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## Changes in the Pattern of Cropping Intensity in different agro-climatic zones of Haryana.

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### Abstract:

*cropping Intensity refers to raising of a number of crops from the same field during one agricultural year. It is another measure of the agricultural productivity of a region. In the 'new agricultural strategy' priority has been given to the intensification of crop land use for checking the widening gap between increasing human population and sustainable food production. During last three decades, average cropping intensity was increased from 167.42% in 1990-92 to 184.4% in 2018-19.*

*Effect of amalgamation of irrigation facilities, small size of land holdings, nature of soil, vagaries of monsoon rain etc. controlled the aerially distribution of cropping intensity. During post reform the state has witnessed several changes in the use of agricultural land; these are technical advances in agriculture, the profitability of different agricultural enterprises, and expansion of irrigation facilities. The key objective of the study is to analyse the spatial variation and the temporal perspective of the changing pattern of cropping intensity in different agro climatic zones of the state. The present secondary data based study entitled 'Changes in the Pattern of Cropping Intensity in different agro-climatic zones of Haryana' indirectly support to bringing about a holistic awareness in pursuing further study to investigate the feasible problems and prospects related to cropping intensity. The finding reveals that cropping intensity scenario in all agro climatic zones is satisfactory except central agro climatic zone. The overall result of these changes could be seen in the improved use of the agricultural land and increased yield per hectare, recording agricultural progress, usually referred to as "agricultural efficiency" by agricultural Geographers.*

### KEYWORD:

Cropping Pattern, Double Cropping Area, Cropping Intensity.



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## INTRODUCTION

Intensity of Cropping is another measure of the agricultural productivity of a region. It is defined as the extent to which the net area sown is cropped or double cropped. In other words, intensity of cropping refers to the number of crops raised on a field during a given agricultural year. In the 'new agricultural strategy' priority has been given to the intensification of crop land use for checking the widening gap between increasing human population and sustainable food production. Different factors such as irrigation possibilities, initiatives, human traditions and agriculture practices together tend to ascertain the extent to which the net sown area is cropped. Also the limitations imposed by the topography, nature of soil and scarcity of water supply, especially in the summer season, outweigh other factors like size of land holding etc. Are all impacted the spatial pattern of cropping intensity of the different agro climatic zones in the state. The cropping intensity has direct correlation with assured irrigation which enables farmers to go for multiple cropping and use higher doses of fertilizers and HYV seeds.

### OBJECTIVES: -

The specific objectives of the present research paper are.

To highlight on the spatio-temporal changes in cropping intensity during the period under study.

To categorize and study the general land use and find out the scope for extension of double cropped area in future.

### DATABASE AND METHODOLOGY: -

The entire work is based on secondary data, concerning total cropped area and net sown area, for the period 1990-91 and 2017-18. The secondary data is obtained from socio-economic review and district statistical abstract of Haryana. The data has been examined for the state at the level of districts. An average of data for three successive years at any point of time has been used to avoid anomalies created by year to year fluctuations in weather. The collected data are processed and analyses in the form of table and maps.

Cropping intensity is derived by following formula.

Intensity of cropping =  $TCA/NSO \times 100$

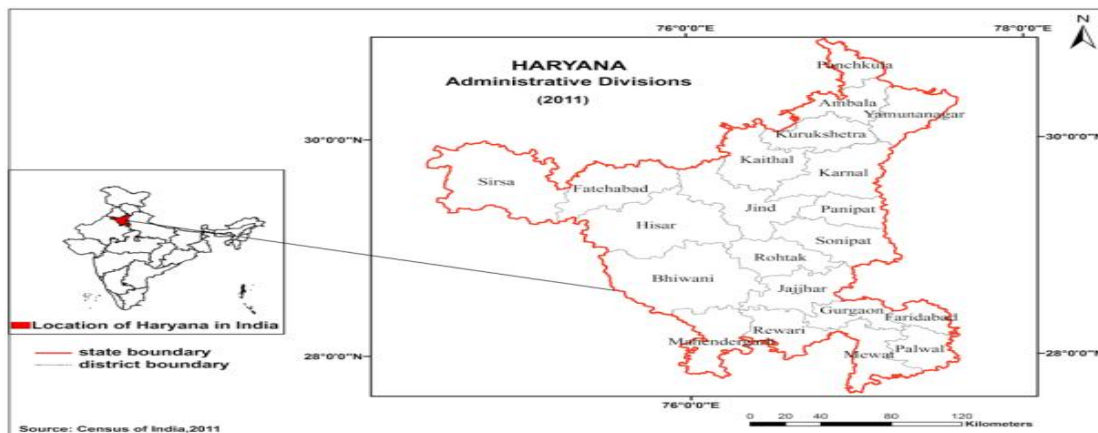
Where,

TCA- Total cropped area

NSO – Net area sown.

