

CHAPTER-7

**MAJOR FINDINGS
AND
RECOMMENDATIONS**

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7.1) Introduction

Disparities in economic development prevail in terms of per capita income, poverty, literacy, gross enrolment ratios, life expectancy, indicators of mortality (maternal mortality, life expectancy at birth) and access to safe drinking water etc. Not only are there interstate disparities but even within the states variations in development. Economic growth rates also reflect economic disparity within the country because economic growth rates vary considerably among states. In India, production and productivity has been increasing since green revolution with increasing use of high yielding seeds, synthetic fertilizers, and extent of irrigation, mechanical power and electricity in farm operations. A comparison of the growth performance of agriculture at state level showed that some regions have performed better than other regions in different time periods. The regional disparities in agricultural development arises out of varied agro-climatic conditions, resource endowment, etc., tended to get further accentuated because of varying levels of investment in agriculture and rural infrastructure.

Several studies such as Mehra (1981), Hazell (1982) etc. have pointed out that the new strategy of agricultural production based on HYV seed fertilizer technology has contributed to the growth in production and productivity in India. Many studies such as those by Evans and Karras (1996), Sala-i-Martin (1996), and Evans (1997) found beta convergence in per capita log income among the states of the U.S.A, Mukherjee and Kuroda (2003) explored the question of convergence in total factor productivity across fourteen major agricultural states of India covering the period 1973-1993, and found no evidence of sigma convergence. Previous studies were based on global and Indian level studies. This study is based on special Haryana district-wise and zone wise.

7.2) Major Findings

The major findings of study are discussed as follow

Disparities of Agriculture Determinants in Haryana

- CAGR area under HYV of wheat positive in three zones except southern, whereas CAGR under maize positive highest in central with 2.82 followed by northern, southern and western zones respectively.
- CAGR of total fertilizer highest in southern zone, whereas lowest in western zone with 0.82. Consumption of pesticides is increased in northern zone, whereas decrease in central and southern zones. Rainfall was increased in northern, central and southern zones, whereas it has decreased in western zone.
- Agricultural credit societies in the Haryana for the years 2001-02 to 2014-15. Number of membership, share capital, own capital, working capital, loan advanced and loan recovered was increased during the period, whereas number of agriculture societies and overdue was decreased.

Area under cultivation of major food grains crops

- The percent share of northern zone is area under cultivation of crop rice was 39.9 during the study. The central zone percent share of rice was decreased whereas share of rice in western and southern zone has been increased. The percentage share of rice was higher in northern zone is compared to central, western and southern zone because highest irrigation facilities in this zones compared to others zone.
- The highest percentage share of area under cultivation of wheat was in western zone is compared to central, northern and southern zones. Area under cultivation of wheat was increased in northern, central and western zones, whereas in southern zone it was decreased.

- Growth rate in cultivation of crop gram was negatively in northern and western zone whereas it was positively in central and southern zone. Except northern and western zone growth in total pulses was recorded positively during the period of time.
- CAGR in area under cultivation of food grain was recorded positive in northern and southern zones in Haryana.
- District-wise CAGR in area under rice cultivation was negative in Kaithal, Panipat, Faridabad and Gurgaon with -2.8, -0.19, -3.55 and -3.08 respectively. It was highest in Bhiwani with 5.17 and lowest in Ambala with 0.75 during the period. There are not much difference between Yamunanagar and Sonipat.
- CAGR in area under wheat cultivation negative in Faridabad, Gurgaon, Rewari and Mahendergarh. It was found highest in Rohtak and Yamunanagar.

Area under cultivation of cash crops

- Western zone were having highest area in crop of total cotton over a period of time. Northern zone were having lowest area under cultivation, it was 0.24 % over the study because this areas not more profitable of this crop.
- CAGR area under cultivation of sugarcane is negative in all districts except kaithal, Jhajjar, Gurgaon, Mahendergarh, Jind and Fatehabad. CAGR area under cultivation Oilseed is higher in Kurukshatra with 18.42 and lowest in Karnal with 0.08. It was negative in Ambala, Panchkula, Kaithal, Sonipat, Faridabad, Gurgaon, Jind and Fatehabad.

Production under cultivation of food grains crops

Production under cultivation of food grains crops found more or less disparities in Haryana.

- In case of crop bajra western zone have more production; it was followed by southern, central, and northern zone respectively. Production of bajra was lowest in northern zone

due to highest irrigation in this area whereas bajra required lowest irrigation facility. But the trend share of production of bajra was increased during the period except central zone.

