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ASYSTEMATICANALYSIS OFINDIAN AGRICULTURE AND WHEAT EXPORT

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Abstract

Agriculture is a significant and one of the vastindustries in India. It is necessary for the Indian economy's survival and expansion. Agriculture provides a living for about 70% of households and 10% of the urban population on average. India is also a major exporter of a variety of agricultural products to the international market, including coffee, tea, oil meals, grains, spices, fresh fruits,vegetables, marine products and meat. India is a key producer of a variety of agricultural goods. India is recognized as the world's largest milk producer and the world's second largest wheat and rice producer. Agricultural development is vulnerable to a number of threats that concern both farmers and consumers. Cohesive and coordinated long-term strategies and policies are needed to reduce risk aversion and create flexibility among Indian rural producers in order to increase investment and achieve a sustained increase in production. Farmers' wages must be increased by providing them with remunerative costs. The aim of this research paper is to look into the major agriculture crops, as well as their productivity, export, and import. Wheat, a large agricultural product, is also the subject of an observational analysis by the scholar.

Key words: Agriculture, Agricultural Productivity, Farming, Production, Productivity.

Introduction

Following the green revolution, India made enormous strides in agricultural productivity, which was made possible by the introduction of modern farming methods, high-yielding varieties of crops, fertilizer use, increased irrigation capacity, and the availability of electricity. Millions of small and marginal farmers contributed their physical and mental efforts to make this achievement possible. The programme encourages production policies, public sector spending, technical advancements, and grain, livestock, and fisheries science and extension, both of which have helped to boost food production and availability. Between 1950-51 and 2011-12, India's food grain production rose by 62 percent, from 50.8 million tonnes (Mt) to 259.32 Mt. The increase in production was mostly attributed to an increase in food grain productivity from 522 kg/ha to 1757 kg/ha, rather than an increase in cultivated land. Since 1950-51, the cropping intensity of 137 percent has only increased by 26 percent. In 1951, the net sown area was 118.55 Mha, but by 2009, it had risen to 141.36 Mha. The gross net irrigated area currently accounts for 45.5 percent of the net sown area, with the remaining 54.5 percent being rain fed. During the period 1981 to 2011, the availability of net per capita food grains rose from 454 gm/day to 476 gm/day, despite the fact that the country's population nearly doubled [1].

The essence of Indian agriculture has always been dominated by domestic demand, and this trend will continue in the future. The commercialization of the agriculture industry after economic restructuring has largely accelerated agricultural diversification in cropping patterns. Faster income growth had a significant effect on domestic demand, resulting in a large-scale demand diversification phase. The expansion and diversification of the demand basket is primarily motivated by the Indian economy's improved growth output since the 1980s. In the consumption baskets of different income classes, a minimum amount of agro-based goods is needed. These aren't just about the rich and famous. People who are better off drink more milk and consume more eggs, tomatoes, bananas, and cheese on a regular basis as a result of their improved circumstances. This occurred in the 1990s, and the diversification of the food basket is now well established. Income growth, taste preferences, and demographic growth can both influence demand[2].

The higher population growth and wages provide the foundation for increased domestic demand for food grains. Cereal consumption has increased by 13% over the last decade. Demand for fruits and vegetables, eggs, chicken, and milk is growing at a rapid pace. Potatoes have grown 24 percent in the last decade, vegetables 30 percent, milk 40 percent, eggs 200 percent, and chicken 250 percent. The demand for beef, mutton, and pork is also increasing, but it is hampered by religious factors, resulting in low absolute figures. The rather high market growth of non-cereal and non-crop dependent agricultural products compensates for the poor growth of cereal demand. However, there are two points of view on the relative importance of grains in India's projected agricultural demand forecasts[3].

