



“MAJOR PULSES PRODUCTION AND PRODUCTIVITY OF MADHYA PRADESH: AN ANALYTICAL ANALYSIS”

¹Jageshwar Prasad Prajapati

¹Senior Research Fellow, Department of Post Graduate Studies and Research in Economics,
R.D.V.V. Jabalpur (M.P.)

Email address-jageshwarprajapati@gmail.com

²Dr. N.G.Pendse

²Professor, Department of Post Graduate Studies and Research in Economics, R.D.V.V. Jabalpur
(M.P.)

Email [address- ngpendse@rediffmail.com](mailto:ngpendse@rediffmail.com)

ABSTRACT:

Pulses crop is one of the well-known groups of crops in our country. The group consists of chickpea, pigeon pea, lentil, green gram, black gram, uradbean and moong bean. Which are widely cultivated major pulses in the state of Madhya Pradesh, Maharashtra, Rajasthan, U.P. and Andhra Pradesh pulses production in India and they occupy an important place in human diet. Pulses are an integral part of Indian agriculture, an important source of protein, for its people and a significant source of nitrogen for the soil. India is very well known as the largest producer, exporter and importer of pulses in the world and play a significant role in world pulses market. India achieved 25575 (000 Tonnes) pulses production in 2020-21 and Madhya Pradesh contributed the significant share with the production 4364.74(000 Tonnes) followed by Rajasthan 4821(000 Tonnes) and Maharashtra 4224(000 Tonnes). Apart from these pulses are unaffordable for population due to supply bottlenecks and poor productivity resulting in growing import quantity and price escalation in our country. Indian pulses are suffering from cost pull and demand-pull inflation simultaneously. This paper addresses the bottleneck and focus on the way forward for improving pulses production in Madhya Pradesh, vertically and horizontally as well.

Keywords: Indian Agriculture, Pulses production, Import and Export quantity, supply bottlenecks, Price escalation, Way forward.

Introduction-

India is the largest producer, largest consumer and the largest importer of pulses in the world. In India Pulses are grown in around 24-26 million hectares of area producing 17-19 million tons of pulses annually. India accounts for over one third of the total world area and over 20 per cent of total world production. India primarily produces Bengal gram (chickpeas), red gram (tur), lentil (masur), green gram (mung) and black gram (urad).

Pulses are an important group of food crops that can play a vital role to address national food and nutritional security and also tackle environmental challenges. The share of pulses to total food grain basket is around 9-10 per cent. Pulse is a critical and inexpensive source of plant-based proteins, vitamins and minerals. Pulses are critical in food basket (dal-roti, dal-chawal), are a rich source of protein (@20-25 per cent, it is double the protein content of wheat and thrice



that of rice) and help address obesity, diabetes malnutrition etc. Pulse-wise nutritional status is given in Table-1.

(Table-1): Nutritional label of various pulses

Name of foodstuff	Gram	Urd	Mung	Kulthi	Lentil	Pea	Tur	Moth	Khesari	Cowpea
Protein (%)	20	24	25	22	25	22	22	25	31	23
Vit. A (I.U.)	316	64	83	119	450	31	220	16	200	60
Vit. C	3			1				2		
Vit. K	0.29	0.19	-	-	0.25	-	-	-		
Thiamine	0.3	0.41	0.72	0.42	0.45	0.47	0.45	0.45	0.39	0.5
Ribo-flavin	0.51	0.37	0.15	0.2	0.49	0.21	0.51	0.09	0.41	0.48
Nicotinic-acid	2.1	2	2.4	1.5	1.5	3.5	2.6	1.5	2.2	1.3
Biotin (g/100g)	10	7.5	-	-	13.2	-	7.6	-	7.5	202
Choline	194	206	-	-	299	-	183	-	-	-
Folic-acid (g/100g)	125	144	-	-	107	-	83	-	100	-
Inositol	240	90	-	-	130	-	100	-	140	-
Pantothenic-acid	1.3	3.5	-	-	1.6	-	1.5	-	2.6	-
Total No. of Vitamins/Minerals	12	11	5	6	11	5	10	6	9	6

Source- Success Report 2018-19, Published by Ministry of Agriculture and Farmers Welfare, GOI.

