

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 10; October 2025; Page No. 22-26

Received: 16-07-2025
Accepted: 19-08-2025

Indexed Journal
Peer Reviewed Journal

Economics of Coffee processing in Wayanad district of Kerala

¹N Karthik, ²PJ Kshirsagar, ³SR Torane, ⁴SC Warawadekar, ⁵PR Kolhe and ⁶MR Yalajeri

¹M.Sc. Scholar, Department of Agricultural Economics, College of Agriculture, DBSKKV, Dapoli, Maharashtra, India

²Professor (CAS), Department of Agricultural Economics, College of Agriculture, DBSKKV, Dapoli, Maharashtra, India

³Professor & Head, Department of Agricultural Economics, College of Agriculture, DBSKKV, Dapoli, Maharashtra, India

⁴Professor (CAS) & Head, Department of Agricultural Extension Education, College of Agriculture, DBSKKV, Dapoli, Maharashtra, India

⁵Professor (CAS) & Officer Incharge, DBSKKV, Dapoli, Maharashtra, India

⁶M.Sc. Scholar, Department of Agricultural Economics, College of Agriculture, DBSKKV, Dapoli, Maharashtra, India

DOI: <https://www.doi.org/10.33545/26180723.2025.v8.i10a.2504>

Corresponding Author: N Karthik

Abstract

The present study examines the economics and financial feasibility of coffee processing units in Wayanad district, Kerala a major coffee-producing region in India. A total of 30 processing units were selected and categorized into small, medium, and large groups based on their processing capacities. Data were collected through structured interviews and analysed using statistical tools like averages, percentages, and financial metrics such as Net Present Value (NPV), Benefit-Cost Ratio (BCR), Payback Period (PBP), and Internal Rate of Return (IRR). The analysis revealed that the majority of capital investment goes into working capital especially raw materials, which alone account for 88.38 per cent of total costs. Large units dominated both in scale and profitability, accounting for the highest share of capital investment and production. Labour usage showed a male-dominated workforce, with large units employing the highest number of workers. While small units relied more on manual labour and had higher labour costs proportionally, large units demonstrated greater efficiency due to economies of scale. In terms of profitability, all unit sizes were economically viable, with large units reporting the highest net returns (₹7.63 crore) and BCR (1.65), followed by medium units (BCR 1.29) and small units (BCR 1.35). The average overall BCR was 1.35. Break-even analysis further confirmed the stability of large units, which had a high margin of safety (382.99 tonnes) compared to medium and small units. Financial feasibility measures showed positive outcomes across all unit sizes. Large units recorded the highest NPV and IRR (22.98%), while at overall level payback period was of 3-4 years. Overall, the findings confirm that coffee processing is a profitable and economically sound investment in Wayanad, particularly at larger scales of operation.

Keywords: Coffee processing, capital investment, financial feasibility, break-even analysis, labour utilization, net present value, benefit-cost ratio, internal rate of return

Introduction

The phrase 'A cup that refreshes' is commonly linked to coffee. Its flavour is largely attributed to the presence of caffeine, an alkaloid known for its nerve-soothing and refreshing properties. Coffee ranks among the most significant non-alcoholic drinks globally. Coffee (*Coffea* species) is a significant beverage crop in India that is primarily focused on exports. It is also one of the most widely traded and valuable agricultural products in the global market. This evergreen shrub belongs to the Rubiaceae family, with two main commercially distinct species cultivated around the world: arabica coffee (*Coffea arabica*) and robusta coffee (*Coffea canephora*). Arabica coffee thrives at higher altitudes, while robusta coffee is cultivated at lower altitudes and is favoured for its excellent blending qualities, although it typically commands a lower price. The two differ in taste and caffeine content, with robusta containing twice the caffeine of arabica.

Additionally, arabica is better suited for larger farms, whereas robusta can be grown on farms of any size. The harvest season for arabica occurs from November to January, while robusta is harvested from December to February.

