



Plant Archives

Journal homepage: <http://www.plantarchives.org>
DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2022.v22.sppecialissue.016>

TASAR SERICULTURE AS A SOURCE OF INCOME AND EMPLOYMENT – AN ECONOMIC ANALYSIS

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ABSTRACT

Tasar sericulture employs considerable size of workers belonging to economically weaker section of the rural sector. The activity is known to provide gainful employment and a notable level of income to the people dependent on community based forest land, for opportunities. With the raising of many number of block tasar plantations, in addition to the already existing plantations, in the forest community land, the silkworm rearers and silkworm seed producing graineurs have gained opportunity to deploy their existing resources of production mainly, the family labour. The community living surrounding the tasar block plantations, could benefit by engaging in activities related to tasar silk cocoon production and seed production beside other economic activities like reeling and weaving, by utilising the available family labour. In this regard, four important economic unit models of tasar sericulture for the production of tasar silk cocoon by the rearers and production of silkworm seed by the private graineurs, have been discussed and presented in the present study. These models include i) Economics of Daba Bivoltine Tasar Silkworm Rearing, ii) Economics of Daba Trivoltine Tasar Silkworm Rearing, iii) Economics of Commercial Daba Bivoltine Tasar Seed Production by the private Graineurs and iv) Economics of Commercial Daba Trivoltine Tasar Seed Production by the Private Graineurs. The estimated costs associated and the measure of profits in tasar sericulture, are worked out employing standard procedures adopted for accounting costs and returns. It revealed that the estimated net farm income and family labour income, from rearing 600 Disease Free Layings of Daba Bivoltine, is to the tune of Rs. 35,139 per year and Rs. 98,739 per year respectively with a cost benefit ratio of 1:1.39. Similarly, the estimated net farm income and family labour income, from rearing 900 Disease Free Layings of Daba Trivoltine is to the tune of Rs. 34,989 per year and Rs. 1,04,589 per year with a cost benefit ratio of 1:1.35. Further the estimated net income and family labour income by processing 80000 Daba Bivoltine tasar seed cocoon by a private graineur is to the extent of Rs. 99,650 per year and Rs. 1,14,450 per year respectively with a cost benefit ratio of 1:1.42. Similarly, the estimated net income and family labour income by processing 90000 Daba Trivoltine tasar seed cocoons by a private graineur is to the extent of Rs. 99,650 per year and Rs. 1,14,450 per year respectively with a cost benefit ratio of 1:1.42. It thus reveals that the tasar sericulture has a potential to employ the available family labour for gainful employment and provide livelihood income to the weaker sections of the society.

Keywords : Tasar plantation, private graineur, Daba Bivoltine, Daba Trivoltine, Disease Free Layings.

Introduction

Sericulture industry in India provides employment to approximately 9.18 million persons, of which a sizeable number of workers belong to the economically weaker sections of society. With a production of 3136 MT during 2019-20, Tasar raw silk contributes around 9.30 % of total silk production in India (Central Silk Board, 2020). Tasar silk production is a forest and agro-based industry which holds great promise for the rural and tribal people as a subsidiary occupation. Tasar industry plays a dual role of arresting the deforestation and generating employment to the tribal inhabitants. The rich natural resources of food plants for tasar silkworm and abundant manpower are asset to tasar sericulture. The sector is known to provide better livelihood and employment to the dependent population. In tasar

sericulture the major economic activities performed include rearing of silkworm, production of quality Disease Free Layings (DFLs) through grainage operation, reeling of silk cocoon, weaving etc. These activities employ the resources of production available in nature, mainly the land and labour. This is evident from the fact that, the farmers try to minimise out of pocket expenses of cultivation, and that, by and large, they make use of the resources they own (Waheebuddin and Tripathy, 1972). Under the traditional setup for conducting all the activities, the family labour is employed. Hence the sector has the potential to employ significant amount of labour force living around the forest areas. With the gainful employment provided through engaging labour in these activities, has accredited the activity as one of the essential tools of rural development.

