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Assessment of integrated farming system in Haryana

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Abstract

Integrated Farming System (IFS) is the system that integrates livestock and crop production. The crop residues serve as food to the fish and livestock, and the wastes from the fish and livestock serve as fertilizer to the crops. Livestock, birds, trees and crops are the major components of IFS. Crop may have subsystem like monocrop, mixed/intercrop, multi-tier crops of cereals, legumes (pulses), oilseeds, forage etc. Livestock components may be milch cow, goat, sheep, poultry and bees. The adoption of feasible farm enterprise combinations, efforts should be made to help farmers to adopt more integrated and resource efficient farming systems that maintains agricultural productivity and profitability while protecting the environment and farm family health. The study was conducted in two agro climatic (Eastern and Western) zones of Haryana State. Two districts were selected from each zone. Out of each selected District 30 respondents were selected at random thus a total 120 respondents were selected for the purpose of investigation. It was found that majority of farmers were doing farm allied activities as subsidiary occupation. It was found that prominent farming system adopted by all the respondents were (Crop + Dairy). Apart from Crop + Dairy only 2.5 per cent of marginal land holding respondents, 3.3 per cent of small land holding and 12.5 per cent of semi- medium land holding respondents were practicing (crop + vegetables + fruits + dairy + vermi composting).

Keywords: Integrated farming system, practice

Introduction

Today's agriculture has totally moved into a non-profitable occupation because of low cost market price and repeated disruption of natural calamities, although more than 70% people depend on agriculture. Indian agriculture influenced the responsibility of providing national as well as household food and nutritional security to its swarming millions. The linear growth in population and unplanned colonization lead to rapid fragmentation of land holdings and shrinkage in fertile cultivated land. Integrated Farming System (IFS) is the system that integrates livestock and crop production. The crop residues serve as food to the fish and livestock, and the wastes from the fish and livestock serve as fertilizer to the crops. Livestock, birds, trees and crops are the major components of IFS. Crop may have subsystem like monocrop, mixed/intercrop, multi-tier crops of cereals, legumes (pulses), oilseeds, forage etc. Livestock components may be milch cow, goat, sheep, poultry and bees. The adoption of feasible farm enterprise combinations, efforts should be made to help farmers to adopt more integrated and resource efficient farming systems that maintain agricultural productivity and profitability while protecting the environment and farm family health. Besides livelihood security, social, economic and environmental sustainability is also ensured by the integrated farming system (Dahiya *et al.*, 2019) ^[1]. Considering these facts in mind this study was planned with the objective to study the different Integrated Farming System adopted by the respondents.

Methodology

The study was conducted in two agro climatic (Eastern and Western) zones of Haryana State. Two districts namely Hisar and Bhiwani were selected randomly from Western zone and Kaithal and Jind districts were selected from Eastern Zone. Three villages were selected purposively from each selected district namely Harikot, Mangali, and Kaimri from Hisar district, Bwani Kheda, Prem Nagar and Kungad from Bhiwani district, Peyoda, Songal and

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Kheri Sheru from Kaithal district and Kaer Kheri, Ahirka and Julna from Jind district and 10 Respondents were selected purposively from each villages. Out of each selected District 30 respondents were selected at random thus a total of 120 respondents were selected for the purpose of investigation. A well-structured interview schedule was prepared to obtain information from respondents. The data were collected personally by the researcher and obtained data were analyzed by using frequency and percentage.

Results and Discussions

Socio- personal profile of respondents

Table -1 depict the results regarding the socio- personal profile of the respondents which revealed that majority of respondents were from middle age group (60.0%), belonged

to upper caste category (74.1%), married (94.1), educated up to matriculation (35.8), having medium education status of family (40.0%), had joint family type (68.3), with large family size (65.0%), had medium score on material possession (47.5%), had member of formal/non formal organization (95.0), had 2-5 buffaloes (41.6), had 1-2 cow (21.6) and had big size of poultry farm (4.1%). 100 percent respondents were farmers and majority of them were doing farm allied activities as subsidiary occupation (81.6%) with earning monthly family income less than Rs.20,000/- (51.6%), had semi-medium size of land holding 5.1 -10 acre (51.6%). Majority of respondents had 15-21 years of experience of farming (52.5%) and using tube-well as a source of irrigation (61.6%).

