Thematic Study on

Cost of Cultivation

on Major Crops & Agriculture Product Pricing at District Level

Conducted by
Directorate of Economics & Statistics,
Government of Nagaland, Kohima

In collaboration with
School of Agricultural Sciences & Rural Development,
Nagaland University, Medziphema Campus

PREFACE

The Department of Economics & Statistics, Government of Nagaland in collaboration with Nagaland University, School of Agricultural Sciences & Rural Development, Medziphema conducted a Study entitled "Thematic study on Cost of Cultivation on Major Crops and Agriculture Product Pricing at District Level" with the objective to assess actual cost of cultivation incurred by the farmers for different agricultural and horticultural crops in the state of Nagaland under Support for Statistical Strengthening Scheme 2021-22.

Experiment has been made to ascertain the product pricing for each crop in order to evaluate the profitability of the crops in the State. Right from choosing inputs to determine the most suitable processes, the cost of production acts as a crucial factor that enables farmers to make the best decision in any given situation. Cost of cultivation includes every aspect of farm production, right from the expenses of inputs such as fertilisers, seeds, etc to the costs of labour and machinery on a farm.

I hope the information presented in this report will facilitate the need of unit level data by researchers, departments, agencies and policy makers.

I wish to place on record my sincere thanks and acknowledge the dedication extended by Dr. Sanjoy Das, Associate Professor, Dept. of Agricultural Economics, SASRD, Medziphema and his team for completion of the Report. My gratitude also goes to the officers from the Directorate, District Economics & Statistics Officers and staff involved in collation of data.

Suggestions are gladly welcome for the improvement of this report.

Place: Kohima
Date:

Sd/-
NEIDILHOU ANGAMI
Director

ACKNOWLEDGEMENT

The "Thematic Study on Cost of Cultivation on Major Crops and Agriculture Product Pricing at District Level" under Support for Statistical Strengthening (SSS) 2021-2022, was conducted under Directorate of Economics and Statistics, Govt. Of Nagaland, Kohima in collaboration with School of Agricultural Sciences and Rural Development (SASRD), Nagaland University, Medziphema Campus, Medziphema, Nagaland. Study was conducted during 2021-22 in order to estimate the cost of cultivation of 10 major crops grown in Nagaland as well as to estimate the product pricing at district levels. Trial had been made to estimate cost of production and Benefit Cost Ratio (BCR) also for each crop selected. I am indebted to the Directorate of Economics and Statistics for giving me this responsibility to work as a consultant for the esteemed project. I also express my hearty thanks to Prof. A. Aleminla Ao, then Pro-Vice Chancellor, SASRD, Medziphema for allowing me to conduct this exercise. I am extremely thankful to Shri Neidilhou Angami, Director, Directorate of Economics & Statistics, Government of Nagaland; Shri Charles N. Kikon, Nodal officer & Additional Director, Directorate of Economics and Statistics, Government of Nagaland for giving me this opportunity to work with the Directorate of Economics & Statistics. I want to thank Shri Nyushotho Nyuthe, Economics & Statistics Officer, who helped me lot for making this project successful. I extend my sincere thanks to all the Village Council Chairman and all the 2340 farmers household respondents, without whose contribution and cooperation no information would have been gathered. I express my hearty thanks and congratulations to all District Economics & Statistics Officers, Data collectors, enumerators and staffs of Directorate of Economics and Statistics, Kohima, Government of Nagaland. Without the support of my parents, my wife and most important my two sons, I would not have been able to honestly contribute to the work entrusted on me. Lastly, I thank almighty for keeping his blessings for the successful completion of the project.

Sd/-

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List of Abbreviation

BCR : **Benefit Cost Ratio**

DAP : **Diammonium Phosphate**

Ha : **Hectare**

K : **Potash**

MOP : **Murate of Potash**

N : **Nitrogen**

P : **Phosphorus**

Qtl. : **Quintal**

WTR : **Wet Transplanted Rice**

Contents

1

INTRODUCTION

Agriculture is an important sector of Indian Economy as more than half of its population relies on Agriculture as principal source of income. In agro-industrial complex, cost structure is of strategic importance for data generation on cost structure of crops, because it allows to determine the level of innovation activity. These are very intensive surveys wherein data are collected on the various inputs which are used for the cultivation of crop. Cost of production is a key component in agriculture that can help farmers in shaping smart production strategies to make their farm processes more efficient. It is also useful in managing critical farm management risks and ensuring judicious use of farm resources.

Knowing the costs of production can help farmers in planning their production operations to stay in line with defined profitability goals. Right from choosing inputs to determining the most suitable processes, the cost of production can act as a crucial factor enabling farmers to make the best decisions in any given situation. Cost of production includes every aspect of farm production, right from the expenses of inputs such as fertilisers, seeds, etc to the costs of labour and machinery on a farm. Cost of cultivation data is extremely crucial for policy formation by administrators and policy planners. In addition, these data are used by many organizations for micro level decision making. The knowledge of the cost and return structure of different crops is crucial for policy formulation, selecting appropriate production strategies and identifying regional comparative advantages in crop production. The reliable information on cost and return of various crops helps the farmers in allocating the scarce resources most optimally. Besides, such information is of critical importance to the financial and insurance institutions to make provisions for farm credit and fix insurance premium.

The main objective of the study was to assess actual cost of cultivation incurred by the farmers for different agricultural and horticultural crops in the state. This report is based on the sample survey on Cost of Cultivation of Important Crops conducted during the year 2021-22 agriculture year. The crops covered under this study are wet transplanted rice, jhum paddy (autumn, winter and summer), maize, soyabean, rapeseed and mustard, cabbage, banana, pineapple, orange and ginger.

The main objective of the survey is to produce reliable estimates on production cost involved in major agricultural crops in the State. Major perennial, annual and seasonal crops are covered in the survey with a breakup of cost incurring during various stages from sowing to harvest.

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METHODOLOGY

Major crops have been identified based on proportionate area under cultivation of a crop to net sown area of the state. Accordingly 5 major agronomical crops have been identified based on the percentage of cultivable area to net sown area of the State. Five agronomical crops identified were W/TRC rice, Jhum paddy, Maize, Rape and Mustard and Soyabean. Similarly on the basis of the same principle five horticultural crops vis. Banana, Cabbage, Pineapple, Orange and Ginger were also identified.

For selection of blocks, minimum one third of the total blocks in each district were selected out of old 11 districts. As sample technique was framed out before the formation of new districts, so study was confined within the old 11 districts. Blocks having more proportional area for a particular crop were selected for the survey. For selection of villages, 2 villages in a block were selected considering the same principle. Villages having more area in a particular crop were selected. Likewise, for selection of farmer households, 2 farmer households were selected from each village. Thus a total of 234 farmer households for each crop from a total of 117 villages (@ 2 villages/block) of 39 blocks from 11 districts were selected making a total sample size of 2340 farmer households for 10 crops.

For the survey, an interview schedule was prepared and it was pilot tested in order to check the interview schedule performance and also to verify its 'ease of handling' by data collectors. Data were collected pertaining to the year 2021-22. After collection, data were entered in EXCEL sheet for further compilation and analysis.

Cost Items

The items of cost of cultivation cover both paid out cost (out of pocket expenses) and the imputed costs. The items covered under these costs are:

Paid-out costs: (i) Hired labour (human, animal and machinery). (ii) Maintenance expenses on owned animals and machinery. (iii) Expenses on material inputs such as seed (home grown and purchased), fertiliser, Manure (owned & purchased), Pesticides and Irrigation. (iv) Depreciation on implements and farm buildings (such as cattle sheds, machine sheds, storage sheds). (v) Land revenue. (vi) Rent paid for leased-in-land.

Imputed Costs: Value of family labour/managerial input of the farmer, rent of owned land and interest on owned fixed capital for which the farmer does not incur any cash expenses.

Imputation Procedures

Some of the inputs used in production process come from family sources. The procedure adopted for deriving imputed values of these inputs is as under:

(i) Family Labour	On the basis of statutory wage rate or actual market rate whichever is higher.
(ii) Owned animal	On the basis of cost of maintenance labour which includes the following: (a) Cost of green and dry fodder, (b) Cost of concentrates, (c) Depreciation on animals & cattle sheds, (d) Upkeep labour charges, (e) Other expenses, if any.
(iii) Owned machinery	On the basis of cost of maintenance charges of farm machinery which includes diesel, electricity, lubricants, depreciation, repairs and other expenses, if any.
(iv) Implements	Depreciation & charges on account of minor repairs.
(v) Farm Produce	Evaluation at rates prevailing in the village.
(vi) Rent of owned land	Estimated based on prevailing rents in the village for identical type of land or as reported by the sample farmers, subject to the ceiling of fair rents given in the land legislation of the concerned State.
(vii) Interest on owned Fixed Capital	Interest on present value of fixed assets charged at the rate of 10% per annum.
(viii) Interest on Working Capital	Interest is charged at the rate of12.5% per annum on the working capital for half the period of crop.
(ix) Kind payments	The kind payments are evaluated at prices prevalent in the village at the time such payments are made.
(x) Main product & by- product	Imputed based on post-harvest prices prevailing in the selected villages.

Cost Concepts

Costs are generated following certain cost concepts. These cost concepts and the items of costs included under each concept are given below:

(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) Hired machinery charges
(vi) Value of seed (both farm produced and purchases)

(vii) Value of insecticides and pesticides

(viii) Value of manure (owned and purchased)

(ix) Value of fertilizer

(x) Depreciation on implements and farm buildings

Cost A1 : 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

Crops under the study

Various agricultural and horticultural crops widely grown in Nagaland have been taken into consideration under the present study.

SN	Particulars	Name of crops	Cultivated area (ha) (2019-20)	Production (MT) (2018-19)
1	Agriculture crops	Wet Transplanted Rice (WTR)	126120	364220
		Jhum paddy	90830	180750
		Maize	69130	137160
		Rapeseed and mustard	27490	27820
		Soybean	25170	31770
2	Horticulture crops	Banana	6888	86957
		Cabbage	6942	118652
		Pineapple	8698	115086
		Orange	237	2068
		Ginger	4749	35630

Selected Samples

SN	Name of the district	No of blocks	No of blocks selected	Name of the blocks selected	Name of the village(s)
1	Dimapur	8	3	Dhansiripar	Tsithrongse
					Murise
					Singnijam
				Niuland	Hovukhu
					Nihokhu
					Nikheku
				Medziphema	New Medziphema
					Molvom
					New Chumukidima
2	Kiphire	5	3	Kiphire	Kiphire
					Longthongre
					Singrep
				Amahator	Amahator
					Changchar
					New Risethsi
				Longmatra	Longmatra
					Thetuyo
					Sanphure
3	Kohima	7	4	Jhakama	Kidima
					Viswema
					Khuzama
				Sechu	Sechu
					Mengujuma
					Khonoma
				Chiephobozou	Merima
					Zhadima
					Chiechama
				Tseminyu	Thangsu
					Sendenyu
					New Sendenyu
4	Longleng	3	2	Longleng	Pongo
					Mongtekang
					Yaongyimchen
				Tamlu	Yongam
					Kangching
					Yongshei

5	Mokokchung	8	4	Ongpangkong(N)	Chuchuyimpang
					MokokchungVillage
					Longmisa
				Kubulong	Longjang
					Yimchalu
					Longpa
				Tuli	Loyung
					Aopenzu
					Merangkong
				Changtongya	Chantongya
					Yaongyimsen
					Leroyim
6	Mon	8	4	Pomching	S. Lokyo
					Longzang
					S.Tangten
				Chen	ChingkaoHhingnyu
					Wangti
					Chingpong
				Wakching	Shiyong
					Tanhai
					Wakching
				Chen	Chenloiso
					Choknyu
					ChenloishoWangto
				Tizit	Sangsa
					Lapalampong
					Tizit Village
7	Peren	4	2	Peren	Ngwalwa
					Heningkuglwa
					Old Peren
				Jalukie	New Jalukie
					Old Jalukie lower
					Mhainamtsi
8	Phek	7	4	Chizami	Chizami
					Zhaveme
					Mesulumi
				Pfutsero	Thenyizu
					Khezakheno
					Leshimi
				Chetheba	Chesezu
					Chesezumi
					Rihuba
				Sekreu	Chozuba
					RunguzuLuruo
					Khesomi

9	Tuensang	9	5	Sangsangyu	Chendang
					Hakchang
					Maksha
				Noklak	Noyang
					Kusong
					Noklak Village
				Shamator	Lfankonger
					Chassir
					Lasikiur
				Chessore	K. Longsor
					Chessore
					Hukir
10	Wokha	7	4	Wokha	Wokha
					Elumyo
					Yimkha
				Chukitong	Kolo
					Tsungiki
					Mungya
				Ralan	Worukhu
					Yanpha
					Ronsuyan
				Bhandari	Serika
					Liphiyan
					Liphi
11	Zunheboto	8	4	Zunheboto	Sukhalu
					Natha old
					Lizuaviqato
				Ghathashi	Lazami
					Ghokimi
					Natsumi
				Tokiye	AkumbaNeW
					Lukhiyi
					Luthusumi
				Akuluto	Lumthasami
					Sutemi
					Shichimi

RESULTS AND OBSERVATIONS

1. Wet Transplanted Rice (WTR)

Table 1. Area and number of holdings under Wet Transplanted Rice (WTR)

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding(ha)
Marginal (Up to 1 ha)	154	66.50	32.65	0.43
Small (1.1-2ha)	40	42.67	20.95	1.07
low-medium (2.1-4ha)	29	49.60	24.35	1.71
High medium (4.1-10)	11	44.92	22.05	4.08
Total	**234**	**203.69**	**100.00**	**0.87**

Table 1.1 Breakdown estimates of different variable and fixed cost components for Wet Transplanted Rice (WTR) of Nagaland (district wise) (₹/ha)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	701.08	1204.72	6458.06	2354.55	3000.00	717.53	1971.15	2302.26	2557.58	2657.14	2568.99	1685.83
Hire human labour (Female)	624.21	1211.86	5604.44	1100.00	2154.55	567.53	1925.00	1928.10	2131.87	2231.40	2335.08	1215.44
Family human labour (male)	388.16	722.83	4109.68	1009.09	3000.00	717.53	1576.92	1444.16	1278.79	1328.57	1284.50	1352.73
Family human labour (female)	345.85	969.49	3880.00	660.00	2154.55	756.70	1540.00	1619.25	955.69	1275.09	1167.54	1204.64
Bullock labour	534.48	-	3799.98	-	-	-	-	1241.49	-	-	-	516.47
Machinery charges	-	-	16891.00	-	1772.13	-	2507.61	4880.40	-	-	-	2302.09
Seeds	724.03	360.90	2622.32	1068.12	1068.15	552.64	363.54	1151.88	2137.02	2873.73	671.87	1236.44
Fertilizers												
N(kg): Urea	1717.95	-	-	-	-	-	-	-	-	-	-	156.18
P(kg): DAP	787.48	-	-	-	-	-	-	-	-	-	-	71.59
K(kg): MOP	1823.15	-	-	-	-	-	-	-	-	-	-	165.74
Interest on working capital @6%	458.78	268.19	2601.93	371.51	788.96	198.72	593.05	874.05	543.66	621.96	481.68	594.43
Total variable cost	8105.17	4737.99	45967.41	6563.27	13938.34	3510.65	10477.27	15441.59	9604.61	10987.89	8509.66	10501.58
Fixed cost												
Rental value of land	9304.38	10031.04	19760.00	17270.00	3887.42	16750.00	8478.51	23230.66	8178.51	5715.00	14305.58	19562.86
Interest of fixed capital @12%	1074.07	1203.73	2348.40	2072.40	466.49	2010.00	1017.42	2541.58	981.42	685.80	1716.67	2319.92
Total Fixed cost	10024.61	11234.77	21918.40	19342.40	4353.90	18760.00	9495.93	23721.41	9159.94	6400.80	16022.24	21652.61
Total cost (₹/ha)	**18129.78**	**15972.75**	**67885.81**	**25905.67**	**18292.25**	**22270.65**	**19973.20**	**39163.00**	**18764.54**	**17388.69**	**24531.90**	**32411.98**

Table 1.2 District wise estimates of cost of production and BCR for Wet Transplanted Rice (WTR) of Nagaland (Per ha)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunhebhoto	Overall
Quantity of main produce (qtl)	38.02	21.58	58.71	17.27	21.07	26.80	18.00	25.36	23.43	15.24	28.82	26.75
Rate (₹/qtl)	1412.50	2687.50	2000.00	6000.00	1107.00	3750.00	2826.17	5011.00	2094.37	2250.00	2978.26	4310.06
Total value of main product (qtl)	53703.25	57996.25	117420.00	103620.00	23324.49	100500.00	50871.06	127078.96	49071.09	34290.00	85833.45	115313.62
Quantity of by produce (qtl)	3.86	0.73	0.57	-	-	2.07	-	8.56	-			1.44
Rate (₹/qtl)	550.00	3000.00	2000.00	-	-	200.00	-	1437.50	-			1437.50
Total value of By-produce	2123.00	2190.00	1140.00			414.00		12305.00		0.00	0.00	4539.63
Total value of produce	55826.25	60186.25	118560.00	103620.00	23324.49	100500.00	50871.06	139383.96	49071.09	34290.00	85833.45	117377.16
Net return	35573.47	44213.50	49534.19	77714.33	5032.24	78229.35	30897.86	87915.96	30306.55	16901.31	61301.55	84965.18
Cost of production (₹/qtl)	476.85	740.16	1156.29	1500.04	868.17	830.99	1109.62	1544.28	800.88	1140.99	851.21	1149.77
BCR	2.96	3.77	1.73	4.00	1.28	4.51	2.55	3.24	2.62	1.97	3.50	3.62

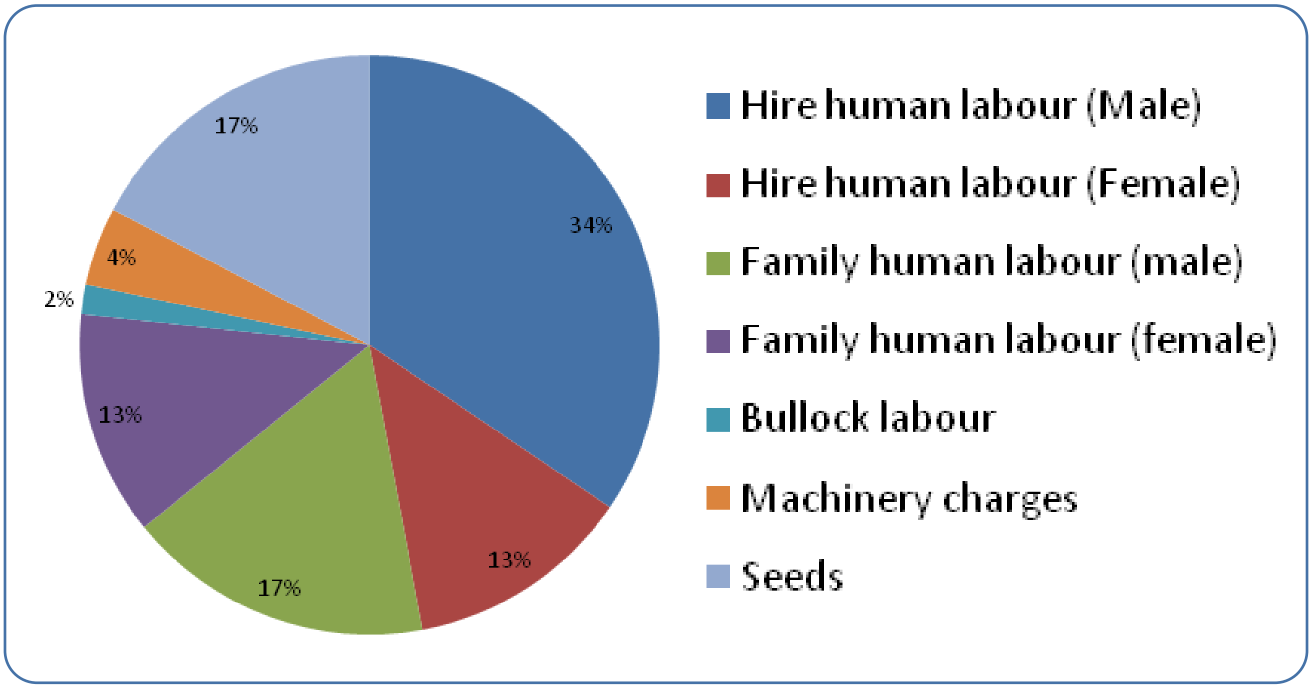

Fig 1. Share of variable costs components for Wet Transplanted Rice in Nagaland (Per ha)

Under the variable cost components i.e.; paid out cost actually incurred by the cultivator's 23 percent of cost incurred against machinery charges is the highest. The BC ratio stood at 3.62 cost of cultivation of ₹32411.98/ha and cost of production at ₹1099.00/qtl respectively.

