

1 **Study the Impact of Integrated Farming System on Reducing Cost of**
2 **Cultivation and Increasing Income of Farmers in of Chatra District of**
3 **Jharkhand**

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8 **ABSTRACT**

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10 The Study was conducted on purposively selected Mardanpur village of Chatra block in
11 Chatra district where Sri. Danbhusan Lakra, Progressive farmer has developed a unique
12 model of integrated farming system(IFS) in his 5 acre of farm. He has designed the farm and
13 segregated the land as per the crops and animal requirement. The IFS model is comprised of
14 field crops in 2 acre, vegetables in 1 acre, fruit plants in 0.5 acre, pig farm in 0.25 acre, dairy
15 farm in 0.25 acre, Poultry in 0.25 acre, composite fish farming in 0.75 acre. Sri Danbhusan
16 Lakra has adopted the best practices of farming under technological support of Krishi Vigyan
17 Kendra, Chatra. The productivity and economic return of different enterprises and
18 commodities were calculated and compared with previous productivity and economics.
19 Result indicated that Sri. Danbhusan Lakra has got more than 80 percent additional yield
20 and profit on different enterprises, which are integrated in farming system. He has reduced
21 60% external input like feed of animal, chemical fertilizer requirement, over all he earns the
22 annual net income Rs. 94430.75 that is 68.6% more as compared to his previous income. It
23 happens due to inter relation set of enterprises used so that the waste from one component
24 became input for another part of the system, which reduced cost and increased
25 productivity.

26 *KVK, Chatra

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30 **INTRODUCTION**

31 Unsustainable farming leads to environmental pollution and threatens the livelihood
32 of millions of small farm holders. Strengthening agricultural production system for greater
33 sustainability and higher economic return is a vital process for increasing income and food
34 and nutrient security in developing countries. Therefore, integrated farming system (IFS) is a
35 multidisciplinary whole farm approach and very effective in solving the problems of small
36 and marginal farmers. The approach aims at increasing income and employment from small
37 holding by integrating various farm enterprises and recycling crop residues and by products
38 within the farm itself resulting into reduce cost of cultivation. The farmers need to be
39 assured of regular income for living at least above poverty line. In this context Integrated
40 Farming System (IFS) is one of the important solutions to face this peculiar situation.

41 Keeping this fact under consideration KVK Chatra developed 5 acre crops and animal
42 based Integrated Farming System with available resources which will result into sustainable
43 development.

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49 **METHODOLOGY**

50 KVK Chatra has developed 5 acre based module of integrated farming system in the
 51 year 2009, with discussion [from](#) of farmers and suggestion taken? [given](#) by scientists. After
 52 that this module was implemented on the field of Sri Dan bhushan Lakra who has five acre
 53 of land at one place near the renovated pond under NICRA project of Mardanpur village of
 54 Chatra block in Chatra district of Jharkhand. Before implementation of farming system
 55 module, Rice and Maize were the important crops in Kharif and in some area they grow
 56 wheat and mustard in Rabi season. They also grow vegetable for their home consumption.
 57 For better utilization of his 5 acre land the IFS module was discussed with Mr. Dan bhushan
 58 and designed the farm and segregated the land as per the crops requirement.

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60 **Table : 1 Layout of Integrated Farming System (IFS)**

Sl.No	Crops/Enterprises	Area in Acre
1	Field crops	2.0
2	Fruit plant	0.5
3	Vegetable	1.0
4	Pig farming (5F + 1M)	0.25
5	Dairy farming (5 Cow)	0.25
6	Poultry	0.25
7	Compost fish farming	0.75
Total		5.0

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62 Besides this improved technology of farming, improved varieties, recommended
 63 dose of nutrient, package of practices, drip and sprinkler irrigation, plastic mulching,
 64 reducing chemical fertilizer by using vermi-compost, Plant residues, vermi wash, cow urine,
 65 Bio-gas slurry, application of Bio-Pesticides etc were included facilities in the farm.

