



Research Article

ECONOMICS OF TEA CULTIVATION IN TIRAP DISTRICT OF ARUNACHAL PRADESH

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Received: December 01, 2018; Revised: December 11, 2018; Accepted: December 12, 2018; Published: December 15, 2018

Abstract: The present study was conducted in Tirap District of Arunachal Pradesh. Arunachal Pradesh is the fifth largest tea growing state in India. It is the leading non-traditional tea growing state of the north eastern region. Therefore, a study on the economics of tea cultivation in Arunachal Pradesh has been conducted to evaluate the cost and returns from teagarden. Total 80 respondents were selected for the study. Cost concepts like Cost A₁, Cost A₂, Cost B₁, Cost B₂, Cost C₁ and Cost C₂ were employed to analyse the primary data. The investment in teagarden has been seen as a money-making business in the study area. It was observed from the study that the total cost of cultivation of teagarden was found to be ₹ 277942 per ha, which has been comprised of Cost A₁ at ₹ 165221 per ha, Cost A₂ at ₹ 165221 per ha, Cost B₁ at ₹ 173880 per ha, Cost B₂ at ₹ 203880 per ha and Cost C₁ has been estimated at ₹ 247942 per ha. The share of Cost A₁, Cost A₂, Cost B₁, Cost B₂ and Cost C₁ in to Cost C₂ was found to be 59.44 percent, 59.44 percent, 62.56 percent, 73.35 percent and 89.21 percent respectively. Further, it concluded that the net return including family labour in tea cultivation was ₹ 279701 per ha, net return excluding family labour was ₹ 353763 per ha, farm business income of tea cultivation was found to be ₹ 392421 per ha, family labour income was calculated at ₹ 353763 per ha, net farm income was ₹ 279701 per ha and farm investment income was estimated to be ₹ 318359 per ha in the tea garden. Hence, tea cultivation in Tirap district has been very profitable and economically viable and it should be realized to the farming community of the state for attraction towards tea cultivation.

Keywords: Cost, Returns, Tea, Tea garden

Citation: Wangnow N., et al., (2018) Economics of Tea Cultivation in Tirap District of Arunachal Pradesh. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 23, pp.- 7617-7619.

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Introduction

Tea is one of the most popular, cheapest and widely consumed beverages in the world. India is one of the main tea manufacturing countries of the world. Tea industry is of considerable importance in the national economy of India in terms of income generation, foreign exchange earnings and employment generation. India ranks first in tea consumption, second in terms of tea area and production next to China and fourth in export of tea after Kenya, Sri Lanka and China in the world [1]. Tea is grown in more than 30 countries around the world. The major tea producing countries are China, India, Kenya, Sri Lanka, Turkey and Indonesia. These six countries alone account for 75 percent of the world's total tea production and 80 percent of the world's tea exports. China is the largest producer of tea with annual production of 2248 million kg in 2015. The total area under tea in India is about 567 thousand ha which contributes around 1208 million kg of tea production which is approximately 23 percent of world production [1]. Export of tea is around 20 percent of domestic production. The bulk (75 to 80 %) of tea production comes from Northern India, Assam and West Bengal being the major contributors [2]. Tea (*Camellia sinensis*) is an evergreen woody perennial plant mostly grown in the tropical and sub-tropical regions of the world. There are two major types of *Camellia*, i.e., the China tea plant (*C. sinensis* var. *sinensis*), and the Assam tea plant (*C. sinensis* var. *assamica*). There is another type of *Camellia* which is a sub-species of *C. assamica* referred as Cambod tea plant (*Camellia assamica* sub-sp. *Lasiocalyx*). The entire tea population is composed of three different races namely China, Assam and Cambod type. Major tea producing states in India are Assam, West Bengal, Tamil Nadu and Kerala. Apart from this, it is also grown in non-traditional areas such as Karnataka, Himachal Pradesh, Tripura, Uttarakhand, Arunachal Pradesh, Manipur, Sikkim and Meghalaya. The north-eastern states account for around 58 percent (approximately 340 thousand ha) of area under tea cultivation in India and employs about 6.5 lakh people. It contributes 54 percent (approximately 652.97 million kg) of total production of tea in India [1].

