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ECONOMICS OF FARMING IN HARYANA 2005-2006

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PREFACE

The present report relates to the annual series on 'Economics of Farming in Haryana' and it refers to the agricultural year 2004-05 (July,2004 to June,2005).

This study provides comprehensive assessment regarding the annual gross income, expenditure and net income from cultivation under irrigated and unirrigated holdings. It also highlights impact of irrigation, cropping pattern, consumption of chemical fertilizers and use of improved agricultural machinery and farm equipments on the yield of various crops and cropping intensity. It also analyses the share of bullock and manual labour as well as machinery deployed in agricultural operations.

The study has revealed that the average gross income per hectare under peasant proprietorship holdings (which form 73% of total selected holdings) was Rs. 45659 and average net income of Rs. 24338 taken together from irrigated and unirrigated holdings where as the average gross and net income from peasant proprietorship-cum-tenancy holdings was Rs. 55700 and Rs. 22885 respectively.

The report has been prepared by Sh. R.N.Dalal, Research Officer under the supervision of Major SCL. Datta, Dy. Economic and Statistical Adviser and overall guidance of Sh. O.P. Dhankhar, Additional Economic and Statistical Adviser. The assistance rendered by Sarvshri Jai Singh Malik, Assistant Research Officer, Baldev Singh, J.F.I. and Smt. Rajwanti, J.F.I., for scrutiny, compilation and tabulation of data is also acknowledged. Typing support was given by Smt. Kamlesh, Stenotypist.

The valuable assistance and active co-operation rendered by the selected cultivators who maintained the record of day-to-day operations in connection with cultivation of their respective holdings is also acknowledged.

I hope this issue will prove useful for the agricultural planners and research workers in the State who are interested in the development of rural economy.

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to Government, Haryana.

Chandigarh
Dated : 9-6-2006

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CHAPTER – I
INTRODUCTION

General

Agriculture holds the key to prosperity. Despite the decline in the share of agriculture to about one-fourth of Gross State Domestic Product, nearly two third of our population still depends on this sector for their livelihood. In terms of area, agriculture has already reached at a saturation level and almost all the available cultivable land in the state is under plough. Thus, there is hardly any scope to bring more area under cultivation. The agriculture production can only be increased through enhanced cropping intensity, change in cropping pattern, improvement in seeds of high yielding varieties, better cultivation practices and post harvest technology etc., State Govt. is trying to re-orient agriculture in this direction through various policy measures for increasing the production. Considering the importance of this sector, Agriculture wing of this organisation has been bringing out the annual publication "Economics of Farming" which provides useful information on various aspects of farm economy and is greatly helpful in the formulation and evaluation of agricultural development programmes and policies. The study is also highly useful in a small state which is endowed with the variations of soil, topography, climate, cropping pattern and irrigation.

The present report on "Economics of Farming in Haryana" relates to the agricultural year 2004-2005 and covers 232 selected holdings from all the districts of the state..

1.1 Objectives of the Study

The main objective of this study is to make an in-depth study of 'Economics of Farming' in Haryana and to work out the annual investment and net return per hectare under different types and size of holdings. In addition, this study also highlights the following aspects :

(i) Input-output analysis of various crops.

(ii) Income, expenditure and net return per hectare under the prevalent forms of cultivation i.e. peasant proprietorship and peasant proprietorship-cum- tenancy .

(iii) Employment and utilisation of farm capital, manual labour and bullocks labour.

1.2 Method of Data Collection

The study is based on the data collected from the selected cultivators through District Statistical Agencies. Various farm operations were recorded by the selected cultivators in the prescribed registers. To ensure accuracy of data, the record maintained by the farmers regarding this study was supervised and checked both by the staff of Headquarter and the District Statistical Agencies. Each selected cultivator was paid an honorarium of Rs. 225/-per annum for maintaining farm accounts register during the year 2004-05.

1.3 Sampling Design

Multistage sampling design was adopted for conducting the annual field survey. The village was taken as a primary unit and the particular holding was ultimate unit of survey. The farm holdings in the villages have been selected purposively depending on the co-operation, willingness and capability of the cultivators in maintaining the day-to-day record of farm operations. As such, the results and conclusions arrived at in this report are based on the study of sample holdings and therefore, cannot necessarily be taken to reflect the situation prevailing in the state as a whole.

1.4 Coverage

The study is comprehensive in nature and gives detailed account of 232 agricultural holdings. Out of these holdings, 207 holdings were irrigated, 8 unirrigated and the remaining 17 agricultural holdings were partly irrigated. Various characterstics of farm holdings such as size,tenancy, level of irrigation, area under various crops, agro-climatic conditions, intensity of cropping and yield per hectare have been analysed in the report. The economic impact of various inputs like (i) Manual labour, (ii) Bullock/Camel labour, (iii) Seeds (local and Improved varieties), (iv) Agricultural implements and machinery, (v) Farm yard manure and chemical fertilizers, (vi) Irrigation charges (abiyana and tubewell charges) etc., (vii) Rent (actually paid) and (viii) Miscellaneous inputs e.g. payments made to artisans, cost of insecticides and pesticides etc. have been calculated and shown separately for irrigated and unirrigated areas. Similarly, gross income, expenditure and net income per hectare under peasant proprietorship and peasant proprietorship-cum-tenancy have been worked out to determine the profitability of farming. The holdings have been classified according to various size groups to facilitate group-wise comparison of different inputs and out puts of farm cultivators.

1.5 Agro-Climatic Zones

Haryana consists of different agro climatic zones which are conducive for different variety of crops. To facilitate the analysis of data and to make the study more useful in planning and research for agricultural development, Haryana State has been divided into four homogeneous agro-climatic zones which are as under :-

Sr. No.	Zone	Districts included
1	Northern	Panchkula, Ambala, Yamunanagar, Kurukshetra,Karnal, Panipat
2.	Central	Kaithal, Jind, Sonipat, Rohtak, Jhajjar
3.	Western	Bhiwani, Hisar, Fatehabad, Sirsa.
4.	Southern	Faridabad,Gurgaon, Rewari, Mahendragarh.

CHAPTER – II

ANALYSIS OF FARM ACCOUNT HOLDINGS

2.0 General

This chapter deals with zone-wise and size group wise classification of all the 232 selected farm holdings, the prevalent land tenure system, the extent of irrigation, use of chemical fertilizer per hectare area under different crops and yield per hectare. The capital investment in agricultural machinery & equipment, tubewells & pumping sets has also been worked out along with the maintenance cost of the pair of bullocks. The Micro level data in repect of selected holdings has been presented in Appendices I to III

2.1 Number and size of farm holdings

The zone-wise number of selected farm holdings, total cultivated area and average size of holdings is presented in the table given below.

Table 2.1 : Zone-wise number and average size of selected holdings

Sr.No.	Zone	No.of farm holdings	Total cultivated area of farm holdings (hectares.)	Average size of holdings (hectares)
1.	2	3	4	5
		64	247.09	3.86
		(27.59)	(29.29)	
2.	Central	58	164.50	
		(25.00)	(19.50)	
3.	Western	60	243.39	
		(25.86)	(28.86)	
	Southern	50	188.50	
		(21.55)	(22.35)	
	Total	232	843.48	3.64
		(100.00)	(100.00)	

Note Figures in brackets indicate percentage to total.