66 The data on production cost and monetary return was collected for two year (2016-
 67 17 and 2017-18) from Integrated farming system, to work out the economic feasibility of
 68 integrated farming system over the farmers farming system.

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70 **Results & Discussion**71 **Increasing productivity of commodity/enterprises under Integrated Farming System**

72 Production and productivity increase in integrated farming system is presented in
 73 Table-2

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76 **Table:2 Increasing productivity of different commodities/Enterprises under Integrated farming system**

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S.No	Commodity/ Enterprises	Yield Q/ha		Percentage Increase
		Before (IFS)	After (IFS)	
1. Kharif				
	Rice	21	32	52.58
	Maize+Redgram	Maize -13	Maize – 17 Red gram - 13	30.76 100.00
	Cucurbits	-	45	100

	Brinjal	42	135	221.4
	Cauliflower	-	155	100
2. Rabi				
	Wheat	13	21	61
	Gram	9.5	16	68.42
	Mustard	6.8	11	61.76
	Brinajl	6.48	156	144
	Cauliflower	-	168	100
3. Summer				
	Cauliflower	-	142	100
	Dairy (3 Cow)	1kg /cow/day	8kg/cow/days	700
	Piggery (5F + 1M)	-	9 piglet/harrowing	100
	Duckery (6 birds)	-	180 egg/ duck/year	100
	Composite fish farm	23q/ha	38q/ha	65.21

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80 Table-2 Shows that so many commodities which were not taken by farmers before
81 implementation of integrated farming system i.e. cauliflower, pig farming and duckery,
82 which contribute 100% extra *income*. It **is** also seen in table 2 that in dairy farming farmers
83 were having indigenous Cow before IFS, which **give** only 1kg/cow/day milk but after
84 introduction of improved breed they got 8kg/cow/day which **is** 700% more compared to
85 before IFS. In vegetable cultivation farmer get 200% extra yield compared to previous
86 practice and in field crops like Rice, Maize + Red gram, Wheat, Mustard, farmers get
87 (52.38%), 30.76% , (61%), and (37.5%) extra yield respectively. It has happened due to use
88 of inter related set of enterprises so that the waste from one component becomes an input
89 for another component of IFS, which reduced cost and improved productivity. This finding
90 was also supported with the finding of Alexandratos N (ed) (1995).

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92 Economics of Integrated Farming System (IFS)

93 | Analysis of Economics of Integrated Farming System **as is** given in Table-3

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94 Table :3 Economics of different enterprises/commodities under in Integrated Farming System before and after integration.

S.No	Enterprises commodity	Yield Q/ha		Cost of Cultivation (Rs./ha)		Cross return (Rs./ha)		Net Return (Rs./ha)		BC Ratio	
		BIFS	AIFS	BIFS	AIFS	BIFS	AIFS	BIFS	AIFS	BIFS	AIFS
Kharif											
	Rice	21	32	19000	21000	44100	67200	25100	46200	2.32	3.20
	Maize+Redgram	13	17	9000	13400	14300	37600	5300	24200	1.58	2.70
	Cucurbits	-	54	-	32000	-	59400	-	27400	-	1.85
	Brinjal	42	135	28000	48000	37800	121500	9800	73500	1.35	2.53
	Cauliflower	-	155	-	48800	-	139500	-	90700	-	2.85
Rabi											
	Wheat	13	21	16500	17800	27300	44100	10800	26300	1.65	2.47
	Gram	9.5	16	14800	19600	20900	35200	6100	15600	1.41	1.79
	Mustard	8	11	10800	11600	18400	25300	7600	13700	1.70	2.18
	Brinajl	48	156	8000	51200	43200	140400	24800	89200	5.4	2.74
	Cauliflower	-	168	-	51300	-	184800	-	133500	-	3.60
Summer											
	Cauliflower farming	-	142	-	68000	-	156200	-	88200	-	2.29

