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Analyzing and suitability of yield crop in western district of Haryana

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Abstract

The evaluation of increase is generally utilized in monetary research to discover the fashion of a specific variable over a time frame and used for making coverage decisions. The increase with inside the region, manufacturing and yield of garlic in Haryana vis-à-vis India changed into expected the usage of the compound increase function. The cropping sample and reading of various districts in developing exceptional plants in Haryana are assessed the usage of 3 requirements measures, namely (i) area quotient, (ii) crop versatility index, and (iii) district versatility index over the length 1999-2000 to 2019-20. This suggests that the region and manufacturing increase developments in Haryana had been high-quality at the same time as in yield increase a fashion changed into negative. But in case of India, the region, manufacturing and productiveness developments are high-quality.

Keywords: Yield crops, rice, production

Introduction

India is an agriculturally vital nation. 66% of its population is occupied with rural exercises. Agriculture is an essential movement, which creates the majority of the nourishment that we devour. Other than nourishment grains, it likewise delivers crude material for different ventures. The word 'Agriculture' is gotten from the Latin word 'Ager' signifies Land or field and 'Culture' signifies development. It implies the science and Art of creating harvests and domesticated animals for monetary reason. Agriculture is a craft of raising vegetation from the dirt for the utilization of humanity. Agriculture is the achievement ever of development, because of agriculture man settled at specific spot. Spices represent a vital organization of agricultural commodities that are honestly in dispensable with inside the culinary art. In India, spices are vital industrial vegetation from the factor of view of each home intake and export. India is well-known for its spices which can be extensively utilized in industries like pharmaceutical, perfumery and cosmetics. The weather of our use is appropriate for nearly all spices. Spices are outstanding from herbs, which are part of leafy inexperienced flowers used for flavoring or as garnish. Spices are the ones flowers, the goods of that are made use as meals adjuncts to feature aroma and flavor. Haryana is predominantly an agriculture financial system with preponderance of wheat, rice, bajra, mustard, sugarcane and cotton. In the current years, industrial orientation of the country agriculture is greater related to mustard, vegetables, culmination etc. and the location below pluses has declined considerably. The annual compound increase charge of cereals manufacturing with inside the use for the duration 1966-67 to 2019-20 has been anticipated at 2 in keeping with cent. However for the equal length, manufacturing of pluses accelerated at a far decrease annual compound boom fee of one in step with cent. Among the cereals the yearly compound boom charges for excellent cereals, viz. wheat and rice are 3.7 in step with cent and 2.4 in step with cent even as for coarse cereals, viz. bajra and jowar the boom charges are 1.4 in step with cent and 0.76 in step with cent for the equal length respectively. These modifications in cropping sample have particularly marked with inside the areas that have witnessed the arrival of Green Revolution. For example, the pluses manufacturing in Haryana has declined alarmingly from 952.0 thousand tones in 1975-76 to a hundred thousand tones in 2019-20. Contrary, at some stage in remaining 4 decades, wheat manufacturing with inside the kingdom has accelerated approximately tenfold; from 1059 thousand tones in 1966-67 to 10500 thousand tones in 2019-20. Similarly the rice manufacturing has accelerated from 223 thousand tones to 3630 thousand tones at some stage in the equal length, greater than sixteen-fold.

The decline in manufacturing of pulses, which might be the primary supply of proteins for a massive phase of populace with inside the kingdom in addition to with inside the united states of America at massive, isn't always best elevating doubts approximately the dietary protection however additionally suggests structural transformation of the kingdom agriculture. An extraordinary characteristic of adjustments in cropping sample in Haryana is the improved proportion of the cereals, occupying 0.33 of general cropped area. Considering the variety of soil, agro-climatic situations and availability of canal irrigation and infrastructure services (e.g., roads and controlled markets) throughout the sub-areas, potentiality to domesticate various sorts of vegetation exists with inside the kingdom. The statistics at countrywide or kingdom stage on mixture boom land usage sample gives no enough clue for powerful human efforts due to the fact the areas fluctuate with appreciate to their wishes and useful resource endowments. Since there was a developing consensus approximately the want of district-degree agricultural planning, it'd be of hobby to degree the extent of agricultural hobby at district degree. A take a look at on the district degree may be beneficial to formulate district particular agricultural policies. It is likewise instructive to recognize the adjustments in cropping sample over the years. The seriousness of rising acute nearby imbalances has now no longer but obtained the general public attention, it deserves. The zone of India is 2.4% from the remainder of world. Also, 7.3% fauna and 30% verdure in which 167 developed and 320 wild species are available