- This study found growth rate of rice production positively in central and southern zone of Haryana state. It was higher in western zone.
- CAGR of wheat production was negative in southern zone.
- CAGR of bajra was highest in southern zone. It was positively in northern and southern zone of Haryana state. Except western zone, there were not much disparities in growth rate in other three zones.
- Growth rate of total production in total cereal was higher in southern zone, whereas lowest in northern zone.
- Growth of production under rice cultivation in Rewari with 8.16 percent whereas lowest in Panipat with 0.19 percent. It was negative in case of Faridabad and Gurgaon. Growth of production under wheat cultivation negative in Faridabad Gurgaon and Rewari with -9.18, -5.59 and -0.19. It was higher in Yamunanagr whereas lowest in Panipat. Growth of Production under bajra was higher in Kaithal with 7.63 and lowest in Sirsa.
- Coefficient of variation shows highest disparities in production of crop rice, total cereal and gram in southern zone whereas disparities were observed in case of bajra and maize in northern zone. In production crops, wheat, total pulses and total food grains highest variations in central zone during the study period.

Production under cultivation of cash crops

- Northern zone have highest production in case of sugarcane whereas it was lowest in southern zone during the period. The trend of share in production of western and southern zone is decreasing and increasing in northern and central zone.

- This study found growth rate of sugarcane production was recorded positively in northern and central zones with 0.06 % and 1.19 % respectively, whereas negative growth rate was recorded in western and southern zone with -6.97% and -1.63 % over the study period.
- CAGR of production total cotton was not recorded in northern zone over a period. It was highest in central zone with 2.20%. There was recorded positive CAGR in crop Rapeseed and mustard production in northern and southern zones with 6.02 % and 1.21 % respectively. There was noted positive growth in crop total oilseeds production in northern, central and western zones with 1.64 %, 2.10 % and 0.46 % respectively.
- CAGR production under total oilseed negative in Kaithal, Sonipat, Faridabad and Gurgaon. CAGR production under Rapeseed and Mustard was negative in Faridabad and Gurgaon. There are not much disparities in Ambala, Panchkula, Kurukshetra, Kaithal, Karnal and Bhiwani.

Productivity under cultivation of food grain crops

- Northern zone was recorded higher average yield of crop rice. It was 4057.21 kg/ha over the study period.
- Trend share of average productivity of crop rice was decreasing. Trend share of average productivity of crop wheat was increased in all zones during 2001 to 2012, after that it was decreased in all zones.
- Productivity under total cereal cultivation negative in Panipat, Sonipat, Rohtak, Jhajjar and Faridabad with -2.86, -2.90 and -1.75. It was highest in Bhiwani with 4.17 and lowest in Jind with 1.13. Productivity under total pulses cultivation positive in Rohtak, Jhajjar, Mahendergarh, Hisar and Sirsa with 2.81, 0.01, 0.35, 14.25 and 2.75 respectively. CAGR under productivity of total food grain positive in Rewari and Jind with 0.01 and 0.68.

- The compound growth rate of area, production, and yield of sugarcane during 2000-01 to 2011-12 has declined compared to the 1980s. The decline in growth rate of yield during this period is because of relatively higher decline in growth rate of production compared to decline in growth rate of area. So there are required to increase productivity of this crop to avoid fluctuations in production. Both public and private sector investment in research and development (R&D) needs to be encouraged.
- It was found σ - divergence in area and production of food grain crops and productivity of cash crops. σ -convergence in area and production of cash crops and productivity of food grain crops in Haryana (zone-wise).
- It was found that in case of production food grain and cash crop beta divergence. It means the disparities in production of cash crops.
- In case of district-wise sigma convergence in area of food-grains and cash crops and production of cash crops. σ -divergence in production and productivity of food grain crops. Sigma divergence in productivity under cash crops.

Impact of agricultural inputs on total production

- Agriculture production is dependent variable and Fertilizer, Rainfall, Irrigations, Pesticides and Tractors are independent variables. Total production is highly dependent on rainfall in northern zone during the period.
- Total production is highly dependent on fertilizer in central zone during the period.
- In Central zone production is depends 78 percent on agricultural inputs. P-Value of irrigations, fertilizer, pesticides, rainfall, and tractors are (0.10, 0.48, 0.23, 0.39 and 0.25).
- In western zone total production was dependent 93 percent on inputs.
- In southern zone 80 percent agricultural production depend on agricultural inputs.

