

Impact of interventions/ diversification in farming system on profitability and sustainability of small farmers of Mehsana district of Gujarat

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ABSTRACT

A field experiment was conducted at 24 farmer's field in Mehsana district of North Gujarat Agro climatic zone of Gujarat. Among them, 12 farmers fall under high productive block of Visnagar Taluka (Laxmipura, Savala- Ravlapura and Ganeshpura villages) and 12 farmers fall under low productive block of Kadi Taluka (Nandasan, Borisana and Ambaliyara villages) under the On Farm Research Programme, SDAU, Jagudan through different interventions or diversification. Results revealed that, the intensification/ diversification/ interventions increased net income of small land holders in low productive block of Kadi (Mehsana) from Rs 23117 to Rs 66134 per ha with the increase in net income to the tune of 20.3 to 65.1 % over their existing farming system, while under high productive block (Visnagar taluka) the range of increasing net profit per ha was Rs 9550 to Rs 95247per ha with the percent increase from 11.2 to 68.1% in net income. The response of intensification/diversification/ interventions was relatively higher (44.8 %) under low productive block of Kadi Taluka over high productive block of Vishnagar Taluka of Mehsana district.

Key words: Diversification, existing system, farming system, intervention

Globally food security is one of the largest concerns, particularly considering increasing global food demand related to projected population growth. Crop production can be increased by expanding crop land area (extensification) and/or by increasing crop yield (intensification, production/crop land area). It is contended that viability of small farms could be improved only through intensification/ diversification of agriculture. Diversification is an on-farm strategy that is generally propagated as a measure against risk. The theory is that profit with specialization in a single crop will be greater, but two or more products may be produced to

reduce the risk of very low incomes in some years (Binding *et al.*, 1993). Studies also revealed that fruits and vegetables offer immense scope to increase income levels of small holders and improve the productivity of scarce resources (Joshi *et al.*, 2003). In North Gujarat, the sole cotton-wheat rotation is the dominant cropping system, where the productivity of sole cotton and sole wheat in North Gujarat has been increased due to adoption of high yielding semi-dwarf varieties and application of greater doses of chemical fertilizers. There are reports of declining factor productivity; hence there is a need for intensification or diversification of existing farming system. Therefore, the data of three years of intensification/ diversification/ interventions in farming system is presented here as under.

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MATERIALS AND METHODS

Data analyzed in this study were obtained from a field experiment conducted at 24 farmer's field in Mehsana district of North Gujarat Agro climatic zone of Gujarat. Among them, 12 farmers fall under high productive block of Visnagar Taluka (Laxmipura, Savala- Ravlapura and Ganeshpura villages) and 12 farmers fa under low productive block of Kadi Taluka (Nandasan, Borisana and Ambaliyara villages) under farming system diversification scheme of On Farm Research Programme, SDAU, Jagudan. The site has a semi-arid sub-tropical climate with severe hot summers and fairly cool winters. The annual average rainfall is 580 mm. The soil of the experimental site is sandy loam texture. Each year under predominant cropping system, cotton was used to sow in may- June with the 90 cm spacing and castor was used to sow during middle of August with the spacing of 120 to 150 cm raw spacing. After harvest of cotton, wheat was used to sow in November using 120 kg/ha seed rate in rows spacing of 22.5 cm apart. The farmers of low and high productivity blocks of Mehsana district were following the only sole castor or sole cotton or sole mustard and/ or sole wheat cropping system before 2013-14, but after that under the On Farm Research Programme, SDAU, Jagudan existing cropping system were diversified, *i.e.*, wheat with Lucerne, castor with fennel, wheat with tobacco and wheat with *Rabi* fennel, intensification of existing cropping system through relay cropping of castor in cotton, lucerne in castor, relay cropping of cotton in green gram and intervention in livestock and cropping system were followed. For calculating profitability, return was calculated using the prevailing market price of different commodities in the different years of the experiment.

RESULT AND DISCUSSION

The low productive block of Kadi taluka were

intensified through relay cropping of castor in cotton, lucerne in castor, green gram in cotton and diversified cropping system through wheat with fennel, lucerne with oat and cotton with vegetables. Data presented in the Table-2 and depicted in the Figure 1 and 2 revealed that all 12 farmers of Kadi block adopted either intensification or diversification during *Kharif* season or in *Rabi* season along with livestock in which interventions were adopted. Due to adoption of intensification/diversification/ intervention in livestock and cropping system, farmers were benefited by increasing net profit ranges from Rs 23117 to Rs 73126 per ha. The percentage increase in net profit ranging from 20.30 to 65.10 % over their existing farming system. The average increase in net profit of 12 farmers farming system was Rs 44923 per ha (44.8 %) over their existing farming system.