In the last decade, there has been a fluctuation in agricultural commodity markets. It occurred as a result of a shortage of food supplies and the presence of large merchants. In the future, the focus will be on fruits, vegetables, pulses, milk, eggs, chicken, and beef. As a result, either an increase in imports or an acceleration of allied sector growth in tandem with agricultural growth above the current percent target rate is needed. With scarce land and water supplies, agricultural development must be accelerated. It would be possible to achieve balanced growth in agriculture and meet existing demand by combining ecological and traditional farming practices by taking into account the sustainability of the soil and the consistency of the produce[4].

Literature Survey

Shinoj P. et al. investigated the post-reforms shifts in the competitive advantage position of main agricultural exports of India's in comparison to various other Asian countries (1991-2004). India successfully managed to retain its competitive edge regarding the export of certain goods, such as cashews and oil meals, but some others, such as tea, chocolate, spices, and marine items, have been adversely affected. During the time following economic reforms, India was found to be losing its competitive edge in the export of certain agricultural resources to other Asian competitors. Recent changes in changes in foreign trade policies of India as well as the international trade landscape had broad consequences for agricultural exports and India's agriculture zone in general. The study found that during post-reform era, various agricultural commodities exports from India performed differently considering the comparative advantage. India has a competitive edge in tea exports, but the trend has been downward in recent years. In contrast to India and other countries such as China and Indonesia, however, Sri Lanka has shown a significant benefit. In coffee exports, a similar trend has been noted, with India losing its competitive edge to other coffee exporters such as Vietnam and Indonesia. In the case of rice exports, an erratic trend of competitive advantage has been noted, with ups and downs in the status. In the case of spices and cashews, India's comparative advantage has been gradually eroding. In terms of competitive advantage in cashew exports, Vietnam has surpassed India in recent years[5].

Sinha et al. discusses other technologies that can be implemented in India in the promotion of agri-business. Finally, the influence of contract farming is explored through the Nadukkara Agro Processing Company Ltd., a modern fruit processing factory for the commercial processing of pineapples, mango, or other fruits, built under the Kerala Horticulture Development Programme, which was established in the heart of Kerala. For the survival of the Indian farm economy the efficacy of selling agricultural goods is of importance. It was possible to corporate agri-business through the evolving regulatory environment. They discuss other technologies that can be implemented in India in the promotion of agri-business. In recent years, a significant trend is the signing of farming deals with farmers between multinational organizations, such as Pepsico. The research contract, its ways and purposes and the manner in which farmers and businesses communicate are significant findings. In order to assess the feasibility of contract farming, this calls for a multidisciplinary approach and analysis aims to combine observations into the economics, the legislative system relating to land law, planning, includingsupply chain management and marketing. An effort is done to estimate the feasibility of the contract farming model in India through a literature survey[6].

MorakinyoO.Adetutu et al.proposedstochastic frontier analysis prototype to look at the effect of international and domestic R&D on 30 Sub-Saharan African countries agricultural production during 1981-2011. The findings indicate that both domestic and foreign R&D investment in the agriculture industry has a major impact on overall factor production, although the former play a major role. The annual average rate of productivity increase shows a decomposition of the Total Productivity Factor (TPF) and its elements, which was mostly

powered by technological modifications with an average annual gain of 3.2%. Productivity was negatively impacted by efficiency changes, which resulted in a net decrease in TFP growth of 0.8 percent on average each year. In the time under review, our sub-regional analysis showed Western Africa's highest productivity increase. Overall, the information stocks major hand in driving agricultural production in the Sub-Saharan African countries area is highlighted in their results[7].

Saeed ur Rahman et al. explored the potential to assist farmers in improving Pakistan's agricultural production by providing a sufficient amount of loans in due course. The purpose of their paper is to study the effect on agricultural production of a ZaraiTaraqiatibank by analyzing the loans for farmers. This paper is based on the main data source gathered from Bahawalpur Tehsil's field survey. It concluded that the number of households, household incomes, family education, farm credit, short-term as well as long-term loans had a main positive effect on per acre farm incomes.The positive link between credit and farm productivity indicates that credit allows farmers to obtain superior quality or high rates of seeds, fertilizers and pesticides and improves farm production due to timely and sufficient inputs[8].

