

Changing Cropping Pattern in Haryana: A Temporal Analysis of Major crops (1966-2019)

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ABSTRACT

Agriculture is an art and science of growing crops since ages. Haryana is a seat of green revolution along with the Punjab, western Uttar Pradesh and some other states of India. Since 1966, centuries old traditional practices are being replaced by the modern technologies with the onset of the green revolution. The rate of increase or decrease in the share of major crops over the two time periods *i.e.* (1966-1991) and (1991-2019) has been observed. The base year 1966-67 has been selected because on November 01, 1966, the state of Haryana was carved out of Punjab as an independent state which coincides with the onset of green revolution. During the first time period (1966-91), an analysis of the impacts of onset of green revolution in Haryana has been carried out. During the next time period (1991-2019), an analysis of the impacts of economic reforms adopted in the year 1991 has been carried out. The agricultural pattern has shown a significant acceleration in the area, production and productivity of rice and wheat and a significant diminution in the pulses and coarse crops. The paradigm shift towards rice and wheat specialization has helped the state of Haryana in securing self-sufficiency. But this constant mono-cropping system has contributed to a number of problems related to soil and water.

Key Words : Cropping pattern, Major crops, Agriculture

INTRODUCTION

Agriculture has inevitably played a vital role in the economic development and poverty alleviation in Haryana since its inception. The indigenous methods could not increase the agricultural production beyond a certain limit, even with the experience of several generations. The main limitation was the agricultural tools which were not modified to meet the emerging challenges of farming. Hence, with the adoption of modern inputs, the agricultural sector has undergone a significant change in Haryana. The green revolution was a complete package where modern inputs such as High Yielding Variety (HYV) seeds, chemical fertilizers and extensive irrigation facilities led to the improvement in the production.

Joshi and Tyagi (1991) revealed that the relative advantages of advanced technology, production and

profitability of rice and wheat have been declining in the districts of Haryana and Punjab. Decline in the soil health and technology stagnation have been observed as the main hurdles in the crop production system. Bhalla (2007) has analyzed about the impacts of declining ground water levels on agricultural land due to changing crop pattern in Haryana. R.B. Singh (2009) analysed that state has gained the profits of green revolution but the expense of environmental loss. Mor (2010) recommended that the adoption of HYVs technology has reached to its threshold levels in terms of production in the state in recent years. Hence, it indicates that agricultural growth will be slower, unless, a new technological revolution is introduced by incorporating HYVs hybridization and reducing the post-harvest wastage at farm level. Sihmar (2014) examined the instability of rice and paddy was low and declined over the time period. But for the pulses and coarse grains,

the trend of instability was very high due to the shift towards the rice and wheat crops.

In a nutshell, green revolution has significantly increased the total cropped area. But, it also changed the agricultural base of the state of Haryana.

Study area:

The state of Haryana covers an area of 44212 sq. km. and constitutes 1.34 percent of India’s total geographical area. The latitudinal extent lies between 27°39' N to 30°35' N and longitudinal extent lies between 74°28' E to 77°36' E as depicted in the Fig. 1. Haryana attained self-sufficiency in the 1970’s in food grain production with the help of green revolution. The state holds second position after Punjab in the center pool of our country in food grains.