Similarly, the farmers of high productive block of Visnagar talukas also followed the intensification of lucerne and chicory in castor, lucerne in mustard, relay cropping of green gram in cotton and relay cropping of *Rabi* fennel in castor or diversification of wheat with tobacco and wheat with mustard or intervention in livestock and cropping system. They were also benefitted through intensification/ diversification/ interventions in livestock and cropping system. The range of increasing in net profit of farming system through intensification/diversification/ interventions was varied from Rs 9550 to Rs 95247 per ha and in term of percentage it was 11.2 to 8.1 % over their existing farming system. The average increase in net profit of 12 farmers farming system was Rs 37095 per ha (37.00 %) over their existing farming system. The response of intensification/diversification/ interventions was relatively higher (44.80 %) under low productive block Kadi of Mehsana district over high productive block Vishnagar (37.00 %).

From the results it can be concluded that the productivity and profitability of existing farming system can be increased by the adoption of intensification in cropping system or diversification of cropping system or adoption of interventions in cropping system and livestock

under low and high productive block of Mehsana district. The response of intensification/diversification/ interventions was relatively higher under low productive block (Kadi) over high productive block (Visnagar) of Mehsana district.

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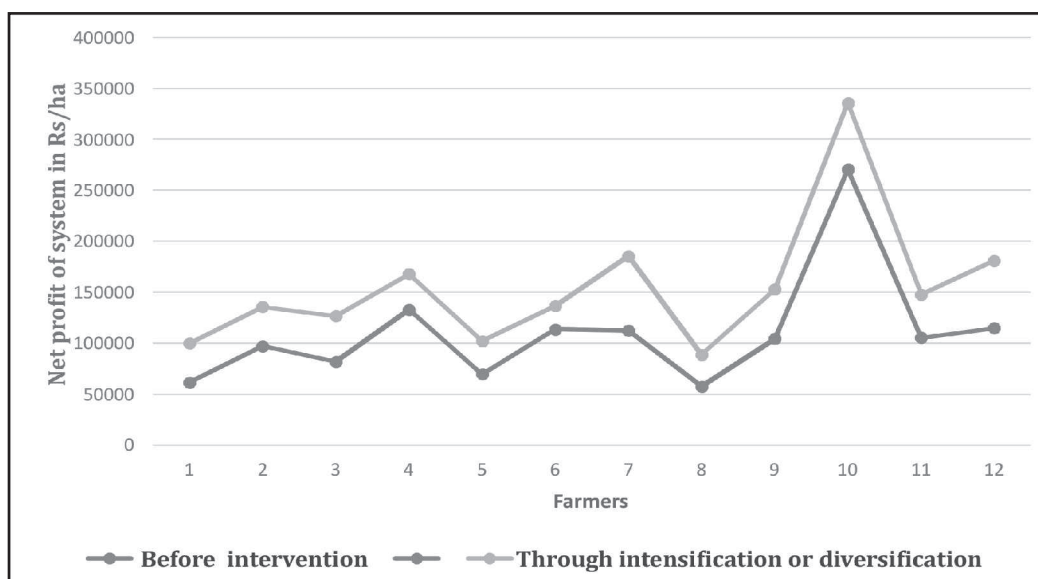


Figure 1 Effect of interventions /intensification/diversification on net profit of farming system under low fertility block(Kadi) of Mehsana

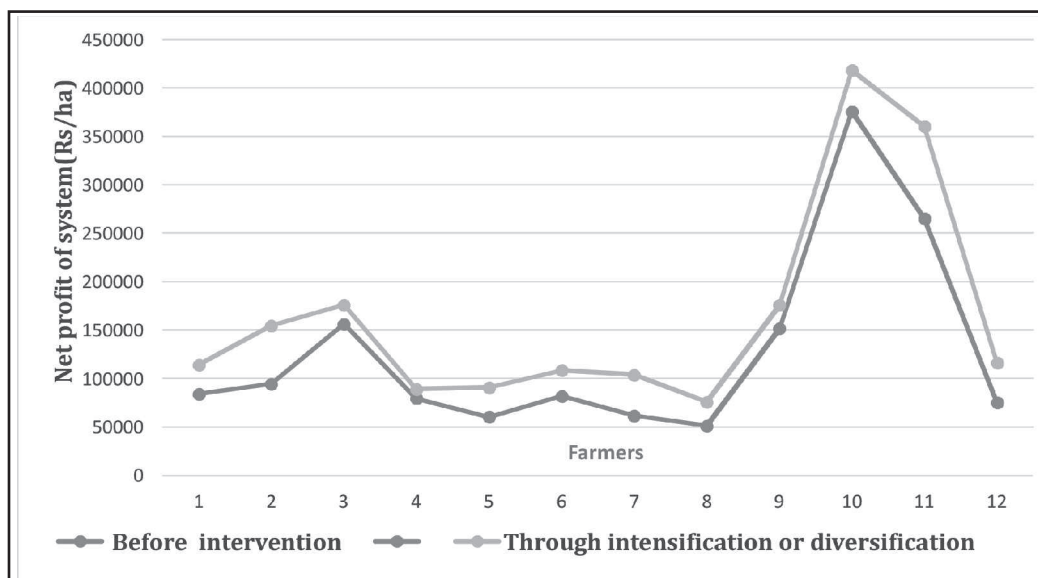


Figure 2 Effect of interventions//intensification/diversification on net profit of farming system under high fertility block (Visnagar) of Mehsana