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S.No	Enterprises commodity	Yield Q/ha		Cost of Cultivation (Rs./ha)		Cross return (Rs./ha)		Net Return (Rs./ha)		BC Ratio	
		BIFS	BIFS	BIFS	AIFS	BIFS	AIFS	BIFS	AIFS	BIFS	AIFS
	Dairy (3 Cow)	1kg/cow/ days	8kg/cow/ day	800/cow/ month	3200/cow/ month	1050/cow/ month	8400/cow/ month	250 Rs./month	5200 Rs./month	1.31	2.62
	Pig farming (5F + 1M)	-	9 piglet/ harrowing	-	46000/ harrowing	-	122000/ harrowing	-	76000	-	2.65
	Duckery	-	180 egg/ Duck/year	-	920 duck/year	-	1800/egg	-	880	-	1.95
	Composite fish farm farming	23	38	42000	89000	184000	304000	142000	215000	4.38	3.41

96 Table-3 shows that farmers get maximum net income of Rs. 215000/ha in fish farming
 97 followed by Cauliflower cultivation of Rs. 88200/ha, pig farming Rs. 76000, field crops,
 98 Duckery and dairy respectively. The benefit cost ratio was also found more in Rice 3.55
 99 followed by cauliflower cultivation 3.60 and fish farming 3.41 respectively. The minimum
 100 cost benefit ratio recorded in gram 1.79 followed by cucurbits 1.85 and duck farming 1.95
 101 respectively. But overall under integrated farming system benefit cost ratio **would be is**
 102 more compare to farmer's farming system. It is due to location specific systems which has
 103 been developed on the basic of available resources which yield result into sustainable
 104 development. Integrated Farming System (IFS) ensured **s** that wastes from one form of
 105 agriculture become a resource for another form since it utilizes wastes as resources, we not
 106 only crimate wastes but we also ensure overall increase in productivity, profitability for
 107 the whole agricultural systems. This finding **agreed, will be supported** with the finding of
 108 Rajju Priya Soneet *al.* (2014)

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110 Annual net income within 5 Acre

111 After implementation on IFS in 5 Acre land annual income was calculated and it is presented
 112 in table 4

113 **Table: 4, Annual Income in 5 acre Integrated Farming system model.**

S.No	Commodity/Enterprises'	Area under different commodity /enterprises' before (IFS) Acre)	Annual Income (Rs.) Farmer farm system	Area under different commodity /enterprises' after (IFS) Acre	Annual net income. (Rs.)and IFS
1	Field crops	4	37108	2	36272.00
2	Fruit plant	-	-	0.5 (Three year old)	10000.00
3	Vegetable	0.75	35000	1	121000.00
4	Piggery (5F+1M)	-	-	0.25	76000.00
5	Dairy, Improved Breed (5 Cow) (22Dasi breed)in farmer house	0.6	5500	0.25	260,000.00
6	Poultry	-	-	0.25	26400.00
7	Composite fish farming	-	-	0.75	64758.75
Total Net Annual Income in One year			77608	-	594430.75

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 115 Table 4 showed **s** that before implementation of IFS model farmer utilized his 4 acre
 116 land in field crops and get Rs. 37108 net income and grew vegetables only for home
 117 consumption with traditional technology in 0.75 acres and got Rs. 35000 net income
 118 annually, in dairy farming, farmers reared 2 cow of local breed which gave only 1 liter milk
 119 per day and earned Rs. 5500 annual income. When calculating total annual income in 5 acre
 120 land farmer got Rs. 77608

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121 Table further showed **s** total income after adoption of Integrated Farming System
 122 (IFS) model with integration of different commodities and enterprises. Farmers get Rs,
 123 594430.75 in 5 acre of land which is 686% more in compare to farmer's farming system.

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128 **Conclusion**

129 Integrated farming system give unique opportunities for maintaining and extending
130 biodiversity. The emphasis in such system is on optimizing resource utilization rather than
131 maximization of individual elements in the system. The wellbeing of poor farmers can be
132 improved by bringing together the experiences and efforts of farmers, scientist, researchers.
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