Table 2.1 shows that the total cultivated area of all 232 selected holdings was 843.48 hectares with an average size of holdings of 3.64 hectares. The average size of holdings was the highest 4.06 hectares in Western zone and the lowest 2.84 hectares in central zone. It may, however, be pointed out that the average size of holdings does not represent the average size of holdings in the state as the selection of farm holdings was purposive in character.

2.2 Land Tenure Systems

There are two types of land tenure systems prevalent in the State i.e. (i) peasant proprietorship where a peasant cultivates his own land with the help of his own family members or hired labourers, (ii) peasant proprietorship-cum-tenant where a farmer cultivates his own land alongwith some land either on rent (cash) or on batai (kind) with the help of his own family members or hired labourers so as to make the cultivation of holding economically viable.

The classification of selected holdings according to prevailing land tenure systems in the different zones is given in Table 2.2.

Table 2.2 Zone-wise classification of farm holdings under peasant proprietorship and peasant proprietorship-cum- tenancy system .

Zone	Peasant proprietorship		Peasant proprietorship - cum-tenancy		Total	
	No. of holdings	Area (hectares)	No. of holdings	Area (hectares)	No. of holdings	Area (hectares)
	2	3	4	5	6	7
Northern	40	133.56	24	113.53	64	247.09
	(62.50)	(54.05)	(37.50)	(45.95)	(27.59)	(29.29)
Central	39	102.60	19	61.90	58	164.50
	(67.24)	(62.37)	(32.76)	(37.63)	(25.00)	(19.50)
Western	50	204.49	10	38.90	60	243.39
	(83.33)	(84.02)	(16.67)	(15.98)	(25.86)	(28.86)
Southern	41	145.70	9	42.80	50	188.50
	(82.00)	(77.29)	(18.00)	(22.71)	(21.55)	(22.35)
Total	170	586.35	62	257.13	232	843.48
	(73.28)	(69.52)	(26.72)	(30.48)	(100.00)	(100.00)

Note : Figures in brackets show the percentage to the total number of holdings and total area.

Table 2.2 shows that out of total 843.48 hectares 586.35 hectares (69.52%) belonged to the peasant proprietor cultivators and remaining 257.13 hectares (30.48%) was covered under peasant proprietor-cum-tenant holdings. The peasant proprietor-cum-tenants are represented by small and marginal farmers who had to supplement their holdings by taking land on rent/batai in cash or kind so as to make the cultivation of holding economically viable.

2.3 Classification of cultivated area of selected holdings

Classification of area of the selected holdings under different size groups and land tenure systems is given in the following table :-

Table 2.3 : Classification of selected holdings according to size and land tenure systems.

(Area in hectares)

Size of holdings	Peasant proprietorship		Peasant proprietorship-cum-tenancy					Total	
	No. of holdings	Area	No. of holdings	Owned	Rented (Cash)	Batai (Kind)	Total area	No. of holdings	Area
1	2	3	4	5	6	7	8	9	10
Below 2.0	44	59.74	8	5.99	4.92	-	10.91	52	70.65
								(22.41)	(8.35)
2.0-4.0	74	203.78	28	45.80	23.50	3.80	76.10	102	279.88
								(43.97)	(33.18)
4.0-7.5	41	216.43	20	67.12	44.00	-	104.12	61	320.55
								(26.29)	(38.00)
7.5 – 10.0	7	58.80	3	9.60	13.60	-	23.20	10	82.00
								(4.31)	(9.72)
10.0 & above	4	47.60	3	32.00	10.80	-	42.80	7	90.40
								(3.02)	(10.72)
Total	170	586.35	62	156.51	96.82	3.80	257.13	232	843.48
	(73.28)	(69.52)	(26.72)				(30.48)	(100.00)	(100.00)

Note : Figures in brackets show the %ages to the total number of holdings and total area

It may be seen from Table 2.3 that out of total 232 farm holdings,170 holdings (73.28%) and 62 holdings (26.72%) were under peasant proprietorship & peasant proprietorship-cum-tenancy having an area of 586.35 hectares (69.62%) & 257.13 hectares (30.48%), respectively. It may also be inferred from the table that the maximum (43.97%) concentration of holdings was in the size group of 2.0-4.0 hectares and the minimum (2.59%) in the size group of 7.5-10.00 hectares. A majority of the holdings i.e. 70.69% were in the size groups of 2.0-4.0 & 4.0-7.5 hectares whereas 23.70% of the holdings belonged to the smallest size group of below 2.0 hectares. The remaining 5.61% holdings were in the size group of 7.5-10.0 and 10.0 hectares and above during the year 2004-05.

Table 2.4 : Number of holdings by extent of irrigation.

Zone	Total number of selected holdings	Irrigated holdings	Unirrigated holdings	Partly irrigated holdings			
				Below 25%	25% to 50%	50% to 75%	75% to 100%
	2	3	4	5	6	7	8
Northern	64	60	1	-	1	1	1
Central	58	52	-	-	-	3	3
Western	60	54	2	-	1	2	1
Southern	50	41	5	-	-	1	3
Total	232	207 (89.22)	8 (3.45)	-	2 (0.86)	7 (3.02)	8 (3.45)

Table 2.4 shows that out of total 232 holdings, maximum number of holdings i.e. 207 holdings (89.22%) were wholly irrigated as many as 8 holdings (3.45%) were totally unirrigated and the remaining 17 holdings (7.33%) were partly irrigated.

Irrigation

Irrigation is a vital input to increase agricultural production. The state has limited water resources viz canal as well as under ground water. The State Government in its plans accords high priority to the provision of adequate irrigation facilities.

Irrigated/Unirrigated area of selected holdings

The zone wise total cultivated area, irrigated and unirrigated area of the selected holdings is presented in the table 2.4 (a).

Table 2.4 (a) : Zone-wise irrigated/unirrigated area of the selected holdings.

Zone	Total cultivated area of all selected holdings	Irrigated area	Unirrigated area	Area irrigated/unirrigated as percentage of the total cultivated area	
				Irrigated	Unirrigated
1	2	3	4	5	6
Northern	247.09	243.58	3.51	98.58	1.42
Central	164.50	158.70	5.80	96.47	3.53
Western	243.39	226.19	17.20	92.93	7.07
Southern	188.50	159.30	29.20	84.51	15.49
Total	843.48	787.77	55.71	93.40	6.60

It may be observed from the above table that 93.40 percent of the cultivated area v under irrigation whereas only 6.60 percent area was found unirrigated during agricultural year 2004- The maximum of 98.58% of the total cultivated area in Northern zone was found under irrigation. Wh as it was the minimum of 84.51% in the Southern zone.

2.5 Classification of holdings by number and extent of irrigation in different size groups.

The classification of holdings by number and extent of irrigation in different size groups is given in Table 2.5.

Table 2.5 : Classification of holding by number/area and level of irrigation in different size groups.