Historically, Madhya Pradesh has been the major pulse producing state in the country. It ranked first both in terms of area (19.8 percent) and production (20.9 percent) of pulses in India (Figure 3). Over 20 percent of the Gross Cropped Area (GCA) of Madhya Pradesh is under pulses. Though ranked first in terms of area and production, it ranked sixth after Uttar Pradesh, Bihar, Haryana, West Bengal and Gujarat in terms of average yield. In current scenario production of pulses in Madhya Pradesh has come down to 81.11 lakh tones in 2017-18 to 43.64 lakh tones in



2020-21 (as per third advance estimate), However it lacks in average yield, states like Maharashtra, Rajasthan, Karnataka, and Gujarat have reported increase in production of pulse during 2016-17 and 2020-21 in Maharashtra the manufacturing of pulses elevated from 37.68 lakh tones in 2016-17 to 42.42 lakh tones in 220-21. In Rajasthan it Increase from 31.81 lakh tones to 48.21 lakh tones.

Table 2- Area, production and productivity of total pulses in Madhya Pradesh

Year	Area	Production	Productivity
2000-2001	3554.2	2275.4	640
2001-02	4170.2	3224.6	773
2002-2003	4137.5	2375.5	574
2003-04	4585.4	3488	761
2004-05	4519.7	3429.2	759
2005-06	4284.9	3232.6	754
206-07	418.1	3203.1	780
2007-08	426.2	2453.6	609
2008-09	4559.8	3683.1	808
2009-10	4940.5	434.6	871
2010-11	5178	3381	655
2011-12	5179	416.1	83
2012-13	5314.4	5165.9	972
2013-14	5395.8	4644.3	861
2014-15	5548.9	5224.2	941

Source- compiled from Directorate of Economic & Statistics, DA&FW

Area- Million Hectare, production- million tones, productivity- kg/hectare

Agriculture is the main stay of the state's economy and 71.73% of the people are rural. As much as 49% of the land area is cultivated. M.P. is heavily dependent on the agriculture sector. The economy of M.P. depends mainly on the agriculture sector as more than 80% of the people of the state depend on the sector for their livelihood. The agriculture sector contributes around 40% to the state's economy. M.P. is richly endowed in natural resources such as alluvial black (Deep Medium and Shallow) mixed red and black, red and yellow and skeletal soils. Black soil cover about 47.6% of the total area of the state followed by red and yellow soils about 36.5% about



74% population of M.P. resides rural area, around 65% of the total land holdings belong to small and marginal farmer occupying only 26% areas in 202.16 lakh hectares.

Madhya Pradesh	2020-21	2019-20
area	4.89	4.76
%to all India	16.95	17
production	5.3	4.11
% to all India	2.6	17.84
productivity	1084	864

Sources- E- pulses data book from ICAR- Indian institute of pulses research

Objectives-

- 1 To access the production and productivity of pulses in Madhya Pradesh.
- 2 To analyze the trend and growth rate of pulses in Madhya Pradesh.
- 3 To suggest the way and policy implication for sustainable growth of pulse production.

Limitation of the study-The study doesn't claim for free from limitation. Major limitation of the present study is based on data collected from different published records and reports and therefore validity of data cannot be questioned.

Data Sources and Methodologies- The data for the period of 1970-71 to 2014-15 on area, production, and yield of pulses in India and Madhya Pradesh both were compiled from the Indian Agricultural statistics, Agriculture statistics at a glance and Indian institute of pulses research. State wise area, production and productivity data for the period of 2015-16 to 2020-21 compiled from directorate of economic & statistics, DA&FW as per fourth advance estimates. Data for the year of 2021 on area, production and productivity and its percentage share in all India for five major pulses in Madhya Pradesh i.e. chickpea, mungbean, urdbean, pigeon pea and lentil were compiled from E- pulses data book from ICAR- Indian institute of pulses research (<https://iipr.icar.gov.in/>) .

Research Methodology-

1 Linear trend- To study the growth rate of pulse crop in Madhya Pradesh the trend analysis was carried out using linear trend method.