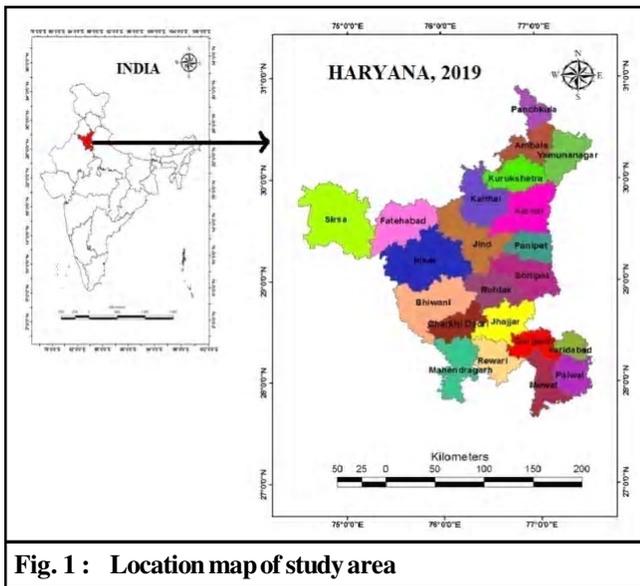


Fig. 1 : Location map of study area

METHODOLOGY

The distributional pattern of individual crops (rice, wheat, pulses and coarse grains) varies over the time periods. A study of rate of increase or decrease of major crops over the two time periods; 1966-1991 and 1991-2019 has been undertaken. The base year 1966-67 has been selected because on November 01, 1966, the state of Haryana was carved out of Punjab as an independent state which coincides with the onset of green revolution. During the first time period (1966-91), an analysis of the impacts of onset of green revolution in Haryana has been carried out. During the next time period (1991-2019), an analysis of the impacts of economic reforms adopted in the year 1991 has been carried out.

The linear growth rates in area, production and productivity of major food crops grown in Haryana have been calculated by using the regression equation.

It is expressed as $Y = a + bX$, Y = growth trend model for area, production and productivity separately. X = time variable.

RESULTS AND DISCUSSION

Cropped area under major crops:

Since the beginning of ‘Green Revolution’ there are signs of imbalances in the cropping pattern. Technological changes of mid-sixties caused significant shifts in land utilization.

The Table 1 show a negative growth rate for the pulses and coarse grains and a positive growth rate for the wheat and rice. The linear rates of changes in cropped area are shown in the Fig. 2 for the pre-reform period and Fig. 3 for of the post-reform period. In the pre-reform period, the crops mainly wheat, pulses and coarse grains are initially showing a fluctuating trend but by the late 1970s, rice and wheat seems to surpass the rate of growth of pulses and coarse grains. The trend line of rice is constantly increasing since 1966-67.

Table 1: Linear growth rate of cropped area (% per annum)			
Crops	1966-91	1991-2019	1966-2019
Rice	5.15	3.04	3.88
Wheat	3.80	1.28	2.37
Pulses	-1.83	-6.25	-5.33
Coarse Grains	-2.30	-1.58	-2.08

Agricultural production pattern :

The main objective of green revolution was to increase the production and productivity to help the nation to become a self-reliant particularly in food grains. The agricultural production and productivity both can be increased by using the yield enhancing inputs like chemical fertilizers, access to irrigation and choice of crops or cropping pattern (Chand *et al.*, 2011).

The linear growth rate of production of major crops are presented in the Table 2. With the expansion of irrigation facilities, extensive use of fertilizers, improved or HYV seeds, plant protection chemicals and mechanical power, a shift in favour of more remunerative and less risky crops like wheat and rice has been observed. The less preferred crops may be less remunerative and risks associated with them might be higher. The wheat and

