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Growth Trend of Pearl Millet and its Impact on Indian Economy: Performance Analysis

¹Dr. Prabha Rani, ²Charu Singh, ³Dr. Kishore Kumar

¹ Associate Professor, Department of Mathematics, M.M.H. College, Ghaziabad, Uttar Pradesh, India

² Head: Instructional Design, Newjobs.ai, New Delhi, India

³ Ex Deputy Director General, National Informatics Centre, Ministry of Electronics & IT, Govt. of India, India

Corresponding Author: **Dr. Prabha Rani**

Abstract

The Indian economy is an agro-economy and depends highly on the agricultural sector. Agriculture plays a vital role in the Indian economy. Over 70 per cent of the rural households depend on agriculture. India is the largest producer of millets in the world. Accounting for 20% of global production and 80% of Asia's production. Millets provide food security to millions of households and contribute to the economic efficiency of farming. Millets are grown in about 21 States. There is a major impetus in Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Kerala, Telangana, Uttarakhand, Jharkhand, Madhya Pradesh, Haryana and Gujarat. In India, millets are

cultivated in an area of 13.83 M ha, producing 17.26 M tones with a yield of 1248 kg per ha. Sorghum is the fourth most important food grain in India after rice, Wheat and Maize in terms of area (4.09 M ha) and production (3.47 m Mt). India is the topmost producer of Barnyard (99.9%), Finger (53.3%), Kodo (100%), Little (100%) and Pearl (44.5%), producing 12.46 million metric tones from an area of 8.87 million ha. Pearl millet is important millet of India, second to sorghum in area and production. This article will examine pearl millet production and agronomic issues and future prospects, and research and development challenges.

Keywords: Agriculture, Millets, Pearl Millet, Economy, Growth Rate, Production, Productivity

Introduction

Government of India had proposed to United Nations for declaring 2023 as International Year of Millets (IYOM). The proposal of India was supported by 72 countries and United Nation's General Assembly (UNGA) declared 2023 as International Year of Millets on 5th March, 2021. Now, Government of India has decided to celebrate IYOM, 2023 to make it peoples' movement so that the Indian millets, recipes, value added products are accepted globally. India is the largest producer of millets in the world. Accounting for 20 % of global production and 80% of Asia's production. Millets provide food security to millions of households and contribute to the economic efficiency of farming In India, Important millet crops grown in India are Sorghum (Great millet), Bajra (Pearl millet), Ragi (Finger millet) and small millets viz., Korra (Foxtail millet), Little millet, Kodo millet, Proso millet and Barnyard millet. Pearl millet is important millet of India, second to sorghum in area and production. Pearl millet is a tall, warm season and an annual grass belongs to family Poaceae. It locally known as Bajra is a very important dual-purpose crop - as food for consumption and fodder for livestock. India is one of the largest producers of Pearl Millet in the world with around 7 million ha area under cultivation. Rajasthan is highest producing state within the country. The grain is converted into flour and used for making bread while the stems are used as fodder for cattle. Pearl millet is known for its high nutritive value because of its high iron and zinc.

Importance of Pearl Millet Crop

- Pearl millet is important millet of India, second to sorghum in area and production.
- Pearl millet is known by various regional names such as bajra (Hindi), sajja (Telugu) and kambu (Tamil and Malayalam) in India.
- Pear millet cultivation is confined to the drier tracts of South Asia (mainly India) and Africa (Nigeria, Niger, Mali, Chad, Tanzania, Sudan and Senegal).
- It is one of the coarse grain crops and is considered to be poor man's food.
- It provides staple food for the poor in a short period in the relatively dry tracts of the country.

- It is the most drought tolerant crop among cereals and millets.
- It is also used as feed for poultry and green fodder or dry for cattle.
- The grain of pearl millet is superior in nutritive value to sorghum grain but inferior in feeding value. It contains about 11.6% protein, 5% fat, 67% carbohydrates and 2.7% minerals.



Methodology

Millet sector has been facing numerous challenges pertaining to production, processing, value addition, marketing and consumption which have hindered the process of advocating millets as the staple foods through the world. The present study is based on secondary data. The study examines growth rates of area, production and productivity Of Pearl Millet in India. The following formulae were used:

Projection

Least Square Technique has been applied for the following linear model:

$$Y = a + bX$$

Where:

Y is Soyabean production

a is constant

b is regression of Y on X,

X is year (X=1 for 1995-96 =2 for 2000-01 & so on)

Projection based on Simple Growth Rate

$$Y_t = Y_0 (1 + n g)$$

Where:

Y₀ = Base year value

Y_t = The projection year value

n = Number of years from base year and

g = Simple proportionate growth rate

Growth Rate

The moving averages have been used to estimate growth rates.

$$R_t = \frac{Y_1 - Y_0 * 100}{Y_0}$$

Where:

R_t = Simple growth rate during two periods

Y_t = Value of the variable of the time t.