Linear trend, $Y = a + b x$

Where,

Y= dependent variables (area, production and yield)

a= intercept

b= Regression coefficient

x= period

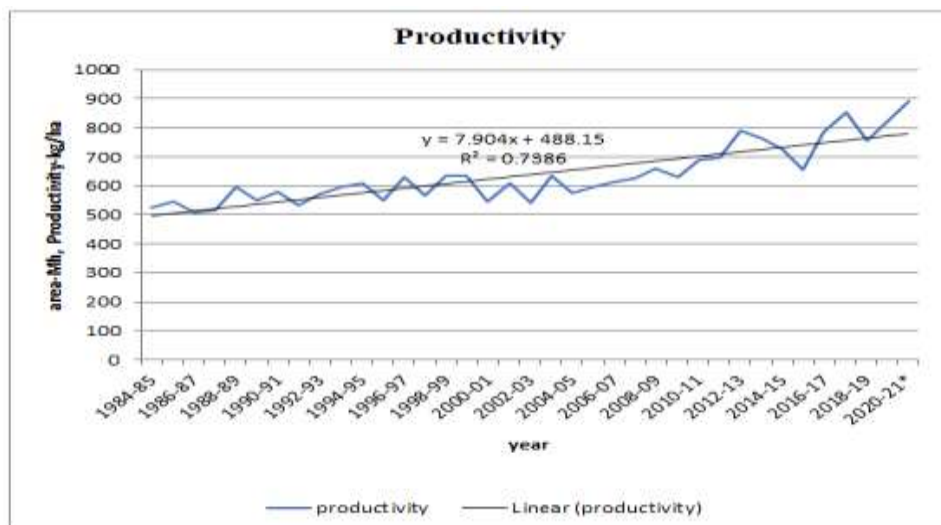
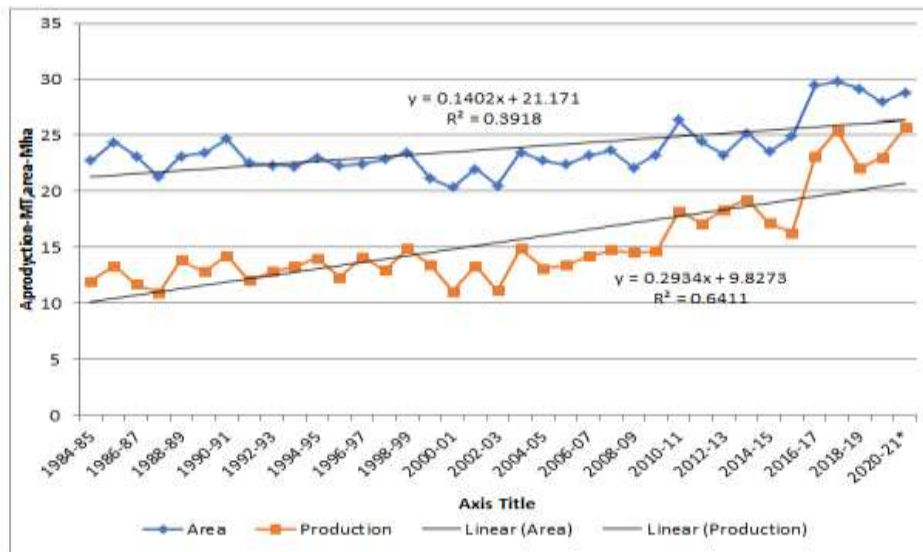


3 Simple Growth Rate (SGR)-

$$\text{growth rate} = \frac{\text{Current year value} - \text{previous year value}}{\text{previous year value of indicator}} \times 100$$

Result and Discussion-

India's status of pulses production -The total world acreage under pulses is about 85.40 (Mha) with production of 87.40 (Mt) at 1023 kg/ha yields level. India, with 28.83 Mha pulses cultivation area, is the largest pulse producing country in the world. It ranks first in area and production with 34 per cent and 26 per cent respectively. During 2020-21 the country's productivity at 892 kg/ha and 2017-18 at 835kg/ha, are a significant increase over Eleventh (662 kg/ha) and Twelfth plans (745 kg/ha).



