IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876
 Journal UGC CARE Listed (Group-I) Volume 11, Issue 11 Nov 2022

FROM TRADITION TO TRANSITION: CHANGING WHEAT AND RICE CULTIVATION IN HARYANA

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ABSTRACT

The cropping pattern can be defined as the spatial sequence of cropping under various crops for a given area at a certain time. There have been a lot of changes which have taken place in cropping pattern of Haryana since Green revolution. The Haryana government encouraged the farmers to cultivate Wheat and Rice as a part of this green revolution drive and procure both these crops at MSP. The present paper is attempted to present an analytical account of Wheat and Paddy crops in the state of Haryana. The paper reveals the spatial and temporal variations in both the crops for the time period from period of green revolution to 2019-20. The paper studies the area wise production of both the crops under study. The data has been sourced from Statistical Abstract of Haryana. Secondary data from books, journals, periodicals etc. has been used to draw conclusions for the present paper. The paper finds that the change in cropping pattern of the crops has largely been affected by the changing market- oriented farming of the crops which has in turn, affected the soil fertility, nutritional value of crops and environment as well.

KEYWORDS- Agriculture, Cropping Pattern, Wheat, Rice, Green Revolution.

Introduction

Haryana is predominantly an agricultural economy dominated by agricultural and cropping practices. Haryana recorded a remarkable growth in the agriculture sector which helped Haryana in attaining self sufficiency in food grains production. The changes in agricultural inputs technology and the modernisation techniques introduced as a result of Green Revolution reforms, the state has shifted more towards the production of Wheat and Rice crops due to better inputs and also better support given by the government in the form of Procurement at Minimum Support Prices as well as providing other facilities like subsidies on fertilizers, seeds, irrigation facilities and more. This in turn, favours the production of majorly these two crops even more.

The Indo Gangetic plain's intensive Rice Wheat system in the north-west has contributed to make it a significant cereal basket in the South Asia and thus it has also emerged as an area strategically important for national as well as regional food security.

However, the increasing dependence on ground water as well as overuse of fertilizers has resulted in one of the lowest total factor productivity for this wheat rice system in comparison to other wheat based systems. And hence, there is a quest to address the challenges faced by the farmers by finding appropriate responses like better understanding of farmers' practices and thus helping in reducing these challenges.

Review of Literature

Pathak (2019) made a study to suggest optimal combinations and cropping patterns for development of agriculture. He studied 11 different crops and he made his study using LINGO-18 programming software. The results suggested crop combination of gram, wheat, potato, mustard and pea during Rabi season and for Kharif season a combination of maize, sorghum, paddy , til and arhar.

Sihmar (2014) made a study to analyze the district wise data of 12 major districts of Haryana. They studied the increase in agriculture production of almost all the crops during 1980s, however during the nineties, there was a decline in a few. The major role played in increasing the production of crops was played by Wheat and Paddy crops which helped the state becoming the food bowl of the country. He also studied the production stability and instability in the agricultural production of both the crops among the districts selected under the study.

Kumar and Mittal (2006) estimated crop-specific Total Factor Productivity (TFP) growth across different states for paddy and wheat. The results indicated that TFP of paddy in Haryana and Punjab had started showing deceleration in but in case of TFP of wheat remained growing in these two revolution states. The sustainability issues related to various crops was also studied and was found that most of the crops specially principle crops such as rice and wheat were suffering from the serious sustainability issues as they are prone to much ecological and economic factors. Whereas the cash crops such as sugarcane and tobacco were much susceptible to the environmental factors as they have to suffer from interstate problems.

Kalamkar *et al.* (2002) had examined the growth in area, production and productivity of principal crops in India for a period of 49 years (1949-50 to 1997-98). The compound annual growth rate using exponential functional forms were worked out for the major crops. The results revealed that for most of the principal crops under consideration the results were positive and significant for observed the periods. A high growth rate in production was accompanied by increased variability in production and the risks associated with the production of the crops under study. The principal crops under study such as rice, jowar, bajra, maize and sugarcane had a greater imapact of yield effect whereas the area effect was more prominent in tur and oilseeds while wheat recorded a majority of the interaction effect towards the increase in production.

Research Methodology

The present study is based on the Secondary data scanned from various sources which includes Statistical Abstract of Haryana and Economic Survey of Haryana.

The results of the study have been presented using simple statistics and various linear as well as non linear growth rates. Simple analytical tools like Average, Growth Rates are used to analyse the data using which the trends for area, production and yield for both the crops have been studied.

Objectives

The objective of the present study is to analyse the spatial and temporal variations in the cropping pattern of Wheat and Rice crops for the time period from 1966-67, that is, from the time of green revolution upto 2020-21.

Data and Statistics

Table 1- Rice

(Area in 000 ha.)

(Production in 000 Tonne)

(Yield in Kg. per ha.)

Time Period	Area	Production	Average Yield per hectare
1966-67	192	223	1161
1970-71	269.2	460	1697
1980-81	483.9	1259	2606
1990-91	661.2	1834	2775
2000-01	1054.3	2695	2557
2010-11	1243.3	3465	2788
2018-19	1446.9	4516	3121
2019-20	1559	5198	3334
2020-21	1525.8	5633	3692

Source: Statistical Abstract of Haryana 2020-21

Table 2- District wise distribution- Rice

(Area in 000 ha.)

(Production in 000 Tonne)

(Yield in Kg. per ha.)

