

Temporal Change in Cropping Pattern in Agro Climatic Zones of Haryana

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Abstract – Cropping pattern is a basic element of cropping system. Cropping pattern of a region plays a vital role in determining the level of agricultural production and reflects the agricultural development of the area. In the present research work an attempt has been made to analyse the change in cropping pattern in agro climatic zones of Haryana during the period 1991-92 and 2011-12. The changes have been examined in term of change in percentage share of individual crops in total cropped area. The analysis of cropping pattern in the study area has been done for major crops separately. The cropping pattern of the study area reveals that the cereal crops covered the large extent of agricultural land. The share of rice, wheat and sugarcane in total cropped area of northern agro climatic zone is more than the share of area of these crops in other agro climatic zones of the state.

Key Words: Temporal change, Cereal crops, Agro-Climatic Zones, Cropping pattern.

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INTRODUCTION

Text Text Text Text Text Text Text Text Text In a geographical study, it is important to study the cropping pattern because it plays an important role to find out the agricultural transformation of an area. Cropping pattern of a region plays a vital role in determining the level of agricultural production and reflects the agricultural development of that area. The interplay of complex social, economic and physical factors is responsible for cropping pattern changes (Singh 1980). A change in the cropping pattern implies a change in the proportions of area under different crops, which depends to a large extent on the resources available to raise crops in the given agro-climatic settings (Palaniappan, 1985).

In the present research work an attempt has been made to analyse the temporal change in cropping pattern in Haryana during the period 1991-92 and 2011-12. In Haryana significant changes have taken place in the cropping pattern. In different agro climatic zones of Haryana also there are variations in cropping pattern. That is why the study of the extent of changes in cropping patterns in Haryana and different agro-climatic zones of Haryana has been done.

Economic and Statistical Organization, Planning Department Haryana, (2007) has divided the state into four agro climatic zones which are conducive for a different crops. An agro-climatic zone is a land unit uniform in respect of climate and length of growing

period which is climatically suitable for a certain range of crops and cultivators (FAO, 1983). Haryana has been divided into four following agro climatic zones:

OBJECTIVES OF THE STUDY

1. Northern Zone- Panchkula, Ambala, Yamunanagar, Kurukshetra, Karnal and Panipat districts.
2. Central Zone- Kaithal, Jind, Sonipat, Rohtak and Jhajjar districts.
3. Western Zone- Bhiwani, Hisar, Fatehabad and Sirsa districts.
4. Southern Zone- Faridabad, Gurugram, Palwal, Nuh, Rewari and Mahendragarh districts.

Main objectives of the present study are-

- To study the existing pattern of crops over the space.
- To examine the inter-district variations in cropping pattern in the state.
- To analyse the temporal change in cropping pattern in various agro climatic zones of the state.

- Find out the reasons responsible for changes in cropping pattern.

DATABASE AND METHODOLOGY

Database

The present research work is based on secondary data. The secondary data has been collected from Statistical abstract of Haryana, Government of Haryana.

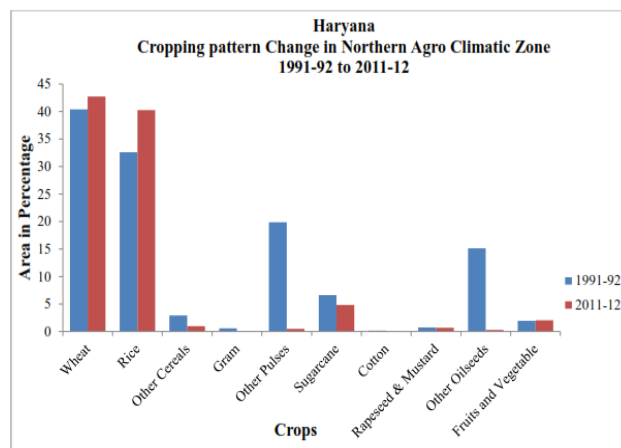
Methodology

In this paper percentage method has been used and the changes have been examined in term of change in percentage share of individual crops in total cropped area during 1991-92 and 2011-12. The analysis of cropping pattern in the study area has been done for major crops separately. In different agro climatic zones of Haryana there are variations in cropping pattern. That is why, the study of major crops (wheat, rice, gram, sugarcane, cotton, rapeseed & mustard and fruits & vegetables) has been done separately in four agro climatic zones of the state and some minor crops (bajra, jowar, maize, barley, mash, moong, massar, ground nut, sesamum and linseed), for which separate analysis could not be done included in the category of residual crops.