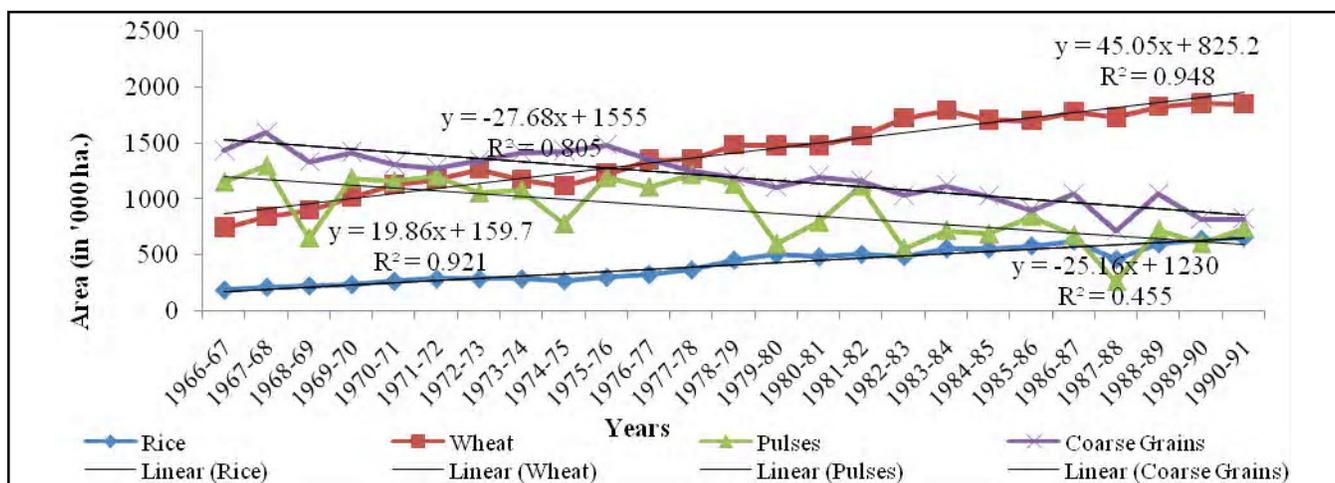


Fig. 2 : Pattern of cropped area of foodgrains (1966-1991)

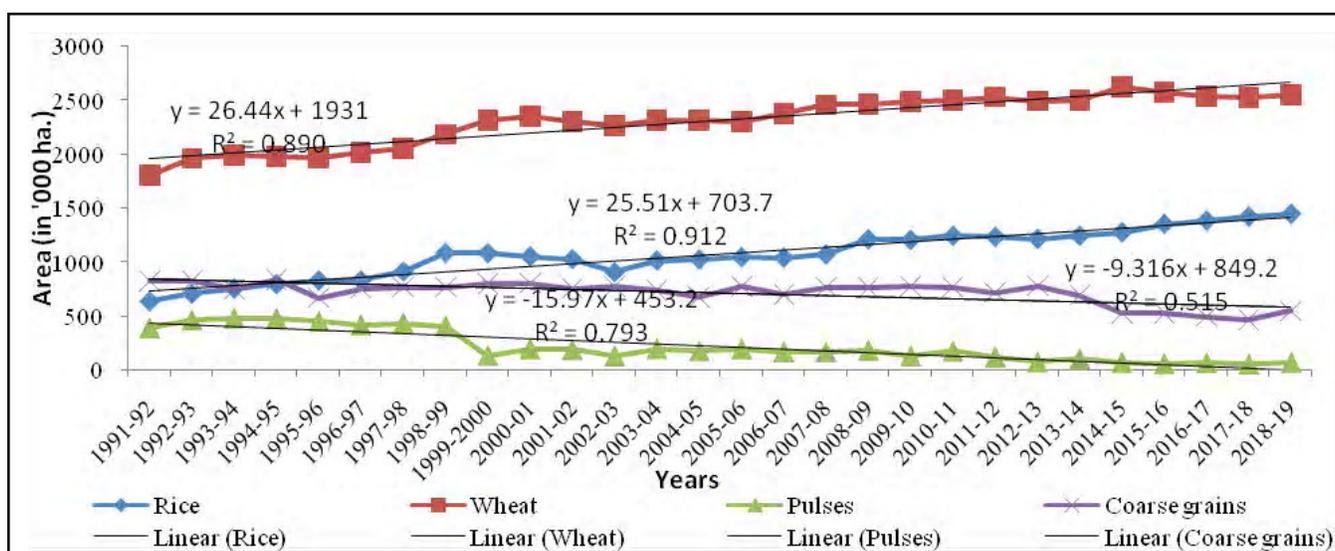


Fig. 3 : Pattern of cropped area of food grains (1991-2019)

rice crops have played a major role in pushing up the agricultural production. Table 2 shows a remarkable increase in the production of rice which grew at a rate of 9.18 per cent in the first period and increased at the rate of 3.16 percent during post-reform period. It resulted into a total increase of 5.96 per cent during the whole period of study under consideration. Similarly, the production of

wheat has increased, but the rate of wheat production is slightly less than that of rice. The growth rate of coarse grains is noticed to be less during the pre-reform period as compared to post-reform period. Irrespective of decrease in the area under coarse grains to the tune of -2.08 per cent (Table 1), coarse grains have shown an increasing trend in the production pattern at a rate of 0.51 per cent. This is because now people have recognized the nutritive values of the coarse grains and have started including these in their dietary habits apart from the awareness that the jowar has the property of extreme drought tolerance. So, in rain-deficit areas, it has become a popular crop and its residue is often used as fodder. In case of bajra, hybrids seeds played a major