Table 1.3 District wise estimates of cost of cultivation, production, and related data for Wet Transplanted Rice (WTR) by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	6768.65	6768.65	17318.26	17925.12	18129.78
Kiphire	3383.81	3383.81	14347.03	15190.37	15972.75
Kohima	32971.98	32971.98	60760.35	62897.92	67885.81
Longleng	5931.38	5931.38	7467.86	9250.16	25905.67
Mokokchung	12022.08	12022.08	12208.44	14444.86	18292.25
Mon	21166.67	21166.67	24022.38	37080.34	22270.65
Peren	33158.11	33158.11	34235.82	46518.09	19973.20
Phek	8321.06	8321.06	10693.51	14447.76	39163.00
Tuensang	9095.21	9095.21	9839.01	12276.81	18764.54
Wokha	6549.62	6822.51	15516.85	16758.91	17388.69
Zunheboto	7568.13	7568.13	8873.05	11557.10	24531.90
Overall	19115.95	19115.95	19979.15	30337.67	32871.08
Cost of Production per quintal (Rs)					
Dimapur	178.03	178.03	455.50	471.47	476.85
Kiphire	156.80	156.80	664.83	703.91	740.16
Kohima	561.61	561.61	1034.92	1071.33	1156.29
Longleng	343.45	343.45	432.42	535.62	1500.04
Mokokchung	570.58	570.58	579.42	685.57	868.17
Mon	789.80	789.80	896.36	1383.59	830.99
Peren	1842.12	1842.12	1901.99	2584.34	1109.62
Phek	328.12	328.12	421.67	569.71	1544.28
Tuensang	388.19	388.19	419.93	523.98	800.88
Wokha	429.76	447.67	1018.17	1099.67	1140.99
Zunhebhoto	262.60	262.60	307.88	401.01	851.21
Overall	639.12	639.12	667.98	1014.30	1149.77

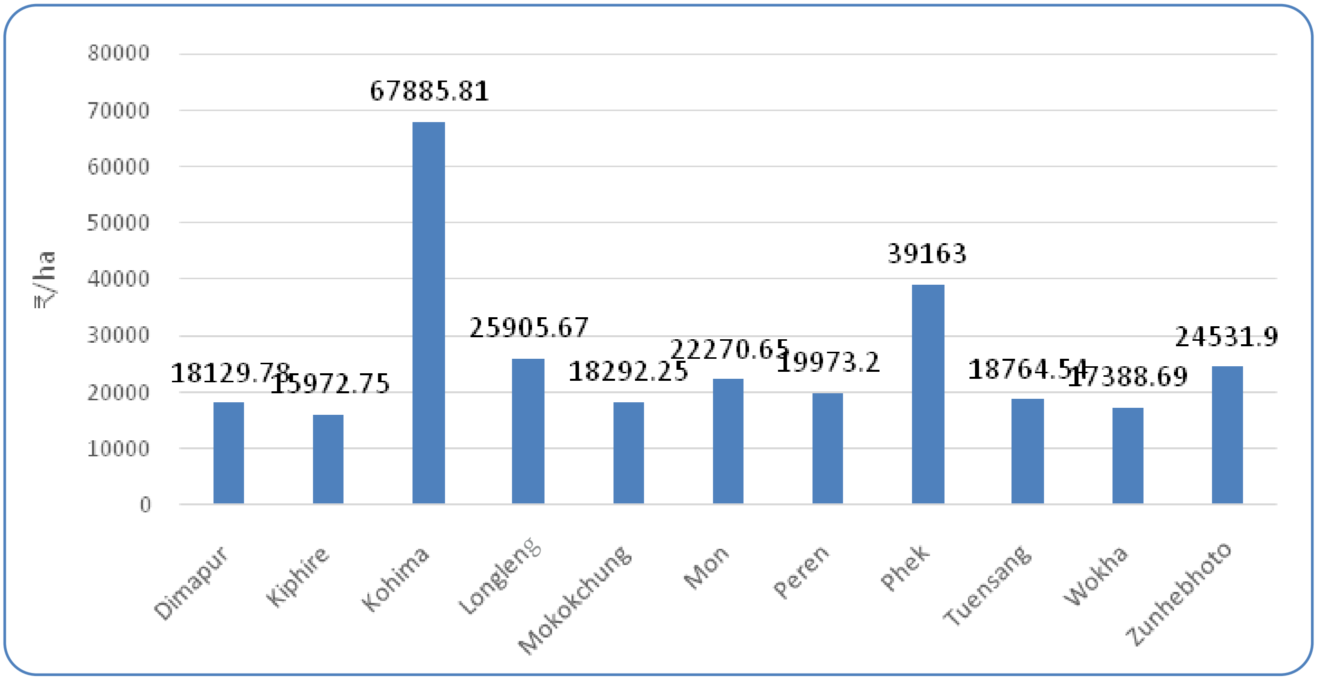

Fig 2. District wise cost of cultivation of WTR

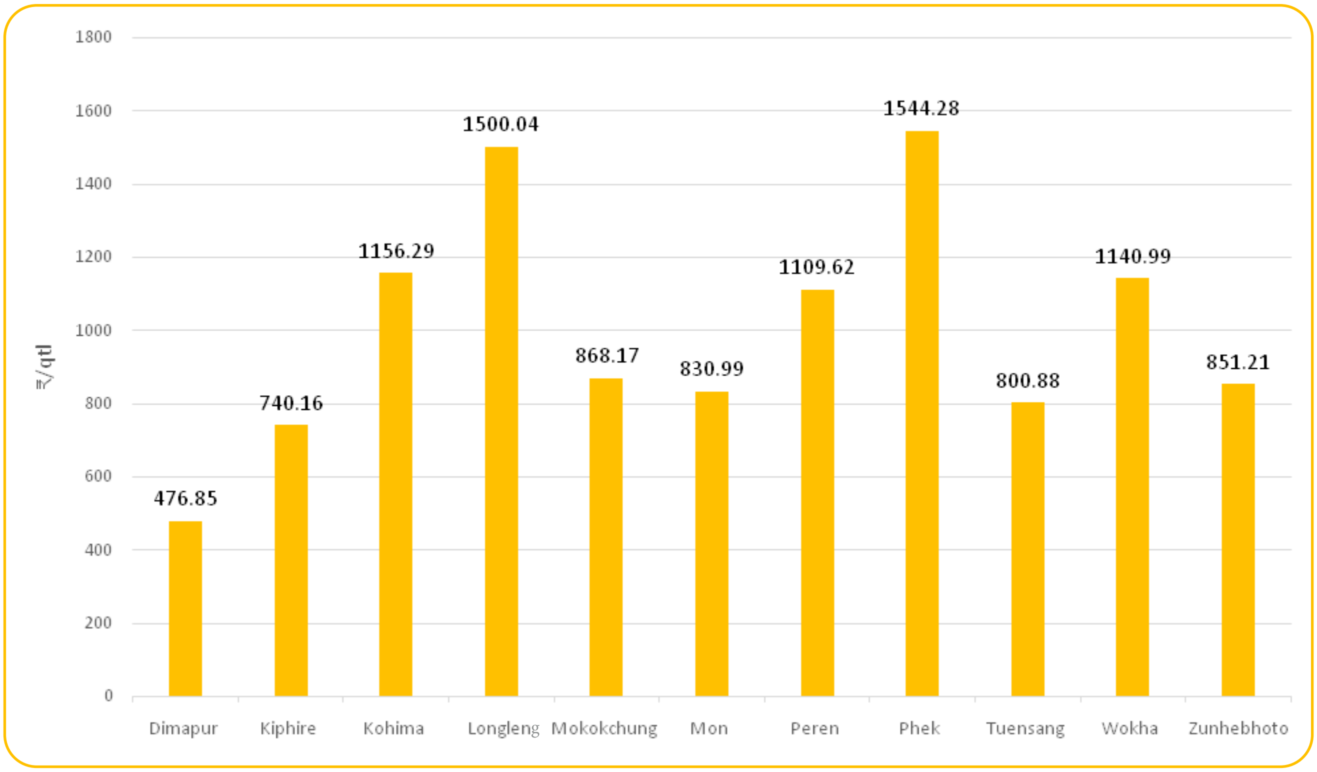

Fig 3. District wise cost of production of WTR

Under the cost of cultivation, Kohima recorded the highest with ₹67885.81/ha while Kiphirehad the lowest i.e., ₹15972.75/ha. The cost of production was highest for Phek (₹1544.28/qtl) while Dimapur had the lowest cost of production (₹476.85/qtl).

2. *Jhum* paddy

Table 2.1 Area and number of holdings under jhum paddy

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	162	55.25	40.44	0.59
Small (1.1-2ha)	36	30.34	22.21	1.44
low-medium (2.1-4ha)	34	45.82	33.54	2.29
High medium (4.1-10)	2	5.22	3.82	5.22
Total	**234**	**136.64**	**100.00**	**0.87**

Table 2.2 Breakdown estimates of different variable cost and fixed components for jhum paddy of Nagaland (district wise) (₹/ha)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	2611.63	674.26	3320.51	1225.00	5141.30	694.07	1480.00	1967.75	2218.64	669.57	2231.88	3752.93
Hire human labour (Female)	1624.25	451.61	3307.50	1232.14	3358.70	561.86	1480.00	1583.29	1815.25	635.00	1995.97	1374.81
Family human labour (male)	960.00	449.50	2656.41	612.50	6543.48	925.42	2220.00	1845.60	1411.86	1339.13	956.52	1860.74
Family human labour (female)	5819.41	677.42	2205.00	492.86	4702.17	936.44	2590.00	3932.86	1008.47	1587.50	855.42	1364.76
Bullock labour	1000.00							1000.00				181.82
Machinery charges	2250.00							3009.62				476.45
Seeds	700.00	332.63	3261.02	8470.59	4251.40	557.06	1161.08	700.00	6737.77	866.58	1072.85	1879.61
Fertilizers												
N(kg): Urea												
P(kg): DAP												
K(kg): MOP												
Interest on working capital @6%	897.92	155.13	885.03	721.99	1439.82	612.48	535.86	842.35	791.52	305.87	426.76	653.47
Total variable cost	15863.21	2740.55	15635.47	12755.08	25436.87	3895.34	9466.94	14881.47	13983.51	5403.65	7539.40	11544.59
Fixed costs												
Rental value of land	16734.59	8621.73	16419.32	13704.17	8444.12	3520.00	4855.07	26660.11	35626.67	8458.22	14549.72	15051.02
Interest of fixed capital @12%	2008.15	1034.61	1970.32	1644.50	1013.29	422.40	582.61	3199.21	4275.20	1014.99	1745.97	1806.12
Total Fixed cost	18742.74	9656.34	18389.64	15348.67	9457.42	3942.40	5437.68	29859.33	39901.87	9473.20	16295.69	16857.14
Total cost	**34605.95**	**12396.89**	**34025.11**	**28103.75**	**34894.29**	**7837.74**	**14904.62**	**44740.80**	**53885.38**	**14876.85**	**23835.09**	**28401.73**

Table 2.3 District wise estimates of cost of production and BCR for jhum paddy (District wise) (Per ha)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Quantity of main produce (qtl)	30.96	18.78	20.86	14.95	37.41	19.20	11.11	18.04	25.60	24.60	29.45	22.81
Rate (₹/qtl)	3045.00	2714.29	4722.72	5500.00	1354.31	1100.00	2622.00	8867.00	8350.00	2062.98	2964.29	5241.99
Value of main produce ₹)	94273.20	50974.37	98515.94	82225.00	50664.74	240900.00	211200.00	159960.68	213760.00	50749.31	87298.34	119593.62
Quantity of by-produce (qtl)	3.21	0.18	-	-	-	-	-	1.70	-	-	-	1.59
Rate (₹/qtl)	1911.00	4200.00	-	-	-	-	-	3055.50	-	-	-	1068.42
Value of by-produce (₹)	6134.31	756.00						5194.35				1698.79
Total value of produce (₹)	100407.51	51730.37	98515.94	82225.00	50664.74	21120.00	29130.42	165155.03	213760.00	50749.31	87298.34	90306.11
Net return (₹)	65801.56	39333.48	64490.83	54121.25	15770.45	13282.26	14225.80	115219.88	159874.62	35872.45	63463.25	61904.38
Cost of production (₹/qtl)	1117.76	660.11	1631.12	1879.85	932.75	2256.22	408.22	1341.55	2104.90	604.75	809.34	1220.15
BCR	2.90	4.17	2.90	2.93	1.45	2.69	1.95	3.58	3.97	3.41	3.66	3.18

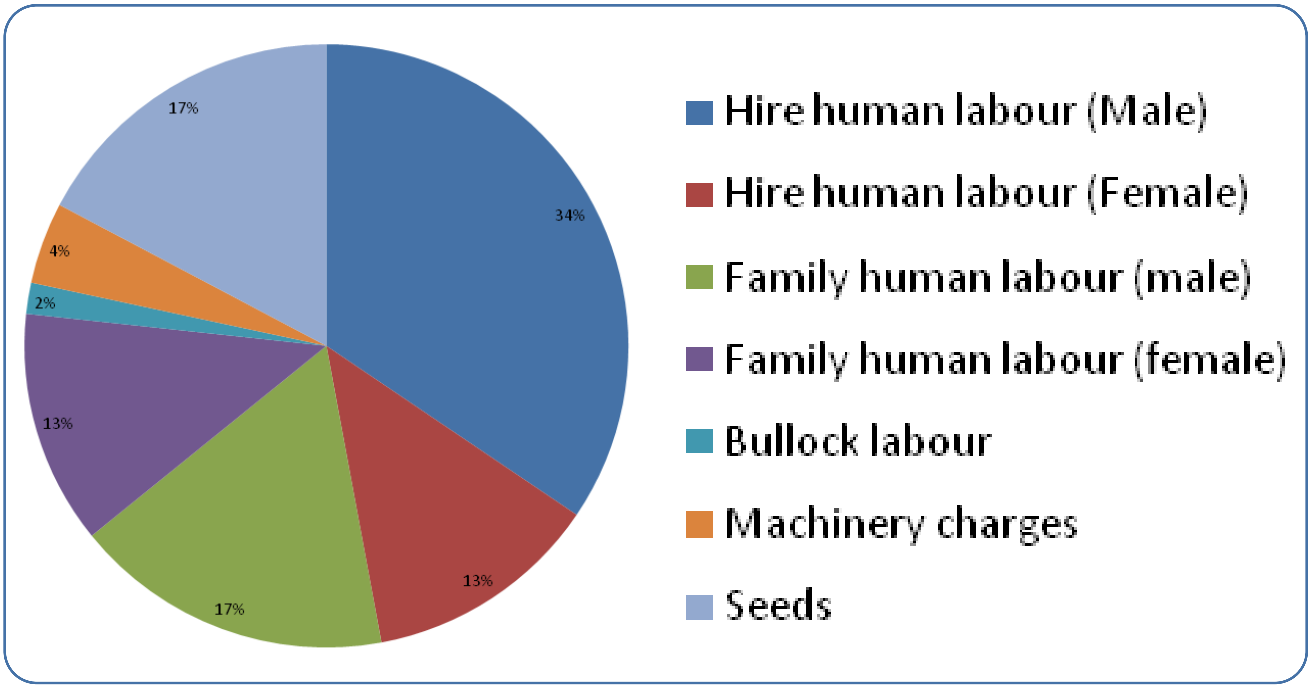

Fig. 4 Share of variable costs components for jhum paddy in Nagaland

Under the variable cost components (table 3.1), paid out cost actually incurred by the cultivator's 34 percent (fig.2) of cost incurred against hired human labour (male) is the highest. The BC ratio stood at 3.18. the cost of cultivation was ₹28401.73/ha and cost of production at ₹1220.15/qtl respectively.

Table 2.4. District wise estimates of cost of cultivation/production and related data for jhum paddy by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	12762.25	13819.38	26504.85	21920.47	34605.95
Kiphire	1895.71	2616.52	11266.19	3747.21	12396.89
Kohima	12005.31	13335.56	29298.40	18062.26	34025.11
Longleng	12583.89	13694.98	27028.25	14770.48	28103.75
Mokokchung	15736.28	16397.32	24329.80	26961.81	34894.29
Mon	2198.86	2502.78	6149.83	4190.69	7837.74
Peren	5331.48	5716.22	10333.09	10287.75	14904.62
Phek	14328.79	16550.22	43207.47	18083.55	44740.80
Tuensang	12944.90	15908.36	51469.79	18323.95	53885.38
Wokha	5964.84	6205.84	9097.93	11984.77	14876.85
Zunheboto	6425.10	7626.26	22040.20	9421.15	23835.09
Overall	13326.37	14260.99	25476.38	17186.34	28401.73
Cost of Production per quintal (Rs)					
Dimapur	412.22	446.36	856.10	708.03	1117.76
Kiphire	100.94	139.33	599.90	199.53	660.11
Kohima	575.52	639.29	1404.53	865.88	1631.12
Longleng	841.73	916.05	1807.91	987.99	1879.85
Mokokchung	420.64	438.31	650.36	720.71	932.75
Mon	114.52	130.35	320.30	218.26	408.22
Peren	479.88	514.51	930.07	925.99	1341.55
Phek	794.28	917.42	2395.09	1002.41	2480.09
Tuensang	505.66	621.42	2010.54	715.78	2104.90
Wokha	242.47	252.27	369.83	487.19	604.75
Zunhebhoto	218.17	258.96	748.39	319.90	809.34
Overall	572.51	612.66	1094.47	738.33	1220.15

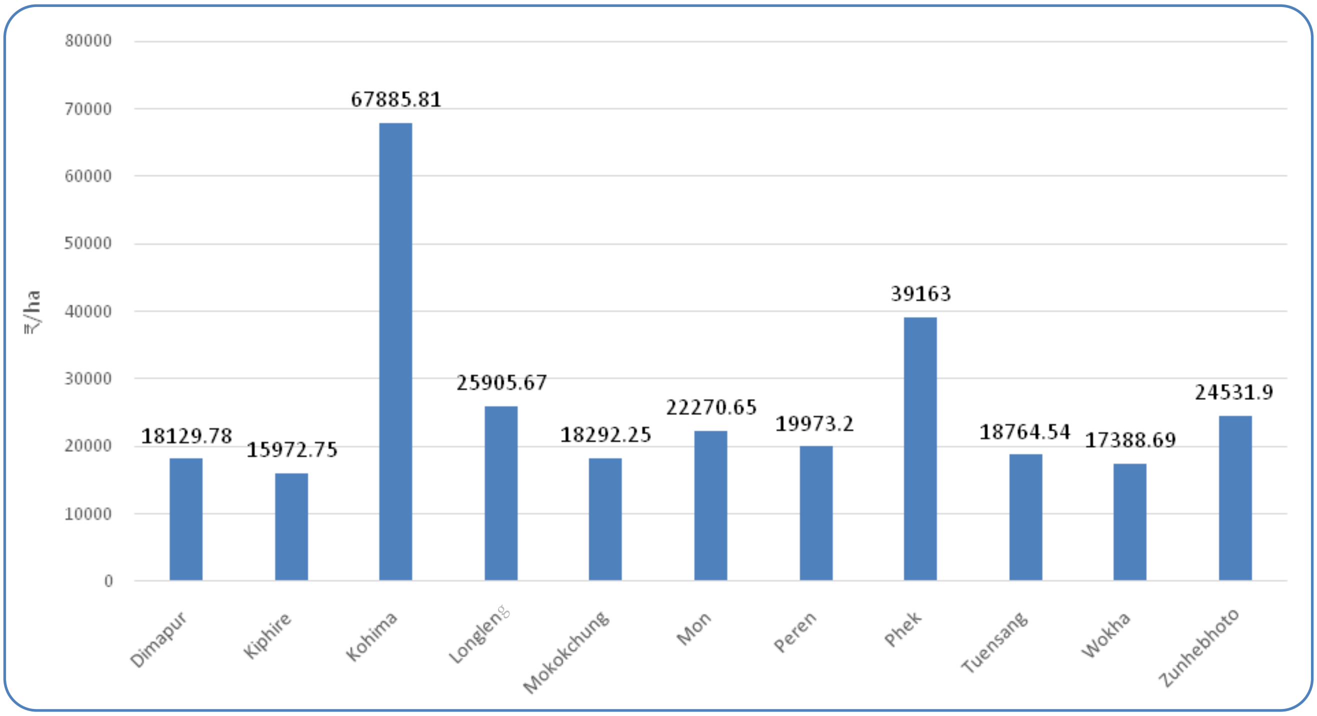

Fig. 5 District wise cost of cultivation of Jhum paddy

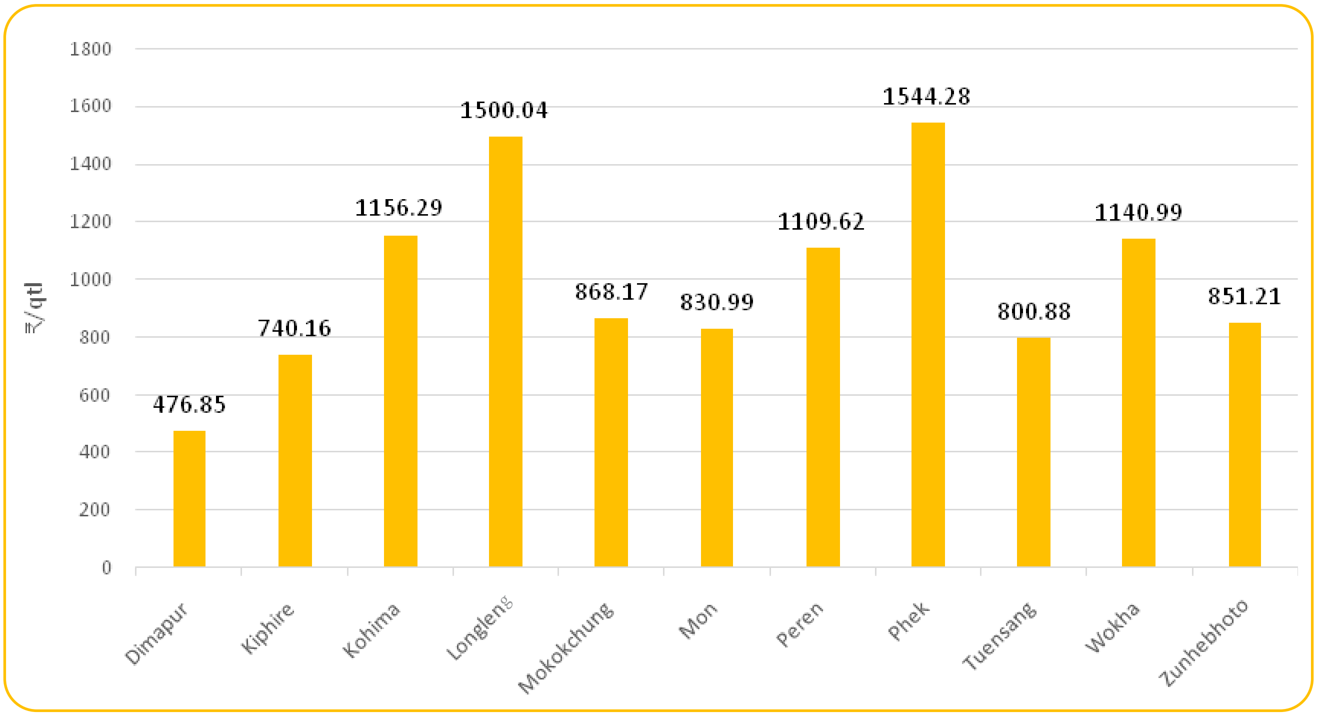

Fig. 6 District wise cost of production of Jhum paddy

Under the cost of cultivation (table2.4), Tuensang recorded the highest with ₹ 53885.38/ha while Mon had the lowest (₹ 7837.74/ha). The cost of production was highest for Phek (₹2480.09/qtl) while Wokha had the lowest cost of production (₹ 408.22/qtl).

