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# Agricultural Productivity, Cropping Patterns and Cropping Intensity in Haryana: A Comprehensive Review

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**ABSTRACT**
Agriculture is the main occupation of the rural population in Haryana. Steady growth in production and productivity of agriculture is very important for the overall sustainability of the economy of Haryana state. Thus, it becomes necessary to understand the important role and status of agriculture in Haryana. The cropping pattern, influenced by multifaceted factors, not only shapes production landscapes but also reflects local dietary preferences. Over the decades, Haryana has witnessed significant shifts in its cropping pattern, notably driven by the Green Revolution era starting in the 1960s. The Green Revolution significantly influenced the production of staple food crops in Haryana. The present research article attempts to present an analytical account of major crops in Haryana. This study aims to reveal the complexities of agricultural productivity in Haryana by examining crop production, area coverage, cropping patterns, and production trends. The green revolution has highly affected the cropping pattern of Haryana because it improved the production of wheat and rice and their prices. Drawing upon secondary data sources, this paper primarily focuses on production trends, cropping patterns, productivity, and cropping intensity. The secondary data is collected from statistical abstracts of Haryana from three decades i.e. 2000-01,2010-11 and 2020-21. The study concluded that the cropping pattern of Haryana preferred cereals mainly rice and wheat while pulses have shown a declining trend and oilseeds have an increasing trend.
Keywords: Agriculture, Cropping Pattern, Production and Productivity, Net Sown Area, cropping intensity

## INTRODUCTION

Haryana, the 17th state of India, is situated in the north-western region of the country, spanning from 27°39' to 30°35' N latitude and 74°28' to 77°36' E longitude. It covers a geographical area of 4.42 million hectares, the state is organized into six administrative divisions, which include 22 districts, 126 blocks, 154 cities and towns, and 6848 villages (Kharb, 2020). Haryana is extremely hot in Summer and mild in winter. May and June are the hottest months and December and January are the coldest (Economic Survey, 2020-21). Haryana state was formed on 1st November 1966 from the eastern state of former Punjab on a linguistic basis(Rani,2019). The area of the state is 44,212 sq. km. In terms of area, Haryana ranks 21st, with less than 1.4% of the total land area of India (Census of India). In Haryana, the net sown area is 82.5% of the total land area. The gross cropped area is 66.12 lakh ha (Statistical Abstract of Haryana). Cropping patterns are a crucial aspect of a cropping system, which includes all the components essential for crop growth and the harmonious interaction between crops and their environment. These patterns are defined by their spatial arrangement within a field. There are two primary categories: mono-cropping (one crop grown in a field per year) and multiple-cropping (more than one crop grown in the same field per year)( Mahlayeye et.al.,). Haryana is a leading contributor to the production (food grain and milk) of India (Preparation of Sub Regional Plan for Haryana Sub-Region of NCR-2021:Interim Report -II). Almost 65-70 percent of the population of the state of Haryana engaged in agricultural activities(Economic Survey 2020-21).

The Green Revolution played a great role in agricultural development in Haryana and made it self-sufficient in food production. Haryana stands on the third rank in per capita income among all the states of our country. It has held

sustainable growth in the field of agriculture and manufacturing since the 1970s and it is an economically developed region in South Asia (Misra and Puri, 2011). In the 1960s and 1970s, almost all crops were sown in Haryana, but due to the Green Revolution, farmers now prefer to cultivate only two crops: wheat and rice Therefore, the state has had to face several changes in its crop pattern (Rawat & Bala, 2021).

The contribution of area under Wheat and Rice crops to the total Gross area sown is 41.61 percent in the State of Haryana during 2020-21(p) (statistical abstract of Haryana 2020-21). During 2020-21, wheat crop is grown in 23.54 lakh ha area. During 2020-21, rice crop is grown in a 15.285 lakh ha area. The area under Sugarcane, Cotton, and Oilseeds (commercial crops)–has fluctuating trends during 2020-21(Statistical Abstract of Haryana 2020-21).

**REVIEW OF LITERATURE**

The study discussed cropping patterns, production trends, and agricultural productivity in Uttar Pradesh. It analyzed the production trends and cropping patterns in Uttar Pradesh and showed the comparison of agricultural growth rates in different plan periods as well as examined the land use patterns and cropping coverage in Uttar Pradesh. It concluded that wheat production increased by 11 times from 1950-51 to 2011-12, rice production rose from 2.0 MT to 14 MT in 2011-12 pulses production declined, oilseeds decreased, and potato production increased. The area under wheat and rice increased between 1980 and 2000 (Goyal & Kumar, 2013).