Temporal Change in Cropping Pattern in Agro Climatic Zones of Haryana

Cropping Pattern Change in Northern Agro Climatic Zone

In the northern zone the percentage share of individual crops presented in table 1.1, 1.2. The table 1.1 shows that the cereals are prominent in the zone which accounted 75.89 percent of total cropped area in 1991-92. In cereals wheat and rice are the main crops of the state that is why, wheat in rabi season accounted 40.39 percent and rice in kharif season accounted 31.19 percent of the total cropped area. Sugarcane in kharif season and oilseeds are the other important crops which accounted for about 6.61 percent and 1.96 percent of total cropped area respectively. In rabi season, the share of gram in pulses is 0.57 percent whereas of rapeseed and mustard in oilseeds is 0.73 percent respectively. The share of cotton in kharif season in total cropped area is very small which is 0.17 percent followed by pulses (2.18 percent), fruits and vegetables (1.96 percent). The share of area under residual crops is 11.23 percent. It is observed from the figure 1.1 that in northern agro climatic zone the cropping pattern was dominated by cereals mainly with rice during kharif season and wheat crops during the rabi season in 1991-92.



Source: Statistical Abstract of Haryana 1991-92, 2011-12

Fig. 1.1

It has been observed from the figure 1.1 that the changes in cropping pattern in the zone during 1991-92 and 2011-12 was small. But not in the case of cereals. The area under cereals increased from 75.89 to 83.95 percent while area under sugarcane, pulses and cotton declined from 6.61 to 4.83 percent, 2.18 to 0.53 percent and 0.17 to 0.01 percent respectively. Gram and rapeseed & mustard also recorded a decline of 0.57 to 0.04 percent and 0.73 to 0.68 percent respectively. The share of area under remaining crops in the zone has also declined gradually.

2.3.2 Cropping Pattern Change in Central Agro Climatic Zone

Cropping pattern change in central agro climatic zone during the 1991-92 and 2011-12 is presented in the table 1.1 & 1.2 and figure 1.2. The table 1.2 shows that wheat in rabi

Table 1.1: Haryana: Percentage of Area under Different Crops to total Cropped Area in 1991-92

Districts/Agro climatic zones	Rice	Wheat	Other Cereals	Total Cereals	Gram	Other Pulses	Total Pulses	Sugarcane	Cotton	Rapeseed & Mustard	Other Oilseeds	Total Oil seeds	Fruits & Vegetables	Residual crops
Percent to Total Cropped Area														
Ambala	24.61	38.51	8.29	71.40	1.43	3.20	4.63	4.35	0.22	1.84	1.80	3.64	2.91	12.83
Yamunanagar	21.12	31.76	4.11	58.39	1.00	2.07	3.07	22.35	0.16	0.85	1.07	1.92	1.49	11.22
Kurukshetra	38.97	40.54	0.69	80.21	0.18	0.71	0.88	4.73	0.05	0.58	1.71	2.28	2.80	9.05
Karnal	39.66	43.44	1.01	84.10	0.22	0.96	1.18	2.46	0.15	0.22	0.85	1.07	1.03	10.01
Panipat	31.13	45.48	1.56	78.17	0.27	1.56	1.83	3.76	0.30	0.41	0.71	1.12	1.86	12.97
Northern	31.19	40.39	2.91	75.89	0.57	1.61	2.18	6.61	0.17	0.73	1.22	1.96	1.96	11.23
Kaithal	31.35	46.32	3.37	81.04	0.50	1.12	1.62	1.77	2.18	2.06	0.51	1.17	0.31	10.52
Sonapat	12.42	29.83	27.73	69.99	0.46	5.06	5.53	5.09	0.53	2.99	1.85	4.83	3.10	10.92
Rohatak	1.08	34.64	23.63	59.36	4.80	3.58	8.38	4.92	2.19	17.31	0.12	17.42	0.81	6.91
Jind	10.76	38.48	12.05	61.29	4.19	1.92	6.12	2.71	11.04	4.62	0.35	4.98	0.72	13.14
Central	13.33	37.93	15.94	67.10	2.85	2.72	5.57	3.52	4.46	7.53	0.56	8.09	1.03	10.25
Faridabad	3.20	46.44	20.17	69.81	0.36	3.48	3.84	4.38	0.12	7.64	0.46	8.10	1.23	11.11
Gurgaon	0.51	31.65	29.84	62.00	3.91	0.71	4.62	0.17	0.01	21.85	0.52	22.36	1.18	9.65
Rewari	0.00	21.72	33.02	54.74	5.60	0.03	5.64	0.00	0.02	30.58	0.15	30.74	0.14	8.73
Mahendragarh	0.00	12.95	38.76	51.72	11.53	0.07	11.60	0.00	0.07	28.22	0.01	28.23	0.34	8.05
Southern	0.94	28.38	30.44	59.76	5.39	1.09	6.48	1.14	0.06	21.76	0.30	22.05	0.76	9.75
Bhiwani	0.00	11.10	31.51	41.21	26.67	1.06	27.73	0.17	4.65	15.12	0.06	15.18	0.33	9.32
Hisar	3.91	27.50	9.82	41.23	12.24	0.64	12.88	0.48	25.02	9.33	0.47	9.79	1.08	9.51
Sirsa	4.45	29.64	2.40	36.49	12.77	0.13	12.90	0.02	29.86	8.88	0.70	9.59	0.61	10.54
Western	2.99	23.61	13.72	40.31	16.32	0.62	16.94	0.27	20.78	10.79	0.42	11.21	0.75	9.74