in India, Haryana is the creating state. It is the one of the most extravagant agriculture state in the India. As per the report of the FSI (2011) Haryana spread the 3.64% of the regular woodland out of the generally land zone. The most important purpose of the take a look at is to advantage perception into the importance of efforts had to obtain balanced agricultural increase in Haryana. The particular targets of our take a look at are:

- (i) To consider the speciality of various regions in diverse crops.
- (ii) To survey the suitability of the unlike districts for developing numerous crops.

Study Area: The present study relates to the state of Haryana. The kingdom Haryana become carved out from the previous kingdom of Punjab on 1st November 1966 at the linguistic basis. The capital of Haryana is Chandigarh which is likewise the capital of its neighboring kingdom Punjab. It is noncoastal, indoors kingdom and positioned withinside the northern a part of India. Haryana is bounded with the aid of using Uttar Pradesh withinside the east, Himachal Pradesh withinside the north, Punjab withinside the west and Rajasthan withinside the south. It is positioned at an altitude of 2 hundred meters above sea floor and prolonged among 27 29' to 30 55' north range and seventy four 27' to seventy seven 36' east longitude with a complete geographical location of 44212 sq. kilometer.

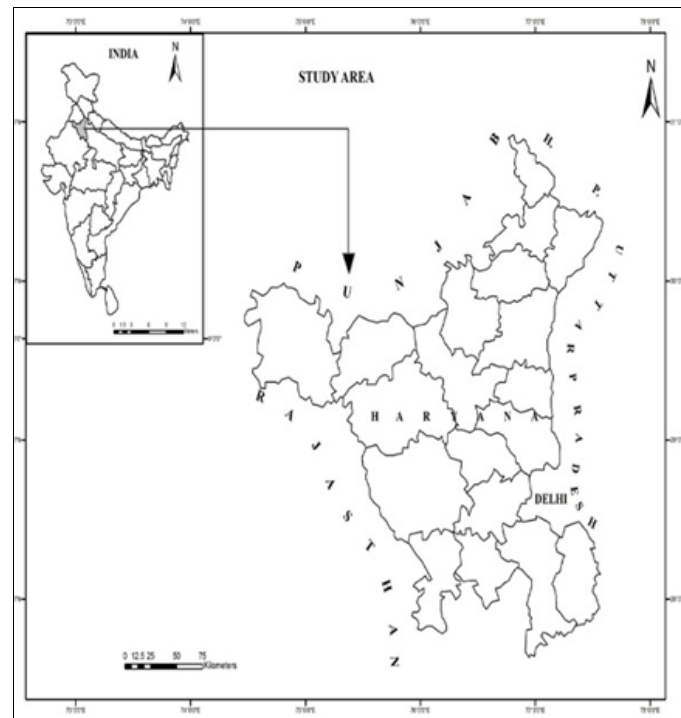


Fig 1: District wise Map of Haryana

Methodology

The adoption of sound research procedure is an imperative part of research study. Considering the fundamental perspectives and their factors the examination technique will be adopted, in the present study; to suit the satisfaction of destinations in short the exploration procedure will be as under: - The whole research work depends on essential and auxiliary sources. Essential information will be gathered

through the escalated field work – by executing surveys, directing meeting of farmers, heads of neighborhood foundations and individual perceptions. Surveys covers the perspectives like general land use, crop land use, farmer's development techniques, utilization of manures, instruction, salary, issues identified with agriculture. The present study is primarily based totally on secondary source of land use records. The district smart data this is based on location in