The role of agriculture in economic development and changing cropping patterns showed a Shift from food crops to commercial crops due to population growth. It analyzed the land use and cropping pattern changes in Kolhapur district. The study is based on secondary data collected from the socio-economic abstract of Kolhapur district. Utilization of simple statistical techniques like percentage and average for analysis used. The result of the study showed that Shift from food to cash crops due to population growth, an increase in cropping intensity due to diversified land use patterns, a Decrease in food crops, and an increase in commercial crops like sugarcane. It suggested that there is a need for afforestation, rural communications, and agricultural development in the region (Hazare et.al., 2014).

The study focussed on trends in pulse area, production, and yield in India. It analyzed the Trends in pulse growth using the ARIMA model for forecasting Positive growth in production and productivity, but area growth stagnated. The principle of fertilization assisted policymakers and farmers in making decisions. ARIMA models were used for forecasting areas for production, and productivity of pulses, and the BJ forecasting model was applied for time series analysis and also used Diagnostic checking for model adequacy and fitting. Overall concluded that the Area under pulse crops might marginally increase and then stagnate and show positive growth in area, production, and productivity of pulses. Efforts are needed to enhance pulse crop area to meet future demand (Savadatti, 2017).

The impact of cropping patterns on land and water productivity analyzed the major crops grown in Kharif and Rabi seasons and production trends in Haryana state from 1966 to 2016. It computed land and water productivity. The results show that gross cropped area increased to 25140 square km over the years and major crops in the kharif season are rice, jowar, maize, and bajra. It increased pressure on water resources due to high water-consuming crops and shifted to basmati varieties for higher remuneration and export demand (Rani, 2019).

The future challenges in agriculture and food systems using social network analysis identified root causes, trends, and interlinkages among proposed solutions. It focused on root causes, trends, and interlinkages among proposed solutions. Bi-modal network analysis is used to link proposed solutions to challenges. Ending extreme poverty and malnutrition have common trends with other challenges. The study concluded that many solutions addressed food stability also impact food access and utilization. FAO's follow-up publication confirmed the strong interlinkage of climate change with trends. The practical implication of the study addressed extreme poverty could partially solve multiple food security challenges and Climate change has a significant impact on food and agriculture trends (Calicioglu et.al., 2019).

The role of groundwater, irrigation, and accessibility of Haryana covered groundwater dynamics, quality, waterlogging, depletion, and inequality in access. It evaluated the groundwater markets and accessibility across different availability regimes. It showed Groundwater dynamics and irrigation trends and the Impact of groundwater depletion and

waterlogging on agricultural practices. The result showed that Groundwater availability increased in Haryana, particularly in eastern and northeastern parts but seemed that there as been certain areas in which Water logging and soil salinity issues are seen (Sharma, 2020).

The cropping pattern changes in Haryana for agricultural transformation reflects the choices of farmers, influenced by various factors. It analyzed the economic growth trends of Haryana from 1980 to 2014 and examined factors influencing the economic development of Haryana. It is based on Statistical tools for data analysis and growth rate computation and uses J. C. Weaver's method for crop combination analysis. The study concluded that the Cropping pattern shift towards rice and wheat due to irrigation improvement and groundwater pressure due to rice cultivation, necessitating crop diversification (Gautam & Sangwan, 2021).

The study analyzed wheat and rice crops in Haryana from 2001-2018. It showed the impact of the green revolution on cropping patterns and agricultural practices and also showed the transformation from intensive to market-oriented farming in Haryana. It is based on secondary data of Quantitative analysis from Agricultural Statistical Abstract Haryana. It used district-wise choropleth maps for spatial pattern analysis and also used Geographical Information System technology for mapping spatial distribution. The study concluded that impact on the environment and farming mindset, Soil degradation, and water scarcity due to excessive wheat and rice cultivation. It suggested that Crop diversification is essential, and incentives are needed for farmers to adopt new crops (Rawat & Bala, 2021).

India's minor millet cultivation declining due to cereals and cash crops. The main aim of the study is to increase millet consumption and prevent nutritional deficiencies. Descriptive statistics and compound annual growth rate analysis were used and secondary data was collected from 1990 to 2020. The main results of the study are Cultivation area and production of minor millets decreased significantly, the Productivity of minor millets increased due to new cultivation technology and the Consumption of minor millets is high in northeastern India. Minor millet cultivation decreased due to cereals, pulses, and cash crops. Growth rates help in identifying changing crop patterns and designing policies. Cultivation areas, production, and productivity trends of minor millets have been seen in India. This study used a compound annual growth rate to predict agricultural crop trends (Kumar et.al., 2022).