3. Maize

Table 3.1 Area and number of holdings under maize

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	206	49.21	53.89	0.24
Small (1.1-2ha)	6	6.02	6.59	0.95
Low-medium (2.1-4ha)	21	32.08	35.13	1.56
High medium (4.1-10)	2	4.01	4.39	2.54
Total	**234**	**91.32**	**100.00**	**0.39**

Table 3.2 Breakdown estimates of different variable and fixed cost components for maize of Nagaland (district wise)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	2815.97	696.43	-	1280.00	2500.00	2797.89	5200.00	7889.74	2490.00	600.00	2195.45	2311.60
Hire human labour (Female)	1960.61	467.74	2887.50	1125.00	2345.45	2420.92	4000.00	7786.61	1863.46	552.00	1945.3	2734.69
Family human labour (male)	1772.85	464.29	2333.33	1600.00	5500.00	3264.21	6000.00	5105.13	1245.00	600.00	1568.18	2855.29
Family human labour (female)	1300.21	467.74	4125.00	900.00	4300.00	3352.04	6000.00	7786.61	1035.26	552.00	1389.5	1320.31
Bullock labour	206.00	-	-	-	-	-	-	-				18.73
Machinery charges		-		-	-	-	-	-				
Seeds	2462.26	187.94	1511.65	133.00	2663.35	884.27	390.00	1040.49	892.22	188.50	374.69	975.31
Fertilizers												-
N(kg): Urea	8512.47											773.83
P(kg): DAP	105.00											9.55
K(kg): MOP												
Interest on working capital @6%	1148.12	137.05	651.45	302.28	1038.53	763.16	1295.40	1776.51	451.56	149.55	448.39	659.96
Total variable cost	20283.49	2421.19	11508.93	5340.28	18347.33	13482.49	22885.40	31385.09	7977.50	2642.05	7921.51	11659.27
Fixed costs												
Rental value of land	8230.79	5333.84	15648.11	10750.00	13499.09	17522.73	18505.67	15346.40	4918.88	7779.56	12026.56	12227.77
Interest of fixed capital @12%	987.70	640.06	1877.77	1290.00	1619.89	2102.73	2220.68	1841.57	590.27	933.55	1443.19	1467.33
Total Fixed cost	**9218.49**	**5973.90**	**17525.89**	**12040.00**	**15118.98**	**19625.45**	**20726.35**	**17187.97**	**5509.14**	**8713.10**	**13469.75**	**13695.10**
Total cost	**29501.98**	**8395.09**	**29034.82**	**17380.28**	**33466.30**	**33107.94**	**43611.75**	**48573.07**	**13486.64**	**11355.15**	**21391.26**	**25354.37**

Table 5.2 District wise estimates of cost of cultivation, production and BCR for maize

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunhebhoto	Overall
Quantity of main produce (Qtl)	11.39	14.69	19.66	12.90	16.96	13.36	28.84	19.83	18.64	16.30	26.85	18.13
Rate (₹/qtl)	4335.80	2111.11	4775.62	5000.00	4775.62	7655.56	3850.00	4643.39	1583.33	2863.64	2687.50	4025.60
Value of main quantity (₹)	49384.76	31012.21	93888.69	64500.00	80994.52	102278.28	111034.00	92078.42	29513.27	46677.33	72159.38	72984.08
Quantity of by produce (Qtl)		0.29				1.12						0.13
Rate (₹/qtl)	-	3416.67	-	-	-	2551.85	-	-	-	-	-	2984.26
Value of by-produce (₹)		990.83				2858.07						2118.82
Total value of produce (₹)	49384.76	32003.04	93888.69	64500.00	80994.52	105136.35	111034.00	92078.42	29513.27	46677.33	72159.38	73366.61
Net return (₹)	19882.78	23607.95	64853.87	47119.72	47528.21	72028.41	67422.25	43505.36	16026.63	35322.18	50768.12	48012.24
Cost of production (₹/qtl)	2590.17	571.48	1476.85	1347.31	1973.25	2478.14	1512.20	2449.47	723.53	696.64	796.69	1388.66
BCR	1.67	3.81	3.23	3.71	2.42	3.18	2.55	1.90	2.19	4.11	3.37	2.89

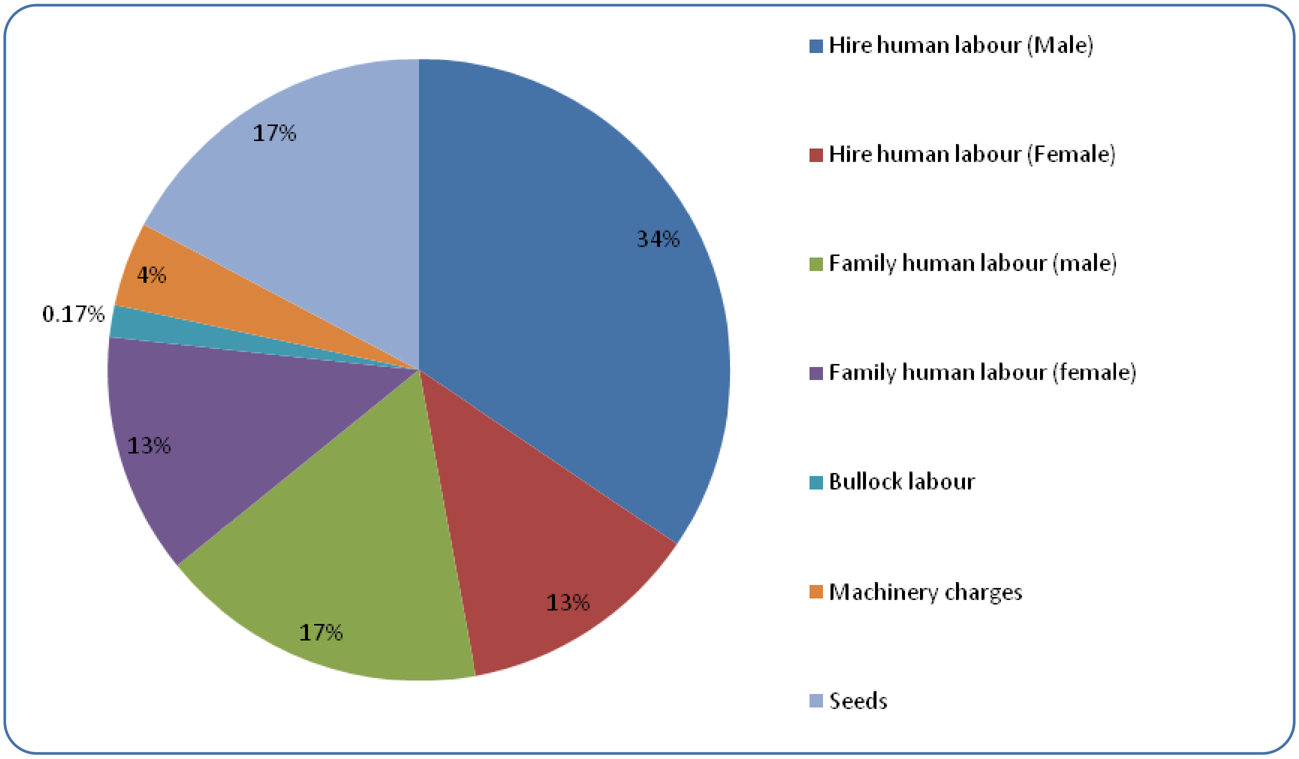

Fig. 7 Share of variable costs components for maize in Nagaland

Under the Cost A1 i.e.; paid out cost actually incurred by the cultivator's 26 percent of cost incurred against male family labour is the highest. The BC ratio stood at 2.89with net returns of ₹48012.24, cost of cultivation of ₹25354.37/ha and cost of production at ₹1388.66/qtl respectively.

Table 5.3
District wise estimates of cost of cultivation, production, and related data for maize by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	18180.90	18828.51	26599.83	21730.66	29501.98
Kiphire	1723.05	2165.00	7468.30	3091.78	8395.09
Kohima	8585.67	9471.70	20103.99	18402.53	29034.82
Longleng	4139.04	4921.96	14316.75	7985.48	17380.28
Mokokchung	12855.16	13508.25	21345.33	25629.23	33466.30
Mon	13617.43	14273.88	22151.27	25230.56	33107.94
Peren	13467.45	14843.63	31357.78	27097.59	43611.75
Phek	19717.64	21034.19	36832.84	32774.41	48573.07
Tuensang	6213.88	6605.64	11306.75	8785.52	13486.64
Wokha	4390.51	4704.69	8474.68	7585.16	11355.15
Zunheboto	5666.79	6652.57	18481.92	9561.90	21391.26
Overall	11255.43	12125.23	22562.83	14916.77	25354.37
Cost of Production per quintal (Rs)					
Dimapur	1596.22	1653.07	2335.37	1907.87	2590.17
Kiphire	117.29	147.38	508.39	210.47	571.48
Kohima	436.71	481.77	1022.58	936.04	1476.85
Longleng	320.86	381.55	1109.83	619.03	1347.31
Mokokchung	757.97	796.48	1258.57	1511.16	1973.25
Mon	1019.27	1068.40	1658.03	1888.51	2478.14
Peren	466.97	514.69	1087.30	939.58	1512.20
Phek	994.33	1060.73	1857.43	1652.77	2449.47
Tuensang	333.36	354.38	606.59	471.33	723.53
Wokha	269.36	288.63	519.92	465.35	696.64
Zunhebhoto	211.05	247.77	688.34	356.12	796.69
Overall	**616.46**	**664.10**	**1235.77**	**816.99**	**1388.66**

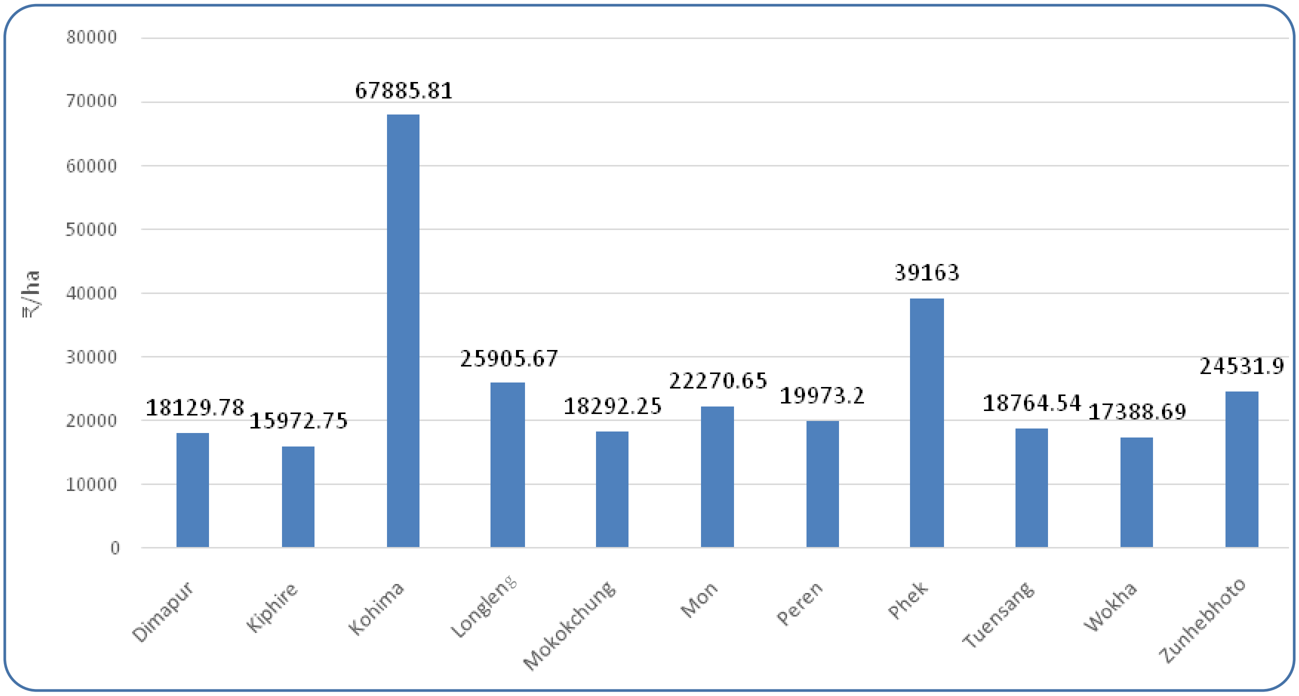

Fig. 8 District wise cost of cultivation of Maize

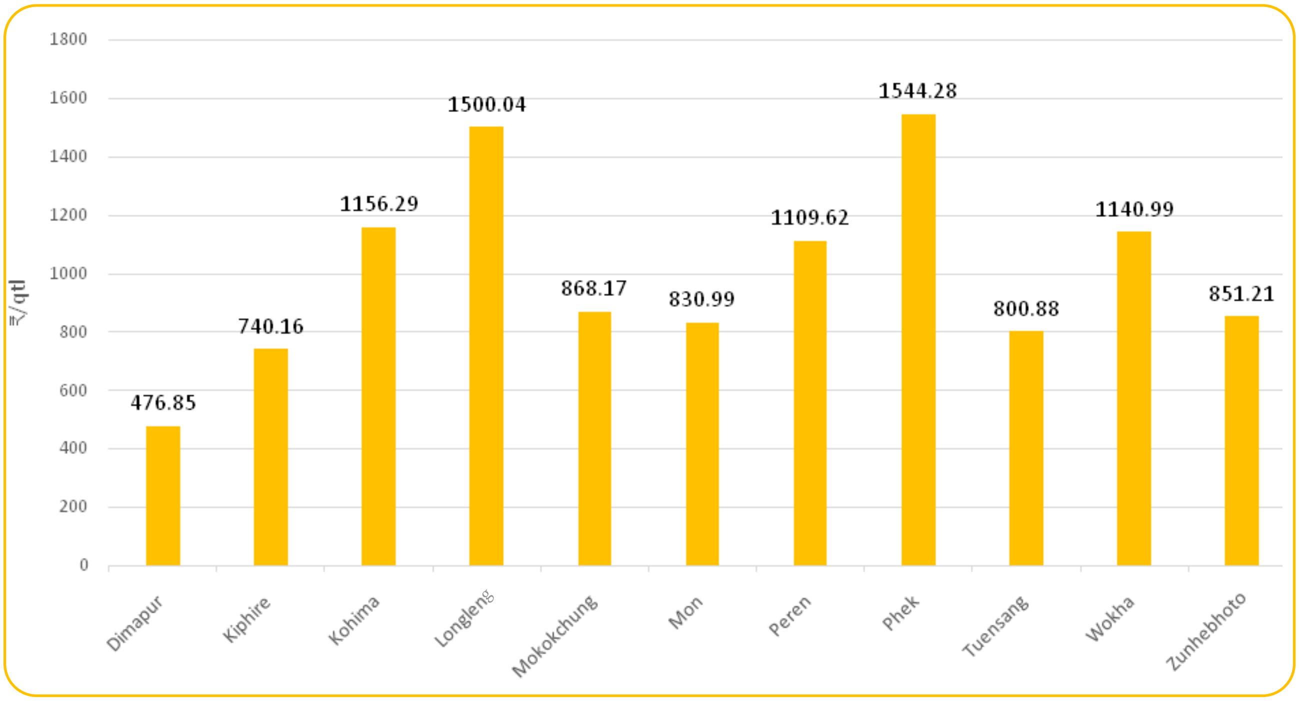

Fig 9. District wise cost of production of Maize

Table 5.3 shows that under the cost of cultivation, Phek recorded the highest with ₹48573.07/ha while Kiphire had the lowest (₹8395.09/ha). The cost of production was highest for Dimapur (₹2590.17/qtl) while Kiphire had the lowest cost of production (₹571.48/qtl).

