

## Supplementary file

**Supplementary Table 1.** Performance and profitability analysis of natural farming system for different crop combinations during kharif season

Parameters	Unit of Measurements	Low Hills		Mid Hills	
		O+(V+P)	P+(V)	T+(V+P)	P+(V)
Yield	Q/ha	29.80	33.76	190.65	36.00
Gross returns	₹/ha	119192	135033	571945	144000
Costs	₹/ha	69473	72026	76201	68990
Net returns	₹/ha	49719	63007	495744	75010
Gross margins	₹/ha	86761	100284	528182	107517
Benefit-cost ratio	Ratio	1.72	1.87	7.51	2.09
Farm business income	₹/ha	100895	117588	542133	121345
Family labour income	₹/ha	70687	87186	515261	94473
Farm investment income	₹/ha	80615	94121	523370	102565

\*O+(V+P): okra+(vegetables+pulses), T+(V+P): tomato+(vegetable+pulses), P+(V): pea+(vegetables)

**Supplementary Table 2.** Performance and profitability analysis of conventional farming system for different crops

Particulars	Unit of Measurements	Low Hills					Mid Hills					
		Cucur bits	Okra	Pea	Cauliflower	Cucur bits	Okra	Capsicum	Tomato	Pea	Cauliflower	Garlic
Yield	Q/ha	38.80	25.93	33.13	36.25	31.31	26.90	162.50	156.25	33.42	36.94	18.75
Gross returns	₹/ha	116385	103733	132500	108750	93915	107619	487500	468750	133690	110811	187500
Cost	₹/ha	86775	95531	111667	96254	79309	86645	186913	209837	121991	88591	137954
Net returns	₹/ha	29610	8202	20833	12496	14606	20974	300587	258913	11699	22221	49546
Gross margins	₹/ha	71268	49886	62461	54224	52641	58906	337673	295795	49285	60205	69578
Benefit-cost ratio	Ratio	1.34	1.09	1.19	1.13	1.18	1.24	2.61	2.23	1.10	1.25	1.25
Farm business income	₹/ha	83001	57260	75097	6s4161	63203	67915	354074	313323	58490	72822	88701
Family labour income	₹/ha	47639	21898	39735	28799	30870	35582	321742	280991	26157	40489	56368
Farm investment income	₹/ha	65831	44510	57300	48811	47724	54165	334770	293323	45240	55430	83218

**Supplementary Table 3.** Detailed insights into the cost structure of crops of NF farmers in low hills

(₹/ha)

Costs	Particulars	Crop combinations			
		Low hills		Mid hills	
		O+(V+P)	P+(V)	T+(V+P)	P+(V)
	Ploughing/Tractor	2400	2100	2044	2128
	Seed	5488	5440	13563	9967
	Ghanjivamrit	537	690	990	643
	Jivamrit	437	522	463	250
	Bijamrit	10	36	111	123
	Agniashttra	1006	-	1310	-
<b>Cost A<sub>1</sub></b>	Saptdhanykur	466	323	128	203
	Khatti Lassi	209	180	945	284
	Hired Labour	1132	1750	4485	3423
	Depreciation	6348	6348	5261	5261
	Interest on Working Capital	234	220	481	340
	Land Revenue	31	31.25	31	31
	Subtotal	18296	17640	29812	22655
	Cost A <sub>1</sub>	18296	17640	29812	22655
<b>Cost B<sub>1</sub></b>	Interest on Fixed Capital	6193	6192	3278	3278
	Subtotal	24489	23832	33090	25933
	Cost B <sub>1</sub>	24489	23832	33090	25933
<b>Cost B<sub>2</sub></b>	Rental Value of Owned Land	24016	24015	23594	23594
	Subtotal	48505	47847	56684	49527
	Cost B <sub>1</sub>	24489	23832	33090	25933
<b>Cost C<sub>1</sub></b>	Imputed Value of Family Labour	20280	23466	18762	18780
	Subtotal	44769	47298	51853	44714
	Cost B <sub>2</sub>	48505	47847	56684	49527
<b>Cost C<sub>2</sub></b>	Imputed value of Family Labour	20280	23466	18762	18780
	Subtotal	68785	71313	75447	68307
	Cost C <sub>2</sub>	68785	71313	75447	68307
<b>Cost C<sub>3</sub></b>	Managerial Cost @10% of working capital	688	713	754	683
	Subtotal	69473	72026	76201	68990

\*M+(P): maize+(pulses), M+(V+P): maize+(vegetables+pulses), O+(V+P): okra+(vegetables+pulses), FM+(P): finger millet+(pulses)

**Supplementary Table 4.** Detailed insights into the cost structure of crops of CF farmers in low hills

Costs	Particulars	Crops			
		(₹/ha)			