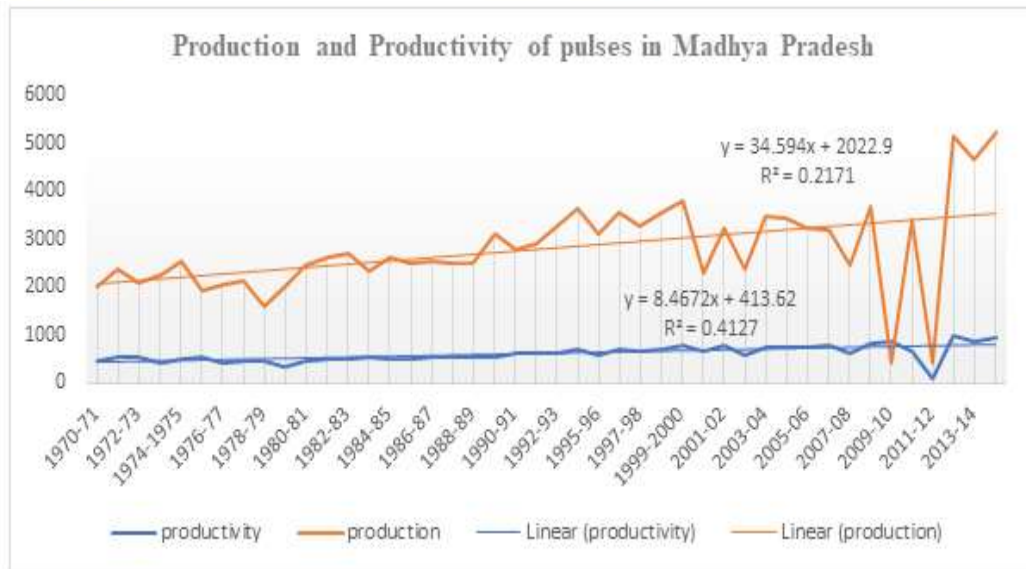


In the above chart depicts area, production and productivity trend in India. 11.96 MT pulses production in the year 1984-85 against the area of 22.74 Mha and it increases 14.26 MT in the year of 1990-91 against the area of 24.66Mha. in the decade of 2000 slightly decrease in the production level of pulses. After that 14.66 MT in the year of 2009-10 and in the year 2020-21 increased with the biggest figure 25.72MT against the area of 28.82 Mha. There has been an increase in pulses production mainly due to improvement in their productivity. The average productivity increased from 526 kg/ha in 1984-85 544 kg/ha in 2001-02 691 kg/ha in 2010-11 and 892 kg/ha in 2020-21. The pulses sector has moved right direction during the last two decades by registering positive growth in area, production and productivity. Many of the policy intervention made by the govt.in recent past may be the factor responsible for this increase of pulses. The total area under pulses fluctuating 20-25 Mha remained practically since independence. However, the advance estimate suggests highest acreage under pulses during 2020-21 with an area of 28.83 Mha. After analyzing the chart, we find that area and production of pulses showing irregular increasing trend over the period of time but productivity of pulses increase with regular trend except some years over the period of time. The equation for trend line of production and productivity is given below:

$$Y = a + bx$$

Where, y is the dependent variable showing area, production and productivity separately. X is the independent variable showing period of time. B is the rate of change and a is the intercept of y. chart showing the positive slope of the trend line of area, production and productivity in India. over the period of time. In the view of trend line equation, the trend line of upward sloping with the slope magnitude of 0.1402(area), 0.2934(production) 7.904(productivity). Especially increasing pattern of productivity reflects increased area under irrigation, enhancing cropping pattern method, marketing of pulses, increases minimum support price and govt. intervention such as dissemination of high yielding varieties and integrated pest and nutrient management practices under NFSM.

Pulses status in Madhya Pradesh: in the above shows production and productivity of Madhya Pradesh .1991.6 thousand tones production against the area of 4245 thousand ha in the year 1970-71, 2792 thousand tones against the area of 5012 thousand ha in the year of 1990-91, 2275.4thousand tones against the area of 3554.2 thousand ha in the year of 2000-01 and 5224.2 thousand tones against the area of 5548.9 in the year of 2014-15 in Madhya Pradesh. There has been increase in pulses production mainly due to improvement in their productivity. The average productivity increased from 469 kg/ha in 1970-71, 617 kg/ha in 1990-91, 640 kg/ha in 2000-01 and 941 kg/ha in 2014-15. After analyzing the chart, we find that production showing irregular increase trend but productivity of pulses showing regular type of positive trend. Productivity is upward sloping with the slope magnitude of 8.467. it reflects increasing pattern of productivity due to increasing area under irrigation, enhance cropping pattern, govt. provide support for pulses production and support price also.