**STUDY AREA:**

The state of Haryana extends over 27°03'00" North latitudes and 74°02'08" to 77°03'05" East longitude. It is one of the north western states of India adjoining Delhi, the capital of the country and forms virtually a part of the National Capital Region (NCR). Haryana is bound by Himachal Pradesh in the North, by Uttar Pradesh and Delhi in the East, by Rajasthan on its south west and by Punjab and Chandigarh on its northwest. It covers an area of 44,212 kms<sup>2</sup> and comprises 22 districts, 83 tehsils, 126 Community Development Blocks, 154 towns and 6,841 villages (Statistical Abstract of Haryana 2018-19) as the administrative set up.



**Agro Climatic Zones:**

Soil and climatic conditions of a region largely determines the cropping pattern and crop yield. The purpose of zoning, as carried out for land-use planning, is to separate areas with similar sets of potentials and constraints for development. Specific programs can then be formulated to provide the most effective support to each zone. A geographical region can be divided into two types of zones. To facilitate the analysis of data and to make the study more useful in planning and research for agricultural development, Haryana has been divided into four homogeneous agro climatic zones which are as under: -

Agro climatic Zones		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

Economic and Statistical Organization, Planning Department Haryana, (2007)

**Table 1.1**

**Haryana: Characteristics of Agro Climatic Sub Zone of Trans-Gangetic Zone.**

Sub Zone	District Falling in the Sub Zone	Rainfall (in mm.)	Climate	Soil	Crops
Plain	Kurukshetra, Karnal, Jind, Sonapat, Rohtak, Faridabad and Gurgaon	720	Semi-arid to Dry sub-humid	Alluvial (Recent)	Wheat, Rice, Maize, Sugarcane
Foothills of Shiwalik & Himalayas	Ambala, Yamunanagar	1000	Semi- arid to Dry sub Humid	Calcareous	Wheat, Rice, Maize, Sugarcane
Scarce Rainfall Arid Region	Hisar, Sirsa, Bhiwani, Rewari, Mahendragarh	360	Arid and Extreme arid	Calcareous, Sierozemic, Alluvial (Recent) Desert	Wheat, Cotton, Gram, Bajra, Rice

Source: Planning Commission of India, 1989.

**Table –1.2**

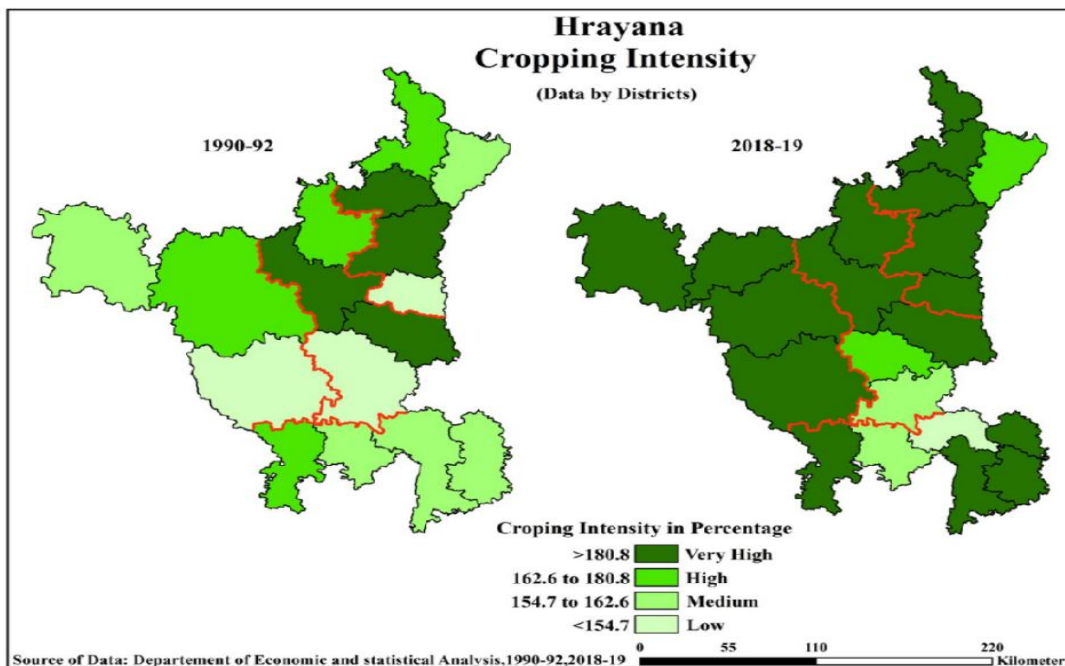
**Cropping intensity in different agro- climatic zones of Haryana (1990-92 and 2018-19)**

