

# International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452

Maths 2023; SP-8(6): 287-289

© 2023 Stats & Maths

<https://www.mathsjournal.com>

Received: 14-06-2023

Accepted: 15-07-2023

**Ajay Singh Tomar**

Research Scholar, Mansarovar  
Global University, Bhopal,  
Madhya Pradesh, India

**Dr. Vijay Kumar**

Former Professor IIFM, Bhopal,  
Madhya Pradesh, India

**Pathade Kaveri Laxman**

Research Scholar, Mansarovar  
Global University, Bhopal,  
Madhya Pradesh, India

**Corresponding Author:**

**Ajay Singh Tomar**

Research Scholar, Mansarovar  
Global University, Bhopal,  
Madhya Pradesh, India

## Changing Scenerio in area and production of gram over three decades in agroclimatic zones in Madhya Pradesh & its implications

**Ajay Singh Tomar, Dr. Vijay Kumar and Pathade Kaveri Laxman**

### Abstract

An attempt has been done in this research paper to assess the changes in Area and Production of gram over three decades from 1989-90 to 2019-20 and also its implications(s). It has been found that there has been significant changes but it is quite different in different agroclimatic zones. On an average the major change has taken place in zone 5th which comprises of districts Bhopal, Vidisha, Rajgarh, Sagar, Guna + Ashoknagar, Damoh, Raisen and Sehore whereas changes are minor in Chambal region districts Bind, Gwalior, Morena + Seopur and Shivpuri. Hence govt has to plan for the growth of gram area and production separately for different agroclimatic zones.

**Keywords:** Gram, area, production, absolute change, relative change, agroclimatic zones

### Introduction

India is the Second largest producer of pulses in the world. China and India these two countries together produce about two third of the total world pulses production, Pulses constitute an important and cheapest source of protein in our country, where other items meeting requirement are virtually beyond the reach of an average Indian. The Majority of Indian population being vegetarian, these pulses are widely accepted as an important item of food in practically every part of the country.

Pulses have an important place in the farming system of the country. They are next only to cereals in respect to acreage. About 239221.80 thousand hectares are covered with different pulses in the different seasons, which accounts for almost 22% of the total area under food grain. However, it has been rather observed that the growth in acreage and production has been rather unsteadily.

India is a popular country, where plants are mostly the major source of proteins for the people. Pulses from an important group of edible legumes are the cheapest source of proteins (20-30%) which is two third time more than that of the cereals. The Protein rich grain legumes have a special importance to millions of vegetarian people in the country. It is a known fact that the paucity of protein diet, results in malnutrition of a sizeable section of the people in India.

It is Paradoxical that pulses which have been since long time and which form an important part of our dietary habits are today in short supply, therefore their prices always increase almost to alarming proportions with the increasing demand. Hence the crisis of the pulses has frequently formed a subject to hot discussion and savers repeatedly enhance even in the national parliament, However with the increase in population the availability of pulses per capita has progressively declined from 65.0 gram in the second plan period to 39.5 gram in the fifth plan period Therefore the availability of protein per capita will not increase more than 62.70 gram, by end of century even after all best efforts.

Although the production of a dynamic system like agriculture cannot be rigid and fixed quantity consequently the yield levels, have remained static with no sign of constant increase and decrease in the past decades. Several factors have been assigned for such low productions *viz.*, the pulses are grown under rainfed conditions on neglected and marginal land thus hardly enjoyed the inputs or irrigation and fertilization.

The grain legumes have also remained neglected by breeders till recent past. The Majority of pulses grown are traditional local cultivars which are low yielder and susceptible to diseases and pest. Almost no genetic improvement has been made as they have never been so remunerative and protein needs were not realized other factors like weather, intricate insect pest diseases and their control, policies etc prevailing at a given point of time govern the production of pulses.

Madhya Pradesh and Chhattisgarh are important pulses growing states in the country rating first in term of area and production and tenth in terms of productivity. The Share of Madhya Pradesh and Chhattisgarh in total food grain over the year registered a declining trend.

