

48 **METHODOLOGY**

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

59 **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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61 Besides this improved technology of farming, improved varieties, recommended
62 dose of nutrient, package of practices, drip and sprinkler irrigation, plastic mulching,
63 reducing chemical fertilizer by using vermi-compost, Plant residues, vermi wash, cow urine,
64 Bio-gas slurry, application of Bio-Pesticides etc were included facilities in the farm.

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

69 **Results & Discussion**

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

72 Production and productivity increase in integrated farming system is presented in
73 Table-2
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75 **Table:2 Increasing productivity of different commodities/Enterprises under**
76 **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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79 Table-2 Shows that so many commodities which were not taken by farmers before
80 implementation of integrated farming system i.e. cauliflower, pig farming and duckery,
81 which contribute 100% extra *income*. It is also seen in table 2 that in dairy farming farmers
82 were having indigenous Cow before IFS, which give only 1kg/cow/day milk but after
83 introduction of improved breed they got 8kg/cow/day which is 700% more compared to
84 before IFS. In vegetable cultivation farmer get 200% extra yield compared to previous
85 practice and in field crops like Rice, Maize + Red gram, Wheat, Mustard, farmers get
86 (52.38%), 30.76% , (61%), and (37.5%) extra yield respectively. It has happened due to use
87 of inter related set of enterprises so that the waste from one component becomes an input
88 for another component of IFS, which reduced cost and improved productivity. This finding
89 was also supported with the finding of Alexandratos N (ed) (1995).

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91 **Economics of Integrated Farming System (IFS)**

92 Analysis of Economics of Integrated Farming System is given in Table-3

93 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

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

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108 Annual net income within 5 Acre

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

111 **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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113 Table 4 shows that before implementation of IFS model farmer utilized his 4 acre
 114 land in field crops and get Rs. 37108 net income and grew vegetables only for home
 115 consumption with traditional technology in 0.75 acres and got Rs. 35000 net income
 116 annually, in dairy farming, farmers reared 2 cow of local breed which gave only 1 liter milk
 117 per day and earned Rs. 5500 annual income. When calculating total annual income in 5 acre
 118 land farmer got Rs. 77608

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

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126 **Conclusion**

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