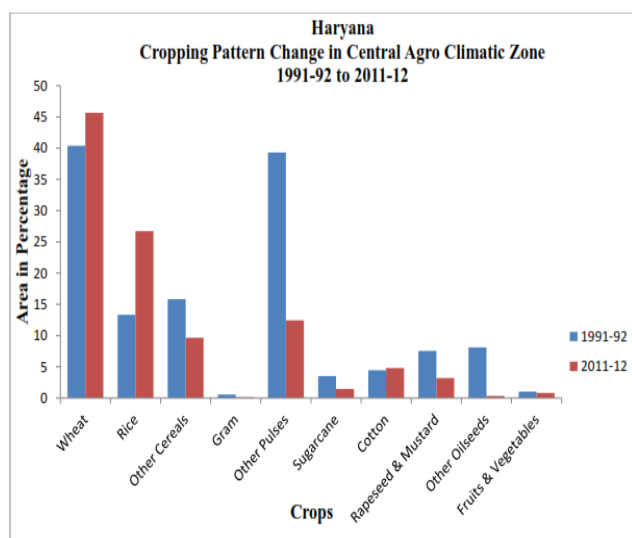
Source: Statistical Abstract of Haryana 1990-92.

Table 1.2: Haryana: Percentage of Area under Different Crops to total Cropped Area in 2011-12.

Districts/Agro climatic zones	Rice	Wheat	Other Cereals	Total Cereals	Gram	Other Pulses	Total Pulses	Sugarcane	Cotton	Rapeseed & Mustard	Other Oilseeds	Total Oil seeds	Fruits & Vegetables	Residual crops
Percent to Total Cropped Area														
Ambala	39.92	41.3	0.76	82.84	0.03	0.68	0.71	4.73	0.0	0.63	0.08	0.71	1.67	9.34
Panchkula	22.42	39.68	17.34	79.44	0.48	2.02	1.10	1.05	0.0	3.71	0.08	3.79	3.20	10.02
Yamunanagar	34.17	39.83	0.85	74.84	0.05	0.74	0.79	12.34	0.0	1.26	0.19	1.45	1.4	8.41
Kurukshetra	43.31	41.74	0.16	85.21	0.04	0.32	0.36	3.41	0.0	0.55	1.16	1.71	3.43	5.89
Karnal	43.65	44.35	0.34	88.34	0.03	0.25	0.28	2.83	0.0	0.26	0.02	0.28	1.24	7.04
Panipat	39.95	45.33	0.26	85.54	0.00	0.38	0.38	3.44	0.0	0.47	0.00	0.47	1.78	8.36
Northern	40.24	42.73	0.98	83.95	0.04	0.49	0.53	4.83	0.0	0.68	0.29	0.97	2.05	7.67
Kaithal	41.75	45.43	1.71	88.89	0.03	0.04	0.07	0.70	2.0	0.21	0.01	0.22	0.40	7.73
Sonapat	30.41	49.21	6.58	86.20	0.00	0.69	0.69	2.49	0.3	0.81	0.00	0.81	2.13	7.34
Rohatak	16.76	44.91	18.35	80.03	0.36	2.20	1.17	3.34	4.1	5.90	0.01	5.92	0.82	3.26
Jhajjar	12.21	42.37	24.13	78.71	0.22	2.01	2.22	1.10	0.6	13.16	0.07	13.23	0.57	3.53
Jind	24.12	45.62	6.78	76.52	0.03	0.10	0.13	0.59	11.1	0.97	0.02	0.99	0.39	8.92
Central	26.72	45.68	9.66	82.06	0.10	0.77	0.86	1.44	4.8	3.20	0.02	3.22	0.80	6.77
Faridkot	16.09	47.36	8.07	71.52	0.00	0.66	0.66	1.07	0.1	1.12	0.15	1.27	4.88	20.50
Palwal	16.54	50.73	8.70	75.97	0.00	0.59	0.59	1.19	0.3	1.73	0.03	1.76	0.42	19.79
Gurgaon	4.39	44.79	31.42	80.61	0.00	0.55	0.55	0.03	0.1	11.79	0.30	12.09	2.04	4.62
Nuh	3.27	42.97	22.26	68.50	0.22	0.92	1.14	0.36	0.0	15.55	0.22	15.77	2.21	12.00
Rewari	1.39	24.98	32.42	58.80	0.02	0.54	0.56	0.00	0.6	33.82	0.17	33.99	0.62	5.44
Mahendragarh	0.00	15.30	37.49	52.79	3.09	0.19	3.27	0.00	0.8	33.51	0.05	33.56	0.19	9.38
Southern	5.49	33.77	25.94	65.20	0.90	0.52	1.43	0.36	0.4	20.06	0.13	20.19	1.16	11.26
Bhiwani	2.44	21.49	22.47	46.40	6.38	1.01	7.39	0.28	7.1	21.36	0.06	21.42	0.33	17.04
Hisar	6.79	36.09	7.66	50.54	2.04	1.69	3.73	0.17	22.1	10.03	0.13	10.16	0.83	12.44
Fatehabad	20.75	44.26	2.02	67.03	0.13	0.22	0.35	0.03	20.4	2.43	0.19	1.22	0.59	8.95
Sirsa	8.77	40.78	1.56	51.11	1.04	0.31	1.35	0.00	27.7	5.58	0.37	5.95	1.03	12.88
Western	8.44	34.56	9.28	52.28	2.70	0.85	3.55	0.13	15.2	10.78	0.19	10.96	0.70	17.21

