



## Research Article

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# Economic evaluation of extraction, value addition and contribution of medicinal plants to household economy in district Ganderbal, Jammu & Kashmir

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## ABSTRACT

The present study was carried out in four community blocks of district Ganderbal viz., Lar, Kangan, Gund and Sherpathri of the Kashmir valley owing to the majority of medicinal plant collectors in these blocks of Ganderbal district. A total number of 120 respondents i.e. Medicinal plant collectors were selected for the study. An all-around organized meeting plan was developed for the assortment of essential information from the respondents. Information got from the interviewees was investigated by utilizing both engaging and inferential insights. Description of fourteen species of medicinal plants was made in the study area. The study led to conclude that there were 14 major medicinal plants collected, consumed and marketed by the local people in Ganderbal. The medicinal plants comprised of twenty one types of plant parts which were extensively collected from herbs, shrubs, trees, climbers, fungi, fern etc. and consumed for curing sixteen different types of diseases by the local population and to meet their livelihood needs. The collection, value addition and marketing of medicinal plant generated a gross income of Rs.37670.50/HH/year and net income of Rs.24869.70/HH/year and an employment opportunity of 7052.40/Man-days/year among the sampled households. *Morchella esculenta* generated maximum income and employment among all the medicinal plants while the *Taraxacum officinale* accrued minimum income and employment in the sample households.

**Keywords:** Medicinal plants, Value addition, Extraction, Market value.

## INTRODUCTION

Forests have assumed key part in the daily routine of individuals experiencing in the two mountains and marsh regions by providing new water and oxygen just as giving a variety of significant woodland items for food and medication. It is a complex ecosystem consisting mainly of trees that buffer the earth and support a myriad of life forms. Forests are the source of various products of which various medicinal plants (MPs) are the main product, while as, some of the MPs are cultivated on low land areas (Kala, 2004). The MPs consumption is widespread in developing countries. Medicinal plants are an important source of livelihoods for the rural populations all over the world. This is on the grounds that it is now and again the solitary wellspring of medical care conveyance for wiped out people and animals in most provincial regions <sup>[1, 2]</sup>. The MPs subsector is complicatedly intertwined in the provincial economies of non-industrial nations. Outstandingly, the 2010 yearly worldwide interest for MPs and their items was assessed at US\$14 billion and is projected to develop to US\$5 trillion by 2050 <sup>[2]</sup>.

Medicinal plant crude materials have a place with just about 18 to 22 species. The medicinal worth of plants are ascribed to their constituent mixtures, for example, alkaloids glycosides, saponins, nutrients, natural acids, mineral salts, unpredictable oils, and anti-infection agents. The extraction of leaves, blossoms, tubers, roots, bulbs, seeds and bark of therapeutic plants are specifically utilized in making tonics, mixtures, teas, juices, colors, powders and poultices. Logically approved and mechanically normalized home grown medications might be inferred utilizing a protected way of opposite pharmacology approach dependent on conventional information data set <sup>[3]</sup>.

The market of restorative plants material is profoundly nimble and strategy creators and specialists consistently advocate for their worth expansion to get higher monetary returns. Indeed, even basic intercessions, as better technique for gathering, stockpiling, evaluating and nearby level worth expansion can significantly improve returns. Promoting of semi prepared item instead of crude harvest can improve the productivity of the cultivators <sup>[4, 5]</sup> has the view that, in this day and age with monetary