As a mandated activity of Central Silk Board (Central Silk Board, 2021) under the Central Sector Scheme, seed organisation is considered as one of the major components for the development of silk industry. In this regard many schemes were implemented through Silk Samagra – An Integrated Scheme for Development of Silk Industry (ISDSI), including means for developing improved methods for host plant cultivation, silkworm rearing, and preparation of healthy silkworm seed by coordinating with the states for the overall development of silk industry, besides generation of rural employment opportunities. Further, Silk Samagra – 2 was implemented for the period of 2021-22 to 2025-26 in the states to bring in beneficiary-oriented critical interventions required in the field for promotion of sericulture (Central Silk Board, 2022). As a part of host plantation development, many block tasar plantations were raised in addition to maintenance of existing block plantations in forest community land (Central Silk Board, 2020). This has led to utilization of skills and techniques of the tasar silkworm rearers and commercial seed producers, who could judiciously employ the resourceful labour. The project also envisaged to support building forward and backward linkages to facilitate basic and commercial seed production, supply of rearing appliances and disinfect for disease management, cocoon storage facilities, reelers collectives, cocoon bank and marketing support in order to encourage the local silkworm rearers in the project area.

Materials and Methods

In the present study an attempt is made to ascertain the costs associated and income generated by the individuals/economic units involved in tasar sericulture. Economics of production of silk cocoon and commercial silkworm seed have been worked out using the estimated data. These models include:

1. Model 1: Economics of Tasar Silkworm Rearing - DBV
2. Model 2: Economics of Tasar Silkworm Rearing - DTV
3. Model 3: Economics of Commercial Tasar Seed Production under Private Graineurs - DBV
4. Model 4: Economics of Commercial Tasar Seed Production under Private Graineurs - DTV

Costs and Returns associated in tasar sericulture:

The resources employed in production of tasar silk cocoon and the DFLs produced in the grainage operation are computed using the estimates of production. The costs associated and the revenue generated in sericulture have been accounted by adopting the procedure of estimated cost of

production and the revenue generated at the end. The data are computed for a time period of one year, per unit of production. Different input components are evaluated and valued keeping specific standards and these are as listed below:

1. The cost of human labour is valued at the prevailing market rate. The major share of labour engaged for silk worm rearing and grainage activities constitute mainly the family labour, and hence the imputed value of family labour is taken into account.
2. The cost of inputs such as Farm Yard Manure (FYM), compost, chemical fertilizer, Disease Free Layings (DFLs), seed cocoons etc., are evaluated at the purchase rate in the local market.
3. For calculating the annual depreciation on equipments and buildings the purchase value and the life span are considered.
4. The annual apportioned cost of establishment is estimated by dividing the total establishment cost by the economic life span of the tree plantation. The establishment cost of tasar plantation is estimated during the reference year by using the average physical input requirement for the tasar plantation.
5. The output value of silk cocoons and DFLs produced are valued at the actual price received by the rearers and graineurs respectively, at the market.
6. The value of by-products in tasar silk cocoon production is estimated and valued at the local market price.

The costs associated with the production is classified as variable costs and the fixed costs, while the total returns or the gross income is derived as the gross value of output i.e., the value of cocoon, DFLs and the by-products sold at the market.

Costs concepts and procedure of evaluation: For determining the cost structure, of the farms, a method similar to the farm management studies conducted by Sadhu and Mahajan (1985) and Jayaram (2010) has been adopted. For determining the cost associated with production, costs are worked out as Cost A1, Cost A2, Cost B1, Cost B2, Cost C1 and Cost C2. On the basis of cost concepts the total costs of inputs are worked out for both silk cocoon and silkworm seed production. The input items included under each category of costs incurred in tasar production are as indicated below:

Table 1: Associated costs of production in tasar sericulture

Type of cost	Inputs
Cost A1	Hired human labour, hired and owned machine labour, value of farmyard manure (FYM), value of chemical fertiliser, cost of plant protection chemicals, Cost of DFLs, cost of disinfectants, cost of marketing and transporting, land revenue, depreciation charges, interest on working capital and other miscellaneous cash expenses.
Cost A2	Cost A1 + rental value of leased in land
Cost B1	Cost A2 + interest on fixed cost
Cost B2	Cost B1 + rental value of owned land
Cost C1	Cost B1 + imputed value of family labour
Cost C2	Cost B2 + imputed value of family labour

On the basis of these concepts, total costs of inputs were worked out for tasar silk cocoon production and DFLs production. The estimated gross income from sericulture and

grainage activity for DFLs production, were also estimated based on the prevailing market price.