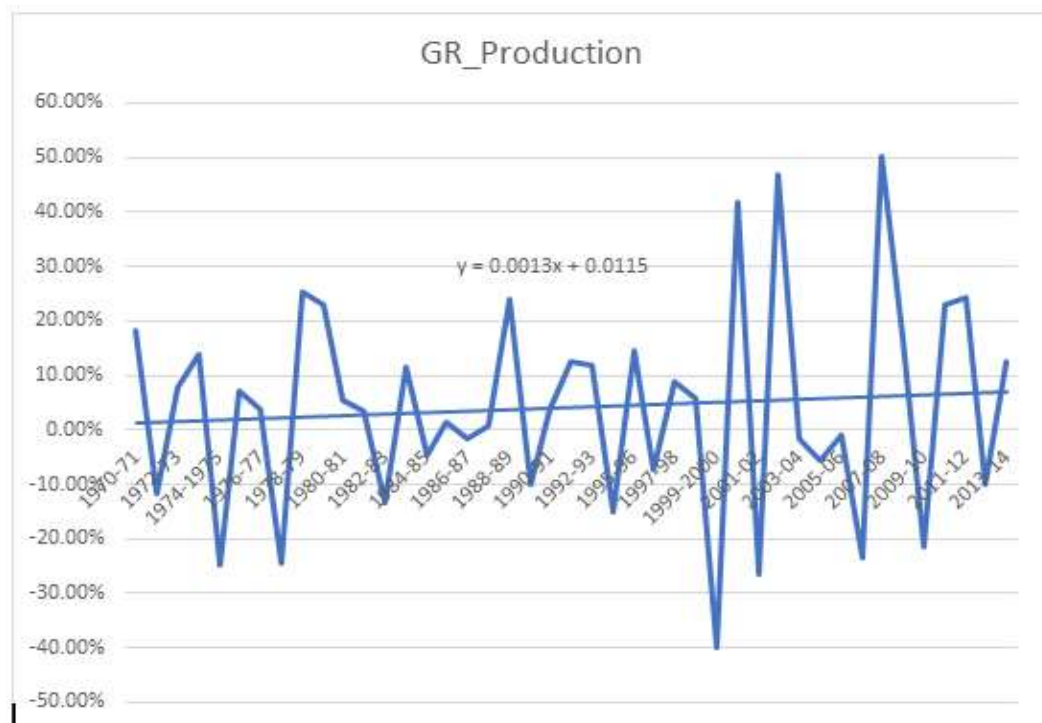
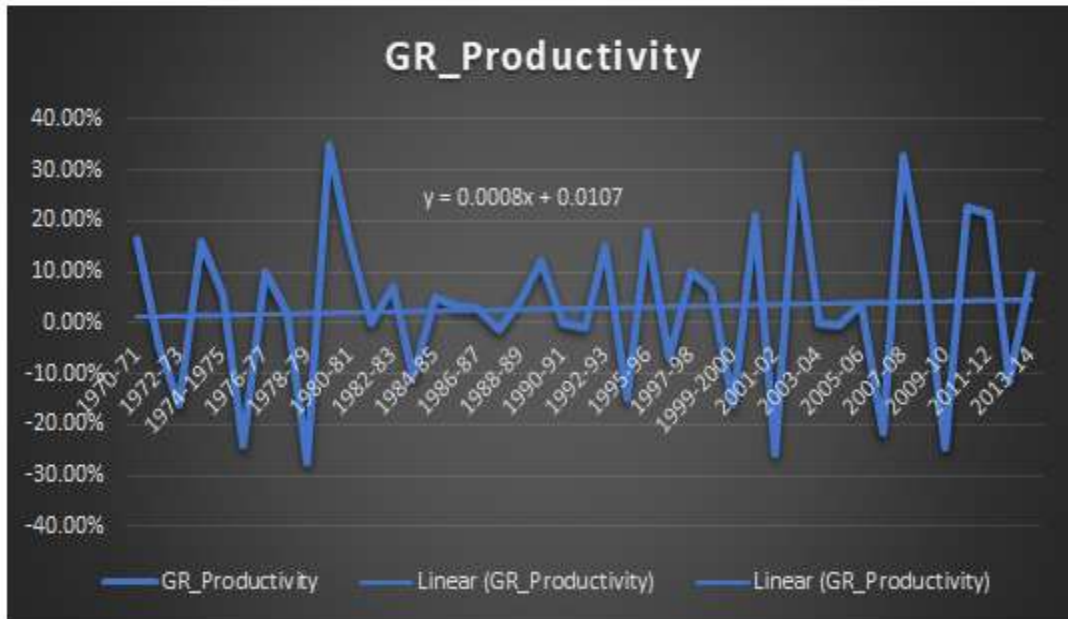