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globalization, restorative plant activities ought to be founded on a sound comprehension of the exchange circumstance at nearby and worldwide levels. Benchmark research is fundamental to foster proper and experimentally based techniques. Statistical surveying will permit individuals to distinguish species in exchange, discover exchange volumes and elements, recognize source regions and end markets for plants and handled items, and, above all, add to evaluating the effect that use and exchange have on the situation with restorative plant species in nature. As per the World Health Organization (WHO), more than 80% of the total populace depends upon customary plant-based frameworks of prescriptions to give them essential medical services [6]. [7, 8] additionally repeated something similar with their assessment that 70-80 per cent of individuals overall depend essentially on customary, generally natural, medication to meet their essential medical service's needs. Restorative plants have additionally been utilized to foster family-based wellbeing and vocation situated ventures in rustic regions. The business sectors, explicitly the global business sectors for therapeutic plants, have consistently been extremely enormous. The business is unpredictable with minimal vertical incorporation [9]. thinks that it's hard to investigate information identifying with the therapeutic plant markets as countless little and medium-sized organizations in the business are hesitant to share information. Wholesalers are likewise feel hesitance to give data to expect that organizations may attempt to sidestep them. In addition, cross-exchanging between organizations is regularly worked on, adding to the troubles of understanding the exchange [10].

#### DATA AND METHODOLOGY

The study was conducted purposively in Ganderbal district of Kashmir province using multi-stage random sampling technique. In the first stage, four (4) blocks were selected. In the second stage, a village cluster was randomly selected from each block. In the final stage, six (6) households were randomly selected from each village making the total target of respondents up to 120. To study diversity, distribution and utilization pattern of medicinal plant the data recorded were medicinal plants type, plant part, species (local/ common/ scientific name), plant habit, seasonality (peak/ lean), usage and value addition. In order to analyze the economic of medicinal plants collection the data gathered were quantity sold (Kg), Price/kg (Rs./kg), Gross returns (Rs.), Transportation cost (Rs.), labour man days, Opportunity cost of labour (Rs.), Net returns (Rs.), Net return/kg and Net return/rupee of cost.

#### Mean (x)

The mean is computed by the formula:

$$\bar{X} = \frac{\sum f \cdot x}{N}$$

Where,  $\bar{X}$  = mean of the scores

$\sum$  = summation

$f$  = frequency of the class

$x$  = class value or midpoint of the class interval

$N$  = number of observations

#### Standard deviation ( $\sigma$ )

Standard deviation is defined as the square root of the mean of the squared deviations of individual's vales from their mean and it is denoted by  $\sigma$ . It's computed by formula

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

#### RESULTS AND DISCUSSION

##### Medicinal plants available, seasonality, parts collected, methods of collection and end use of the products:

The Table 1 depicts details on various medicinal plants available, seasonality, parts collected, methods of collection and end use of the products. The major medicinal plants are *Morchella esculenta*, *Trillium govanianum*, *Podophyllum hexandrum*, *Dioscorea deltoidea*, *Prunella vulgaris*, *Bergenia ciliate*, *Pinus Wallachia*, *Rheum emodi*, *Alkanna tinctoria*, *Jurinea himalaica*, *Taxus wallichiana*, *Artemisia absinthium*, *Taraxacum officinale*, *Saussurea costus* medicinal plants are collected all year round. Notwithstanding, the vast majority of them are occasional in nature. In this way most extreme therapeutic plants assortment was finished during summer and rainstorm seasons. Every gatherer makes on normal 4 to 7 visits to the woodland in seven days. In any case, this recurrence may differ as indicated by season and kind of restorative plant gathered in the particular season. Assortment of restorative plants in the examination region is finished by men, ladies and kids' in sure cases. The restorative plants gathered were having a place with 14 genera and 10 families.