(Area in hectares)

Size of holdings (hectares)	Total number of holdings	Total area of all selected holdings	Wholly irrigated holdings/ area		Partly irrigated holdings/ area			Wholly unirrigated holdings/ area	
			No.	Area	No	Area		No	Area
						Irri.	Unirri.		
1	2	3	4	5	6	7	8	9	10
Below 2.0	52	70.65	45	51.04	2	1.60	0.00	5	
2.0-4.0	102	279.88	96	261.68	5	10.70	3.90	1	
4.0-7.5	61	320.55	53	278.65	7	23.90	11.40	1	
7.5 –10.0	10	82.00	8	65.60	1	7.20	0.80	1	
10.0 & above	7	90.40	6	64.80					
Total				731.77 (86.76)				8	25.81 (3.06)

Note :- Figures in brackets show the percentages to the total number of holdings and total area

It may be seen from Table 2.5 that out of total 232 holdings as many as 102 holdings were in the size group of 2.0-4.0 hectares having a total area of 279.88 hectares, 62 holdings were in the size group of 4.0-7.5 hectares with an area of 320.55 hectares. Whereas only 7 holdings belonged to the size group of 10.0 hectares & above. The table further reveals that 86.76 percent and 10.18 percent of the total area was found fully irrigated or partly irrigated during the year 2004-05 and the remaining 3.06 percent area had no irrigation facility.

2.6 Area under different crops (Irrigated and Unirrigated holdings)

Zone- wise and crop-wise distribution of irrigated/unirrigated area of selected holdings is given in Table 2.6 (a) and 2.6 (b), respectively.

Table 2.6 (a) : Zone-wise and crop-wise distribution of irrigated area of selected holdings :

(Area in hectares)

	Crops	Northern	Central	Western	Southern	Total
		2	3	4	5	6
		101.98	70.40	27.20	8.60	268.18 (19.03)
	Bajra	-	15.30	31.24	37.24	83.78 (5.95)
	Maize	5.48	-	-	-	5.48 (0.38)
	Wheat	169.54	126.52	144.58	80.68	521.32 (37.00)
	Barley	-	0.20	1.00	5.10	6.30 (0.45)
	Total Cereals	**337.00**	**212.42**	**204.02**	**131.62**	**885.06 (62.81)**
II	**Pulses**					
	Gram	0.04	-	4.00	1.00	5.04 (0.36)
	Other pulses	1.30	5.70	1.60	5.80	14.40 (1.02)
	Total pulses	**1.34**	**5.70**	**5.60**	**6.80**	**19.44 (1.38)**
III.	**Cash crops**					
	Oilseeds (Rape & Mustard)	7.00	13.70	56.80	56.46	134.06 (9.51)
	Sugarcane	44.90	6.70	-	0.20	51.80 (3.68)
	Cotton (Desi)	-	8.00	35.60	2.60	46.20 (3.28)
	Cotton (American)	-	4.30	73.48	-	77.78 (5.52)
	Total cash crops	**51.90**	**32.70**	**165.98**	**59.26**	**309.84 (21.99)**
IV.	Green Fodder	41.57	32.92	23.43	19.90	117.82 (8.36)
V.	Other crops	9.30	8.50	31.80	27.40	77.00 (5.46)
	Total of all crops	**441.11**	**292.24**	**430.83**	**244.98**	**1409.16 (100.00)**

Note : Figures in brackets indicate percentages to total

Table 2.6 (b) : Zone-wise and crop-wise distribution of unirrigated area of selected holdings:

(Area in hectares

	Crops	Northern	Central	Western	Southern	
						6
	Bajra		1.00	3.20	4.40	8.60 (13.54)
	Maize	1.91	-	-	-	1.91 (3.01)
	Wheat	2.51	2.00	-	11.60	16.11 (25.36)
	Barley	-	-	-	1.00	1.00 (1.57)
	Total Cereals	**4.42**	**3.00**	**3.20**	**17.00**	**27.62 (43.48)**
II.	**Pulses**					
	Gram			11.60	5.20	16.80 (26.45)
	Other pulses	-	-	-		-
	Total pulses	**-**	**-**	**11.60**	**5.20**	**16.80 (26.45)**
III.	**Cash crops**					
	Oilseeds (Rape & Mustard)	0.40	3.60	3.80	5.60	13.40 (21.10)
	Sugarcane					
	Cotton (Desi)					
	Cotton (American)					
	Total cash crops	**0.40**	**3.60**	**3.80**	**5.60**	**(21.10)**
IV.	Green Fodder	1.04	-	-	4.00	5.04 (7.93)
V.	Other crops	0.06	-	0.60	-	0.66 (1.04)
	Total of all crops	**5.52**	**6.60**	**19.20**	**31.80**	**63.52 (100.00)**

Note Figures in brackets indicate percentages to total.

It may be observed from the foregoing Tables 2.6 (a) and 2.6 (b) that the total irrigated and unirrigated area of all crops was 1409.16 hectares and 63.52 hectares, respectively.

The percentage of irrigated area under wheat was the highest (37.00) followed by paddy 19.03, oilseeds 9.51 and green fodder 8.36. It may also be seen that the highest (441.11 hectares) irrigated area of all crops was observed in northern zone whereas it was lowest (244.98 hectares) in the southern zone. It may also be seen that southern zone had maximum (31.80 hectares) unirrigated area. Whereas it was minimum (5.92 hectares) in northern zone.

The cropping pattern in unirrigated areas was found to be different than that of the irrigated areas. In case of unirrigated areas, the percentage of area under Gram was the highest (26.45) followed by Wheat (25.36), Oilseeds (21.10) & bajra (13.54).

2.7 Intensity of Cropping

The choice and scope of various crops is determined by assured irrigation facilities and availability of improved high yielding varieties of seeds and other inputs. The cropping intensity is defined as the total cropped area as a percentage to net area sown. The total cropped area under various crops of selected holdings alongwith percentage of irrigated area and intensity of cropping are presented in Tables 2.7 (a) & 2.7 (b) respectively.

Table 2.7 (a) : Area under different crops and crop-wise percentages of irrigated area to the total cropped area.

(Area in hectares)

Sr.No.	Crops	Total cropped area (Irrigated & unirrigated)	Percentage to total cropped area	Irrigated area	%age of irrigated area to total cropped area
	2	3	4	5	6
1.	Paddy	268.18	18.21	268.18	100.00
2.	Bajra	92.38	6.27	83.78	90.69
3.	Maize	7.39	0.50	5.48	74.15
4.	Wheat	537.43	36.49	521.32	97.00
5.	Barley	7.30	0.50	6.30	86.30
6.	Gram	21.84	1.48	5.04	23.08
7.	Other Pulses	14.40	0.98	14.40	100.00
8.	Oilseeds (Rape & Mustard)	147.46	10.02	134.06	90.91
9.	Sugarcane	51.80	3.52	51.80	100.00
10.	Cotton Desi	46.20	3.14	46.20	100.00
	Cotton American	77.78	5.28	77.78	100.00
12.	Green Fodder	122.86	8.34	117.82	95.90
13.	Other Crops	77.66	5.27	77.00	99.15
	Total	1472.68	100.00	1409.16	95.69

It may be observed from the above table that the percentage of area under wheat was the highest 36.49, followed by paddy 18.21, Oilseeds (Rape & Mustard) 10.02, Green fodder 8.34 whereas only 0.50 percent area was under maize. The area under paddy, sugarcane, cotton (desi & american) and pulses was fully irrigated where as 97% of the area under wheat & 90.91% of the area under oilseeds was found irrigated.

