

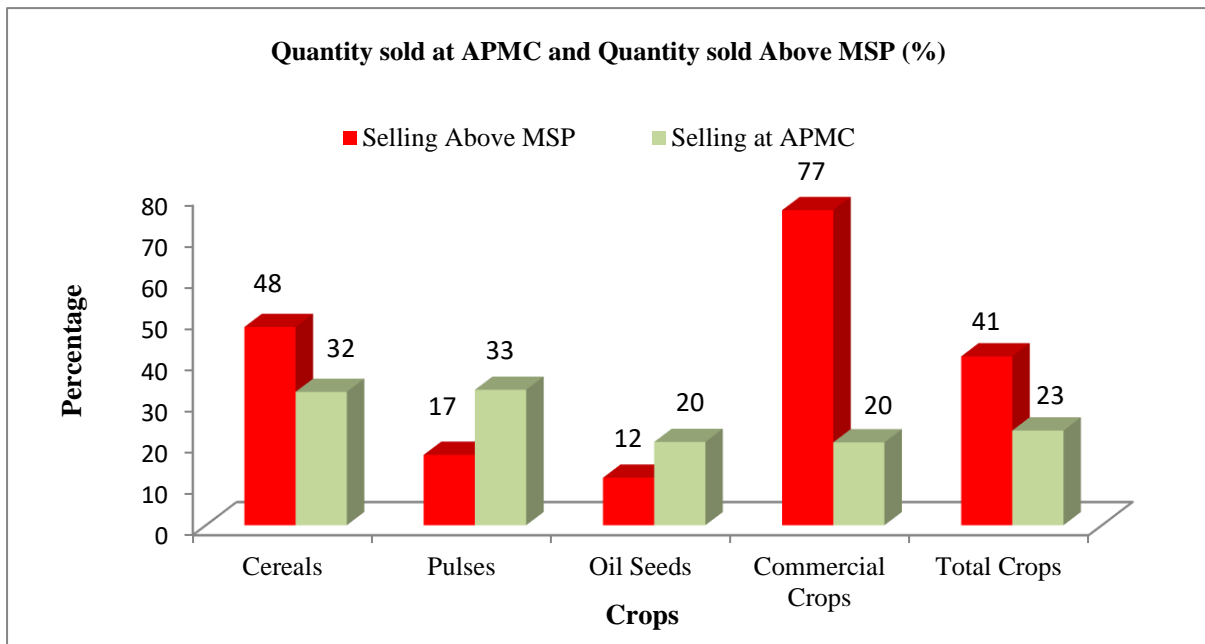


Government of Karnataka

Karnataka Agriculture Price Commission

ASSURED PRICE AND STABLE MARKET FOR AGRICULTURE AND HORTICULTURE CROPS IN KARNATAKA: 2017-18

" Multi-Faceted Recommendations "



December-2018

Department of Agriculture Campus,
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Executive Summary and Multi-Faceted Recommendations

I. Methodology:

- This Perspective Report has been prepared by analysing 26 Major agriculture and horticulture crops of Karnataka for estimated cost of cultivation, market arrivals, market analysis and price forecasting. These 26 crops together account for almost 87 percent of the total cropped area in the state, and reflects upon the financial security of a majority of farmers in the state.
- The data was collected at different stages of crop production (such as germination, growth, ripening and harvesting) from about 2000 farmers spread across 24 districts and 90 taluks by “Survey Method” for the year 2017-18.
- The data collection and analysis were done online using a software “*Amayakrishi*” and market analysis as well price forecasting were undertaken through a newly developed dashboard “KRIPA” (*Krishi Dharane Vishleshana Palaka*).

II. Decadal Change in Cropped Area:

- In the last one decade (2008-09 to 2017-18) area under cultivation of many agricultural crops decreased considerably in the state except Bengal Gram and Soya bean whose area has been increased by 74% and 106% respectively. Area under Groundnut (-28%), Paddy & Chilli (-36%) and Sunflower (-81%) has declined significantly. In total, nearly six lakh hectares of agricultural land is found to be uncultivable during the last one decade in Karnataka.
- It is a matter of concern that area under major food grains, Paddy & Jowar has declined considerably resulting in reduced production of Paddy by 18.34 Lakh tons and Jowar by 2.88 Lakh tons which has adversely impacted food security scenario in the state.

III. Economics of Crop Production:

- ❖ In line with the guidelines of CACP, three types of production costs are worked out with suitable modifications. These cost types are: **Cost A₁+FL**- that includes paid out cost + family labour charge, **Cost C₂-Opportunity Cost**, which is the total cost including rental value of own land and **Cost C₃**- Comprehensive cost including managerial cost. The modifications are:
 - 25% of the gross revenue is taken as Rental value of Land –
 - 15% of the total cost is Managerial cost
 - 1.5% to 5% of the sum insured under PMPBY is taken as the Risk Premium
 - Amortized and Establishment Cost in case of perennials is considered as an additional fixed cost

- 15% is considered as interest on Working Capital and Fixed Capital.
- ❖ It is pertinent to note that almost 31 percent of the total cost forms the expenditure towards labour (human, bullock and machinery) indicating that our crop husbandry is fast turning into a labour intensive enterprise.
- ❖ The KAPC also works out costs at different stages of cultivation, as per which almost 54% of the expenditure is incurred in the germination stage and nearly 20% expenditure is incurred during growth as well as harvesting stages.
- ❖ If we consider the paid out cost and family labour charge (Cost A_1+FL) incurred per quintal of produce, as against the market price received by the farmers of the state, it is seen that farmers have incurred 5% loss for all agricultural crops put together during 2017-18. However, except in the case of potato, farmers have received an average profitability of around 105% in case of horticulture crops.
- ❖ Against total cost C_2 , in case of agriculture crops farmers have incurred losses to the tune of 30%.

IV. Inadequate MSP:

- ❖ The Average cost of production considered by the CACP while fixing the MSP is much less at the national level than the cost incurred by farmers in Karnataka.
- ❖ If we consider the overall average of all crops, MSPs of last year (2018) resulted in a deficit of 3% against Cost A_1+FL . It means that farmers will incur losses even if MSP is ensured.
- ❖ Further, against total cost C_2 this deficiency is to the tune 27%. Hence both the market and the Govt has failed to provide justice to the farmers.

V. Cost Reduction and Yield Enhancement:

- ❖ High level of variability because of unstable market is also a matter of concern. If we compare Co-efficient of Variation (CV) with the relatively stable market prices of Paddy, variability is very high in case of vegetables like Onion and Tomato.
- ❖ Hence, instead of looking into only profitability one should also consider stability of prices and cost reduction technologies.
- ❖ KAPC has clearly established that through mechanization agriculture can become a profitable enterprise. CACP highlighted this in its Kharif Policy Report 2016-17.
- ❖ KAPC has identified eight such machines for land preparation through which cost can be reduced to the tune of 37%. Similarly there are about 26 machines which could result in cost reduction to the tune of 49% in post harvest operations.
- ❖ It was estimated that under “**Krishi bhagya**” **the yield level can be enhanced to the tune of 77%** through **proper** rain water harvest from farm ponds. Hence it is equally important to concentrate on yield enhancement and cost reduction technologies to make agriculture as a profitable enterprise even with existing price situation.

VI. Transaction in APMCs:

- ❖ It is a matter of concern that most of the farmers produce is being transacted outside the purview of APMCs and MSP is not being ensured for many of the commodities even within APMCs. This is due to failure of our marketing system.
- ❖ If we analyze production statistics during 2017-18 and the APMC transactions, only 23% of the production was transacted in APMCs, out of which MSP was ensured for only 41% of the commodities sold in APMCs

VII. Government Procurement:

- ❖ GOK to safeguard the interest of farmers is intervening in the market regularly. Since last five years state has procured nearly 257 Lakh quintals of different farm commodities amounting to Rs.7635 crores.
- ❖ During 2013-14 71 Lakh quintals of Maize and 23 Lakh quintals of Paddy, in 2015-16 20 Lakh quintals of Ragi and in 2016-17 35 Lakh quintals of Tur were procured by paying incentives in addition to declared MSPs of those years.
- ❖ Timely procurement is as important as quantity procured. During 2017-18 nearly 33% of the production of Green gram and Black gram were sold before commencement of procurement; it was to the tune of 50% in case of Bengal gram.

VIII. Current year's Production Scenario:

- ❖ As per the area sown data of the departments of agriculture and horticulture, area sown declined by 2% when compared to last year. In case of Onion area sown was nearly doubled when compared to last year which may result in glut in the markets leading to price crash.
- ❖ If we observe the seasonality index, in most of the agriculture crops, Onion, Arecanut and Coconut in general, arrival will be high during January to October. As per the KAPC estimation prices of Paddy, Maize and Bajra are likely to fall considerably below MSP from November 3rd week.

IX. KAPC Proposals before the Government:

- ❖ KAPC recently developed a web based Decision Support System (DSS) called "KRIPA" which helps in keeping close watch on the market situation of agriculture and horticulture crops for timely market intervention in case of crash in prices.
- ❖ KAPC has recommended the adoption of Price Deficiency Payment Scheme (PDPS) for Tomato and Onion for which Hon'ble Chief Minister has positively reacted. It is heartening to note that same is being implemented for Onion in this year.
- ❖ As per the request from the Govt. to fix procurement prices for minor millets KAPC has scientifically estimated the cost of production of six major minor millets, Barnyard Millet, Brown top Millet, Kodo Millet, Little Millet, Fox Tail Millet and Proso Millet.

- ❖ Impact of GST on agriculture related products was thoroughly analyzed and a proposal was prepared to be submitted before the GST Council to reduce GST burden on certain agriculture commodities.

Multi Faceted Recommendations

In a competitive market government intervention should play the role of complementarily to ensure remunerative and predictable prices to farm commodities. In addition enhancing farmers bargaining capacity through group approach, production policy as per the requirement, suitable crop plan, accurate price forecasting and supply projections are to be made as necessary conditions to ensure remunerative prices and predictable returns to farmers. Many a times these conditions may also fail due to role of unscrupulous middlemen and vested interests which calls for a legal protection to agriculture prices.

KAPC to ensure remunerative prices and stable market to farmers is putting forth following thirteen recommendations for government's consideration:

1. Legal Status to Prices and Selling:

- a. Bringing amendment to Karnataka Agricultural Produce Marketing (Regulation and Development) act 1966 in line with the Maharashtra State to make MSP as Statutory Minimum Price (SMP) in APMCs.
- b. Essential Commodity Act 1995 has to be suitably amended to include penalty clauses for not honouring the SMP.

2. Enhancing Productivity:

- a. Need for strengthening the production of Rainfed Paddy, Ragi and Rabi Jowar so as to increase the procurement of these cereals which could be distributed under “ ANNABHAGYA “.
- b. Area under major oil seed crops like Sunflower and Groundnut are declining at a faster rate since last one decade. Necessary steps should be taken to halt this declining trend.
- c. Govt. itself is a major consumer of various food articles under many welfare schemes other than distribution under PDS. Govt. can procure its requirement at MSP directly from the farmers instead of procuring from open market.

3. Extending Procurement:

- a. Procurement can be further strengthened by effectively adopting recent GOI initiative **PM-AASHA**.
- b. GOI's earlier proposed **Market Assurance Scheme** (MAS) can be another programme for further strengthening procurement. There is a need to pressurize the GOI to implement the scheme.

- c. Decentralizing the procurement at PACS level so that procurement can be done at farmers level itself.
- d. Establishment of Pulses Federation.
- e. Streamlining the payment system after procurement, payment should be done within one month. In case of any delay farmers should be compensated by providing interest for delayed period.
- f. In order to have assured supply of quality seeds it is necessary to ensure purchase price as per the Swaminathan committee recommendation, i.e. $C_2 + 50\%$ at least for seed farmers.

4. Statutory/Legal Status of Procurement Responsibility:

- a. To protect food security of people and commitment under different welfare schemes it may be necessary to bring “**Karnataka Agriculture Produce Procurement Responsibility Act**” to make it mandatory for the government to procure certain quantity of food grains at MSP.
- b. To further augment the quantum of procurement provisions under The National Food Security Act 2013 can be revoked in collaboration with State Food Commission.

5. Implementation of Price Deficiency Payment Scheme (PDPS):

- a. GOI has restricted this scheme to only oil seeds, however state has implemented similar scheme for onion during this year.
- b. This scheme is highly suitable for crops like Maize, Tur, Tomato and Onion, needs to negotiate with the GOI to extend this to other crops.

6. Need for mobilizing sufficient Price Stabilization Fund:

State should create ever maintainable minimum price stabilization of Rs. 5000 crores and government should create a separate Secretariat for its management.

7. Strengthening of Group Marketing:

- a. Formulating a “**Comprehensive Policy on Group Marketing of Agriculture & Horticulture Produce**” for the State.
- b. Establishing a “**Centre of Excellence for Group Marketing.**”
- c. Promoting collective agriculture on line with the “**Keebut**” in Israel after thorough understanding of the method.

8. Promoting Cost Efficient/Reduction technologies:

- a. Promoting online aggregation platform similar to that of “**Ola/Uber**” so that machineries available with different farmers can be aggregated for timely availability so that machineries which are already available can be put to optimum use.
- b. Establishing “**Labour Bank**” on line with the Kerala model.

- c. To reduce the burden of ever increasing wage rates on cost of production by linking MGNREGA to agriculture.

9. Productive use of Fallow Lands and Comprehensive Production and Crop Planning:

- a. Establishing a “Karnataka Agriculture Land Utilization Board” under Chairmanship of Hon’ble Chief Minister.
- b. Responsibility of land use planning and district level crop planning can be entrusted to Planning Board.

10. Strengthening of Marketing Department:

- a. To attract farmers to APMCs, markets should move towards farmers with farmer friendly policies.
- b. Need for popularizing pledge loan facility.
- c. Further strengthening of Marketing Department and bringing it under Principle Secretary of Agriculture.

11. Comprehensive Price Policy for Organic Crops/Millet:

Minor millets/Nutri-cereals can be procured at profitable support prices and arrangements can be made to market them through HOPCOMS and similar organizations.

12. Income Insurance to Farmers:

- a. To mitigate income risk of the farming community, government should think of introducing different innovative schemes like Group Crop Insurance and Individual level Income Insurance.
- b. Private insurance companies are to be encouraged to float such schemes with incentives.

13. Proper Negotiations with Centre on certain Issues:

- a. To consider Cost C2 as the basis for fixing MSP.
- b. Legal status to MSP and transactions of farm produce.
- c. Go before the GST council to reduce burden of GST on agriculture commodities.
- d. Comprehensive National Policy on Pulses and Onion.
- e. Establishment of Areca nut Board.
- f. To enhance Minimum Import Prices of Pepper and Arecanut.

Table-1: Details of sample farmers selected for the study on cost of cultivation of crops in Karnataka: 2017-18

Sl. No.	Landholding Size*	Number	Percentage	Karnataka's share in percentage
1	Marginal farmers (less than 1 Hectare)	491	25	49
2	Small farmers (1-2 ha)	635	32	27
3	Semi- Medium farmers (2-4 ha)	498	25	16
4	Medium farmers (4-10 ha)	267	14	7
5	Large farmers (More than 10 ha)	74	4	1
Total		1965	100	100

*Directorate of Economics and Statistics, Government of Karnataka

Table- 2 (A): Major Agriculture Crops Area, Production, Cost and Price Analysis : 2017-18

Si No	Crops	Area		Production		Average Yield (qtl/Acre)	Production Cost (Rs/ Qtl)		Market Price (Res/qtl)	Profit /Loss Compare to Market Price(%)		2017-18 Minimum Support Price (Rs/qtl)	Difference when compared Minimum Support Price (%)	
		Present (Lakh Ha)	Decadal Change (%)	Present (Lakh tonnes)	Decadal Change (%)		Cost Incurred + Family Labour (A ₁ +FL)	Total Cost (C ₂)		On Cost Incurred + Family Labour (A ₁ +FL)	On Total Cost (C ₂)		On Cost Incurred + Family Labour (A ₁ +FL)	On Total Cost (C ₂)
I	Cereals													
1	Paddy (Irrigated)	9.68 (XIII)	-36	42.10	-30	27.97	1234	1841	2079	68	13	1550	26	-16
	Paddy (Rainfed)					18.06	1343	1898	1730	29	-9	1550	15	-18
2	Ragi	7.75 (I)	-8	15.55	26	7.58	2349	3390	2214	-6	-35	1900	-19	-44
3	Hybrid Jowar	10.89 (V)	-21	11.69	-19	7.32	2283	2980	1292	-43	-57	1700	-26	-43
	White Jowar					4.5	2651	3725	2482	-6	-33	1725	-35	-54
4	Maize	12.88 (I)	21	54.32	84	20.16	1078	1504	1190	10	-21	1425	32	-5
5	Bajra	2.32 (VI)	-13	3.67	103	5.17	3195	3898	1181	-63	-70	1425	-55	-63
Average			-14		7					-2	-30		-9	-35
II	Pulses													
6	Red gram	8.85 (II)	48	8.40	168	4.92	5493	7117	5263	-4	-26	5450	-1	-23
7	Green gram	3.97 (III)	44	1.28	228	3.98	4379	5786	4564	4	-21	5575	27	-4
8	Black gram	1.36 (VIII)	21	0.65	103	3.28	5482	6894	3667	-33	-47	5400	-1	-22

9	Bengal gram	12.65 (IV)	74	7.21	82	4.13	4609	5775	3889	-16	-33	4400	-5	-24
Average			57		124					-12	-32		5	-18
III	Oilseeds													
10	Groundnut	6.15 (IV)	-28	6.43	62	5.11	4297	5729	4152	-3	-28	4450	4	-22
11	Soybean	2.76 (IV)	106	4.22	354	5.70	3541	4522	2840	-20	-37	3050	-14	-33
12	Sunflower	1.89 (I)	-81	1.44	-65	3.92	4619	5991	2961	-36	-51	4100	-11	-32
Average			-46		34					-20	-38		-7	-29
IV	Commercial crops													
13	Cotton (Long staple)	5.46 (V)	33	18.51	124	8.21	4098	5454	5162	26	-5	4320	5	-21
14	Dry chilli	0.78 (III)	-36	1.41	4	14.08	6358	8678	8851	39	2			
Average			17		107					33	-2		5	-21
A	Agriculture-Average/Total	87 (90%)^α	-6		177 (38%)[§]	22				-5	-30		-3	-27

Note : Roman numbers in bracket indicates Rank of Karnataka

Rs 400 is given as incentive for Ragi and Jowar By State Government in 2017-18

α Percentage of Total Agriculture Land of State

Cost A₁ = Total Cost Incurred and Depreciation on Fixed Asset

FL= Family Labour Cost

Cost C₂ = Cost A₁ + FL + Land Revenue + Interest on Fixed Capital

§ Percentage of Total Agriculture Production

Table- 2 (B): Major Horticulture Crops Area, Production, Cost and Price Analysis : 2017-18

Sl No.	Crops	Area		Production		Average Yield (Qtl/Acre)	Production Cost (Rs/ Qtl)		Market Price (Rs/qtl)	Profit /Loss Compare to Market Price(%)		2017-18 Minimum Support Price (Rs/qtl) β	Difference when compared Minimum Support Price (%)	
		Present (Lakh Ha)	Decadal Change (%)	Present (Lakh tonnes)	Decadal Change (%)		Cost Incurred + Family Labour (A ₁ +FL)	Total Cost (C ₂)		On Cost Incurred + Family Labour (A ₁ +FL)	On Total Cost (C ₂)		On Cost Incurred + Family Labour (A ₁ +FL)	On Total Cost (C ₂)
V	Vegetables													
15	Tomato	0.59 (III)	72	18.38	428	148.80	767	1009	921	20	-9			
16	Onion	2.10 (II)	55	33.46	364	62.66	745	1093	1253	68	15	624	-16	-43
17	Potato	0.30 (XI)	-61	4.66	89	36.47	1499	1872	1122	-25	-40			
	Average		22		330					21	-11			
VI	Fruits													
18	Banana (Yelakki)	0.96 (I)	58	24.06	127	92.77	884	1914	4038	357	111			
	Banana (G-9)					290.10	285	1114	1409	394	26			
19	Grapes (Table)	0.26 (II)	115	5.02	58	115.34	1239	2317	3377	173	46			
	Dry Grapes					39.28	4355	9217	16721	284	81			
	Grapes (Bangalore Blue)					115.44	931	1651	1576	69	-5			
20	Pomegranate	0.26 (II)	46	2.07	8	58.37	1903	3298	4328	127	31			
21	Mango	2.40 (V)	109	16.59	242	25.20	972	1540	1029	6	-33			

	Average		89		133					201	37			
VII	Horticulture Crops													
22	Coconut	5.19 (II)	24	49.27	72	4964*	8	13	14	75	8			
	Copra					7.09	7587	11174	12871	70	15	7750	2	-31
23	Red Arecanut	2.82 (I)	53	4.42	81	8.02	11744	22720	33613	186	48	27000	130	19
	White Arecanut					8.75	10095	20315	28030	178	38	25100	149	24
	Average		33		73					127	27			
VII	I Spices													
24	Ginger	0.26 (I)	1	2.96	-64	126.8	1568	2094	2043	30	-2			
25	Turmeric	0.22 (VI)	52	0.65	-4	23.26	2974	5416	8668	191	60	3		
26	Black Pepper	0.46 (II)	163	0.19	-74	2.29	27110	43277	39881	48	-8			
	Average		64		-60					90	17			
B	Horticulture Average/Total	16 (75%)^μ	42	162 (98%)[#]	93.00					105	19			
	Agriculture and Horticulture Average/Total (A+B)	103 (87%)[€]	-1	339 (54%)	48					70	-1			

Note : Roman numbers in bracket indicates Rank of Karnataka

*Coconut (Number)

β Market Intervention Price for Onion (2016-17), Arecanut (2016-17) and Minimum Support Price for Copra (2017-18) By Karnataka Government.