**Table 1:** Descriptions of medicinal plants extracted from forest to support rural economy

S. No.	Species	Family	Common name/ Local name	Plant part	Plant habit	Seasonality	Usage	Value addition
1.	<i>Morchella esculenta</i> Dill. ex Pers.	Morchellaceae	Morel/ Guchie	Basidiocarp	Fungi	March-April	Antioxidant, Liver Immune protection, system active	Drying, packing
2.	<i>Bergenia ciliata</i> (Haw.) Sternb. Revis. Saxifrag. Suppl.	Saxifragaceae	Elephants ears/ Pahand	Root, Leaves	Herb	September-October	Anti-Cancer drug, antioxidant	Drying, packing
3.	<i>Artemisia absinthium</i> L.	Asteraceae	Absinthewormwood/Tethwan	Whole plant	Herb	May - July	Antiseptic, digestive	Drying
4.	<i>Dioscorea deltoidea</i> Wall. Ex Griseb.	Dioscoreaceae	Dioscoria/Yam	Whole plant	Herb	May-June	Steroid hormones for use in medicines and as contraceptives	Dryings, packing
5.	<i>Rheum emodi</i> L.	Polygonaceae	Himalayan rhubarb/ Pambchalan	Root, Leaves	Herb	June-September	Antiseptic, antitumor, antispasmodic, stomachic	Drying, packing
6.	<i>Trillium govanianum</i> Wall. ex D.Don	Melanthiaceae	Himalayan Trillium/ Nag chhatri	Flower,Leaves	Herb	September-October	Cancer treatment	Drying, packing
7.	<i>Saussurea costus</i> (Falc.)Lipsch.	Asteraceae	Costus / Kuth	Root, Leaves	Herb	September-October	Cooling of head	Drying, packing
8.	<i>Alkanna tinctoria</i> (L.) Tausch	Boraginaceae	Alkanet/ Ratanjot	Root, Leaves	Herb	June	Colouring agent, wood staining, food colouring agent	Drying, packing
9.	<i>Jurinea himalaica</i> Cass.	Asteraceae	Dhoop/Duph	Whole plant	Herb	August-September	Treatment of colic and puerperal fever	Drying, packing
10.	<i>Taxus wallichiana</i> Zucc.	Taxaceae	Himalayan yew/ Posthul chai	Stem, Bark ,Young shoots	Shrub	January-April	Source of chemical precursors to the anticancer drug paclitaxel. Also used for making tea	Drying, packing
11.	<i>Taraxacum officinale</i> (L.) Weber ex F.H. Wigg	Asteraceae	Common dandelion/ Hand	Whole plant	Herb	March-April	Liver and gallbladder treatment	Drying
12.	<i>Prunella vulgaris</i> L.	Limiaceae	Self-heal/ Kalveth	Whole plant	Herb	June-July	Wound healing	Drying, Packing
13.	<i>Pinus wallichina</i> A.B. Jacks.	Pinaceae	Himalayan pine/kaayur	Resign	Tree	October	Crack treatment of feet	Packing
14.	<i>Podophyllum hexandrum</i> L.	Berberidaceae	Himalayan mayapple/ Wanwagun	Fruit	Herb	May	Lung cancer treatment, Arthritis	Drying, packing

### Collection, consumption and household income generation of medicinal plants

The involvement of households in collection of medicinal plants was observed maximum in *morchella esculenta* (91.67%/HH) followed by *Pinus wallichiana* (90.00%/HH), *Dioscorea deltoidea* (89.17%/HH), *Podophyllum hexandrum* (88.33%/HH), *Bergenia ciliate* (87.50%/HH), *Trillium govanianum* (85.83%/HH), *Jurinea himalaica* (85.00%/HH), *Taxus wallichiana* (85.00%/HH), *Rheum emodi* (81.66%/HH), *Alkanna tinctoria* (79.16%/HH), *Prunella vulgaris* (77.50%/HH), *Taraxacum officinale* (70.83%/HH), *Artemisia absinthium* (65.83%/HH) and *Saussurea costus* (40.00%/HH).

Maximum sale price was yielded by *morchella esculenta* (9000/kg) followed by *Trillium govanianum* (1600/kg), *Dioscorea deltoidea* (650/kg), *Rheum emodi* (650/kg), *Prunella vulgaris* (650/kg), *Podophyllum hexandrum* (650/kg), *Saussurea costus* (600/kg), *Bergenia ciliate* (550/kg), *Pinus wallichiana* (550/kg), *Alkanna tinctoria* (450/kg), *Jurinea himalaica* (350/kg), *Artemisia absinthium* (350/kg), *Taxus wallichiana* (250/kg) and *Taraxacum officinale* (100/kg),

