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STATUS OF RAGI CROP: CHANGING TRENDS AND GROWTH OF ITS AREA, PRODUCTION AND PRODUCTIVITY IN INDIA

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ABSTRACT

Agriculture is the backbone of Indian economy that plays a vital role in its development. Almost 54.6% of the population engaged directly or indirectly in agriculture and allied activities. It's one of the most important operation is food grain production, among the food grain; coarse cereal development not given a priority in India until recent years. It was only post 2007 period that a focused attention was given to increase the production of coarse cereal through an enhancement of plan allocation by National Food Security Mission (NFSM) and implementation of location specific technology. In coarse cereal crop, Ragi (Finger Millet) crop is one of the major crops and its production is not only in terms of food security, but also in creating better nutrient for people. It has several varieties such as yellow, white, tan, red, brown, or violet color, only the red colored are cultivated extensively throughout world. The main objective of this paper is to analysis the trends and growth of area, production and productivity of ragi crop in India. The study indicated that the Compound Growth Rate (CGR) of area under ragi has decreased -1.10 per cent, production has increased 0.36 per cent, and productivity has increased 1.47 per cent during the period 1950-15 in India. CGR of area under ragi cultivation has increased 4.35 per cent, production has increased 4.12 per cent, and productivity has increased 1.93 per cent during the reference period in selected states of India.

KEY WORDS: *Coarse Cereal, Ragi Crop, Compound Growth Rate.*

INTRODUCTION

Agriculture and allied activities remain the major source of livelihood for nearly half of the Indian population. It is provided employment opportunity about 48.9 per cent of the workforce and agriculture sector contributes about 17.4 per cent to the Gross Domestic Product (GDP) in 2014 -15. Agriculture, taken as a whole, includes not only cultivation of food crops like rice and wheat, but also other food crops like, maize, ragi, sorghum, barley, pearl millet, small millet, etc. Ragi is an important crop in India, it is livelihood to poor people (Giacomo Pallante et al 2016), and also major food for diabetic patients. A millet crop includes grasses like finger millet, (Eleusine coracana (L.) Gaertn), pearl millet (Pennisetum Glaucm (L.) R.Br), foxtail millet (Setaria italica (L.) P.Beauvois), kodo millet (Paspalum Scorbiculatum L.), bahiagrass (paspalum nota- tum flugge), little millet (panicum sumatrense Roth ex Roem.& Schult.), proso millets (Panicum miliaceum L.), barnyard millet (Echinochola crusgalli (L.) P.Beauv), guinea grass (panicum maximum Jacq), elephant grass (pennisetum purpurium Schumach.) these are belong to the family poaceae of the mono cotyledon group.

Finger millet (Eleusine coracana) commonly known as Ragi, a native of Ethiopia, is one of the important minor millers belonging to the family

Gramineae and it's grown as a cereal in Africa and Asia. It is nearly globular in shape and is very small in size (1.0 to 1.5 mm in diameter). Ragi has brown predominant color, although a few varieties have white seeds (Vadivoo et al.1998). It is known by many other local names such as Ragi (Hindi, Urdu, and Kanada), Kelvaragu (Tamil), Nachani (Marathi), Manddina (Oriya), Ragulu or Chollu (Telagu), and Koovasagu (Malayalam).

Ragi probably first reached the south or southwest coasts of India and these coastal areas are the most direct as well as the most convenient in the early days of navigation. It has established a secondary center of diversity and distribution (Hilu.K.W et al.1976). The production area of Ragi stands sixth place after wheat, rice, maize, sorghum and Bajra in India and it ranks fourth in importance among millets after sorghum, pearl millet and foxtail millet in the world (Chandra Dinesh -June 2016).

The soil and climatic condition of India is ideally suited for Ragi cultivation, specifically in south India. Ragi is season bound crop and the best season to take up sowing is December – January and June – July, Ragi is adapted to a wide range of environments, significant levels of salinity, are relatively resistant to water logging (Dida.M.M et al 2007). It is a stable diet in many villages across south India, especially in north Karnataka besides Maharashtra and North West Zone of Tamil Nadu. It has nutritional value as its seeds contain 11.7 per cent of protein and are particularly rich in ethionine, calcium, and iron (Barbeau. W.E, 1993). Ragi is majorly utilized in savories, sathu mavu, preparation of traditional food like roti (unleavened breads), biscuit, and feed industry.

