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Agricultural Economy of Bhiwani district of the state Haryana (India)

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Abstract: Indian agriculture history is witness of the new agriculture arrangement which took place in India has changed the overall traditional cropping pattern in India as well as in Haryana. There are many agriculture reforms such as land reforms, green revolution, minimum support price, and new economic reforms have adopted in Indian agriculture. All these reforms have directly affected the agriculture sector in overall India. Even these reforms are favourable in terms of productivity and production of all the crops but they have inadequately affected in terms of crop stability. Only a few crops such as rice and wheat are going to more stable but the coarse cereals and pulses are going to highest instable in area and production in Haryana

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Introduction:

As the twentieth century draws to a close, the challenge facing agricultural researchers, planners and policy makers is greater than ever. The demand for food continues to grow steadily due to fast population growth. Agriculture in India has along and rich history marked by a series of technological breakthroughs which today allow an exceedingly large number of people to be fed from a relatively small area. Presently, India in general and the high input user states such as Haryana, Punjab and Western Uttar Pradesh in particular, are going through the third phase of agricultural development, i.e., a second post-green revolution phase among the three phases of technological changes described by Byerlee (1992). This phase is input efficiency phase wherein the farmers move toward increased technical efficiency by using available purchased inputs more efficiently and adopt practices that contribute to the sustainability of the resource base.

Haryana State has the prime position of being one of the major contributors to the central pool of India. This has been possible only because the state, since its inception in 1966, along with speedy infrastructural development, could reap the maximum benefits of green revolution. A straightforward view of production figures show that after the introduction of high-yielding varieties (HYVs) and associated technologies, the yield of rice increased by eleven times and wheat by six times, with total foodgrain production by more than four times during the last 30 years. The yield potential of modern varieties was fully exploited by increased fertiliser use and increased investment in irrigation. The fertiliser consumption each for rice and wheat increased from 40 kg NPK/ha in 1970-71 to 175 kg NPK/ha in 1990-91. Haryana just like other Indian states having advanced agriculture with marked diversities in agro-climatic conditions, resource endowment and population density is likely to be characterised by uneven economic and agricultural development among various districts. The inter-district or regional differences in agricultural development arising out of these varied conditions tend to get further accentuated because of varying levels of investment in rural infrastructure and adoption of improved technology. Keeping the above in view, the present study was done to examine the agricultural performance of different districts (regions) of Haryana during the green revolution and post-green revolution periods, its growth and variability and the important factors determining its performance.

Materials and Methods:

Out of 439 villages in the study area an intensive sample study of agricultural land use of 44 sample villages has been taken up by obtaining data from unpublished revenue record i.e. Lal Kitabs.

These sample villages account for ten per cent of the total number of villages representing 5.26 percent of the total land of the study area. Stratified Random sampling method has been used for taking the sample. Three village are taken for in depth study with the help of primary data. The work has proceeded two stages firstly whole of the study area is stratified into three categories of irrigation intensity, normally, low irrigation intensity area, moderate irrigation intensity areas and high irrigation intensity areas. The village Lohani from the category of low irrigation intensity; village Nandha and change from the category of moderate and high irrigation intensity respectively. The operational holding are classified into marginal, small, medium, large and very large size groups. Four cultivatators of different size groups are randomly selected from the different size groups except in cases where they do not emerge.

The cropping intensity has been examined using the under mentioned formula.

$$\text{Cropping intensity} = \frac{\text{Total Cropped Aare}}{\text{Net Sown Area}} \times 100$$

Table 1. List of sample villages with their location code.

