

A Study On The Changing Agricultural Environment In Western Haryana

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Abstract:

The agriculture system encompasses the interactions of physical, technical, biological and socio-economic factors, some of which are under human control, to produce food and the agro-ecological entity. The agro-ecosystem, therefore, is considered to be in equilibrium with environmental and management factors, which produce sustained yields. The existing agricultural production system focuses only on intensifying crop yields while ignoring the wider implication of changes in agricultural practices on the quality of natural resources. Environmental issues, including land degradation, damage to underground water quality and loss of biodiversity, have not been given sufficient prominence. The continuous progress will depend upon a more holistic approach that would focus on the health of the natural resources base. Information and database of the area's natural resources are essential for sustainable land use plans and management of natural resources.

Keywords: Agricultural, Development, Infrastructure, Facilities.

1) Introduction:

In developing countries like India, with a huge population to feed, Changing the Agricultural scenario of agriculture is even more important. As the two-thirds population of India is dependent on agriculture for livelihood, agricultural development plays a very significant role in the country's overall economic development. Further, because of the very personal input, output and demand link ages with the non-agricultural sectors, agricultural development is an essential component of the nation's overall development strategy.

Agriculture is Haryana's core industry, and the majority of the population is either directly or indirectly reliant on agriculture and related industries. Agriculture has been the state's primary focus for decades. Infrastructure facilities such as metalled roads, rural electricity, canal network expansion, and market yard development have been established to offer the necessary push for

the state's agricultural growth. In combination with agricultural research assistance and a solid extension network for disseminating knowledge about better farm practices to farmers, these facilities resulted in measurable outcomes. The State has been transformed into a state of food excess. Haryana is one of the main providers of food grains to India's central pool, accounting for around 15% of total grains. Rice, wheat, sugarcane, cotton, oilseeds, pearl millet, gramme, and barley are the state's primary crops. Haryana is a mostly agricultural state, with over 80% of the state's total land area under cultivation. The state's agroecology and cropping patterns are different. The state is mostly composed of three agroecoregions. Haryana is a significant contributor to the country's food basket. The state is the world's largest producer of basmati rice, pearl millet, rapeseed, and mustard. Haryana exports more than 60% of India's Basmati Rice. Rice, wheat, legumes, cotton, sugarcane, pearl millet, rapeseed, and mustard are the state's major crops. Cauliflower, onion, potato, tomato, chillies, and guava are the state's primary horticulture crops with high potential. The state is well-known for its Murrah buffaloes, sold to other states and internationally.

Haryana is currently a significant contributor to the country's grain and milk output. Agriculture is the primary employment of the state's population. Irrigation of the flat agricultural land is accomplished by using ground water retrieved through submersible pumps and tube wells and surface water via an extensive canal system. Haryana's contribution to the Green Revolution enabled India to achieve food self-sufficiency in the 1960s and beyond.

Storage of agricultural products is another critical part of agricultural marketing that is just as critical as transportation and real market handling of the item. The allocation of storage capacity across state-owned godowns is inconsistent. However, a marginal growth of 0.06 per cent each year has been seen, although agricultural output grew by around 2.45 per cent in the case of food grains and almost 5.5 per cent in the case of edible oil seeds. We must overlook the fact that Haryana is a significant provider of food grains to the central pool, which means that a significant portion of the crop is sold. As a result, the growth of storage, transportation, and market yards, among other things, must be coordinated with production and arrivals. While the private sector is anticipated to expand its role, one must remember that it must operate profitably; if a liquor baron gives more money, the private sector will choose to store food grains, which may be less lucrative. Foodgrains were often left out in the open in Haryana, completely exposed to the elements.

2) Sampling

Random sampling performed for questionnaire survey in which, Sample size 300 respondents. The responses will be collected on a structured questionnaire constructed on five-point Likert scale.