keeping with village papers taken from statistical summary of Haryana, financial and statistical business enterprise Panchkula. A strive has been made to tabulate system examine and interpret the records through making use of appropriate statistical techniques. We don't forget 10 essential vegetation grown in Haryana, particularly rice, jowar, bajra, maize, wheat, barley, gram, mustard (such as rapeseed), cotton (each American and Desi) and sugarcane. The vegetation blanketed with inside the examine account for 88 in step with cent of general cropped location within side the country in 2019-2020. The pattern duration is 1999-2000 to 2019-2020. It displays the post-liberalization duration and allows us to adopt an extra disaggregated analysis.

In marketplace economies the incentive to apply land in a selected manner derives from the earnings motives, and the top-rated cropping sample is that which returns the best earnings to the farmer. A preliminary worthwhile crop starts off evolved to dominant a place while call for for that product upward thrust regularly within side the countrywide in addition to remote places markets. The crop expands within side the place with the aid of using cultivators growing agglomeration economies for its production. Against this theoretical underpinning, to have a look at the cropping sample and overall performance of various districts in developing extraordinary crops, we practice 3 requirements measures, namely (i) place quotient, (ii) crop versatility index, and (iii) district versatility index. A short advent of the strategies of evaluation used within side the look at is in order.

Location Quotient

The region quotient is an easy and maximum widely used degree of local crop specialization. It is described because the ratio of the percentage of acreage beneath neath a selected crop within side the district to the percentage of that crop within side the country general cropped acreage. This metric considers the relative role of a crop in a district with that of on the country level. The end result well-known shows the diploma of local specialization in every crop. It is calculated as:

$$LQ_{ij} = \frac{A_{ij}/A_j}{A_i/A}$$

LQ_{ij} = Location quotient of i^{th} crop in j^{th} district

A_{ij} = Acreage of i^{th} crop in j^{th} district

A_j = Gross cropped acreage in j^{th} district

A_i = Acreage of i^{th} crop in j^{th} state

A = Gross cropped acreage in the state.

A value of position quotient equivalent to unity ($LQ_{ij} = 1$) specifies that the state and district extents of a crop are equal, however a value beneath unity ($LQ_{ij} < 1$) wealth that the district is less specific than the state. A value of proportion in superfluous of unity ($LQ_{ij} > 1$) indicates that the crop considered is more significant or specific in the district in relation of its position at the state level. Larger the price of quotient indicates, better the specialization of the district within side the involved crop. Also, staring at place quotients over the years display if a crop is turning into extra or much less specialized with inside the district. It is

viable to boom the quotient even if the acreage beneath neath the crop within side the district has cut back and vice-versa.

Crop Versatility Index

Crop versatility is one of the vital characters which may be derived from the statistics at the cropping sample winning within side the state. It is useful in understanding crop with appreciate to its spatial insurance in quantitative terms. The versatility index of a crop is inversely proportional to coefficient of version some of the district-sensible acreages of the corresponding crop. A greater versatility crop is one that grows in greater wide variety of districts. The crop versatility index is calculated as follows:

$$CV_i = \frac{\sigma AS_i}{XAS_i} \times 100$$

Where

CV_i = Coefficient of variation of i^{th} crop

σAS_i = Standard deviation of district-wise acreage share of i^{th} crop

XAS_i = Mean of district-wise acreage share of i^{th} crop

A crop is taken into consideration to be extra flexible if the coefficient of variant is much less and conversely, the crop is taken into consideration to be extra region-particular if the coefficient of variant is extra.

District Versatility Index

It reproduces the appropriateness of a given region for growing additional number of crops. The most multipurpose district is solitary in which more number of crops is grown with same percentage apportionment of acreage of gross cropped area. It is intended as:

$$CV_i = \frac{\sigma AS_i}{XAS_i} \times 100$$

Where

CV_i = Coefficient of variation of i^{th} crop

σAS_i = Standard deviation of district-wise acreage share of i^{th} crop

XAS_i = Mean of district-wise acreage share of i^{th} crop

A district with lesser coefficient of variation might be regarded as additional versatile in the sense of agro-climate conditions authorizing a variety of crops being full-grown in the district.