Oduro-Ofori Eric et al. analyzed the education's impacts on the farmer's productivity in the agricultural sector; how different types of education influence the productivity of agriculture; to propose policies to make education a more efficient and efficient way for the farming community to boost their quality of education. This paper included eight farming families. Data were collected from 100 farmers and the Municipal Agricolas Development Unit, as well as the Offinso Municipal Educative Directorate's Non-Formal Education Section. The main result in the study was that with the increasing level of schooling, production rises with the highest rates of agricultural productivity in secondary education. Agricultural production is more influenced by extension services than traditional education despite the poor coverage. The study found that technology is essential for improving agricultural productivity because formal education opens the farmer's mind to expertise, non-formal education provides hands-on instruction and improved farming methods, and informal education keeps the farmer abreast of emerging technologies and ideas while also allowing him to share his experience. The government should strengthen the standard of formal schooling, extension programmes, and adult literacy courses in the municipality, according to the recommendations. Transportation, input access, and credit facilities for farmers are all factors that influence productivity[9].

Lokesh Kumar Jat et al. explores the significance of Integrated Nutrient Management in addressing agricultural issues, that has been suggested as anencouraging approach to address these challenges. Integrated Nutrient Management has a multifaceted capacity for improving plant production and resource productivity, while at the same time allowing environmental and resource quality conservation. Lower chemical fertilizers import as well as lower human and environmental costs have been attained by advanced Integrated Nutrient Management activities with no detrimental impact on crop yields. A full literature study has shown that Integrated Nutrient Managementincreases crop yields by 8 to 150%, improves productivity and economic returns to growers, and improvesland health,grain quality and sustainability relative to traditional practices. Strong and compelling data suggests that Integrated Nutrient Management practices for sustainable agriculture worldwide may be creative and environmentally friendly. Nowadays, a rising human population's global food needs and a green policy for a balanced soil-plant microorganism-environmental framework deserve considerable consideration when answering the question of increasing agricultural productivity. Chemical fertilization is one way to increase crop yields, but due to injudicious use of chemical input in farming systems, which has detonated the soil, food, climate, and human health, chemical fertilization is also raising their prices in the twenty-first century. Natural manures, on the other hand, cannot meet any of a crop's nutritional needs. INM was created by taking into account the above facts[10].

Discussion

Secondary Data:

The secondary data is simply primary data that has been compiled by someone else. Since it is cheaper, researchers reuse this information as secondary data. The researcher is using secondary data from The Directorate General of Commercial Intelligence & Statistics (DGCIS) Annual Export, and *Maharashtra State Agricultural Marketing Board*(MSAMB), Ministry of Agriculture, National Horticulture Board Database, Govt.

of India, Food & Agricultural Organization (FAO), UNComtrade, as stated by the Importing countries, and so on for the study.

Tools and Techniques Implemented:
Certain mathematical methods have been used to measure different phenomena and to analyze the data gathered accurately and reliably in order to draw sound conclusions. Trend analysis, graphical analysis and Analysis of Variance (ANOVA), statistical statistics such as mean, variance, and standard deviation, etc. have been used to validate the hypothesis. Researchers also use methods such as SPSS (Statistics Package for Social Science) version 20.0 and Microsoft Excelfor review purposes.

Trend Line:
A trend line is a circular shape that is most effective as data values climb or fall at higher rates. If the data includes zero or negative values, we cannot construct a trend line. In this present study, a trend line is used to demonstrate the rising yield of agricultural wheat crops. It is noticed that the R-square value is greater than or equal to 0.80, it is easier to read our values, which means that the line matches well with the data. Trends are those in which data increases or falls not at a constant pace, but at a rising rate.The trade wheat all across the world is higher than combined trade of all other crops. The Indian wheat demand is showing an upward trend across the world. During the year 2013-14 India exported wheat of quantity 55, 62,374.75 Metric Ton (MT) to the world of worthRs. 9,261.60 Crores. The major export destinations for wheat during 2013-14 are Korea, Bangladesh, United Arab Emirates, Djibouti, Indonesia, Oman and Republic of Yemen.