3) Analysis of Data

The primary data collected from the sample area will be analyzed by using the following statistical tools to obtain a torrent of results concerning the objectives of the study:

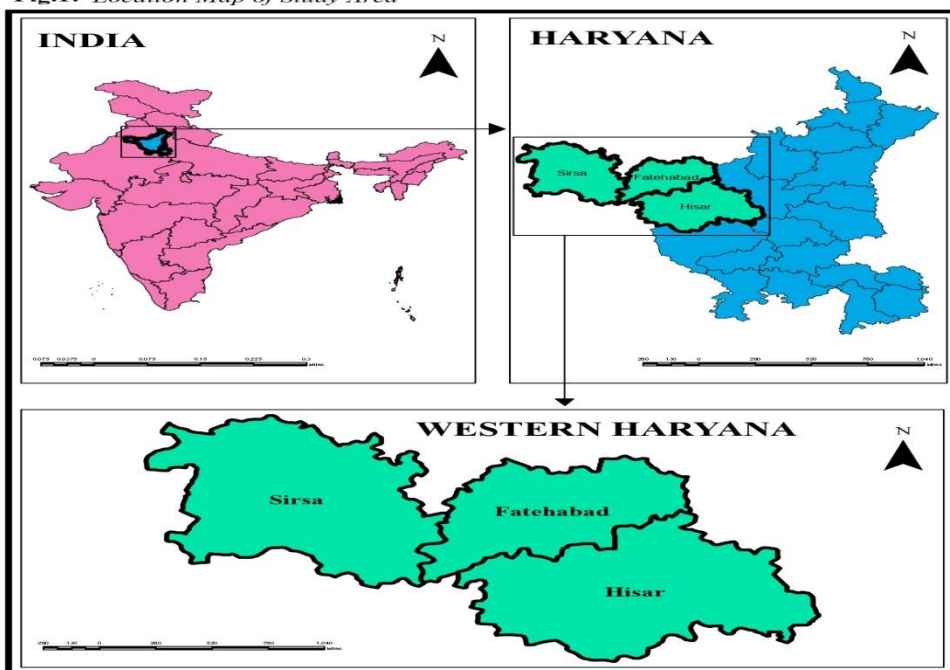
- The application of one-way Analysis of Variance (ANOVA)

4) Study Area

Hisar, Fatehabad and Sirsa Districts in Western Haryana region is selected for the study in which selected for questionnaire survey is done.

Hisar, Fatehabad, and Sirsa are important Districts in Western Haryana in many ways: economy, Culture, History, and demography. Agriculture methods are influenced by geographical and climatic factors such as soil composition, type, temperature, rainfall, and humidity. These variables vary by location. It is vital to investigate the area's topographical and agro-economic characteristics. The study area map is shown in figure 1 below:

Fig.1: Location Map of Study Area



5) Data Analysis

This presents the findings that were attained due to carrying out the methodical process outlined in the study methodology section. In the questionnaire survey, there were 26.6% of respondents in the 18-30 years age group, 24.0% respondents were in the 31-40 years age group, 22.0% respondents were in the 41-50 years age group and 27.4% respondents were in 50-61 years age group.

5.1) Statistics of agricultural practices on land of the concerned area

In this section, statistics of agricultural practices on land of the concerned area has been reported.

Table 1: Statistics of agricultural practices on land of the concerned area

Sr. No.	Statement	Response
1	Agriculture contributes to a number larger of environmental issues that cause environmental degradation including: climate change, deforestation, biodiversity loss etc	SD-30(10.0), D-50(16.7), N-55(18.3) A-135(45.0), SA-30(10.0)
2	When agricultural operations are sustainably managed, they can preserve and restore critical habitats, help protect watersheds, and improve soil health and water quality	SD-27(9.0), D-83(27.7), N-61(20.3), A-105(35.0), SA-24(8.0)
3	Agriculture's deep connections to the world economy, human societies and biodiversity make it one of the most important frontiers for conservation around the globe	SD-3(1.0), D-25(8.3), N-73(24.3), A-159(53.0), SA-40(13.3)