Labor productivity is crucial for economic development and societal well-being. Russia lagged in labor productivity compared to leading countries. The study analyzed labor productivity in the agricultural sector using key indicators. It calculated the level of labor productivity. The study emphasized the importance of digital transformation for increasing labor productivity. The result showed that the Indicator of labor productivity showed a rising trend, but wages outpaced productivity. The practical implication is to accelerate updating equipment and technologies to level the outflow of labor resources and state investment needed for high-performance equipment to enhance agricultural production. The study is contributed to Large agricultural organizations renewing machinery, small farms struggling with outdated equipment, and focussed on replacing living labor with highly productive machine labor (Gusev & Koshkina, 2022).

The cropping patterns and agricultural productivity in Tamil Nadu showed a significant impact of Tea, Sugarcane, Coffee, and Cotton prices on productivity and analyzed shifting cropping patterns. The study focused on the significant influence of price on agricultural productivity and the price of Tea, Sugarcane, Coffee, and Cotton significantly impact agricultural productivity. Tamilnadu Administrative Service (TNAS) should improve productivity through integrated farming and soil health improvement, agricultural productivity through integrated farming systems, and also enhance soil health with biofertilizers and Green Manuring (Chellasamy & Supraja, 2022).

The organic and inorganic farming practices in Haryana, focusing on crop diversification. The large data comparison, from 234 farmers, Data were collected through a structured survey. This study identified the key factors leading to the adoption of organic farming in the state. Crop patterns, mixed crops, and different crops were compared using statistical methods such as the Doi method and the Herfindahl index. This study showed that farmers have preferred organic farming who have small and high education. It has been seen that organic farming is small in the state, half of organic farmers own more than three-thirds of their land (Kumar and Jaglan).

The rice cultivation in Haryana during the Green Revolution shift from wheat to rice cultivation impacted cropping patterns significantly. The study showed that growth, distribution, and changes in cropping patterns over time. It is based on secondary data analysis from published and unpublished sources and statistical techniques applied to agriculture data for trend analysis. The result showed that Rice cultivation increased significantly in Haryana over 61 years and the area under rice cultivation expanded from 175 to 1526 thousand hectares. Rice production showed an upward trend with fluctuations (Kumar, 2023).

The study focused on optimizing water efficiency, energy productivity, and sustainable agricultural production. The main aim is to maximize cost efficiency, irrigation efficiency, energy productivity, energy efficiency, and food efficiency. Linear and multi-objective programming models are used for analysis and questionnaires are classified by random sampling method. It is concluded that multi-objective planning improves irrigation and energy efficiency and proposed that cropping patterns maximize irrigation and cost efficiency (Zhigang Ye et.al., 2023).

Farm experiments assessed the impact of different cropping systems on wheat yield, productivity, and profitability. Conservation agriculture soybean-wheat-summer moong showed potential to enhance yield, productivity, and profitability. Different cropping systems under conservation agriculture (CA) practices are used. It is concluded that the highest wheat yield in scenarios Sc6, Sc4, and Sc2 has been seen. Highest grain yield observed in full conservation agriculture (CA) permanent-bed cropping systems (Kumar & Saini,2023).

The Changing Pattern of Irrigation Intensity in Haryana covered about 1.4% of India's total land area but has contributed 15% of India's agricultural production since the creation of Haryana in 1966. Agricultural land, 96% of which is cultivated. Its irrigation intensity has seen changes over the years, especially after the Green Revolution, due to the presence of canals and other sources, including tube wells. The major objective of the present study is to analyze the patterns of irrigation intensity in Haryana between the periods of 2004–2005 and 2019– 2020, with the district as the unit of study. It also aimed to highlight the factors responsible for the change in irrigation intensity (Kumar and Kumar, 2024).

## RESEARCH METHODOLOGY

### Data Collection

The present study employs a quantitative approach, drawing primarily from secondary data sources such as the Agricultural Statistical Abstract Haryana spanning three decades (2000-01, 2010-11, 2020-21). Besides, different other sources like district statistical offices, economic surveys, and government publications and reports have been used to supplement our analysis. The data of area, production, yield, and net sown area (in terms of hectare) of major crops has been extracted from Agricultural Statistical Abstract Haryana for three decades to fulfill the objective of the study.

### Gross Cropped Area

The gross cropped area (GCA), is the cumulative area sown once and more than once in a given year (Paul et al.,2023). Gross cropped area and share of area in GCA in terms of percentage is calculated using MS Excel.

### Intensity of Cropping

It refers to the no. of crops raised on a field during an agriculture year. For example, if one crop is grown on a field either as a kharif or as a rabi crop in given agriculture year, the intensity index is 100% and it is known as single cropping. If two crops are produced in a year kharif and rabi the intensity index will be 200% and it is termed as double cropping (Singh, 2013).