Measure of profits: There are important measures of farm profit which can be termed as net farm income, farm investment income, family labour income and farm business income (Singh, 1993). For the benefit of present calculation, the net farm income and the family labour income have been computed. Since the activities such as the silkworm rearing and the grainage production by the beneficiaries, employ

mainly the family labour, in the present estimates the imputed value of family labour has been considered. The estimates of gross income per unit for tasar silk cocoon and silkworm seed production (DFLs) have been estimated based on the prevailing market price and presented. The measures of farm profits are calculated as under:

Gross Farm Income/ Gross Income =	Gross Value of output including the by-product
Net Farm Income/Net Income =	Gross Income – Cost C
Family Labour Income =	Gross Income – Cost B2, also refers to returns to family labour and management

While calculating the net farm income, all the costs associated in the production (Cost-C) are considered, while calculating the family labour income, the imputed value of family labour is added to the net farm income. It is assumed here that, due to the involvement of all the family labour in tasar production, the income generated confines mainly to

family labour income, than mere net income from the farm or grainage.

Results and Discussion

An analysis of the estimated costs and returns associated in the production of seed cocoons and the DFLs, have been worked out and presented in the following tables:

Table 2 : Economics of Tasar Silkworm Rearing - DBV(2 crops/year)

Food Plants: Asan (*Terminalia tomentosa* L.), Arjun (*T. arjuna*).

Spacing under economic plantation: 6' x 6', 8' x 8' & 10' x 6'

Rearing capacity of DFLs: 600 DFLs per year Area: 2 ha

(Value in Rs/ year)

A	Establishment cost of Plantation & chawki garden	Labour		Material		Total cost (Rs)
		No./ Unit (MD)	Cost (Rs)	Qty	Cost (Rs)	
I	Land preparation @ 50 MD/ha	100	20000			20000
ii	Preparation of saplings @ 12 MD/ha	24	4800			4800
iii	Pit digging (@ 50 MD/ha	100	20000			20000
iv	Plantation @ 130 MD/ha	260	52000			52000
v	Cultural operation (weeding/pruning) @ 150 MD/ha	300	60000			60000
vi	Cost of FYM/Compost (2 kg/plant)			12 MT	6000	6000
vii	Chemical fertiliser (75 N: 25 P: 25 K) Urea: 24 g/plant, SSP : 23 g/plant & MOP : 6 g/plant			321	2421	2421
viii	Fertiliser application @ 8 MD/ha	16	3200			3200
ix	Pot irrigation @ 60 MD/ha	120	24000			24000
	Total Establishment Cost		184000		8421	192421
	Apportioned cost of establishment (assuming the life span = 40 years)					4811
B	Rearing Equipments (Depreciation cost)	Unit cost (Rs)	Life span (Yr)			Dep. Value(Rs)
i	Knapsack sprayer @ Rs. 2000 per sprayer	2000	5			400
	Total depreciation cost					400

C	Maintenance cost of plantation (II year onwards)	Labour		Material		Total cost (Rs)
		No./ Unit (MDs)	Cost (Rs)	Qty	Cost (Rs)	
i	Maintenance cost of garden for chawki & late age rearing					
A	Pruning/Pollarding @ 10 MD / ha	20	4000			4000
B	Cultural operation @ 10 MD / ha	20	4000			4000
C	Cost of FYM/Compost (2 kg/plant)			12 MT	6000	6000
D	Green Manuring (Rs/kg)			100 Kg	2500	2500
E	Labour - Green manuring @ 4 MD/ha	8	1600			1600
ii	Cost of silkworm rearing (Late age)					
A	Cost of DFLs (I Crop rearing)			250	1500	1500
B	Cost of DFLs (II Crop rearing)			250	1500	1500
C	Rearing inputs - Lime @ 90 kg/ crop			180	1800	1800
D	Rearing inputs - Bleaching powder @ 10 kg/crop			20	1000	1000
E	Rearing consumables (secateure, plastic tray, stools, plastic basin, pruning saw, plastic sheet, plastic rope etc.)					2000