District	*A*	*P*	*Y*
Ambala	96	398	4150
Bhiwani	22.3	51	2276
Charkhi Dadri	5.3	13	2472
Faridabad	14.8	39	2617
Fatehabad	126	532	4222
Gurugram	5.5	16	2867
Hisar	82.8	242	2925
Jhajjar	42.2	114	2698
Jind	139.7	446	3195
Kaithal	176.2	706	4006
Karnal	177.5	789	3760
Kurukshetra	120.8	553	4580
Mahendragarh	0	0	0
Nuh	8.1	17	2157
Palwal	38.9	116	2980
Panchkula	13.8	49	3574
Panipat	84.8	270	3180

Rewari	1.5	4	2862
Rohtak	67.7	191	2825
Sirsa	100.3	361	3596
Sonipat	114	343	3006
Yamunanagar	87.6	383	4368

Source: Statistical Abstract of Haryana 2020-21

Table 3- Wheat

(Area in 000 ha.)

(Production in 000 Tonne)

(Yield in Kg. per ha.)

Time Period	Area	To Production	Average Yield per hectare
1966-67	743	1059	1425
1970-71	1129.3	2342	2074
1980-81	1479	3490	2360
1990-91	1850.1	6436	3479
2000-01	2354.8	9669	4106
2010-11	25.4	11578	4624
2018-19	2553.2	12573	4925
2019-20	2553.9	11877	4687
2020-21	2354	11406	4845

Source: Statistical Abstract of Haryana 2020-21

Table 4- District wise distribution- Wheat

(Area in 000 ha.)

(Production in 000 Tonne)

(Yield in Kg. per ha.)

District	A	P	Y
Ambala	93.9	475	5060
Bhiwani	116.3	493	4239
Charkhi Dadri	5.1	25	4988
Faridabad	30.7	103	3370
Fatehabad	189.8	956	5037
Gurugram	41.8	198	4740
Hisar	231.2	1150	4972
Jhajjar	102.1	463	4531
Jind	215.6	1080	5011
Kaithal	182	901	4949
Karnal	186.7	967	5181
Kurukshetra	111.3	574	5154
Mahendragarh	34.6	168	4841
Nuh	73.8	312	4224
Palwal	10.1	45	4445
Panchkula	20.4	73	3596
Panipat	94.6	467	4936

Rewari	37.5	176	4698
Rohtak	42.8	205	4792
Sirsa	293.7	1362	4639
Sonipat	143.5	721	5019
Yamunanagar	96.5	492	5101

Source: Statistical Abstract of Haryana 2020-21

Results and Findings

RICE CROP

Table 1 shows the area sown, total production and average yield per hectare of the Rice crop under study. Area under rice crop has increased constantly from the time of green revolution up to 2019-20 from 1,92,000 hectares to 15,59,000 hectares, owing to the green revolution period reforms introduced majorly for wheat and rice crops so as to make India a self sufficient country. The area under production in the year 2020-21 declined a bit to 15,25,800 hectares due to some awareness campaigns introduced by the government to reduce ground water depletion as well as to diversify the cropping patterns to other less water intensive crops like millets. The production levels of the crop has however increased constantly for the whole period under study from 2,23,000 tonnes in 1966-67 to 56,33,000 tonnes in 2020-21. All through this period under study, the average yield levels per hectare has also increased with showing a little fluctuation levels in between ranging from as low as 1161 kg per hectare in 1966-67 to as high as 3692 kg per hectare at present.

And when the spatial study is done with the help of Table 2, the district wise data displayed the area, production and yield levels being variably high in various districts. The table shows the maximum area under Rice crop in Karnal district which is 1,77,500 hectares, followed closely by Kaithal district with area recorded of 1,76,200 hectares and the least in case of Mahendragarh district with no area under rice crop at all accruing to the unfavourable climatic as well as soil conditions for the cultivation of the same. Karnal also tops in the production level being highest at 7,89,000 tonnes followed by 7,06,000 tonnes recorded by Kaithal district and Mahendragarh being at the lowest with 0 production level. The highest yield level has been recorded by Kurukshetra district at 4580 kg per hectare while the least was recorded for Mahendragarh district at 0.

WHEAT CROP

Table 3 depicts the temporal distribution for the area, production and average yield per hectare of Wheat crop. The area under Wheat crop has increased from being at 7,43,000 hectares in green revolution year to a high of 25,53,900 hectares in the year 2019-20. A slight decline was recorded for the year 2020-21 to 23,54,000 hectares. The production level was highest in the year 2018-19 at as high as 1,25,73,000 tonnes while the least production level was measured in the year 1966-67 when the green revolution period just started, at 10,59,000 tonnes which then continued to rise in the later years. There was a slight decline in the production levels after 2018-19. The yield levels on the other hand, continued to rise from 1966-67 at 1425 kg per hectare to 4845 kg per hectare in the year 2020-21. Year 2018-19 peaked with the highest yield level at 4925 kg per hectare.

The spatial study depicts the district wise distribution of area, production and yield levels of Wheat crop as presented in the Table 4. As per the data, the district of Sirsa recorded the largest area under the Wheat crop at 2,93,700 hectares and the smallest area under district of Charkhi Dadri at 5100 hectares. The production level of the Wheat crop was recorded the highest for district of Sirsa at 13,62,000 tonnes while the lowest production level was recorded for Charkhi Dadri district at 25,000 tonnes. The average yield per hectare varied among different districts with highest yield at 5181 kg per hectare for Karnal district and the lowest being at 3370 kg per hectare for the district Faridabad.

Conclusion

Haryana is one of the major food producing states in India. And since Green revolution there was much stress on cultivation of 2 crops rice and wheat which played a significant role in making the Haryana state a major food bowl of the country. Since time progressing, the temporal and spatial study of both the crops signify a significant shift towards the cultivation of these crops after the green revolution reform period accruing to better input facilities and better government support schemes introduced at various times accordingly so as to achieve the objective of self sufficient India in terms of food security.

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