μ Total Percentage area of Horticulture crops

€ Total Percentage area of Agriculture and Horticulture crops

Cost A₁ = Total Cost Incurred and Depreciation on Fixed Asset

FL = Family Labour cost

Cost C₂ = Cost A₁ + FL + Land revenue + Interest on Fixed Capital

Table- 3: Cost comparison between Commission for Agriculture Costs and Prices (CACP) and Karnataka Agriculture Price Commission (KAPC) : 2018-19

Sl No	Crops	Minimum Support Price 2018-19 (Rs/ctl)	Total Cost (C ₂) (Rs/ctl)		Minimum Support Price According to M S Swaminathan Report (Total Cost (C ₂) +50%)	
			According to CACP	According to KAPC	CACP	KAPC
1	Paddy (Common)	1750	1560	1841	2340 (34)	2762 (58)
2	Hybrid Jowar	2430	2183	2980	3275 (35)	4470 (84)
3	White Jowar	2450	2183	3725	3275 (34)	5588 (128)
4	Bajra	1950	1324	3898	1986 (2)	5847 (200)
5	Ragi	2897	2370	3390	3555 (23)	5085 (76)
6	Maize	1700	1480	1504	2220 (31)	2256 (33)
7	Red gram	5675	4981	7117	7472 (32)	10676 (88)
8	Green gram	6975	6161	5786	9242 (32)	8679 (24)
9	Black gram	5600	4989	6894	7484 (34)	10341 (85)
10	Bengal gram	4620	3526	5775	5289 (14)	8663 (88)
11	Groundnut	4890	4186	5729	6279 (28)	8594 (76)
12	Soybean	5388	4501	5991	6752 (25)	8987 (67)
13	Sunflower	3399	2972	4522	4458 (31)	6783 (100)
14	Cotton (Long staple)	5450	4514	5454	6771 (24)	8181 (50)
Average					28	76

Figures in Brackets indicates Loss percentage compare to Minimum Support Price

Cost C₂ = Cost A₁ + FL + Land revenue + Interest on Fixed Capita

Table 4(A): Profitability of Major Agriculture Crops in Karnataka 2017-18

Group	Sl No	Crops	Cost Incurred + Family Labour (Rs/Acre) (A ₁ +FL)	Total Cost (Rs/Acre) (C ₂)	Yield (qtl/Acre)	Market Price (Rs/qtl)	Total Income (Rs/Acre)*	Net Profit/Loss on Cost Incurred + Family Labour		Net Profit/Loss on Total cost	
								(Rs/Acre)	(%)	(Rs/Acre)	(%)
I Cereals	1	Paddy (Irrigated)	37282	54282	27.97	2079	60921	23639	63	6640	12
		Paddy (Rainfed)	26026	36044	18.06	1730	33013	6987	27	-3031	-8
	2	Ragi	21619	29509	7.58	2214	20595	-1024	-5	-8914	-30
	3	Hybrid Jowar	20105	25209	7.32	1292	12855	-7250	-36	-12354	-49
		White Jowar	15036	1988@0	4.51	2482	14273	-763	-5	-5607	-28
	4	Maize	22566	31160	20.16	1190	24831	2265	10	-6329	-20
	5	Bajra	17534	21164	5.17	1181	7120	-10413	-59	-14044	-66
Average			22881	31035	12.97	1738.43	24801	1920	8	-6234	-20
II Pulses	6	Red gram	27301	35292	4.92	5263	26172	-1129	-4	-9120	-26
	7	Green gram	17646	23249	3.98	4564	18382	736	4	-4867	-21
	8	Black gram	17980	22612	3.28	3667	12027	-5953	-33	-10585	-47
	9	Bengal gram	19247	24062	4.13	3889	16272	-2975	-15	-7790	-32
	Average			20544	26304	4.08	4345.57	18213	-2330	-11	-8091
III Oilseeds	10	Groundnut	22492	29809	5.11	4152	21747	-744	-3	-8061	-27
	11	Soybean	20182	25774	5.70	2840	16189	-3993	-20	-9585	-37
	12	Sunflower	19244	24623	3.92	2961	12746	-6498	-34	-11878	-48
	Average			20639	26735	4.91	3317.71	16894	-3745	-18	-9841
IV Commercial crops	13	Cotton (Long staple)	34028	45161	8.21	5162	42759	8731	26	-2402	-5
	14	Dry chilli	89527	122183	14.08	8851	124617	35090	39	2434	2
	Average			61778	83672			83688	21910	35	16
A Agriculture Crops			26738	35626			29032	2294	9	-6593	-19

*By products income is added in Total Income

Table 4(B): Profitability of Major Horticulture Crops in Karnataka 2017-18

Group	Sl No	Crops	Cost Incurred + Family Labour (Rs/Acre) (A ₁ +FL)	Total Cost (Rs/Acre) (C ₂)	Yield (qtl/Acre)	Market Price (Rs/qtl)	Total Income (Rs/Acre)	Net Profit/Loss on Cost Incurred + Family Labour		Net Profit/Loss on Total cost	
								(Rs/Acre)	(%)	(Rs/Acre)	(%)
V Vegetables	15	Tomato	114127	150115	148.80	921	136978	22851	20	-13137	-9
	16	Onion	46655	68508	62.66	1253	78529	31874	68	10021	15
	17	Potato	54670	68254	36.47	1122	40916	-13754	-25	-27338	-40
	Average		71817	95626	82.64	1098.57	85474	13657	19	-10151	-11
VI Fruits	18	Banana Yelakki	81998	177580	92.77	4038	374628	292630	357	197048	111
		Banana (G9)	82695	323090	290.13	1409	408793	326098	394	85703	27
	19	Grapes (Table)	142943	267245	115.34	3377	389479	246536	172	122234	46
		Dry Grapes	171056	362048	39.28	16721	656802	485746	284	294754	81
		Grapes (Bangalore Blue)	107504	190544	115.44	1576	181948	74444	69	-8596	-5
	20	Pomegranate	111080	192504	58.37	4328	252622	141542	127	60117	31
	21	Mango	24517	38820	25.21	1029	25951	1434	6	-12869	-33
	Average		103113	221690	105.22	4639.79	327175	224062	217	105485	48
VII Horticulture crops	22	Coconut	38264	63706	4964*	14	72135	33871	89	8429	13
		Copra	53798	79239	7.09	12871	91270	37472	70	12031	15
	23	Red Arecanut	94190	182211	8.02	33613	269573	175383	186	87362	48
		White Arecanut	88329	177755	8.75	28030	245264	156935	178	67509	38
	Average		68645	125728			169561	100916	147	43833	35
VIII Spice crops	24	Ginger	198826	265619	126.83	2043	259104	60277	30	-6515	-2
	25	Turmeric	88804	145618	23.26	8668	221258	132454	149	75640	52
	26	Black Pepper	62082	99105	2.29	39881	91327	29245	47	-7778	-8
	Average		116571	170114			190563	73992	63	20449	12
B. Horticulture Crops			91855	167762			223328	131473	143	55566	33

*coconut (in numbers), Rs/nut ** By products income is added in Total Income

Table-5: Profitability of utilization of Machineries in Ragi and Paddy Cultivation

Sl. No.	Particulars	Ragi Harvester (%)	Paddy Transplanter (%)
1	Human and bullock labour cost savings	-23	-16
2	Seed and implements cost savings	-1	-20
3	Total cost savings (per acre)	-17	-18
4	Production cost savings (per quintal)	-18	-28
5	Increase in yield	0	16
6	Bi-product reduction	-6	-33
7	Increase in Net Income	144	123

Table-6: Cost Effective Mechanization in Agricultural and Horticultural Crops of Karnataka

Sl.No.	Stage/ Machinery	Crops	Cost Reduction (%)
A	Land Preparation	Average	37
1	Power tiller with rotary attachment	Paddy	18
2	Tractor operated Ridger	Paddy, Ragi	50
3	Blade Harrow	Groundnut	25
4	Mounted Offset Disc Harrow	Paddy, Ragi, Jowar, Maize, Bajra, Tur, Greengram, Blackgram, Bengalgram, Groundnut and Soybean	25
5	Tractor operated furrow opener	Banana, Pomegranate, Arecanut, Ginger, Turmeric and Pepper	40
6	Tractor operated Bund former	All crops	80
7	Tractor operated plastic lacing machine	Tomato	30-35
8	Green manure incorporator	All field crops	25
B	Sowing	Average	40
1	Tractor drawn seed cum fertilizer drill	Cotton	30
2	Transplanter	Ginger, Onion	75-80
3	Tractor drawn seed cum fertilizer drill	Ragi, Jowar, Bajra, Tur, Blackgram, Greengram, Bengalgram	30
4	Tractor drawn nine rows groundnut seed drill	Groundnut	25
5	Tractor operated Paddy Transplanter	Paddy	38
C	Weeding	Average	43
1	Cycle Weeder	Greengram, Maize	60 - 70
2	Tractor operated Rotovator	Tur, Cotton	75
3	Tractor operated weed control and earthing-up implement	Ragi, Jowar and Bengalgram	25
4	Mini tractor and Rotovator	Pomegranate	20 - 25
5	Self-propelled weeder	Groundnut, Maize, Soybean, Tur	25
D	Crop Protection	Average	33
1	Solar Powered sprayer	Tur	25-30
2	Hand drawn sprayer	Greengram	30 - 35

3	Tractor operated sprayer	Maize, Cotton, Banana, Jowar, Grapes	30
4	Multipurpose polyhouse solar dryer	Dry chilli	50
5	Parth hand sprayer	Tomato, Onion, Potato	25
E	Harvest	Average	34
1	Tractor operated Harvester	Groundnut	20-25
2	Harvester	Soybean, Sunflower	15-17
3	Coconut tree climber	Coconut	15
4	Power tiller operated harvester	Turmeric	65
5	Tractor operated harvester	Turmeric	70
6	Mango Harvester	Mango	20
7	Harvester	Potato	20
8	Combine Harvester	Paddy	33
9	Power tiller operated harvester	Paddy, Ragi	46
10	Harvester	Cotton	25-30
11	Harvester	Groundnut	32
F	Post Harvest	Average	49
1	Groundnut shell breaker	Groundnut	55
2	Tractor operated multi crop thresher	Jowar, Bengalgram, Sunflower, Groundnut	66
3	Tractor operated square straw bundler	Paddy	64
4	Pedal and motor operated groundnut shell breaker	Groundnut	60
5	Multi crop thresher	Paddy, Ragi, Jowar and Maize	27
6	Automated harvester and straw bundler	Paddy	65
7	Groundnut shell breaker	Groundnut	55
8	thresher	Sunflower	55
9	Multi crop thresher	Jowar, Sunflower, Maize, Tur, Greengram	75
10	Hand operated Coconut slicer	Coconut	50
11	Coconut slicing machine	Coconut	71
12	Tender coconut punch and cutter	Coconut	66
13	Turmeric Slicer	Turmeric	48
14	Tractor operated Harvester	Groundnut	20-25
15	Turmeric Polisher	Turmeric	56

16	Ginger Peeler	Ginger	44
17	Hand operated Peeler	Arecanut	31
18	Seed extractor	Dry Chilli	79
19	Foot/Pedal operated Coconut Dehusker	Coconut	25
20	PKV Chilli seed extractor	Dry Chilli	99
21	Groundnut Decorticator	Groundnut	15
22	2-in-1 Sunflower Thresher-cum-Maize Sheller	Sunflower, Maize	25
23	3-in-1 Mini Groundnut Decorticator-cum-Sunflower Thresher and Maize Sheller	Sunflower, Maize, Groundnut	30
24	Arecanut peeler	Arecanut	23
25	Manual Arecanut Dehusker	Arecanut	25
26	White Pepper Processing Machine	Pepper	30

Source: Karnataka Agriculture Price Commission sponsored “Cost reducing mechanisation and cost effective technologies” project undertaken by University of Agricultural Sciences, Bengaluru, Raichur, Dharwad and University of Horticultural Sciences, Bagalkote

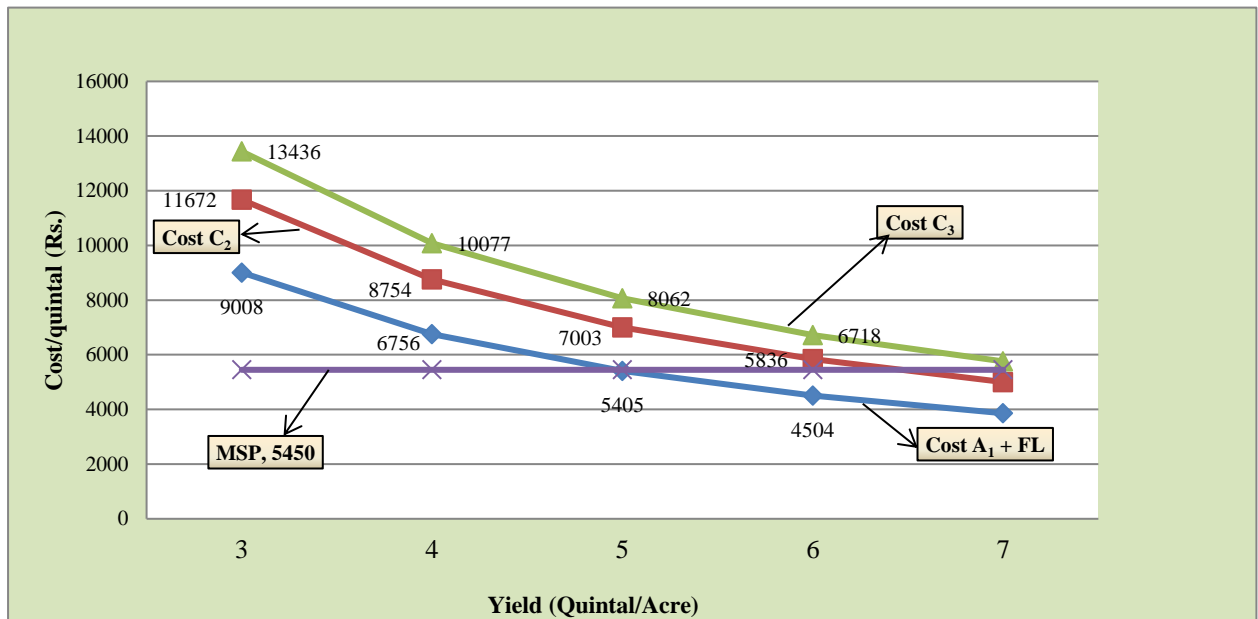
Table-7: Details of Minimum Support Price benefited farmers: 2017-18

Sl.No.	Crops	MSP (2017-18)	Average Yield	Yield level of Profitable MSP (Qtl/ Acre)				Yield of Krishi Bhagya Beneficiaries (Qtl/ Acre)
				If Cost A ₁ + FL considered	Profitable yield obtained farmers (%)	If Cost C ₂ considered	Profitable yield obtained farmers (%)	
1	Paddy (IRR)	1550	27.97	25 and above	69	35 and above	6	-
2	Paddy (RF)		18.06	18 and above	50	25 and above	21	26
3	Ragi	1900	7.58	10 and above	31	15 and above	5	9
4	Jowar(Hybrid)	1700	7.32	10 and above	51	13 and above	19	14
5	White Jowar	1725	4.50	7 and above	19	10 and above	2	
6	Maize	1425	20.16	17 and above	100	23 and above	42	43
7	Bajra	1425	5.17	12 and above	2	-	-	-
8	Tur	5450	4.92	5 and above	77	7 and above	5	8
9	Greengram	5575	3.98	4 and above	67	5 and above	48	11
10	Blackgram	5400	3.28	4 and above	47	5 and above	9	-
11	Bengal gram	4400	4.13	5 and above	17	6 and above	7	11
12	Groundnut	4450	5.11	5 and above	59	7 and above	24	11
13	Soybean	3050	5.70	7 and above	54	9 and above	6	8
14	Sunflower	4100	3.92	5 and above	22	6 and above	15	6
15	Cotton	4320	8.21	8 and above	78	13 and above	10	9
<i>Average</i>					50		16	

Table - 8: Inverse Functional Relationship between yield and cost in Tur

Yield (Qtl/Acre)	Cost Incurred + Family Labour (Cost A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
3	9008	11672	13436	5450	13
4	6756	8754	10077	5450	10
5	5405	7003	8062	5450	52
6	4504	5836	6718	5450	20
7	3861	5002	5758	5450	5

Fig: Inverse Functional Relationship between yield and cost in Tur



$$\ln(\text{Cost } A_1 + \text{FL}) = 10.2045 - 1.00 \ln(\text{Yield})$$

$$(1.47\text{E}+16) \quad (-2.3\text{E}+15)$$

R Square 0.9989

Figures in brackets are *t* values

Table-9 : Selling in state regulated markets and Price situation in 2017-18

Grup	Crop	Production in lakh tonnes	Selling at APMC (Lakh tonnes)	Selling at Regulated market (%)	Average market Price (Rs./Qtl)	MSP (Rs./Qtl)	Selling at Above MSP (%)
Cereals	Paddy	42.10	18.58	44	1952	1550	94
	Ragi	15.55	0.73	5	2380	1900	65
	Hybrid Jowar	11.96	0.25	2	1426	1700	16
	White Jowar		0.26	2	2102	1725	80
	Maize	54.32	20.71	38	1316	1425	16
	Bajra	3.67	0.79	22	1317	1425	18
Total/Average		127.60	41.32	32			48
Pulses	Tur	8.40	2.90	35	3766	5450*	0
	Greengram	1.28	0.99	77	4832	5575	13
	Black gram	0.65	0.29	45	4389	5400	18
	Bengal gram	7.21	1.59	22	4750	4400	37
Total/Average		17.54	5.77	33			17
Oil seeds	Ground nut	6.43	1.32	21	3871	4450	10
	Soybean	4.22	0.69	16	2877	3050	19
	Sunflower	1.44	0.43	30	2899	4100	6
Total/Average		12.09	2.45	20			12
Commercial crops	Cotton (Long staple)	18.51	2.62	14	4856	4320	77
	Dry chilli	1.41	1.39	99	9395		
Total/Average		19.92	4.01	20			77
Vegetables	Tomato	18.38	4.03	22	1436		
	Onion	33.46	10.19	30	1563	624**	93.37
	Potato	4.66	4.44	95	1022		