Area under food grain cultivation increased from 124.3 million hectares in 1970-71 to 127.8 million hectares in 1990-91. Thereafter, it is decreased 121.3 million hectares in 2009-10. Perhaps, it has increased from 126.7 million hectares in 2010-11 to 122.1 million hectares 2014-15(4th advanced estimates). Among the food grain, area under coarse cereals (includes Maize, Jower, Ragi, Bajra, Small Millets and Barley) cultivation decreased from 45.9 million hectares in 1970-71 to 24.1 million hectares in 2014-15 (A33, Economic Survey 2015-16). Food grain production is increased from 50.83 million tonnes in 1950-51 to 253.16 million tonnes in 2015-16 while it is expected to be higher by 1.14 million tonnes over the production of 252.02 million tonnes during 2014-15 (Economic Survey 2015-16).

The share of rice production is increased from 20.58 million tonne 1950-51 to 104.32 million tonnes in 2015-16, while wheat production increased 6.46 million tonnes to 93.5 million tonnes, similarly coarse cereal cereals production from increased 15.38 million tonnes to 37.94 million tonnes wherein Ragi is more than doubled 3200 thousand tonnes in 1978-79 then that are 1429 thousand tonnes in 1950-51, and also pulses production increased from 8.41 million tonnes to 16.47 million tonnes during this period.

SCOPE OF THE STUDY

The result of the study would be useful to understanding the trend and growth of the production system. It would also help the grower to enhance production. Further the finding could be used to make policy suggestions to improve production and development of farmers. and also used to farmer to make a better planning for increasing the production in ragi cultivation, to increase the nutrient for people and to promote the food processing industry by making use of the availability of ragi in India.

This trend indicates clearly how ragi crop is an essential in present era and hence. Thus, considering in the importance and need, therefore, the study aims to analyze the growth of the ragi crop in India with the following specific objectives:

1. To measure the trend and growth of area, production, and productivity of Ragi crop in India during the period 1950 -51 to 2014- 15.
2. To analysis the growth of area, production, and productivity of Ragi crop in the selected states of India during the period 2001-02 to 2014 -15.

DATA AND METHODOLOGY

The secondary data has been collected for the study to analyzed, draw a meaningful interpretation and to evaluate the situation of the Ragi crop in India. In order to analyze the growth rate, the time series data of area, production, and productivity of ragi were collected from various publications, economic survey, ministry of agriculture and web source such as indiastat.com, Center for Monitoring Indian Economy (CMIE) etc., have been referred for the collection of data from 1950 - 51 to 2014-15 and to measure growth rate of selected states, the data have been collected from 2001-02 to 2014 -15.

COMPOUND GROWTH RATE ANALYSIS

There are several methods to estimate the growth rates. In this study, exponential function was

used to estimate compound growth rate by making time as the independent variable and credit as dependent variable. This exponential trend equation gives constant rate of increase or decrease per unit of time and they are termed as geometric or compound growth rate.

Compound growth rate is estimated by fitting exponential trend equation of the following type.

$$Y = ab^t \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Y = the area / production/ productivity

t = time variable in years

a = constant

And b = (1+ r)

Where "r" = Compound Growth Rate

The equation (1) takes the linear form by taking logarithms of both sides of the equation,

Log y = log *a* + log *b*.

Compound growth rate is computed using the following formula.

Compound Growth Rate (CGR) = Antilog (log b-1)*100

RESULT AND DISCUSSION

Trend of Area, Production, Productivity of Ragi in India

Table 1 indicates that the trend of area, production, and productivity of Ragi cultivation in India during time period 1950-55 to 2010-15. Area under Ragi cultivation increased from 11267 (8.23 per cent) thousand hectares in 1950-55 to 13046 (9.53 per cent) thousand hectares in 1975-80. Thereafter, it is declined 12493 (9.13 per cent) thousand hectares in 1980-85 to 5995 (4.38 per cent) thousand tonnes in the period 2010-15.

The production increased from 7607 (5.43 per cent) thousand tonnes in 1950-55 to 13629 (9.73 per cent) thousand tonnes in 1975-80. And then it is declining from 12964 (9.73 per cent) thousand tonnes in 1980-85 to 9754 (6.97 per cent) thousand tonnes in 2010-15. The production is highest 13046 thousand tonnes in 1975-80. Productivity is increased 8105 kilogram per hectare in the year 2010-15 and it is lowest 3367 kilogram per hectares in the year 1950-55.