7.3) Recommendations

Many studies have been conducted to measure the pattern of regional development among states. Intra state also disparities attract attention of researchers. In India various states are growing at different level and gap between the developments of various states is well observable in India. In the present study an attempt was made to study the district-wise regional disparities in agricultural growth in Haryana. On the base of forgone analysis the following recommendations are made.

- Irrigation with high yielding variety seeds and fertilizer forms a significant input to increased agricultural production. Out of the agricultural inputs, irrigation availability is the major input in the agricultural sector. The northern Haryana which was most irrigation benefited region along with other inputs rather than other regions. The maximum irrigation was provided to sugarcane crop than other crops. Southern zone have low irrigation facilities. Therefore, the deliberate efforts should be made to provide the water to subordinate crops like cotton, rabbi jowar etc. in the agricultural sector.
- Haryana is having largest area under rice crop. However, productivity is lowest. The reason for low productivity is that rice is being grown in the country under various agro-ecologies ecologies in both irrigated and rain fed systems. National Food Security Mission (NFSM), which is being implemented in 25 states of the country, should focus to improve productivity in Haryana state.
- There is need to ensure farmers access to sufficient quantities of improved seeds, chemical fertilizers and other complementary inputs to improve their rice productivity.
- CAGR production under total oilseed negative in Kaithal, Sonipat, Faridabad and Gurgaon. CAGR production under Rapeseed and Mustard was negative in Faridabad and Gurgaon. Government should focus of the strategy is to increase production of traditional oilseeds and bring more area under oil-palm cultivation through mission mode farm projects.

- Growth rate of total pulses was negative except southern zone during the period.
- The chemical fertiliser technology is also limited to the crops that have other available inputs like irrigation. Moreover, the much disparity was observed in the chemical fertiliser in the regions of Haryana. CAGR was lowest in western zone compared to others three zone. So, Government should take care of supply of fertilizers to farmers at ruling prices.
- Agriculture credit is an important factor for agriculture production. Number of societies is decreased during the period. CAGR is lowest in Karnal, Panipat, Kurukeshatra and Rewari compared to other districts. There is need to improving credit supply in state for farmers.
- HYV was used only few crops like rice, wheat, Jowar and bajra. Effort is required to encourage the farmers to use improved and new varieties of seeds of cereals, pulses, groundnut and cotton. Government should also the supply of certified seed at reasonable prices. Small and marginal farmer who are large number, may be provided with HYV seed at subsidised rate. This would help in improving the growth performance of cereal, pulses and oilseeds.
- Agricultural productivity can also be increased by changing the pattern of production towards more intensive system of cultivation or by progressively changing cropping pattern from low value crops to high value crops.
- σ -divergence in area and production of food grain crops. Government should provide facilities for improved production of food grain crops.
- District wise σ -divergence in productivity under cash crops. Newer varieties, resource conservation technologies like zero till seed drill need to be promoted in state for enhancing production and productivity.
- Availability of tractors highest in western zone. CAGR are negative in all three zones, except southern zone. Hence, Bank should be increasing finance made availability to farmers of these districts for purchase of machineries'.

- There are needed to be taken to enhance agricultural growth in India. Therefore, to provide agricultural sector a growth momentum, more and more public investment is necessary for intensive agricultural development in the lagged region especially in the areas like dry.

7.4) Limitations of the study

There are many restrictions in this study. All variables which are used in this study based are on the secondary information compiled from Ministry of Agriculture Government of India.

There are following limitations of the study:

- The variables taken in the study are selected on the basis of availability of data. However, the selected variables represent the phenomenon appropriately as a number of other studies have adopted almost similar variables for the purpose.
- The number of districts in Haryana has been increasing continuously. At present there are 22 districts. The increase in number has created the problem of comparability of values in the districts over the period of time. However the change in the number of districts does not affect the ranking of the districts at particular point of time.
- This study included selected major food-grains and cash crops. Food grains crops are rice wheat, jowar, bajra, maize, gram, total cereals, total pulses and total food grains production and Cash crops are sugarcane, total cotton, rapeseed & mustards and total oilseeds.

7.5) Future research directions

- The present study is based on the availability of data on different agriculture variables. There are certain variables those have not been include in to the present study due to the non availability data. Hence one can extend this study by adding the information on the left out variables.
- This study, further, can be extended to compare with other state their policy phenomena regarding the development.