Coffee is processed using two primary methods: dry processing and wet processing. The dry processing method, which involves sun-drying, is traditionally favoured for its ability to enhance flavour. Conversely, the wet processing method involves fermenting and washing the coffee beans, making it the preferred choice for higher quality coffee varieties. During wet processing, the beans undergo cleaning and the removal of defective seeds. Various bean types and sizes are then blended to achieve optimal flavour. The subsequent step involves roasting, which can be done using commercial roasters or individual roasters. Finally, the roasted coffee is sorted into appropriate sizes.

Kerala ranks as the second largest coffee producer in India.

As of the 2022-23 period, coffee is cultivated over an area of 85,957 hectares, which includes 81,719 hectares dedicated to Robusta and 4,238 hectares to Arabica. A significant portion of coffee farming in Kerala occurs in Wayanad, with notable areas also found in the Palakkad and Idukki districts. The average yearly coffee production is 72,425 million tonnes, consisting of 70,450 million tonnes of Robusta (97.27%) and 1,975 million tonnes of Arabica (2.73%). The average yield for Robusta farms is 869 kg per hectare, while Arabica farms yield an average of 499 kg per hectare.

Data Source and Methodology

Kerala is coffee producing and processing state and Kerala ranks as the second largest coffee producer in India. Kerala as leading state of the coffee production in South India, the major processors are engaged in processing of coffee, so purposively selected for the study. Data was collected through personal interviews with processors. A special schedule was used for this purpose. All the three tahsils were selected from Wayanad district on the basis of higher coffee production and processing units were scattered in all the three tahsils of Wayanad district. From each tahsil 10 processing units were selected randomly. Thus, the total samples were 30 from the district.

The study includes 30 samples of coffee processors. The samples were categorised in small, medium and large group according to their processing capacity. The small group were categorised on the processing capacity up to 25 kilograms per hour, the medium processors having processing capacity of 25 to 100 kilograms per hour whereas large processors having 100 to 1000 kilograms per hour processing capacity. According to processing capacity, it was found from the data collected that, of 30 samples 15 processors were grouped into small scale processors, 3 samples of processors were identified in medium group and remaining 12 processors were categorised into large scale group of processors. The data were analysed and interpreted according to their group of processing capacity. The

collected primary data were organized and examined using appropriate statistical and economic methods. Basic statistical tools like arithmetic mean, average, percentages, and ratios were employed in the analysis. Additionally, built-in formulas and features available in MS Excel were utilized to conduct further analysis. Items of processing cost includes opportunity cost of land, depreciation on building and machinery, raw material price, casual labour charges, cost of repairs and maintenance, electricity charges, transport, depreciation, interest on working and fixed capital, salary of employees, other miscellaneous cost etc. In addition to this the various standard cost concepts such as fixed cost, variable cost and economic criteria such as Net Present Value, Benefit Cost Ratio, Payback Period, Internal Rate of Return, break-even point were used in analysis.

Results and Discussion

Capital Investment in coffee processing units.

Table 1 provides a comprehensive overview of the capital investment structure in coffee processing units, categorized into small, medium and large units. The total capital investment across all units amounts to ₹4,90,83,505. Among these, large units accounted for the highest share with ₹11,41,26,960, followed by medium units with ₹2,13,09,791, and small units with ₹31,93,526, indicating that larger units dominate in terms of scale and financial input.

In terms of fixed capital, the total investment stood at ₹48,10,013, representing about 9.80 per cent of the total investment. Medium-sized units allocated the largest portion to fixed capital ₹51,63,333 (24.22%), primarily on machinery and equipment, highlighting their emphasis on mechanization. Large units also invested in land and building infrastructure, with ₹14,76,667 in land and ₹13,06,917 in buildings, making them the only group with notable infrastructure investment. In contrast, small units showed relatively lower investment in fixed assets, with machinery and furniture comprising the bulk of their fixed capital.