Trend of area, production and productivity of Ragi in Selected States of India

Table 2 pertain the data on area, production and productivity of ragi crop in selected states of India during 2001-02 to 2004-05. In selected states of India, Karnataka is the one of the leading states in area under Ragi; it is about 3611.9 (57.53 per cent) thousand hectares during 2001-05, followed by Uttarakhand 600.7 (9.57 per cent) thousand hectares, Maharashtra 588.7 (9.38 per cent) thousand hectares, Tamil Nadu 483.5 (7.70 per cent) thousand hectares, Odisha 301.9 (4.81 per cent) thousand hectares, Andhra Pradesh 299.7 (4.77 per cent) thousand hectares. The lowest is recorded by Puducherry 0.4 thousand hectares with 0.01 per cent in the same period.

The percentage share of ragi production in total production, it is recorded the highest 63.23 per cent (5112 thousand tonnes) in Karnataka, followed by Tamil Nadu 800.4 thousand tonnes with 8.91 per cent, Uttarakhand 694 thousand tonnes with 7.73 per cent, Maharashtra 622.6 thousand tonnes with 6.93 per cent, and Andhra Pradesh 368.8 thousand tonnes with 4.11 per cent. The lowest share is recorded by Madhya Pradesh 0.5 thousand tonnes at 0.006 per cent.

In productivity, Puducherry is the leading state in India, is highest 11000 kg/ha with 14.45 per cent, followed by Tamil Nadu 6505 kg/ha with 8.55 per cent, Karnataka 5614 kg/ha with 7.38 per cent, Dadra and Nagar Haveli 5309 kg/ ha with 6.98 per cent, Andhra Pradesh 4913 kg/ha with 6.46 per cent, Himachal Pradesh 4758 kg/ ha with 6.25 per cent, West Bengal 4686 kg/ha with 6.16 per cent. Lower Productivity of Ragi is about 933 kg/ ha with 1.23 per cent Madhya Pradesh during 2001-02 to 2004-05. Table 3 shows that the data on area, production and productivity of ragi crop in India during 2005-06 to 2009-10. Among the selected states, Karnataka is the one of the leading states in area under ragi, it is about 3983 (59.05 per cent) thousand hectares during 2005-06 to 2009-10, followed by Uttarakhand 671 (9.95 per cent) thousand hectares, Maharashtra 646 (9.58 per cent) thousand hectares, Tamil Nadu 461.2 (6.84 per cent) thousand hectares, Odisha 322.8 (4.79 per cent) thousand hectares, Andhra Pradesh 275 (4.08 per cent) thousand hectares.

The lowest share of area under Ragi is recorded by Puducherry 0.3 thousand hectares with 0.004 per cent. The percentage share of Ragi production in total production, it is recorded the highest 68.29 per cent (6743 thousand tonnes) in Karnataka, followed by Uttarakhand 895 thousand tonnes with 9.06 per cent, Tamil Nadu 789.4 thousand tonnes with 7.99 per cent, Maharashtra 613 thousand tonnes with 6.21 per cent and Andhra Pradesh 317 thousand tonnes with 3.21 per cent. The lowest share of Ragi is recorded by Madhya Pradesh, it is about 0.5 thousand tonnes with 0.01 per cent.

In productivity, Tamil Nadu is one of the leading states in India, the highest about 8624 kg/ha with 13.15 per cent, followed by Puducherry 6000 kg/ ha with 11.63 per cent, Karnataka 8355 kg/ha with 8.86 per cent, Dadra

and Nagar Haveli 6655 kg/ha with 7.48 per cent, and Uttarakhand 6674 kg/ha with 6.77 per cent. And lowest productivity is about 1333 kg/ ha with 1.58 per cent during 2005-10.

Table 4 shows that the area, production and productivity of Ragi crop in India during 2010-11 to 2014-15. Among the states, Karnataka is one of the leading states in area under Ragi cultivation which is about 3492 (58.72 per cent) thousand hectares during 2010-15, followed by Maharashtra 613 (10.31 per cent) thousand hectares, Uttarakhand 602.7 (10.13 per cent) thousand hectares, Tamil Nadu 451.9 (7.60 per cent) thousand hectares, Odisha 286.5 (4.82 per cent) thousand hectares, Andhra Pradesh 193 (3.25 per cent) thousand hectares. The lowest share is recorded by Puducherry 0 thousand hectares with 0 per cent.