The formula to calculate cropping intensity is the ratio of gross cropped area to net sown area, expressed as a percentage:
Cropping Intensity- (Gross Cropped Area/Net Sown Area) ×100
Cropping Intensity is calculated by using MS Excel.

### Net Sown Area

The total cultivated area includes the net area (sown and fallow land). The net area sown and the cultivated area are

identical in terms of distribution patterns, which means that fallowing land has no important status in land use and the major proportion in any cultivated area is that of the net area sown (Singh, 2013).

**Agriculture Productivity**

The ratio of total agricultural output to total inputs used in farm production is known as agricultural productivity (Shafi, 1984).

Productivity = production/land area

Agricultural productivity is calculated by using the formula (Production/Land Area) through MS Excel.

**RESULTS AND DISCUSSIONS**

**Land Use Pattern in Haryana**

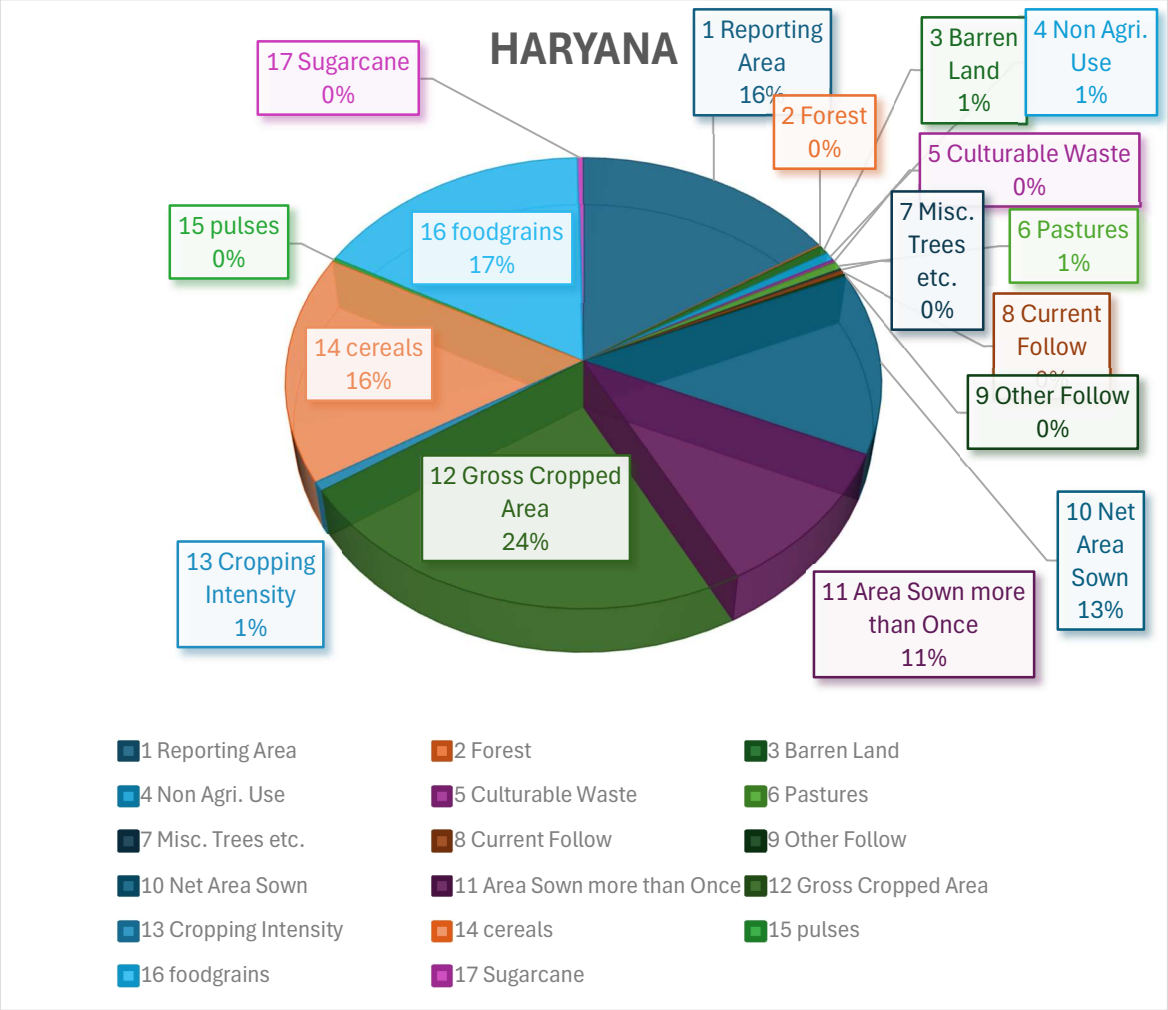
**Table 1.** Land Use of Haryana 2020-21 (Lakh Ha)