Table 1: Capital Investment in coffee processing units

Sr. No	Item of cost	Small (N=15)	Medium (N=3)	Large (N=12)	Overall (N=30)
i	Fixed capital				
1	Machinery and equipment's	172560 (5.40)	4815000 (22.59)	6068750 (5.31)	2988613 (6.08)
2	Land	--	--	1476667 (1.29)	590666 (1.20)
3	Buildings	--	--	1369167 (1.19)	547666 (1.15)
4	Furniture & office equipment	76133 (2.38)	348333 (1.63)	1873749 (1.64)	683066 (1.39)
	Sub total	249693 (7.81)	5163333 (24.22)	10788333 (9.45)	4810013 (9.80)
ii	Working capital				
1	Raw material	2670100 (83.60)	15624583 (73.32)	101546666 (88.97)	43383175 (88.38)
2	Packing material	3000 (0.09)	8500 (0.039)	20735 (0.018)	10544 (0.02)
3	Transportation	--	--	343750 (0.301)	343750 (0.70)
4	Labour charges	239667 (7.50)	351500 (1.64)	818808 (0.717)	473640 (0.96)
5	Electricity	26840 (0.84)	41000 (0.192)	262000 (0.229)	121520 (0.24)
6	Others	4226 (0.13)	120875 (0.56)	346666 (0.3)	147113 (0.29)
	Sub total	2943833 (92.18)	16146458 (75.77)	103338626 (90.54)	44273492 (90.20)
iii	Grand Total	3193526 (100.00)	21309791 (100.00)	114126960 (100.00)	49083505 (100.00)

(Figures in parentheses indicates percentage to total)

In case of large unit, the capital investment in fixed capital was reported to ₹1,07,88,333 which was 9.95 per cent to total investment in large unit (₹11,41,26,960) where as in case of small units the total fixed investment was reported to

₹2,49,693 which was 7.81 per cent to total investment (₹31,93,526).

The working capital component was significantly higher than fixed capital across all unit sizes, totalling

₹4,42,73,492, or 90.20 per cent of the total capital investment. Raw material costs made up the majority share, accounting for ₹4,33,83,175 (88.38%) of the total investment, and were most significant in large units ₹10,15,46,666 (88.97%). Other working capital expenses included labour charges, packing material, electricity, transportation, and miscellaneous costs. Labour charges were relatively high in small units, indicating a higher

dependence on manual labour.

Labour utilisation in the coffee processing units.

It is seen from the table 2 that the overall labour force engaged in coffee processing consists of 2.86 male and 0.96 female workers per unit, highlighting a male-dominated workforce across all unit sizes.

Table 2: Labour utilisation in the coffee processing units

Sr. No	Particulars	Small (N=15)		Medium (N=3)		Large (N=12)		Overall (N=30)	
		Male	Female	Male	Female	Male	Female	Male	Female
i	Permanent								
1	Administrative	1 (28)	1 (50)	1 (33.33)	1 (28.57)	1 (22.93)	1 (29.41)	0.33 (11.62)	0.26 (27.58)
2	Technical	1.53 (43.97)	0 (50)	1 (44.44)	1.5 (42.85)	2 (45.87)	1.4 (41.17)	1.56 (54.65)	0.26 (27.58)
	Sub total	2.53 (71.98)	1 (50)	2 (66.66)	2.5 (71.42)	3 (68.8)	2.4 (70.58)	1.9 (66.27)	0.53 (55.17)
ii	Hired								
1	Administrative	-	-	-	-	-	-	-	-
2	Technical	1 (28)	1 (50)	1 (33.33)	1 (28.57)	1.36 (31.19)	1 (29.41)	0.96 (33.72)	0.43 (44.82)
	Sub total	1 (28)	1 (50)	1 (33.33)	1 (28.57)	1.36 (31.19)	1 (29.41)	0.96 (33.72)	0.43 (44.82)
	Grand Total	3.53 (100)	2 (100)	3 (100)	3.5 (100)	4.36 (100)	3.4 (100)	2.86 (100)	0.96 (100)

(Figures in parentheses indicates percentage to total)

In small units, the total average number of workers is 3.53 males and 2 females per unit. Most of the labour (71.98% male and 50% female) was permanent staff. Male workers are mainly employed in technical roles (1.53 on average), while female workers were mostly in administrative jobs. Interestingly, female workers were more represented here compared to other unit sizes.