F	Bamboo - 10 nos @ Rs. 100 per bamboo			10	1000	1000
G	Nylon net of size 40' x 30' @ Rs. 2000 per net - 2 nets			2	4000	4000
H	Labour Man days - I Crop @ 40 MD/100 DFLs	120	24000			24000
i	Labour Man days - II Crop @ 50 MD/100 DFLs	150	30000			30000
	Total Maintenance cost C					84900
	Depreciation cost B					400
	Apportioned cost of establishment A					4811
IV	Total cost of cocoon production (A + B + C)					90111
V	No. of Man days Employed & Cost of Family Labour	318	63600			
VI	Income from rearing					
i	Production of cocoons @ 50 cocoons /DFL in I crop rearing			15000	52500	52500
ii	Production of cocoons @ 55 cocoons /DFL in II crop rearing			16500	57750	57750
iii	Income by sale of by-products viz., Non-seed/ compost/ vermi-compost etc			15000	15000	15000
	Total Income					125250
VII	Net Farm Income (VI-IV)					35139
	Benefit : Cost Ratio					1.39
VIII	Family Labour Income (Net Income + Cost of family labour)					98739

The estimates of costs and returns from rearing 600 DFLs of DBV is worked out and presented as Table-2. Based on the estimates, the cost of silk worm rearing including the apportioned cost of establishment, depreciation cost and the annual maintenance cost works out to Rs. 90111 per year, while the gross income from the sale of silk cocoon and the by-products works out to Rs. 1,25,250 per year. The net farm

income is therefore calculated at Rs. 35,139 per year with a cost benefit ratio of 1:1.39. Further the enterprise is found to employ around 318 man days per year with a family labour income of Rs. 98,739 per year, as he employs his own labour for production. It thus indicates that, the rearing of silkworm with DBV for two consecutive periods, enable the farmer to reap a reasonable income.

Table 3 : Economics of Tasar Silkworm Rearing - DTV (3 crops/year)

Food Plants: Asan (*Terminalia tomentosa* L.), Arjun (*T. arjuna*).

Spacing under economic plantation: 6' x 6', 8' x 8' & 10' x 6'

Rearing capacity of DFLs : 900 DFLs per year (DTV)Area: 2 ha

(Value in Rs/ year)

A	Establishment cost of Plantation & chawki garden	Labour		Material		Total cost (Rs)
		No./ Unit (MDs)	Cost (Rs)	Qty	Cost (Rs)	
i	Land preparation @ 50 MD/ha	100	20000			20000
ii	Preparation of saplings @ 12 MD/ha	24	4800			4800
iii	Pit digging (@ 50 MD/ha	100	20000			20000
iv	Plantation @ 130 MD/ha	260	52000			52000
v	Cultural operation (weeding/pruning) @ 150 MD/ha	300	60000			60000
vi	Cost of FYM/Compost (2 kg/plant)			12 MT	6000	6000
vii	Chemical fertiliser (75 N: 25 P: 25 K) Urea: 24 g/plant, SSP : 23 g/plant & MOP : 6 g/plant			321	2421	2421
viii	Fertiliser application @ 8 MD/ha	16	3200			3200
ix	Pot irrigation @ 60 MD/ha	120	24000			24000
	Total Establishment Cost		184000		8421	192421
	Apportioned cost of establishment (assuming the life span = 40 years)					4811
B	Rearing Equipments (Depreciation cost)	Unit cost (Rs)	Life span (Yr)			Dep. Value (Rs)
i	Knapsack sprayer @ Rs. 2000 per sprayer	2000	5			400
	Total depreciation cost					400