Maximum quantity yield was collected in case of *Taraxacum officinale* (7.00/kg/HH/year) followed by *Taxus wallichiana* (5.65/kg/HH/year), *Podophyllum hexandrum* (5.08/kg/HH/year), *Bergenia ciliate* (4.80/kg/HH/year), *Dioscorea deltoidea* (4.77/kg/HH/year), *Alkanna tinctoria* (4.60/kg/HH/year), *Prunellavulgaris* (4.54/kg/HH/year), *Trillium govanianum* (4.53/kg/HH/year), *Jurinea himalaica* (4.38/kg/HH/year), *Pinus wallichiana* (4.28/kg/HH/year). *Artemisia absinthium* (4.10/kg/HH/year), *Rheum emodi* (3.97/kg/HH/year), *morchella esculenta* (1.12/kg/HH/year) and *Saussurea costus* (1.06/kg/HH/year)

In case of home consumption *Artemisia absinthium* (0.61/kg/HH/Year) was maximum consumed followed by *Taraxacum officinale* (0.59/kg/HH/Year), *Rheum emodi* (0.50/kg/HH/Year), *Trillium govanianum* (0.49/kg/HH/Year), *Bergenia ciliate* (0.45/kg/HH/Year), *Dioscorea deltoidea* (0.42/kg/HH/Year), *Taxus wallichiana* (0.40/kg/HH/Year), *Prunella vulgaris* (0.37/kg/HH/Year), *Podophyllum hexandrum* (0.34/kg/HH/Year), *Jurinea himalaica* (0.30/kg/HH/Year), *Alkanna tinctoria* (0.25/kg/HH/Year), *Pinus wallichiana*

(0.17/kg/HH/Year), *morchella esculenta* (0.17/kg/HH/Year) and *Saussurea costus* (0.09/kg/HH/Year)

Same in case of quantity sold *Taraxacum officinale* (6.42/kg/HH/Year) was maximum sold followed by *Taxus wallichiana* (5.24/kg/HH/Year), *Podophyllum hexandrum* (4.73/kg/HH/Year), *Dioscorea deltoidea* (4.35/kg/HH/Year), *Bergenia ciliate* (4.34/kg/HH/Year), *Alkanna tinctoria* (4.35/kg/HH/Year), *Prunella vulgaris* (4.17/kg/HH/Year), *Pinus wallichiana* (4.11/kg/HH/Year), *Jurinea himalaica* (4.08/kg/HH/Year), *Trillium govanianum* (4.04/kg/HH/Year), *Rheum emodi* (3.47/kg/HH/Year), *Artemisia absinthium* (3.49/kg/HH/Year), *morchella esculenta* (0.95/kg/HH/Year), *Saussurea costus* (0.97/kg/HH/Year),

Total income among the sample households from medicinal plant collection and sale was recorded to be Rs 2984364.00 Rs./annum @ 37670.50/HH/annum. among the medicinal plant maximum income was of *morchella esculenta* (7766.66/Rs./HH/year) followed by *Trillium govanianum* (6464.00/Rs./HH/year), *Podophyllum hexandrum*

(3074.50/Rs./HH/year), *Dioscorea deltoidea* (2827.50/Rs./HH/year), *Prunella vulgaris* (2710.50/Rs./HH/year), *Bergenia ciliate* (2387.00/Rs./HH/year), *Pinus wallichiana* (2260.50/Rs./HH/year), *Rheum emodi* (2255.50/Rs./HH/year), *Alkanna tinctoria* (1957.50/Rs./HH/year), *Jurinea himalaica* (1428.00/ Rs./ HH/ year), *Taxus wallichiana* (1310.00 / Rs./HH/year), *Artemisia absinthium* (1221.50/Rs./HH/year), *Taraxacum officinale* (642.00/Rs./HH/year) and *Saussurea costus* (582.00/Rs./HH/year).