Medium units employed an average of 3 male and 3.5 female workers per unit, showing the highest average female employment among all unit sizes. Like small units, no administrative workers were hired, and all hired workers was in technical roles 1 male and 1 female on average per unit.

Large coffee processing units employ the most workers overall, with an average of 4.36 males and 3.4 females per unit. The majority of these were permanent employees, especially male technical staff (2 per unit) and female technical staff (1.4 per unit). Among hired workers, large units employed 1.36 males and 1.36 females in technical positions, suggesting a more even gender distribution in temporary jobs.

Among permanent workers, permanent labour accounted for 66.27 per cent of male and 55.17 per cent of female workforce, showing a strong presence of consistent employment in the processing sector.

In the case of hired labour, the trend was slightly different. All hired workers were technical, as there were no hired administrative staff across any unit size. On average, 0.96 male (33.72%) and 0.43 female (44.82%) hired technical workers were employed per unit, suggesting a somewhat higher reliance on female hired labour in technical tasks relative to their permanent representation. This could indicate seasonal or temporary employment patterns, particularly among women.

When comparing across unit sizes, large units employed the most labour overall, with 4.36 male and 3.4 female workers per unit, followed by medium and small units. Small units,

despite employing fewer overall workers, showed relatively higher female participation in permanent roles.

Cost and returns of dry coffee processing unit per year (Rs)

Table 3 indicates that small units handle less raw material only about 7.25 tonnes and have a total annual cost of around ₹33.33,024. Most of this cost (about 88%) goes to working costs, mainly coffee beans, which alone make up ₹26,70,100 (80%). Labour costs were higher in percentage terms here, at 7.19 per cent, indicated small units depend more on manual work. Other expenses like electricity, packing, and interest on working capital was relatively small, but still important. Despite their small scale, these units earn a gross return of ₹45,09,389, resulting in a net profit of ₹11,76,365. Their benefit-cost ratio (BCR) was estimated to 1.35, showing they were profitable.

Medium units process about 40.16 tonnes of raw material, with a total cost of ₹1,88,06,300 per year. Like small units, the bulk of expenses (85.85%) was in working capital, especially coffee beans, which cost about ₹1,56,24,583 (83%). Labour and electricity costs take up a smaller share (1.86% and 0.21%, respectively), showed some efficiency in operations. The gross return was worked out to ₹2,44,12,871 and net return was ₹56,06,571, with a BC ratio of 1.29 slightly lower than small units.

Large units operate on a much bigger scale, processing around 520 tonnes of raw material yearly. Their total cost was about ₹11,72,21,590 with raw material alone costing ₹10,15,46,666 (86.62%). Even though their absolute labour cost was higher, it makes up just 0.69 per cent of the total showed that larger units benefit from economies of scale. These units also spend more on transport and depreciation, but they generate massive returns of ₹19,35,75,000 in gross returns, and ₹7,63,53,410 in net profit. The benefit-cost ratio was found to be 1.65, the highest among all units, indicated large processors were the most efficient and profitable.

Table 3: Cost and returns of dry coffee processing unit per year (Rs)

Sr. No	Particulars	Small (N=15)	Medium (N=3)	Large (N=12)	Overall (N=30)
i	Working costs				
1	Raw material (ton)	7.25	40.16	520	225.3
2	Coffee beans	2670100 (80.11)	15624583 (83.08)	101546666 (86.62)	43383175 (86.32)
3	Packing materials	3000 (0.09)	8500 (0.04)	20735 (0.017)	10544 (0.02)
4	Transportation	-	-	343750 (0.29)	137500 (0.26)
5	Labour charges	239667 (7.19)	351500 (1.86)	818808 (0.69)	473640 (0.94)
6	Electricity	26840 (0.80)	41000 (0.21)	262000 (0.22)	121520 (0.24)
7	Other charges	4226 (0.12)	120875 (0.64)	346666 (0.29)	147113 (0.29)
	Sub total	2943833 (88.32)	16146458 (85.85)	103338626 (88.15)	44273492 (88.09)
ii	Depreciation on				
1	Buildings	-	-	27383 (0.02)	10953 (0.02)
2	Machinery	8932 (0.26)	199267 (1.05)	334556 (0.28)	157859 (0.31)
3	Furniture & office equipment's	2030 (0.06)	6666 (0.03)	41555 (0.03)	18215 (0.03)
iii	Interest on				
1	Working capital @12%	353260 (10.59)	1937575 (10.30)	12400635 (10.57)	5312819 (10.57)
2	Fixed capital @ 10%	24969 (0.74)	516333 (2.74)	1078833 (0.92)	481001 (0.95)
iv	Grand total cost	3333024 (100.00)	18806300 (100.00)	117221590 (100.00)	50254340 (100.00)
v	Gross returns	4509389	24412871	193575000	68246123
vi	Net returns	1176365	5606571	76353410	17991783
vii	Benefit-cost ratio	1.35	1.29	1.65	1.35