| | Particulars | Haryana |
|---|---|---|
| 1 | Reporting Area | 43.71 |
| 2 | Forest | 0.32 |
| 3 | Barren Land | 1.71 |
| 4 | Non Agri. Use | 1.68 |
| 5 | Culturable Waste | 0.65 |
| 6 | Pastures | 1.53 |
| 7 | Misc. Trees etc. | 0.37 |
| 8 | Current Follow | 0.85 |
| 9 | Other Follow | 0.49 |
| 10 | Net Area Sown | 36.11 |
| 11 | Area Sown more than Once | 29.17 |
| 12 | Gross Cropped Area | 65.28 |
| 13 | Cropping Intensity | 1.8 |
| 14 | Cereals | 45.265 |
| 15 | Pulses | 0.761 |
| 16 | Foodgrains | 46.03 |
| 17 | Sugarcane | 0.997 |

Source: Statistical Abstract of Haryana

Note: ha (hectare)

Table 1. illustrates the land use distribution in Haryana for the year 2020-21, showing a diversity in land utilization. While the total reporting area of the state stands at 43.71 lakh hectares, only a fraction is dedicated to forested land (0.32 lakh hectares). Barren land occupies a significant portion (1.71 lakh hectares), alongside areas designated for non-agricultural use (1.68 lakh hectares) and culturable waste (0.65 lakh hectares). Agricultural activities dominate with a net area sown of 36.11 lakh hectares, where a substantial portion (29.17 lakh hectares) is subjected to multiple sowings. The gross cropped area, including multiple cropping, totals 65.28 lakh hectares, indicating a cropping intensity of 1.8. Cereal crops cover the largest land area (45.265 lakh hectares), followed by foodgrains (46.03 lakh hectares), pulses (0.761 lakh hectares), and sugarcane (0.997 lakh hectares).




**Cropping Pattern/Coverage in Haryana**

**Table 2. Cropping Pattern of Haryana**

| Crop | Area (000 ha) | | | Share in GCA (%) | | |
|---|---|---|---|---|---|---|
| | TE (2000-01) | TE (2010-11) | TE 2020-21(p) | TE 2000-01) | TE (2010-11) | TE (2020-21) |
| Rice | 1,054.30 | 1,243.30 | 1,525.80 | 11.92 | 13.09 | 16.36 |
| Jowar | 109.4 | 70.8 | 32.7 | 1.24 | 0.75 | 0.35 |
| Bajra | 608.3 | 659.6 | 594.1 | 6.88 | 6.94 | 6.37 |
| Maize | 15.4 | 9.6 | 9.3 | 0.17 | 0.10 | 0.10 |
| Wheat | 2,354.80 | 2,504.00 | 2,354.00 | 26.63 | 26.36 | 25.25 |
| Barley | 44.1 | 37.3 | 9.3 | 0.50 | 0.39 | 0.10 |
| Other Cereals | 0.5 | 0 | 1.3 | 0.01 | 0.00 | 0.01 |
| All Cereals | 4,186.50 | 4,524.60 | 4,526.50 | 47.35 | 47.63 | 48.54 |
| Gram | 124.5 | 111.5 | 40.5 | 1.41 | 1.17 | 0.43 |
| Mash | 1.5 | 1.4 | 0.5 | 0.02 | 0.01 | 0.01 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Moong | 5.3 | 26 | 28.5 | 0.06 | 0.27 | 0.31 |
| Masar | 6.5 | 3.7 | 0.9 | 0.07 | 0.04 | 0.01 |
| Other pulses | 19.2 | 33 | 5.7 | 0.22 | 0.35 | 0.06 |
| All pulses | 157 | 176.6 | 76.1 | 1.78 | 1.86 | 0.82 |
| Sugarcane (Gur) | 143 | 84.5 | 99.7 | 1.62 | 0.89 | 1.07 |
| Potatoes | 9.3 | 12.4 | 19.2 | 0.11 | 0.13 | 0.21 |
| Chilies (Dry) | 2.1 | 1.1 | 0.5 | 0.02 | 0.01 | 0.01 |
| Tobacco | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 |
| Ground nut (Nuts in shell) | 0.3 | 2.3 | 9.4 | 0.00 | 0.02 | 0.10 |
| Sesamum | 3.5 | 3.3 | 1.6 | 0.04 | 0.03 | 0.02 |
| Rape Seed and Mustard | 408.8 | 509.7 | 617.5 | 4.62 | 5.37 | 6.62 |
| Linseed | 0 | 0 | 0.4 | 0.00 | 0.00 | 0.00 |
| Other Oilseeds | 1.4 | 5.9 | 14.3 | 0.02 | 0.06 | 0.15 |
| Total Oilseeds | 4,343.50 | 4,700.20 | 4,602.60 | 49.13 | 49.48 | 49.36 |