Table 2 : Linear growth rate of production (% per annum)			
Crops	1966-91	1991-2019	1966-2019
Rice	9.18	3.46	5.96
Wheat	7.81	2.48	4.87
Pulses	-0.16	-4.35	-3.63
Coarse Grains	0.52	2.45	0.51

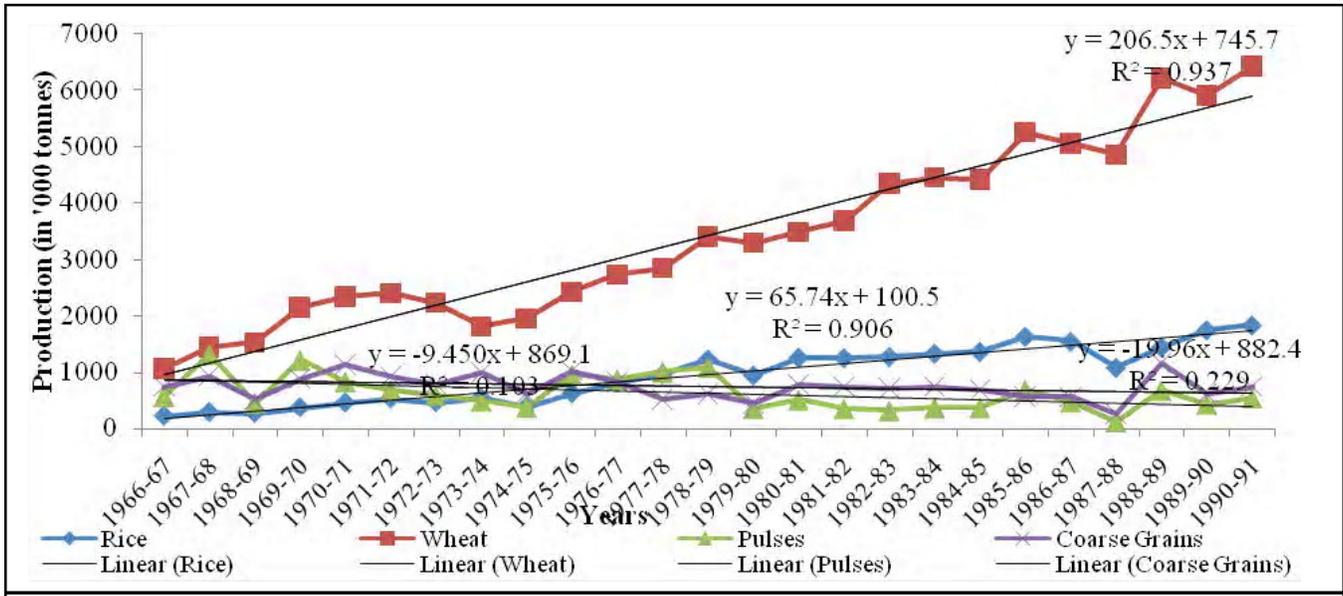


Fig. 4 : Production pattern of major crops (1966-91)