Table 1: TheProduction of Wheat in Metric Ton (World-wide). The Demand for Indian Wheat in The World Is Showing an Upward Trend.

Country	**2012**	**2011**	**2010**	**2009**	**2008**
China	120580000	117410300	115181303	115115364	112464292
India	94880000	86874000	80800000	80680000	78570200
United States	61755240	54413300	**0**	**0**	**0**
France	40300800	38037000	40787000	38332200	39006400
Russia	37719640	56240000	41507600	61739800	63765100
Australia	29905009	27410100	22138000	21656000	21420200
Canada	27012900	25261400	23166800	26847600	28611100
Pakistan	23473000	25213800	23310800	24033000	20958800
Germany	22432000	22800000	24106700	25192400	25988600
Turkey	20100000	21800000	**0**	**0**	**0**

The researcher will certainly note in the above statistic that India is the world's second largest producer of wheat. China is the world's leading wheat manufacturer (Table 1). The United States ranks third in the world for wheat production. The production of wheat in India is on the rise.

Table 2: International Share of Indian Crop Wheat. China Is The World's Leading Wheat Manufacturer.

Year	**Share in %**	**Production in MT**
2005	11.48	72000000

2006	14.49	69354500
2007	15.6	75806700
2008	14.82	78570200
2009	14.83	80680000
2010	15.63	80800000
2011	12.34	86874000
2012	14.14	94880000

In the Table 2 illustrated above, the researcher analyzes the international production of the Indian farming crop wheat. This processing of wheat reveals a second order polynomial pattern in the dataset. This trend is rising in order and wheat production continues to increase from 2006 to 2012. R-squared is a mathematical term to find out how near the data lies on the regression line. It is also known as the coefficient of determination or the coefficient of multiple determinations for multiple regressions. The R-square meaning is a fraction between 0.0 and 1.0 and has no units. If the R-square value is 0 means that learning X doesn't help you determine Y. There is no linear relationship between X and Y, and the best-fit line is a horizontal line passing along the mean of all Y-values. When the R-square is equal to 1, all points lie precisely on a straight line without a scatter. Knowing X allows you to foresee Y-perfectly. Also, the R-square value is greater than 0.80 according to the data beat suit.

Table 3: Yearly Production of Wheat in India.The year 2011-12 reveals the highest wheat yield, i.e. 97880 MT.

Production (In 000 T)	**Year**
69,150.00	2005-06
75,620.00	2006-07
78,360.00	2007-08
80,471.00	2008-09
80,557.10	2009-10
86,870.00	2010-11
97,880.00	2011-12
97,113.60	2012-13

In the Table 3, the researcher observes the development of the agricultural crop wheat in India. This processing of wheat reveals a second order polynomial pattern in the dataset. This polynomial pattern shows some variations in wheat demand. The year 2011-12 reveals the highest wheat yield, i.e. 97880 MT. After the year 2011-12, wheat yield decreased by 766.4 MT. From 2009-10 to 2011-12, Indian wheat production is steadily growing.

Table 4:The Results of the ANOVA Study for Indian Production of Wheat.There Is A Statistically Important Difference In The Quality Of Wheat In Indian Agriculture.

Model	**Sum of Squares**	**Mean Square**	**df**	**F**	**Sig.**

Regression	658711550.701	658711550.701	1	69.899	.000[b]
Residual	56542646.808	9423774.468	6	-	-
Total	715254197.509	-	7	-	-
a. Dependent Variable: Production (In 000 T)					
b. Predictors: (Constant), Year					

Table 4 indicates the results of the ANOVA study and whether the researchers found a statistically important difference between year-by-year wheat crop productions in India. In order to test the null hypothesis, the p-value is compared to an alpha stage. The importance rating for the researcher is 0.000, which is less than 0.01. As a result, the model fits the results. A straight line, representing a linear relationship, represented the relationship between these two variables, i.e. year and Indian wheat yield. As a result, there is a statistically important difference in the quality of wheat in Indian agriculture.