(Figures in parentheses indicates percentage to total)

At overall level, the working costs form the bulk of total costs across all unit sizes, accounting for 88.09 per cent of the overall total expenditure (₹ 5,02,54,340). Among these, raw material costs were the most significant component, representing 86.32 per cent of the total cost on average, which was followed by interest on working capital (10.57%) and labour charges (0.94%).

At overall level the Gross returns were accounted for ₹ 6,82,46,123 and by deducting the total cost the average per processing unit net return were estimated to ₹ 1,79,91,783 with 1.35 BC ratio. The benefit-cost ratio also found to be

improved with size, being 1.35 for small, 1.29 for medium, and a high 1.65 for large units, indicating that larger units are significantly more profitable and efficient in their operations.

Break even analysis of coffee processing units.

As indicated in table 4 small coffee processing units have break-even output to the ton was 1.04 tonnes, meaning they need to produce just over a tonne to cover all costs. Their margin of safety was how much they produce above the break-even point is 5.49 tonnes, indicating a safe and financially secure position for small units.

Table 4: Break even analysis of coffee processing units

Break even analysis of coffee processing units					
Sr. No	Particulars	Small	Medium	Large	Overall
1	Total annual fixed cost (Rs.)	249693	5163333	10788333	4810013
2	Total variable cost (Rs.)	2943833	16146458	103338626	44273492
3	Per unit selling price (Rs.)	690565	680593	445000	425183
4	Per unit variable cost (Rs.)	450817	450138	237560	275830
5	Actual production (tonnes)	6.53	35.87	435.00	160.51
6	Break-even point output (Tonnes)	1.04	22.40	52.01	32.21
7	Margin of safety (Tonnes)	5.49	13.47	382.99	128.30

Medium units have produced level to the extent of 35.87 metric tonnes annually, but their break-even point was worked out to be 22.40 tonnes much higher than small units, which means they need to sell more to cover costs. Still, they manage a margin of safety of 13.47 tonnes, showed they were operating well above break-even. This indicates that medium units were financially viable, though they operate at a tighter margin compared to small and large units.

In case of large units break-even output was accounted to be 52.01 tonnes, and they exceed that by a massive margin. Their margin of safety was found to be 382.99 tonnes, indicated they operate at a very comfortable level and were the most financially secure and efficient among all unit sizes. Across all unit sizes, the average break-even output is 32.21 tonnes, while actual production is 160.51 tonnes. At

the overall level the margin of safety was 128.30 tonnes, showed the industry was running at a healthy and profitable scale. Considerably, the fixed and variable cost at overall level was ₹48,10,013 and ₹4,42,73, 492. They had average ₹4,25,183 per tonne selling price and ₹2,75,830 per unit variable cost at overall level. Despite the high break-even point, large units maintain the greatest margin of safety at 382.99 tonnes, indicating strong financial security.

Financial feasibility of investments in coffee processing units.

Table 5 provides an assessment of the financial feasibility of investments in coffee processing units of different scales: small, medium, and large. The analysis, based on a 12 per cent discount rate, shows that Net Present Value (NPV) increases with the size of the unit, with small units having

an NPV of ₹34,11,817, medium units ₹1,67,47,524, and large units ₹13,90,65,002. The overall NPV across all units

was estimated to ₹5,23,83,911, indicating positive returns on investment.