Growth rate of pulses production and productivity in Madhya Pradesh: in the chart shows growth rate of production and productivity of pulses in Madhya Pradesh. Pulses production growth rate 18.15% in the year 1971-72, -10.02% in 1990-91 -39.80% in 2000-01 and 12.49 % in 2014-15. In order to productivity growth rate 15.99% in the year of 1971-72, 12.14% in the year of 1990-91, -16.45% in the year of 2000-01 and 9.27% in the year of 2014-15. After analyzing the data of growth rate over the period of time we find that pulses production growth rate in Madhya Pradesh can be negative in specific years but still it has performed well comparatively. negative growth rate can be caused of lack of power supply, change the cropping pattern, lack of market information, lack of high yielding varieties seeds, lack of infrastructure and transportation also. Productivity growth rate in the most of the years remains positive as per reported data.to increase the pulses productivity due to increase the area under irrigation, technological and innovative market practices and, level of awareness. After analyzing the chart, we find that production and productivity growth rate trend line are irregular increase trend over the period of time. The equation for trend line of production and productivity growth rate are given below-

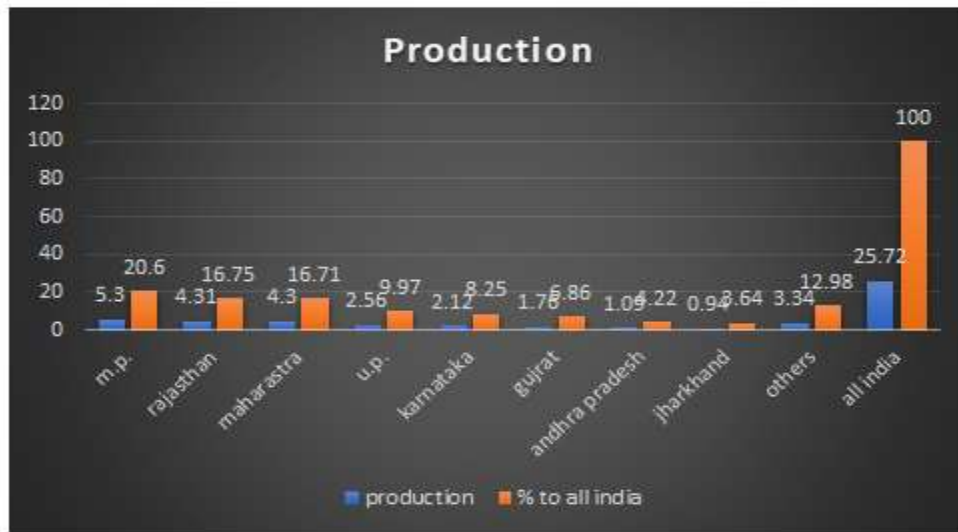
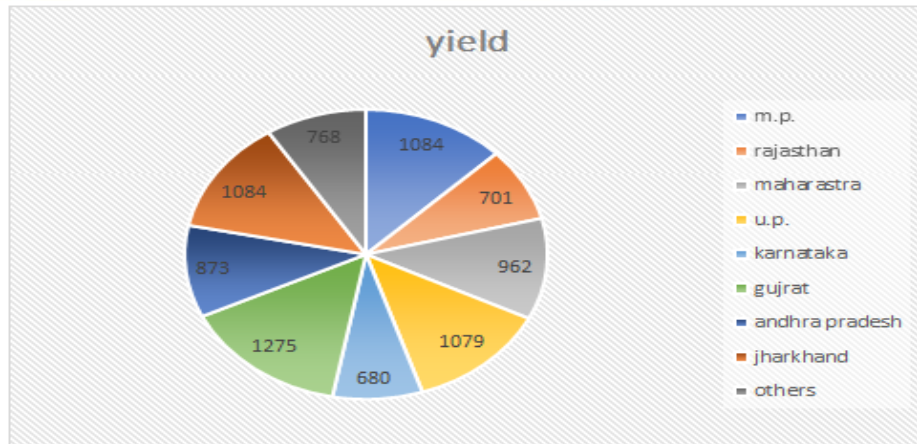
$$Y=a+bx$$