Total/Average		56.49	18.66	33			93
Fruit crops	Banana (G-9)	24.06	0.09	0.37	1539		
	Banana(Yelakki)		0.04	0.17	3437		
	Grapes (Table)	5.02	0.03	0.60	3057		
	Grapes(Resin)		0.03	0.60	3057		
	Grapes(Bangalore blue)		0.01	0.20	1797		
	Pomegranate	2.07	0.62	30	5229		
	Mango	16.59	0.90	5	1518		
Total/Average		47.74	1.73	4			
Plantation crops	Coconut	49.27	1.17	5.93	2572		
	Copra		1.75		9012	7750	81
	Arecanut (Red)	4.42	2.21	50	37893	27000**	100
	Arecanut(Chali)				21904	25100**	1
Total/Average		53.69	5.13	9.56			60
Spice crops	Ginger	2.96	0.08	3	6264		
	Turmeric	0.65	0.12	19	7653		
	Pepper	0.19	0.09	49	40619		
Total/Average		3.80	0.29	8			
Total / Average		338.87	79.36	23			41

* State additional Bonus- Rs.500/Quintal

** Karnataka state announced market intervention price for onion and arecanut in 2016-17

Table-10: Details of State procurement under MSP in Past 5 years

Year	Procurement Quantity (in Lakh quintals)	Total value (Rs. in crores)	No. Beneficiaries
2013-14	104.52	1717.97	1,62,012
2014-15	27.28	464.21	49,867
2015-16	29.21	565.52	78,835
2016-17	44.07	2044.95	1,63,282
2017-18	51.49	2842.33	4,37,828
Total	256.57	7634.98	891.85

Table-11: Summary of arrivals Prices of Agricultural and Horticultural crops in 2017-18

Sl.No.	Crops	Arrivals and Prices situation compared to last year up to October Compare (%)		Highest arrivals months	Price forecasting in future days
		Arrivals	Price		
1	Paddy	-10	-4	January, May June, November, December	Forecast Price is lies near Rs.2106 and this price above compared to Production Cost and MSP also
2	Ragi	175	-20	January, June, November, December	Forecast Price is lies near Rs.2500 and Chances for increasing in future. This price is slightly above compared to A ₁ +FL and below compared to MSP
3	Hybrid jowar	194	-13	January, February, March, April, May	Forecast Price is lies near Rs.1500, this price is Below compared to both A ₁ +FL and MSP.
	White jowar	26	-12	February, March, April, May, October	Forecast Price is lies near Rs.2000 and chances of decreasing in future, this price is Below compared to both Production cost and MSP.
4	Maize	46	-18	January, February, March November, December	Forecast Price is lies near Rs.1400 and Chances for increasing in future. This price is slightly above compared to A ₁ +FL and below compared to MSP.
5	Bajra	-4	-21	January, September, October,	Forecast Price is lies near Rs.1450, this price is Below compared to

				November, December	both Production cost and MSP.
6	Tur	-13	-6	January, February, March, April , December	Forecast Price is lies near Rs.3300 chances of decreasing in future, this price is Below compared to both A ₁ +FL and MSP.
7	Green gram	21	2	August , September, October	Forecast Price is lies near Rs.4400 chances of decreasing in future, This price is slightly above compared to A ₁ +FL and below compared to MSP.
8	Black gram	-18	-27	September, October, November, December	Forecast Price is lies near Rs.4000 , this price is Below compared to both A ₁ +FL and MSP.
9	Bengal gram	81	-34	January, February, March, April	Forecast Price is lies near Rs.3900 , this price is Below compared to both A ₁ +FL and MSP.
10	Ground nut	11	-16	February, March, April, October	Forecast Price is lies near Rs.3800 , this price is Below compared to both A ₁ +FL and MSP.
11	Soy bean	-11	22	January,, , March, October, November,December	Forecast Price is lies near Rs.2900 chances of decreasing in future, this price is Below compared to both A ₁ +FL and MSP.
12	Sunflower	23	13	January,October, November, December	Forecast Price is lies near Rs.1400 and Chances for increasing in future. this price is Below compared to both A ₁ +FL and MSP.
13	Cotton	11	-2	January,September,October, November, December	Forecast Price is lies near Rs.5900 and Chances for slightly increasing in future. this price is above compared to both A ₁ +FL and MSP.

14	Dry chilli	-13	21	January, February, March, April	Forecast Price is lies near Rs.7500 and Chances for slightly increasing in future, . this price is above compared to both A ₁ +FL and MSP.
15	Tomato	76	-64	June, July August ,September	Forecast Price is lies near Rs.700 chances of decreasing in future, this price is Below compared to both A ₁ +FL and expecting same for the future
16	Onion	32	9	September, October, November, December	Forecast Price is lies near Rs.1100 and expecting same for the future, this price is above compared to A ₁ +FL and expecting same for the future.
17	Potato	-4	53	May, August , September December	Forecast Price is lies near Rs.1500 and Chances for increasing in future. this price similar to A ₁ +FL
18	Banana	37	-6	March, April, May	Forecast Price is lies near Rs.3300, and Chances for increasing in future. this price is above compared to A ₁ +FL.
19	Grapes	-13	41	January, February, March, April	White Grapes : Forecast Price is lies near Rs.3700, and Chances for increasing in future, this price is above compared to A ₁ +FL. Black Grapes : Forecast Price is lies near Rs.2600, and Chances for increasing in future .this price is above compared to A ₁ +FL.
20	Pomegranate	-5	37	May, June, July, August, September	Forecast Price is lies near Rs.8000, and Chances for increasing in future. this price is above compared to A ₁ +FL.
21	Mango	-32	-25	March, April, May, August	NA

22	Coconut	-10	41	July, August, September, October, November, December, January	Forecast Price is lies near Rs.14500, and Chances for increasing in future. this price is above compared to A_1+FL .
	Copra	-5	67	January August, September, October, November, December	Forecast Price is lies near Rs.13500, and Chances for increasing in future. this price is above compared to A_1+FL .and MSP also.
23	Red areca nut	8	-8	January, February, March,, December	Forecast Price is lies near Rs.35000, and Chances for increasing in future.this price is above compared to A_1+FL .
	White chali	-3	5	January and May	Forecast Price is lies near Rs.27000, and Chances for increasing in future. this price is above compared to A_1+FL .
24	Ginger	-26	18	January, February, March, April, May October	Forecast Price is lies near Rs.10000, and Chances for increasing in future this price is above compared to A_1+FL .
26	Turmeric	16	12	February, March, April, June, October	Forecast Price is lies near Rs.7800 and Chances for increasing in future, this price is above compared to A_1+FL ..
26	Pepper	103	-33	March ,April ,May, June	Forecast Price is lies near Rs.7800 and Chances for decreasing in future, this price is above compared to A_1+FL .

Table-12: Letter to DCs and their replies for the Price crash for different Crops based on Newspaper reports

Sl.No	Date of Letter	Crop	District	News paper date	Reply date
1	15-06-2018	Tomato	Chickballapur	Udayavani 05-06-2018	No
2	15-06-2018	Onion	Vijayapura	Prajavani 07-06-2018	No
3	15-06-2018	Areca nut	Shimogga	Prajavani 12-06-2018	06-07-2018
4	19-06-2018	Tomato	Bangalore-Rural	Hosa diganta 15-06-2018	No
5	06-07-2018	Pepper	Chikmagaluru	Prajavani 05-07-2018	No
6	01-08-2018	Tomato	ChamarajaNagara	Vijaya Karnataka 01-08-2018	16-08-2018
7	01-09-2018	Ground nut	Belagavi	Samyukta Karnataka 29-08-2018	01-10-2018
8	07-09-2018	Tomato	Dharwad	Samyukta Karnataka 03-09-2018	No
9	09-10-2018	Bajra	Vijayapura	Prajavani 08-10-2018	26-10-2018
10	09-10-2018	Onion	Dharwad	Prajavani 09-10-2018	No
11	16-11-2018	Paddy	Shivamogga	Shivamogga Live.com 13-11-2018	No
12	19-11-2018	Onion	Gadag	Vijaya Karnataka 18-11-2018	No
13	19-11-2018	Paddy and Maize	Uttar Kannada	Vijaya Karnataka 18-11-2018	No
14	19-11-2018	Maize	Haveri	Vijaya Karnataka 18-11-2018	No
15	19-11-2018	Black gram,Green gram and Bengal gram	Kalburgi	Vijaya Karnataka 18-11-2018	No
16	19-11-2018	Black gram,Green gram and Bengal gram	Bidar	Vijaya Karnataka 18-11-2018	No
17	19-11-2018	Black gram,Green gram and Bengal gram	Yadgir	Vijaya Karnataka 18-11-2018	No
18	19-11-2018	Onion and Maize	Chitradurga	Vijaya Karnataka 18-11-2018	No
19	19-11-2018	Paddy	Mandya	Vijaya Karnataka 18-11-2018	No
20	19-11-2018	Paddy	Mysuru	Vijaya Karnataka 18-11-2018	No
21	19-11-2018	Green gram, Soy bean and Maize	Dharwad	Vijaya Karnataka 18-11-2018	No
22	18-12-2018	Banana	Ramnagara	Prajavani 17-12-2018	-
23	19-12-2018	Drychilli	Ballari	New Indian express 1 9-12-2018	-

Table-13: Karnataka Agriculture Price Commission proposals to the Government for price stabilization of Agriculture and Horticulture crops-2018-19

Sl. No	Proposal	Submission	Date	Appendix No.
1	Regarding to start procurement of Green gram under MSP for the price stabilization	Additional Chief secretary and Development Commissioner, Vidhana soudha, Govt. Of Karnataka, Bengaluru.	09-07-2018	23
2	Procurement of crops under MSP through market intervention scheme in Kharif season due to Price fall-2018-19.	Sri. Shiva Shankar Reddy Honb'le Agriculture Minister Govt. Of Karnataka, Bengaluru.	17-08-2018	24
3	Implementation of PDPS Scheme for Tomato and Onion in Karnataka.	Sri.H D Kumaraswamy Honb'le Chief Minister Govt. Of Karnataka, Bengaluru.	12-09-2018	25
4	Procurement of Kharif crops(Maize, Black gram, Groundnut, Soy bean, Sunflower, and Bajra) under MSP	Sri. Shiva Shankar Reddy Honb'le Agriculture Minister Govt. Of Karnataka, Bengaluru.	20-10-2018	26
5	Cost of cultivation and Minimum support Price for Millets.	Commissioner Department of Agriculture, Bengaluru	30-10-2018	27
6	Procurement of Maize under Minimum support price and distribution through PDS.	Sri.H D Kumaraswamy Honb'le Chief Minister Govt. Of Karnataka, Bengaluru.	09-11-2018	28
7	Regarding to start procurement of tur under MSP for the price stabilization	Additional Chief secretary and Development Commissioner, Vidhana soudha, Govt. Of Karnataka, Bengaluru.	18-12-2018	51

Table-14: Estimation of cost of production and minimum support price for Millets in 2017-18

Sl.No.	Crops	Yield / Acre (Quintal)	Cost/ Acre (Rs)		Cost/ Quintal (Rs)		MSP as per CACP formula
		Actual	A ₁ + FL	C ₂	A ₁ + FL	C ₂	[(A ₁ + FL)+50%]
1	Barnyard Millet (Udalu)	6.3	18539	28119	2862	4383	4293
2	Browntop Millet (Korale)	5.5	16502	19714	2755	3339	4133
3	Foxtail Millet (Navane)	3.01	10584	12054	3028	3516	4542
4	Kodo Millet (Haraka)	7.32	18971	23891	2349	3021	3524
5	Little Millet (Saame)	4.88	7958	11147	1515	2168	2273
6	Proso Millet (Baragu)	3.75	15117	22271	3900	5808	5850

Cost A₁ = Actual paid out cost + Depreciation on fixed capital

FL = Family labour cost

Cost C₂ = Cost A₁ + FL + Rental value on land + Interest on fixed capital

**Table-15: Quantity of Agricultural and Horticultural commodities utilised for programmes under Food security act and various welfare schemes
(Lakh quintal)***

Sl. No.	Commodities	Prison Department	Public student hostels	Welfare agencies	Mid-day meal at School	Indira canteen	Public distribution system (PDS)**	Total	Future plans ***	Revised needs
1	Paddy	0.27	9.35	0.68	16.34	2.48	332.40	361.53	272.40	301.53
2	Ragi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	30.00
3	Jowar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	30.00
4	Pulses	0.09	3.18	0.23	3.27	0.77	12.00	19.54	12.00	31.54
5	Cooking oil	0.02	0.75	0.05	0.82	0.23	0.00	1.87	12.00	13.87
6	Onion	0.03	0.94	0.07	0.00	0.31	0.00	1.34	-	1.34
7	Vegetables	0.09	2.99	0.22	8.17	0.76	0.00	12.23	-	12.23
Total		0.49	17.20	1.25	28.60	4.56	344.40	396.51	-	420.51
No. of Beneficiaries (in lakh numbers)		0.15	6.23	0.37	54.43	2.00	100.00	163.19	-	-

*Food grains needed for mid-day meal scheme are estimated at a daily basis and in other projects materials required by the department of prison is based on daily necessity.

** As per present prescribed rules.

*** Distribution of 5kg Ragi and 5 kg Jowar to 50 per cent of families under public distribution system and also distributing pulses along with 1 kg Tur

Source: Department of Education, Mid-day meal scheme section, Food and civil supplies department and department of Prison, Government of Karnataka

Table-16: Quantity of various Agricultural and Horticultural commodities utilised under several Government programmes

(Quantity in grams)

Sl. No.	Commodities	Mid-day meal at School		Prison		Average (Per day per person)
		1 to 5 th standard	6 to 10 th standard	Breakfast	Meal	
1	Paddy	100	150	100	200	400 (56)
2	Pulses	20	30	10	80	97 (13)
3	Cooking oil	50	75	20	10	110 (15)
4	Onion	-	-	30	10	37 (5)
5	Vegetables	5	7.5	20	70	75 (10)
Total		175	263	180	370	718 (100)

Source: Department of Education, Mid-day meal scheme section, Food and civil supplies department and Department of Prison, Government of Karnataka.

Note: Values in the parenthesis denotes percentage

Table-17: Categories of Cost Reduction Machineries recorded by Universities

Sl. No.	Particulars	UAS Bengaluru	UHS Bagalkote	UAS Raichur	UAS Dharwad	Total
1.	Crop production technologies	23	101	40	13	177
2.	Crop protection technologies	29	42	44	11	126
3.	Farm machineries	35	100	38	8	181
4.	Post-harvest machineries	11	28	20	1	60
Total Machineries		98	271	142	33	544

Appendix-1: Selected Sample Farmers Details for the study: 2017-18

Sl. No.	Crops	District	Taluk	No. of Farmers	
A. Agricultural Crops					
1	A. Paddy (Irrigated)	Shivamogga	Shikaripura	Bhadravati	90
		Mysuru	T.Narsipura	K.R.Nagar	
		Raichur	Manvi	Sindhanur	
	B. Paddy (Rainfed)	Belagavi	Khanapur	Belagavi	60
Uttara Kannada		Haliyala	Mundagodu		
2	Ragi	Ramnagar	Kanakpura	Magadi	60
		Tumkur	Gubbi	Kunigal	
3	A. Hybrid Jowar	Chamrajnagar	Gundlupet	-	75
		Belagavi	Ramdurga	Hukkeri	
		Bidar	Basavakalyana	Humnabad	
	B. White Jowar	Vijayapura	Indi	Vijayapura	105
		Belagavi	Hukkeri	Chikkodi	
		Chamrajnagar	Chamrajnagar	-	
4	Maize	Davangere	Harappanahalli	Davangere	60
		Haveri	Hirekerur	Haveri	
5	Bajra	Koppal	Kustagi	Gangavati	60
		Raichur	Devadurga	Lingasuguru	
6	Tur	Kalaburgi	Jeevaragi	Kalaburgi	90
		Bidar	Aurad	Bhalki	
		Vijayapura	Basavana Bagevadi	Managuli	
7	Greengram	Kalaburgi	Chittapura	Sedam	60
		Gadag	Gadag	Rona	
8	Blackgram	Mysuru	T. Narsipur	Nanjagud	90
		Kalaburgi	Chincholi	Alanda	
		Bidar	Bhalki	Aurad	
9	Bengalgram	Kalaburgi	Alanda	Chittapura	60
		Vijayapura	Basavana Bagewadi	Vijayapura	
10	Groundnut	Tumkur	Sira	Pavagada	60
		Chitradurga	Challakere	Molakalmuru	
11	Soybean	Belagavi	Bailahongal	Hukkeri	60
		Bidar	Bhalki	Aurad	
12	Sunflower	Koppal	Yelaburgi	Gangavati	60
		Vijayapura	Basavana Bagewadi	Vijayapura	
13	Cotton	Yadgir	Surapura	Shahapura	60
		Haveri	Hirekerur	Haveri	
14	Dry Chilli	Gadag	Shirahatti	Rona	60
		Ballari	Siraguppa	Ballari	

Sl.No.	Crops	District	Taluk		No. of Farmers
B. Horticultural Crops					
15	Tomato	Belagavi	Bailahongal	Belagavi	60
		Chikballapur	Chintamani	-	
		Kolar	Kolar	-	
16	Onion	Chitradurga	Challakere	Chitradurga	60
		Gadag	Rona	Gadag	
17	Potato	Belagavi	Khanapur	Belagavi	60
		Hassan	Arkalgudu	Hassan	
18	A. Banana (Yelakki)	Mysuru	Nanjangudu	H.D.Kote	30
	B. Banana (G-9)	Chamrajnagar	Gundlupete	Kollegala	30
19	A. Grapes (Table)	Belagavi	Athani	Raibhag	45
		Vijayapura	Vijayapura	-	
	B. Grapes (Raisins)	Belagavi	Athani	-	30
		Vijayapura	Indi	-	
	C. Grapes (Bangalore Blue)	Chikballapur	Shidlaghatta	Chikballapur	30
20	Pomegranate	Ballari	Hagari Bommanahalli	Ballari	60
		Vijayapura	Indi	Vijayapura	
21	Mango	Kolar	Srinivaspura	Kolar	60
		Ramnagar	Chanpatna	Ramnagar	
22	Coconut	Tumkur	Tiptur	Turuvekere	60
		Hassan	Chanraypatna	Arsikere	
23	A. Arecanut (Red)	Chikmagalur	Tarikere	Koppa	90
		Shivamogga	Bhadravati	Theerthahalli	
		Davangere	Honnali	Channagiri	
	B. Arecanut (White)	Dakshina Kannada	Beltangadi	Sulya	60
		Udupi	Karkala	Kundapura	
24	Ginger	Shivamogga	Hosanagar	Shikaripura	60
		Hassan	Arakalgud	Hassan	
25	Turmeric	Belagavi	Raibhag	Athani	60
		Chamrajnagar	Kollegala	Chamrajnagar	
26	Pepper	Chikmagalur	Mudigere	Chikmagalur	60
		Hassan	Aluru	Sakleshpur	
Total		24	90		1965

Note : 15 Model farmers selected from each taluk

Appendix- 4 (A): Decadal Change in Area and Production of Agricultural Crops (2008-09 to 2017-18)

(Area: Lakh Ha Production: Lakh Tons)