The intensity of cropping in irrigated and unirrigated areas of all the four agro climat zones has been worked out in the following table:-

Table 2.7 (b) : Zone-wise intensity of cropping under irrigated and unirrigated areas.

Zone	Percentage of intensity		Total
	Irrigated	Unirrigated	
	2	3	4
Northern	181.09	168.66	180.92
Central	184.15	113.79	181.67
Western	190.47	113.63	184.90
Southern	153.79	108.90	146.83
Overall intensity	178.88	114.02	174.95

The average intensity of cropping in the irrigated and unirrigated areas was 178.88 anc 114.02, respectively. The western zone recorded the highest intensity of 190.47 whereas it was the lowest of 153.79 in southern zone on irrigated land. In case of unirrigated land, the intensity of cropping was highest (168.66) in northern zone and lowest (108.90) in southern zone. The overall intensity was 174.95% for irrigated and unirrigated areas.

2.8 Output per hectare

The average yield per hectare of sugarcane was 60697 kgs; paddy 4793 kgs; wheat 3997 kgs; barley 3000 kgs; oilseeds 1342 kgs; respectively in irrigated areas. The average yield in unirrigated areas under wheat, oilseeds and barley was 2228 kgs., 1325 kgs., 4500 kgs., respectively. Zone-wise yield per hectare of different crops in irrigated and unirrigated land is given in Table 2.8 (a) & 2.8 (b), respectively.

Table 2.8 (a) : Zone-wise yield per hectare of different crops under irrigated areas during 2004-2005.

(In Kgs.)

Sr.No.	Crops	Northern	Central	Western	Southern	Average yield
1	2	3	4	5	6	7
	A-Cereals					
1.	Paddy	4756	4403	5934	5058	4793
2.	Wheat (Grain)	3788	4237	4355	3416	3997
3.	Wheat (Bhusa)	3343	4112	4152	3242	3736
4.	Bajra (Grain)		1654	1425	1410	1460
5.	Maize (Grain)	1734	-	-	-	1734
6.	Barley (Grain)	-	3000	2900	3020	3000
7.	Barley (Bhusa)	-	3000	2700	2471	2524
	B-Pulses					
1.	Gram (Grain)	2500	-	750	1600	933
2.	Gram (Bhusa)	-	-	325	1600	575
3.	Other Pulses (Grain)	923	895	500	897	854
	C-Cash Crops					
	Oilseeds (Rape & Mustard)	1486	1168	1346	1362	1342
2.	Sugarcane	61984	52239		55000	60697
3.	Cotton (Desi & American)		1407	1738	808	1686

Table 2.8 (b) : Zone-wise yield per hectare of different crops under unirrigated areas during 2004-05.

(In Kgs.)

Sr.No.	Crops	Northern	Central	Western	Southern	Average yield
1	2	3	4	5	6	7
	A-Cereals					
1.	Paddy					
2.	Wheat (Grain)	2191	2000	-	2276	2228
3.	Wheat (Bhusa)	1793	2000	-	1629	1701
4.	Bajra (Grain)		700	938	1250	1015
5.	Maize (Grain)	1466	-	-	-	1466
6.	Barley (Grain)	-	-	-	2500	2500
7.	Barley (Bhusa)	-	-		2000	2000
	B-Pulses					
1.	Gram (Grain)			1379	385	952
2.	Gram (Bhusa)			1379	385	952
3.	Other Pulses (Grain)					
	C-Cash Crops					
1.	Oilseeds (Rape & Mustard)		1139	1474	1339	1323
2.	Sugarcane					
3.	Cotton (Desi and American)					

2.9 Capital investment in farm, agricultural machinery and equipments.

The capital investment has been classified into two broad heads i.e. (a) investment to improve the farm and (b) investment in agricultural machinery and equipments.

(a) The capital investment in farm includes the following :-

(i) Investment in land such as reclamation, improvement, fencing, terracing and bunding etc.

(ii) Construction and maintenance of farm buildings, comprising of cattlesheds, tractor sheds, godown and stores etc. (excluding investment in dwelling houses).

(iii) Acquisition and maintenance of drought animals.

(b) Capital investment in agricultural machinery and equipments includes the following :-

Agricultural implements and machinery including tractors with accessories, bar harrow, thrasher, cart, iron plough, cane crusher, chaff cutter and gur boiling pan etc.

(ii) Installation of tubewells / pumping sets and sinking of wells. It also includes the cost of construction and remodeling of kacha and pucca water courses.

Zone-wise details of capital investment in farm and agricultural machinery/equipments are given in Table 2.9 (a)

Table 2.9 (a) : Capital investment in farm agricultural machinery and equipments ;

(In Rs.)

Items	Northern	Central	Western	Southern	Total
1	2	3	4	5	6
A-Farm					
(i) Farm buildings, cattlesheds & other structures	1162720 (30.48)	786040 (33.95)	399808 (22.70)	236800 (7.67)	2585368 (23.55)
(ii) Drought animals (including its acquisition)	66976 (1.76)	51296 (2.21)	64992 (3.69)	4032 (0.13)	187296 (1.71)
Total-A	**1229696 (32.24)**	**837336 (36.16)**	**464((26.**	**240832 (7.80)**	
B-Agricultural machinery					
(i) Tubewells/pumping sets	768152 (20.14)	306872 (13.26)	543368 (30.85)	544960 (17.65)	2163352 (19.71)
(ii) Machinery and equipments	1816056 (47.62)	1171240 (50.58)	753120 (42.76)	2301248 (74.55)	6041664 (55.03)
Total – B	**2584208 (67.76)**	**1478112 (63.84)**	**1296488 (73.61)**	**2846208 (92.20)**	**8205016 (74.74)**
Grand Total (A+B)					
Investment per hectare					

The perusal of the table shows that the total capital investment on farm buildings and drought animals was 25.26% against 74.74% capital investment on Tubewells/pumping sets and machinery & equipments. The capital investment in farm was the highest (36.16%) in central zone whereas it was lowest (7.80%) in southern zone during the year 2004-05. Similarly, in case of agricultural machinery, capital investment ranged between 64% to 93% in different zones. The overall capital investment per hectare was worked out to Rs. 13015.

The percentage investment made in various types of agricultural machinery and equipment, tubewells/pumping sets of selected holdings is shown in Table 2.9 (b).