*Morchella esculenta* (21.8 days/HH) major source of employment followed by *Trillium govanianum* (6.12 days/HH), *Bergenia ciliate* (4.35 days/HH), *Pinus wallichiana* (3.75 days/HH), *Rheum emodi* (2.96 days/HH), *Dioscorea deltoidea* (2.80 days/HH), *Taxus wallichiana* (2.80 days/HH), *Prunella vulgaris* (2.62days/HH), *Podophyllum hexandrum* (2.54days/HH), *Jurinea himalaica* (2.39days/HH), *Alkanna tinctoria* (2.37days/HH), *Artemisia absinthium* (1.93days/HH), *Taraxacum officinale* (1.33days/HH) and *Saussurea costus* (0.95days/HH).

**Table 2:** Collection, Consumption household income generation of medicinal plants 1

Medicinal Plants	No. of HH involved	Price/kg (INR/kg)	Quantity collected (Kg/HH/year)		Home consumption (Kg/HH/year)		Quantity sold (Kg/HH/year)		Income generated (INR/HH/year)		Employment (man days)
			Mean	S.D	Mean	S.D	Mean	S.D.	Mean	S.D	
<i>Morchella esculenta</i> Dill. ex Pers.	110 (91.67)	9000	1.12	0.43	0.17	0.26	0.95	0.39	8550.00 (22.69)	3322.27	21.8
<i>Bergenia ciliate</i> (Haw.) Sternb. Revis. Saxifrag.	105 (87.50)	550	4.80	3.10	0.46	0.61	4.34	2.91	2387.00 (6.33)	1783.39	4.35
<i>Artemisia absinthium</i> L.	79 (65.83)	350	4.10	3.89	0.61	0.81	3.49	3.34	1221.50 (3.24)	1296.65	1.93
<i>Dioscorea deltoidea</i> Wall. Ex Griseb.	107 (89.17)	650	4.77	2.51	0.42	0.46	4.35	2.44	2827.50 (7.50)	1622.72	2.80
<i>Rheum emodi</i> L.	98 (81.67)	650	3.97	2.62	0.50	0.62	3.47	2.41	2255.50 (5.98)	1582.51	2.96
<i>Trillium govanianum</i> Wall. ex D.Don	103 (85.83)	1600	4.53	2.91	0.49	0.46	4.04	2.54	6464.00 (17.15)	4288.75	6.12
<i>Saussurea costus</i> (Falc.)Lipsch.	48 (40.00)	600	1.06	1.56	0.09	0.27	0.97	1.38	582.00 (1.54)	828.44	0.95
<i>Alkanna tinctoria</i> (L.) Tausch	95 (79.16)	450	4.60	3.11	0.25	0.30	4.35	2.90	1957.50 (5.19)	1368.70	2.37
<i>Jurinea himalaica</i> Cass.	102 (85.00)	350	4.38	2.83	0.30	0.32	4.08	2.65	1428.00 (3.79)	1008.12	2.39
<i>Taxus wallichiana</i> Zucc.	102 (85.00)	250	5.65	3.61	0.41	0.56	5.24	3.26	1310.00 (3.47)	954.24	2.80
<i>Taraxacum officinale</i> (L.) Weber ex F.H. Wigg	85 (70.83)	100	7.01	6.17	0.59	0.72	6.42	5.55	642.00 (1.70)	554.67	1.33
<i>Prunella vulgaris</i> L.	93 (77.50)	650	4.54	3.92	0.37	0.47	4.17	3.69	2710.50 (7.19)	2578.89	2.62
<i>Pinus wallichiana</i> A.B. Jacks.	108 (90.00)	550	4.28	2.54	0.17	0.38	4.11	2.49	2260.50 (6.00)	1529.10	3.75
<i>Podophyllum hexandrum</i> L.	106 (88.33)	650	5.08	2.85	0.35	0.41	4.73	2.70	3074.50 (8.161)	1847.98	2.54
Total (INR)									37670.50 (100)		