Sl.No.	Crops	2017-18		2008-09		Decadal Change (%)	
		Area	Production	Area	Production	Area	Production
1	Paddy	9.68 (11.08)	42.10 (23.77)	15.14 (16.28)	60.44 (41.55)	-5.46 (-36)	-18.34 (-30)
2	Ragi	7.75 (8.87)	15.55 (8.78)	8.41 (9.05)	12.33 (8.48)	-0.66 (-8)	3.22 (26)
3	Jowar	10.89 (12.46)	11.96 (6.75)	13.82 (14.86)	14.84 (10.2)	-2.93 (-21)	-2.88 (-19)
4	Maize	12.88 (14.74)	54.32 (30.66)	10.68 (11.49)	29.56 (20.32)	2.20 (21)	24.76 (84)
5	Bajra	2.32 (2.65)	3.67 (2.07)	2.66 (2.86)	1.81 (1.24)	-0.34 (-13)	1.86 (103)
Total Cereals		43.52 (49.8)	127.60 (72.03)	50.71 (54.54)	118.98 (81.8)	-7.19 (-14)	8.62 (7)
6	Tur	8.85 (10.13)	8.40 (4.74)	5.97 (6.42)	3.14 (2.16)	2.88 (48)	5.26 (168)
7	Greengram	3.97 (4.54)	1.28 (0.72)	2.75 (2.96)	0.39 (0.27)	1.22 (44)	0.89 (228)
8	Black gram	1.36 (1.56)	0.65 (0.37)	1.12 (1.2)	0.32 (0.22)	0.24 (21)	0.33 (103)
9	Bengal gram	12.65 (14.48)	7.21 (4.07)	7.26 (7.81)	3.97 (2.73)	5.39 (74)	3.24 (82)
Total Pulses		26.83 (30.7)	17.54 (9.9)	17.10 (18.39)	7.82 (5.38)	9.73 (57)	9.72 (124)
10	Ground nut	6.15 (7.04)	6.43 (3.63)	8.50 (9.14)	3.98 (2.74)	-2.35 (-28)	2.45 (62)
11	Soybean	2.76 (3.16)	4.22 (2.38)	1.34 (1.44)	0.93 (0.64)	1.42 (106)	3.29 (354)
12	Sunflower	1.89 (2.16)	1.44 (0.81)	10.01 (10.77)	4.14 (2.85)	-8.12 (-81)	-2.70 (-65)
Total Oilseeds		10.80 (12.36)	12.09 (6.82)	19.85 (21.35)	9.05 (6.22)	-9.05 (-46)	3.04 (34)
13	Cotton	5.46 (6.25)	18.51 (10.45)	4.09 (4.4)	8.25 (5.67)	1.37 (33)	10.26 (124)
14	Dry chilli	0.78 (0.89)	1.41 (0.79)	1.22 (1.32)	1.35 (0.93)	-0.44 (-36)	0.06 (4)
Total Commercial crops		6.24 (7.14)	19.92 (11.24)	5.31 (5.71)	9.60 (6.6)	0.93 (17)	10.32 (107)
Total Agricultural crops (A)		87.39 (100)	177.15 (100)	92.97 (100)	145.45 (100)	-5.58 (-6)	31.70 (22)

Source: Directorate of Economics and Statistics 2008-09 and 2017-18 (4th Estimate)

Values in the Parenthesis denotes Percentage

Appendix- 4 (B): Decadal Change in Area and Production of Horticultural Crops (2008-09 to 2017-18)

(Area: Lakh Ha Production: Lakh Tons)

Sl.No.	Crops	2017-18		2008-09		Decadal Change (%)	
		Area	Production	Area	Production		
15	Tomato	0.59 (3.74)	18.38 (11.37)	0.35 (3.1)	3.48 (4.68)	0.25 (72)	14.90 (428)
16	Onion	2.10 (13.26)	33.46 (20.69)	1.35 (12.14)	7.21 (9.7)	0.75 (55)	26.25 (364)
17	Potato	0.30 (1.88)	4.66 (2.88)	0.76 (6.81)	2.46 (3.31)	-0.46 (-61)	2.19 (89)
Total Vegetable crops		2.98 (18.86)	56.49 (34.94)	2.45 (22.05)	13.15 (17.7)	0.53 (22)	43.34 (330)
18	Banana	0.96 (6.09)	24.06 (14.88)	0.61 (5.49)	10.59 (14.25)	0.35 (58)	13.46 (127)
19	Grapes	0.26 (1.66)	5.02 (3.11)	0.12 (1.1)	3.17 (4.27)	0.14 (115)	1.85 (58)
20	Pomegranate	0.26 (1.64)	2.07 (1.28)	0.18 (1.59)	1.91 (2.57)	0.08 (46)	0.16 (8)
21	Mango	2.40 (15.17)	16.59 (10.26)	1.15 (10.34)	4.85 (6.53)	1.25 (109)	11.73 (242)
Total Fruit crops		3.88 (24.55)	47.74 (29.52)	2.06 (18.52)	20.53 (27.62)	1.82 (89)	27.20 (133)
22	Coconut	5.19 (32.82)	49.27 (30.47)	4.19 (37.69)	28.68 (38.58)	1.00 (24)	20.59 (72)
23	Arecanut	2.82 (17.85)	4.42 (2.73)	1.85 (16.59)	2.44 (3.28)	0.98 (53)	1.98 (81)
Total Plantation crops		8.01 (50.67)	53.69 (33.2)	6.04 (54.28)	31.12 (41.86)	1.98 (33)	22.57 (73)
24	Ginger	0.26 (1.63)	2.96 (1.83)	0.26 (2.29)	8.12 (10.92)	0.00 (1)	-5.16 (-64)
25	Turmeric	0.22 (1.37)	0.65 (0.4)	0.14 (1.28)	0.67 (0.91)	0.07 (52)	-0.03 (-4)
26	Pepper	0.46 (2.91)	0.19 (0.12)	0.18 (1.57)	0.74 (1)	0.29 (163)	-0.55 (-74)
Total Spice crops		0.94 (5.91)	3.80 (2.35)	0.57 (5.14)	9.53 (12.82)	0.36 (64)	-5.73 (-60)
Total Horticultural crops (B)		15.82 (100)	161.71 (100)	11.12 (100)	74.33 (100)	4.70 (42)	87.38 (118)
Total Crops (A + B)		103.21	338.86	104.10	219.78	-0.88 (-1)	119.08 (54)

Source: Directorate of Economics and Statistics 2008-09 and 2017-18 (4th Estimate)

Values in the Parenthesis denotes Percentage

Appendix-5: Acreage cost estimation of Agricultural and Horticultural crops (Cost C₃) (Percentage): 2017-18

Group	Crops	Cost (Rs/ Acre)			Types of cost (%)							
		Variable cost + Amortised cost	Fixed cost	Cost C ₃	Daily wages	Animal/ Machine	Family labour	Inputs	Interest (Variable + Fixed cost)	Establishment cost	Rental value of Land	Managerial cost
Cereals	Paddy (Irrigated)	35001 (64)	19281 (36)	62424 (100)	13	12	4	27	6	0	26	14
	Paddy (Rainfed)	21762 (60)	14282 (40)	41450 (100)	15	11	11	21	8	0	21	14
	Ragi	19855 (67)	9654 (33)	33936 (100)	21	14	6	20	8	0	17	14
	Hybrid Jowar	18333 (73)	6876 (27)	28991 (100)	18	21	7	20	7	0	12	15
	White Jowar	13684 (69)	6196 (31)	22862 (100)	19	16	6	20	7	0	17	14
	Maize	20410 (66)	10750 (34)	35834 (100)	15	14	7	25	6	0	19	14
	Bajra	16031 (76)	5133 (24)	24339 (100)	23	23	7	18	7	0	8	15
Average		20725 (68)	10310 (32)	31035 (100)	18	16	7	21	7	0	17	14
Pulses	Tur	25763 (73)	9529 (27)	14823 (100)	15	22	4	22	6	0	17	14
	Greengram	16553 (71)	6696 (29)	10183 (100)	19	19	4	19	6	0	18	14
	Black gram	16498 (73)	6114(27)	9506 (100)	21	18	6	21	6	0	13	14
	Bengal gram	17428 (72)	6634 (28)	10243 (100)	18	15	7	24	7	0	15	14
Average		19061 (72)	7243 (28)	26304 (100)	18	19	5	22	6	0	16	14
Oil seeds	Ground nut	18890 (63)	10919 (37)	34280 (100)	18	9	11	24	6	0	17	14
	Soybean	19006 (74)	6768 (26)	29640 (100)	18	18	4	24	6	0	15	14
	Sunflower	17682 (72)	6941 (28)	28317 (100)	21	15	6	23	8	0	13	15
Average		18526 (70)	8209 (30)	26735 (100)	19	14	7	23	7	0	15	14
Commercial crops	Cotton	31899 (71)	13262 (29)	51935 (100)	16	9	4	25	11	0	21	14
	Dry chilli	85686 (70)	36497 (30)	140510 (100)	23	6	3	22	10	0	23	14
Average		58793 (71)	24880 (30)	83672 (100)	20	7	4	24	10	0	22	14
Vegetable crops	Tomato	105355 (70)	44760 (30)	172632 (100)	18	3	6	28	7	0	23	15
	Onion	41277 (60)	27231 (40)	78784 (100)	17	6	7	22	7	0	27	14
	Potato	50739 (74)	17515 (26)	78492 (100)	12	8	5	39	8	0	14	14

Average		65790 (68)	29835 (32)	95626 (100)	16	6	6	30	7	0	21	14
Fruit crops	Banana (Yelakki)	78801 (44)	98779 (56)	204217 (100)	9	2	2	21	6	0	47	13
	Banana (G-9)	78695 (24)	244395 (76)	371553 (100)	6	1	1	10	3	0	65	13
	Grapes (Table)	162255 (53)	145077 (47)	307332 (100)	14	1	2	21	7	9	32	13
	Grapes(Raisin)	185670(45)	230685(55)	416355 (100)	12	1	3	17	6	6	41	13
	Grapes(Bangalore blue)	131935 (60)	87191 (40)	219126 (100)	16	0	5	21	8	16	21	13
	Pomegranate	168034(76)	53346(24)	221380 (100)	11	2	3	23	8	30	8	14
	Mango	29663(66)	14981 (34)	44644 (100)	13	5	3	20	13	16	16	14
Average		96928 (47)	124762 (53)	221690 (100)	12	2	3	19	7	11	33	13
Plantation crops	Coconut	40028 (55)	33234 (45)	209542 (100)	10	9	5	16	9	8	28	15
	Arecanut (Red)	105712 (50)	103830 (50)	209542 (100)	16	1	3	15	9	9	33	14
	Arecanut (Chali)	83456 (41)	120962 (59)	204418 (100)	14	0	8	16	9	6	33	14
Average		65352 (48)	75871 (52)	207653 (100)	13	3	5	16	9	8	31	14
Spice crops	Ginger	192705 (73)	72914 (27)	305461 (100)	18	3	2	32	10	0	21	13
	Turmeric	73464 (65)	40207(35)	167461 (100)	11	3	4	26	9	0	34	13
	Pepper	60854 (61)	38251 (39)	113971 (100)	12	0	1	20	19	12	22	14
Average		111738 (63)	58376 (37)	170114 (100)	14	2	2	26	13	4	26	13
Total Average					17	9	5	23	8	3	23	14

Appendix-6: Stage wise cost of cultivation: 2017-18 (Rs/Acre)

Crops	Cost	Germination stage		Growth stage		Maturity stage		Harvest stage		Total	
		Value (Rs)	%	Value (Rs)	%	Value (Rs)	%	Value (Rs)	%	Value (Rs)	%
Paddy (Irrigated)	A ₁ +FL	16777	45	7829	21	6711	18	5965	16	37282	100
	C ₃	28091	45	13109	21	11236	18	9988	16	62424	100
Paddy (Rainfed)	A ₁ +FL	15616	60	3383	13	2082	8	4945	19	26026	100
	C ₃	24870	60	5389	13	3316	8	7876	19	41450	100
Ragi	A ₁ +FL	10377	48	3675	17	1297	6	6270	29	21619	100
	C ₃	16289	48	5769	17	2036	6	9841	29	33936	100
Hybrid Jowar	A ₁ +FL	10656	53	4624	23	804	4	4021	20	20105	100
	C ₃	15365	53	6668	23	1160	4	5798	20	28991	100
White Jowar	A ₁ +FL	9773	65	2857	19	301	2	2105	14	15036	100
	C ₃	14860	65	4344	19	457	2	3201	14	22862	100
Maize	A ₁ +FL	12411	55	3836	17	677	3	5642	25	22566	100
	C ₃	19709	55	6092	17	1075	3	8959	25	35834	100
Bajra	A ₁ +FL	10170	58	2630	15	701	4	4033	23	17534	100
	C ₃	14117	58	3651	15	974	4	5598	23	24339	100
Tur	A ₁ +FL	12558	46	7917	29	1365	5	5460	20	27301	100
	C ₃	18670	46	11770	29	2029	5	8117	20	40586	100
Greengram	A ₁ +FL	10764	61	3353	19	353	2	3176	18	17646	100
	C ₃	16309	61	5080	19	535	2	4812	18	26736	100
Black gram	A ₁ +FL	10069	56	3776	21	539	3	3596	20	17980	100
	C ₃	14562	56	5461	21	780	3	5201	20	26004	100
Bengal gram	A ₁ +FL	11356	59	3464	18	385	2	4042	21	19247	100
	C ₃	16326	59	4981	18	553	2	5811	21	27671	100
Ground nut	A ₁ +FL	12820	57	5173	23	675	3	3824	17	22492	100
	C ₃	19540	57	7884	23	1028	3	5828	17	34280	100
Soybean	A ₁ +FL	10898	54	4440	22	404	2	4440	22	20182	100
	C ₃	16006	54	6521	22	593	2	6521	22	29640	100
Sunflower	A ₁ +FL	13086	68	3464	18	192	1	2502	13	19244	100
	C ₃	19256	68	5097	18	283	1	3681	13	28317	100
Cotton	A ₁ +FL	14972	44	8507	25	3403	10	7146	21	34028	100
	C ₃	22851	44	12984	25	5194	10	10906	21	51935	100
Dry chilli	A ₁ +FL	25068	28	28649	32	11639	13	24172	27	89527	100
	C ₃	39343	28	44963	32	18266	13	37938	27	140510	100
Tomato	A ₁ +FL	45651	40	23967	21	5706	5	38803	34	114127	100
	C ₃	69053	40	36253	21	8632	5	58695	34	172632	100
Onion	A ₁ +FL	26593	57	8864	19	6065	13	5132	11	46655	100
	C ₃	44907	57	14969	19	10242	13	8666	11	78784	100
Potato	A ₁ +FL	34442	63	2734	5	6014	11	11481	21	54670	100
	C ₃	49450	63	3925	5	8634	11	16483	21	78492	100
Ginger	A ₁ +FL	127249	64	29824	15	17894	9	23859	12	198826	100
	C ₃	195495	64	45819	15	27491	9	36655	12	305461	100
Turmeric	A ₁ +FL	54170	61	14209	16	7992	9	12433	14	88804	100
	C ₃	102151	61	26794	16	15071	9	23445	14	167461	100
Average	A ₁ +FL	23594	54	8437	19	3581	6	8716	20	44328	100
	C ₃	37010	54	13215	20	5695	6	13525	20	69445	100

Appendix- 7 (A): Comparison of Minimum Support Price and Cost of Production of crops for 2018-19

Sl.No.	Crops	MSP (Rs/ Qtl)			Production cost (Rs/ Qtl)				Profit or Loss on Production cost (%)			
		2018-19	2017-18	Change (%)	On Cost incurred + family labour (A ₁ +FL)		On Total cost C ₂		On Cost incurred + family labour (A ₁ +FL)		On Total cost C ₂	
					CACP	KAPC	CACP	KAPC	CACP	KAPC	CACP	KAPC
1	Paddy (Common)	1750	1550	13	1166	1234	1560	1841	50	42	12	-5
2	Hybrid Jowar	2430	1700	43	1619	2283	2183	2980	50	6	11	-18
	Jowar (Maldandi)	2450	1725	42	1619	2651	2183	3725	51	-8	12	-34
3	Bajra	1950	1425	37	990	3195	1324	3898	97	-39	47	-50
4	Ragi	2897	1900	52	1931	2446	2370	3390	50	18	22	-15
5	Maize	1700	1425	19	1131	1078	1480	1504	50	58	15	13
7	Tur	5675	5450	4	3432	5493	4981	7117	65	3	14	-20
8	Greengram	6975	5575	25	4650	4379	6161	5786	50	59	13	21
9	Blackgram	5600	5400	4	3438	5482	4989	6894	63	2	12	-19
10	Bengal gram	4620	4400	5	2461	4609	3526	5775	88	0	31	-20
11	Groundnut	4890	4450	10	3260	4297	4186	5729	50	14	17	-15
12	Sunflower	5388	4100	31	3592	4619	4501	5991	50	17	20	-10
13	Soybean	3399	3050	11	2266	3541	2972	4522	50	-4	14	-25
14	Cotton (Long staple)	5450	4320	26	3433	4098	4514	5454	59	33	21	-0.07
Average				23					59	14	19	-14

Cost A₁ = All Actual expenses in cash and depreciation on fixed assets

Cost FL = Family Labour Cost

Cost C₂= Cost A₁+ FL + Rental value of own land + interest on fixed capital

CACP Commission for Agricultural Costs and Prices KAPC Karnataka Agriculture Price Commission Cost

Annexure -8 (A): Yield and Production cost of Major Agricultural crops of Karnataka 2017-18 in comparison to previous year

Group	Crops	Yield (Qtl/ Acre)		Change (%)	Total cost (C ₂)		Change (%)	Cost of Production (Rs/ Qtl)					
		2016-17	2017-18		2016-17	2017-18		Cost incurred + Family Labour (A ₁ + FL)		Change (%)	Total Cost (C ₂)		Change (%)
								2016-17	2017-18		2016-17	2017-18	
Cereals	Paddy (Irrigated)	27.88	27.97	0.32	48835	54282	11.15	1150	1234	7.27	1649	1841	11.65
	Paddy (Rainfed)	14.57	18.06	23.95	34294	36044	5.10	1558	1343	-13.80	1966	1898	-3.44
	Ragi	7.28	7.58	4.12	28184	29509	4.70	2446	2349	-3.97	3300	3390	2.73
	Hybrid Jowar	7.32	7.32	0.00	19685	25209	28.06	1937	2283	17.84	2318	2980	28.56
	White Jowar	4.47	4.51	0.89	19347	19880	2.75	2222	2651	19.31	3204	3725	16.25
	Maize	21.32	20.16	-5.44	28246	31160	10.32	920	1078	17.17	1278	1504	17.67
	Bajra	5.57	5.17	-7.18	17931	21164	18.03	2443	3195	30.80	2891	3898	34.83
Average				2.38			11.45			10.66			15.46
Pulses	Tur	5.38	4.92	-8.55	34692	35292	1.73	4918	5493	11.69	6335	7117	12.35
	Greengram	3.81	3.98	4.46	20653	23249	12.57	4038	4379	8.44	5320	5786	8.77
	Black gram	3.02	3.28	8.61	21408	22612	5.63	5546	5482	-1.16	7081	6894	-2.64
	Bengal gram	4.05	4.13	1.98	23673	24062	1.64	4572	4609	0.81	5847	5775	-1.23
Average				1.62			5.39			4.95			4.31
Oil seeds	Ground nut	3.90	5.11	31.03	26722	29809	11.55	4142	4297	3.75	5548	5729	3.26
	Soybean	6.49	5.70	-12.17	23825	25774	8.18	2787	3541	27.04	3515	4522	28.63
	Sunflower	4.49	3.92	-12.69	21883	24623	12.52	3615	4619	27.77	4617	5991	29.75
Average				2.05			10.75			19.52			20.55
Commercial crops	Cotton	8.77	8.21	-6.39	45847	45161	-1.50	3765	4098	8.84	5230	5454	4.29
	Dry chilli	6.51	14.08	116.28	66060	122183	84.96	7548	6358	-15.76	10147	8678	-14.48
Average				54.95			41.73			-3.46			-5.10
Overall Average (A)				8.70			13.59			9.13			11.06

Appendix -8 (B): Yield and Production cost of Major Horticultural crops of Karnataka 2017-18 in comparison to previous year