Results and Discussion

Table 1 illustrates the district-smart vicinity quotients (Eq. 1) of maize, wheat, rice, mustard and cotton for the Period-I (1999-2000), Period-II (2001 to 2010) and Period-III (2011-2020). Columns three, 4 and 5 of Table I show that maize crop does its first-rate in Ambala and Yamunanagar districts at some stage in the complete studied length. The district of Bhawani (1.15) stays specialized in maize in the course of Period-I only. The maximum specialization of the crop is discovered within side the district Ambala with the quotient price 20.08 in the course of Period-II implying that the percentage of maize crop in gross cropped place of the district is greater than twenty instances than the percentage of the crop in gross cropped place of the state. The cotton

crop stays specialized in districts of Hisar, Jind and Sirsa at some stage in the length below reference. The maximum specialization of the crop is took place in Hisar district at some point of Period-I (4.04) and Period-III (3.38) at the same time as the Sirsa (3.08) district confirmed maximum specialization at some point of Period- II. Looking to the specialization of wheat, Karnal, Ambala, Kurukshetra, Sonipat, Kathal, Panipat, Faridabad, Jind and Hisar districts continue to be specialized at some point of the entire period. The directorate of wheat studies of the nation is placed at Karnal. The Yamunanagar district enjoys specialization in wheat crop at some point of Period-I and III even as Rohtak district has received specialization at some point of Period-II and III. The specialization of Gurgaon district in wheat is determined at some point of Period-II only. The maximum

specialization is determined in Hisar district at some point of Period-I (2.25) even as at some point of Period-II (1.53), the location has captured via way of means of Faridabad district. During Period-III (1.58), each Hisar and Faridabad districts similarly percentage the fame of maximum specialization in wheat. Rice crop stays specialised for the duration of the complete duration in Kathal, Panipat, Ambala, Kurukshetra, Karnal, Sonipat, Yamunanagar, and Jind districts. The districts of Kurukshetra and Karnal, each having 100 per cent irrigated cropped areas, similarly revel in the fame of maximum specialization all through Period- I (3.07) even as Karnal keeps on the pinnacle all through Period II (2.66) and Period-III (2.83) as well. The maximum rice turbines of the nation are placed in Karnal.

Table 1: Location quotient of maize, whet, rice, mustard and cotton in different districts

District	Maize			Wheat			Rice			Mustard			Cotton		
	P-I	P-II	P-III	P-I	P-II	P-III	P-I	P-II	P-III	P-I	P-II	P-III	P-I	P-II	P-III
Ambala	18.47	20.08	19.14	1.47	1.07	1.26	2.01	1.98	1.99	0.23	0.12	0.17	0.01	0.00	0.01
Yamunanagar	3.00	3.89	3.32	1.25	0.96	1.08	1.82	1.76	1.78	0.09	0.10	0.10	0.00	0.00	0.00
Kurukshetra	0.73	0.12	0.44	1.54	1.14	1.33	3.07	2.62	2.82	0.16	0.02	0.09	0.12	0.00	0.06
Kathal	0.74	0.05	0.42	1.38	1.25	1.30	2.74	2.55	2.64	0.06	0.03	0.05	0.07	0.07	0.07
Karnal	0.72	0.21	0.54	1.02	1.19	1.11	3.07	2.66	2.83	0.03	0.02	0.02	0.01	0.00	0.00
Panipat	0.30	0.04	0.18	1.73	1.23	1.46	2.60	2.39	2.50	0.24	0.05	0.14	0.04	0.00	0.02
Sonipat	0.09	0.72	0.31	1.49	1.30	1.39	1.40	1.49	1.46	1.48	0.18	0.82	0.20	0.06	0.13
Rohtak	0.30	0.13	0.21	0.99	1.11	1.06	0.31	0.49	0.41	0.85	1.44	1.14	0.18	0.35	0.26
Faridabad	0.62	0.37	0.59	1.61	1.53	1.58	0.60	0.80	0.71	1.69	0.24	0.95	0.01	0.01	0.01
Gurgaon	0.00	0.00	0.00	0.79	1.04	0.92	0.12	0.15	0.14	1.83	1.74	1.77	0.00	0.01	0.00
Rewari	0.00	0.00	0.00	0.68	0.67	0.68	0.01	0.02	0.02	4.25	3.73	4.01	0.11	0.21	0.15
Mahendragarh	0.02	0.00	0.01	0.62	0.42	0.52	0.00	0.00	0.00	3.87	3.56	3.75	0.70	0.22	0.47
Bhiwani	1.15	0.01	0.63	0.18	0.49	0.35	0.02	0.10	0.06	0.69	2.26	1.49	0.39	0.87	0.61
Jind	0.18	0.15	0.15	1.52	1.21	1.35	1.18	1.22	1.22	1.19	0.21	0.69	3.16	1.14	2.22
Hisar	0.73	0.01	0.40	2.25	1.00	1.58	0.52	0.59	0.55	2.31	0.76	1.52	4.04	2.60	3.38
Sirsa	0.00	0.00	0.00	0.34	0.98	0.68	0.27	0.40	0.34	0.28	0.99	0.63	1.28	3.08	2.12