Note: Figures in parentheses indicate percentage to total

### Income composition of medicinal plants

Medicinal plants add to jobs for the enormous extent of helpless living in backwoods of most tropical nations. The Medicinal plants earnings differ across ancestral families. They gather fourteen Medicinal plants, anyway just not many of these contribute altogether to the absolute

family income. In the study area, *Morchella esculenta*, *Trillium govanianum*, *Dioscorea deltoidea*, *Podophyllum hexandrum*, *Prunella vulgaris*, *Bergenia ciliate* and *Rheum emodi* accounts for more than 70% of Medicinal plants annual income (figure 4). It was found that, *Morchella esculenta* (22.69%) contributed the most to the medicinal plant cash income followed by *Trillium govanianum* (17.15%),

*Podophyllum hexandrum* (8.16%), *Dioscorea deltoidea* (7.50%), *Prunella vulgaris* (7.19%), *Bergenia ciliate* (6.33%), *Pinus wallichiana* (6.00%) and *Rheum emodi* (5.98%), *Alkanna tinctoria* (5.19%), *Jurinea himalaica* (3.79%), *Taxus wallichiana* (3.47%), *Artemisia absinthium* (3.24%), *Taraxacum officinale* (1.70%), *Saussurea costus* (1.53%). The substantial downpours during Kharif season in the examination region upholds development of *Morchella esculenta*. Despite the fact that the amount of *Morchella esculenta*, *Pinus wallichiana* and *Saussurea costus* gathered per family was not exactly other Medicinal plants the money pay produced was higher on account of the great unit cost and the fare interest.

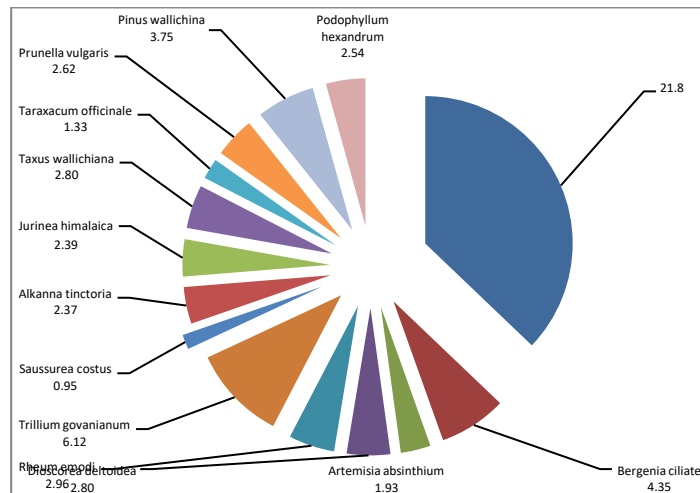
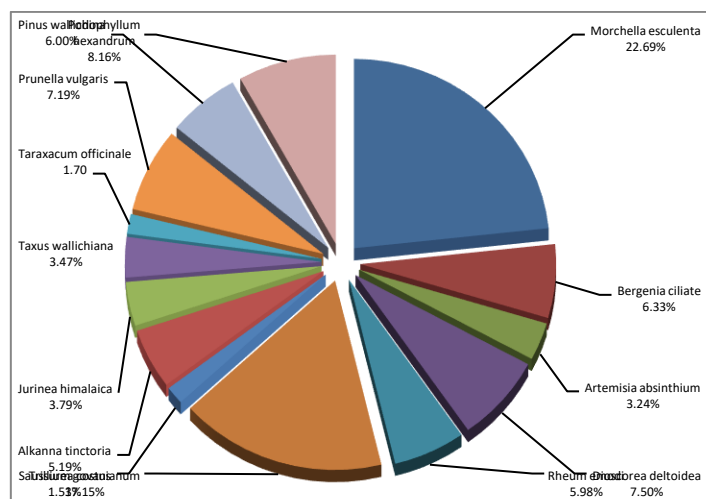


Figure 2: Employment contributions of Medicinal plants

### Economic of medicinal plant collection

Financial aspects of Medicinal plants incorporate expenses and returns engaged with Medicinal plant assortment and advertising. The chance expense of work is assessed considering normal work mandays engaged with Medicinal plant assortment. Opportunity cost is a significant financial idea that actions the monetary expense of an activity or choice as far as what is offered up to complete that activity. The expense of time spent for therapeutic plants assortment is attributed from the chance pay rate winning in the examination region. The gross pay per family got from the offer of items, was determined by considering distinction between complete amount gathered and sold. The expenses and returns of various restorative plants got during assortment season is displayed in (Table - 4.5).