The percentage share of ragi production in total production, Ragi recorded the highest 64.99 per cent (6313.3 thousand tonnes) in Karnataka, followed by Tamil Nadu 1246.2 thousand tonnes with 12.83 per cent, Uttarakhand 827.6 thousand tonnes with 8.52 per cent, Maharashtra 655 thousand tonnes with 6.74 per cent, Odisha 205.6 thousand tonnes with 2.12 per cent, and Andhra Pradesh 203.1 thousand tonnes with 2.09 per cent. The lowest share of ragi production is recorded by Goa 0.3 thousand tonnes at 0.003 per cent.

In productivity, Tamil Nadu is one of the leading states in India, it is highest 13343 kg/ha with 13.15 per cent, followed by Puducherry 11801 kg/ha with 11.63 per cent, Karnataka 8990 kg/ ha with 8.86 per cent, Uttarakhand 6867 kg/ha with 6.77 per cent, Dadra and Nagar Haveli 5725 kg/ ha with 5.64 per cent, Bihar 5682 kg/ha with 5.6 per cent, West Bengal 5548 kg/ha with 5.47 per cent, Maharashtra 5339 kg/ha with 5.26 per cent, Andhra Pradesh 5264 kg/ha with 5.19 per cent, Kerala 5067 kg/ha with 4.99 per cent, Sikkim 4956 kg/ha with 4.89 per cent. And lowest is about 1339 kg/ ha with 1.32 per cent in Chhattisgarh.

Growth of Area, production, productivity of Ragi crop in India

The result indicated that the growth of total area, production, and productivity of Ragi crop in India during 1950-51 to 2014-15 is shown in the Table 5. The overall performance of area under ragi cultivation has negative CGR of -1.10 per cent; there was a positive growth rate 0.36 per cent in production, similarly positive growth 1.47 per cent in productivity during the same period. It is indicated that there is an improvement of production and productivity of ragi crop even though the area under cultivation of ragi crop declined.

CGR of the area under Ragi has increased from 1.50 per cent in 1950-55 to 2.88 per cent in 1955-60; it has increased 1.38 per cent during the five year period. Thereafter, the growth rate declined from 0.60 per cent in 1960-65 to -5.24 per cent in 1990-95 and there was some recovery in the growth rate to -1.09 per cent in 2010-15 during the past twenty years. CGR of production of Ragi has increased from 6.70 per cent in 1950-55 to 9.91 per cent in 1965-70; it has increased 3.21 per cent during fifteen year period. Thereafter, the growth rate declined to -4.13 per cent in 2001-05 and there was some recovery in the growth rate to -0.96 per cent in 2010-15 during the past ten years. CGR of productivity of Ragi in India highest growth rate is about 9.60 per cent in 1965-70 and 5.61 per cent 1990-95. The lowest growth rate is about -1.81 per cent in 2001-05.

Growth of Area, production, productivity of Ragi crop of Selected states in India

Table 6 indicates that the compound growth rate of area, production, and productivity of ragi crop by selected states of India during 2001-02 to 2014-15. The area under ragi cultivation increased at the CGR of 4.59 per cent in 2001-05 to 8.94 per cent in 2010-15. It may be noted that there is an expansion of area under cultivation of ragi crop during the reference period. CGR of production of ragi crop in India increased to 11.75 per cent in 2010-15 as against to 7.63 per cent in 2001-05, CGR is increased to 4.12 per cent during a 15 year period. Among the states, Goa had the highest CGR of 9.02 per cent during 2001-2005, followed by Uttarakhand 3.68 per cent. The CGR of Gujarat 2.87 per cent, Dadra and Nagar Haveli 1.44 per cent, Karnataka 0.69 per cent, Puducherry (0.00 per cent), Odisha (-0.28 per cent), West Bengal (-0.67 per cent), Tamil Nadu (-0.83 per cent), Sikkim -0.92 per cent, Maharashtra (-1.1 per cent), Chhattisgarh (-1.55 per cent), Madhya Pradesh (-1.8 per cent), Andhra Pradesh (-4.02 per cent), Himachal Pradesh (-8.86 per cent), Bihar (-9.45 per cent), Jharkhand (-17.91 per cent), Kerala (-32.05 per cent) was the result of the cultivated area during 2001-2005.