Group	Crops	Yield (Qtl/ Acre)		Change (%)	Total cost (C ₂)		Change (%)	Cost of Production (Rs/ Qtl)					
		2016-17	2017-18		2016-17	2017-18		Cost incurred + Family Labour (A ₁ + FL)		Change (%)	Total Cost (C ₂)		Change (%)
								2016-17	2017-18		2016-17	2017-18	
Vegetables crops	Tomato	127.00	148.80	17.17	155443	150115	-3.43	865	767	-11.33	1224	1009	-17.58
	Onion	53.07	62.66	18.07	46117	68508	48.55	653	745	14.02	869	1093	25.82
	Potato	59.10	36.47	-38.29	76660	68254	-10.97	948	1499	58.12	1298	1872	44.23
Average				-1.02			11.39			20.27			17.49
Fruit crops	Banana(Yelakki)	75.92	92.77	22.19	144187	177580	23.16	1211	884	-27.03	1899	1914	0.79
	Banana (G-9)	247.60	290.10	17.16	171891	323090	87.96	343	285	-16.90	694	1114	60.41
	Grapes (Table)	75.05	115.34	53.68	256326	267245	4.26	2151	1239	-42.39	3416	2317	-32.16
	Grapes (Raisins)	24.50	39.28	60.33	299502	362048	20.88	7079	4355	-38.48	12225	9217	-24.60
	Grapes (Bangalore blue)	174.50	115.44	-33.85	232323	190544	-17.98	675	931	37.91	1331	1651	24.01
	Pomegranate	41.00	58.37	42.37	191910	192504	0.31	2741	1903	-30.57	4681	3298	-29.54
Mango	30.55	25.21	-17.48	49904	38820	-22.21	831	972	16.91	1631	1540	-5.57	
Average				20.63			13.77			-14.37			-0.95
Plantation crops	Coconut *	3898	4964	27.35	61033	63706	4.38	10	8	-20.00	15	13	-15.56
	Copra	7.80	7.09	-9.10	71985	79239	10.08	6685	7587	13.49	9234	11174	21.01
	Arecanut (Red)	7.75	8.02	3.48	171823	182211	6.05	12688	11744	-7.44	22171	22720	2.48
	Arecanut(Chali)	8.21	8.75	6.58	166405	177755	6.82	10662	10095	-5.32	20281	20315	0.17
Average				7.08		125728				-4.82			2.02
Spice crops	Ginger	76.87	126.83	64.99	198673	265619	33.70	1608	1568	-2.51	2546	2094	-17.73
	Turmeric	29.46	23.26	-21.05	161596	145618	-9.89	2814	2974	5.69	5017	5416	7.94
	Pepper	2.87	2.29	-20.21	113868	99105	-12.96	20744	27110	30.69	39675	43277	9.08
Average				7.91			3.61			11.29			-0.24
Overall Average (B)				11.38			9.92			-1.48			3.13
Total Agriculture and Horticulture crops (A+B)				20.08			23.51			7.65			14.19

* Coconut in yield numbers

Appendix- 9 : Increase in Minimum Support Price of Major Crops Over Last 13 Years

Sl No.	Crops	UPA period										NDA period						
		2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Annual Growth Rate (%)	Annual Increase in Average (Rs/Qtl)	2014-15	2015-16	2016-17	2017-18	2018-19	Annual Growth Rate (%)	Annual Increase in Average (Rs/Qtl)
1	Paddy	580	645	850	1000	1000	1080	1250	1310	12.28	91	1360	1410	1470	1550	1750	6.17	78
2	Hybrid Jowar	540	600	840	840	880	980	1500	1500	15.69	120	1530	1570	1625	1700	2430	10.57	180
3	Ragi	540	600	915	915	965	1050	1500	1500	15.63	120	1550	1650	1725	1900	2895	14.92	269
4	Maize	540	620	840	840	880	980	1175	1310	12.52	96	1310	1325	1365	1425	1700	6.12	78
5	Red gram	1410	1550	2000	2300	3000	3200	3850	4300	18.18	361	4350	4625	5050	5450	5675	7.21	265
6	Green gram	1520	1700	2520	2760	3170	3500	4400	4500	17.4	373	4600	4850	5225	5575	6975	10.21	475
7	Black gram	1520	1700	2520	2520	2900	3300	4300	4300	16.56	348	4350	4625	5000	5400	5600	8.05	250
8	Groundnut	1520	1550	2100	2100	2300	2700	3700	4000	15.31	310	4000	4030	4220	4450	4890	5.14	178
9	Sunflower	1500	1510	2215	2215	2350	2800	3700	3700	14.76	275	3750	3800	3950	4100	5388	8.34	327.6
10	Soybean	1020	1050	1390	1390	1440	1690	2240	2560	13.79	193	2560	2600	2775	3050	3399	7.54	167.8
11	Sesamum	1560	1580	2750	2850	2900	3400	4200	4500	16.68	368	4600	4700	5000	5300	6249	7.60	329.8
12	Niger	1220	1240	2405	2405	2450	2900	3500	3500	16.94	285	3600	3650	3825	4050	5877	11.45	455.4
13	Cotton	1770	1800	2500	2500	2500	2800	3600	3700	11.27	241	3750	3800	3860	4020	5450	8.37	340
	Average									15	228						9	261

Source: Commission for Agricultural Costs and Price (CACP).

Appendix- 10 : Economics and Price Stability of Agriculture and Horticultural crops compared to Paddy -Last 3-4 Years Average

Group	Sl. No.	Crops	Acre-wise Profit/Loss (Rs)	Acre-wise Cost (A ₁ +FL) (Rs/ Acre)	Monthly Price Fluctuation (%)	Compared to paddy		
						Acreage Profitability	Acreage Cost (A ₁ +FL)	Monthly Price Fluctuation (%)
Cereals		Paddy (Irrigated) ^μ	17739	33402	3	100	100	100
		Paddy (Rainfed) ^μ	222	27448	3	1	82	100
	2	Ragi ^μ	-1413	23449	12	-8	70	400
	3	Hybrid Jowar ^μ	-2688	15287	10	-15	46	333
		White Jowar ^μ	1450	14891	9	8	45	300
	4	Maize ^μ	6228	19839	13	35	59	433
5	Bajra ^μ	-6661	15251	15	-38	46	500	
Average			2125	21367	9	12	64	310
Pulses	6	Red gram ^μ	8848	22337	6	50	67	200
	7	Green gram	2809	16604	5	16	50	167
	8	Black gram	-2022	17050	19	-11	51	633
	9	Bengal gram ^μ	119	17597	19	1	53	633
Average			2438	18397	12	14	55	408
Oilseeds	10	Groundnut ^μ	281	21966	11	2	66	367
	11	Soybean ^μ	1646	18228	11	9	55	367
	12	Sunflower ^μ	-1432	16861	6	-8	50	200
Average			165	19018	9	1	57	311
Commercial crops	13	Cotton ^μ	9880	31762	9	56	95	300
	14	Dry chilli ^μ	24653	65043	7	139	195	233
Average			17266	48402	8	97	145	267
Vegetables	15	Tomato ^μ	37166	115118	73	210	345	2433
	16	Onion	31510	39878	45	178	119	1500
	17	Potato	4379	56509	6	25	169	200
Average			24352	70502	41	137	211	1378
Fruits	18	Banana Yelakki	176127	82631	19	993	247	633
		Banana (G-9)	228944	81493	7	1291	244	233
	19	Grapes (Table)	106804	121334	7	602	363	233
		Dry Grapes	290695	136745	7	1639	409	233
		Grapes (Bangalore Blue)	116517	112652	12	657	337	400
	20	Pomegranate	174330	92829	11	983	278	367
21	Mango	20536	24958	40	116	75	1333	
Average			159136	93234	15	897	279	490
Horticulture Crops	22	Coconut	1035	49465	14	6	148	467
		Copra	9929	62724	20	56	188	667
	23	Red Arecanut	135816	82396	7	766	247	233
		White Arecanut	129984	95758	3	733	287	100
Average			69191	72586	11	390	217	367
Spices	24	Ginger	125986	149428	19	710	447	633
	25	Turmeric	178843	88307	7	1008	264	233
	26	Black Pepper	83366	59975	10	470	180	333
Average			129398	99237	12	729	297	400
Total			57928	55431	14	327	166	470

For Grapes (Bangalore Blue) and Mango Two Years Average
^μ Four years Average, For others Three year average.
 CV= Coefficient of Variation

Note : Quantity of Paddy = Considered as 100

Appendix-11: Cost Reduction Mechanization in Agriculture and Horticultural Crops of Karnataka

Sl. No.	Crops	Machinery	Cost Reduction (%)
1	Agricultural Crops		
1	Paddy	Tractor operated Paddy Transplanter	38
		Power tiller with rotary attachment	18
		Tractor operated Ridger	50
		Tractor operated square straw bundler	64
		Automated harvester and straw bundler	65
		Power tiller operated harvester	46
		Mounted Offset Disc Harrow	25
		Combine Harvester	33
		Multi crop thresher	27
2	Ragi	Tractor operated Ridger	50
		Tractor operated weed control and earthing-up implement	25
		Tractor drawn Ragi seed cum fertilizer drill	30
		Mounted Offset Disc Harrow	25
		Multi crop thresher	27
		Power tiller operated Ragi Harvester	46
3	Jowar	Multi crop thresher	27
		Tractor operated weed control and earthing-up implement	25
		Multi crop thresher	75
		Mounted Offset Disc Harrow	25
		Tractor operated multi crop thresher	66
		Tractor drawn seed cum fertilizer drill	30
		Tractor operated sprayers	30
4	Maize	Cycle Weeder	60 - 70
		Multi crop thresher	75
		Self-propelled weeder	25
		Multi crop thresher	27
		2-in-1 Sunflower Thresher-cum- Maize Sheller	25
		Mounted Offset Disc Harrow	25
		3-in-1 Mini Groundnut Decorticator-cum-Sunflower Thresher and Maize Sheller	30
		Tractor operated sprayers	30
5	Bajra	Tractor drawn seed cum fertilizer drill	30
		Mounted Offset Disc Harrow	25
6	Tur	Tractor drawn seed cum fertilizer drill	30
		Tractor operated Rotovator	75
		Solar Powered sprayer	25 - 30
		Self-propelled weeder	25
		Mounted Offset Disc Harrow	25
		Multi crop thresher	75
7	Blackgram	Tractor drawn seed cum fertilizer drill	30
		Mounted Offset Disc Harrow	25

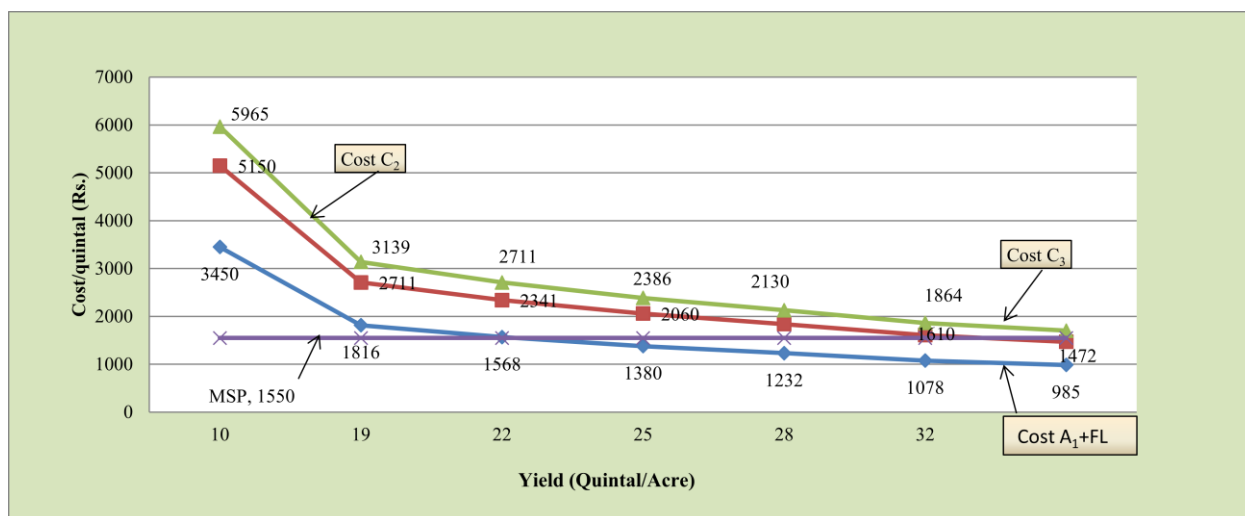
8	Greengram	Hand drawn sprayer	30 - 35
		Cycle Weeder	60-70
		Tractor drawn seed cum fertilizer drill	30
		Mounted Offset Disc Harrow	25
		Multi crop thresher	75
9	Bengalgram	Tractor drawn seed cum fertilizer drill	30
		Tractor operated multi crop thresher	66
		Mounted Offset Disc Harrow	25
		Tractor operated weed control and earthing-up implement	25
10	Groundnut	Tractor operated Harvester	20 - 25
		Blade harrow	25
		Pedal and motor operated groundnut shell breaker	60
		Tractor operated multi crop thresher	66
		Grader	55
		Groundnut shell breaker	55
		Tractor drawn nine rows groundnut seed drill	25
		Self-propelled weeder	25
		Groundnut Harvester	32
		Mounted Offset Disc Harrow	25
		Groundnut Plucker	20-25
		Groundnut Decorticator	15
11	Soybean	3-in-1 Mini Groundnut Decorticator-cum-Sunflower Thresher and Maize Sheller	30
		Harvester	15 - 17
		Self-propelled weeder	25
12	Sunflower	Mounted Offset Disc Harrow	25
		Harvester	15 - 17
		Multi crop thresher	75
		Tractor operated multi crop thresher	66
		thresher	55
13	Cotton	2-in-1 Sunflower Thresher-cum- Maize Sheller	25
		3-in-1 Mini Groundnut Decorticator-cum-Sunflower Thresher and Maize Sheller	30
		Harvester	25 - 30
		Tractor drawn seed cum fertilizer drill	30
14	Dry Chilli	Tractor operated Rotovator	75
		Tractor operated sprayer	30
		Multipurpose polyhouse solar dryer	50
15	Tomato	PKV Chilli seed extractor	99
		seed extractor	79
II	Horticultural Crops		
15	Tomato	Tractor operated plastic lacing machine	30-35
		Parth hand sprayer	25
16	Onion	Transplanter	80
		Parth hand sprayer	25
17	Potato	Harvester	20
		Parth hand sprayer	25

18	Banana	Tractor operated sprayer	30
		Tractor operated furrow opener	40
19	Grapes	Tractor operated sprayer	30
20	Pomegranate	Mini tractor and Rotovator	20 - 25
		Tractor operated furrow opener	40
21	Mango	Mango Harvester	20
22	Coconut	Coconut tree climber	15
		Tender coconut punch and cutter	66
		Hand operated Coconut slicer	50
		Coconut slicing machine	71
		Tractor operated furrow opener	40
		Foot/Pedal operated Coconut Dehusker	25
23	Arecanut	Arecanut peeler	23
		Hand operated Peeler	31
		Manual Arecanut Dehusker	25
24	Ginger	Ginger Peeler	44
		Transplanter	75
		Tractor operated furrow opener	40
25	Turmeric	Power tiller operated harvester	65
		Tractor operated harvester	70
		Turmeric Slicer	48
		Tractor operated furrow opener	40
		Turmeric Polisher	56
26	Black Pepper	White Pepper Processing Machine	30
		Tractor operated furrow opener	40

Source: Karnataka Agriculture Price Commission sponsored "Cost reducing mechanisation and cost effective technologies" project undertaken by University of Agricultural Sciences, Bengaluru, Raichur, Dharwad and University of Horticultural Sciences, Bagalkote

Appendix- 12 : Inverse Functional Relationship between Yield and Cost Incurred + Family Labour for Minimum Support Price announced Crops of Selected Farmers

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
10	3450	5150	5965	1550	5
19	1816	2711	3139	1550	13
22	1568	2341	2711	1550	14
25	1380	2060	2386	1550	15
28	1232	1839	2130	1550	13
32	1078	1610	1864	1550	36
35	986	1472	1704	1550	6



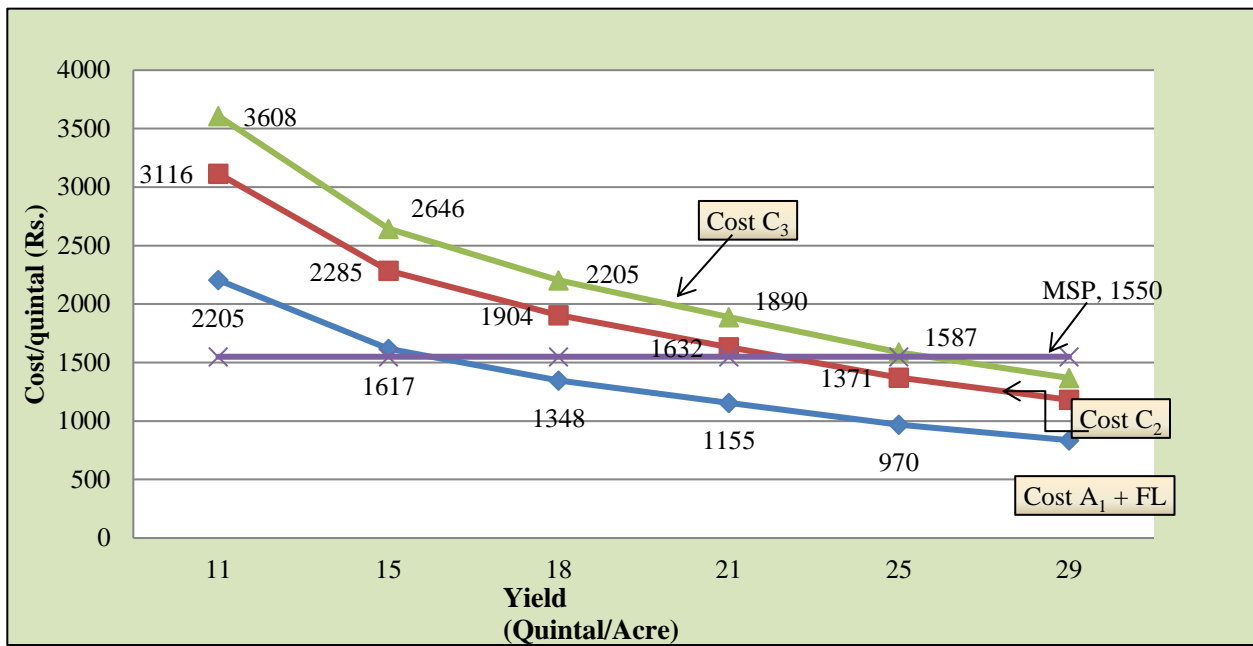
$\ln(\text{Cost } A_1+\text{FL}) = 10.4488 - 1 \ln(\text{Yield})$
 (1.91E+16) (5.9E+15)