Source: Statistical Abstract of Haryana, 2010, 2011, 2012.

season, rice in kharif season and oilseeds dominated in 1991-92. The larger proportion of total cropped area has been under wheat which was 37.93 percent followed by rice 13.33 percent and oilseeds 8.09 percent in 1991-92, on the other hand fruit and vegetables has covered small proportion of total cropped area which is 1.03 percent followed by sugarcane (3.52 percent), cotton (4.46 percent) and pulses (5.57 percent).



Source: Statistical Abstract of Haryana 1991-92, 2011-12.

Fig. 1.2

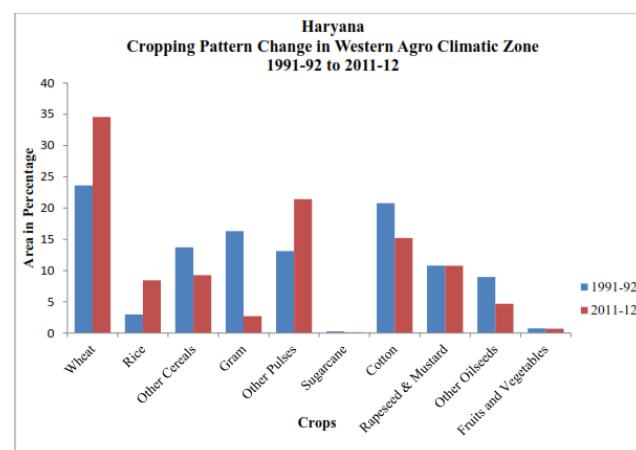
It is observed from the figure 1.2 that the cropping pattern in this zone during 1991-92 to 2011-12 has shown the substantial changes. Mainly in case of rice the dramatic change has been observed. The area under rice increased from 13.33 to 26.72 percent

followed by wheat from 37.93 to 45.68 percent and cotton from 4.46 to 4.8 percent.

On the other hand the share of area under rest of crops including residual crops showed a sharp decline. Maximum decline has been observed in case of oilseeds which is 8.09 to 3.22 percent followed by sugarcane 3.52 to 1.44 percent, pulses 5.57 to 0.86 percent and residual crops 10.25 to 6.77 percent. In rabi season also the share of gram and rapeseed & mustard declined from 2.85 to 0.10 percent and from 7.53 to 3.20 percent respectively.