Table 5: Financial feasibilities of investments in coffee processing units

Sr. No	Particulars	Coffee processing units			
		Small	Medium	Large	Overall
A	Discounted measures (%)	12			
	Net Present Value (Rs.)	34,11,817	1,67,47,524	13,90,65,002	5,23,83,911
	Benefit Cost Ratio	1.14	1.13	1.17	1.15
	Internal rate of return (%)	21.94	21.90	22.98	21.96
B	Undiscounted measure				
	Payback period (Years)	4	4	3	4

The Benefit Cost Ratio (BCR) was favourable for all unit sizes, with values exceeding 1.0, which confirms the economic viability of investment. Small units show a BCR of 1.14, medium units 1.13, and large units 1.17, with an overall average of 1.15. Similarly, the Internal Rate of Return (IRR) was found to be significantly higher than the discount rate, further validating the profitability that is small units have an IRR of 21.94 per cent, medium units 21.90 per cent and large units 22.98 per cent with an overall level IRR of 21.96 per cent.

In terms of payback period, small and medium units require 4 years to recover their investment, while large units have a slightly shorter payback period of 3 years. This suggests that, although large units involve higher investment, they tend to be more efficient in terms of returns and recovery time.

Conclusion

Capital investment in coffee processing units mainly contributed by working capital (90.20%) rather than fixed assets (9.80%). At overall level, all unit sizes are spent on raw materials, which make up overall 88.38 per cent of the total investment. Large units spend more on labour ₹8,18,808 and large units only have transportation costs, pointing to wider operations. The labour used in coffee processing units was mostly male, with an overall average of 2.86 male and 0.96 female workers per unit. Most of the workers are permanent, especially male technical staff. Female workers were fewer, especially in technical roles, though they have a stronger presence in administrative positions. The coffee processing enterprise is financially feasible in the study area which is indicated by Net Present Value (₹5,23,83,911), Benefit Cost Ratio (1.15), Payback Period (4 years), Internal Rate of Return (21.96%) and present level of output 160.51 tonnes higher than break even point 32.21 tonnes, sufficiently higher margin of safety 128.30 tonnes. Hence the coffee processing in Wayanad district of Kerala is a profitable venture.

References

1. Azhar R, Rahmawaty, Saraan M, Taufik M, Muamar Aulin FR, Situmeang DJ, Barus K. Marketing analysis and feasibility analysis of coffee (*Coffea* sp.). IOP Conf Ser Earth Environ Sci. 2021;782(2):022033. <https://doi.org/10.1088/1755-1315/782/2/022033>
2. Charitha K. Study on supply chain management of coffee in Chikmagalur district of Karnataka [MBA thesis]. Bangalore: University of Agricultural Sciences; 2021.
3. Chethan AJ. An analysis of processing and marketing of coffee in Chikmagalur district of Karnataka [Master's thesis]. Bangalore: University of Agricultural Sciences; 2015.
4. Farida N, Nurdin B, Idrus T, Suhuryono. Financial feasibility study of hydroponic vegetables business: a case study on Serua farm, Kota Depok. Psychol Educ J. 2021;58(1):105-112.
5. Hamidah E. Analysis of financial feasibility and business economics of Manalagi mango cultivation: case study in Mertani Village, Karanggeneng District, Lamongan Regency. J Agrinika. 2023;7(2):97-111.
6. Hiremath DB, Rudrapur S, Parmar T. Financial feasibility analysis of drip irrigation technology in banana: a case of south Gujarat. J Farm Sci. 2024;37(3):254-258.
7. Kabayiza F. A study on supply chain of coffee in Rwanda [MBA thesis]. Telangana: Jayashankar Agricultural University; 2016.
8. Thanuja P, Singh NK. Economic analysis of marketing and processing of coffee in Kodagu district of Karnataka. Int J Agric Sci Res. 2017;7(4):227-232.