Table 1: Socio- personal profile of respondents N-120

Sr. No.	Variable	Categories	Western Zone F (%) N=60	Eastern zone F (%) N=60	Total F (%) N=120
1.	Age	Young (25-40)	16 (26.7)	15 (25.0)	31 (25.8)
		Middle (41-55)	37 (61.6)	35 (58.3)	72 (60.0)
		Old (above 55)	7 (11.7)	10 (16.7)	17 (14.2)
2.	Caste	Lower	0 (0.0)	2 (3.3)	2 (1.7)
		Middle	14 (23.3)	15 (25.0)	29 (24.2)
		Upper	46 (76.7)	43 (71.7)	89 (74.1)
3.	Marital Status	Married	54 (90.0)	59 (98.3)	113 (94.2)
		Unmarried	6 (10.0)	1 (1.7)	7 (5.8)
4.	Education of respondent	Illiterate	7 (11.7)	11 (18.3)	18 (15.0)
		Can read and write	8 (13.3)	6 (10.0)	14 (11.7)
		Primary school	5 (8.3)	9 (15.0)	14 (11.7)
		Middle school	4 (6.7)	6 (10.0)	10 (8.3)
		Matriculation	25 (41.7)	18 (30.0)	43 (35.8)
		Graduation	9 (15.0)	7 (11.7)	16 (13.3)
5.	Family Educational Status	Technical/vocational Education	2 (3.3)	3 (5.0)	5 (4.2)
		Low (1.33-2.44)	18 (30.0)	20 (33.3)	38 (31.7)
		Medium (2.45-3.55)	26 (43.3)	22 (36.7)	48 (40.0)
6.	Family type	High (3.56-4.66)	16 (26.7)	18 (30.0)	34 (28.3)
		Nuclear	23 (38.3)	15 (25.0)	38 (31.7)
7.	Family Size	Joint	37 (61.7)	45 (75.0)	82 (68.3)
		Small (upto 4 members)	5 (8.3)	10 (16.7)	15 (12.5)
8.	Material Possession	Medium(5-7 members)	13 (21.7)	14 (23.3)	27 (22.5)
		Low (3-6)	11 (18.3)	12 (20.0)	23 (19.2)
		High (more than 7 members)	42 (70.0)	36 (60.0)	78 (65.0)
9.	Social Participation	Member of formal/ non formal organization	56 (93.3)	58 (96.7)	114 (95.0)
		Medium (7-10)	32 (53.4)	25 (41.7)	57 (47.5)
		High (11-14)	17 (28.3)	23 (38.3)	40 (33.3)
10.	Possession of livestock	Member of formal/ non formal organization	56 (93.3)	58 (96.7)	114 (95.0)
		No Membership	4 (6.7)	2 (3.3)	6 (5.0)
i.	Buffalo	Low (2-5)	46 (76.7)	4 (6.7)	50 (41.7)
		Medium (6-9)	9 (15.0)	11 (18.3)	20 (16.7)
		High (10-12)	5 (8.3)	8 (13.3)	13 (10.8)
ii.	Cow	Low (1-2)	16 (26.7)	10 (16.7)	26 (21.7)
		Medium (3-4)	7 (11.7)	9 (15.0)	15 (12.5)
		High (5-6)	3 (5.0)	3 (5.0)	6 (5.0)
iii.	Poultry	Small (up to 1000 Baby chicks)	3 (5.0)	02 (3.3)	5 (4.2)
		Big (More than 1000 Baby chicks)	1 (1.7)	02 (3.3)	3 (2.5)

Figures in parenthesis indicate percentages

Existing Farming System adopted by respondents

The findings regarding existing farming system adopted by the respondents have been furnished in Table 2. Results reveals that 17.5 per cent respondents with marginal land

holding were practicing vegetables and (crop+ vegetables) 18.3 per cent (fruits), 13.3 per cent (crops+ vegetables+ fruits and crops + Vegetables + fruits + dairy) and 2.5 per cent (crop + vegetables + fruits + dairy + vermi composting).