Table 1 Existing farming system and types of intensification or diversification or interventions adopted in farming system by farmers

Block	Farmer	Existing cropping system	Intensification adopted	Type of Diversification
Kadi Low productivity	1	Sole cotton and sole castor	Castor in cotton, Lucerne in castor	Nil
	2	Sole castor	Lucerne in castor	Nil
	3	Sole cotton and sole castor	Greengram in cotton, Lucerne in castor, Greengram in castor	Nil
	4	Sole cotton and sole castor	Lucerne in castor, Greengram in cotton	Nil
	5	Sole cotton and sole wheat	Greengram in cotton, Wheat with lucerne	Wheat with fennel
	6	Sole cotton and sole castor	Castor in Greengram, Greengram in cotton	Wheat with fennel
	7	Sole cotton	Greengram in cotton	Wheat with lucerne
	8	Sole cotton, sole Wheat	Greengram in cotton, Wheat with lucerne	Nil
	9	Sole castor, sole Lucerne	Lucerne in castor, Lucerne in chickory	Nil
	10	Sole castor, sole Lucerne	Lucerne in castor, Lucerne in chickory	Cotton with Bhinda/Cowpea
	11	Sole wheat	Lucerne in wheat	Lucerne with oat
Vishnagar High productivity	12	Sole Mustard, Sole castor	Lucerne in Mustard, Lucerne in castor	Nil
	13	Sole cotton	Intensification of lucern and Chickory in castor	Nil
	14	Sole castor	Intensification of lucern in mustard and greengram in cotton	Nil
	15	Sole castor	Intensification of Green gram in castor	Nil
	16	Sole castor	Intensification of Green gram in cotton	Nil
	17	Sole castor	Intensification of castor in cotton	Nil
	18	Sole castor	Intensification of fennel in castor	Nil
	19	Sole castor	Intensification of fennel in castor	Nil
	20	Sole castor	Nil	Wheat with tobacco
	21	Sole castor	Nil	Wheat with mustard
	22	Sole castor	Intensification of lucern in castor	Nil
	23	Sole castor	Nil	Wheat with tobacco
	24	Sole cotton	Intensification of Green gram in cotton	Nil

Table 2 Net profit of system as influenced by intensification / diversifications/ interventions in farming systems over existing farming system

Net profit of system before intervention/ existing				Net profit of system through intensification/ diversification/interventions				Increased due to diversification/intensification			
Farmers	Crops	Dairy	Total	Crops	Dairy	Total	Rs/ha	%	Rs/ha	%	Average
Low productive block of Kadi (Mehsana)											
1	161078	99547	61532	218340	118317	100023	38492	62.6	Rs/ha	62.6	Rs/ha %
2	230227	132933	97294	283396	147725	135672	38378	39.4			
3	200483	118605	81878	269373	142637	126737	44859	54.8			
4	310231	177309	132922	339206	171148	168058	35136	26.4			
5	217813	148128	69685	246775	144618	102157	32472	46.6			
6	217605	103947	113658	262306	125532	136775	23117	20.3			
7	307114	194735	112379	386590	201085	185505	73126	65.1	44923	44.8	
8	171911	114278	57633	205291	116499	88792	31159	54.1			
9	293471	188934	104537	421103	267950	153153	48616	46.5			
10	741310	470693	270617	778759	442958	335801	65185	24.1			
11	354314	248847	105468	401372	253500	147872	42404	40.2			
12	270903	155972	114932	341526	160460	181066	66134	57.5			
High productive block of Visnagar(Mehsana)											
13	195901	111709	84192	216656	102479	114177	29985	35.6			
14	245315	150626	94689	288682	133843	154839	60150	63.5			
15	393579	237078	156502	417358	241189	176169	19667	12.6			
16	186822	107296	79526	174935	85860	89076	9550	12.0			
17	162335	102067	60268	198581	107823	90757	30489	50.6			
18	175880	93909	81971	221709	113201	108508	26538	32.4	37095	37.0	
19	145305	83595	61710	203596	99851	103744	42035	68.1			
20	139955	88495	51460	177730	101870	75860	24400	47.4			
21	334128	182268	151860	324320	148592	175728	23868	15.7			
22	676038	300102	375936	698017	279812	418205	42268	11.2			
23	455855	190912	264943	548020	187830	360190	95247	35.9			
24	140968	65730	75238	196982	80797	116185	40947	54.4			