C	Maintenance cost of plantation (II year onwards)	Labour		Material		Total cost (Rs)
		No./ Unit (MD)	Cost (Rs)	Qty	Cost (Rs)	
I	Maintenance cost of garden for chawki & late age rearing					
A	Pruning/Pollarding @ 10 MD/ ha	20	4000			4000
B	Cultural operation @ 10 MD/ ha	20	4000			4000
C	Cost of FYM/Compost (2 kg/plant)			12 MT	6000	6000
D	Green Manuring (Rs/kg)			100 kg	2500	2500
E	Labour - Green manuring @ 4 MD/ha	8	1600			1600
li	Cost of silkworm rearing (Late age)					
A	Cost of DFLs (I Crop rearing)			300	1800	1800
B	Cost of DFLs (II Crop rearing)			300	1800	1800
C	Cost of DFLs (III Crop rearing)			300	1800	1800
D	Rearing inputs - Lime @ 60 kg/crop			180	1800	1800
E	Rearing inputs - Bleaching powder @ 10 kg/crop			30	1500	1500
F	Rearing consumables (secateure, plastic tray, stools, plastic basin, pruning saw, plastic sheet, plastic rope etc.)					3000
G	Bamboo - 10 nos @ Rs. 100 per bamboo			10	1000	1000
H	Nylon net of size 40' x 30' @ Rs. 2000 per net - 2 nets			2	4000	4000
I	Labour Man days - I Crop @ 30 MD/100 DFLs	90	18000			18000
J	Labour Man days - II Crop @ 30 MD/100 DFLs	90	18000			18000
K	Labour Man days - III Crop @ 40 MD/100DFLs	120	24000			24000
	Total Maintenance cost (C)					94800
	Depreciation cost (B)					400
	Apportioned cost of establishment (A)					4811
D	Total cost of cocoon production					100011
E	No. of Man days Employed & Cost of Family Labour	348	69600			
F	Income from rearing					
I	Production of cocoons @ 45 cocoons /DFL in I crop rearing			13500	33750	33750
ii	Production of cocoons @ 50 cocoons /DFL in II crop rearing			15000	37500	37500
iii	Production of cocoons @ 65 cocoons /DFL in III crop rearing			19500	48750	48750
Iv	Income by sale of by-products viz., Non-seed/ compost/ vermi-compost etc			15000	15000	15000
	Total Income					135000
G	Net Farm Income (VI-IV)					34989
	Benefit : Cost Ratio					1.35
H	Family Labour Income (Net Income + Cost of family labour)					104589

The estimates of costs and returns from rearing 900 DFLs of DTV is worked out and presented as Table-3. Based on the estimates, the cost of silk worm rearing including the apportioned cost of establishment, depreciation cost and the annual maintenance cost works out to Rs. 100011 per year, while the gross income from the sale of silk cocoon and the by-products works out to Rs. 1,35,000 per year. The net farm

income is therefore calculated at Rs. 34,989 per year with a cost benefit ratio of 1:1.35. Further the enterprise is found to employ around 348 man days per year with a family labour income of Rs. 1,04,589 per year, as he employs his own labour for production. It thus indicates that, the rearing of silkworm with DTV for three consecutive periods, enable the farmer to reap a reasonable income.

Table 4 : Economics of Commercial Tasar Seed Production under Private Graineurs - DBV

Grainage capacity : 80000 Tasar Coccons per year

No. of grainage activity: 2

(Value in Rs/ year)

A	Establishment cost of Grainage House	Labour		Material		Total cost (Rs)
		No./ Unit (MD)	Cost (Rs)	Qty	Cost (Rs)	
I	Construction of Grainage Building (30' X 20') @ Rs. 300/sq ft			600 sq ft	180000	180000
	Depreciation cost of grainage building @ 5% per annum					9000
B	Grainage equipment (Depreciation cost in Rs.)	Unit cost (Rs)	Life span (Yr)			Dep. value (Rs)
I	Microscope - 1 No.	7000	20			350
ii	Centrifuge - 1 No	5000	20			250
iii	Earthen cups - 10000 No. @ Rs2/unit	10000	2			5000
Iv	Green Shade net 100 Meter (3 Meter width) @ Rs. 60/Meter	6000	5			1200
	Total depreciation cost of equipment & stock items					6800