Figure 1: Percentage income contributions from sale of different Medicinal plants

### Employment composition of medicinal plants

Medicinal plants add to occupations for the enormous extent of helpless living in woodlands of most tropical nations. The Medicinal plants business differ across the families. *Morchella esculenta* (21.8 days/HH) major source of employment followed by *Trillium govanianum* (6.12 days/HH), *Bergenia ciliate* (4.35 days/HH), *Pinus wallichiana* (3.75 days/HH), *Rheum emodi* (2.96 days/HH), *Dioscorea deltoidea* (2.80 days/HH), *Taxus wallichiana* (2.80 days/HH), *Prunella vulgaris* (2.62days/HH), *Podophyllum hexandrum* (2.54days/HH), *Jurinea himalaica* (2.39days/HH), *Alkanna tinctoria* (2.37days/HH), *Artemisia absinthium* (1.93days/HH), *Taraxacum officinale* (1.33days/HH) and *Saussurea costus*(0.95days/HH).

The total opportunity cost of labour was amounting Rs.11751, of which *Morchella esculenta* was highest (Rs. 4360.00 ), followed by *Trillium govanianum* (Rs. 1225.00 ), *Bergenia ciliate* (Rs. 871.60 ), *Pinus wallichiana* (Rs. 750.00), *Rheum emodi* (Rs.593.20), *Dioscorea deltoidea* (Rs.561.60), *Taxus wallichiana* (Rs.560.00), *Prunella vulgaris* (Rs.525.00), *Podophyllum hexandrum* (Rs.508.20), *Jurinea himalaica* (Rs.478.00), *Alkanna tinctoria* (Rs.475.00), *Artemisia absinthium* (Rs.386.60), *Taraxacum officinale* (Rs.266.60), *Saussurea costus* (Rs.190.00) and so on. This was mainly due to a higher number of days spent for collection. Table 3 shows household income from medicinal plants collection. The gross income per household was Rs.37670.50.

Table 3: Economic of Medicinal plant collectors (HH/year)

Particulars	Quantity sold (Kg)	Price/kg (Rs./kg)	Gross returns (Rs.)	Transportation cost (Rs.)	labour mandays	Opportunity cost of labour* (Rs.)	Net returns (Rs.)	Net return/kg	Net return/rupee of cost
<i>Morchella esculenta</i>	0.95	9000.00	8550.00	75.00	21.80	4360.00	4115.00	4331.57	0.45
<i>Bergenia ciliate</i>	4.34	550.00	2387.00	75.00	4.35	871.60	1440.40	331.88	2.61
<i>Artemisia absinthium</i>	3.49	350.00	1221.50	75.00	1.93	386.60	759.90	217.73	2.17
<i>Dioscorea deltoidea</i>	4.35	650.00	2827.50	75.00	2.80	561.60	2190.90	503.65	3.37

<i>Rheum emodi</i>	3.47	650.00	2255.50	75.00	2.96	593.20	1587.30	457.43	2.44
<i>Trillium govaniatum</i>	4.04	1600.00	6464.00	75.00	6.12	1225.00	5164.00	1278.21	3.22
<i>Saussurea costus</i>	0.97	600.00	582.00	75.00	0.95	190.00	317.00	326.80	0.52
<i>Alkanna tinctoria</i>	4.35	450.00	1957.50	75.00	2.37	475.00	1407.50	323.56	3.12
<i>Jurinea himalaica</i>	4.08	350.00	1428.00	75.00	2.39	478.00	875.00	214.46	2.50
<i>Taxus wallichiana</i>	5.24	250.00	1310.00	75.00	2.80	560.00	675.00	128.81	2.70
<i>Taraxacum officinale</i>	6.42	100.00	642.00	75.00	1.33	266.60	300.40	46.79	3.00
<i>Prunella vulgaris</i>	4.17	650.00	2710.50	75.00	2.62	525.00	2110.50	506.11	3.24
<i>Pinus wallichina</i>	4.11	550.00	2260.50	75.00	3.75	750.00	1435.50	349.27	2.61
<i>Podophyllum hexandrum</i>	4.73	650.00	3074.50	75.00	2.54	508.20	2491.30	526.70	3.83
<b>Total (INR)</b>			<b>37670.50</b>		<b>58.77</b>		<b>24869.70</b>		