2.3.3 Cropping Pattern Change in Western Agro Climatic Zone

In this zone the percentage share of individual crops is presented in table 1.1 & 1.2. It is observed from the table 1.1 that the cereal was prominent in the zone which is accounted 40.31 percent of total cropped area in 1991-92.



Source: Statistical Abstract of Haryana 1990-92, 2010-12.

Fig. 1.3

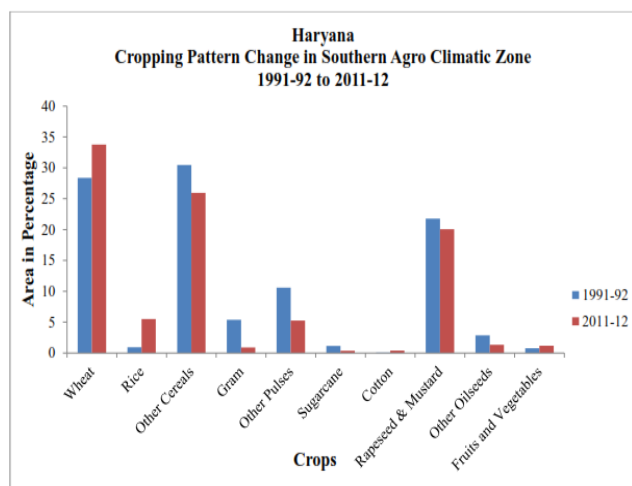
The area under cereals has increased immensely, from 40.31 to 52.28 percent during 1991-92 to 2011-12. In cereals rice in kharif season and wheat in rabi season are the main crops and the figure 4 shows that wheat was the most important crop, followed by cotton in kharif season and oilseeds in this zone. But in comparison to wheat, the area under rice increased from 2.99 to 8.44 percent during 1991-92 to 2011-12. The area under residual crops also increased during this period from 9.74 to 17.21 percent.

On the other hand, the percentage share of area under cotton has decreased from 20.78 to 15.2 percent, followed by pulses 16.94 to 3.55 percent and oilseeds 11.21 to 10.96 percent, the same results found in case of gram and rapeseed & mustard which is 16.32 to 2.70 percent and 10.79 to 10.78 percent respectively. But in case of fruits

and vegetable the share of area shows minor decline during the period.

2.3.4 Cropping Pattern Change in Southern Agro Climatic Zone

In the southern agro climatic zone the percentage share of individual crops in total cropped area during the 1991-92 to 2011-12 is presented in table 1.1 & 1.2 and also shown by figure 1.4.



Source: Statistical Abstract of Haryana 1990-92, 2010-12.

Fig 1.4

It is observed from the table that the area under two main crops wheat and rice increased gradually which is 28.38 to 33.77 and 0.94 to 5.49 percent, as similar as in case of cotton and fruits and vegetable, on the other hand the share of area under oilseeds, sugarcane and pulses declined during the 1991-92 to 2011-12. The share of area under residual crops increased from 9.75 to 11.26 percent.

In the southern agro climatic zone the percentage share of individual crop in total cropped area is presented in table 2&3 and figure 5. It is observed from the table 1.1 & 1.2 that the area under two main crops wheat in rabi season and rice in kharif season increased gradually from 28.38 to 33.77 percent and 0.94 to 5.49 percent respectively. There is also an increase in area under cotton and fruits & vegetables, whereas, the share of area under oilseeds, sugarcane and pulses declined. In rabi season the share of gram and rapeseed & mustard also declined from 5.39 to 0.90 per cent and 21.75 to 20.06 percent respectively. The share of area under residual crops has increased from 9.75 to 11.26 percent.

CONCLUSION

There are variations in the cropping pattern in agro climatic zones of the state. In northern agro climatic zone it is observed that due to irrigation facilities, fertile soil and well developed agricultural

infrastructure, the share of area under rice, wheat and sugarcane is more than the other crops of the zone. The share of rice, wheat and sugarcane in total cropped area of northern agro climatic zone is more than the share of area of these crops in other agro climatic zones of the state. Area under oilseeds and pulses has declined in the state and also in all the agro climatic zones of the state. The share of area under oilseeds has declined because of the increase in the area under wheat due to spread of irrigation facilities. In the same way, the area under pulses has declined. The area under sugarcane in kharif season has declined in all the agro climatic zones of state except the western agro climatic zone, due to development of irrigation facilities in the zone during the period 1991-92 to 2011-12. Area under cotton has also decreased in the state. After the analysis, a major shift is identified in cropping pattern in favour of wheat and rice, which happened due to the development of irrigation, agricultural infrastructure, mechanization of agriculture etc.

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