The districts of Rewari, Mahendragarh and Gurgaon stay specialised in mustard during the whole length. Besides these, Sonipat and Jind districts throughout Period-I, Bhawani and Rohtak throughout Period-II and Period-III, Hisar throughout Period-III, stay specialised in mustard crop. The fine role withinside the crop is attained handiest via way of means of Rewari and Mahendragarh during the whole length with the very best fee of quotient starting from 4.25 to 3.56. The districts of Rewari, Mahendragarh and

Bhawani constitute excessive arid to semi-arid climate, mild sloping to undulating plains and tremendous rain fed cropland. These situations necessitate for devoting better acreages to low water eating plants like mustard, bajra, barley and gram. The fee of vicinity quotient of mustard for Bhawani district extended from 0.69 during Period-I to 2.26 during Period-II in particular because of creation of sprinkler irrigation system.

Table 2: Location Quotient of sugarcane, barley, jowar, bajra and gram in different districts

District	Maize			Wheat			Rice			Mustard			Cotton		
	P-I	P-II	P-III	P-I	P-II	P-III	P-I	P-II	P-III	P-I	P-II	P-III	P-I	P-II	P-III
Ambala	5.51	2.74	4.11	0.20	0.11	0.16	0.00	0.15	0.06	0.09	0.04	0.06	0.18	0.16	0.18
Yamunanagar	6.35	8.85	7.66	0.11	0.00	0.06	0.00	0.00	0.00	0.05	0.05	0.05	0.04	0.04	0.04
Kurukshetra	1.77	2.50	2.15	0.10	0.00	0.06	0.06	0.00	0.04	0.16	0.00	0.08	0.04	0.03	0.04
Kathal	0.74	0.38	0.57	0.06	0.01	0.04	0.04	0.00	0.03	0.12	0.32	0.21	0.03	0.03	0.03
Karnal	0.92	1.36	1.13	0.06	0.07	0.07	0.11	0.01	0.06	0.03	0.04	0.04	0.02	0.03	0.03
Panipat	2.07	1.63	1.82	0.35	0.08	0.23	1.55	0.02	0.86	0.20	0.03	0.11	0.05	0.03	0.05
Sonipat	2.21	2.02	2.07	1.20	0.27	0.78	4.84	2.90	3.93	0.80	0.28	0.54	0.46	0.02	0.36
Rohtak	1.43	1.62	1.52	1.40	1.31	1.40	5.27	7.24	6.15	0.86	1.04	0.95	0.31	0.40	0.34
Faridabad	1.07	1.23	1.17	3.44	1.35	2.50	5.00	4.38	4.75	1.69	0.49	1.09	0.35	0.00	0.26
Gurgaon	0.10	0.05	0.07	1.81	1.62	1.73	1.99	2.50	2.27	1.76	1.74	1.77	0.37	0.19	0.32
Rewari	0.00	0.00	0.00	1.76	1.29	1.68	0.36	0.48	0.40	4.02	3.09	3.54	1.17	0.15	0.93
Mahendragarh	0.07	0.00	0.03	1.39	0.54	1.03	0.26	0.02	0.15	4.91	3.72	4.31	4.78	2.15	4.11
Bhiwani	0.53	0.11	0.32	1.33	1.70	1.44	0.32	0.39	0.34	1.02	2.68	1.87	1.26	5.12	2.25
Jind	0.65	0.62	0.64	1.50	0.40	1.02	0.23	0.07	0.16	1.40	1.09	1.23	2.23	0.07	1.70
Hisar	1.41	0.23	0.82	3.10	1.60	2.43	1.36	0.00	0.74	1.89	0.78	1.32	2.96	0.94	2.45
Sirsa	0.01	0.07	0.04	0.57	1.85	1.14	0.00	0.00	0.00	0.02	0.08	0.05	0.30	0.88	0.43