Where, y is the dependent variable showing growth rate of production and productivity separately. X is the independent variable showing period of time. B is the rate of change and a is the intercept of y. chart shows the positive slope of the trend line of production and productivity growth rate in Madhya Pradesh over the period of time. In the view of trend line equation, the trend line is upward slopping with the slope magnitude of 0.0008(productivity growth rate) and 0.0013(production growth rate). It reflects pulses sector in Madhya Pradesh slightly moved right direction during last decades by registering positive growth in production and productivity. To increase the production of pulses the national food security mission (NFSM) pulse programme is being implemented in 644 districts and 28 states with UTS JK and Ladakh. under NFSM programme there govt provides support for breeder seed production of pulses and seed hubs have been created at ICAR, state agriculture universities and KVK for increasing certified seeds

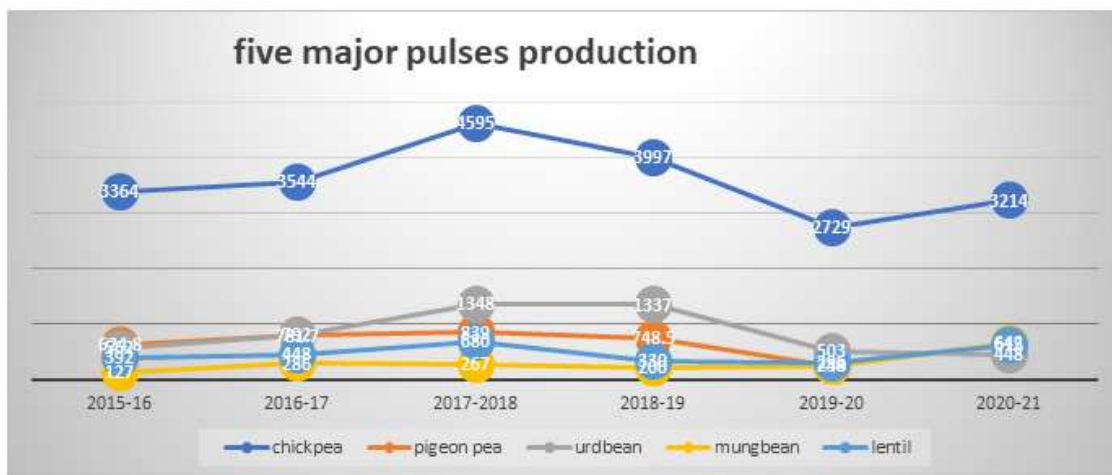
production of pulses. New scheme intercropping of pulses with sugarcane was implemented in M.P. also. Apart from this, special action plan was implemented during 2019-20 for increasing pulses productivity under NFSM.

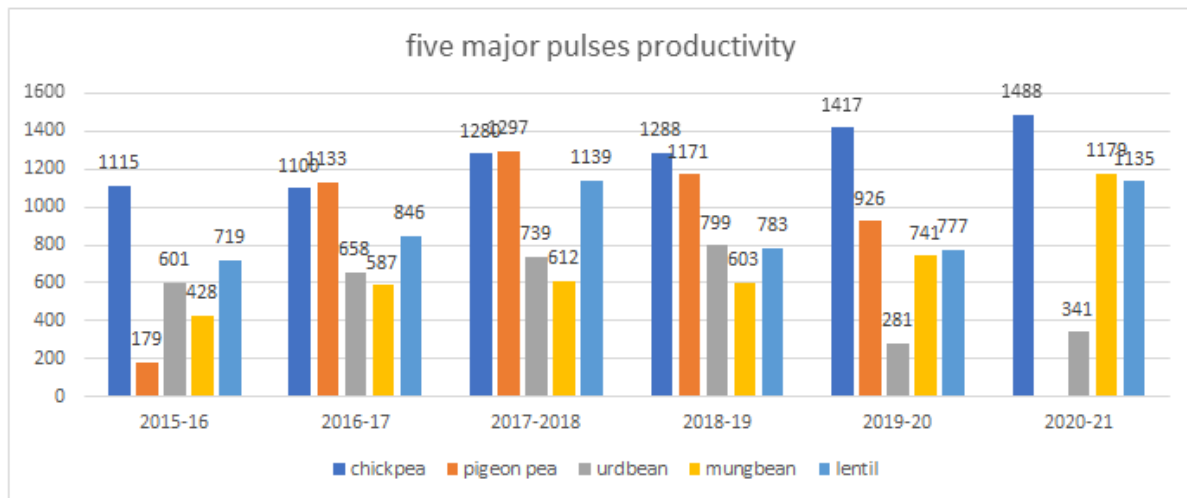


State wise production and productivity: in this chart clearly shows the pulses production in Madhya Pradesh stood rank first and in the productivity point of view Madhya Pradesh ranked second after Gujarat.