C	Working Capital for grainage operation	Labour		Material		Total cost (Rs)
		No./ Unit (MD)	Cost (Rs)	Qty	Cost (Rs)	
I	Grainage consumables					
i	Gunny threads (Suthli) @ 10 kg for 80000 cocoon garlanding			10	1200	1200
ii	Slides, Cover slips, Piercing Stick etc for moth testing				1000	1000
iii	Pebrine Visualising Solution (1 Litre) & Depuratex (5 Litre)			6	700	700
iv	Mosquito net - 5 Mtr for egg washing			5	200	200
v	Egg Carrying bag (small) - 200 Nos @ Rs. 4/bag			200	800	800
vi	Lime			50	750	750
vii	Bleaching Powder			10	600	600
viii	Plastic basin, scissors and other accessories				500	500
	Total Cost of Consumables					5750
II	Cost of tasar seed cocoon					
i	Purchase cost of tasar seed cocoon @ Rs. 2.50 /Seed Cocoon			80000	200000	200000
	Total cost of Tasar Seed Cocoon					200000
III	Cost of Labour (I & II Grainages)					
i	Making of cocoon garland @ 1 MD/5000 cocoons	16	3200			3200
ii	Emergence, pairing, depairing @ 3 MD/10000 cocoons	24	4800			4800
iii	Moth crushing smear ppn @ 1MD/1000 smears	10	2000			2000
iv	Moth Examination @ 1 MD/ 500 smears	20	4000			4000
v	Washing, disinf& drying of eggs @ 1 MD / 10000 DFLs	2	400			400
vi	Packing of dfls in cloth bags @ 1 MD/ 10000 DFLs	2	400			400
	Total Cost of Labour					14800
D	TOTAL COST OF SEED PRODUCTION (A +B+C)					236350
E	No. of Mandays Employed & Cost of Family Labour (Rs)	74	14800			

F	Income from seed production	Qty.	Value			Total Value (Rs)
	Total DFLs produced from 2 grainages	18000				
	Total revenue from the sale of DFLs @ Rs. 12/DFLs	18000	216000			216000
	Revenue from sale of PC cocoon @ Rs. 1.50/cocoon	80000	120000			120000
	Total Income (Rs)					336000
G	Net Income (Rs) (F-D)					99650
	Benefit : Cost Ratio					1.42
H	Family Labour Income (Net Income + Cost of family labour)					114450

The estimates of costs and returns from commercial tasar seed production of DBV by a private graineur is worked out and presented as Table-4. Based on the estimates, the total cost of tasar seed production, including the cost of construction of grainage, depreciation cost of grainage equipments, grainage consumables, labour engaged etc., works out to Rs. 236350 per year, while the gross income from the sale of silk cocoon and the by-products works out to

Rs. 3,36,000 per year. The net income is therefore calculated at Rs. 99,650 per year with a cost benefit ratio of 1:1.42. Further the enterprise is found to employ around 74 man days per year with a family labour income of Rs. 1,14,450 per year, as he employs his own labour for production. It thus indicates that, the production of commercial tasar silkworm seed with DBV for two consecutive periods, enable the graineur to reap a notable income.