Table 2.9 (b) : Capital investment in agricultural machinery and equipments and tubewells/ pumping sets :

Sr. No.	Implements	Investment (In Rs.)	Percentage
1	2	3	4
1.	Tractor with accessories	4548456	55.44
2.	Tubewells/pumping sets	2163352	26.37
3.	Thrashers	277128	3.38
4.	Carts	122200	1.49
5.	Chaff cutters	98808	1.20
6.	Bar harrows	275528	3.36
	Iron ploughs	7248	0.09
8.	Rollers	11768	0.14
9.	Seed drills	58200	0.71
10.	Gur boiling pans		
11.	Cane crashers		-
12.	Miscellaneous (Triphali-Sohaga, Spray pumps etc.)	642328	7.82
	Total	8205016	100.00

It may be observed from the above table that investment on tractor with accessories was 55.44% of the total capital investment on agricultural machinery and equipments followed by 26.37% on tubewells/pumping sets, 3.38% on thrashers, 3.36% on bar harrows and 1.49% on carts, respectively. The rest of the implements accounted for 9.96% of the total capital investment on agricultural machinery and equipments.

2.10 Use of chemical fertilizers

The study of farm accounts also reveals the extent of chemical fertilizers used as an input in the adoption of improved agricultural practices.

It has been observed that all the selected holding were found using chemical fertilizers during the year 2004-05. Crop-wise area of the selected holdings where chemical fertilizers were used is presented in the following table :-

Table 2.10 : Total crop-wise area of holdings where chemical fertilizers were used

(Area in hectares)

Sr. No.	Crops	Irrigated			Unirrigated		
		Total cropped area	Area under chemical fertilizers	% age of col.4 to col.3	Total cropped area	Area under chemical fertilizers	% age of col.7 to col.6
1	2	3	4	5	6	7	8
1.	Paddy	268.18	268.18	100.00	-	-	
2.	Bajra	83.78	63.28	75.53	8.60	4.80	55.81
3	Maize	5.48	5.48	100.00	1.91	1.91	100.00
4.	Wheat	521.32	519.92	99.73	16.11	12.91	80.14
5.	Barley	6.30	6.10	96.83	1.00	1.00	100.00
6.	Sugarcane	51.80	51.80	100.00			
7.	Cotton (Desi)	46.20	42.30	91.56			
8.	Cotton(American)	77.78	77.78	100.00	-	-	
9.	Oilseeds (Rape & Mustard)	134.06	132.66	98.96	13.40	10.40	77.61
10.	Green fodder	117.82	77.88	62.71	5.04	3.25	64.48
11.	Other crops	96.44	84.54	87.86	17.46	8.30	47.54
	Total	1409.16					

The data given in Table 2.10(b) reflects that the percentage of area under chemical fertilizers in the irrigated holdings was the highest (100%) in case of paddy, maize, sugarcane & cotton american, followed by wheat (99.73%), oilseeds (98.96%), barley (96.83%), cotton desi (91.56%) and bajra (75.53%). In case of unirrigated holdings, the chemical fertilizer was found being used in the entire area under maize and barley. Where as it was being put in 80.14% of area under wheat, 64.48% of the area under green fodder and 55.81% of area under bajra.

2.11 Consumption of chemical fertilizers per hectare

The use of chemical fertilizers varied considerably in irrigated and unirrigated holdings. In irrigated areas, the consumption of chemical fertilizers depends on the soil texture and the extent of irrigation facilities available . The consumption of chemical fertilizers per hectare under different crops is given in Table 2.11.

Table 2.11 : Consumption of chemical fertilizers per hectare under various crops during the year 2004-05 :

Sr. No.	Crops	Irrigated			Unirrigated		
		Area under chemical fertilizers (hectares)	Total quantity of fertilizers used (kgs.)	Quantity per hect. (kgs.)	Area under chemical fertilizers (hectares)	Total quantity of fertilizers used (kgs.)	Quantity per hect. (kgs.)
1	2	3	4	5	6	7	8
1.	Paddy	268.18	127695	476.15			
2.	Bajra	63.28	7900	124.84	8.60	800	93.02
3.	Maize	5.48	960	175.18	1.91	250	130.89
4.	Wheat	519.92	218920	421.06	16.11	2750	170.70
5.	Barley	6.10	1475	241.80	1.00	190	190.00
6.	Sugarcane	51.80	32060	618.92			
7.	Cotton (Desi)	42.30	10070	238.06			
8.	Cotton (American)	77.78	17000	218.56			
9.	Oilseeds (Rape & Mustard)	132.66	27205	205.07	13.40	1950	145.52
10.	Green fodder	73.88	13001	175.97	5.04	650	128.97
11.	Other crops	84.54	12610	149.16	17.46	2112	120.96
	Total	1325.92	353996	266.98	63.52	8702	137.00

It may be seen from the above table that the consumption of chemical fertilizer per hectare in irrigated areas was highest in areas under sugarcane (618.92Kg) followed by paddy (476.15 Kg.), wheat (421.06 Kg.), Barley (241.80 Kg.), Cotton Desi (238.06Kg.) & Cotton American (218.56 Kg.).

In unirrigated areas, the consumption of fertilizer per hectare was highest in areas under Barley (190.00 Kg.) followed by Wheat (170.70 Kg.), Oilseeds (145.52 Kg.) and Maize (130.89 Kg.) overall, the consumption of fertilizer per hectare was 266.98 Kg. in irrigated area where as it was 137.00 Kg. is unirrigated area.

2.12 Operated area per permanent agricultural worker under different types of holdings.

The operated area per permanent agricultural worker in various types of holdings in different zones is given below:-

Table 2.12 : Zone-wise operated area per permanent agricultural worker in various types of Holdings. (Area in hectares)

Particulars	Northern	Central	Western	Southern	Total
1	2	3	4	5	6
A Totally Irrigated holdings					
(i) Area	238.88	142.08	206.19	143.90	
(ii) No. of agricultural workers	158	144	178	142	
(iii) Operated area per agricultural worker	1.51	0.99	1.16	1.01	
B Partly irrigated holdings					
(i) Area	7.00	21.70	34.00	23.20	
(ii) No. of agricultural workers	11	18	16	14	
(iii) Operated area per agricultural worker	0.64	1.21	2.42	1.66	
C Unirrigated holdings					
(i) Area	1.2 1		3.20	21.40	
(ii) No. of agricultural workers	3		6	17	
(iv) Operated area per agricultural worker	0.40		0.53	1.26	
Total holdings					
(i) Area	247.09	164.50	243.39	188.50	
(ii) No. of agricultural workers	172	162	198	173	
(iii) Operated area per agricultural worker	1.44	1.02	1.23	1.09	

The perusal of Table 2.12 shows that the total operated area per permanent agricultural worker was 1.20 hectares. The operated area per agricultural worker in case of totally irrigated, partly irrigated and unirrigated holdings was 1.18, 1.51 and 0.99 hectares, respectively during 2004-05. The table further indicates that the northern zone claimed the largest operated area i.e. 1.44 hectares per agricultural worker whereas central zone claimed the smallest area of 1.02 hectares.

2.13 Wages of agricultural workers

The prevalent average annual /daily wages of a permanent/casual agricultural worker in the four agro-climatic zones is shown in the following table:-

Table 2.13 : Zone-wise wages of a permanent and casual agricultural worker during 2004-05.