R Square 0.9999

Figures in brackets are t values

1. Paddy (Rainfed)

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
11	2205	3116	3608	1550	17
15	1617	2285	2646	1550	33
18	1348	1904	2205	1550	17
21	1155	1632	1890	1550	12
25	970	1371	1587	1550	12
29	837	1182	1368	1550	9



$$\ln(\text{Cost } A_1+FL) = 10.0864 - 0.9975 \ln(\text{yield})$$

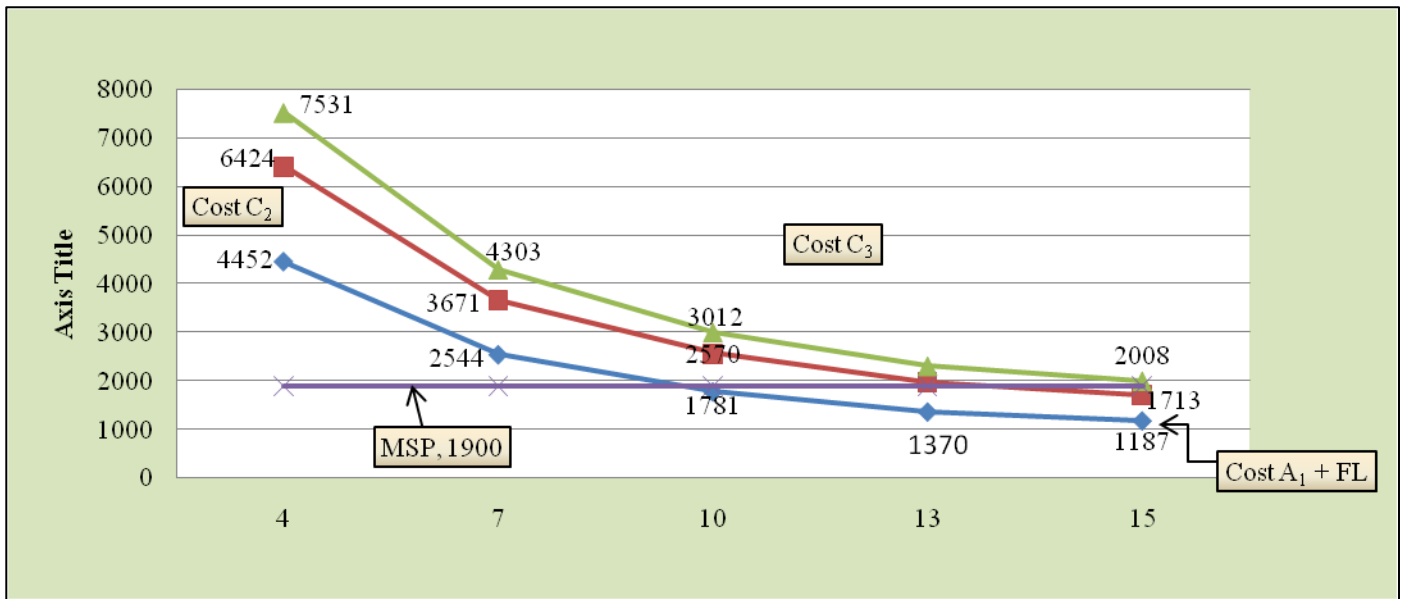
(466.12) (-132.35)

R Square 0.9968

Figures in brackets are t values

2. Ragi

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
4	4452	6424	7531	1900	17
7	2544	3671	4303	1900	52
10	1781	2570	3012	1900	21
13	1370	1977	2317	1900	5
15	1187	1713	2008	1900	5



$$\ln(\text{Cost } A_1 + \text{FL}) = 9.7650 - 0.99414 \ln(\text{Yield})$$

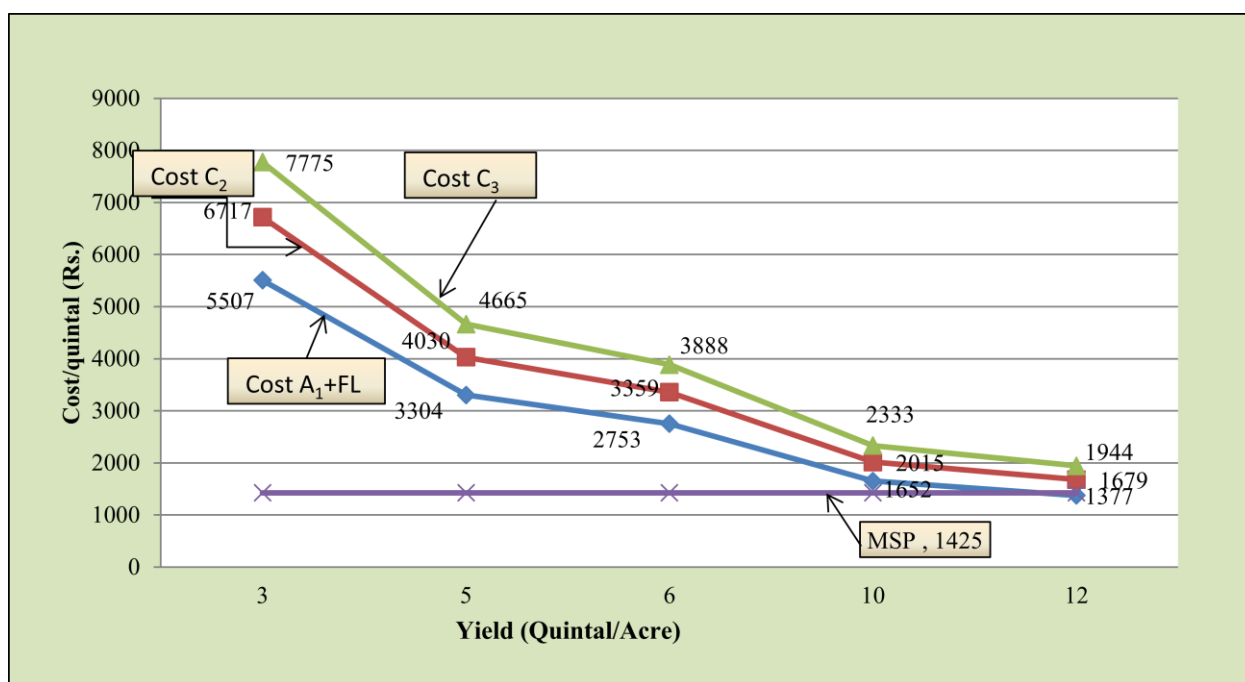
(387.59) (-80.021)

R Square 0.9913

Figures in brackets are t values

3. Bajra

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
3	5507	6717	7775	1425	31
5	3304	4030	4665	1425	27
6	2753	3359	3888	1425	15
10	1652	2015	2333	1425	25
12	1377	1679	1944	1425	2



$$\ln(\text{Cost } A_1+\text{FL}) = 9.5620 - 0.9183 \ln(\text{yield})$$

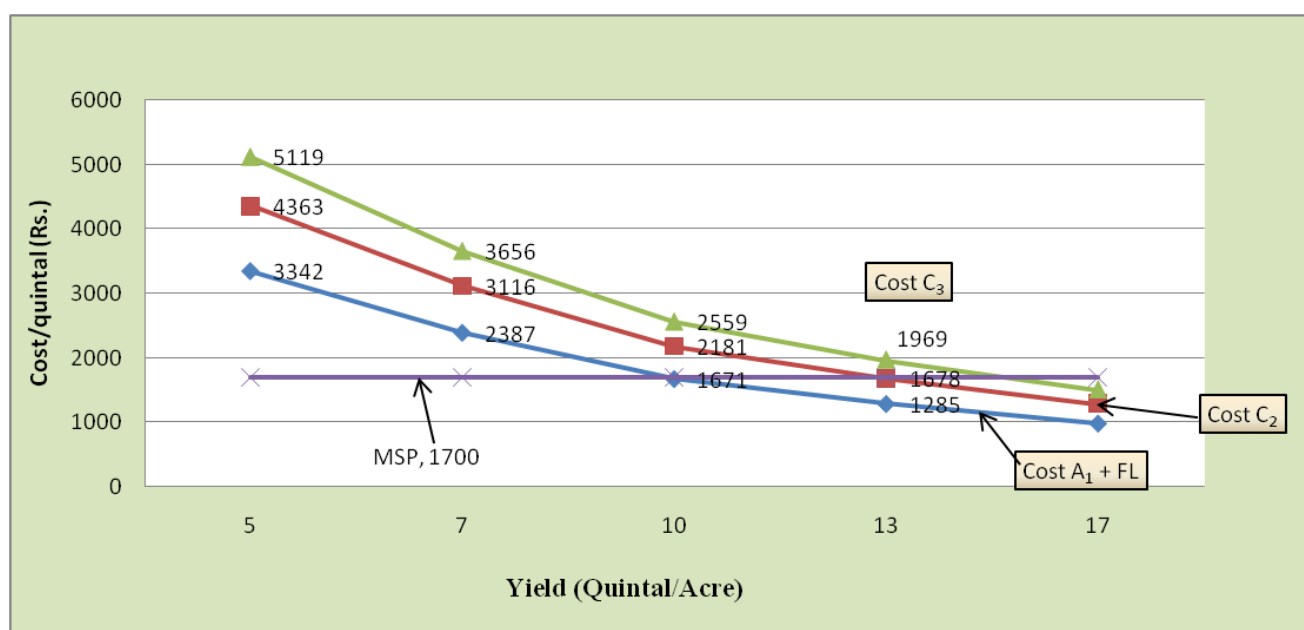
(307.7386) (-50.4778)

R Square 0.9777

Figures in brackets are t values

4. Hybri Jowar

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
5	3342	4363	5119	1700	20
7	2387	3116	3656	1700	29
10	1671	2181	2559	1700	32
13	1285	1678	1969	1700	12
17	983	1283	1506	1700	7



$$\ln(\text{Cost } A_1 + \text{FL}) = 9.9800 - 0.9969 \ln(\text{Yield})$$

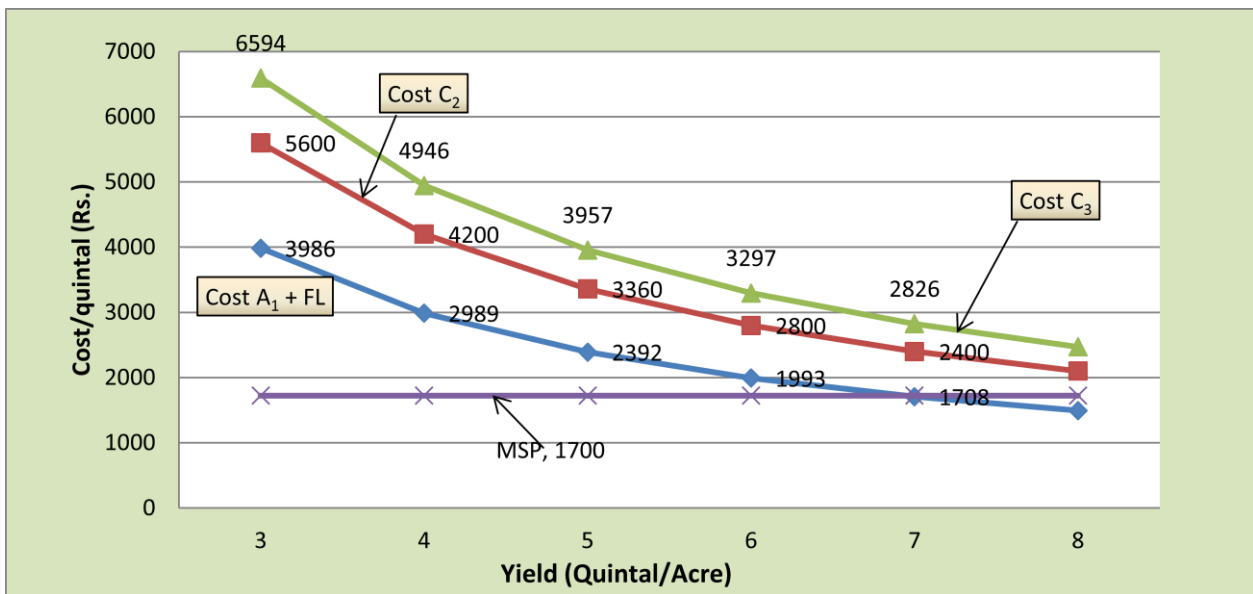
(579.61) (-122.82)

R Square 0.9956

Figures in brackets are t values

5. White Jowar

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
3	3986	5600	6594	1725	11
4	2989	4200	4946	1725	16
5	2392	3360	3957	1725	42
6	1993	2800	3297	1725	12
7	1708	2400	2826	1725	12
8	1495	2100	2473	1725	5
10	1196	1680	1978	1725	2



$\ln(\text{Cost } A_1+\text{FL})=9.1958-0.8961$

$\ln(\text{Yield})$

$(339.29) \quad (-53.20)$

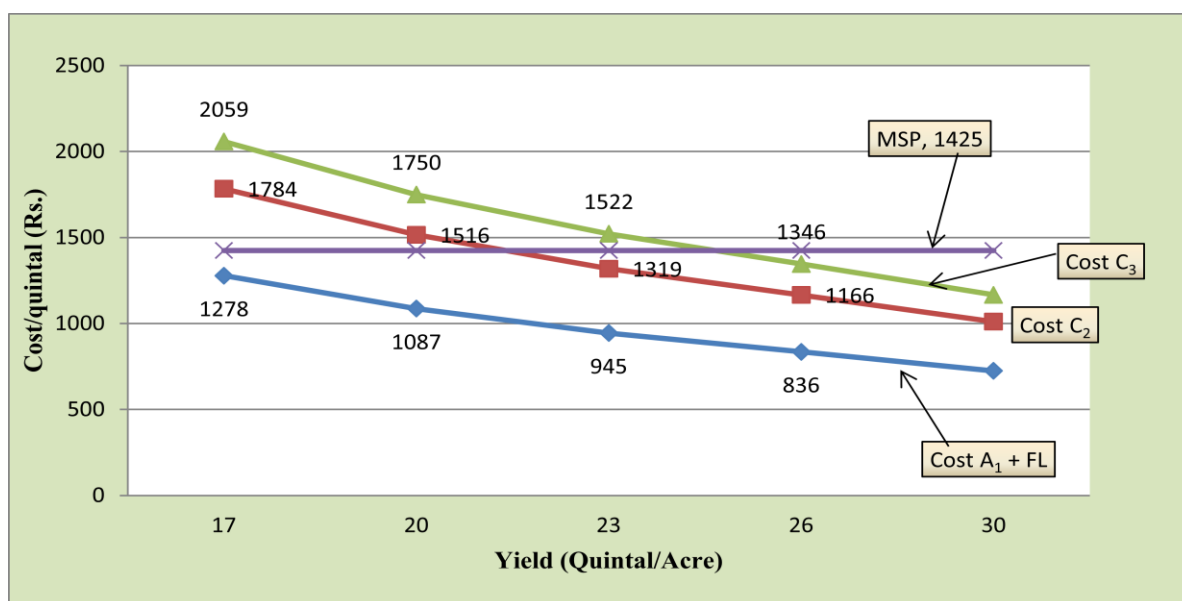
R Square

0.9665

Figures in brackets are t values

6. Maize

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
17	1278	1784	2059	1425	27.12
20	1087	1516	1750	1425	30.51
23	945	1319	1522	1425	20.34
26	836	1166	1346	1425	15.25
30	724	1011	1167	1425	6.78



$$\ln(\text{Cost } A_1 + \text{FL}) = 9.976 - 0.9977 \ln(\text{Yield})$$

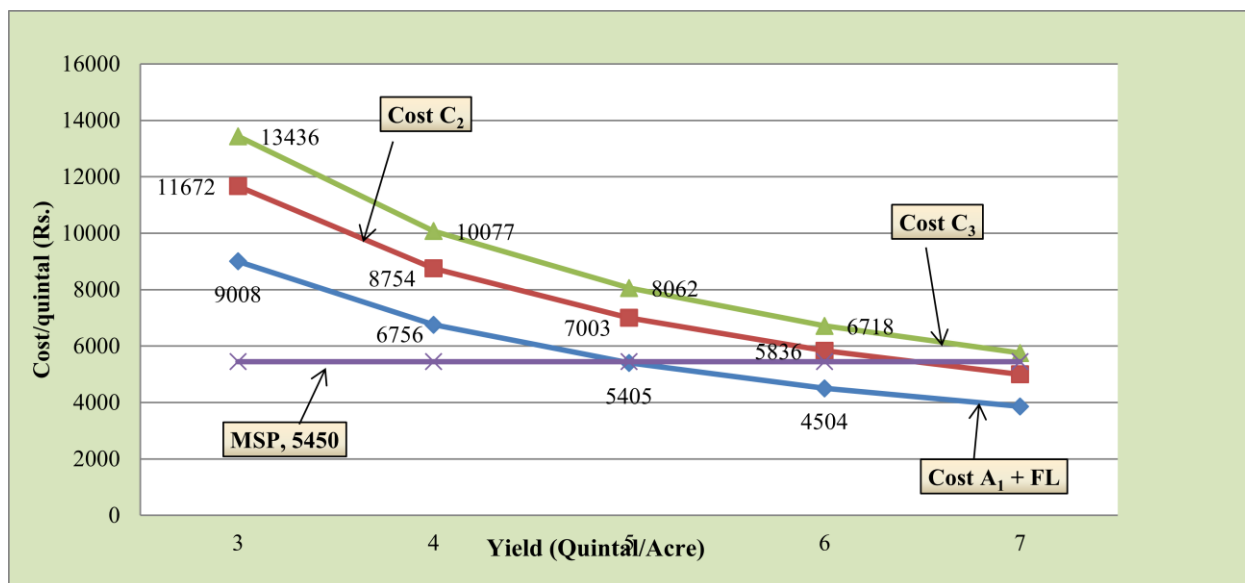
(387.49) (-118.04)

R Square 0.9959

Figures in brackets are t values

7. Red gram

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
3	9008	11672	13436	5450	13
4	6756	8754	10077	5450	10
5	5405	7003	8062	5450	52
6	4504	5836	6718	5450	20
7	3861	5002	5758	5450	5



$$\ln(\text{Cost } A_1 + \text{FL}) = 10.2045 - 1.00 \ln(\text{Yield})$$

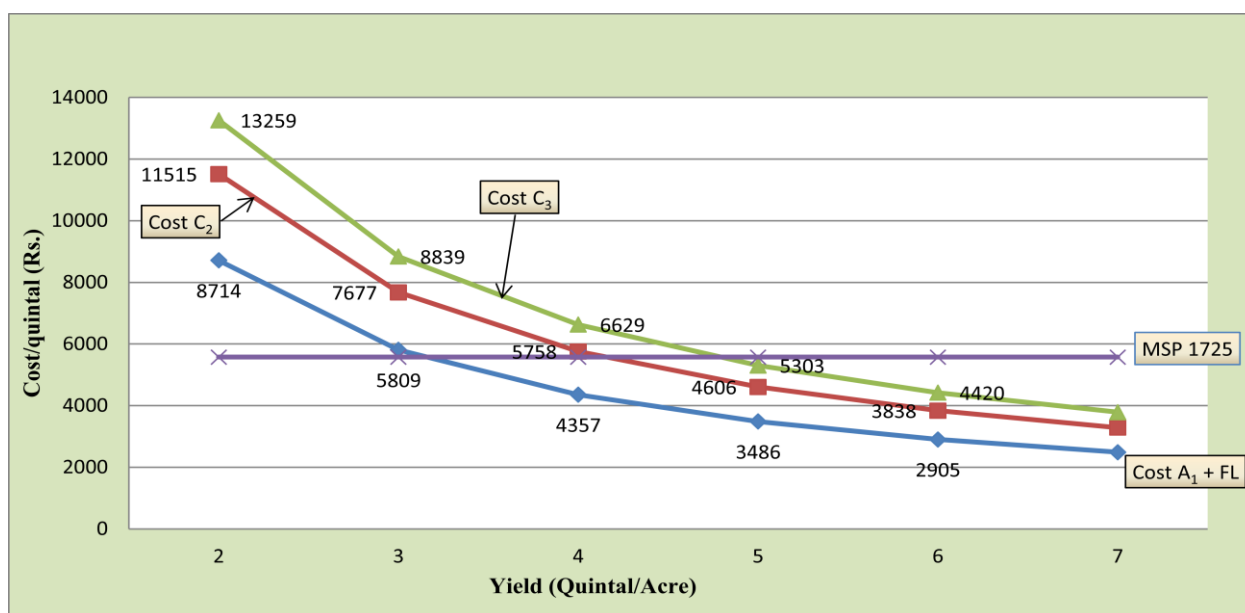
$$(1.47\text{E}+16) \quad (-2.3\text{E}+15)$$