The above table shows the opinion of numerous respondents regarding agriculture contributes to a number larger of environmental issues that cause environmental degradation including: climate change, deforestation, biodiversity loss etc and there are respondents who strongly disagree 30(10.0%) and, disagree 50 (16.7%), no opinion 55 (18.3%) and there are respondents who agree 135(45%), strongly agree 30(10.0%). The opinion of numerous respondents regarding agricultural operations are sustainably managed, they can preserve and restore critical habitats, help protect watersheds, and improve soil health and water quality and there are respondents who strongly disagree 27(9.0%), and disagree 83 (27.7%), no opinion 61(20.3%) and there are respondents who agree 105(35.0%), strongly agree 24 (8.0%). The opinion of numerous respondents regarding agriculture's deep connections to the world economy, human societies and biodiversity make it one of the most important frontiers for conservation around the globe and there are respondents who strongly disagree 3(1.0%) and, disagree 25 (8.3%), no opinion 73(24.3%) and there are respondents who agree 159(53.0%), strongly agree 40(13.3%).

5.2) Statistics of problems faced by the farmers in the concerned districts

In this section, statistics of problems faced by the farmers in the concerned districts have been reported.

Table 2: Statistics of problems faced by the farmers in the concerned districts

Sr. No.	Statement	Response
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1	Agricultural effects on air pollution include pesticides, odors, smoke, dust, allergenic pollens, and trash	SD-16(5.3), D-32(10.7), N-77(25.7), A-142(47.3), SA-33(11.0)
2	Cope with climate change, soil erosion and biodiversity loss	SD-31(10.3), D-66(22.0), N-53(17.7), A-122(40.7), SA-28(9.3)
3	Satisfy consumers' changing tastes and expectations	SD-18(6.0), D-70(23.3), N-53(17.7), A-131(43.7), SA-28(9.3)
4	Meet rising demand for more food of higher quality	SD-26(8.7), D-38(12.7), N-68(23.0), A-136(45.3), SA-31(10.3)
5	Unfortunately, good quality seeds are out of reach of the majority of farmers.	SD-58(19.3), D-73(24.3), N-53(17.7), A-84(28.0), SA-32(10.7)
6	Irrigation is the most important agricultural input in a tropical monsoon country like India where rainfall is uncertain, unreliable and erratic	SD-34(11.3), D-48(16.0), N-40(13.3), A-138(46.0), SA-40(13.3)
7	Large tracts of fertile land suffer from soil erosion by wind and water	SD-39(13.0), D-46(15.3), N-53(17.7), A-136(45.3), SA-26(8.7)

8	In the absence of sound marketing facilities, the farmers have to depend upon local traders and middlemen for the disposal	SD-21(7.0), D-32(10.7), N-60(20.0), A-149(49.7), SA-38(12.7)
9	The role of capital input is becoming more and more important with the advancement of farm technology	SD-23(7.7), D-69(23.0), N-84(28.0), A-102(34.0), SA-22(7.3)
10	Lack of access to formal credit and also insurance	SD-39(13.0), D-30(10.0), N-56(18.7), A-148(49.3), SA-27(9.0)
11	Lack of infrastructure in the agriculture sector	SD-35(11.7), D-63(21.0), N-54(18.0), A-118(39.3), SA-30(10.0)
12	Lack of low selling price of agriculture product	SD-34(11.3), D-46(15.3), N-56(18.7), A-134(44.7), SA-30(10.0)
13	Low and high rainfall affect agriculture	SD-21(7.0), D-28(9.3), N-80(26.7), A-155(51.7), SA-16(5.3)

The above table shows the opinion of numerous respondents regarding agricultural effects on air pollution include pesticides, odors, smoke, dust, allergenic pollens, and trash and there are respondents who strongly disagree 16(5.3%), and, disagree 32(10.7%), no opinion 77(25.7%) and there are respondents who agree 142 (47.3%), strongly agree 33(11.0%). The opinion of numerous respondents regarding cope with climate change, soil erosion and biodiversity loss and there are respondents who strongly disagree 31(10.3%), and, disagree 66(22.0%), no opinion 53(17.7%) and there are respondents who agree 122(40.7%), strongly agree 28(9.3%). The opinion of numerous respondents regarding the meet rising demand for more food of higher quality and there