Zone	Wages paid (In Rs.) Annually (**) (Permanent)	Daily (*) (Casual)
1	2	3
Northern	21619	87
Central	21865	105
Western	20154	101
Southern	21189	100
Average	21207	98

* Exclusive of meal, tea, tobacco charges etc

** Inclusive of meals, tea, tobacco charges etc.

The data given in Table 2.13 shows that during the year 2004-05, total wages paid to a permanent worker for various agricultural operations worked out to Rs. 21207. Besides, the permanent worker was also given meals, tea, tobacco etc. The daily wages paid to an agricultural worker (casual/hired) excluding daily perks like meals, tea and tobacco were Rs. 98. The daily wages paid to the agricultural worker was the highest (Rs. 105) in central zone and the lowest (Rs. 87) in northern zone.

2.14 Operated area per plough under various types of holdings.

The operated area per plough (Bullocks, Camels and Tractors) during the year 2003-04 under different types of holdings based on irrigation facilities in different zones is given in the following table :-

Table 2.14 : Zone-wise operated area per plough under different types of holdings (Bullocks, Camels and Tractors) during the year 2004-05.

(Area in hectares)

Item	Northern	Central	Western	Southern	Total
1	2	3	4	5	6
A Totally Irrigated holdings					
(i) Area	238.88	142.80	206.19	143.90	731.77
(ii) No. of plough	304	151	176	192	823
(iii) Operated area per plough	0.79	0.95	1.17	0.75	0.89
B Partly irrigated holdings					
(i) Area	7.00	21.70	34.00	23.20	85.90
(ii) No. of plough	2	17	19	16	54
(iii) Operated area per plough	3.50	1.28	1.79	1.45	1.59
C Unirrigated holdings					
(i) Area	1.21		3.20	21.40	25.81
(ii) No. of plough	2			12	14
(iii) Operated area per plough	0.61			1.78	1.84
Total holdings					
(i) Area	247.09	164.50	243.39	188.50	843.48
(ii) No. of plough	308	168	195	220	891
(iii) Operated area per plough	0.80	0.98	1.25	0.86	0.95

Note :- One Tractor = 8 Pair of Bullocks
One Camel = 1 Pair of Bullocks

, It is revealed from the above table that the operated area per plough during the year 2004-05 taking into account both animal and tractor power worked out to 0.95 hectares. The operated area per plough was highest (1.84 hectares) in case of unirrigated holdings.

The area per plough in western zone was found to be maximum (1.25 hectares) where as it was minimum (0.80 Hectares) in northern zone.

2.15 Number of working days per plough under different types of holdings

The zone wise number of working days per plough under various types of holding: has been worked out in the table 2.15 given below.

Table 2.15 : Number of working days per plough under various types of holdings during 2004-05

(Area in hectors

Type of holdings	Northern	Central	Western	Southern	Total
1	2	3	4	5	6
A Totally Irrigated holdings					
(i) No. of working days	14986	7550	9152	10586	42274
(ii) No. of plough	304	151	176	192	823
(ii) No. of working days per plough	49	50	52	55	51
B Partly irrigated holdings					
(i) No. of working days	95	820	960	818	2693
(ii) No. of plough	2	17	19	16	54
(iii) No. of working days per plough	48	48	50	51	49
C Unirrigated holdings					
(i) No. of working days	80			480	560
(ii) No. of plough	2			12	14
(iv) No. of working days per plough	40			40	40
D Total (A+B+C)					
(i) No. of working days	15161	8370	10112	11884	45527
(ii) No. of plough	308	168	195	220	891
(iii) No. of working days per plough	49	50	52	54	51

The above table reveals that on an average, a cultivator worked with his plough for 51 days during the year 2004-05. Number of working days per plough in totally irrigated holdings was 51 where as it was found to be 40 only in case of unirrigated holdings but the zone wise number of working days did not varie considerably.

2.16 Maintenance cost per pair of bullocks

The break -up of maintenance cost per pair of bullocks is shown in Table 2.16.

Table 2.16 Zone-wise break up of the maintenance cost per pair of bullocks during 2004-05.

(In Rs.)

Sr.No.	Item	Northern	Central	Western	Southern	Overall average
1	2	3	4	5	6	7
1	Fodder				3779	39841
					(34.35)	(36.86)
2	Concentrates				2205	1755
					(20.04)	(16.24)
3.	Upkeep labour				3938	3706
					(35.80)	(34.28)
4.	Interest & depreciation				567	304
	on capital cost				(5.15)	(2.81)
5.	Housing (Cattleshed)				356	920
					(3.24)	(8.51)
6.	Medical care &				156	141
	miscellaneous				(1.42)	(1.30)
	Total				11001	10810
					(100.00)	(100.00)

It may be observed from Table 2.16 that average maintenance cost per pair of bullocks during 2004-05 was Rs. 10810. The expenditure on fodder and concentrates taken together formed 53.10% of the total maintenance cost. The percentage of upkeep labour and interest on capital investment on bullocks was 34.28 and 2.81, respectively. The expenditure on housing (cattleshed) and medical care was merely 8.51% and 1.30%, of the maintenance cost respectively. It was found to be maximum of Rs. 11135 in central zone and minimum of Rs. 10442 in western zone.

CHAPTER-III

ECONOMIC ANALYSIS OF SELECTED HOLDINGS

General

Efforts have been made to present an overall analysis of input and output per hectare of area of the selected holdings. In this chapter, the profit and loss per hectare of area held and cropped by the cultivators under irrigated and unirrigated holdings have been studied and worked out separately.

3.1 Gross Income

Gross income is the total value of the farm produce whether consumed at home, stocked for sale or future use, sold in the market, paid in kind as wages to farm labourers or disposed off in any other way. It consists of the cash value of the produce actually sold and the value of the remaining produce estimated at harvest price prevalent in the village. Crop-wise average gross return per hectare under irrigated and unirrigated holdings has been worked out for each zone separately. The crop-wise and zone-wise average gross income under irrigated and unirrigated holdings have been shown in Tables 3.1(a) and 3.1(b), respectively.

Table 3.1 (a) Zone-wise average gross income per hectare from different crops in irrigated holdings during 2004-05:

(In Rs.)

Sr.No.	Crops	Northern	Central	Western	Southern	Overall average
1	2	3	4	5	6	7
1.	Paddy	33785	34142	40435	44851	34908
2.	Wheat (Grain)	23962	27119	27874	21862	25488
3.	Wheat (Bhusa)	3974	5101	4244	3601	4265
4.	Barley (Grain)	-	7500	17100	16549	16683
5.	Barley (Bhusa)	-	450	2700	3186	3103
6.	Bajra (Grain)	-	8187	7268	7211	7410
7.	Maize (Grain)	10443	-	-		10443
8.	Gram (Grain)	8000		11500	8000	12302
	Gram (Bhusa)	-		325	-	645
10.	Other pulses (Grain)	16077	12834	9500	13121	12822
11.	Other pulses (Bhusa)	-	1018	-	379	556
12.	Cotton (Desi)	-	23106	23592	13750	22954
13.	Cotton (American)	-	35581	33943	-	32263
14.	Cotton (Sticks)	-	1056	983	1038	9730
15.	Sugarcane	64852	52765	-		63208
16.	Oilseeds (Rape & Mustard)	24050	19540	22227	23267	22485
17.	Green fodder	18545	14399	19050	11130	16867
18.	Stalks of Paddy, Jowar, Bajra, Maize & sugarcane	1162	1235	3533	2772	1389
	Other crops	33419	15729	14592	10721	15075

Table 3.1 (b) : Zone-wise average gross income per hectare from different crops in unirrigated holdings during 2004-05 :

(In Rs.)