4. Rapeseed and mustard

Table 6.1 Area and number of holdings under rapeseed and mustard

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
marginal (Up to 1 ha)	215	23.00	53.33	0.11
Small (1.1-2ha)	6	2.08	4.83	0.32
low-medium (2.1-4ha)	3	3.01	6.97	0.94
High medium (4.1-10)	10	15.04	34.87	1.56
Total	**234**	**43.12**	**100.00**	**0.39**

Table 6.2 Breakdown estimates of different variable and fixed cost components for rapeseed mustard

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	3118.23	859.26	NA	NA	4957.82	3835.90	2450.00	5600.00		1928.57		3619.14
Hire human labour (Female)	2437.55	880.00	NA	NA	4893.88	2108.33	2450.00	2394.00		1700.00		2582.80
Family human labour (male)	283.48	644.44	NA	NA	1549.30	2876.92	1050.00	4200.00		1285.71		1505.81
Family human labour (female)	497.96	487.63	NA	NA	1334.70	2683.33	2450.00	3600.00		1133.33		1215.23
Bullock labour	280.00	-	NA	NA		-	-	-				46.67
Machinery charges	1260.00	-	NA	NA			2026.08	-				1469.87
Seeds	6154.42	400.27	NA	NA	491.08	823.51	2222.11	3139.00		635.99		1812.80
Fertilizers	-		NA	NA								-
N(kg): Urea	1137.10		NA	NA								189.52
P(kg): DAP			NA	NA								
K(kg): MOP			NA	NA								
Interest on working capital @6%	910.12	196.30	NA	NA	793.61	739.68	758.89	1135.98		401.02		746.51
Total variable cost	16078.86	3467.90	NA	NA	14020.39	13067.67	13407.08	20068.98		7084.62		13188.35
Fixed Costs												
Rental value of land	5302.42	3304.67	NA	NA	4071.44	8431.15	49416.67	7005.65		4154.67		7297.00
Interest of fixed capital @12%	636.29	396.56	NA	NA	488.57	1011.74	593.00	840.68		498.56		875.64
Total Fixed cost	**5938.71**	**3701.23**	**NA**	**NA**	**4560.01**	**9442.89**	**5534.67**	**7846.33**		**4653.23**		**8172.64**
Total cost	**22017.57**	**7169.13**	**NA**	**NA**	**18580.40**	**22510.56**	**18941.75**	**27915.31**		**11737.85**		**21360.99**

Table 6.3 District wise estimates of cost of production and BCR for rapeseed mustard

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Quantity of main produce (Qtl)	10.72	2.56			9.00	23.27	11.86	13.04		3.04		10.48
Rate (₹/qtl)	2967.77	7300.00			2714.29	2173.91	2500.00	3223.46		8200.00		4154.20
Value of Main quantity (₹)	31814.49	18688.00			24428.61	50586.89	29650.00	42033.92		24928.00		43536.06
Quantity of by-produce	-	0.38			-	-	-	-		-		0.05
Rate (₹/qtl)	-	3000.00			-	-	-	-		-		3000.00
Value of by-produce (₹)	-	1140.00			-	-	-	-		-		162.86
Total value of produce (₹)	31814.49	19828.00	0.00	0.00	24428.61	50586.89	29650.00	42033.92	0.00	24928.00	0.00	43782.00
Net return (₹)	9796.93	12658.87			5848.21	28076.33	10708.25	14118.61		13190.15		22421.01
Cost of production (₹/qtl)	2053.88	2800.44			2064.49	967.36	1597.11	2140.74		3861.13		2023.92
BCR	1.44	2.77			1.31	2.25	1.57	1.51		2.12		2.05

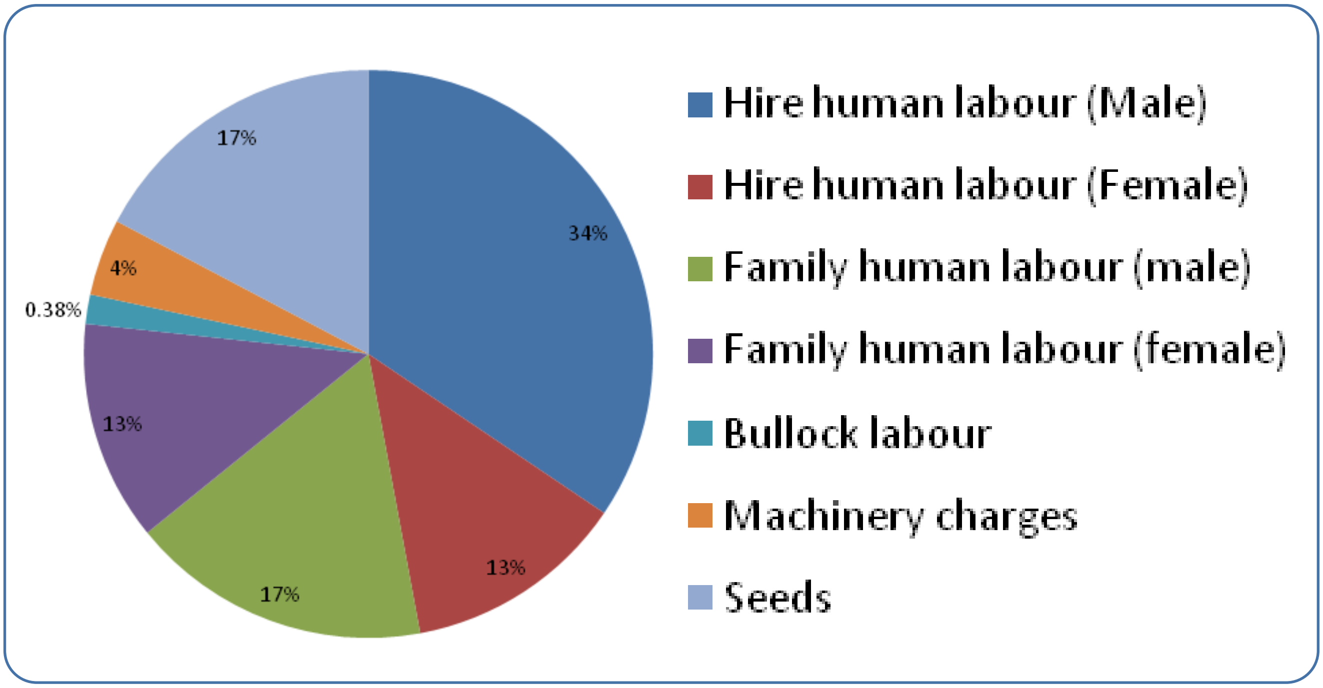

Fig.10 Share of variable costs components for rapeseed and mustard

Under the variable cost components (table 6.2), the paid-out cost actually incurred by the cultivator's 29percent of cost incurred against hired male human labour is the highest. The BC ratio stood at 2.05 (table 6.3)with cost of cultivation of ₹21360.99/ha and cost of production at ₹ 2023.92/qtl respectively. Table 6.4 District wise estimates of cost of cultivation, production, and related data for rapeseed and mustard by different category of costs

Table 6.4 District wise estimates of cost of cultivation, production, and related data for rapeseed and mustard by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	15264.37	15729.60	21312.40	16434.77	22017.57
Kiphire	2604.60	2871.24	6070.87	3969.50	7169.13
Kohima					
Longleng					
Mokokchung	11749.48	12067.20	15879.76	14767.82	18580.40
Mon	8444.57	9117.17	17188.43	14439.29	22510.56
Peren	3123.14	4265.25	17970.64	5236.36	18941.75
Phek	13439.88	13989.00	20578.56	21325.75	27915.31
Tuensang					
Wokha	5134.16	5464.51	9428.70	7773.66	11737.85
Zunheboto					
Overall	11526.78	12101.67	19000.31	14446.85	21360.99
Cost of Production per quintal (Rs)					
Dimapur	1423.91	1467.31	1988.10	1533.09	2053.88
Kiphire	1017.42	1121.58	2371.43	1550.58	2800.44
Kohima					
Longleng					
Mokokchung	1305.50	1340.80	1764.42	1640.87	2064.49
Mon	362.89	391.80	738.65	620.51	967.36
Peren	263.33	359.63	1515.23	441.51	1597.11
Phek	1030.67	1072.78	1578.11	1635.41	2140.74
Tuensang					
Wokha	1688.87	1797.53	3101.54	2557.12	3861.13
Zunhebhoto					
Overall	**1094.22**	**1148.79**	**1803.66**	**1371.41**	**2027.76**

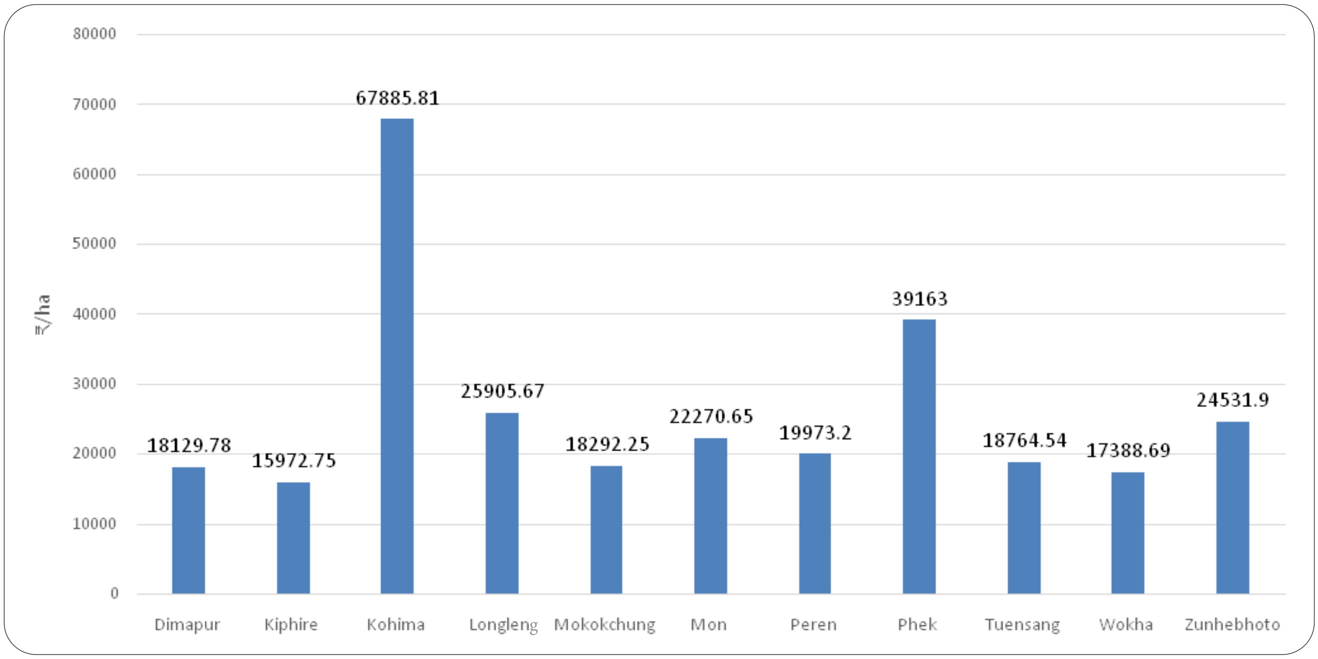

Fig 11. District wise cost of cultivation

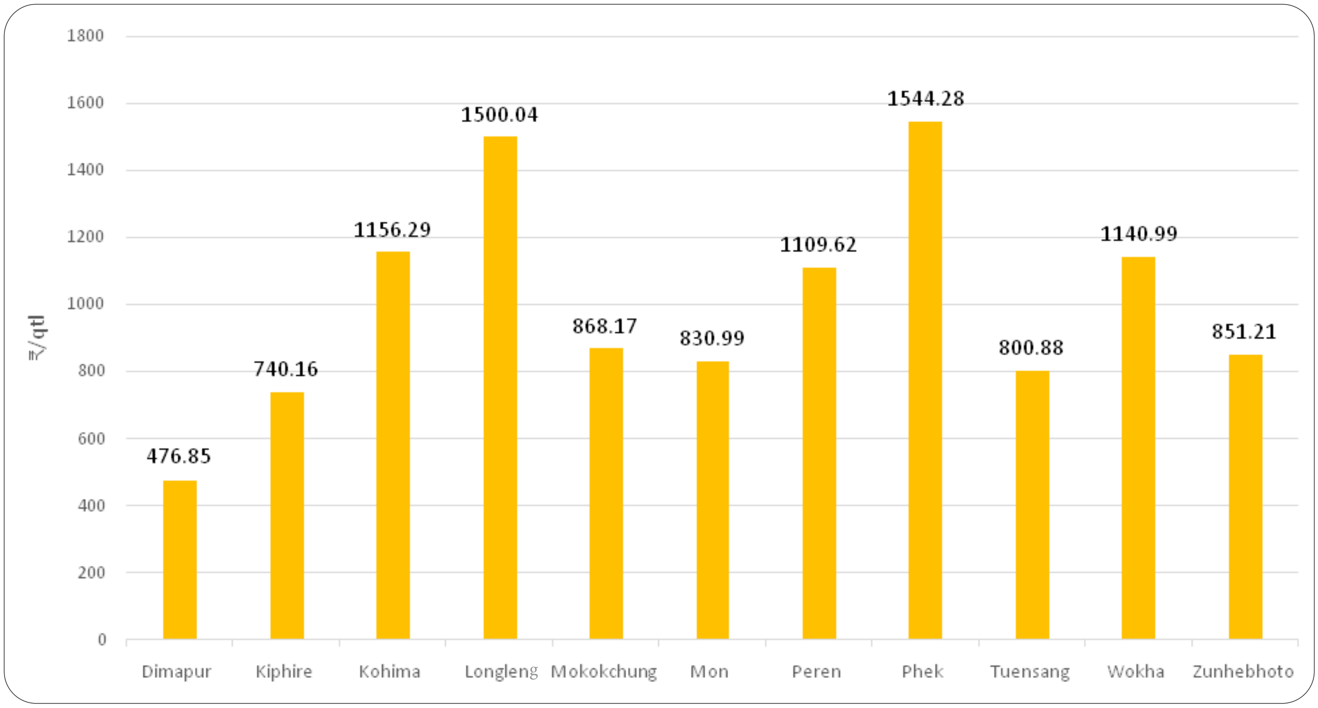

Fig 12. District wise cost of production

Under the cost of cultivation, Phek recorded the highest with ₹ 27915.31/ha while Kiphire had the lowest (₹8738.90/ha). The cost of production was highest for Wokha (₹3861.13/qtl) while Mon had the lowest cost of production (₹967.36/qtl).

5. Soybean

Table 7.1 Area and number of holdings under soybean

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	222	29.44	83.61	0.13
Small (1.1-2ha)	9	3.76	10.68	0.42
Low-medium (2.1-4ha)	3	2.01	5.71	0.67
High medium (4.1-10)	-	-	-	-
Total	**234**	**35.21**	**100.00**	**0.15**

Table 7.2 Breakdown estimates of different variable and fixed cost components for soybean (district wise)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	2320.37	676.12	-	1400.00		-	-	2500.00		1500.00	4693.44	2156.73
Hire human labour (Female)	1800.00	675.00	6089.03	1400.00		-	-	2000.00		1588.89	4272.73	1783.03
Family human labour (male)	994.44	676.12	3500.00	800.00		3257.46	700.00	2500.00		1500.00	4693.44	1617.58
Family human labour (female)	1200.00	450.00	3709.09	800.00		3101.35	700.00	2000.00		2224.44	3703.03	1528.31
Bullock labour		-		-			-	-				
Machinery charges		-	-	-			-	-				
Seeds	2054.25	190.40	1200.58	116.40		2581.03	130.00	1097.03		1001.41	2733.15	2586.03
Fertilizers												-
N(kg): Urea	33.33											3.71
P(kg): DAP	750.00											83.33
K(kg): MOP												
Interest on working capital @6%	549.14	160.06	869.92	270.98		536.39	91.80	605.82		468.88	1205.75	585.52
Total variable cost	9701.53	2827.70	15368.62	4787.38		9476.23	1621.80	10702.85		8283.62	21301.54	10344.24
Fixed Costs												
Rental value of land	21129.17	13509.58	15097.38	23908.75		13675.00	16875.00	19815.48		22081.46	20881.04	18655.22
Interest of fixed capital @12%	2535.50	1621.15	1811.69	2869.05		1641.00	2025.00	2377.86		2649.78	2505.73	2238.63
Total Fixed cost	**23664.68**	**15130.73**	**16909.07**	**26777.80**		**15316.00**	**18900.00**	**22193.34**		**24731.23**	**23386.77**	**20893.85**
Total cost	**33366.21**	**17958.43**	**32277.69**	**31565.18**		**24792.23**	**20521.80**	**32896.19**		**33014.85**	**44688.31**	**31238.09**

Table 7.3 District wise estimates of cost of production and BCR for soybean

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Quantity of main produce (qtl)	13.83	12.83	11.84	12.34		10.94	9.00	13.58		12.77	13.73	12.32
Rate (₹/qtl)	9166.67	6250.00	7650.70	11625.00		7500.00	11250.00	8755.00		10375.00	9125.00	9077.49
Value of main quantity (₹)	126775.05	80187.50	90584.29	143452.50		82050.00	101250.00	118892.90		132488.75	125286.25	111814.45
Quantity of by-produce (qtl)	-	0.29		-			-			-	-	0.03
Rate (₹/qtl)	-	3000.00		-			-		-	-	-	3000.00
Value of by-produce (₹)		870.00										870.00
Total return (₹)	126775.05	81057.50	90584.29	143452.50		82050.00	101250.00	118892.90		132488.75	125286.25	148767.78
Net return (₹)	93408.84	63099.07	58306.60	111887.32		57257.77	80728.20	85996.71		99473.90	80597.94	80693.25
Cost of production (₹/qtl)	2412.60	1399.72	2726.16	2557.96		2266.20	2280.20	2422.40		2585.34	3254.79	2528.95
BCR	3.80	4.51	2.81	4.54		3.31	4.93	3.61		4.01	2.80	3.58

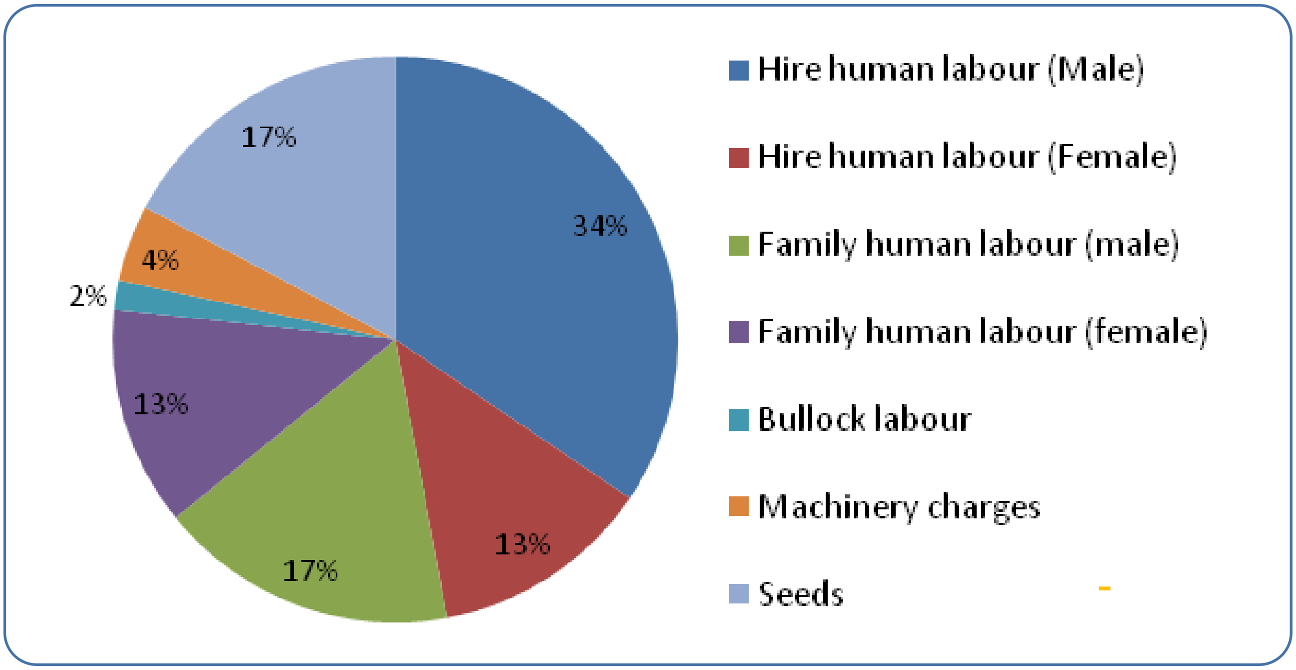

Fig.13 Share of variable costs components for soybean

Under the variable cost components, the paid-out cost actually incurred by the cultivator's 26 percent of cost incurred against seeds is the highest (table 7.2). The BC ratio stood at 3.58(Table 7.3), cost of cultivation of ₹31238.09/ha and cost of production at ₹2528.95/qtl respectively.

Table 7.4 District wise estimates of cost of cultivation, production, and related data for soybean by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	16633.08	17589.27	29063.62	21891.85	33366.21
Kiphire	5900.43	6570.60	14612.96	9916.07	17958.43
Kohima	9491.29	10701.82	25228.12	17751.38	32277.69
Longleng	4552.40	6477.60	29580.01	8462.77	31565.18
Mokokchung					
Mon	4868.19	5815.88	17188.23	13419.89	24792.23
Peren	3592.59	3889.90	7457.78	16953.93	20521.80
Phek	9874.45	11175.83	26792.37	17279.67	32896.19
Tuensang					
Wokha	9244.16	10234.60	24761.15	18488.32	33014.85
Zunheboto	13069.19	14940.50	37396.27	22232.54	44688.31
Overall	13012.03	14066.16	26715.76	18588.49	31238.09
Cost of Production per quintal (Rs)					
Dimapur	1202.68	1271.82	2101.49	1582.93	2412.60
Kiphire	459.89	512.13	1138.97	772.88	1399.72
Kohima	801.63	903.87	2130.75	1499.27	2726.16
Longlen	368.91	524.93	2397.08	685.80	2557.96
Mokokchung					
Mon	444.99	531.62	1571.14	1226.68	2266.20
Peren	399.18	432.21	828.64	1883.77	2280.20
Phek	727.13	822.96	1972.93	1272.43	2422.40
Tuensang					
Wokha	723.90	801.46	1939.01	1447.79	2585.34
Zunheboto	951.87	1088.16	2723.69	1619.27	3254.79
Overall	**1053.42**	**1138.76**	**2162.83**	**1504.87**	**2528.95**