Source: Statistical Abstract of Haryana, note: GCA (gross cropped area)

Haryana is highly diversified in its cropping pattern towards fruits and vegetables after the green revolution. It produces a variety of crops due to its comparative advantage in a wide range of agro-climatic changes. The largest area is devoted to food grain cultivation, while only 2% is devoted to pulses. Approximately 50% of the total cultivated area is used for food production. Other important crops in the state are sugarcane, potatoes, mustard, peanuts, legumes, peas, and lentils. However, there are significant differences in cropping patterns across the agro-climatic and agro-economic zones of the state in terms of sales and seasonal products ~~e~~. The area sown with coarse rice is gradually decreasing and being replaced by other commercial crops. There is an increasing tendency in the area under oilseed and an increasing trend of pulses from 2000-01 to 2010-2011 but decreasing trend in 2020-21.

The cropping pattern of Haryana, as depicted in Table 2 across three time periods (2000-01, 2010-11, and 2020-21), offers valuable insights into the agricultural dynamics of the region. Over the years, significant shifts have occurred in the cultivation areas of various crops. Notably, rice cultivation has steadily expanded, reflecting a rising trend in both area and share in the gross cropped area (GCA). Conversely, crops like jowar and barley have experienced notable declines in cultivation areas. While some crops, such as wheat and sugarcane, have maintained relatively stable cultivation areas, others like pulses and oilseeds have shown fluctuations.

**Area, Production, and Yield Trend of Different Crops in Haryana**

The given table 3 provides a comprehensive overview of the area, production, and yield trends of different crops in Haryana across three distinct periods: 2000-01, 2010-11, and the projected data for 2020-21. Analyzing the data revealed significant shifts in crop performance over the years. For instance, rice production has exhibited a substantial increase from 1,054 thousand metric tons (MT) in 2000-01 to a projected 3,692 thousand MT in 2020-21, indicating significant growth in both area and yield. Similarly, wheat production has surged, showcasing a remarkable rise from 2,355 thousand MT to a projected 4,845 thousand MT over the same period. Conversely, crops like jowar and barley have seen fluctuations in both area and production, with varying degrees of impact on yield. Notably, oilseed crops have also displayed noteworthy changes, with rapeseed and mustard exhibiting significant growth in production.

**Table 3. Area, Production, and Yield Trend of Different Crops In Haryana**

| Crop | TE (2000-01) | | | TE (2010-11) | | | TE 2020-21(p) | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | P | Y | A | P | Y | A | P | Y |
| Rice | 1054 | 2695 | 2557 | 1243 | 3465 | 2788 | 1526 | 5633 | 3692 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Jowar | 109.4 | 23 | 208 | 70.8 | 38 | 535 | 32.7 | 15 | 403 |
| Bajra | 608.3 | 656 | 1079 | 659.6 | 1183 | 1792 | 594.1 | 1411 | 2378 |
| Maize | 15.4 | 34 | 2267 | 9.6 | 19 | 1900 | 9.3 | 28 | 2963 |
| Wheat | 2355 | 9669 | 4106 | 2504 | 11578 | 4624 | 2354 | 11406 | 4845 |
| Barley | 44.1 | 118 | 2682 | 37.3 | 130 | 3514 | 9.3 | 31 | 3345 |
| Othercereals | 0.5 | 0 | 0 | 0.5 | 0 | 0 | 1.3 | 0 | 0 |
| All cereals | 4187 | 13195 | 0 | 4525 | 16413 | 0 | 4527 | 18524 | 0 |
| Gram | 124.5 | 80 | 640 | 111.5 | 110 | 982 | 40.5 | 40.1 | 990 |
| Mash | 1.5 | 0.3 | 148 | 1.4 | 0.5 | 357 | 0.5 | 0.3 | 559 |
| Moong | 5.3 | 1.2 | 226 | 26 | 11.9 | 468 | 28.5 | 19.6 | 688 |
| Masar | 6.5 | 5.2 | 798 | 3.7 | 3.3 | 901 | 0.9 | 0.6 | 678 |
| Other pulses | 19.2 | 13.1 | 0 | 33 | 27.4 | 0 | 5.7 | 6.4 | 0 |
| All pulses | 157 | 99.8 | 0 | 176.6 | 153.1 | 0 | 76.1 | 67 | 0 |
| Sugarcane | 143 | 817 | 5713 | 84.5 | 604 | 7108 | 99.7 | 858 | 8598 |
| Potatoes | 9.3 | 141.2 | 15226 | 12.4 | 280.9 | 22631 | 19.2 | 366.9 | 19145 |
| Chilies | 2.1 | 2.1 | 975 | 1.1 | 10.9 | 9569 | 0.5 | 2.6 | 5739 |
| Tobacco | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ground nut | 0.3 | 0.2 | 688 | 2.3 | 2.4 | 1039 | 9.4 | 10.6 | 1129 |
| Sesamum | 3.5 | 1 | 295 | 3.3 | 1.4 | 430 | 1.6 | 0.9 | 533 |
| Rapeseed &Mustard | 408.8 | 560 | 1369 | 509.7 | 953 | 1852 | 617.5 | 1221 | 0 |
| Linseed | 0 | 170 | 0 | 0 | 0 | 0 | 0.4 | 0.3 | 800 |
| OtherOilseeds | 1.4 | 1.6 | 0 | 5.9 | 8.1 | 0 | 14.3 | 24.8 | 0 |
| TotalOilseeds | 4344 | 13295 | 0 | 4700 | 16566 | 0 | 4603 | 18591 | 0 |