Agro climatic Zones/ District	Cropping Intensity	
	1990-92	2018-19
Ambala	165.75	191.36
Panchkula	-	196.83
Yamunanagar	157.14	176.19
Kurukshetra	189.21	196.57
Karnal	217.42	200.17
Panipat	135.48	180.14



<b>Northern Agro climatic Zone</b>	<b>173.36</b>	<b>190.21</b>
Kaithal	170.23	187.85
Rohtak	123.73	164.96
Jhajjar	-	159.16
Sonipat	195.35	194.08
Jind	200.00	189.81
<b>Cntral Agro climatic Zone</b>	<b>172.32</b>	<b>179.17</b>
Faridabad	155.80	196.67
Palwal	-	188.82
Gurgaon	154.78	143.98
Mewat	-	165.64
Rewari	154.69	154.76
Mahendergarh	167.95	183.88
<b>Southern Agro climatic Zone</b>	<b>158.25</b>	<b>172.29</b>
Bhiwani	153.40	198.31
Hisar	178.04	196.10
Fatehabad	-	192.26
Sirsa	159.52	186.17
<b>Western Agro climatic Zone</b>	<b>163.63</b>	<b>190.96</b>
<b>Haryana</b>	<b>167.42</b>	<b>184.40</b>

Source: Department of economic and statistical Analysis, 1990-92,2018-19



## Results and Suggestions:

During the study period the index of cropping intensity in districts of different agro climatic zones showed a positive change. The data revealed that cropping intensity in the state had increased from 167.42 pn 1990-92 to 184.4 percent in 2018-19 and remarkable changes also observed in the regional distribution of cropping intensity in the districts of four agro climatic zones.

Maximum change has been observed in Northern and Western agro climatic zone where district Panipat moved from low category with 135.48% cropping intensity to high category with 180.14 whereas Bhiwani districts moved from low category to very high category with 153.40% to 189.31 %.

Due to development in canal irrigation facilities especially in the southern part of Sirsa district in the western agro-climatic zone, Sirsa district was taken up in very high category from moderate. Low progress has recorded in the central agro climatic zone where in Rohtak district shifted from low category to medium category, decreasing land-holding size is one of the main reasons behind low cropping intensity in this agro climatic zone. In case of Jhajjar district the basic problems is that nearly 2/3 of the area is unirrigated and having various problems like soil salinity, alkanity and water logging.



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During the study period, major share of area change in the southern agro climatic zone under very high category has been increased. In 2018-19, districts registered in this category were Fraidabad (196.67%), Palwal (188.82%) and Mehandergarh (183.88%).

The only change from low category to medium has observed in district Rewari of this zone, and it was due to the development in the sprinkler irrigation. The level of cropping intensity has reached at the saturation level in almost all districts of the state excluding Gurgaon, Mewat, Rewari and Rohtak district.

To wind up the study following suggestions are put forward: Since the state has limited cropped land, in present time more priority should be given to the acceleration of productivity of the crops grown. A holistic and scientific strategy is required in the practical ground to mitigate it. Adoption of improved technology can never be possible if the farm size is not raised to an economically feasible unit. Therefore, fragmentation of land holdings should be prohibited by legislation. Non-cultivators should not be allowed to possess cultivable land. The name of the genuine cultivators should be officially registered; and cooperative farm societies should be established in order to inspire and make them responsible to accelerate agricultural economy. Government can also influence cropping intensity through legislative and administrative measures. Steps may be taken by the government to ease or subsidize the supplies of farm inputs and knowledge.

Cropping intensity depends on availability of agriculture related facilities such as high yielding of seeds, fertilizers and manures; adoption of crop rotation, mixed cropping, relay cropping etc. improved facilities for plant protection, water-storage, marketing, transport etc. Hence, adequate and immediate measures should be taken on the part of government regarding it targeting the benefit of the cultivators. The state government must emphasis on development of zone wise suitable crops on priority basis.





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- iv) Singh, J. (1972): Spatio temporal Development in cropping pattern in Haryana Geographical Review of India Vol. XXXIV, PP. 313-317.
- v) Shinde, S.D. (1980): Agricultural in an under developed Region, Himalaya Publishing House Mumbai PP 111.114.
- vi) The agro-climatic zone is nothing but a climatically classified location suitable to agriculture. The National Commission on Agriculture classified India into 127 agro-climatic zones in 1971.
- Vii) Statistical Abstract of Haryana, (1989, 90, 91, 2016, 17, 18). Department of Economic and Statistical Analysis, Government of Haryana, Chandigarh.