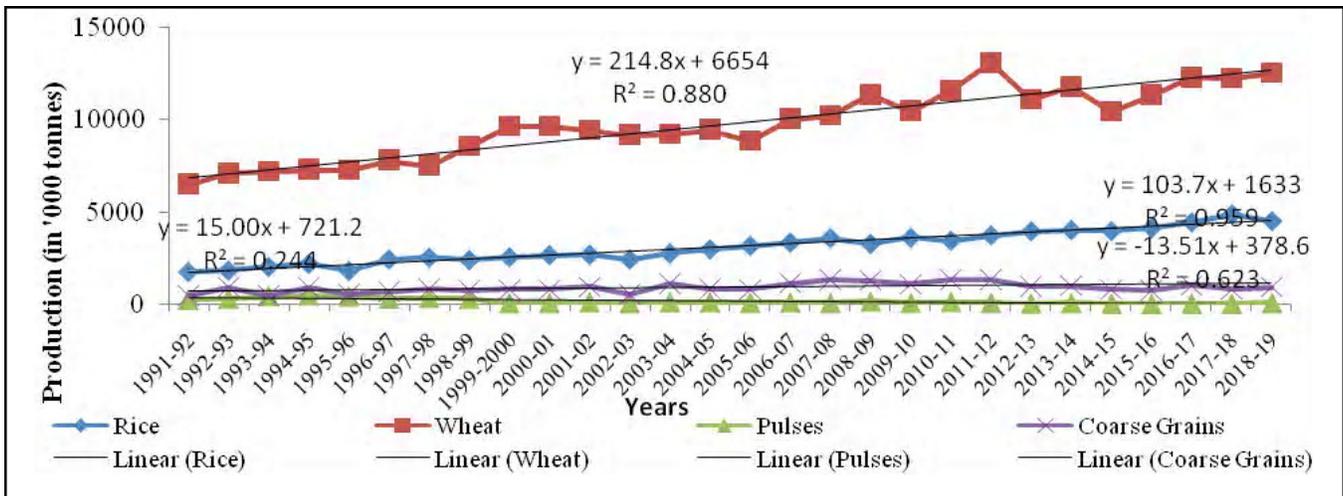


Fig. 5 : Production pattern of major crops (1991-2019)

role in increasing the production. The total production of food grains has increased at differential rates. A total of -3.63 per cent decline is contributed by the pulses which show just a minimal decline (-0.16 %) during the pre-reform period *i.e.* 1966-1991. But a noticeable change (-4.35 %) is observed in the time periods of 1991-2019. But in case of pulses, a continuous declining trend is observed. The linear trend in the production pattern of the pre-reforms and the post-reform periods are depicted in the Fig. 4 and 5, respectively. The percentage share of rice and wheat is much more and it is continuously increasing at the share of pulses. Coarse grains remained

more or less constant during both the time period.

Agricultural productivity pattern :

The productivity depicts a true picture of the production of a crop in the area sown under that crop. So, the productivity of a crop is estimated by dividing the production of a crop by area sown under that crop. Yield rate of the crops is an important indicator of agricultural development. The linear growth rate of productivity/yield of major crops are presented in the Table 3.

The productivity of each crop has increased during the time periods in the study region. It is essential to

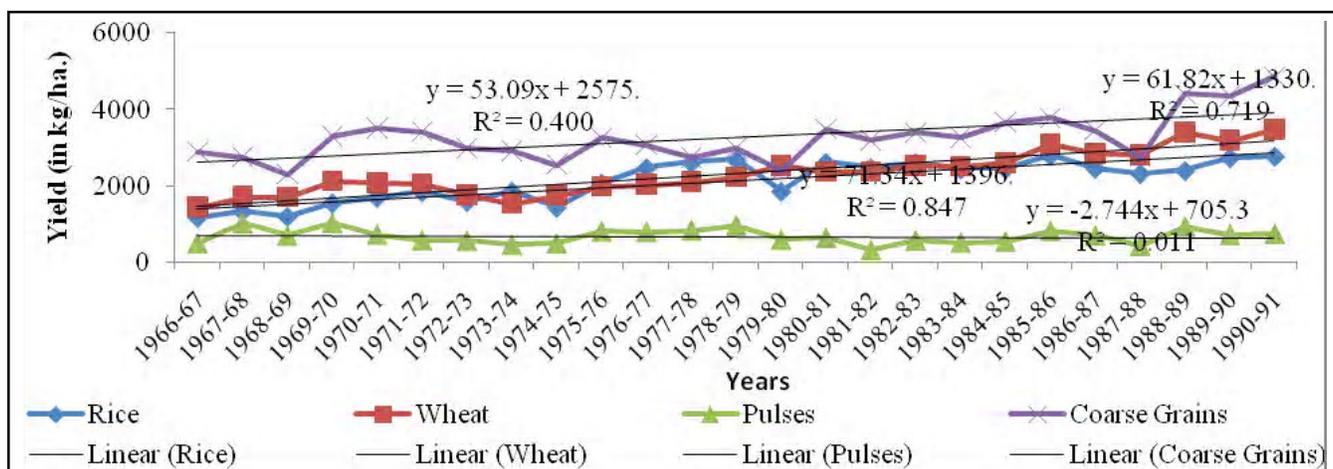


Fig. 6 : Yield pattern of foodgrains (1966-91)