Y₀ = Value of the variable of the initial period

Moving Average

$$Y_{t+1} = \frac{Y_t + Y_{t+1} + Y_{t+2}}{3}$$

Where:

Y_t = Variable (area sown, production or productivity).

t = period, say, t = 0, 1, 2,....

Findings and Discussion

In India, millets are cultivated in an area of 13.83 M ha, producing 17.26 M tones with a yield of 1248 kg per ha. Sorghum is the fourth most important food grain in India after rice, Wheat and Maize in terms of area (4.09 M ha) and production (3.47 m Mt). India is the topmost producer of Barnyard (99.9%), Finger (53.3%), Kodo (100%), Little (100%) and Pearl (44.5%), producing 12.46 million metric tones from an area of 8.87 million ha. Pearl millet is important millet of India, second to sorghum in area and production. Table 1 shows the moving three yearly averages of area sown, production and productivity for Bajra It is seen that area sown has increased from 9.19 M ha in 1950-51 to 12.39 M ha in 1970-71. After 1970-71 there is negative trend in the area sown and it has decreased to 7.56 M ha during 2020-21 from 12.39 M ha during 1970-71. The production has the positive trend and it has increased to 10.69 M Tones in 2020-21 from 2.52 M Tones in 1950-51. Productivity has also positive trend. It has constantly increased from 274 kg per ha in 1950-51 to 1327 kg per ha in 2020-21. The annual growth rates during different periods also worked out and presented in the table. The highest growth rate was observed of the order of 7.95 % in production during 1960-61 to 1970-71 and negative (2.07%) during 1970-71 to 1980-81. However, in case of productivity, the highest growth rate was observed during 1960-61 to 1970-71 of the order of 6.03%. The irrigated area also increased from 3.57% during 1950-51 to 9.4% in 2020-21.

Table 1: Three years moving average of area, production and Yield of the Bajra

Year	Area Sown M ha	Growth rate per annum	Production M Tones	Growth rate per annum	Productivity Kg per ha	Growth rate per annum	Irrigated Area %age	Growth Rate
1950-51	9.19		2.52		274		3.57	
1960-61	11.15	2.13	3.47	3.77	312	1.39	2.71	-2.41
1970-71	12.39	1.11	6.23	7.95	500	6.03	3.94	4.54
1980-81	11.34	-0.85	4.94	-2.07	434	-1.32	5.82	4.77
1990-91	10.47	-0.77	6.07	2.29	578	3.32	5.96	0.24
2000-01	9.42	-1.00	6.94	1.43	736	2.73	7.51	2.60
2010-11	9.1	-0.34	9.05	3.04	994	3.51	8.44	1.24
2020-21	7.56	-1.69	10.69	1.81	1327	3.35	9.4	1.14

Table 2: Area, Production and Productivity of Bajra for Major States (2020-21)

	Area Sown M ha	%age of Total Area	Cumulative % Share Area	Production M Tones	% age of Total Production	Cumulative % Share Production	Productivity Kg per ha
Rajasthan	4.32	57.07	57.07	4.53	41.71	41.71	1049
Uttar Pradesh	0.91	12.02	69.09	2.01	18.51	60.22	2221
Haryana	0.57	7.53	76.62	1.35	12.43	72.65	2372
Gujarat	0.46	6.08	82.69	1.00	9.21	81.86	2192
Madhya Pradesh	0.33	4.36	87.05	0.74	6.81	88.67	2256
Maharashtra	0.64	8.45	95.51	0.64	5.89	94.57	1003
Karnataka	0.22	2.91	98.41	0.29	2.67	97.24	1303
Others	0.13	1.72	100	0.3	2.76	100	2360
All India	7.57	100		10.86	100		1436

The State-wise break up of area sown, production and productivity of Bajra is presented in Table 2. It could be observed that Rajasthan is the highest Bajra producing state with 57% of the total Bajra production in the country. Rajasthan along with Uttar Pradesh, Haryana, Gujarat and Madhya Pradesh produce about 89% production in the

country. The highest productivity level has been recorded in Haryana (2372 kg per ha) followed by Madhya Pradesh (2256 Kg per ha), Uttar Pradesh (2221 kg per ha) and Gujarat (2192 kg per ha) and lowest 1003 Kg per ha in Maharashtra.