Note: \*Off seasonal wage rates were considered (Rs.200/Day)

Financial matters of medicinal plants incorporate expenses and returns engaged with medicinal plant assortment and advertising. The chance expense of work is assessed considering normal work mandays associated with medicinal plant assortment. Opportunity cost is a significant monetary idea that actions the financial expense of an activity or choice as far as what is offered up to complete that activity. The chance expense of work for the respondents in the examination region is regularly estimated utilizing wage pace of Rs.200/day. The absolute chance expense of work was measuring Rs.11750.00; of which *Morchella esculenta* was most noteworthy (4360) trailed by *Trillium govaniatum* (Rs.1225), *Bergenia ciliate* (Rs.871.60), *Pinus wallichina* (Rs. 750), etc. This was principally because of a higher number of days spent for assortment. The gross pay per family was Rs.37670.50. The assortment of therapeutic plants by families is a customary movement for their occupations for quite a while. Prior, these therapeutic plants had just worth being used of late, because of commercialization; the majority of these items have furthermore gained trade esteem. Because of this, therapeutic plants gathered by backwoods inhabitants are meeting their means needs as well as for bringing in money pay. In this manner, assortment and selling of restorative plants is a significant kind of revenue. Thusly, restorative plants add to food security by expanding their buying power, which builds their financial admittance to food. Pay in the investigation region is produced by five significant exercises: therapeutic plants, farming, domesticated animals raising, working class, business, administration and different exercises. Farming creates the most noteworthy normal yearly pay (Rs. 32583.99) bookkeeping 30.18% to the complete pay (Rs.107937.78). The following pay source was animals raising contributing 27.91% (Rs. 30120.71) to the absolute pay. The third significant pay source was restorative plants assortment with a yearly pay (Rs. 24869.70) contributing 23.04% to the complete pay discoveries are like the investigations of (Kala, 2004). They tracked down that, the normal pay commitment from NTFPs ranges between Rs. 5000 - 6000. Different areas, similar to wage profit (3.32%), business (13.05%), administration (0.20%) and different exercises (2.30%) significant pay creating exercises. Rural creation in the locale will in general be very better due

to the enormous land property great water system offices, and reasonable soil quality. With the huge homesteads and high creation, most families develop crops fundamentally for home utilization and furthermore bigger piece of it was sold at ranch entryway which offered monetary help to individuals in investigation region. As anyone might expect, hence, the commitment of farming to cash pay was most noteworthy among all type of revenue. Administration (0.20%) contributed the least among all types of revenue. Domesticated animals (27.91%) contributed the second most elevated to the absolute yearly pay because of a higher utilization of animals items at the family level. The cows claimed by the families were being utilized for completing farming tasks and dairy purposes. In this way horticulture, domesticated animals and restorative plants pay were significant sources in turning out revenue to families as proven by higher rate share towards absolute family pay.

## CONCLUSION

The study led to conclude that there were 14 major medicinal plants collected, consumed and marketed by the local people in Ganderbal. The collection and marketing of medicinal plant generated a gross income of Rs.37670.50/HH/year and net income of Rs.24869.70/HH/year and employment opportunity of Rs.11742.00/HH/year among the sampled households. Of all the off-farm and on-farm income sources, agriculture contributed maximum income followed by livestock, medicinal plants, business, service, wage labour and others. Likewise, among the employment sources, agriculture generated maximum employment opportunities followed by livestock, medicinal plants, business, service, wage labour and others. Hence, the medicinal plants were the 3rd major component of household economy and employment after agriculture and livestock.

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