are respondents who strongly disagree 26(8.7%) and, disagree 38(12.7%), no opinion 69(23.0%) and there are respondents who agree 139(45.3%), strongly agree 31 (10.3%). The opinion of numerous respondents regarding the good quality seeds are out of reach of the majority of farmers and there are respondents who strongly disagree 58(19.3%) and, disagree 73 (24.3%), no opinion 53 (17.7%) and there are respondents who agree 84(28.0%), strongly agree 32 (10.7%). The opinion of numerous respondents regarding irrigation is the most important agricultural input in a tropical monsoon country like India where rainfall is uncertain, unreliable and erratic and there are respondents who strongly disagree 34(11.3%) and, disagree 48(16.0%), no opinion 40(13.3%) and there are respondents who agree 138(46.0%), strongly agree 40(13.3%). The opinion of numerous respondents regarding large tracts of fertile land suffer from soil erosion by wind and water and there are respondents who strongly disagree 39(13.0%) and, disagree 46 (15.3%), no opinion 53 (17.7%) and there are respondents who agree 136(45.3%), strongly agree 26 (8.7%). The opinion of numerous respondents regarding the absence of sound marketing facilities, the farmers have to depend upon local traders and middlemen for the disposal and there are respondents who strongly disagree 21(7.0%) and, disagree 32 (10.7%), no opinion 60 (20.0) and there are respondents who agree 149(49.7%), strongly agree 38(12.7%). The opinion of numerous respondents regarding the role of capital input is becoming more and more important with the advancement of farm technology and there are respondents who strongly disagree 23(7.7%) and, disagree 69 (23.0%), no opinion 84 (28.0%) and there are respondents who agree 102(34.0%), strongly agree 22 (7.3%). The opinion of numerous respondents regarding lack of access to formal credit and also insurance and there are respondents who strongly disagree 39(13.0%) and, disagree 30 (10.0%), no opinion 56 (18.7%) and there are respondents who agree 148(49.3%), strongly agree 27(9.0%). The opinion of numerous respondents regarding lack of infrastructure in the agriculture sector and there are respondents who strongly disagree 35(11.7%) and, disagree 63(21.0%), no opinion 54 (18.0%) and there are respondents who agree 118(39.3%), strongly agree 30(10.0%). The opinion of numerous respondents regarding lack of low selling price of agriculture product and there are respondents who strongly disagree 34(11.3%) and, disagree 46(15.3%), no opinion 56(18.7%) and there are respondents who agree 134(44.7%), strongly agree 30 (10.0%). The opinion of numerous respondents regarding Low and high rainfall affect agriculture and there are respondents who strongly disagree 21(7.0%) and, disagree 28 (9.3%), no opinion 80 (26.7%) and there are respondents who agree 155(51.7%), strongly agree 16(5.3%).

5.3) Statistics of Causes and Factors that promoting changes in Agriculture

In this section, statistics of causes and factors that promoting changes in agriculture have been reported.

Table 3: Statistics of causes and factors that promoting changes in agriculture

Sr. No.	Statement	Response
1	Low income from farming	SD-35(11.7),

		D-40(13.3), N-73(24.3), A-112(37.3), SA-40(13.3),
2	Starting new occupation and services	SD-38(12.7), D-39(13.0) N-66(22.0) A-127(42.3), SA-30(10.0)
3	Money needed for Social need	SD-41(13.7), D-55(18.3), N-52(17.3), A-127(42.3), SA-25(8.3)
4	High land rent making it costly	SD-20(6.7), D-85(28.3), N-61(20.3), A-99(33.0), SA-35(11.7)

The above table shows the opinion of numerous respondents regarding low income from farming and there are respondents who strongly disagree 35(11.7%) and, disagree 40(13.3%), no opinion 73 (24.3%) and there are respondents who agree 112(37.3%), strongly agree 40 (13.3%). The opinion of numerous respondents regarding new occupation and services and there are respondents who strongly disagree 38(12.7%) and, disagree 39(13.0%), no opinion 66(22.0) and there are respondents who agree 127 (42.3%), strongly agree 30 (10.0%). The opinion of numerous respondents regarding money needed for Social need and there are respondents who strongly disagree 41(13.7%) and, disagree 55 (18.3%), no opinion 52 (17.3%) and there are respondents who agree 127(42.3%), strongly agree 25(8.3%). The opinion of numerous respondents regarding high land rent making it costly and there are respondents who strongly disagree 20(6.7%) and, disagree 85 (28.3%), no opinion 61 (20.3%) and there are respondents who agree 99(33.0%), strongly agree 35 (11.7%).