		Cucurbits	Okra	Pea	Cauliflower
<b>Cost A<sub>1</sub></b>	Ploughing/Tractor	3849	3105	3956	3267
	Seed	4375	7804	11250	9000
	FYM	8190	7545	7546	5625
	Fertilizer	350	620	4460	3066
	Plant Protection	8486	16941	14625	15650
	Hired Labour	1239	3500	0	1060
	Interest on Working Capital	730	790	1005	753
	Miscellaneous (Staking)	-	-	8393	-
	Depreciation	6135	6135	6135	6135
	Land Revenue	31	31	31	31
	Subtotal	33385	46474	57403	44589
<b>Cost B<sub>1</sub></b>	Cost A <sub>1</sub>	33385	46474	57403	44589
	Interest on Fixed Capital	5947	5947	5947	5947
	Subtotal	39332	52421	63351	50536
<b>Cost B<sub>2</sub></b>	Cost B <sub>1</sub>	39332	52421	63351	50536
	Rental Value of Owned Land	29414	29414	29414	29414
	Subtotal	68746	81835	92765	79951
<b>Cost C<sub>1</sub></b>	Cost B <sub>1</sub>	39332	52421	63351	50536
	Imputed Value of Family Labour	17170	12750	17797	15350
	Subtotal	56502	65171	81147	65886
<b>Cost C<sub>2</sub></b>	Cost B <sub>2</sub>	68746	81835	92765	79951
	Imputed value of Family Labour	17170	12750	17797	15350
	Subtotal	85916	94585	110561	95301
<b>Cost C<sub>3</sub></b>	Cost C <sub>2</sub>	85916	94585	110561	95301
	Managerial Cost @10% of working capital	859	946	1106	953
	Subtotal	86775	95531	111667	96254

**Supplementary Table 5.** Detailed insights into the cost structure of crops of CF farmers in mid hills

		Crops						
Crops	Particulars	Cucurbits	Okra	Capsicum	Tomato	Pea	Cauliflower	Garlic
<b>Cost A<sub>1</sub></b>	Ploughing/Tractor	3500	3590	3106	3125	3250	3179	3125
	Seed	7500	9286	23438	18750	11250	9000	63750
	FYM	6375	6614	11430	9971	10174	7659	13468
	Fertilizers	2459	2494	10712	13000	3986	2818	3212
	Plant Protection	2470	5134	53573	77225	14131	9281	4593
	Hired Labour	2500	6500	5743	6250	7500	0	5914
	Interest on Working Capital	496	672	2510	2941	1368	639	1881
	Staking	0	0	17500	18750	18128	0	0
	Depreciation	5382	5382	5382	5382	5382	5382	5382
	Land Revenue	31	31	31	31	31	31	31
	Subtotal	30713	39704	133426	155427	75200	37989	98799
<b>Cost B<sub>1</sub></b>	Cost A <sub>1</sub>	30713	39704	133426	155427	75200	37989	98799
	Interest on Fixed Capital	3481	3481	3481	3481	3481	3481	3481
	Subtotal	34194	43186	136907	158908	78681	41470	102280
<b>Cost B<sub>2</sub></b>	Cost B <sub>1</sub>	34194	43186	136907	158908	78681	41470	102280
	Rental Value of Owned Land	28852	28852	28852	28852	28852	28852	28852
	Subtotal	63045	72037	165758	187759	107533	70322	131132
<b>Cost C<sub>1</sub></b>	Cost B <sub>1</sub>	34194	43186	136907	158908	78681	41470	102280
	Imputed Value of Family Labour	15479	13750	19304	20000	13250	17392	21000
	Subtotal	49672	56936	156211	178908	91931	58862	107763
<b>Cost C<sub>2</sub></b>	Cost B <sub>2</sub>	63045	72037	165758	187759	107533	70322	131132
	Imputed value of Family Labour	15479	13750	19304	20000	13250	17392	21000
	Subtotal	78524	85787	185063	207759	120783	87714	136588

	Cost C <sub>2</sub>	78524	85787	185063	20775 <sup>9</sup> <sub>9</sub>	120783	87714	136588
<b>Cost C<sub>3</sub></b>	Managerial Cost @10% of working capital	785	858	1851	2078	1208	877	1366
	Subtotal	79309	86645	186913	20983 <sub>7</sub>	121991	88591	137954

**Supplementary Table 6.** Multidimensional Sustainability Indicators of both farming system across hills

Crop Combination	Composite Sustainability Index (CSI)	Net Return (₹/ha)	Eco-efficiency (₹/kg CO <sub>2</sub> eq)	Yield (Q/ha)	Farming System Type	Sustainability Rank
NF Tomato+(V+P) Mid Hills	0.0014	495744	7163	190.65	NF	1
NF Pea+(V) Mid Hills	0.1	75010	1305	36.00	NF	2
NF Pea+(V) Low Hills	0.15	63007	944	33.76	NF	3
NF Okra+(V+P) Low Hills	0.18	49719	622	29.8	NF	4
CF Pea Low Hills	0.29	20833	360	33.13	CF	5
CF Cucurbits Low Hills	0.33	29610	170	38.8	CF	6
CF Cauliflower Low Hills	0.34	12496	125	36.25	CF	7
CF Cucurbits Mid Hills	0.36	14606	42	31.31	CF	8
CF Pea Mid Hills	0.37	11699	270	33.42	CF	9
CF Okra Mid Hills	0.38	20974	82	26.9	CF	10
CF Okra Low Hills	0.39	8202	4.7	25.93	CF	11
CF Cauliflower Mid Hills	0.41	22221	310	36.94	CF	12
CF Tomato Mid Hills	0.42	258913	36.6	156.25	CF	13
CF Capsicum Mid Hills	0.45	300587	42	162.5	CF	14
CF Garlic Mid Hills	0.52	49546	36.6	18.75	CF	15