Arunachal Pradesh is the leading non-traditional tea growing state of the north eastern region. It is the fifth largest tea growing state in India. At present there are 62 registered big tea gardens (above 10.12 ha), 50 registered small tea growers and around 4,500 unregistered small tea gardens under tea cultivation [3]. The state has 8 estate factories and 7 bought leaf tea factories [4]. Major tea growing districts are Lohit, East Siang, West Siang, Upper Siang, Tirap, Changlang, and Lower Dibang Valley and some parts of Papumpare, Upper Subansiri and Dibang Valley [3]. Arunachal Pradesh is the leading non-traditional tea growing states of the north eastern region and produces about 10 million kg of tea per year [5]. Tea cultivation in Arunachal has wide scope, the virgin land, vast tracts of forested hill slopes having community ownership of the land and favourable climatic conditions present immense potential for tea in the state [6]. Therefore, there is a need to boost its production as well as expand its area, which is possible only when a detailed cost and return analysis is carried out systematically. Therefore, this study was undertaken with the objective; to study the cost and net returns from tea cultivation in Tirap district of Arunachal Pradesh.

Materials and Methods

The present study was conducted in four villages taking two blocks each of Tirap district of Arunachal Pradesh as it is one of the major tea growing regions of the state having high acreage of tea. Total 80 small tea growers were selected by adopting simple random sampling without replacement method. The primary data were collected from the respondents through personal interview method on pre-tested well-structured questionnaire for the tea garden in the year 2017-18. The data were collected on establishment cost of tea garden, cost of seedlings, plant protection, manures and fertilizers, depreciation, interest on fixed cost, rental value of land, training/pruning, intercultural operation, plucking/tipping of tea and drain and fence maintenance in the tea garden.

Analytical Tools

For the analysis of data of tea cultivation in the study area, Cost concepts were used:

Cost A1:

- i) Value of hired human labour
- ii) Value of hired bullock labour
- iii) Value of owned bullock labour
- iv) Value of owned machinery labour
- v) Value of hired machinery charges
- vi) Value of seedlings
- vii) Value of insecticides and pesticides
- viii) Value of manure (owned and purchased)
- ix) Value of fertilizer
- x) Depreciation on farm implements
- xi) Irrigation charges
- xii) Land revenue, assets, cesses and other taxes
- xiii) Interest on working capital
- xiv) Miscellaneous expenses (Artisans etc.)

Cost A2: Cost A1 + rent paid for leased-in land.

Cost B1: Cost A1 + interest on value of owned fixed capital assets (excluding land)

Cost B2: Cost B1 + rental value of owned land (net of land revenue) and rent paid for leased-in land

Cost C1: Cost B1 + imputed value of family labour

Cost C2: Cost B2 + imputed value of family labour

Returns Analyses

Gross Farm income (GFI) = Production x Price

Net return including family labour = GFI – Total Cost including family labour

Net return excluding family labour = GFI – Total Cost excluding family labour

Farm business income = GFI – Cost A₂

Family labour income = GFI – Cost B₂

Net farm income = GFI – Cost C₂

Farm investment income = Farm business income – family labour wages

Results and Discussions

Establishment Cost

Tea cultivation is a capital-intensive enterprise. The initial cost of a teagarden consists of the preparation of land and layout, digging and filling of pit, fencing, procurement of planting materials and cost of planting tea which are presented in Table 1. The total cost of establishment of tea garden per ha was observed to be ₹ 35980. The largest item of expenditure was incurred in the procurement of planting materials which was worked out to be ₹ 12890 (35.83%) followed by land preparation and layout which accounted to ₹ 9799 (27.24%), plantation cost of tea which was calculated at ₹ 6500 (18.07%), digging and filling of pit which was worked out to be ₹ 3632 (10.10%) and fencing which was worked out to be ₹ 3158 (8.78%) respectively.

Operational Cost

The total item wise operational cost of teagarden for 10 years was presented in Table 2. It was revealed from Table 2 that total operational cost of teagarden was estimated of ₹ 165573 per ha. The major share of investment in operational Cost was found to be on plucking and tipping operation which was calculated at ₹ 73294 (44.27%) followed by intercultural operation and weeding which was calculated at ₹ 58661 (35.43%), training and pruning which was calculated at ₹ 22840 (13.79%) and drains and fence maintenance which was calculated at ₹ 10778 (6.51%) respectively.

Cost of cultivation

Per hectare total cost of cultivation of tea for ten years using cost concepts is depicted in Table 3. It was revealed from Table 3 that the total cost of cultivation of teagarden has been estimated to be ₹ 277942 per ha. The total Cost A1 was estimate to be ₹ 165221 per hectare contributing 59.44 percent to the total cost. The total Cost A2 was worked out to be same as total Cost A1 as all the

respondents have their own land and none of the respondents leased in any land. Total Cost B1 was worked out to be ₹ 173880 per hectare contributing 62.56 percent to the total cost. Total Cost B2 was also worked out to be ₹ 203880 per hectare with the share of 73.35 percent to the total cost. Total imputed value of family labour was estimated to be ₹ 74062 per hectare contributing 26.65 percent to the total cost. Cost C1 was estimated to be ₹ 247942 per hectare and Cost C2 was calculated to be ₹ 277942 per hectare.