Table 2: Existing Farming System adopted by respondents N=120

Farming System	Western Zone N=60			Eastern Zone N=60			Total N=120		
	Marginal	Small	Semi-Medium	Marginal	Small	Semi-medium	Marginal	Small	Semi-Medium
	(11)	(15)	(34)	(21)	(11)	(28)	(32)	(26)	(62)
Crops	11 (18.3)	15 (25.0)	34 (56.7)	21 (35.0)	11 (18.3)	28 (46.7)	32 (26.7)	26 (21.7)	62 (51.7)
Vegetables	07 (11.7)	09 (15.0)	32 (53.3)	14 (23.3)	09 (15.0)	27 (45.0)	21 (17.5)	18 (15.0)	59 (49.2)
Fruits	06 (10.0)	08 (13.3)	33 (55.0)	16 (26.7)	07 (11.7)	26 (43.3)	22 (18.3)	15 (12.5)	59 (49.2)
Dairy	11 (18.3)	15 (25.0)	34 (56.7)	21 (35.0)	11 (18.3)	28 (46.7)	32 (26.7)	26 (21.7)	62 (51.7)
Vermi-composting	03 (5.0)	04 (6.7)	06 (10.0)	02 (3.3)	03 (5.0)	12 (20.0)	05 (4.2)	07 (5.8)	18 (15.0)
Bio-gas Plant	04 (6.7)	07 (11.7)	16 (26.7)	03 (5.0)	08 (13.3)	14 (23.3)	07 (5.8)	15 (12.5)	30 (25.0)
Crops + Vegetables	07 (11.7)	09 (15.0)	33 (55.0)	14 (23.3)	09 (15.0)	27 (45.0)	21 (17.5)	16 (13.3)	60 (50.0)
Crops + Vegetables + Fruits	04 (6.7)	07 (11.7)	32 (53.3)	12 (20.0)	05 (8.3)	25 (41.7)	16 (13.3)	12 (10.0)	57 (47.5)
Crops + Vegetables + Fruits + Dairy	04 (6.7)	07 (11.7)	33 (55.0)	12 (20.0)	05 (8.3)	25 (41.7)	16 (13.3)	12 (10.0)	58 (48.3)
Crops + Vegetables + Fruits + Dairy + Vermi-composting	02 (3.3)	02 (3.3)	05 (8.3)	01 (1.7)	02 (3.3)	10 (16.7)	03 (2.5)	04 (3.3)	15 (12.5)

Multiple response

Table further reveals that only 5.8 percent of marginal land holding respondents had bio-gas plant on their field. Table further reveals that 13.3 per cent respondents with having small land holding were practicing (crop + vegetables), 12.5 per cent (fruits), 10.0 per cent (crops + vegetables + fruits) and (crops + Vegetables + fruits + dairy) and only 3.3 per cent (crop + vegetables + fruits + dairy + vermin composting) whereas 12.5 percent of small land holding respondents had bio-gas plant on their field. Further data shows that 49.2 per cent of respondents with semi-medium land holding were practicing of different crops on their field (fruits and vegetables), 48.3 per cent (crop + vegetables, crops + vegetables + fruits + dairy), 47.5 per cent (crops + vegetables + fruits), 12.5 per cent (crop + vegetables + fruits + dairy + vermi composting). Table further revealed that 25.0 percent of respondents had bio-gas plant on their field. Results are inconsonance with results of Singh *et al.*, (2017) ^[7] who studied four farming systems (FS) existed in both the rainfed and irrigated areas of Chittorgarh and Banswara districts *viz.* FS-I: Crop+ Vegetables (C+V), FS-II: Crop + Dairy (C+D), FS-III: Crop + Dairy +Goat (C+D+G) and FS-IV: Crop + Poultry (C+PO) to work out internal cost adjustments in existing farming systems of Southern Rajasthan. Ramrao *et al.* (2006) ^[6] investigated sustainable mixed farming model in Durg district with having different component like crop, livestock, poultry and duck on 1.5 acre land holding. Different viable modules *viz.* (T₁) arable, (T₂) crop + 2 bullocks + 1 cow, (T₃) crop + 2 bullocks + 1 buffaloes, (T₄) crop + 2 bullocks + 1 cow + 1 buffaloes, (T₅) crop + 2 bullocks + 1 cow + 1 buffaloes + 10 goats and (T₆) crop + 2 bullocks + 1 cow + 1 buffaloes + 10 goats + 10 poultry + 10 ducks were developed to find out the best package on the land holding of 1.5 acre suitable for the tribal region. Paramesh *et al.* (2019) ^[4] also studied different farming system models which were crop– livestock-aquaculture, rice-baby corn, rice-cowpea, fodder- azolla, vegetables- fruits and dairy farming for sustainability, profitability, energy efficiency and environmental impact. Results also have been supported by Ponnusawmy and Gupta, 2010 ^[5]; Khan *et al.*, 2015 ^[3] and Khalid *et al.*, 2017 ^[2].

Conclusion

It was found that prominent farming system adopted by all the respondents were (crop + dairy). Only 2.5 to 12.5 per cent of respondents were practicing (crop + vegetables + fruits + dairy + vermi composting) and some of the respondents had bio-gas plant on their field.

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