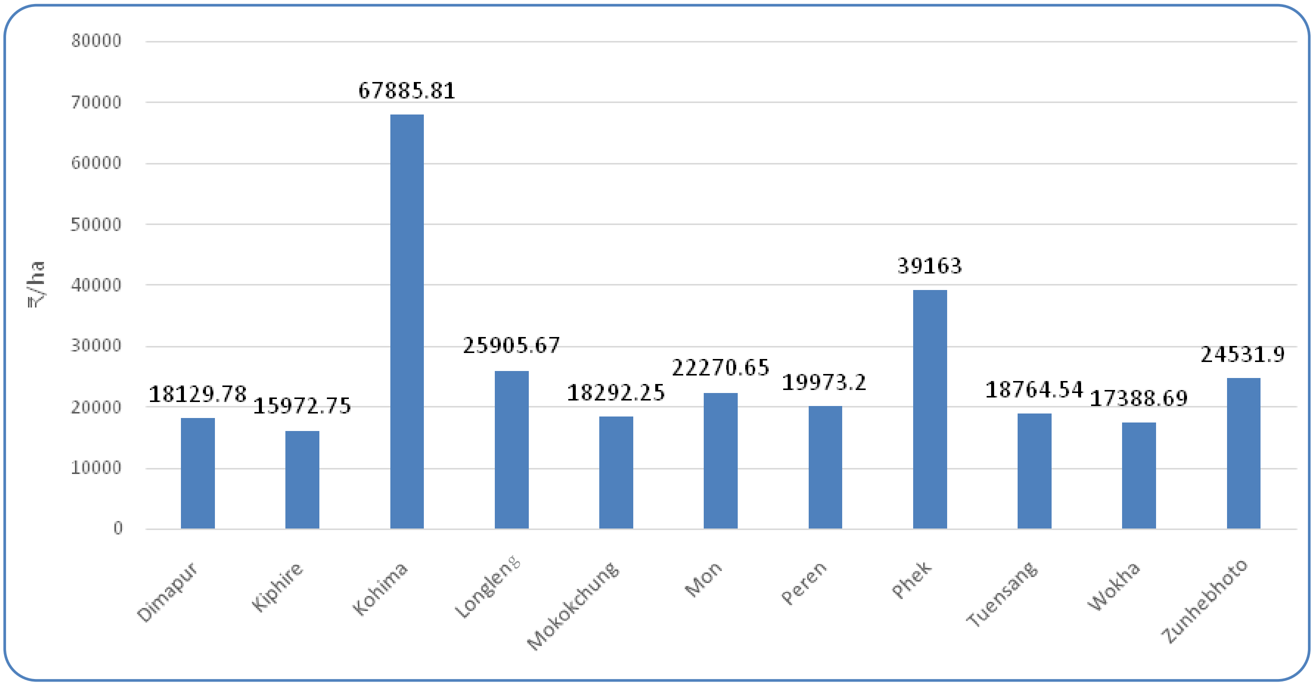

Fig.14 district wise cost of cultivation

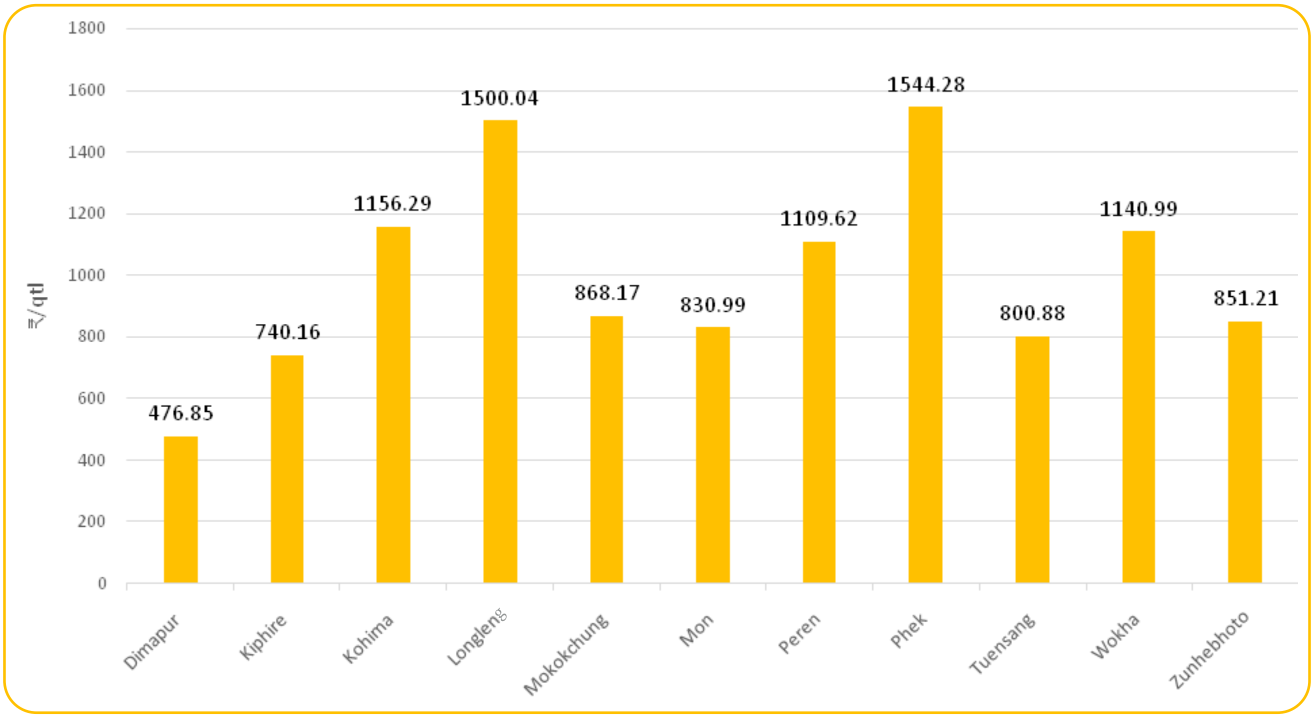

Fig.15 district wise cost of production

Under the cost of cultivation, Zunhebhoto recorded the highest with ₹44688.31/ha while Kiphire had the lowest (₹17958.43/ha). The cost of production was highest for Zunhebhoto (₹ 3254.79/qtl) while Kiphire had the lowest cost of production (₹1399.72/qtl).

6. Cabbage

Table 8.1 Area and number of holdings under cabbage

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	234	31.48	100.00	0.13
Small (1.1-2ha)	-	-	-	-
Low-medium (2.1-4ha)	-	-	-	-
High medium (4.1-10)	-	-	-	-
Total	**234**	**31.48**	**100.00**	**0.13**

Table 8.2 Breakdown estimates of different variable and fixed cost components for cabbage (district wise)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	3462.96	1125.00	2100.00	1200.00	4168.42	1896.55	2800.00	7150.00	1600.00	3050.00	2720.00	3234.61
Hire human labour (Female)	1767.86	1342.11	2916.67	3200.00	3789.47	2293.22	2660.00	8423.33	1600.00	2941.18	2228.57	4312.50
Family human labour (male)	1731.48	1350.00	3675.00	2400.00	7815.79	3318.97	2400.00	5500.00	4000.00	1906.25	3060.00	2912.02
Family human labour (female)	1473.21	1118.42	3750.00	800.00	6063.16	3961.02	2280.00	5066.67	4000.00	1838.24	2228.57	2587.50
Bullock labour	-	-		-	-		-					
Machinery charges	6846.62	-		-	-		2760.00					898.22
Seeds	588.28	14.20	2511.67	980.00	1675.80	824.46	3488.37	41189.87	1020.00	1884.95	1521.31	7501.51
Fertilizers	-											-
N(kg): Urea	3139.25											285.39
P(kg): DAP	1048.36											85.58
K(kg): MOP	1093.75											33.14
Interest on working capital @6%	1269.11	296.98	897.20	514.80	1410.76	737.65	983.30	4039.79	733.20	697.24	705.51	1311.03
Total variable cost	22420.88	5246.71	15850.54	9094.80	24923.40	13031.87	17371.67	71369.66	12953.20	12317.86	12463.96	23161.50
Fixed Costs												
Rental value of land	26303.58	5583.89	16700.11	22248.33	12585.83	10421.20	5813.33	27124.30	4445.00	5710.50	12997.92	17080.37
Interest of fixed capital @12%	3156.43	670.07	2004.01	2669.80	1510.30	1250.54	697.60	3254.92	533.40	685.26	1559.75	2049.64
Total Fixed cost	29460.01	6253.95	18704.12	24918.13	14096.13	11671.74	6510.93	30379.22	4978.40	6395.76	14557.67	19130.01
Total cost	**51880.89**	**11500.67**	**34554.66**	**34012.93**	**39019.53**	**24703.61**	**23882.61**	**101748.88**	**17931.60**	**18713.62**	**27021.62**	**42291.51**

Table 8.3 District wise estimates of cost of production and BCR for cabbage

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunhebhoto	Overall
Quantity of main produce (qtl)	58.52	9.81	27.42	38.14	27.46	23.90	34.88	63.29	26.67	12.69	18.35	37.29
Rate (₹/qtl)	2600.00	3000.00	3654.29	3500.00	2750.00	2571.43	1000.00	2571.43	1000.00	2700.00	4250.00	2700.00
Value of Main quantity (₹)	152152.00	29430.00	100200.63	133490.00	75515.00	61457.18	34880.00	162745.80	26670.00	34263.00	77987.50	100683.00
Quantity of by-produce (qtl)	4.93	0.94				2.14						0.73
Rate (₹/qtl)	1150.00	4333.33	-	-	-	500.00	-		-	-	-	2470.83
Value of by-produce	5669.50	4073.33				1070.00						1799.21
Total return (₹)	157821.50	33503.33	100200.63	133490.00	75515.00	62527.18	34880.00	162745.80	26670.00	34263.00	77987.50	102482.21
Net return (₹)	105940.61	22002.66	65645.97	99477.07	36495.47	37823.56	10997.39	60996.93	8738.40	15549.38	50965.88	60190.70
Cost of production (₹/qtl)	886.55	1172.34	1260.20	891.79	1420.96	1033.62	684.71	1607.66	672.35	1474.67	1472.57	1112.40
BCR	3.04	2.91	2.90	3.92	1.94	2.53	1.46	1.60	1.49	1.83	2.89	2.42

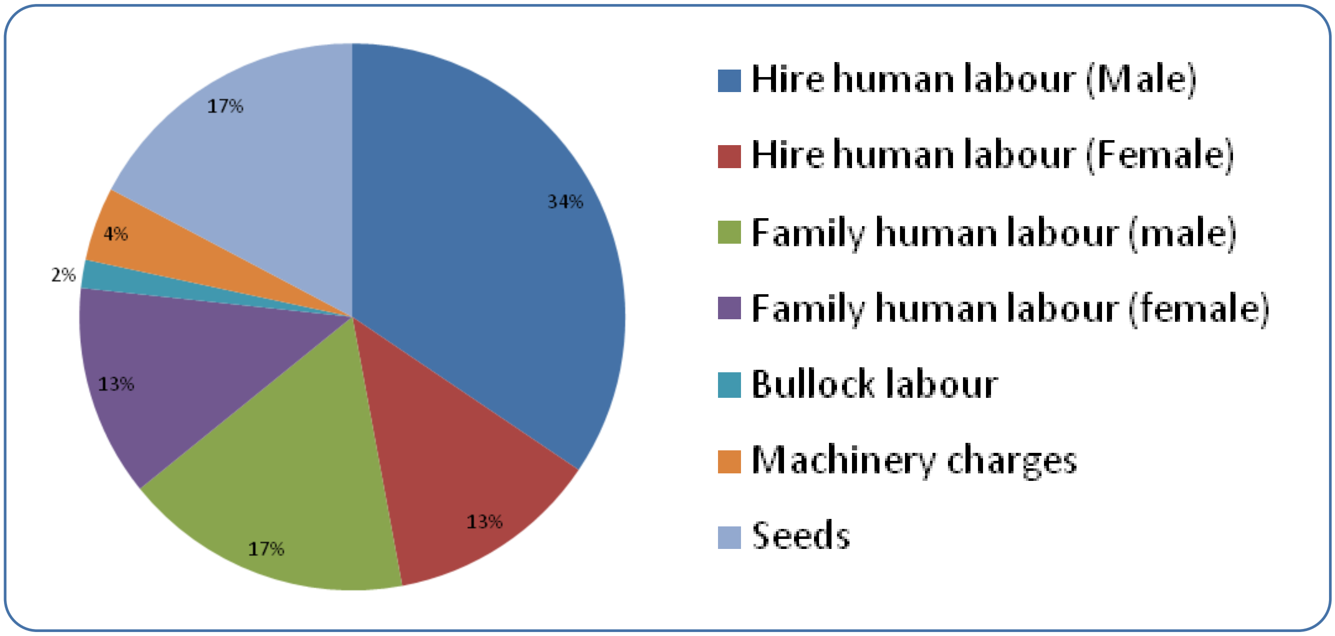

Fig.16 Share of variable costs components for cabbage

Under the variable cost components i.e.; paid out cost actually incurred by the cultivator's 34 percent of cost incurred against seeds is the highest. The BC ratio stood at 2.42, cost of cultivation of ₹42291.51/ha and cost of production at ₹1112.40/qtl respectively.

Table 8.4 District wise estimates of cost of cultivation, production, and related data for cabbage

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	21939.07	24009.43	48853.88	27036.44	51880.89
Kiphire	3354.65	3788.60	8996.15	6293.15	11500.67
Kohima	9744.20	11097.29	27334.43	18317.51	34554.66
Longleng	6789.60	8638.28	30822.52	11828.69	34012.93
Mokokchung	12877.31	13873.83	25831.99	27061.36	39019.53
Mon	6807.80	7644.65	17686.93	14661.34	24703.61
Peren	5173.33	6512.95	22588.46	7807.10	23882.61
Phek	64088.90	66219.58	91787.74	76180.71	101748.88
Tuensang	5882.72	6230.94	10409.74	13752.80	17931.60
Wokha	5239.81	5801.22	14035.21	10479.62	18713.62
Zunheboto	8193.30	9246.22	21881.32	14386.52	27021.62
Overall	31257.24	32589.37	48574.84	37626.18	42291.51
Cost of Production per quintal (Rs)					
Dimapur	374.90	410.28	834.82	462.00	886.55
Kiphire	341.96	386.20	917.04	641.50	1172.34
Kohima	355.37	404.72	996.88	668.03	1260.20
Longleng	178.02	226.49	808.14	310.14	891.79
Mokokchung	468.95	505.24	940.71	985.48	1420.96
Mon	284.85	319.86	740.04	613.44	1033.62
Peren	148.32	186.72	647.60	223.83	684.71
Phek	1012.62	1046.29	1450.27	1203.68	1607.66
Tuensang	220.57	233.63	390.32	515.67	672.35
Wokha	412.91	457.15	1106.01	825.82	1474.67
Zunhebhoto	446.50	503.88	1192.44	784.01	1472.57
Overall	**822.17**	**857.20**	**1277.67**	**989.69**	**1112.40**

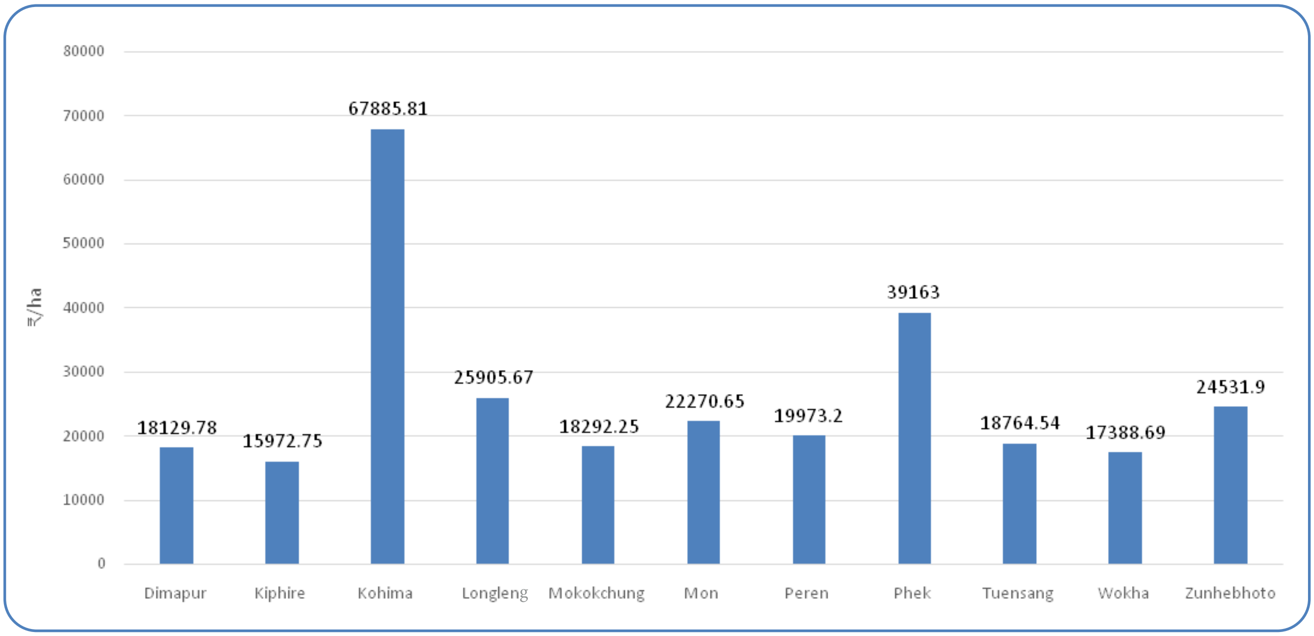

Fig. 17 District wise cost of cultivation

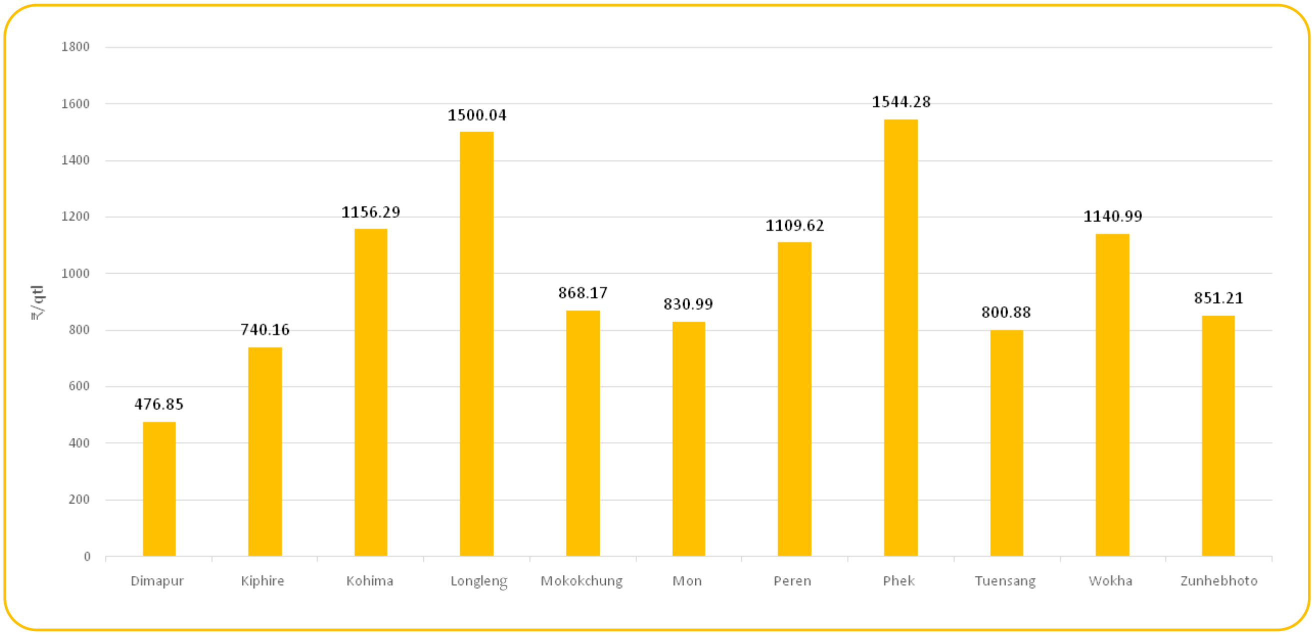

Fig. 18 District wise cost of production

Under the cost of cultivation, Phek recorded the highest with ₹101748.88/ha while Kiphire had the lowest (₹11500.67/ha). The cost of production was highest for Phek (₹1607.66/qtl) while Tuensang had the lowest cost of production (₹672.35/qtl).