Sr.No.	Crops	Northern	Central	Western	Southern	Overall average
	2	3	4	5	6	7
1.	Paddy	-	-	-	-	-
2.	Wheat (Grain)	14024	12809	-	14566	14262
3.	Wheat (Bhusa)	2689	2000	-	1522	1763
4.	Barley (Grain)	-	-	-	12750	12750
5.	Barley (Bhusa)	-	-	-	2000	2000
6.	Bajra (Grain)	-	3780	4828	3409	3980
7.	Maize (Grain)	9241	-	-	-	9241
8.	Gram (Grain)	-	-	18103	10769	15833
9.	Gram (Bhusa)	-		1206	481	982
10.	Other pulses (Grain)	-		-		
11.	Other pulses (Bhusa)	-		-		
12.	Cotton (Desi)	-				
13.	Cotton (American)	-				
14.	Cotton (Sticks)	-				
15.	Sugarcane	-	-	-	-	-
16.	Oilseeds (Rape & Mustard)	-	19172	24589	24196	21436
17.	Green fodder	8654		-	13250	12302
18.	Stalks of Jowar, Bajra, Maize & sugarcane	228	400	1875	1364	2265
19.	Other crops	-		7067		7067

It may be seen from Tables 3.1(a) & 3.1(b) that the gross return per hectare of major crops of irrigated holdings has an edge over the gross income of unirrigated holdings. The gross return per hectare of sugarcane, paddy, wheat, oilseeds & green fodder of irrigated holdings was found to be Rs. 63208, Rs. 34908, Rs. 25488, Rs. 22485 and Rs. 16867, respectively. In case of unirrigated holdings, the gross return per hectare of Wheat, Barley, Bajra, Gram and Oilseeds was worked out as Rs. 14262, Rs. 12750, Rs. 3980, Rs. 15833 and Rs. 21436 respectively.

Group-wise gross income, expenditure and net income per hectare of peasant proprietorship and peasant proprietorship -cum-tenancy under irrigated and unirrigated holdings have been presented in Table 3.1 (c).

Table 3.1(c) Group-wise gross income, expenditure and net income per hectare of peasant-Proprietorship and peasant-proprietorship-cum-tenancy under irrigated and unirrigated holdings during 2004-05 :

(In Rs.

Size group of holdings (hectares)	Peasant-proprietorship			Peasant-proprietorship-cum-tenancy		
	Gross Income	Expenditure	Net Income	Gross Income	Expenditure	Net Income
1	2	3	4	5	6	7
Irrigated						
Below 2.0	47922	22575	25347	40962	27994	12968
2.0-4.0	47684	22148	25536	60431	31442	28989
4.0-7.5	48873	24003	24003	56695	31339	25356
7.5-10.0	42543	18368	24175	47152	37852	9300
10.0 & above	36613	9290	27323	64933	40538	24395
Average	46760	24979	24979	55922	32906	23016
Unirrigated						
Below 2.0	22679	5320	17359	9628	14062	(-)4434
2.0-4.0	23235	9296	13939			
4.0-7.5	19449	12813	6636			
7.5-10.0	17929	12075	5854			
10.0 & above						
Average	20344					
Overall average						

The figures indicated in Table 3.2 show that gross income per hectare under peasant-proprietorship was highest (Rs. 48873) in the size group of 4.0-7.5 hectares in the irrigated holdings whereas it was minimum (Rs. 36613) in the size group of 10.0 hectares & above. In case of unirrigated holdings, the maximum (Rs. 23235) gross income was recorded in the size group of 2.0-4.0 hectares followed by size group of below 2.0 hectares (Rs.22679).

The irrigated peasant proprietorship-cum-tenancy holdings recorded the highest (Rs. 64933) gross income per hectare is the size group of 10 hectares & above where as it was found to be the lowest (Rs. 40962) in the size group of below 2.0 hectares.

The peasant proprietors of irrigated holdings incurred an expenditure of Rs. 21781 per hectare where as it was Rs. 32906 in case of peasant proprietor-cum-tenants. The corresponding figures for unirrigated holdings were worked out to be Rs. 10736 and Rs. 14062 with an overall average of Rs. 21321 and 32815 respectively.

3.2 Input-Output analysis of the holdings

The main objective of this study is to find out the input-output ratio under two types of land tenure systems. Before assessing the gross income, expenditure and net income per hectare from cultivation on the sampled holdings, it is worthwhile to explain about the land tenure systems namely peasant proprietorship and peasant proprietorship-cum-tenancy prevalent in the state.

(A)- Peasant Proprietorship

A peasant proprietor possess the right of ownership. He has the right to sell, transfer it by gift, mortgage or pass it on to descendents. He cultivates the land with his own family members. The cost of cultivation under this system includes manual labour (excluding imputed value of wages

of family workers and exchange labour), bullocks labour (excluding imputed value of bullocks, upkeep labour by family workers), seeds, farm yard manure, chemical fertilizers, irrigation charges (including tubewell electricity bills, canal water charges, repair of tubewell etc.), implements and machinery, interest on capital investment (excluding depreciation on capital investment), payments made to artisans, cost of spray of insecticides/pesticides etc. and miscellaneous costs (cost of bunding, fencing and land leveling etc). The rental value of owned land has been excluded from this cost.

(B) Peasant proprietorship-cum-tenancy

A peasant proprietor-cum-tenant acquires some additional land on rent/batai in addition to his own land to supplement his income. The terms and conditions of rent lease i.e. cash or kind depend on local conditions and urgency of his requirements. He is assisted by his family members and seeks hired labour in agricultural operations. The cost of cultivation under this system includes manual labour (excluding imputed value of wages of family workers and exchange labour), bullocks labour (excluding imputed value of upkeep labour), seeds, farm yard manure, chemical fertilizers, irrigation charges (tubewell electricity bills, canal water charges and repairs etc.), implements and machinery, interest on capital investment, payments made to artisans, cost of spray of insecticides/pesticides etc. and miscellaneous costs (cost of bunding, fencing and land leveling etc.) and rental value of leased in land.

The gross income, expenditure and net income per hectare (zone-wise) under peasant proprietorship & peasant proprietorship-cum-tenancy system have been calculated separately for irrigated and unirrigated areas and is shown in Table 3.3.