During 2004-05 to 2009-10, Madhya Pradesh had highest growth rate of 2.92 per cent and Puducherry had no growth in the same period. And then, the other states had negative growth rates, Goa had lowest growth rate of -16.4 per cent. In 2010-11 to 2014-15, Madhya Pradesh had the highest growth rate of 26 per cent, followed by Tamil Nadu (10.55 per cent), Jharkhand (8.99 per cent), and Sikkim (1.98 per cent) had exhibited positive growth rate, Goa and Puducherry had no growth

in the reference period. And then, the other states had negative growth rates, Kerala had lowest growth of -28.08 per cent in the reference period.

The CGR of production among the selected states, Gujarat was one of the leading states in Ragi production of 10.11 per cent during the period 2001-05, followed by Dadra and Nagar Haveli (9.62 per cent), Karnataka (8.43 per cent), Odisha (7.37 per cent), Uttarakhand (3.58 per cent), and Goa (2.92 per cent), West Bengal (0.6 per cent). In 2005-10, Tamil Nadu had highest CGR of 5.59 per cent, followed by Sikkim had 4.3 per cent growth rate in the same year period. And remaining states had negative growth rates, Goa had lowest growth rate of -20.50 per cent. In 2010-11 to 2014-15, Madhya Pradesh had the highest growth rate 33.51 per cent, followed by Jharkhand had 21.17 per cent, Tamil Nadu (21 per cent), Gujarat (3.47 per cent), Bihar (3.42 per cent) Sikkim (2.53 per cent), Maharashtra 0.63 per cent. Goa had no growth and then the other states had negative growth rates.

CGR of productivity in the selected states of India, Kerala had the highest growth rate 10.59 per cent, Dadra and Nagar Haveli had highest about 8.08 per cent, and Puducherry had lowest about -11.45 per cent in 2001-05. In 2010-11, Tamil Nadu had highest CGR of 11.07 per cent, followed by Sikkim 4.78 per cent, Gujarat had 1.8 per cent, Puducherry has 1.73 per cent, and Bihar had lowest 0.04 per cent and then the other states had negative growth rate, Dadra and Nagar Haveli had lowest negative growth rate about -5.5 per cent. In 2010-11 to 2014-15, Jharkhand had highest CGR of 11.07 per cent in the selected states, followed by Bihar had 11 per cent, Kerala had 9.77 per cent, Tamil Nadu had 9.45 per cent, and Sikkim had lowest 0.19 per cent. And then, the remaining states had negative growth rate, Dadra and Nagar Haveli had lowest (in negative CGR) about -8.61 per cent.

CONCLUSION

The study indicated that the trend of area under Ragi cultivation declined from 11267 thousand hectare with 8.23 per cent in 1950-55 to 5995 thousand hectare with 4.38 per cent in the period 2010-15. It is indicated that area under ragi decreased 5272 thousand hectare with 3.85 per cent in 1950-55 to 201-15. The production increased from 7607 thousand tonnes with 5.43 per cent in 1950-55 to 9754 thousand tonnes with 6.97 per cent in 2010-15, it has increased 2147 thousand tonnes with 1.54 per cent in 1950-55 to 2010-15. Similarly, Productivity is increased from 3367 kg/ha with 4.8 per cent in the year 1950-55 to 8105 kg/ha with 11.56 per cent 2010-15, it has increased 4738 kg/ha with 6.76 per cent. Even though there are some ups and downs in area under cultivation and production, but overall productivity shows increasing trend in the reference period.

The result indicated that the trend of selected states, Karnataka is highest 3611.9 thousand hectares with 57.53 per cent in cultivation and 5112 thousand tonnes with 63.23 per cent in production, highest productivity 11000 kg/ha in Puducherry during the period 2001-05. Karnataka is highest 3983 thousand hectares with 59.05 per cent in cultivation and 6743 thousand tonnes with 68.29 per cent in production, finally productivity is high 8624 kg/ha in Tamil Nadu during the period 2005-10. Karnataka is highest 3492 thousand hectares with 58.72 per cent in cultivation and 6313 thousand tonnes with 65 per cent in production, also highest productivity 13343 kg/ha in Tamil Nadu during the period 2010-15.

The study concluded that the growth of area, production, and productivity of Ragi has increased in 1950-15 in India. Specifically, production and productivity of ragi crop has been increased even though the area under ragi crop declined in during the reference period and the progress was slow during the time, i.e.2000-01 to 2004-05. The overall performance of growth rate of area under ragi has decreased -1.10 per cent, production has increased 0.36 per cent, and productivity has increased 1.47 per cent during the period 1950-15 in India.