Sr. No.	Name of the Villages	Location Code
1.	Devsar	5
2.	Miran	40
3.	Budhsaili	14
4.	Gadhwa	38
5.	Matani	20
6.	Talwani	35
7.	Garwa	22
8.	Kashni Khurd	10
9.	Obra	7
10.	Cheher Khurd	33
11.	Kudal	23
12.	Jhanjra Sheoran	55
13.	Partia Bhiman	69
14.	Saral	25
15.	Rohnat	5
16.	Sagban	9
17.	Dhanimahu	32
18.	Ladianwali	41
19.	Barsi	1
20.	Kungar	11
21.	Rur	19
22.	Dhanana	16
23.	Baliyali	21
24.	Tigrana	6
25.	Chang	12

26.	Devsar	24
27.	Bamla	63
28.	Lohani	52
29.	Nimriwali	71
30.	Manheru	69
31.	Juikhurd	40
32.	Sanjerwas	62
33.	Charkhi	91
34.	Khatiwas	83
35.	Morwala	76
36.	Khosla	26
37.	Huee	33
38.	Mandi Haria	103
39.	Jhoju Kalam	150
40.	Mehrana	139
41.	Nandha	112
42.	Badrai	122
43.	Beejna	158
44.	Datoli	170

Choropleth technique has been applied to show the changes in cropping intensity. The changes in crop combination regions have been examined using the Doi technique in (1957) and choropleth technique has applied to show the changes in crop combination regions.

The crop diversification have evaluated used Gibbs-Martin index as under the formula:

$$\text{Index of Diversification} = 1 - \frac{\Sigma X^2}{(\Sigma X)^2}$$

Where X is the percentage of total cropped area occupied by each crop or hectoreage under one individual crop.

Results and Discussion:

Land Size:-

The operation holding normally implies to the all land which is used wholly or partially for agricultural production and is operated as one technical unit by one person alone or with other without regard to the title, legal form, size as Agricultural Census 2000. In sample villages 2.30 percent are is cultivated by marginal farmers, 6.52 percent by small farmers, 15.08 per cent by the medium farmers 27.300 per cent area large far 48.8 per cent very large farmers. Ninety nine per cent of operational holdings are self owned and with the help of their family labour they cultivate the fields. Therefore, annual system is largely absent the distribution of owners holding of the five relative size groups in the villages are as under.

Table 2: Distribution of Holdings of different Size Groups (in percentages)

Size of Holdings	Lohani	Nandha	Chang	Budhsaili	Average
Marginal	2.50	1.61	2.42	2.65	2.30
Small	2.94	6.47	6.78	5.90	6.52
Medium	13.54	13.57	20.82	12.39	15.08
Large	26.00	28.43	28.82	25.96	27.30
Very large	51.02	49.92	41.16	53.10	48.8

This distribution of holding gives the picture of economy of the study region. Which shows that above 75 per cent of total cultivated area is ploughed by medium farmers. In the village Lohani 2.50 per cent are owned by marginal farmers, 6.94 per cent by small farmers, 26 per cent by large farmers ad 51.02 per cent are is cultivated by very large farmers, about 71 per cent of sample farmers having their own land and cultivated by themselves. Nearly 29 per cent farmers having their own land and they also leased in and leaded out in terms of cost sharing and crop sharing. In Nandha 1.62 per cent area is cultivated by marginal farmer, 6.47 per cent by small farmers 13.57 per cent by medium farmers,28.43 per cent by large farmers. Only one farmer including in the category of very farmers. In this village about 77 per cent farmers having their own land self cultivated. About 23 per cent farmers having their own land but they giving their land on leased out at the rate of fix amount, i.e., Rs 4000 per acre.

In Chang, 2.42 per cent area is cultivated by marginal farmers, 6.78 per cent by small farmers, 20.82 per cent medium and 28.82 per cent large and 41.16 per cent area cultivated by very large farmers. Only two sample farmers including in very large category. In this village all the sample farmers do not have their own land but hey take land on lease. About 64 per cent sample farmers have their own land which is self cultivated. Only 36 per cent farmers which are having their own land and they are taking (leased in) and giving (leased out) also. In village Budhsaili 2.65 per cent area is cultivated by marginal farmer, 5.90 per cent small farmer, 12.39 per cent medium farmers, 25.96 per cent large farmer, 53.10 per cent cultivated by very large farmers. The table 3 shows that farms irrigated by different sources with their different size of farms. The non-availability of canal water in desired amount and time led to the installation of their own tube wells (electric and diesel operated) the owners of tubewells made available water on hire to those who could not afford their own.