Table 3.2(a) : Zone-wise net income per hectare of peasant proprietorship and peasant proprietorship-cum-tenancy under irrigated and unirrigated holdings separately during 2004-05:

Zone	Peasant proprietorship			Peasant proprietorship-cum-tenant		
	Gross Income	Expenditure	Net Income	Gross Income	Expenditure	Net return
1	2	3	4	5	6	7
	57947	31621	26326	59966	38766	21200
	50476	19877	30599	63868	29872	33996
	47870	18554	29316	59730	32415	27315
	30178	18124	12054	28738	21600	7138
	-	-	-	9628	14062	(-)4434
	-	-	-	-	-	-
	32609	5365	27244	-	-	-
	18510	11539	6971	-	-	-
Average	20344	10736	9608	9628	14062	(-)4434
Overall average	45659	21321	24338	55700	32815	22885

It is observed from the above table that overall average gross income, expenditure and net income per hectare for irrigated and unirrigated areas taken together for holdings under peasant proprietorship worked out to Rs. 45659 , Rs. 21321 and Rs. 24338, respectively. Where-as for holdings under peasant proprietorship-cum-tenancy it was worked out to be Rs. 55700, Rs. 32815

and Rs. 22885, respectively. The table further shows that gross income per hectare in irrigated areas under peasant proprietorship systems was the highest (Rs. 57947) in northern zone whereas the lowest (Rs. 30178) income was recorded in southern zone. In case of holdings under peasant proprietorship-cum-tenancy system the highest (Rs. 59966) per hectare gross income was observed in northern zone where as it was the lowest of Rs. 28738 in the southern zone.

3.3 Comparative position of net income under two types of land tenure systems.

The group wise & zone-wise data regarding net income per hectare under peasant proprietorship & peasant-proprietorship-cum-tenant system of holdings has been worked out in Table 3.3.

Table 3.3 : Group-wise and zone-wise net income per hectare according to peasant proprietorship & peasant-proprietorship-cum-tenancy system :

A- Group wise	Peasant proprietorship	Peasant proprietor-ship-cum-tenant
1	2	3
Irrigated		
Below 2.0	25347	12968
2.0-4.0	25536	28989
4.0-7.5	24003	25356
7.5-10.0	24175	9300
10 & above	27323	24395
Average		
Unirrigated		
Below 2.0	17359	(-)4434
2.0-4.0	13939	
4.0-7.5	6636	
7.5-10.0	5854	
10 & above		
Average	9608	(-)4434
B- Zone wise		
Irrigated		
Northern	26326	21200
Central	30599	33996
Western	29316	27315
Southern	12054	7138
Average	24979	23016
Unirrigated		
Northern	-	(-)4434
Central	-	-
Western	27244	-
Southern	6971	-
Average	9608	
Overall average		22885

Inferences can be drawn from the above table that the holdings under peasant proprietorship are more profitable than the peasant proprietorship-cum-tenancy system. The overall average net income per hectare of the operated area of a peasant proprietorship and peasant proprietorship-cum-tenancy was Rs. 24338 and Rs. 22885, respectively under different size groups as well as in zones during 2004-2005.

CHAPTER - IV

SUMMARY AND CONCLUSION

The report on 'Economics of Farming in Haryana' provides a comprehensive analysis of a cultivator's farm economy and highlights in depth his gross income, expenditure and net income per hectare of irrigated and unirrigated holdings. Besides, it gives information about the extent of use of improved seeds, agricultural implements and machinery, consumption of chemical fertilizers, labour and employment etc. The present report makes a detailed study of 232 selected holdings under two commonly practised systems of land tenure i.e. peasant proprietorship and peasant proprietorship-cum-tenancy.. The main findings of the study are as under :-

1. The total operated area of 232 selected holdings under this study was 843.48 hectares. Out of which, the area under peasant proprietorship and peasant proprietorship-cum-tenancy was 586.35 hectares and 257.13 hectares respectively. The average size of holdings was 3.64 hectares.

2. Out of total 232 selected holdings, 207 holdings (89.22%) were irrigated and 8 holdings (3.45%) were unirrigated. The remaining 17 holdings (7.33%) were partly irrigated. The analysis has further revealed that 93.40% of the area held under selected holdings was irrigated. The average intensity of cropping on irrigated and unirrigated areas of selected holdings worked out to 178.88% and 114.02%, respectively. The overall intensity was 174.95%.

3. The study revealed that the great difference was found in the cropping pattern under irrigated and unirrigated areas. In case of irrigated areas, the percentage of cultivated area under cereals, pulses and cash crops was 62.81, 1.38 and 21.99 as against 43.48, 26.45 and 21.10 respectively in case of unirrigated areas.

4. The study further indicated that all the selected holdings were found using chemical fertilizers. The average consumption of chemical fertilizers per hectare in irrigated and unirrigated area was 266.98 kgs., and 137.00 kgs., respectively.

5. The total capital investment per hectare was found to be Rs.13015, out of which 74.74% was utilised for agricultural machinery & tubewell/pumping sets and remaining 25.26% on farm building, cattlesheds and drought animals.

6. The average operated area per permanent agricultural worker was 1.20 hectares. A permanent hired agricultural worker was paid Rs. 21207 per annum inclusive of meals, tea & tobacco charges while a casual daily wage worker was given Rs. 98 per day exclusive of meal, tea & tobacco charges.

7. Average yield per hectare of paddy, wheat, bajra, maize, barley, gram, oilseeds & sugarcane was 4793 kgs., 3997 kgs., 1460 kgs., 1734 kgs., 3000 kgs., 933 kgs., 1342 kgs., and 60697 kgs., respectively on irrigated land as compared to 2228 kgs. yield of wheat, 1015 kgs. bajra, 1466 kgs., of maize, 952 kgs. of gram and 1323 kgs. of oilseeds under unirrigated land.

8. The gross income per hectare of different crops like wheat, gram, sugarcane & oilseeds was Rs. 25488, Rs. 12302, Rs. 63208 and Rs. 22485 respectively in irrigated areas. In case of unirrigated holdings, the gross return per hectare of Wheat, Barley, Bajra, Gram and Oilseeds was worked out as Rs. 14262, Rs. 12750, Rs. 3980, Rs. 15833 and Rs. 21436 respectively.

9. The average gross income of a peasant proprietor per hectare worked out to Rs. 46760 on irrigated areas as against Rs. 20344 on unirrigated areas. The average net income per hectare was calculated at Rs. 24979 from irrigated areas as compared to Rs. 9608 from unirrigated areas. In case of peasant proprietorship-cum-tenancy holdings, the average gross income per hectare was found to be Rs. 55922 on irrigated areas as against Rs. 9628 on unirrigated areas.

10. The gross income per hectare of operated area under peasant proprietorship & peasant proprietorship-cum-tenancy system of holdings was Rs. 45659 & Rs. 55700 respectively during the year 2004-2005.

11. The study further concluded that per hectare expenditure incurred by the sampled cultivators from farm cultivation was Rs. 21321 & Rs. 32815 respectively under peasant proprietorship & peasant proprietorship-cum-tenancy system of holdings .

12. The net income per hectare of operated area came out to Rs. 24338 for peasant proprietors whereas it was found to be Rs. 22885 for peasant proprietor-cum-tenants during 2004-05.