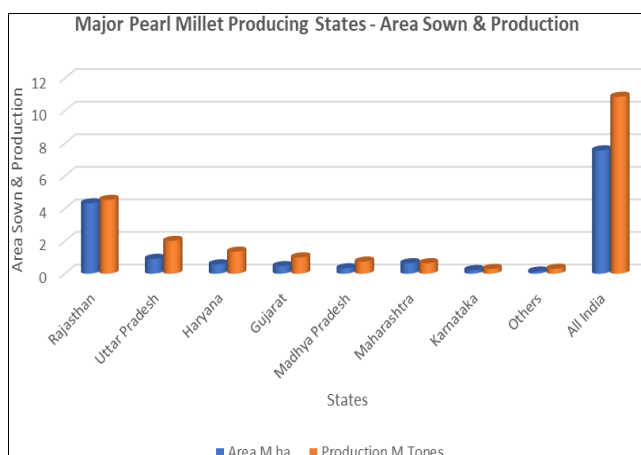
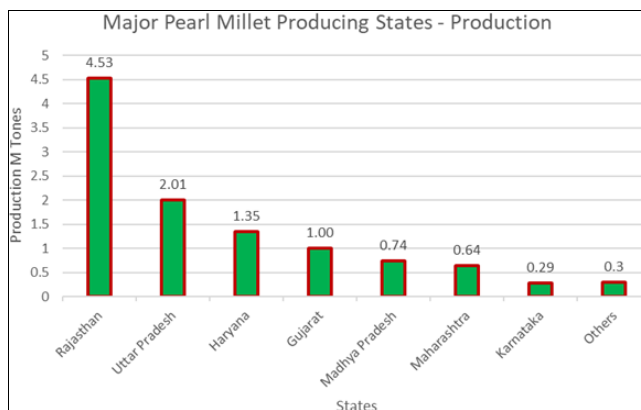


Table 3: Major Millet Producing Countries Globally (2022)

Country	Production M Tones	Production %age	Cumulative Production %age
India	12000	39.33	39.33
Niger	3400	11.14	50.47
China	2700	8.85	59.32
Nigeria	2000	6.55	65.87
Mali	1800	5.90	71.77
Sudan	1500	4.92	76.69
Ethiopia	1100	3.61	80.29
Burkina Faso	1000	3.28	83.57
Senegal	1000	3.28	86.85
Other Countries	4013	13.15	100.00
Global	30513	100.00	

Table 3 presents the major Millet producing countries in the world. It is seen, that India is the highest producing country with 39% share. India, Niger, China, Nigeria, Mali, Sudan and Ethiopia together accounting more than 80% of global production.

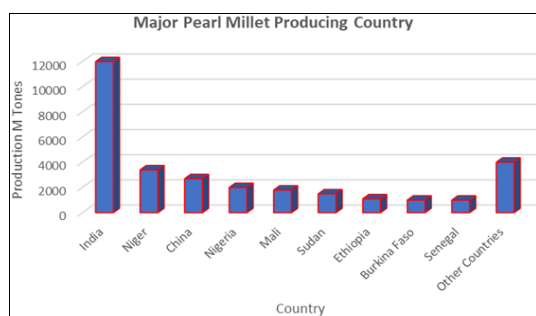
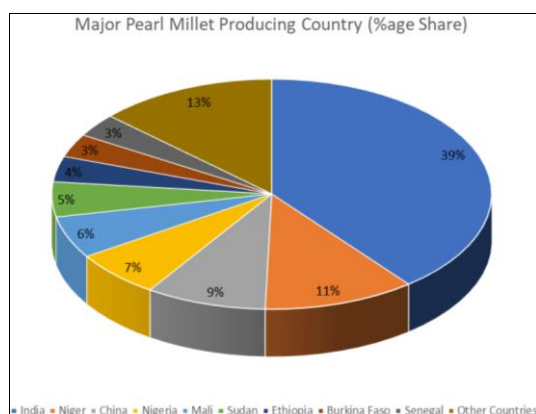


Table 4: Projected Production, Area and Yield for Bajra

	2025-26	2030-31	2035-36
Area M ha	7.16	6.68	6.20
Production M Tones	11.59	12.56	13.53
Productive kg per ha	1543	1711	1880

Table 4 presents the projected area, production and productivity for Bajra for 2025-26, 2030-31 and 2035-36. It is seen that the area sown has been estimated of the order of 71.6 M ha, 6.68 M ha and 6.20 M ha in 205-26, 2030-31 and 2035-36 respectively. The production will be 11.59 M Tones in 2025-26 and 13, 53 M tones in 2035-36. The productivity level has been estimated as 1543 kg per ha in 2025-26, 1711 kg per ha in 2030-31 and 1880 kg per ha in 2035-36.

Concerns and Way Forward

It can be concluded that productivity plays a major role in increased production and the productivity level effect remained greater than area effect and interaction effect. During recent years people are recognizing the nutrient superiority and health benefits of millets compared to fine cereals. There may be an increase in demand for millets due to recent inclusion of millets in public distribution system with the implementation of food security bill coupled with increased awareness of people about inclusion of millets in daily meals for healthy living. The preceding analysis on the trend in area under millets showed that there is a gradual decline. As millets are predominantly grown in marginal and sub marginal dry lands by poor farmers, the fluctuations in area, production and productivity not only bring hardship to farmers but also could create instability. Considering the economic significance of the crops, developmental efforts should be made through demonstrations and training programmes and thus popularizing the cultivation and processing of these crops. The following are some of the key areas for enhancement of Production & Productivity of Millets:

- Strengthening quality seed Chain:
 - Fully Support to Breeder Seed procurement
 - Support Foundation and Certified Seeds
- Frontline technology demonstrations.
- Demand creation through awareness and increase in consumption.
- Crop Diversification focus in favour of millets.
- States to take steps for procurement

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