Out of 88 farmers surveyed 88.63 per cent farmer use available irrigation facility 39.77 per cent under canal irrigation and 48.86 per cent under

tubewell irrigation while remaining 11.37 per cent farmers have no irrigation facility. 48.46 per cent farms are under tubewell irrigation of which 36.78 per cent under private electric operated tubewells 6.90 per cent farmers taking water on tire from these private diesel operated tubewells.

Thus it is observed that tubewell irrigation especially private electric operated tubewells are very popular mode of irrigation in this region probably because it ensures timely and adequacy of water supply. Out of 88 farmers surveyed, 33.33 per cent of marginal farmers irrigation their fields from taking water on hire, 20 per cent irrigation their fields from taking canal water and remaining 46.67 per cent farmers, having their field irrigated by private electric operated tubewells. Among the large farmers 30 per cent are irrigated their fields taking water from canal, 45 per cent by electric operated tubewells and 25 per cent irrigated by private diesel operated tubewells 37.5 per cent of very large farmers irrigated their fields by canal and 62.5 percent irrigated their fields by the electric operated private tubewells.

Sample village Lohani:-

The present study is based on primary data collected through a household survey. This village falls with category of low irrigation intensity. The structured questionnaire is canvassed in all the household. On household questionnaire data regarding size of holdings, land ownership irrigation production, yield and area under different crops in an

agricultural year has been collected at the household level. Village level information on farm harvesting prices of crops also has been collected.

Table 3: Size of farms and sources of Irrigation (percent).

Size of Holding	Canal	Un-irrigated	Tube wells				Total
			Electric Operated		Diesel Operated		
			Private	Hired	Private	Hired	
Marginal	4	10					20
Small	11		9			6	20
Medium	11		9				20
Large	6		9		5		20
Very large	3		5				8
Total	35	10	32		5	6	88
	(39.77)	(11.36)	(36.36)		(5.68)	(6.82)	

Use of H.Y.V. Seeds and Chemical Fertilizers in Agriculture:-

High yielding variety seeds technology is a revolutionary transition from traditional to modern agriculture. In this village 100 per cent of cultivated area is under 'High yielding varieties seeds. About 40 per cent house hold spends less than Rs. 500 on seeds and another 40 per cent household spend Rs. 500 to 1000 on seeds. Only 20 per cent of households make expenditure on seeds more than Rs. 1000 per acre.

Crop production can only increased by intensive use of chemical and organic fertilization. There is no doubt that fertilizers use efficiently and in combination with other improved practices can be one of the most effective means of increasing agricultural productivity. This reveals that 25 percent of total marginal households do not use chemical fertilizers at all. Other 25 per cent of the farmers use up to 50 Kg chemical fertilizers per acre. 50 per cent of the total farmers used 51-150 Kg. Chemical fertilizers per acre. 75 per cent small farmers use 51-150 and 25 per cent 151-250 Kg. Per acre consumption of chemical fertilizers. Among per cent used Rs. 800-1600000 per acre.

It is observed by this table that a large proportion of marginal farmers have low to moderate level of consumption of chemical fertilizers. In fact 25 per cent of this category farers don't use chemical fertilizers at all. The consumption level of chemical fertilizers in moderate to high among the large and medium size farmers in this village.

Consumption of Bio-chemical inputs Rs. Per acre according to the size of land holding. 75 per cent of marginal, small, large and very large farmers showed Rs. 800-1600 per acre. Whenever, 50 per cent medium farmers Rs. 1600-200 and another 50 per cent above Rs 200 per cent. On the other hand 25 per cent marginal and small farmers not any single rupees on consumption of chemical fertilizers.

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