The result indicated that the CGR of area under Ragi in selected states of India has been declined from 9.02 per cent (Goa) to -32.05 per cent (Kerala) in 2001-05. Similarly, it has declined from 2.92 per cent (Madhya Pradesh) to -16.4 per cent (Goa) in 2005-10. Madhya Pradesh had highest growth rate 26 per cent in 2010-15, and it has declined to -28.08 per cent for Kerala in the same reference year. The overall performance of area under ragi cultivation has increased 4.35 per cent during the reference period.

CGR of production of Ragi crop in selected states of India has been declined from 10.11 per cent (Gujarat) to -24.84 per cent (Kerala) in 2001-05. Similarly, it has declined from 5.59 per cent (Tamil Nadu) to -20.05 per cent (Goa) in 2005-10. Madhya Pradesh had highest growth rate 33.51 per cent in 2010-15, after that, it has declined to -22 per cent for Kerala in the same reference year. The overall performance of ragi production has increased 4.12 per cent during the reference period.

CGR of productivity of Ragi crop in selected states of India has been declined from 10.59

per cent (Kerala) to -11.45 per cent (Puducherry) in 2001-05. Similarly, it has declined from 10.34 per cent (Tamil Nadu) to -5.5 per cent (Dadra and Nagar Haveli) in 2005-10. The highest growth rate 11.07 per cent (Jharkhand) in 2010-15, after that, it has declined to -8.61 per cent (Dadra and Nagar Haveli) in the same reference year. The overall performance of ragi productivity has increased 1.93 per cent during the reference period.

TABLES

Table 1: Area, production and productivity of Ragi in India 1950-51 to 2014-15

Year	Area (in '000' Hectare)	Production (in '000' Tonne)	Productivity (in Kg./Hectare)
1950-51 to 1954-55	11267	7607	3367
	(8.23)	(5.43)	(4.8)
1955-56 to 1959-60	12060	9371	3887
	(8.81)	(6.69)	(5.54)
1960-61 to 1994-65	12593	9953	3953
	(9.2)	(7.11)	(5.64)
1965-66 to 1969-70	12324	8607	3515
	(9.01)	(6.15)	(5.01)
1970-71 to 1974-75	12050	10494	4354
	(8.81)	(7.49)	(6.21)
1975-76 to 1979-80	13046	13629	5209
	(9.53)	(9.73)	(7.43)
1980-81 to 1984-85	12493	12964	5181
	(9.13)	(9.26)	(7.39)
1985-86 to 1989-90	11759	12728	5410
	(8.59)	(9.09)	(7.71)
1990-91 to 1994-95	9854	12392	6325
	(7.2)	(8.85)	(9.02)
1995-96 to 1999-00	8616	11826	6870
	(6.3)	(8.45)	(9.8)
2000-01 to 2004-05	8040	10821	6672
	(5.88)	(7.73)	(9.51)
2005-06 to 2009-10	6747	9878	7278
	(4.93)	(7.05)	(10.38)
2010-11 to 2014-15	5995	9754	8105
	(4.38)	(6.97)	(11.56)
1950-51 to 2014-2015	**136844**	**140024**	**70126**
	(100)	**(100)**	**(100)**

Source: Ministry of Agriculture & Farmers welfare, Govt. of India. (ON1299) & Past Issues. Note: percentage share in parentheses

Table 2: State Wise Area, Production, and Productivity of Ragi Crop in India during 2001-02 to 2004-05