Source: Statistical Abstract of Haryana

**Table 4. Trends of Agricultural Production (‘000 tone) & Productivity (quintal per hectare) In Haryana**

| Crop | Production | | | Productivity | | |
|---|---|---|---|---|---|---|
| | 2000-01 | 2010-11 | 2020-21 | 2000-01 | 2010-11 | 2020-21 |
| Rice | 2,695 | 3,465 | 5,633 | 2.56 | 2.79 | 3.69 |
| Jowar | 23 | 38 | 15 | 0.21 | 0.54 | 0.46 |
| Bajra | 656 | 1,183 | 1,411 | 1.08 | 1.79 | 2.38 |
| Maize | 34 | 19 | 28 | 2.21 | 1.98 | 3.01 |
| Wheat | 9,669 | 11,578 | 11,406 | 4.11 | 4.62 | 4.85 |
| Barley | 118 | 130 | 31 | 2.68 | 3.49 | 3.33 |

| | | | | | | |
|---|---|---|---|---|---|---|
| other cereals | 0 | 0 | 0 | 0 | 0 | 0 |
| All cereals | 13,195 | 16,413 | 18,524 | 3.15 | 3.63 | 4.09 |
| Gram | 80 | 110 | 40.1 | 0.64 | 0.99 | 0.99 |
| Mash | 0.3 | 0.5 | 0.3 | 0.2 | 0.36 | 0.6 |
| Moong | 1.2 | 11.9 | 19.6 | 0.23 | 0.46 | 0.69 |
| Masar | 5.2 | 3.3 | 0.6 | 0.8 | 0.89 | 0.67 |
| Other pulses | 13.1 | 27.4 | 6.4 | 0.68 | 0.83 | 1.12 |
| All pulses | 99.8 | 153.1 | 67 | 0.64 | 0.87 | 0.88 |
| Sugarcane | 817 | 604 | 858 | 5.71 | 7.15 | 8.61 |
| Potatoes | 141.2 | 280.9 | 366.9 | 15.18 | 22.65 | 19.11 |
| Chilies (Dry) | 2.1 | 10.9 | 2.6 | 1 | 9.91 | 5.2 |
| Tobacco | 0 | 0 | 0 | 0 | - | - |
| Ground nut | 0.2 | 2.4 | 10.6 | 0.67 | 1.04 | 1.13 |
| Sesamum | 1 | 1.4 | 0.9 | 0.29 | 0.42 | 0.56 |
| Rapeseed & Mustard | 560 | 953 | 1221 | 1.37 | 1.87 | 1.98 |
| Linseed | 170 | 0 | 0.3 | - | - | 0.75 |
| OtherOilseeds | 1.6 | 8.1 | 24.8 | 1.14 | 1.37 | 1.73 |
| TotalOilseeds | 13,294.80 | 16,566.10 | 18,591.00 | 3.06 | 3.52 | 4.04 |

Source: Statistical Abstract of Haryana

The provided data shows the production and productivity trends of various crops in Haryana over three distinct periods: 2000-01, 2010-11, and 2020-21. Analyzing the data revealed notable shifts in both production volumes and crop productivity. For instance, the production of major cereals like rice, wheat, and bajra has seen significant increases over the years, accompanied by improvements in productivity.