The region quotients of sugarcane, barley, jowar, bajra and gram are provided in Table 2. The outcomes monitor that sugarcane now no longer most effective specialised in Yamunanagar, however additionally stays on the pinnacle with quotient values of 6.35, 8.eighty five and 7.sixty six in the course of Period-I, II and III respectively. This might also additionally in part be due to boom in irrigation facilities, availability of massive operational holdings, undeniable land and lifestyles of severa sugar turbines at Yamunanagar. Other districts having specialization in sugarcane vegetation consist of Ambala, Kurukshetra, Panipat, Sonipat Rohtak and Faridabad. Hisar stays specialization in sugarcane in the course of Period-I (1.14). As a ways because the specialization of bajra is concerned, Mahendragarh (4.31) district pinnacle the listing accompanied with the aid of using Rewari (3.54), Bhawani (1.87), Gurgaon (1.77), Hisar (1.32) and Jind (1.23) all through Period-III. The districts of Faridabad (1.69) stays specialised in bajra all through Period-I. During Period- II, its cropping sample has shifted closer to sugarcane and rice. The districts of Bhawani (5.12) and Mahendragarh (2.15) are the middle of the gram cultivation area of the kingdom at some point of Period-II. Hisar (2.96), Jind (2.23) and Rewari (1.17) stay specialised in gram at some point of Period-I. But at some point of Period-II, the cropping sample of Hisar and Jind districts has shifted toward rice and that of Rewari toward cotton. Gram crop is absolutely marginalised withinside the irrigated regions of the kingdom. The district playing better irrigation centers has a tendency to provide low area quotient for gram. For example, for each Kurukshetra and Panipat districts, having excessive irrigation intensity, the cost of area quotient is stated at 0.03 at some point of Period-II. The Rohtak (6.15) district stays on the pinnacle for the duration of the complete duration in jowar specialization observed through Faridabad (4.75), Sonipat (3.93) and Gurgaon (2.27) districts. The quotient fee of different districts is much less than solidarity for jowar crop implying location unique traits of the crop to develop in unique area.

Conclusion

The cropping sample and overall performance of various districts in developing one-of-a-kind plants in Haryana are assessed the use of 3 requirements measures, namely (i) vicinity quotient, (ii) crop versatility index, and (iii) district versatility index over the length 1999-2000 to 2019-2020. The specialization of maize in Ambala and Yamunanagar, cotton in Hisar, sugarcane in Yamunanagar and Ambala, mustard in Rewari and Mahendragarh, gram in Mahendragarh, bajra in Rewari are the best in the course of the examine length with the price of vicinity quotients to be greater than two. The specialization of wheat in Panipat, Hisar and Faridabad, rice in Kurukshetra, Kathal and Karnal, jowar in Rohtak and Faridabad is maximum in the course of the length of examine. The maximum specialization of bajra is discovered in Mahendragarh, Rewari and Gurgaon.

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