State and Union Territory	Area (in '000' Hectare)	Percent	Production (in '000' Tonne)	Percent	Productivity (in kg/ Hectare)	Percent
Andhra Pradesh	299.7	4.77	368.8	4.11	4913	6.46
Bihar	71.1	1.30	51.8	0.58	2895	3.80
Chhattisgarh	42.3	0.67	11.2	0.12	1058	1.39
Dadra and Nagar Haveli	6.0	0.10	8.0	0.09	5309	6.98
Goa	1.5	0.02	1.3	0.01	3500	4.60
Gujarat	90.9	1.45	87.3	0.97	3880	5.10
Himachal Pradesh	13.2	0.21	15.7	0.17	4758	6.25
Jharkhand	89.5	1.43	59.0	0.66	2699	3.55
Karnataka	3611.9	57.53	5112	63.23	5614	7.38
Kerala	5.2	0.08	4.5	0.05	3688	4.85
Madhya Pradesh	2.1	0.03	0.5	0.01	933	1.23
Maharashtra	588.7	9.38	622.6	6.93	4224	5.55
Odisha	301.9	4.81	169.9	1.89	2260	2.97
Puducherry	0.4	0.01	1.1	0.01	11000	14.45
Sikkim	17.6	0.28	15.6	0.17	3542	4.65
Tamil Nadu	483.5	7.70	800.4	8.91	6505	8.55
Uttarakhand	600.7	9.57	694.0	7.73	4646	6.10
West Bengal	52.2	0.83	61.1	0.68	4686	6.16
India	**6278.4**	**100**	**8978.8**	**100**	**76110**	**100**

Source: Ministry of Agriculture & Farmers welfare, Govt. of India. (ON1151) & (ONM1151).

Table 3: Selected State Wise Area, Production, and Productivity of Ragi Crop in India during 2005-06 to 2009-10.

State and Union Territory	Area (in '000' Hectare)	Percent	Production (in '000' Tonne)	Percent	Productivity (in kg/ Hectare)	Percent
Andhra Pradesh	275.0	4.08	317.0	3.21	5755	6.47
Bihar	65.1	0.97	50.2	0.51	3877	4.36
Chhattisgarh	46.2	0.68	12.5	0.13	1354	1.52
Dadra and Nagar Haveli	7.3	0.11	9.8	0.10	6655	7.48
Goa	1.3	0.02	1.4	0.01	5250	5.90
Gujarat	96.0	1.42	82.0	0.83	4221	4.75
Himachal Pradesh	13.1	0.19	13.7	0.14	5344	6.01
Jharkhand	66.9	0.99	40.1	0.41	2984	3.35
Karnataka	3983	59.05	6743	68.29	8355	8.86
Kerala	2.6	0.04	2.2	0.02	3933	4.99
Madhya Pradesh	1.9	0.03	0.5	0.01	1333	1.58
Maharashtra	646.0	9.58	613.0	6.21	4744	5.26
Odisha	322.8	4.79	208.9	2.12	3232	3.54
Puducherry	0.3	0.00	0.8	0.01	6000	11.63
Sikkim	21.9	0.32	20.9	0.21	4776	4.89
Tamil Nadu	461.2	6.84	789.4	7.99	8624	13.15
Uttarakhand	671	9.95	895.0	9.06	6674	6.77
West Bengal	63.3	0.94	73.9	0.75	5841	5.47
India	6744.9	100	9874.3	100	88952	100

Source: Ministry of Agriculture & Farmers welfare, Govt. of India. (ON1151) & (ONM1151).

Table 4: Selected State Wise Area, Production, and Productivity of Ragi Crop in India during 2010-11 to 2014-15.

State and Union Territory	Area (in '000' Hectare)	Percent	Production (in '000' Tonne)	Percent	Productivity (in kg/ Hectare)	Percent
Andhra Pradesh	193	3.25	203.1	2.09	5264	5.19
Bihar	38.3	0.64	42.9	0.44	5682	5.60
Chhattisgarh	37.3	0.63	10.0	0.10	1339	1.32
Dadra and Nagar Haveli	5.5	0.09	6.5	0.07	5725	5.64
Goa	0.4	0.01	0.3	0.00	3474	3.42
Gujarat	84	1.41	71.0	0.73	4313	4.25
Himachal Pradesh	11.4	0.19	11.3	0.12	4941	4.87
Jharkhand	59.4	1.00	43.6	0.45	3598	3.55
Karnataka	3492	58.72	6313.3	65.00	8990	8.86
Kerala	0.9	0.02	0.8	0.01	5067	4.99
Madhya Pradesh	2.6	0.04	0.8	0.01	1606	1.58
Maharashtra	613	10.31	655	6.74	5339	5.26
Odisha	286.5	4.82	205.6	2.12	3589	3.54
Puducherry	0	0.00	0.5	0.01	11801	11.63
Sikkim	17.8	0.30	17.6	0.18	4956	4.89
Tamil Nadu	451.9	7.60	1246.2	12.83	13343	13.15
Uttarakhand	602.7	10.13	827.6	8.52	6867	6.77
West Bengal	50.3	0.85	56.2	0.58	5548	5.47
India	**5947**	**100**	**9712.3**	**100**	**101442**	**100**

Source: Ministry of Agriculture & Farmers welfare, Govt. of India. (ON1151) & (ONM1151).