R Square 0.9989

Figures in brackets are *t* values

8. Green gram

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
2	8714	11515	13259	5575	5
3	5809	7677	8839	5575	28
4	4357	5758	6629	5575	18
5	3486	4606	5303	5575	2
6	2905	3838	4420	5575	22
7	2490	3290	3788	5575	25



$$\ln(\text{Cost } A_1 + \text{FL}) = 9.7658 - 1.00 \ln(\text{Yield})$$

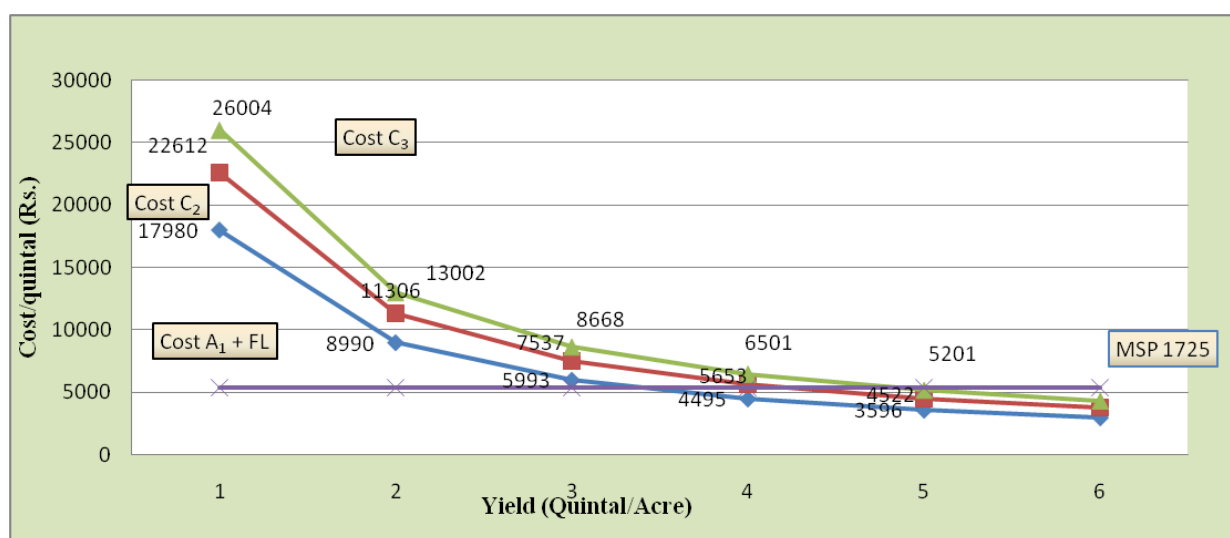
(3.39E+16) (-5.4E+15)

R Square 0.9987

Figures in brackets are t values

9. Black gram

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
1	17980	22612	26004	5400	4
2	8990	11306	13002	5400	17
3	5993	7537	8668	5400	31
4	4495	5653	6501	5400	38
5	3596	4522	5201	5400	7
6	2997	3769	4334	5400	2



$$\ln(\text{Cost } A_1+FL) = 9.79703 - 1.00 \ln(\text{Yield})$$

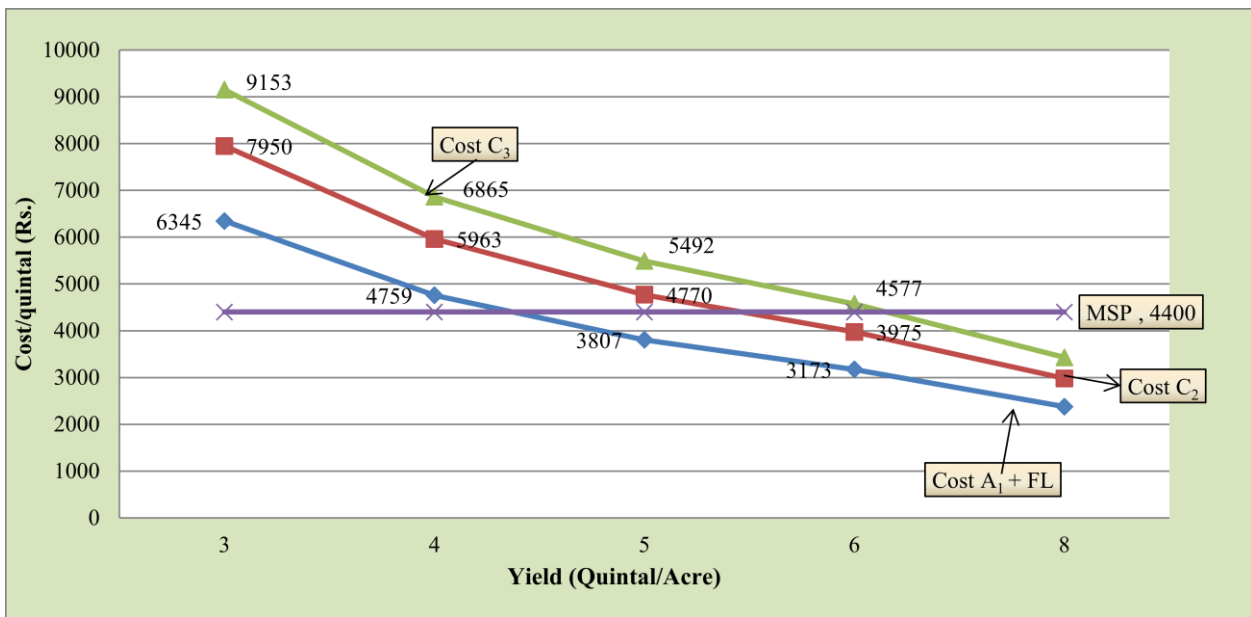
$$(2.620E+16) \quad (-3.211E+15)$$

R Square 0.9999

Figures in brackets are *t* values

10. Bengal gram

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
3	6345	7950	9153	4400	20
4	4759	5963	6865	4400	63
5	3807	4770	5492	4400	10
6	3173	3975	4577	4400	5
8	2379	2981	3432	4400	2



$$\ln(\text{Cost } A_1 + \text{FL}) = 9.8540 - 1.00 \ln(\text{Yield})$$

(2.24E+16) (-3.2E+15)

R Square 0.9987

Figures in brackets are *t* values

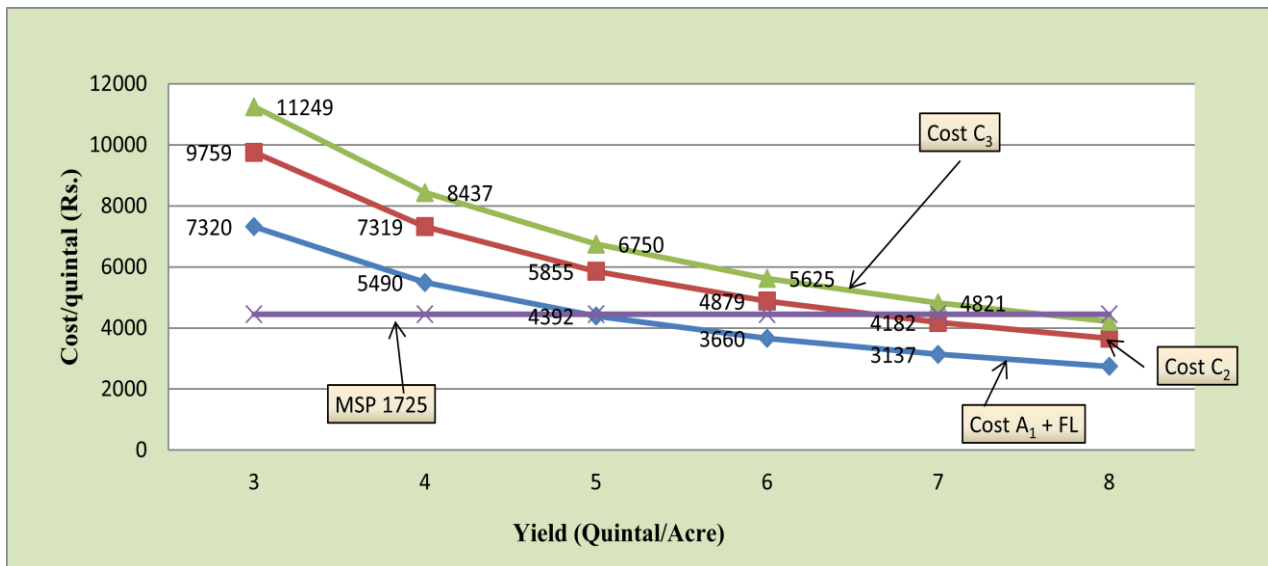
11. Ground nut

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
3	7320	9759	11249	4450	29
4	5490	7319	8437	4450	12
5	4392	5855	6750	4450	16
6	3660	4879	5625	4450	19
7	3137	4182	4821	4450	12
8	2745	3660	4218	4450	12

Ln(Cost A₁+FL)=9.9969 – 1.00 Ln(Yield)
 (4.15E+16) (-6.7E+15)

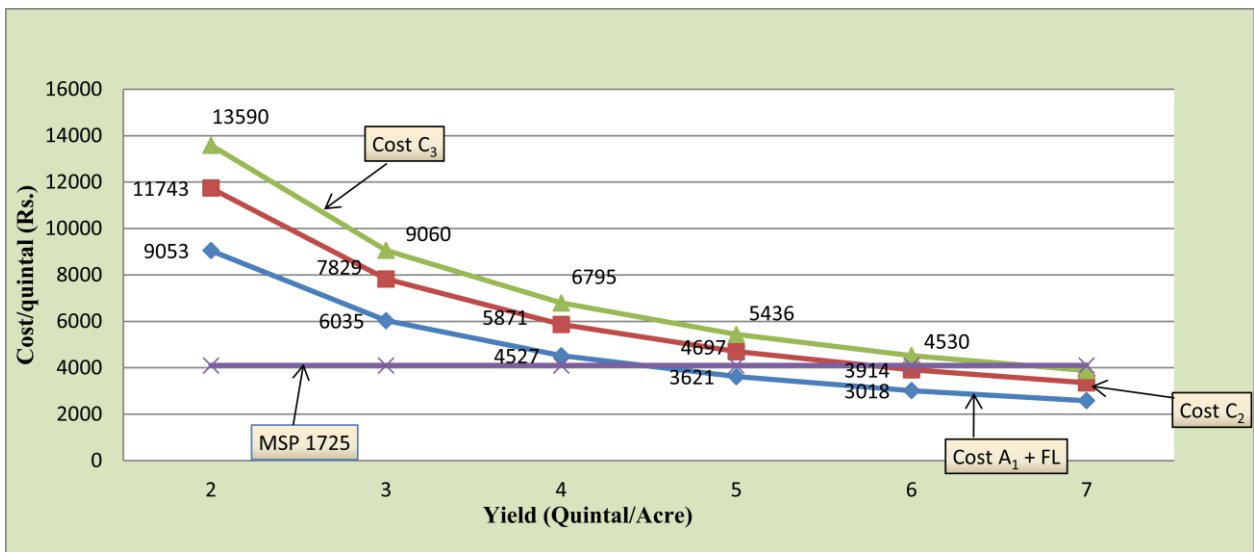
R Square 0.9999

Figures in brackets are t values



12. Sunflower

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
2	9053	11743	13590	4100	14
3	6035	7829	9060	4100	51
4	4527	5871	6795	4100	14
5	3621	4697	5436	4100	7
6	3018	3914	4530	4100	5
7	2587	3355	3883	4100	10



$$\ln(\text{Cost } A_1 + \text{FL}) = 9.8040 - 1 \ln(\text{Yield})$$

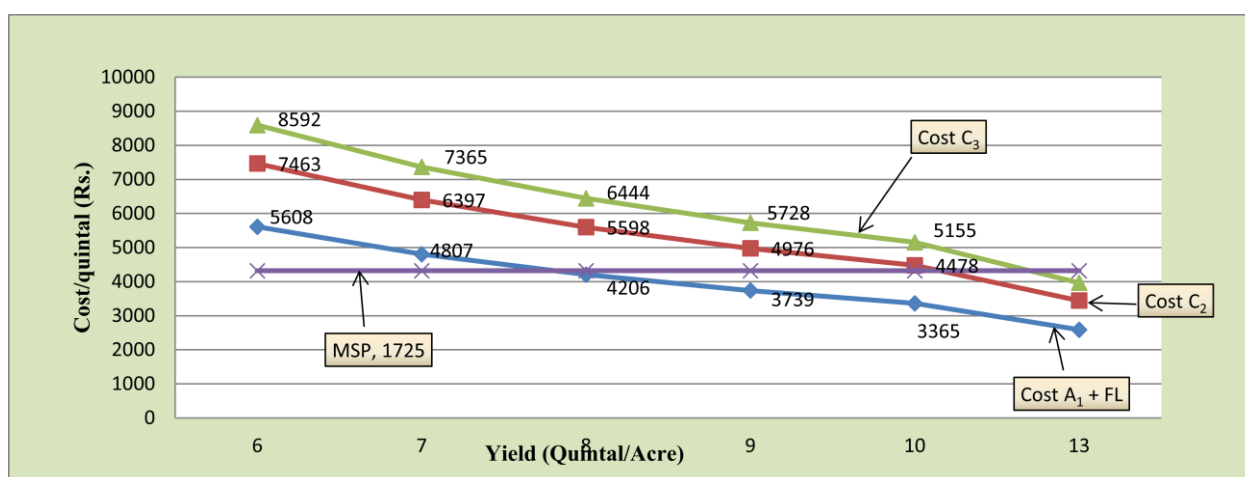
$$(3.18 \text{ E}+16) \quad (-4.2\text{E}+15)$$

R Square 0.9989

Figures in brackets are t values

13. Cotton

Yield Per Acre	Cost Incurred + Family Labour (A ₁ +FL)	Cost C ₂	Cost C ₃	Minimum Support Price	Farmers (%)
6	5608	7463	8592	4320	15
7	4807	6397	7365	4320	7
8	4206	5598	6444	4320	24
9	3739	4976	5728	4320	31
10	3365	4478	5155	4320	14
13	2588	3445	3966	4320	10



$$\ln(\text{Cost } A_1 + \text{FL}) = 10.4237 - 1 \ln(\text{Yield})$$

$$(2.82\text{E}+16) \quad (-5.8\text{E}+15)$$

R Square 0.9999

Figures in brackets are t values

Appendix-12 (B): Increase in Yield of Agricultural and Horticultural Crops from Krishi Bhagya scheme

Qtl/Acre

Sl. No.	Crops	Change in Yield due to Krishi Bhagya		Percentage
		Before	After	
A	Cereals			
1	Paddy	16	26	63
2	Ragi	7	9	29
3	Jowar	12	14	11
4	Maize	4	11	170
5	Fodder Jowar	28	43	52
6	Wheat	3	6	140
	<i>Average</i>	12	18	77
B	Pulses			
7	Red gram	6	8	34
8	Green gram	8	11	38
9	Black gram	3	5	67
10	Bengal gram	5	11	106
	<i>Average</i>	6	9	61
C	Oilseeds			
11	Groundnut	10	11	11
12	Sunflower	5	6	25
13	Soyabean	5	8	67
	<i>Average</i>	6	8	34
D	Vegetables			
14	Dry chilli	4	11	168
15	Onion	20	65	225
	<i>Average</i>	12	38	197
E	Commercial crops			
16	Cotton	5	9	101
F	Horticulture Crops			
17	Coconut	13	14	9
G	Fruits			
18	Bore Fruit	24	30	25
19	Fig	4	5	25
20	Guava	5	11	120
	<i>Average</i>	11	15	57
	Total Average	9	16	77

Appendix-13: Procurement of Agriculture and Horticultural produce of Karnataka in Last Five years (2013-14 to 2017-18)

Sl No	Crops	2013-14				2014-15				2015-16			
		Quantity (Lakh Qtl)	Minimum Support Price + Incentive (Rs/Qtl)	Total Value of Purchase (Crore Rs)	Number of Beneficiaries	Quantity (Lakh Qtl)	Minimum Support Price + Incentive (Rs/Qtl)	Total Value of Purchase (Crore Rs)	Number of Beneficiaries	Quantity (Lakh Qtl)	Minimum Support Price + Incentive (Rs/Qtl)	Total Value of Purchase (Crore Rs.)	Number of Beneficiaries
1	Paddy	22.92	1310+290=1600	366.75	31585	12.43	1360 (Common)	169.46	18509	8.12	1410+100=1510 (Common)	122.64	14587
2	Summer Paddy					0.35	1360	4.72	859				
3	Ragi					13.60	1550+450=2000	271.91	27855	20.38	1650+450=2100	427.91	62487
4	Maize	71.38	1310	934.82	66609	0.22	1100	2.39	562				
5	White Jowar					0.68	1550+750=2300	15.73	2112	0.71	1590+510=2100	14.97	1761
6	Red gram	2.51	4300+700=5000	125.51	15142								
7	Green gram												
8	Bengal gram	1.41	3100	43.77	3785								
9	Black gram												
10	Groundnut	0.89	4000	35.46	3693								
11	Sunflower	0.36	3700	13.38	1704								
12	Round Copra	2.95	5500+1000=6500	191.97	33211								
13	Coconut												
14	Tomato	2.1	300	6.31	6283								
15	Onion												
Total		104.52		1717.97	162012	27.28		464.21	49897	29.21		565.52	78835
Purchase / Person (Qtl)					64.51				54.67				37.05
Purchase Value / Person (Rs)					106040				93034				71735

Contd...

SI No	Crops	2016-17				2017-18				Total Value of Five Years		
		Quantity (Lakh Qtl)	Minimum Support Price + Incentive (Rs/Qtl)	Total Value of Purchase (Crore Rs)	Number of Beneficiaries	Quantity (Lakh Qtl)	Minimum Support Price + Incentive (Rs/Qtl)	Total Value of Purchase (Crore Rs)	Number of Beneficiaries	Quantity (Lakh Qtl)	Total Value of Purchase (Crore Rs.)	Number of Beneficiaries
1	Paddy									43.48	658.85	64681
2	Paddy grown in Summer									0.35	4.72	859
3	Ragi									33.97	699.82	90342
4	Maize									71.60	937.21	67171
5	White Jowar									1.40	30.70	3873
6	Red gram	35.22	5050+450=5500	1955.11	145000	33.58	6000	2015.10	279435	71.31	4095.72	439577
7	Green gram	0.17	5225	9.06	1008	2.19	5575	122.10	22034	2.36	131.16	23042
8	Bengal gram					13.22	4400	581.67	107134	14.63	625.44	110919
9	Black gram					1.32	5400	71.19	19317	1.32	71.19	19317
10	Groundnut					1.17	4450	52.27	9908	2.06	87.73	13601
11	Sunflower									0.36	13.38	1704
12	Round Copra	0.18	6240+1000=7240	13.3	1525					3.13	205.27	34736
13	Coconut	0.12	1600	2.05	724					0.12	2.05	724
14	Tomato									2.10	6.31	6283
15	Onion	8.38	624	65.43	15025					8.38	65.43	15025
Total		44.07		2044.95	163282	51.49		2842.32	437828	256.57	7634.98	891854
Purchase / Person(Qtl)					26.99					11.76		28.77
Purchase Value / Person(Rs)					125240					64919		85608

Appendix-14: Details of the State Procurement under the Minimum support price of 2017-18

(In Lakh Quintals)

Sl.No.	Crops	Production	Total Arrivals	Procurement Date	Total Procurement	Arrivals Before Procurement	Arrivals Before Procurement (%)	Arrivals Before Procurement from total production (%)
1	Tur	81.00	29.16	15.12.2017 to 28.03.2018	33.58	12.56	43	16
2	Greengram	11.80	9.89	11.09.2017 to 24.11.2017	2.19	3.77	38	32
3	Blackgram	3.50	2.88	23.09.2017 to 03.12.2017	1.32	1.15	40	33
4	Groundnut	48.40	13.23	07.12.2017 to 02.02.2018	1.17	4.66	35	10
5	Bengalgram	65.00	15.97	25.01.2018 to 22.04.2018	13.22	7.60	48	12
Total		209.70	71.13		51.49	29.74	42	14

Source- Karnataka State Agricultural Marketing Board (KSAMB)

Appendix-15: Changes in the area of major crops in Karnataka compared to last monsoon Seasons (%)

Sl.No	Crops	India				Karnataka			
		2017-18	2018-19	Change	Percentage change	2017-18	2018-19	Change	Percentage change
Agriculture Crops		950.54	923.03	-27.51	-3	58.79	57.52	-1.27	-2
Cereals		560.82	537.65	-23.17	-4	29.50	26.50	-3.00	-10
1	Paddy	379.08	369.98	-9.10	-2	7.37	8.44	1.07	15
2	Ragi	10.70	7.54	-3.16	-30	7.27	3.98	-3.29	-45
3	Jowar	18.64	17.61	-1.03	-6	0.92	0.89	-0.03	-3
4	Maize	80.58	77.83	-2.75	-3	11.68	11.41	-0.27	-2
5	Bajra	71.82	64.69	-7.13	-10	2.26	1.78	-0.48	-21
Pulses		118.26	115.74	-2.52	-2	14.09	14.91	0.82	6
6	Tur	43.46	44.47	1.01	2	8.85	9.84	0.99	11
7	Green gram	31.81	33.70	1.89	6	3.92	4.23	0.31	8
8	Black gram	42.99	37.57	-5.42	-13	1.32	0.84	-0.48	-36
Oilseeds		148.87	151.98	3.11	2	7.77	8.05	0.28	4
9	Groundnut	41.58	39.14	-2.44	-6	3.90	3.72	-0.18	-5
10	Soybean	105.92	111.76	5.84	6	2.76	3.39	0.63	23
11	Sunflower	1.37	1.08	-0.29	-21	1.11	0.94	-0.17	-15
Commercial crops		122.59	117.66	-4.93	-4	7.43	8.06	0.630	8
12	Cotton	122.59	117.66	-4.93	-4	5.21	4.19	-1.02	-20
Vegetable Crops						1.11	1.93	0.83	74
13	Tomato					0.14	0.20	0.06	41
14	Onion					0.79	1.53	0.74	94
15	Potato					0.18	0.20	0.03	15

Source- 1. Fourth advanced estimates of Area, Production and Yield of important agriculture crops of Karnataka- 2017-18

2.Area, Production and Yield of important agriculture Kharif crops of Karnataka, DES.