Returns

The return over the cost of tea cultivation for ten years has been presented in Table 4. The total yield of tea garden in the study area was estimated to be of 336 qtl per ha. The total gross farm income of tea cultivation was found to be ₹ 557643 per ha. Further, it was revealed from Table 4 that the net return including family labour in tea cultivation was ₹ 279701 per ha, net return excluding family labour was ₹ 353763 per ha, farm business income of tea cultivation was found to be ₹ 392421 per ha, family labour income was calculated at ₹ 353763 per ha, net farm income was ₹ 279701 per ha and farm investment income was estimated to be ₹ 318359 per ha in the tea garden. Similarly, Ramchiary (2011) and Sawian (2016) in their studies reported that tea cultivation was a profitable and viable economic venture for the farmers.

Table-1 Establishment Cost of teagarden

Components	Amount (₹ /ha)	Percentage to total cost
Preparation of land and layout	9799	(27.24)
Digging and filling of pit	3632	(10.10)
Fencing	3158	(8.78)
Planting material	12890	(35.83)
Plantation Cost	6500	(18.07)
Total	35980	(100)

Note: Figures in the parentheses are the percentage to the total

Table-2 Operational Cost of teagarden (₹ /ha)

Particular	Total	Percent of total cost
Intercultural operations	58661	(35.43)
Training & pruning	22840	(13.79)
Drain and fence maintenance	10778	(6.51)
Plucking/Tipping	73294	(44.27)
Total	165573	(100)

Note: Figures in the parentheses are the percentage to the total

Table-3 Cost of cultivation of teagarden using Cost concept (₹ /ha)

Particular	Total Cost 1 to 10 years	Percent of total cost
Hired labour	116319	(41.85)
Planting material	11251	(4.05)
Manures and fertilizers	9566	(3.44)
Plant protection chemical	6665	(2.40)
Interest on working capital	17256	(6.21)
Depreciation	4166	(1.50)
Cost A ₁	165221	(59.44)
Rent paid for lease in land	0	(0.00)
Cost A ₂	165221	(59.44)
Interest on value of owned fixed capital (excluding land)	8658	(3.12)
Cost B ₁	173880	(62.56)
Rental value of owned land	30000	(10.79)
Cost B ₂	203880	(73.35)
Value of owned labour	74062	(26.65)
Cost C ₁	247942	(89.21)
Cost C ₂	277942	(100)

Note: Figures in the parentheses are the percentage to the total

Table-4 Total return from tea cultivation

Particulars	Total (₹ /ha)
Yield (qtl/ha)	336
Gross Farm income (GFI)	557643
Net return including family labour	279701
Net return excluding family labour	353763
Farm business income	392421
Family labour income	353763
Net farm income	279701
Farm investment income	318359

Conclusion

The study concluded that the investment in teagarden has provided favourable returns on capital investment. The total cost of cultivation of teagarden was found to be ₹ 277942 per ha, which has been comprised of Cost A1 at ₹ 165221 per ha, Cost A2 at ₹ 165221 per ha, Cost B1 at ₹ 173880 per ha, Cost B2 at ₹ 203880 per ha and Cost C1 has been estimated at ₹ 247942 per ha. The share of Cost A1, Cost A2, Cost B1, Cost B2 and Cost C1 in to Cost C2 was found to be 59.44 percent, 59.44 percent, 62.56 percent, 73.35 percent and 89.21 percent respectively. Further, it concluded that the net return including family labour in tea cultivation was ₹279701 per ha, net return excluding family labour was ₹353763 per ha, farm business income of tea cultivation was found to be ₹392421 per ha, family labour income was calculated at ₹ 353763 per ha, net farm income was ₹279701 per ha and farm investment income was estimated to be ₹318359 per ha in the teagarden.

Application of research: The findings of the research will be applicable in all groups of farms grown for domestic as well as commercial purpose and where the geo-climatic conditions are similar to the study area.

Research Category: Production Economics

Abbreviations: kg: Kilogram, ha: hectare, qtl: Quintal, GFI: Gross Farm Income

Acknowledgement / Funding: Authors are thankful to School of Social Sciences, College of Post Graduate Studies, Central Agricultural University, Umiam, 793 103, Meghalaya, India.

***Research Guide or Chairperson of research:** Dr Binodini Sethi

University: Central Agricultural University (Imphal), Umiam, 793 103, Meghalaya
Research project name or number: Economics of Tea Cultivation in Tirap District of Arunachal Pradesh.

Author Contributions: All authors equally contributed.

Author statement: All authors read, reviewed, agreed and approved the final manuscript.

Conflict of Interest: None declared.

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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