7. Pineapple

Table 9.1 Area and number of holdings under pineapple

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	219	30.61	74.23	0.14
Small (1.1-2ha)	6	3.49	8.45	0.59
Low-medium (2.1-4ha)	9	7.14	17.32	0.80
High medium (4.1-10)	-	-	-	
Total	**234**	**41.24**	**100.00**	**0.18**

Table 9.2Breakdown estimates of different variable and fixed cost components for pineapple (district wise)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tsng	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	5281.82	2370.37	1000.00	1920.00	7870.27	4363.64	2250.00	4000.00		1750.00	7021.05	4297.38
Hire human labour (Female)	4145.45	1430.77	1800.00	1681.82	3998.65	3636.36	2000.00	4000.00		1390.91	6555.00	3089.53
Family human labour (male)	1886.36	948.15	2000.00	960.00	3935.14	4090.91	3150.00	4000.00		2800.00	2136.84	3223.04
Family human labour (female)	1727.27	715.38	2700.00	1009.09	5089.19	3409.09	2000.00	4000.00		2225.45	2280.00	2780.58
Bullock labour		-		-	-	-	-					
Machinery charges		-		-	-	-	-					
Seeds	26454.69	1382.50	1638.44	915.90	1761.47	3038.83	2035.62	1538.46		9352.24	8800.00	12489.24
Fertilizers	-											-
N(kg): Urea	1483.02											148.30
P(kg): DAP												
K(kg): MOP												
Interest on working capital @6%	2458.72	410.83	548.31	389.21	1359.28	1112.33	686.14	1052.31		1051.12	1607.57	1561.68
Total variable cost	43437.33	7258.00	9686.75	6876.02	24014.00	19651.16	12121.76	18590.77		18569.72	28400.46	27589.75
Fixed Costs												
Rental value of land	25341.25	81596.67	20225.86	6956.67	42200.00	52709.26	38271.16	87266.67		38469.08	97097.85	43036.79
Interest of fixed capital @12%	3040.95	9791.60	2427.10	834.80	5064.00	6325.11	4592.54	10472.00		4616.29	11651.74	5164.42
Total Fixed cost	28382.20	91388.27	22652.96	7791.47	47264.00	59034.38	42863.70	97738.67		43085.37	108749.59	48201.21
Total cost	**71819.53**	**98646.27**	**32339.70**	**14667.49**	**71278.00**	**78685.54**	**54985.46**	**116329.43**		**61655.09**	**137150.05**	**75790.96**

Table 9.3 District wise estimates of cost of production and BCR for pineapple

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tsng	Wokha	Zunheboto	Overall
Quantity of main produce (qtl)	64.02	120.02	42.72	20.87	105.50	91.34	86.11	130.90		94.21	124.84	88.05
Rate (₹/qtl)	2375.00	4000.00	2840.71	2000.00	2400.00	3428.57	2666.67	4000.00	-	2450.00	4666.67	2918.75
Value of Main quantity (₹)	152047.50	480080.00	121355.13	41740.00	253200.00	313165.58	229626.95	523600.00		230814.50	582587.08	257004.69
Quantity of by-produce (qtl)		3.8				6.18						1.00
Rate (₹/qtl)	-	2500.00	-	-	-	500.00	-	-				1227.27
Value of by-produce (₹)		9500.00				3090.00						6124.08
Total return (₹)	152047.50	489580.00	121355.13	41740.00	253200.00	316255.58	229626.95	523600.00		230814.50	582587.08	258220.75
Net return (₹)	80227.97	390933.73	89015.43	27072.51	181922.00	237570.05	174641.50	407270.57		169159.41	445437.03	182429.79
Cost of production (₹/qtl)	1121.83	821.92	757.02	702.80	675.62	861.46	638.55	888.69		654.44	1098.61	851.12
BCR	2.12	4.96	3.75	2.85	3.55	4.02	4.18	4.50		3.74	4.25	3.41

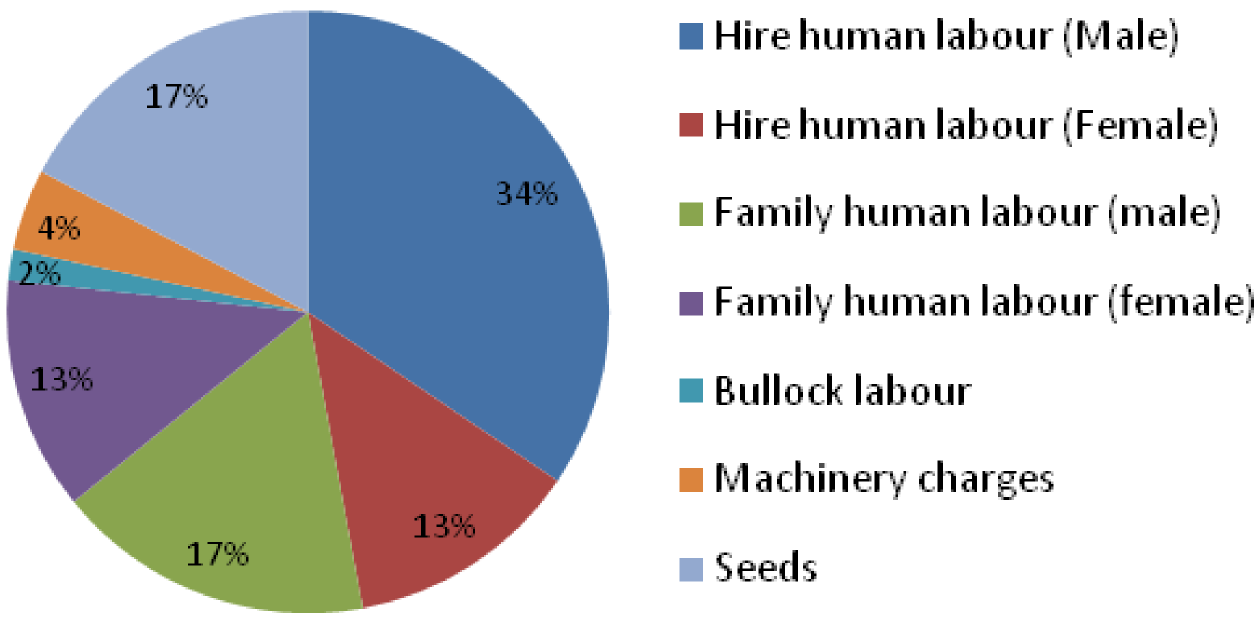

Fig.19 Share of Variable Costs Components for Pineapple

Under the variable cost components i.e.; paid out cost actually incurred by the cultivator's 48 percent of cost incurred against seeds is the highest. The BC ratio stood at 3.41, cost of cultivation of ₹75790.96/ha and cost of production at ₹851.12/qtl respectively.

Table 9.4 District wise estimates of cost of cultivation/production and related data for pineapple by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	46196.81	49317.58	68042.20	53094.91	71819.53
Kiphire	40921.76	44534.16	87883.21	55297.21	98646.27
Kohima	7802.24	9216.57	26188.49	15367.78	32339.70
Longleng	8041.54	8333.68	11839.31	11161.84	14667.49
Mokokchung	23850.15	26547.27	58912.76	38912.52	71278.00
Mon	37217.86	38887.95	58928.93	58644.55	78685.54
Peren	27663.65	28427.47	37593.44	45819.48	54985.46
Phek	45914.55	49063.68	86853.43	78539.69	116329.43
Tuensang					
Wokha	17263.43	19113.08	46241.32	34526.86	61655.09
Zunheboto	51512.53	57447.98	128673.54	65924.50	137150.05
Overall	43676.19	45368.36	65674.49	55484.83	75790.96
Cost of Production per quintal (Rs)					
Dimapur	721.60	770.35	1062.83	829.35	1121.83
Kiphire	340.96	371.06	732.24	460.73	821.92
Kohima	182.64	215.74	613.03	359.73	757.02
Longleng	385.32	399.31	567.29	534.83	702.80
Mokokchung	226.07	251.63	558.41	368.84	675.62
Mon	407.47	425.75	645.16	642.05	861.46
Peren	321.26	330.13	436.57	532.10	638.55
Phek	350.76	374.82	663.51	600.00	888.69
Tuensang					
Wokha	183.24	202.88	490.83	366.49	654.44
Zunheboto	412.63	460.17	1030.71	528.07	1098.61
Overall	490.48	509.48	737.52	623.09	851.12

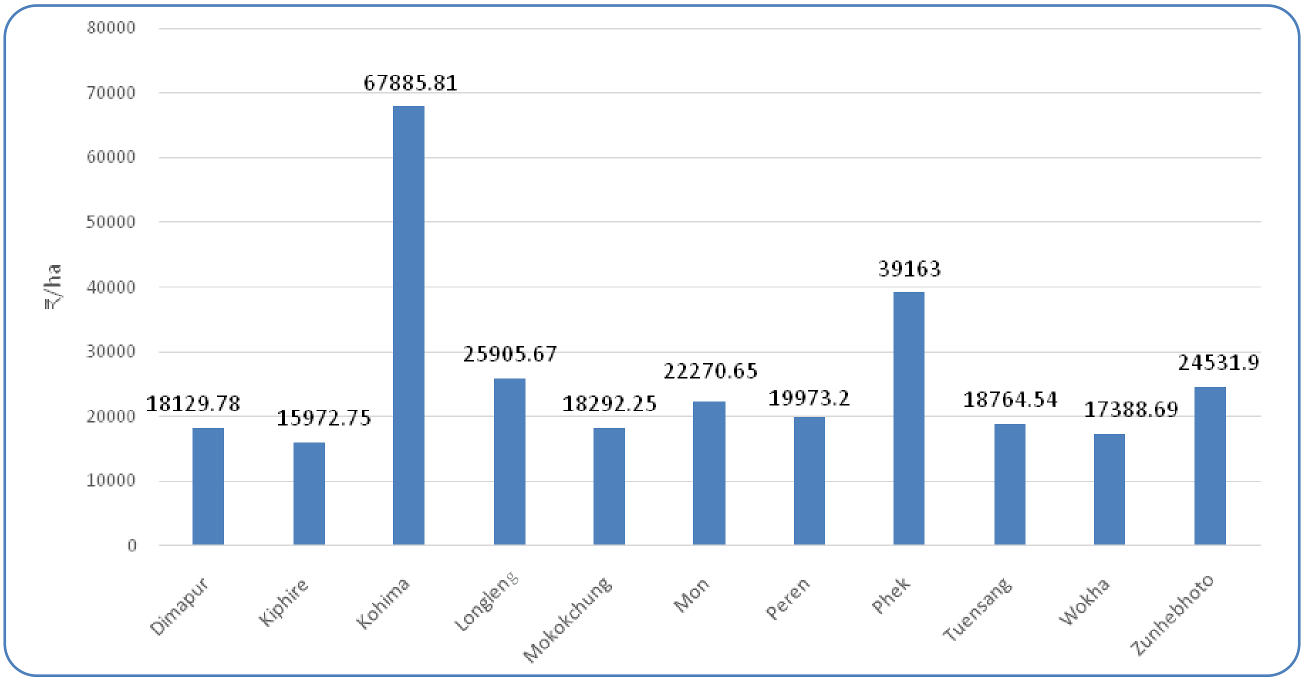

Fig.20 District Wise Cost of Cultivation

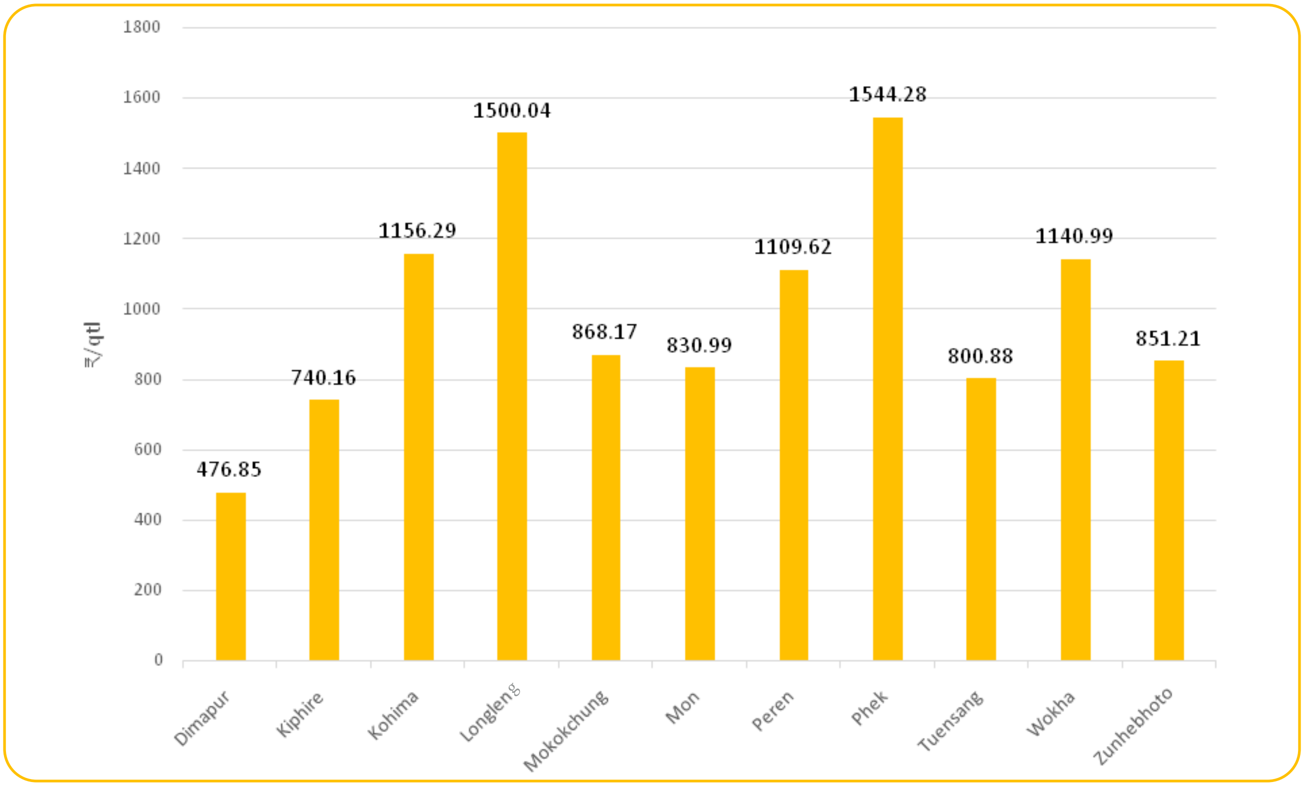

Fig. 21 District Wise Cost of Production

Under the cost of cultivation, Zunhebhoto recorded the highest with ₹137150.05/ha while Longlen had the lowest (₹14667.49/ha). The cost of production was highest for Dimapur (₹1121.83/qtl) while Wokha had the lowest cost of production (₹654.44/qtl).

8. Banana

Table 10.1 Area and number of holdings under banana

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	222	50.53	79.81	0.23
Small (1.1-2ha)	8	5.18	8.19	0.67
Low-medium (2.1-4ha)	2	2.09	3.30	1.08
High medium (4.1-10)	2	5.51	8.71	2.85
Total	**234**	**63.32**	**100.00**	**0.27**

Table 10.2 Breakdown estimates of different variable and fixed cost components for banana (district wise)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	3812.50	1589.00	2057.14	2609.09	4666.67	1944.83	5571.43	8215.38	2800.00	3428.57	4588.89	3861.18
Hire human labour (Female)	1800.00	1371.43	2312.50	2250.00	2411.11	1147.13	5400.00	2830.43	2785.71	2234.17	3546.21	2682.35
Family human labour (male)	1525.00	1589.00	2571.43	1490.91	5133.33	2674.14	2571.43	3594.23	1866.67	3428.57	4916.67	3510.16
Family human labour (female)	1200.00	1394.72	2312.50	843.75	3444.44	2800.00	3085.71	2830.43	928.57	2234.17	3250.69	2384.31
Bullock labour	-	-		-		-	-					
Machinery charges	-	-		-		-	-					
Seeds	10058.41	1990.80	4994.80	4200.00	7247.00	1550.45	24912.94	10864.86	5219.00	2585.20	10610.53	7055.95
Fertilizers	-											
N(kg): Urea	12592.59											1144.78
P(kg): DAP	3333.33											202.02
K(kg): MOP	3888.89											353.53
Interest on working capital @6%	2292.64	476.10	854.90	683.63	1374.15	606.99	2492.49	1700.12	816.00	834.64	1614.78	1271.66
Total variable cost	40503.36	8411.05	15103.27	12077.38	24276.70	10723.54	44034.00	30035.45	14415.95	14745.32	28527.77	22465.94
Fixed Costs												
Rental value of land	66605.47	76688.50	5491.20	73986.07	27272.00	44677.51	63000.00	58081.33	41500.00	43059.58	102041.75	57621.61
Interest of fixed capital @12%	7992.66	9202.62	658.94	8878.33	3272.64	5361.30	7560.00	6969.76	4980.00	5167.15	12245.01	6914.59
Total Fixed cost	74598.13	85891.12	6150.14	82864.40	30544.64	50038.81	70560.00	65051.09	46480.00	48226.73	114286.76	64536.20
Total cost	**115101.49**	**94302.17**	**21253.42**	**94941.77**	**54821.34**	**60762.36**	**114594.00**	**95086.54**	**60895.95**	**62972.05**	**142814.53**	**87002.13**

Table 9.3 District wise estimates of cost of production and BCR for banana

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Quantity of main produce (qtl)	154.00	128.30	11.44	76.10	77.92	188.10	140.00	115.06	124.50	121.58	128.22	115.02
Rate (₹/qtl)	2583.33	3570.00	2880.00	5833.33	2100.00	1425.12	2700.00	3028.75	2000.00	2125.00	4775.00	3001.87
Value of main quantity (₹)	397833.33	458031.00	32947.20	443916.67	163632.00	268065.84	378000.00	348487.98	249000.00	258357.50	612250.50	345274.78
Quantity of by produce (qtl)	1.8	0.7										0.23
Rate (₹/qtl)	1000	3000										2000.00
Value of by produce (₹)	1800.00	2100.00										454.55
Total return (₹)	399632.82	460131.00	32947.20	443916.41	163632.00	268065.07	378000.00	348487.98	249000.00	258357.50	612250.50	345729.63
Net return (₹)	284531.33	365828.83	11693.78	348974.64	108810.66	207302.72	263406.00	253401.44	188104.05	195385.45	469435.97	258727.50
Cost of production (₹/qtl)	747.41	735.01	1857.82	1247.59	703.56	323.03	818.53	826.41	489.12	517.95	1113.82	756.41
BCR	3.47	4.88	1.55	4.68	2.98	4.41	3.30	3.66	4.09	4.10	4.29	3.97

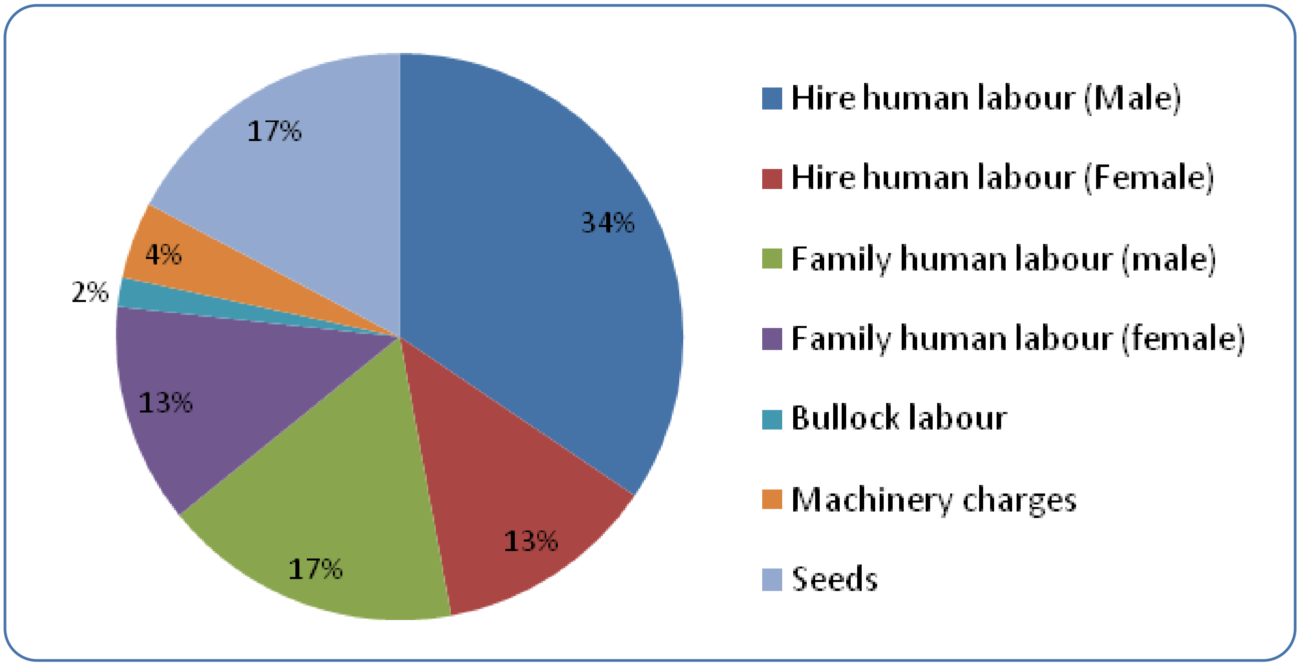

Fig.22 Share of Variable Costs Components for Banana

Under the variable cost components i.e.; paid out cost actually incurred by the cultivator's 33 percent of cost incurred against seeds is the highest. The BC ratio stood at 3.97, cost of cultivation of ₹87002.13/ha and cost of production at ₹756.41/qtl respectively.