3.agricoop.in

4.Department of Horticulture, Govt. of Karnataka

Appendix-16: Monthly Price Forecasts of Agriculture and Horticultural crops in major markets

(Rs/Qtl)

Sl. No	Crops	Markets	Oct 18	Nov 18	Dec 18	Jan19	Feb 19	Mar19	Apr 19
Cereals									
1	Paddy	Sindanur	2178	2165	2157	2163	2155	2147	2150
		Karatagi	2122	2108	2095	2084	2084	2071	2062
		Manvi	2185	2198	2208	2216	2232	2236	2241
Average			2162	2157	2153	2154	2157	2151	2151
2	Ragi	Nagamangala	2306	2344	2378	2414	2447	2480	2516
		Bengaluru	2964	2978	2990	3003	3016	3028	3041
		Harappanahalli	2072	2120	2163	2207	2251	2293	2336
Average			2447	2481	2510	2541	2571	2601	2631
3	Hybrid Jowar	Sindanur	1475	1484	1494	1501	1511	1518	1527
4	White Jowar	Kalaburgi	2245	2204	2167	2131	2088	2058	2015
		Gadag	1553	1568	1581	1593	1606	1618	1632
		Bengaluru	2400	2403	2406	2409	2412	2415	2418
Average			2066	2058	2051	2044	2036	2030	2021
5	Maize	Rani Bennur	1504	1547	1587	1629	1670	1708	1750
		Hassan	1279	1282	1282	1283	1285	1285	1286
		Shikaripura	1352	1363	1372	1382	1390	1400	1411
		Hanagal	1352	1363	1372	1382	1390	1400	1411
Average			1372	1389	1403	1419	1434	1448	1464
6	Bajra	Lingasugur	1531	1553	1573	1594	1614	1633	1654
		Kustagi	1335	1343	1353	1363	1373	1383	1393
Average			1433	1448	1463	1479	1494	1508	1523
Pulses									
7	Tur	Kalburgi	3535	3467	3401	3333	3268	3205	3139
		Bidar	3484	3413	3344	3273	3204	3139	3071
		Raichur	3336	3287	3239	3189	3140	3091	3044
		Yadagiri	3336	3287	3239	3189	3140	3091	3044
Average			3423	3363	3306	3246	3188	3132	3075
8	Green gram	Yadagiri	4468	4441	4407	4373	4352	4313	4291
		Kalburgi	4257	4233	4213	4188	4168	4144	4125
		Bidar	4554	4540	4525	4515	4503	4488	4480
Average			4426	4405	4382	4359	4341	4315	4299
9	Black gram	Kalburgi	4060	4020	3990	3966	3942	3914	3892
		Bidar	4037	3996	3949	3900	3855	3811	3764
Average			4048	4008	3970	3933	3898	3862	3828
10	Bengal Gram	Gadag	3837	3795	3758	3718	3679	3642	3603
		Kalburgi	3842	3815	3788	3764	3738	3715	3689
		Bengaluru	4724	4669	4617	4564	4513	4463	4412
		Bidar	3927	3929	3918	3907	3897	3886	3875
		Dharwad	4048	4046	4054	4056	4057	4064	4066
		Sindanur	3621	3526	3434	3356	3261	3181	3090
		Raichur	3784	3770	3758	3751	3741	3734	3724
Average			3969	3936	3904	3874	3841	3812	3780
Oil seeds									
11	Ground nut	Yadgiri	3313	3332	3329	3323	3314	3310	3302
		Raichur	3760	3729	3706	3677	3646	3623	3594
		Chellakere	4475	4506	4532	4558	4584	4608	4634
		Laxmeshwar	3710	3597	3575	3575	3577	3584	3589
Average			3814	3791	3786	3783	3780	3782	3780
12	Soy bean	Bidar	2992	2991	2995	2998	3003	3006	3008
		Kalghatagi	2955	2967	2979	2991	3002	3012	3023

		Balki	2796	2721	2651	2579	2513	2447	2377
		Haveri	3030	3041	3039	3040	3041	3035	3032
Average			2943	2930	2916	2902	2890	2875	2860
13	Sunflower	Gadag	3810	3879	3947	4012	4079	4139	4207
		Kottur	3844	3894	3938	3982	4026	4068	4112
		Rani bennur	3033	2975	2950	2923	2898	2874	2847
Average			3562	3583	3612	3639	3668	3694	3722
Commercial Crops									
14	Cotton	Vijayapura	5825	5866	5911	5953	5994	6036	6077
		Manvi	5725	5890	6054	6223	6384	6540	6703
		Rani Bennur	5713	5749	5781	5815	5853	5887	5921
Average			5754	5835	5915	5997	6077	6154	6234
15	Dry chilli	Byadagi	8152	7844	7880	7886	7719	7653	7583
		Bengaluru	10742	10757	10760	10752	10742	10737	10733
		Hubballi	4234	4128	3999	3903	3784	3680	3547
		Gadag	6734	7205	7785	8396	9001	9529	10152
Average			7465	7483	7606	7735	7811	7900	8004
Horticultural Crops									
16	Tomato	Kolar	779	776	776	775	775	774	774
		Chintamani	672	668	662	654	651	644	637
		Mysore	600	569	538	507	478	450	420
		Mulabagilu	666	658	652	644	639	632	625
Average			679	668	657	645	636	625	614
17	Onion	Bengaluru	1125	1139	1138	1137	1135	1135	1134
		Hubballi	787	780	773	768	761	754	750
		Belagavi	1198	1192	1186	1192	1187	1181	1183
Average			1037	1037	1032	1032	1027	1024	1022
18	Potato	Belagavi	1713	1721	1728	1737	1741	1750	1759
		Bengaluru	1497	1515	1535	1553	1573	1590	1609
		Hassan	1308	1324	1337	1359	1379	1397	1417
Average			1506	1520	1533	1550	1564	1579	1595
Fruit Crops									
19	Banana (Yelakki)	Bengaluru Binny mill	2911	2844	2844	2852	2861	2870	2878
		Channapatna	3823	3864	3898	3935	3970	4005	4041
		Udupi	3380	3498	3609	3722	3882	3938	4049
Average			3372	3402	3450	3503	3571	3604	3656
20	White Grapes	Bengaluru Binny mill	3722	3730	3750	3772	3792	3811	3832
21	Grapes (Bangalore Blue)	Bengaluru Binny mill	2623	2636	2671	2706	2742	2775	2810
22	Pomegranate	Bengaluru Binny mill	7943	8137	8328	8515	8725	8897	9080
Plantation Crops									
23	Coconut (1000 nuts)	Bengaluru	18566	18705	18840	18978	19113	19240	19375
		Tarikere	13149	13214	13294	13361	13410	13467	13526
		C R Patna	11705	11782	11860	11948	12023	12102	12186
Average			14473	14567	14665	14762	14849	14937	15029
24	Arecanut (Red)	Shivamogga	34408	34686	34945	35214	35474	35724	35986
		Channagiri	34116	34622	35087	35558	36022	36461	36922
		Hosanagara	34497	34491	34545	34545	34474	34496	34459
		Sagara	33126	33381	33694	34006	34322	34626	34942
		Yellapura	34730	35030	35373	35687	36023	36329	36622
Average			34176	34442	34729	35002	35263	35527	35786
25	Arecanut (Chali)	Sirsi	25606	25986	26350	26708	27076	27401	27758
		Sagara	33126	33381	33694	34006	34322	34626	34942

		Kumuta	24588	24768	24949	25129	25301	25473	25654
		Yellapura	24437	24700	24952	25218	25460	25712	25960
Average			26939	27209	27486	27765	28040	28303	28579
Spice Crops									
26	Ginger	Hosanagara	10473	10947	11411	11843	12262	12721	13089
		Arakalagudu	7739	8184	8646	9102	9588	10014	10463
		Shikaripura	9762	10345	10835	11379	11879	12407	12911
		Hassan	9638	10811	12013	13260	14488	15658	16896
Average			9403	10072	10726	11396	12054	12700	13340
27	Black Pepper	Goni koppalu	30927	30793	30793	30819	30746	30716	30661
28	Turmeric	Gundlupete	7365	7400	7434	7473	7499	7533	7567
		Kollegala	6686	6695	6711	6719	6737	6749	6762
		Bengaluru	10318	10370	10420	10470	10522	10568	10617
		C R Nagara	6799	6873	6954	7054	7138	7232	7315
Average			7792	7834	7880	7929	7974	8021	8065

Appendix-18 (A): Average Arrival indicators of the Agricultural crops for the past six years (Seasonal Index)

Months	Paddy	Ragi	Hybrid Jowar	White Jowar	Maize	Bajra	Bengal gram	Tur	Black gram	Green gram	Ground nut	Soybean	Sunflower	Cotton	Dry chilli
January	142	179	127	77	177	116	210	252	55	36	81	109	190	157	178
February	83	100	152	110	151	77	255	173	28	25	275	97	73	132	282
March	74	96	114	203	139	80	189	154	43	30	215	108	98	114	269
April	89	93	101	122	76	59	135	125	73	24	114	96	67	87	175
May	118	88	102	112	79	55	82	77	64	25	92	74	37	45	50
June	118	118	94	83	45	40	64	71	65	73	46	49	15	29	22
July	87	68	78	74	40	36	48	47	72	49	26	49	15	19	19
August	69	68	67	72	36	31	44	43	66	247	9	38	64	34	20
September	62	67	89	81	47	101	42	28	251	409	39	68	162	68	24
October	58	68	91	108	76	219	46	29	230	156	124	188	184	124	24
November	111	145	96	79	141	205	35	30	143	70	93	189	100	186	37
December	188	108	89	79	193	181	49	169	110	57	85	136	197	205	100
	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200

Source-krishimaratavahini.kar.nic.in

Appendix-18 (B): Average Arrival indicators of the Horticultural crops for the past six years (Seasonal Index)

Months								Arecanut						
	Tomato	Onion	Potato	Banana	Grapes	Pomegranate	Mango	Red	Chali	Ginger	Turmeric	Pepper	Coconut	Copra
January	80	78	92	89	138	70		182	431	103	74	44	100	101
February	76	67	83	83	307	60		162	45	112	134	46	57	85
March	69	74	99	119	246	69	101	144	78	142	181	188	63	69
April	65	72	86	164	105	78	138	81	90	104	116	207	63	57
May	74	74	124	122	68	112	101	80	220	121	86	147	70	73
June	104	69	97	85	35	130	78	56	61	65	249	107	93	99
July	142	66	92	97	52	158	64	58	57	99	74	91	113	133
August	176	74	104	98	54	140	137	49	48	62	68	91	132	131
September	128	130	116	86	36	117	81	55	51	99	67	69	142	112
October	99	217	104	94	53	86		84	42	125	50	69	137	138
November	91	169	95	77	35	82		91	43	94	39	77	120	97
December	97	109	109	86	71	98		158	34	73	62	65	111	106
	1200	1200	1200	1200	1200	1200	700	1200	1200	1200	1200	1200	1200	1200

Source-krishimaratavahini.kar.nic.in

Appendix-19 (A): Market arrivals and prices of Agricultural crops up to October compared to Previous Year

Sl.No	Crops	Arrivals/ Prices	Percentage Change										Total
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	
I	Cereals	Arrival	-16	6	31	52	10	28	20	37	37	59	18
		Price	-20	-22	-23	-22	-18	-15	-16	-17	-9	5	-16
1	Paddy	Arrival	-28	-34	1	20	2	28	4	33	53	98	7
		Price	-2	-6	-5	-7	-7	-6	-7	-11	-13	-11	-7
2	Ragi	Arrival	119	226	150	-37	-73	-41	68	24	4	3	-12
		Price	-25	-28	-35	-29	-17	-11	-15	-22	-16	-7	-21
3	Hybrid Jowar	Arrival	-17	-26	-48	-50	-56	-59	-36	-33	-70	-82	-51
		Price	-29	-21	-19	-25	-27	-23	-19	-19	-4	33	-16
4	White jowar	Arrival	5	-1	13	-32	23	92	118	129	23	68	28
		Price	-19	-22	-18	-14	-11	-15	-10	-16	-7	9	-13
5	Maize	Arrival	0	78	70	141	58	34	208	71	-8	-94	40
		Price	-19	-26	-28	-28	-24	-22	-24	-16	-3	95	-12
6	Bajra	Arrival	75	14	6	-7	-30	10	6	44	-11	-41	-4
		Price	-27	-30	-31	-32	-28	-25	-26	-19	-1	28	-21
II	Pulses	Arrival	16	-46	17	-41	-34	-22	10	18	31	9	-2
		Price	26	17	22	25	18	16	14	17	13	6	18
7	Tur	Arrival	-30	17	-31	27	22	-2	-32	-40	-50	-62	-14
		Price	-8	-5	-12	-11	2	3	2	-10	-9	-5	-6
8	Green gram	Arrival	-48	-11	-59	81	-15	-13	0	10	-28	-1	-15
		Price	4	6	2	3	14	18	16	4	5	5	7
9	Black gram	Arrival	16	215	-19	-19	-52	-45	38	-53	-26	22	-8
		Price	-39	-32	-37	-37	-32	-38	-36	-29	-14	0	-31
10	Bengal gram	Arrival	124	181	37	77	86	145	120	-18	-4	27	81
		Price	-44	-31	-34	-42	-42	-36	-28	-26	-28	-21	-34
III	Oil seeds	Arrival	95	-20	-17	184	14	18	17	-9	122	49	12
		Price	-8	0	-2	-6	-4	5	13	4	16	25	4
11	Ground nut	Arrival	152	-20	-15	309	150	476	172	110	343	55	11
		Price	-23	-20	-29	-36	-31	-20	-8	-4	8	17	-16
12	Soy bean	Arrival	-10	-23	-61	-49	-75	-80	-41	-72	69	56	3
		Price	18	34	36	28	25	20	22	15	9	20	23
13	Sunflower	Arrival	162	8	29	43	8	-73	359	385	93	-30	65
		Price	-7	1	10	17	16	31	35	4	32	40	17
IV	Commercial crops	Arrival	-16	-27	11	15	-11	41	19	35	-54	3	-6
		Price	-6	-2	-6	-3	5	12	6	-1	4	10	1
14	Cotton	Arrival	58	10	48	108	63	73	-14	-9	-67	-1	22
		Price	-6	-18	-28	-24	-11	0	9	8	16	31	-3
15	Dry chilli	Arrival	-47	-39	0	-10	-57	-12	109	116	12	23	-23
		Price	-6	7	7	10	16	20	3	-5	-3	0	4
Total Agri Crops(A)		Arrival	-14	4	14	46	11	27	15	23	12	41	12
		Price	-14	-8	-12	-13	-6	-1	-1	-6	0	8	-6

Source – Krishi Vishleshana Phalaka

Appendix-19 (B): Market arrivals and prices of Horticultural crops up to October compared to Previous Year

Sl. No	Crops	Arrivals/ Prices	Percentage Change										Total
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	
V	Vegetable crops	Arrival	5	2	7	-3	-6	21	31	94	89	63	30
		Price	51	-7	-13	25	32	-10	-34	-38	-16	-36	-13
16	Tomato	Arrival	129	50	4	-29	8	98	113	140	100	159	81
		Price	-53	-76	-63	-10	-10	-57	-73	-76	-52	-70	-64
17	Onion	Arrival	-16	3	17	9	-3	-4	11	78	95	65	27
		Price	233	111	28	15	14	15	45	-36	-37	-44	14
18	Potato	Arrival	3	-23	-14	-8	-19	-3	-13	60	60	4	0
		Price	13	21	35	56	68	60	76	71	60	48	52
VI	Fruit crops	Arrival	39	113	9	-44	-32	-20	254	81	14	7	16
		Price	11	10	28	51	45	29	13	12	19	27	24
19	Mango	Arrival			-100	-64	-33	-19	550	2061			19
		Price			-100	158	53	-1	-28	11			35
20	Grapes (BB)	Arrival	-28	61	-3	74	-21	-37	-61	-18	-14	-5	-11
		Price	27	51	51	52	54	40	37	31	38	40	42
21	White grapes	Arrival	-44	40	22	6	-15	16	38	131	82	-81	-6
		Price	5	2	14	29	38	38	30	25	20	22	23
22	Pomegranate	Arrival	73	156	52	-55	-57	-45	-19	114	-11	-5	-3
		Price	13	9	44	61	79	52	26	26	31	41	37
23	Banana	Arrival	8	75	57	40	42	36	69	7	92	45	45
		Price	4	-6	-24	-31	-24	-27	-37	-36	-19	-11	-22
VII	Plantation crops	Arrival	-29	-5	-15	-11	-58	3	-12	14	4	-1	-10
		Price	38	33	16	-2	9	7	-3	-3	0	2	8
24	Areca nut (Chali)	Arrival	-5	-8	-34	24	22	52	7	-4	-30	-26	-2
		Price	13	3	-2	-8	0	3	-3	5	14	18	4
25	Areca nut (Red)	Arrival	2	3	0	10	34	186	87	40	248	70	21
		Price	41	32	0	-24	-13	-13	-24	-22	-15	-11	-8
26	Coconut	Arrival	-29	-6	-15	-11	-59	3	-11	15	4	-2	-10
		Price	68	81	63	47	50	36	27	18	15	-1	39
27	Copra	Arrival	14	38	-43	-24	-27	-26	-52	-38	-34	11	-17
		Price	69	64	62	60	75	80	63	38	11	19	50
VIII	Spice crops	Arrival	-17	15	40	122	17	110	0	18	-26	-19	26
		Price	-34	-28	-24	-27	-16	-20	-25	-19	-12	-13	-22
28	Pepper	Arrival	-30	81	374	101	155	1007	107	87	14	-17	107
		Price	-40	-35	-32	-35	-27	-34	-37	-33	-25	-22	-33
29	Ginger	Arrival	422	8	-6	-83	-74	10	15	-12	-82	-90	-25
		Price	-18	5	13	4	31	29	22	36	49	25	19
30	Turmeric	Arrival	-73	8	18	298	121	-15	-62	-45	-39	8	15
		Price	-2	-9	-6	-4	8	25	10	10	1	-1	3
Total Horticulture crops (B)		Arrival	-25	-3	-10	-10	-47	5	-2	22	12	10	-3
		Price	-5	-2	-4	-10	0	-5	-13	-10	-4	-4	-6
Total Agri and Horti crops (A+B)		Arrival	-27	-4	-11	-7	-52	5	-8	17	6	2	-7
		Price	10	7	9	13	4	6	11	10	4	1	8

Source- Krishi Vishleshana Phalaka