Conversely, some crops like jowar and barley have experienced fluctuations in both production and productivity. Pulses, including gram, moong, and other pulses, show mixed trends with fluctuations in both production and productivity. Similarly, oilseeds display varied patterns, with rapeseed and mustard exhibiting notable growth in both production and productivity. These trends underscore the dynamic nature of agricultural practices in Haryana.

**Pattern of Cropping Intensity in Haryana**

Most districts have a crop intensity close to 100%, indicating efficient utilization of agricultural land. This suggests that farmers are effectively utilizing available land resources for cultivation. Some districts exhibit crop intensities significantly higher than 100%, indicating intensive agricultural practices such as multiple cropping or high cropping frequency. For example, districts like Jhajjar, Kurukshetra, Mahendrakar, and Panchkula have crop intensities well above 100%, implying a high level of agricultural productivity and possibly favorable agro-climatic conditions.

Districts with lower crop intensities, such as Faridabad, Palwal, and Yamuna Nagar, may have the potential for further intensification of agricultural practices to increase productivity and optimize land use. The total for the region shows an overall crop intensity of 106.54%, indicating that, on average, there is a slight surplus of land being utilized for cultivation compared to the gross cropped area.

**Table 5. Pattern of Cropping Intensity in Haryana**

| District | Gross Cropped Area (000 ha.) | Net area sown (000 ha.) | crop intensity |
|---|---|---|---|
| Ambala | 149 | 148 | 100.68 |
| Bhiwani | 294 | 294 | 100.00 |
| Charkhi Dadri | 125 | 112 | 111.61 |
| Faridabad | 32 | 31 | 103.23 |
| Fatehabad | 221 | 219 | 100.91 |
| Gurugram | 118 | 118 | 100.00 |
| Hisar | 356 | 335 | 106.27 |
| Jhajjar | 183 | 134 | 136.57 |
| Jind | 256 | 254 | 100.79 |
| Kaithal | 197 | 197 | 100.00 |
| Karnal | 200 | 200 | 100.00 |
| Kurukshetra | 167 | 143 | 116.78 |
| Mahendragarh | 184 | 152 | 121.05 |
| Nuh | 112 | 110 | 101.82 |
| Palwal | 118 | 105 | 112.38 |
| Panchkula | 44 | 23 | 191.30 |
| Panipat | 122 | 98 | 124.49 |
| Rewari | 131 | 126 | 103.97 |
| Rohtak | 157 | 153 | 102.61 |
| Sirsa | 400 | 394 | 101.52 |
| Sonipat | 154 | 152 | 101.32 |
| Yamunanagar | 127 | 113 | 112.39 |

| | | | |
|---|---|---|---|
| Total 2020-21 (P) | 3,847 | 3,611 | 106.54 |

Source: Statistical Abstract of Haryana

## CONCLUSION

The comprehensive data on land use, cropping patterns, and agricultural trends in Haryana from 2000-01 to 2020-21 revealed significant insights into the state's agricultural dynamics. In 2020-21, Haryana's total reporting area stands at 43.71 lakh hectares, with a predominant focus on agriculture. The net area sown is 36.11 lakh hectares, and the gross cropped area, reflecting multiple cropping, is 65.28 lakh hectares. The cropping intensity of 1.8 highlights the intensive use of agricultural land. Despite significant areas under barren land (1.71 lakh hectares) and non-agricultural uses (1.68 lakh hectares), agriculture remains the backbone of land use. The cropping pattern in Haryana showed a clear preference for cereals, particularly rice and wheat. Rice cultivation has notably increased, both in area and share, reflecting its rising importance. Conversely, crops like jowar and barley have seen a decline, indicating a shift towards more profitable or adaptable crops. Pulses have experienced a fluctuating trend, with a significant decrease in their share of the gross cropped area by 2020-21. However, oilseeds, especially mustard, have shown a consistent increase in cultivation area. The production and productivity data reveal significant improvements in major crops. Rice and wheat have shown substantial growth in both production and yield, while some crops like jowar and barley have seen declines, others like bajra and maize have shown notable increases in productivity. The production of oilseeds, particularly rapeseed and mustard, has also increased. District-wise analysis of cropping intensity indicates that most districts have efficient land utilization, with several districts exhibiting cropping intensities above 100%, such as Panchkula, Kurukshetra, and Mahendragarh. This suggested intensive agricultural practices and favorable agro-climatic conditions in these regions. The overall cropping intensity for the state is 106.54%, indicating the effective use of available land resources for multiple cropping.

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