Table 9.4 District wise estimates of cost of cultivation, production, and related data for banana by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	72310.18	75239.68	110393.59	79947.59	115101.49
Kiphire	34956.37	38242.60	77677.26	54867.51	94302.17
Kohima	1579.92	3042.71	20596.12	3700.00	21253.42
Longleng	46537.21	49497.95	85026.82	59412.90	94941.77
Mokokchung	14522.16	17093.91	47955.03	23960.23	54821.34
Mon	15453.05	17910.16	47395.49	31277.02	60762.36
Peren	83681.72	85208.92	103535.34	96267.59	114594.00
Phek	62992.92	64292.77	79890.93	79488.38	95086.54
Tuensang	32208.40	33885.34	54008.35	40772.94	60895.95
Wokha	27150.86	28787.05	48421.36	43337.75	62972.05
Zunheboto	65553.94	69724.23	119767.75	92771.01	142814.53
Overall	22515.19	27220.29	83681.40	30541.01	87002.13
Cost of Production per quintal (Rs)					
Dimapur	469.55	488.57	716.84	519.14	747.41
Kiphire	272.46	298.07	605.43	427.65	735.01
Kohima	138.10	265.97	1800.36	323.43	1857.82
Longleng	611.53	650.43	1117.30	780.72	1247.59
Mokokchung	186.37	219.38	615.44	307.50	703.56
Mon	82.15	95.22	251.97	166.28	323.03
Peren	597.73	608.64	739.54	687.63	818.53
Phek	547.48	558.78	694.34	690.84	826.41
Tuensang	258.70	272.17	433.80	327.49	489.12
Wokha	223.32	236.77	398.27	356.45	517.95
Zunheboto	511.26	543.79	934.08	723.53	1113.82
Overall	195.75	236.66	727.54	265.53	756.41

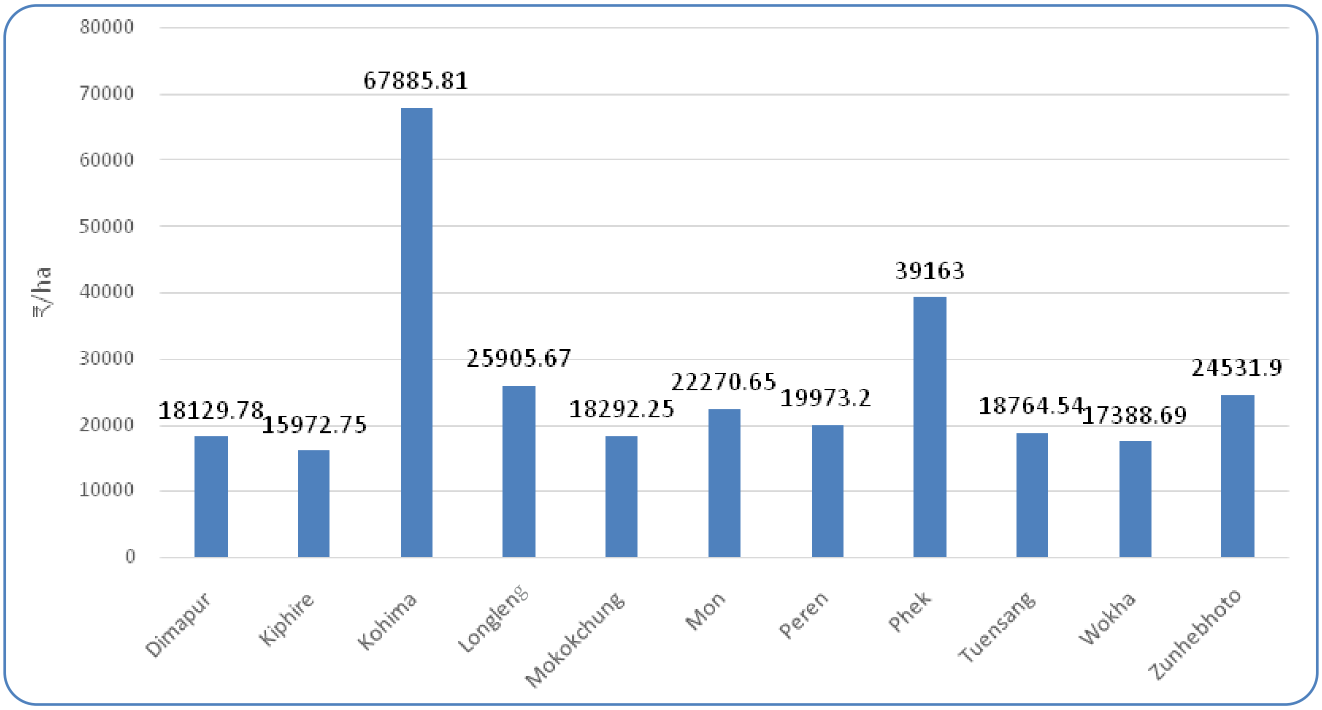

Fig. 23 District Wise Cost of Cultivation

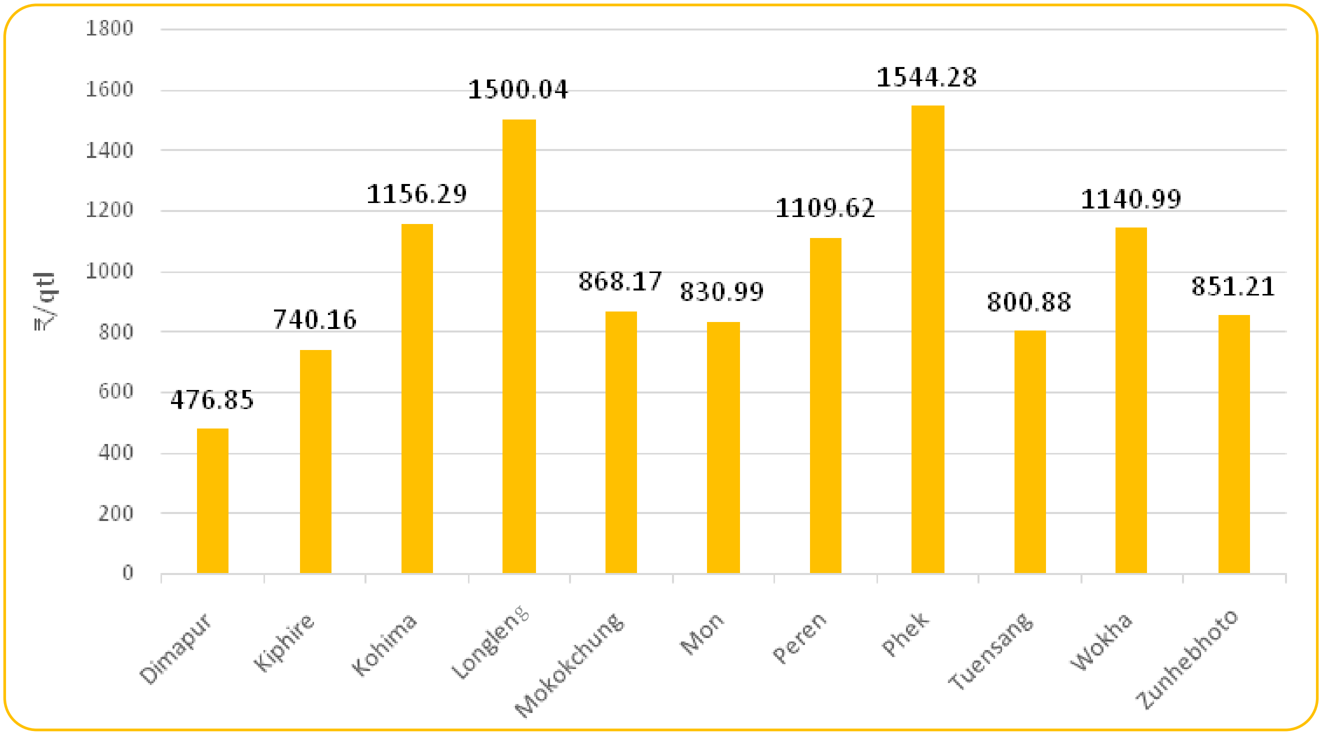

Fig. 24 District Wise Cost of Production

Under the cost of cultivation, Zunheboto recorded the highest with ₹142814.53/ha while Kohima had the lowest (₹21253.42/ha). The cost of production was highest for Kohima (₹1857.82/qtl) while Mon had the lowest cost of production (₹323.03/qtl).

9. Orange

Table 10.1 Area and number of holdings under orange

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	192	30.40	49.35	0.16
Small (1.1-2ha)	19	8.15	13.22	0.42
Low-medium (2.1-4ha)	19	15.04	24.41	0.78
High medium (4.1-10)	3	8.02	13.02	2.50
Total	**234**	**61.60**	**100.00**	**0.26**

Table 10.2. Breakdown estimates of different variable and fixed cost components for orange (district wise)

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	2957.58	890.91	500.00	2120.00	4308.33	1594.74			3533.33	3176.92	3448.28	2758.37
Hire human labour (Female)	1623.94	890.91	971.43	1443.75	2456.60	1078.95			2551.85	2187.50	1406.25	1700.00
Family human labour (male)	739.39	890.91	500.00	706.67	5744.44	1594.74			1767	3176.92	3448.00	1723.98
Family human labour (female)	321.43	890.91	971.43	481.25	3509.43	1078.95			1374	2625	2250.00	1133.33
Bullock labour	-	-		-								
Machinery charges	-	-		-								
Seeds	18081.30	1084.34	3666.92	555.80	4679.06	452.83			8141.50	2494.92	7305.29	7542.89
Fertilizers	-											-
N(kg): Urea	2321.95											257.99
P(kg): DAP												
K(kg): MOP												
Interest on working capital @6%	1562.74	278.88	396.59	318.45	1241.87	348.01			1042.06	819.68	1071.47	906.99
Total variable cost	27608.33	4926.86	7006.37	5625.92	21939.73	6148.22			18409.74	14480.94	18929.29	16023.56
Fixed Costs												
Rental value of land	51574.25	41675.00	105331.38	41708.31	62450.01	74170.35			42507.97	64286.53	69600.00	62120.71
Interest of fixed capital @12%	6188.91	5001.00	12639.77	5005.00	7494.00	8900.44			5100.96	7714.38	8352.00	7454.48
Total Fixed cost	57763.16	46676.00	117971.14	46713.31	69944.01	83070.80			47608.93	72000.91	77952.00	69575.19
Total cost	**85371.48**	**51602.86**	**124977.51**	**52339.22**	**91883.74**	**89219.02**			**66018.67**	**86481.85**	**96881.29**	**85598.75**

Table 9.3 District wise estimates of cost of production and BCR for orange

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Quantity of main produce (qtl)	79.20	62.37	86.21	42.90	71.13	64.11			43.31	53.00	52.20	61.60
Rate (₹/qtl)	3907.14	4000.00	7330.80	5833.33	5267.82	6941.54			5888.89	7277.72	8000.00	6049.69
Value of main produce (₹)	309445.49	249480.00	631988.27	250249.86	374699.86	445022.13			255047.83	385719.16	417600.00	372681.26
Quantity of By-produce (qtl)	-	0.19		-		-			-		-	0.02
Rate (₹/qtl)	-	3000.00		-		-			-		-	3000.00
Value of by produce (₹)	-	570.00										63.33
Total return (₹)	309445.49	250050.00	631988.27	250249.86	374700.04	445022.13			255047.83	385719.16	417600.00	372724.24
Net return (₹)	224074.00	198447.14	507010.76	197910.63	282816.30	355803.11			189029.16	299237.31	320718.71	287125.49
Cost of production (₹/qtl)	1077.92	824.85	1449.69	1220.03	1291.77	1391.66			1524.33	1631.73	1855.96	1389.11
BCR	3.62	4.85	5.06	4.78	4.08	4.99			3.86	4.46	4.31	4.35

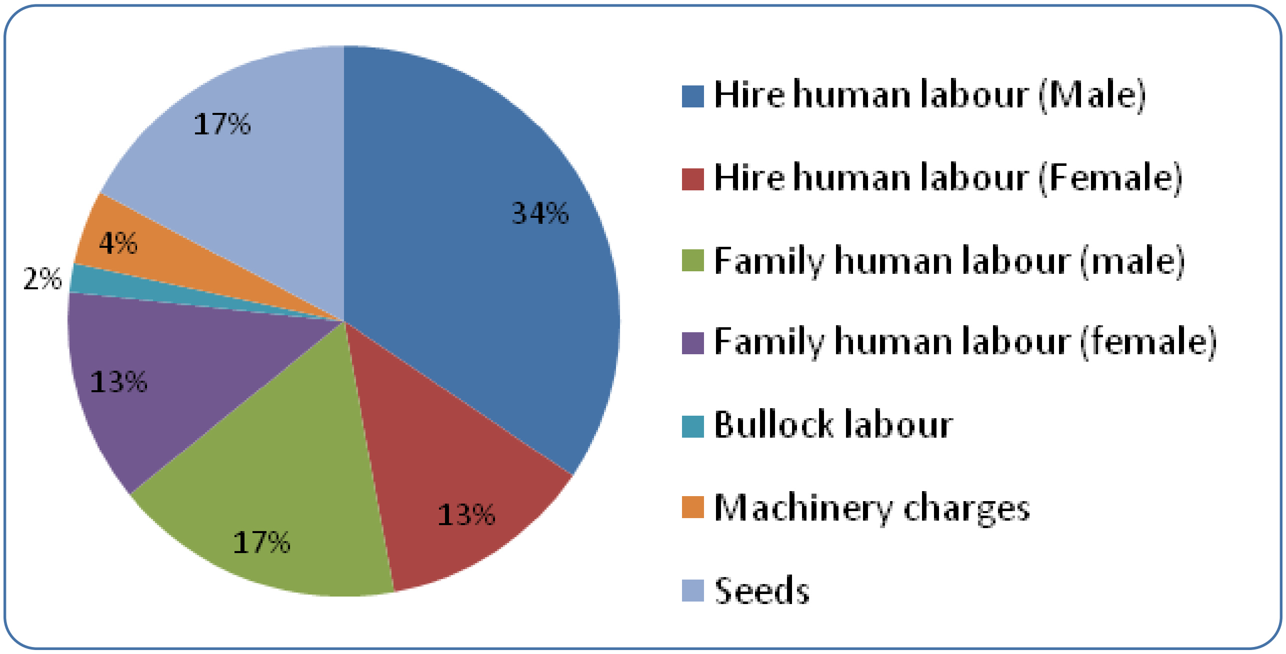

Fig.25 Share of Variable Costs Components for Orange

Under the variable cost components i.e.; paid out cost actually incurred by the cultivator's 50percent of cost incurred against seeds is the highest. The BC ratio stood at 4.35, cost of cultivation of ₹85598.75/ha and cost of production at ₹1389.11/qtl respectively.

Table 9.4 District wise estimates of cost of cultivation, production, and related data for orange by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	47283.03	49881.47	83661.07	51591.87	85371.48
Kiphire	6071.61	9111.60	48631.41	12083.05	51602.86
Kohima	15508.97	23066.93	121320.40	26724.05	124977.51
Longleng	4774.45	8090.96	51205.83	9224.36	52339.22
Mokokchung	16394.88	21059.33	81697.09	31245.98	91883.74
Mon	13115.96	17939.94	80651.68	26507.28	89219.02
Peren					
Phek					
Tuensang	19048.34	22153.76	62524.14	25648.29	66018.67
Wokha	36680.50	38738.05	65486.12	59733.78	86481.85
Zunheboto	24680.67	29174.20	87590.24	38465.26	96881.29
Overall	26078.04	30019.85	81263.22	34355.36	85598.75
Cost of Production per quintal (Rs)					
Dimapur	597.01	629.82	1056.33	651.41	1077.92
Kiphire	97.05	145.65	777.36	193.14	824.85
Kohima	179.90	267.57	1407.27	309.99	1449.69
Longleng	111.29	188.60	1193.61	215.02	1220.03
Mokokchung	230.49	296.07	1148.56	439.28	1291.77
Mon	204.59	279.83	1258.02	413.47	1391.66
Peren					
Phek					
Tuensang	439.81	511.52	1443.64	592.20	1524.33
Wokha	692.08	730.91	1235.59	1127.05	1631.73
Zunhebhoto	472.81	558.89	1677.97	736.88	1855.96
Overall	423.20	487.17	1318.76	557.53	1389.11

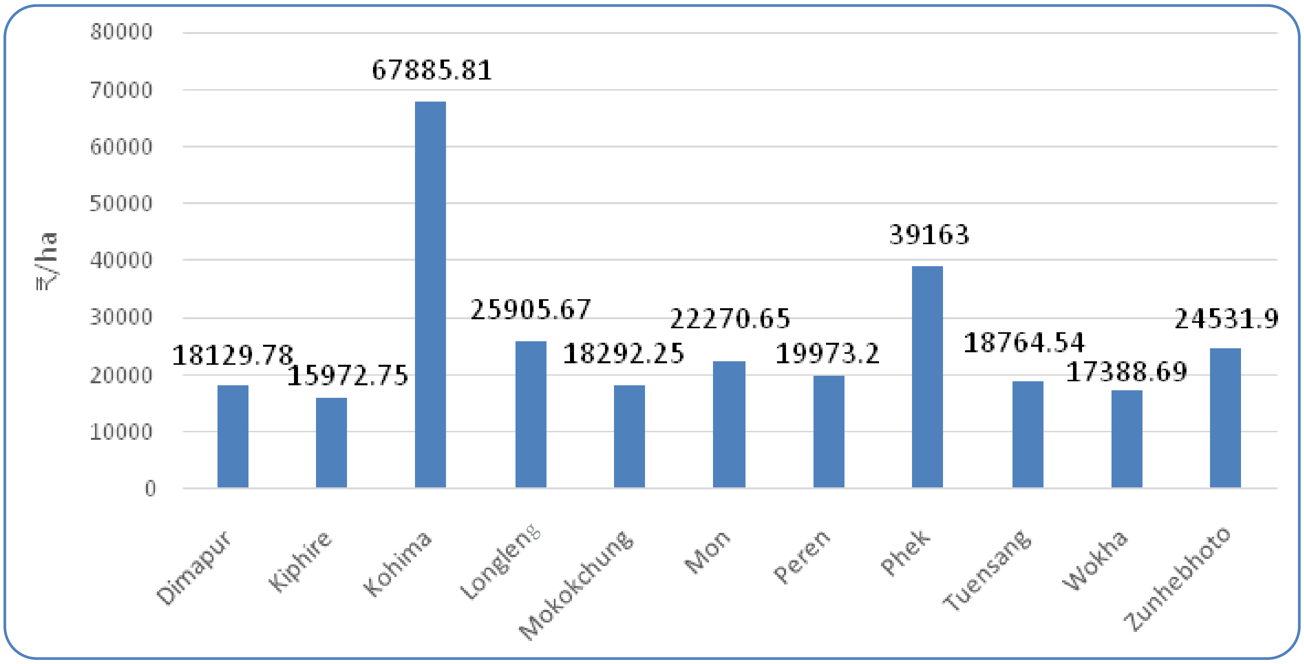

Fig.26 District Wise Cost of Cultivation

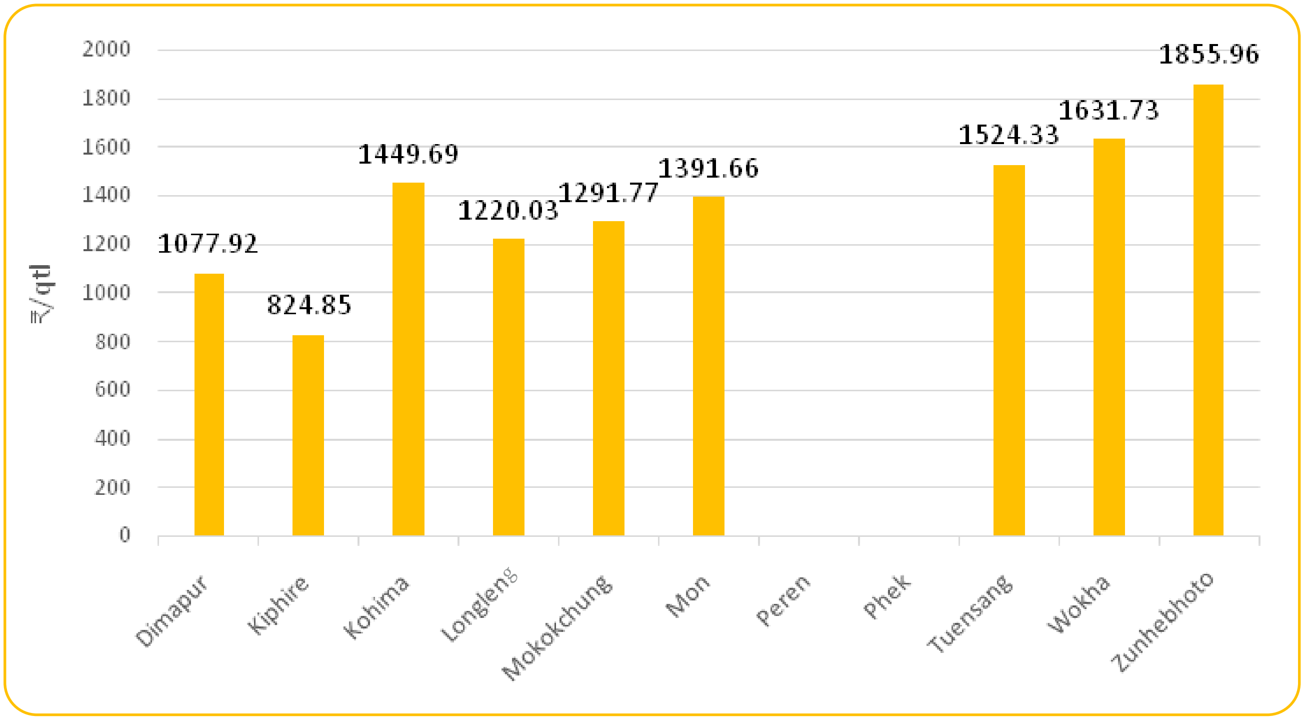

Fig 27 District Wise Cost of Production

Under the cost of cultivation, Kohima recorded the highest with ₹124977.51/ha while Kiphire had the lowest (₹51602.86/ha). The cost of production was highest for Zunhebhoto (₹1855.96/qtl) while Kiphire had the lowest cost of production (₹824.85/qtl).