Table 5 : Economics of Commercial Tasar Seed Production under Private Graineurs - DTV
Grainage capacity : 90000 Tasar Cocoons per year
No. of grainage activity: 3

(Value in Rs/ year)

A	Establishment cost of Grainage House	Labour		Material		Total cost (Rs)
		No./ Unit (MD)	Cost (Rs)	Qty	Cost (Rs)	
i	Construction of Grainage Building (30' X 20') @ Rs. 300/sq ft			600 sq ft	180000	180000
	Depreciation cost of grainage building @ 5 % per annum					9000
B	Grainage equipment (Depreciation cost in Rs.)	Unit cost (Rs)	Life span (Yr)			Dep. value (Rs)
i	Microscope - 1 No.	7000	20			350
ii	Centrifuge - 1 No	5000	20			250
iii	Earthen cups - 10000 No. @ Rs2/unit	10000	2			5000
iv	Green Shade net 100 Meter (3 Meter width) @ Rs. 60/Meter	6000	5			1200
	Total depreciation cost of equipment & stock items					6800

C	Working Capital for grainage operation	Labour		Material		Total cost (Rs)
		No./ Unit (MD)	Cost (Rs)	Qty	Cost (Rs)	
I	Grainage consumables					
i	Gunny threads (Suthli) @ 10 kg for 90000 cocoon garlanding			10	1200	1200
ii	Slides, Cover slips, Piercing Stick etc for moth testing				1000	1000
iii	Pebrine Visualising Solution (1 Litre) & Depuratex (5 Litre)			6	700	700
iv	Mosquito net - 5 Mtr for egg washing			5	200	200
v	Egg Carrying bag (small) - 150 Nos @ Rs. 4/bag			150	600	600
vi	Lime			50	750	750
vii	Bleaching Powder			10	600	600
viii	Plastic basin, scissors and other accessories				500	500
	Total Cost of Consumables					5550
II	Cost of tasar seed cocoon					
I	Purchase cost of tasar seed cocoon @ Rs. 2.00 /Seed Cocoon			90000	180000	180000
	Total cost of Tasar Seed Cocoon - III B					180000
III	Seed Production (I, II & III Grainages)					
I	Making of cocoon garland @ 1 MD/5000 cocoons	18	3600			
ii	Emergence, pairing, depairing @ 3 MD/10000 cocoons	27	5400			
iii	Moth crushing smear ppn @ 1MD/1000 smears	10	2000			
iv	Moth Examination @ 1 MD/ 500 smears	20	4000			
v	Washing, disinf& drying of eggs @ 1 MD / 1000 DFLs	2	400			
vi	Packing of dfls in cloth bags @ 1 MD/ 10000 DFLs	2	400			
	Total Cost of Labour					15800
D	TOTAL COST OF SEED PRODUCTION (A +B+C)					217150
E	No. of Man days Employed & Cost of Family Labour	79	15800			

F	Income from seed production	Qty.	Value			Total Value (Rs)
	Total DFLs produced from 3 grainages	20000				
	Total revenue from the sale of DFLs @ Rs. 12/DFLs	20000	240000			240000
	Revenue from sale of PC cocoon @ Rs. 0.80/cocoon	90000	72000			72000
	Total Income					312000
G	Net Income (F-D)					94850
	Benefit : Cost Ratio					1.43
H	Family Labour Income (Net Income + Cost of family labour)					110650

The estimates of costs and returns from commercial tasar seed production of DTV, by a private graineur is worked out and presented as table-5. Based on the estimates, the total cost of tasar seed production, including the cost of construction of grainage, depreciation cost of grainage equipments, grainage consumables, labour engaged etc., works out to Rs. 2,17,150 per year, while the gross income from the sale of silk cocoon and the by-products works out to Rs. 3,12,000 per year. The net income is therefore calculated at Rs. 99,650 per year with a cost benefit ratio of 1:1.43. Further the enterprise is found to employ around 79 man days per year with a family labour income of Rs. 1,10,650 per year, as he employs his own labour for production. It thus indicates that, the production of commercial tasar silkworm seed with DTV for three consecutive periods, enable the graineur to reap a notable income.

Conclusion

The estimates of production of tasar silk cocoon and the commercial tasar seed, reveal that, the tasar sericulture has a potential to employ the family labour for gainful employment and providing livelihood prospects for the people dependent on tasar block plantations in forest community land. The models discussed above can also be replicated elsewhere in the tasar predominant areas, imparting necessary skills and knowledge. Tasar sericulture thus provides good opportunity for the economically weaker sections of the society by

providing gainful employment and income, utilising the existing natural resources.

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