Table 5: Main Wheat Exporting Countries.The United States of America Is Ranked First In The List Of Major Exporting Countries For Agricultural Wheat Crops.

S.No	**Exporting Country**	**2012**	**2011**	**2010**
1	USA	16525029.47	26957932.96	24532446.64
2	Australia	18007037.11	15716016.19	12912954.53
3	Canada	12349415.79	14502268.97	18490226.63
4	France	13504486.51	19567143.17	22111233.63
5	Russian Federation	11118076.13	10243262.49	10121397.08
6	Argentina	9253581.48	7257188.47	031725.56
7	Ukraine	5208842	3146631.58	5226076.4
8	Germany	5204350.97	5502586.17	8326728.29
9	Kazakhstan	4176735.64	1627111.74	3622782.5
10	Bulgaria	2267968.59	1957695.71	1745116.39
11	India	1500823.05	100710.59	16595.56
12	Romania	1385913.39	892183.55	1860235.04
13	United Kingdom	1591453.68	2150312.42	3251059.41

In the Table 5, the researcher observes that the major exporting countries cultivate wheat. The United States of America (USA) is ranked first in the list of major exporting countries for agricultural wheat crops. In international wheat production, India is the second largest producer and the USA, Australia, France, Russia, Germany are not very big producers compared to Indian international wheat production, but are strong exporters

compared to Indian agricultural wheat exports. India's export rank is as much reversed as that of agricultural wheat production.

Table 6: India Export of Agro Food Products Wheat.In Comparison To The Amount Of Exports, The Volume Of Exports Is Comparatively Low.

Year	**Value(In Lakh)**	**Quantity (In MT)**
2011-12	740746.77	102329
2012-13	6514810.60	1052897
2013-14	5562374.75	926160

In the Table 6, the researcher notices that India exports agro-food products such as wheat. In the 2011-12 fiscal year, India exported 740746.77 MT wheat to the foreign market, valued at 102329 lakh. In addition, in the fiscal year 2012-13, India exported 6514810.60 MT of wheat to the international market, valued at 1052897 lakh. However, in comparison to the previous year, India exported less wheat in 2013-14. In the 2013-14 fiscal year, India exported 5562374.75 MT wheat to the foreign market, valued at 926160 lakh. In addition, the researcher states that, in comparison to the amount of exports, the volume of exports is comparatively low.

Conclusion

It is observed that India is not the world's largest wheat producers, as India is not a major exporter of wheat. In Table 1, the researcher notices that largest producer of wheat is India, having a linear relationship between export and production, but in Table 5, the researcher notices that India is not a major exporter of wheat. India's export policies must be improved, and agricultural crop wheat exports must be increased.

According to the survey, while demand is steadily increasing, there is a need to generate 70% more foodby 2050. In the meantime, agriculture's share in Gross Domestic Product (GDP) has been contracted to just 3%, which is nearly one-third of its value decades ago. Approximately 800 million people globally are suffering from malnourishmentand around 8% of the world's population will be undernourished by the end of 2030. The fact is that very diminutive creativity has been implemented in this sector but none of them are focusing onfood shortages and malnutrition which will be at stake in the coming decades. A collective effort by investors,governments and advanced agricultural knowledge would be required to address these issues. Agriculture 4.0 cannot be focused on the homogeneous application of fertilizers,water and pesticides in entire fields. As an alternative farmershoulduse minimum quantity available to aim very particular areas. In addition, the study reports that farms and farming activities need to operate very contrarily, mostly because of technological improvementsin the agricultural field such as computers, sensors, information technology and robots. Robots, moisture and temperaturesensors, GPS technology and aerial photographs can also be implemented in the future prospects of agriculture. Farms can be more successful, effective, clean, and environmentally friendly as a result of these precision agriculture, advanced devices, and robotic systems.

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