Table 5: Compound Growth Rate of Area, Production and Productivity of Ragi in India 1950-51 to 2014-15

Year	CGR of Area	CGR of Production	CGR of Productivity
1950-51 to 1954-55	1.50	6.70	5.12
1955-56 to 1959-60	2.88	2.33	-0.52
1960-61 to 1964-65	0.60	1.89	1.27
1965-66 to 1969-70	0.29	9.91	9.60
1970-71 to 1974-75	-0.34	-0.81	-0.48
1975-76 to 1979-80	0.69	4.00	3.29
1980-81 to 1984-85	-1.32	0.44	1.80
1985-86 to 1989-90	-0.86	0.72	1.59
1990-91 to 1994-95	-5.24	0.08	5.61
1995-96 to 1999-00	-1.77	-0.68	1.07
2000-01 to 2004-05	-2.35	-4.13	-1.81
2005-06 to 2009-10	-2.19	-0.95	1.39
2010-11 to 2014-15	-1.09	-0.96	0.13
1950-51 to 2014-15	**-1.10**	**0.36**	**1.47**

Source: Ministry of Agriculture & Farmers welfare, Govt. of India. (ON1299) & Past Issues

Table 6: Selected state Wise area, production, and productivity of ragi in India: 2001-2002 to 2010-2011 to 2014-2015 (Compound Growth Rate)

State and Union Territory	Area			Production			Productivity		
	2001-02 to 2004-05	2005-06 to 2009-10	2010-11 to 2014-15	2001-02 to 2004-05	2005-06 to 2009-10	2010-11 to 2014-15	2001-02 to 2004-05	2005-06 to 2009-10	2010-11 to 2014-15
Andhra Pradesh	-4.02	-8.89	-2.89	-2.39	-9.57	-4.88	1.73	-0.74	-2.06
Bihar	-9.45	-8.53	-6.63	-15.66	-8.50	3.42	-6.86	0.04	11.00
Chhattisgarh	-1.55	-5.96	-7.43	-1.65	-5.54	-7.20	-0.16	0.47	0.27
Dadra and Nagar Haveli	1.44	-2.82	-6.83	9.62	-7.79	-13.72	8.08	-5.50	-8.61
Goa	9.02	-16.40	0.00	2.92	-20.05	0.00	-5.59	-4.36	-6.05
Gujarat	2.87	-9.22	-1.33	10.11	-7.58	3.47	7.08	1.80	4.86
Himachal Pradesh	-8.86	-6.45	-5.49	-12.60	-10.94	-5.22	-4.11	-4.79	-0.05
Jharkhand	-17.91	-10.32	8.99	-18.31	-10.81	21.17	-0.49	-0.56	11.07
Karnataka	0.69	-0.80	-2.25	8.43	-0.11	-4.67	7.71	0.69	-2.48
Kerala	-32.05	-10.29	-28.08	-24.84	-13.96	-22.00	10.59	-3.63	9.77
Madhya Pradesh	-1.80	2.92	26.00	-6.70	-9.57	33.51	-4.97	-2.83	6.00
Maharashtra	-1.10	-3.21	-1.68	-3.14	-3.60	0.63	-2.07	-0.41	2.35
Odisha	-0.28	-1.96	-4.62	7.37	-1.82	-0.27	2.41	0.13	4.57
Puducherry	0.00	0.00	0.00	-11.45	-18.77	-9.57	-11.45	1.73	-2.06
Sikkim	-0.92	-0.46	1.98	-0.99	4.30	2.53	-0.10	4.78	0.19
Tamil Nadu	-0.83	-4.30	10.55	-5.89	5.59	21.00	-5.11	10.34	9.45
Uttarakhand	3.68	-1.24	-3.56	3.58	-0.93	-3.00	-0.03	0.31	0.58
West Bengal	-0.67	-1.61	-1.09	0.60	-2.10	-1.32	1.26	-0.46	-0.36
India	**4.59**	**5.16**	**8.94**	**7.63**	**8.61**	**11.75**	**2.91**	**2.55**	**4.12**

Source: Ministry of Agriculture & Farmers welfare, Govt. of India. (ON1151) & (ONM1151).

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