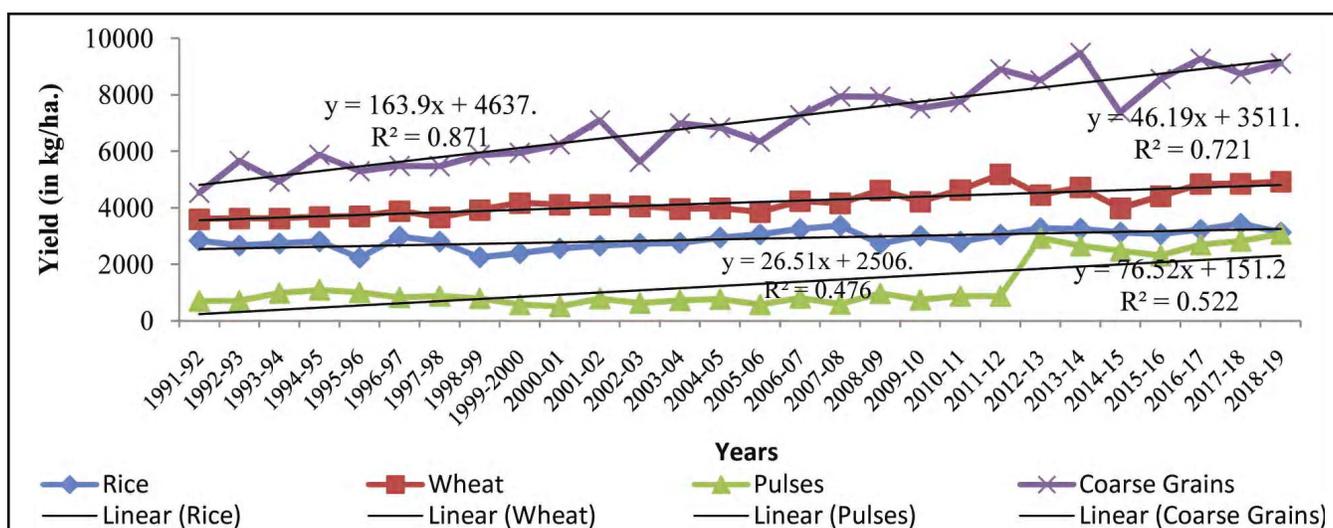


Fig. 7 : Yield pattern of foodgrains (1991-2019)

Table 3 : Linear growth rate of productivity (% per annum)

Crops	1966-91	1991-2018	1966-2019
Rice	3.63	0.36	1.90
Wheat	3.72	1.16	2.38
Pulses	1.66	5.47	3.53
Coarse Grains	2.16	2.59	2.20

mention that overall rate of increase of productivity of rice is the least *i.e.*, 1.90 per cent. This is because the production has reached to its plateau level. While the pulses and coarse grains show an increasing rate of 3.53 per cent and 2.20 per cent respectively. The linear trend in the productivity pattern of the pre-reform and the post-reform periods are depicted in the Fig. 6 and 7,

respectively. It shows that productivity trend of wheat and rice show a fluctuating trend during the pre-reform period. But it has remained stationary during the post-reform period. The yield pattern are highest among coarse grains during both the periods.

Conclusion:

The growth rates of area and production of different crops show that there has been uninterrupted expansion of area under paddy. The pulses are almost at the verge of disappearing. The paradigm shift towards rice and wheat specialization has helped the state of Haryana in securing self-sufficiency. But this constant mono-cropping system has contributed to a number of problems related

to soil and water. The farmers should be encouraged for growing pulses and coarse grains through assured prices and their environmental benefits.

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