5.4) Hypothesis Testing

H1. Enormous Changes have been introduced in Agricultural Scenario of the Region in almost every aspect of the Agricultural Practice like land (i.e. Pattern, Intensity, Seeds, Usage, Mechanisation, and so on).

In order to test the above hypothesis, ANOVA has been applied.

Table 4: ANOVA of Enormous Changes have been introduced in Agricultural Scenario

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Enormous Changes	Between Groups	81.094	4	20.274	25.878	0.000
	Within Groups	113.599	145	0.783		
	Total	194.693	149			

Table 4 depicts the results of ANOVA in terms of Enormous Changes have been introduced in Agricultural Scenario. It can be concluded that significant difference exists between the Enormous Changes have been introduced in Agricultural Scenario owing to $p < 0.05$. Therefore, the null hypothesis is rejected.

H2. Economic prosperity has arrived in recent years in Western Haryana.

In order to test the above hypothesis, ANOVA has been applied.

Table 5: ANOVA of Economic prosperity has arrived in recent years in Western Haryana

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Economic prosperities	Between Groups	86.542	4	21.635	29.007	0.000
	Within Groups	108.152	145	0.746		
	Total	194.693	149			

Table 5 depicts the results of ANOVA in terms of Economic prosperity has arrived in recent years in Western Haryana. It can be concluded that significant difference exists between the Economic prosperity has arrived in recent years in Western Haryana owing to $p < 0.05$. Therefore, the null hypothesis is rejected.

H3. Such Economic prosperities have led to some serious environmental problems including land degradation and declining ground water level.

In order to test the above hypothesis, ANOVA has been applied.

Table 6: ANOVA of Such Economic prosperities have led to some serious environmental problems including land degradation and declining ground water level

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.

Economic prosperities	Between Groups	33.266	4	8.317	7.47	0.000
	Within Groups	161.427	145	1.113		
	Total	194.693	149			

Table 6 depicts the results of ANOVA in terms of Economic prosperities have led to some serious environmental problems including land degradation and declining ground water level. It can be concluded that significant difference exists between the Economic prosperities have led to some serious environmental problems including land degradation and declining ground water level owing to $p < 0.05$. Therefore, the null hypothesis is rejected.

6) Conclusion:

Agriculture has continued to dominate Haryana's economy despite several changes during the previous three decades. The most significant transformation occurred during the Green Revolution of the mid-1960s, when production increased significantly, and the advantages unavoidably 'trickled down' to all segments of rural life. Almost immediately, however, strong criticism of this method arose, pointing out that although the biochemicals were scale-neutral, they were manifest 'not resource neutral. Additionally, evidence indicated that biochemical inputs were intimately tied to mechanisation, which was preferred for bigger landholdings due to economies of scale. Agricultural development plays an important role in stabilizing and initializing the overall process of economic growth. The increase in Agricultural production and stability will automatically lead to the country's overall prosperity. The Green Revolution is a top-down strategy for agricultural production improvement. It refers to significant increases in food production in developing countries such as India due to improved wheat, rice, maize, and other cereal strains developed in the 1960s by Nobel laureate Dr Norman Borlaug and others with funding from the Rockefeller Foundation and other organisations. Chemical fertilisers, insecticides, and irrigation were all used in agronomic methods. India radically altered its food position, transforming it from a chronic food deficit to a surplus state capable of exporting food. India's success story with the green revolution became an example to imitate. Punjab, Haryana, and Western Uttar Pradesh, where wheat and rice are mostly farmed under irrigated circumstances and with equipment, were instrumental in this transformation. However, the productivity benefits were not sustained over time. In this perspective, it is critical to remember that the green revolution approach included seeking input levels that would result in high yields while neglecting permanent losses in soil erosion and insect resistance loss.

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