Major pulses production and productivity in Madhya Pradesh: in our study to account five major pulses in Madhya Pradesh such as chickpea, mung bean, urd bean, pigeon pea and lentil.in which chickpea production and productivity is highest.





Constraints in pulses production: The non-availability of seeds of high-yielding varieties in the desired quantities is perhaps one of the major constraints in the expansion of pulses. Although more than 200 improved varieties of pulses have been released since 1970's, its impact hardly get reflected in the yield. The rate of growth of yield of pulses was 0.03 percent over the past four decades. It is apparent that the distortion in fertilizer subsidy / pricing policy making the phosphatic and potassic fertilizer more-costly relative to the nitrogenous fertilizer also contributed to the adverse impact on the growth of pulse crops. In pulses there are a number of diseases and insect pests which cause heavy losses resulting in poor production. Furthermore, there is hardly any visible technological change in pulse farming in the country. This clearly shows that technological stagnation is primarily responsible for the backwardness of pulses not only in Madhya Pradesh but in the country as a whole. Agricultural markets in Madhya Pradesh could not be termed efficient as the price differentials over different locations exceeded the transportation costs. Farmers generally sell their pulse crops in the village itself, in the weekly markets (hats) or in regulated markets (mandis). Only large quantities are sold in the mandi. About 75 percent of the produce is marketed and the rest is retained by the producers for their own consumption, etc.

Conclusion and policy recommendation: the above study is tried to attempt almost every aspect of pulses production in Madhya Pradesh. The study is done thoroughly and find that pulses production journey from 1970-71 with 1991.6 thousand tonnes to 2014-15 with 5224.2 thousand tonnes and in order to productivity from 469 kg/ha in 1970-71 to 941 kg/h in 2014-15. State wise analysis of production and productivity of pulses in Madhya Pradesh we find that M.P.stood rank first in terms of production with 20.6 thousand tonnes and in the productivity stood rank second with 1084 kg/ha after the Gujarat. crop wise analysis reflects that chickpea production and productivity are highest during last five years followed by urd bean, pigeon pea, mung bean and lentil. But in last two- three years mung bean and lentil performing well comparatively. With the help of the above study, following policy recommendations are given.

- To increase level of awareness about various initiatives of the government to enhance production of pulses.



- To increase the volume of storage capacity because most of the storage done by farmers at the farm level only.
- To provide the adequate level of regular power supply.
- To provide certified seeds and fertilizers to farmers through proper channel.

References:

- Engle R.F. & and granger, C.W.J. 1987. Co integration And Error Correction: Representation, Estimation and Testing, *Econometrica*, 55, 251-276.
- Jha,R., Murthy, M.V.B., Nagrajan, H.K., & SETH,A.K.1997. Market Integration in Indian Agriculture, *Economic Systems*, 21, 217-234.
- Ghosh M. 2000, Co integration test and Spatial Integration of rice Markets in India, *Indian Journal of Agricultural Economics*, 55, 616-626.
- Reddy A., Amarender2004, Consumption Pattern Trade and Production Potential of Pulses, *Economic and Political Weekly*, 39.4854-4860.
- Anil Kumar Singh, SS Singh (2015), Pulses Production in India: Present Status, Bottleneck and Way Forward. *Journal of AgriSearch* 2(2), 75-83.
- <https://iipr.icar.gov.in/>
- Agriculture statistics at a glance (2021), department of agriculture and farmers welfare, department of statistics and economics.
- Shrivastava A. And Awasthi,p.k. 1(992)growth of pulses in Madhya Pradesh .India journal of pulses research ,5(1):109 -111.
- Sodhiya H.C. (1989). Growth trend in area production and productivity of cereals pulses and oil seeds in Sagar division Madhya Pradesh economic affairs Calcutta, 34(2):112-114.