K. *et al.*), Agrotec Publishing Academy, Udaipur, 2008, pp. 591–614.
4. Dhar, U. and Kachroo, P., *Alpine Flora of Kashmir Himalaya*, Scientific Publishers, Jodhpur, India, 1983, p. 169.
5. http://www.reo.gov-/col/wetlandclassification (accessed in 2001).
6. Rather, T. A., Qaisar, K. N. and Khan, P. A., Status and distribution of wicker willow in Kashmir. *Indian J. Tradit. Knowl.*, 2010, **9**(2), 403–406.
7. Anon., Directorate of Economics and Statistics, District Statistics and Evaluation Office, Pulwama, Jammu and Kashmir, 2018–19.
8. Biswas, S. and Hussain, S. S., Livelihood studies on willow dependent communities of Indian Trans Himalayan region with emphasis on sustainable management of bioresource and better well being. Forest Research Institute (ICFRE), Dehra Dun, 2008.
9. Islam, M. A., Sofi, P. A., Rai, R. and Quli, S. M. S., Factors influencing forest-based tribal livelihoods in Jharkhand. *Trends Biosci.*, 2014, **7**(2), 238–242.
10. Azadah, E. and Shehriar, S. Z., Providing poplar plantation map by Indian remote sensing (IRS) satellite imagery in northern Iran. *Afr. J. Agric. Res.*, 2011, **6**(20), 1–15.
11. Pandey, I. M., Capital budgeting practices of Indian companies. *Manage. J.*, 1989, **2**(1), 1–15.
12. Gittinger, J. P., *Economic Analysis of Agricultural Projects*, Johns Hopkins University Press, Baltimore, USA, 1982.