10. Ginger

Table 10.1 Area and number of holdings under ginger

Holding size class	Sample Size	Area under the crop in the sample (ha)	Percentage Area	Average Area per holding (ha)
Marginal (Up to 1 ha)	222	42.33	80.66	0.19
Small (1.1-2ha)	8	5.14	9.79	0.67
Low-medium (2.1-4ha)	4	5.01	9.55	1.31
High medium (4.1-10)	-	-	-	
Total	**234**	**52.48**	**100.00**	**0.22**

Table 10.2 Breakdown estimates of different variable and fixed cost components for ginger

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Variable costs												
Hire human labour (Male)	6110.53	1509.09	4250.00	3758.33	4985.17	2100.00	6460.00	11853.85	2617.39	1371.43	4875.00	2795.72
Hire human labour (Female)	5210.53	1305.88	3257.14	1875.00	2837.21	1875.00	8928.57	13456.00	2617.39	1857.14	3973.03	3203.38
Family human labour (male)	2715.79	1077.92	2266.67	1708.33	4976.74	1866.67	8500.00	6184.62	1495.65	1714.29	4550.00	2174.45
Family human labour (female)	2605.26	870.59	3664.29	937.50	3546.51	1875.00	8928.57	5568.00	1495.65	1547.62	3405.45	2135.59
Bullock labour		-			-	-	-					
Machinery charges		-			-	-	-					
Seeds	17630.86	4121.71	11926.92	8794.74	10132.63	5583.23	4987.29	75827.21	7181.67	8835.98	31982.80	18097.66
Fertilizers	-											-
N(kg): Urea	5625.00											511.36
P(kg): DAP												
K(kg): MOP												
Interest on working capital @6%	2393.88	533.11	1521.90	1024.43	1588.70	797.99	2268.27	6773.38	924.47	919.59	2927.18	1735.09
Total variable cost	42291.85	9418.30	26886.92	18098.33	28066.96	14097.89	40072.70	119663.06	16332.22	16246.05	51713.46	30653.25
Fixed Costs												
Rental value of land	135952.03	6902.76	87564.31	71214.00	88906.40	37280.16	26853.37	32082.08	27580.00	37951.16	83518.75	52371.63
Interest of fixed capital @12%	16314.24	828.33	10507.72	8545.68	10668.77	4473.62	3222.40	3849.85	3309.60	4554.14	10022.25	6284.60
Total Fixed cost	152266.27	7731.10	98072.03	79759.68	99575.16	41753.78	30075.77	35931.93	30889.60	42505.30	93541.00	58656.23
Total cost	194558.12	17149.40	124958.95	97858.01	127642.12	55851.67	70148.47	155594.99	47221.82	58751.35	145254.46	89309.48

Table 10.3 District wise estimates of cost of production and BCR for gingera

Particulars	Dimapur	Kiphire	Kohima	Longleng	Mokokchung	Mon	Peren	Phek	Tuensang	Wokha	Zunheboto	Overall
Quantity of main produce (qtl)	157.30	9.14	136.37	109.56	111.85	82.59	60.42	83.24	59.10	71.00	133.63	92.20
Rate (₹/qtl)	5185.71	4454.55	3852.65	3900.00	4769.23	2708.33	2666.67	2312.50	2800.00	3207.14	3750.00	3407.44
Value of Main produce (₹)	815712.18	40714.59	525385.88	427284.00	533438.38	223680.97	161120.20	192492.50	165480.00	227706.94	501112.50	314165.79
Quantity of by produce (qtl)	-	0.26		-		-						0.02
Rate (₹/qtl)	-	2700.00										2700.00
Value of by-produce (₹)	-	702.00	-	-	-	-	-					63.82
Total return (₹)	815712.18	41416.59	525385.88	427284.00	533438.38	223680.97	161120.20	192492.50	165480.00	227706.94	501112.50	314229.79
Net return (₹)	621154.06	24267.19	400426.93	329425.99	405796.25	167829.30	90971.73	36897.51	118258.18	168955.59	355858.04	224920.31
Cost of production (₹/qtl)	1236.86	1824.40	916.32	893.19	1141.19	676.25	1161.01	1869.23	799.02	827.48	1086.99	968.40
BCR	4.19	2.42	4.20	4.37	4.18	4.00	2.30	1.24	3.50	3.88	3.45	3.52

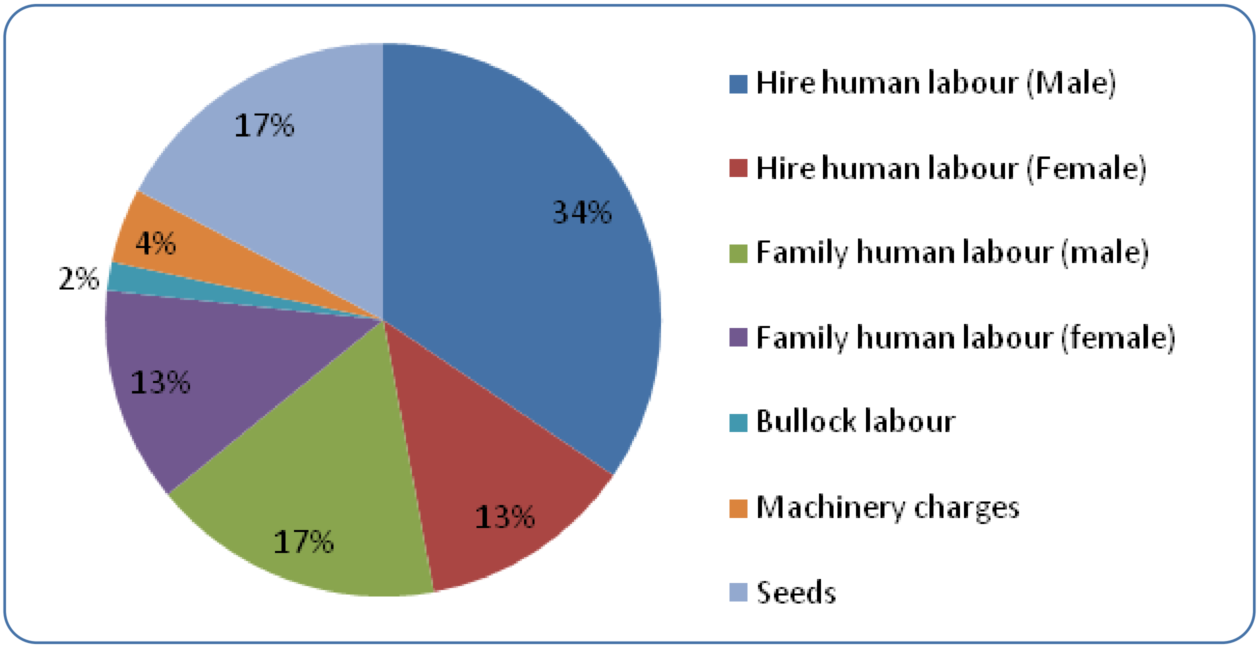

Fig.28 Share of Variable Costs Components for Ginger

Under the variable cost components i.e.; paid out cost actually incurred by the cultivator's 63 percent of cost incurred against seeds is the highest. The BC ratio stood at 3.52, cost of cultivation at ₹89309.48/ha and cost of production at ₹968.40/qtl respectively.

Table 10.4 District wise estimates of cost of cultivation, production, and related data for ginger by different category of costs

Items	Cost A1	Cost B1	Cost B2	Cost C1	Cost C2
Cost of Cultivation per ha (Rs)					
Dimapur	69526.02	78453.60	185584.51	87427.21	194558.12
Kiphire	9341.55	9775.82	14986.99	11938.22	17149.40
Kohima	53861.52	58292.02	111458.13	71792.84	124958.95
Longleng	28974.90	33932.22	93419.91	38370.33	97858.01
Mokokchung	64146.41	67150.48	103199.41	91593.21	127642.12
Mon	22294.52	24330.88	48767.21	31415.36	55851.67
Peren	25566.38	27710.90	53445.24	44414.13	70148.47
Phek	68383.68	74576.85	148894.92	81276.93	155594.99
Tuensang	30598.69	31407.51	41113.49	37515.84	47221.82
Wokha	39053.38	39898.29	50037.41	48612.24	58751.35
Zunheboto	89246.25	92439.13	130753.50	106940.09	145254.46
Overall	53869.75	56083.74	82651.56	62741.65	89309.48
Cost of Production per quintal (Rs)					
Dimapur	442.00	498.75	1179.81	555.80	1236.86
Kiphire	993.78	1039.98	1594.36	1270.02	1824.40
Kohima	394.97	427.45	817.32	526.46	916.32
Longleng	264.47	309.71	852.68	350.22	893.19
Mokokchung	573.50	600.36	922.66	818.89	1141.19
Mon	269.94	294.60	590.47	380.38	676.25
Peren	423.14	458.64	884.56	735.09	1161.01
Phek	821.52	895.93	1788.74	976.42	1869.23
Tuensang	517.74	531.43	695.66	634.79	799.02
Wokha	550.05	561.95	704.75	684.68	827.48
Zunheboto	667.86	691.75	978.47	800.27	1086.99
Overall	584.12	608.13	896.21	680.32	968.40

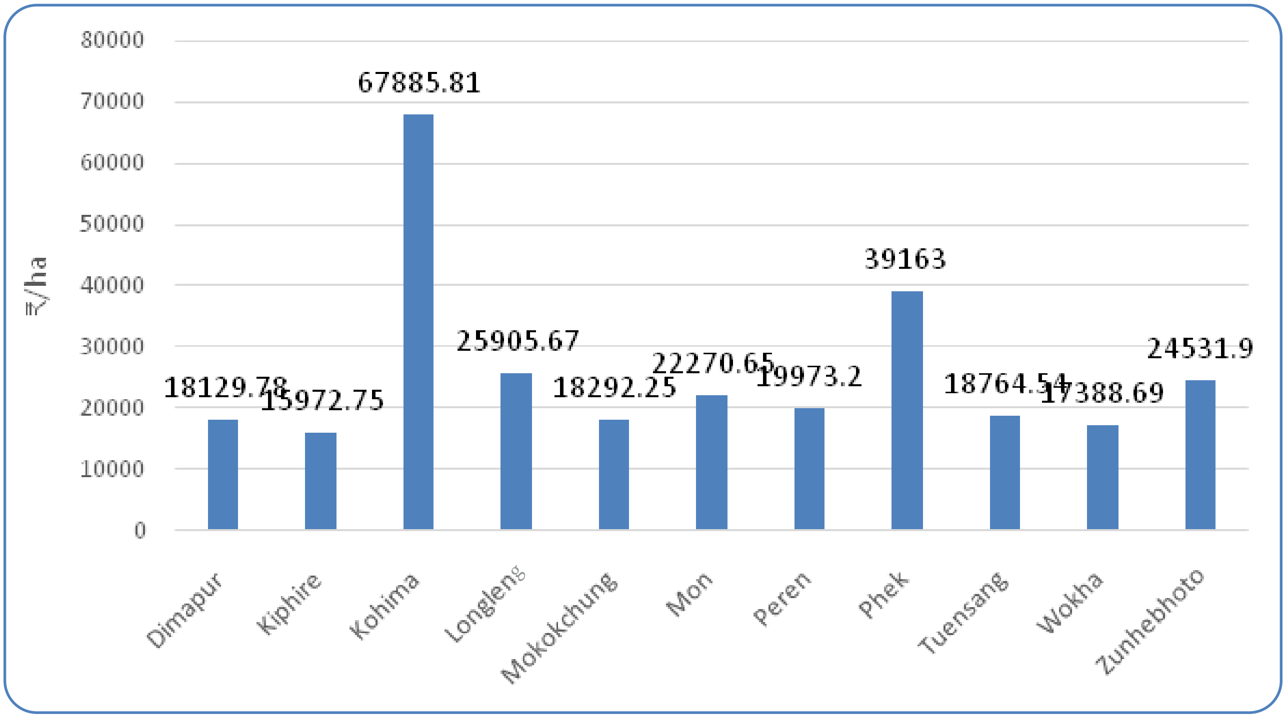

Fig.29 District Wise Cost of Cultivation

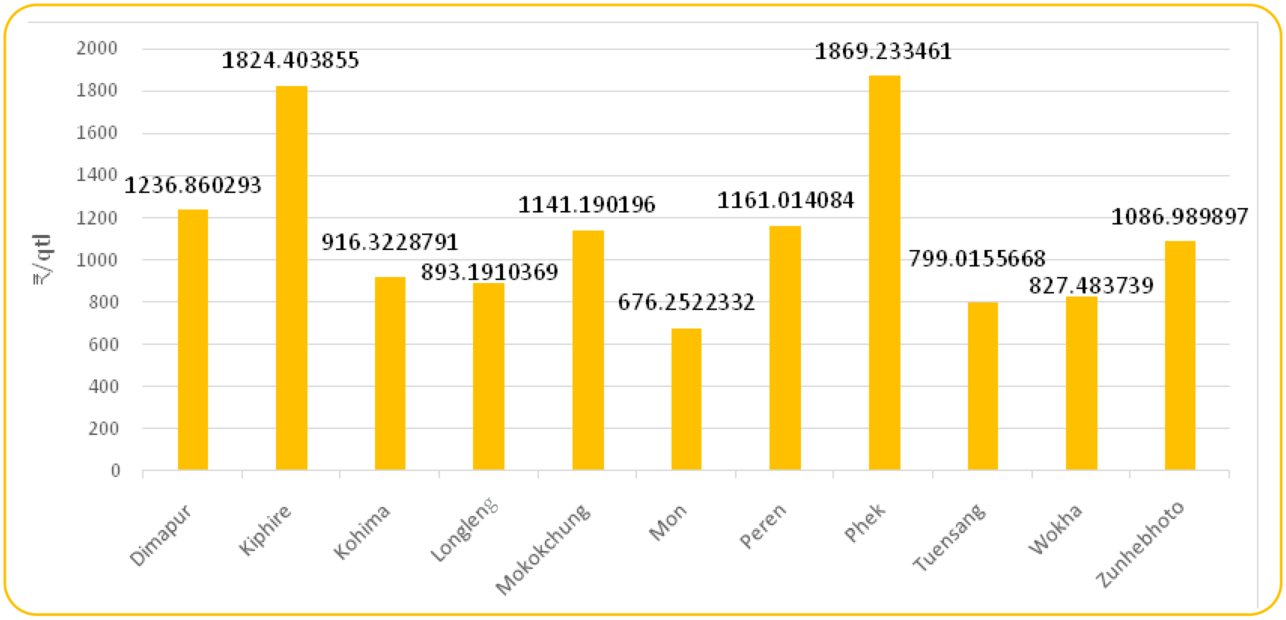

Fig 30. District Wise Cost of Production

Under the cost of cultivation, Dimapur recorded the highest with ₹194558.12/ha while Kiphire had the lowest (₹17149.40/ha). The cost of production was highest for Phek (₹1869.23/qtl) while Mon had the lowest cost of production (₹676.25/qtl).

SURVEY SCHEDULE

Thematic study on Cost of Cultivation on Major Crops and Agriculture Product Pricing at District Level

Name of the respondent :
Village :
Block :
District :

Major crops

WTRC paddy/Jhum paddy/Maize/Rapeseed & Mustard/Soyabean/Pineapple/Cabbage/Banana/Orange/Ginger (For one crop one proforma) *(Pls tick)*

Land holding status

Own/ Lease in/Lease out *(Pls tick)*

Area under the crop (inbigha)

Category of farmer

Marginal/Small/Semi medium/Medium/Large *(Pls tick)*

A. Operational Cost

Operation	No. of Operations	Human labour						Bullock labour (both hired and own)		Tractor/Machinery (both hired and own)	
		Family labour		Hired labour		Rate (Rs./ day/labour)		Total Hrs.	Rate (Rs./ bigha)	Total Hrs.	Rate (Rs./ bigha)
		Male	Female	Male	Female	Male	Female				
Land preparation											
Sowing/transplantation											
Manuring											
Fertiliser application											
Irrigation											
Inter-culture operation											
Plant protection											
Harvesting											
Threshing											
Winnowing											
Any other											
Total											

B. Input Cost

Seed		FYM		Fertiliser								Insecticide		Any other chemical	
Qty. (Kg)	Rate (Rs./kg)	Qty. (Kg)	Rate (Rs./kg)	Urea in Kg	Rate (Rs./ kg)	DAP in Kg	Rate (Rs./ kg)	Potash in Kg	Rate (Rs./ kg)	Any other in Kg	Rate (Rs./ kg)	Qty. (Kg)	Rate (Rs./ kg)	Qty. (Kg)	Rate (Rs./kg)

C. Details of cost of cultivation

SN	Cost item	Qty. used	Value (Rs.)	Total Value (Rs.)/ha
1.	Value of hired human labour (both M & F) (days)			
2.	Value of family labour (both M & F) (days)			
3.	Value of bullock labour (both hired and owned)(Hrs.)			
4.	Value of machine power (both hired and owned) (Hrs.)			
5.	Value of seeds (kg)			
6.	Value of insecticides and pesticides (Kg/Lit)			
7.	Value of weedicides			
8.	Value of manures (both owned and hired) (Qtl.)			
9.	Value of fertilizers (Kg)			
	i) Urea			
	ii) DAP			
	iii) Potash			
	iv) Others			
10.	Irrigation charges			
11.	Depreciation (machinery and farm buildings)			
12.	Land revenue, cesses and taxes			
13.	Miscellaneous expenses (electricity charges, fuel)			
14.	Rental value of land			
15.	Any other			

D. Production

	Qty. Produced (Kg)	Market Rate (Rs./kg)	Total value (Rs.)
Main products			
By products			

(Name of respondent) **(Name of enumerator)** **(Name of the DESO)**

Mobile No. Mobile No. Mobile No.

SUMMARY AND CONCLUSION

Study entitled "**Thematic Study on Cost of Cultivation on Major Crops and Agriculture Product Pricing at District Level**" was undertaken with the objective to assess actual cost of cultivation incurred by the farmers for different agricultural and horticultural crops in the state of Nagaland. At the same time trial has been made to ascertain the product pricing for each crop in order to evaluate the profitability of the crops in the State. Right from choosing inputs to determine the most suitable processes, the cost of production can act as a crucial factor enabling farmers to make the best decisions in any given situation. Cost of cultivation/production includes every aspect of farm production, right from the expenses of inputs such as fertilisers, seeds, etc to the costs of labour and machinery on a farm. Major crops have been identified based on proportionate area under cultivation of a crop to net sown area of the state. Accordingly, 5 major agronomical crops have been identified based on the percentage of cultivable area to net sown area of the state. Five agronomical crops identified were WTR rice, *Jhum* paddy, Maize, Rape and Mustard and Soyabean. Similarly based on the same principle five horticultural crops viz. Banana, Cabbage, Pineapple, Orange and Ginger were also identified. A total of 234 farmer households for each crop from a total of 117 villages (@ 2 villages/block) of 39 blocks from 11 districts were selected that made the total sample size of 2340 farmer households for 10 crops. For the survey, an interview schedule was prepared and it was pilot tested in order to check the interview schedule performance and also to verify its 'ease of handling' by data collectors. Data were collected pertaining to the year 2021-22. After collection, data were entered in EXCEL sheet for further compilation and analysis.

In case of variable cost component among the agronomical crops, survey reported the variance of results with the type of crops in the State. Machinery cost represented the highest percentage i.e. 23% of total variable cost in Wet Transplanted Rice. In case of *Jhum* Paddy, cost incurred against hired human labour (male) was the highest (34%). Male family labour was the highest in case of Maize. Hired male human labour (29%) was the highest in case of Rapeseed and Mustard. In case of Soyabean, highest cost incurred was against seeds (26%). In all the crops BC ratio recorded above 1, which signifies profitable cultivation of all these crops in Nagaland. Cost of cultivation of WTR, *Jhum* Paddy, Maize, Rapeseed and Mustard and Soyabean estimated as ₹32224.36/ha, ₹28401.73/ha, ₹25354.37/ha, ₹21360.99/ha and ₹31238.09/ha respectively in the state. Similarly Cost of production estimated as ₹1143.11/qtl., ₹1220.15/qtl, ₹1388.66/qtl, ₹2027.76/qtl and ₹2528.95/qtl respectively for WTR, *Jhum* Paddy, Maize, Rapeseed and Mustard and Soyabean respectively. However, there was a variation of results among the districts.

In case of Horticultural crops too, results are varied by the type of crops. Among the components of variable cost, highest cost incurred was against the seeds for all the five selected crops out of total variable cost viz. 34% in case of Cabbage, 48% in case of Pineapple, 33% in case of Banana, 50% in case of Orange and 63% in case of Ginger. It can be concluded that in horticultural crops, seed cost is an important component among the variable cost components followed by labour related cost. BC ratio estimated above one (1) that signifies profitable cultivation of these crops in Nagaland. Cost of cultivation estimated in the State were ₹.42,291.51/ha, ₹75790.96/ha, ₹87002.13/ha, ₹85598.75/ha and ₹89309.48/ha for Cabbage, Pineapple, Banana, Orange and Ginger respectively. Similarly Cost of production estimated as ₹1112.40/qtl. ₹851.12/qtl. ₹756.41/qtl., ₹1389.11/qtl. and ₹968.40/qtl. respectively for the State. District wise estimation indicated variation among the figures.

Study has given to all concerned some very important and pertinent information about 10 most important crops grown in Nagaland. Study was seen successful enough in terms of providing information about the resources or input used along with their price, different inter cultural operations undertaken time to time, product pricing and finally the profitability at district level as well as at the State level.

PHOTO GALLERY

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