The Overall productivity of pulses In Madhya Pradesh is quite low and has remained almost stagnant during the last two decades and then productivity has been lower as compared to all India level. In various studies the average yield of gram and tur was 646 kg/ha and 924 kg/ha respectively and in aggregate, the productivity of pulses in Madhya Pradesh was only 534 kg/ha which is lower than the other pulses growing states like Gujarat, Kerala Bihar, Jammu and Kashmir, Orissa, Punjab, West Bengal and Utter Pradesh. A part of that the yield of Madhya Pradesh is even lower than the all India average i.e. 541 kg/ha.

The production of pigeon pea in the state was commendable, but along with the production and productivity of gram, there was also a decrease in the area. The area under gram was 31.60 lakh hectares in the year 2013-14 and it decreased by 10 percent in the year 2014-15. Compared to the year 2013-14, there was a decrease of 10 percent and 0.5 percent in the production and productivity of gram in the year 2014-15 respectively. In the year 2014-15, the production of gram was about 29.64 lakh tonnes at the rate of 10.30 quintals per hectare.

In view of the above it can very well be concluded that there is need as well as scope to raise the level of production of Gram by raising the area as well as production Gram can perform better in comparison to other pulse crops since it needs comparatively less water and also in an average quality of soil from the angle of texture & structure both. But this is only possible only where farmer are encouraged to raise the production by enlarging the area under cultivation of Gram of a better improved variety.

Keeping in mind the above this study has been conducted to assess the changes in terms of direction and magnitude over 3 decades in Area and Production of gram in agroclimatic zones of Madhya Pradesh so that looking to these changes in past 3 decades, Govt (State/Central) can plan, programme and execute the course of action to boost up the area and production of Gram in general in country and state of Madhya Pradesh in its all agro climatic zones in particular with an special attention in those agro climatic zones where there is decline in area and production of Gram. Absolute and Relative Changes have been calculated as given below:-

### Absolute Change

Absolute change is one of the methods of studying comparison in to changes over time/region. The absolute change will be worked out for area and production, by taking the average of base years (Av. of 3 years) and the average of last 3 years as current years.

$$\text{Absolute Change} = Y_n - Y_o$$

Where Y = Area/Production

n = average of last 3 year (Current Year)

o = Average of beginning 3 years

### Relative Change

Relative Change will be worked out by the method given below which gives a better comparison analysis.

$$\text{Relative Change} = \frac{Y_n - Y_o}{Y_o} \times 100$$

The findings have been exhibited here as given below:-

**Table 1:** Absolute and Relative changes in Area under Gram in three decades (from 1989-90 year to 2019-20 years) in agroclimatic zones of Madhya Pradesh.

Zones	Absolute change (in hectare)	Relative change (in %)
1	5068.0	134.9
2	476.0	2.7
3	76496.0	341.1
4	-97636.0	-47.3
5	-159723.2	-13.6
6	-39956.0	-37.5
7	34384.0	77.4
8	-63476.0	-20.1
9	46312	18.2
10	370801.2	103.0
11	12348.0	84.6

In case of Gram the highest figure of absolute change in Area is 370801.2 hectare in zone 10th (comprising of district Khargone + Badwani, Dewas, Dhar, Mandsaur + Neemuch, Indore, Ratlam and Shajapur + Agarmalwa) and the lowest is -159723.2 i.e decline in Area by 159723.2 hectares in zone 5th (comprising of district Bhopal, Vidisha, Rajgarh, Sagar, Guna + Ashoknagar, Damoh, Raisen and Sehore).

In case of Gram, the highest figure of Relative Change in Area is 341.1% in zone 3rd (comprising of district Betul and Chhindwara) and the lowest is -47.3% i.e. decline in the area (in terms of Relative Change) is 47.3% in zone 4th (comprising of district Bhind, Gwalior, Morena+Seopur and Shivpuri).

**Table 2:** Absolute and Relative changes in Production (tonnes) of Gram in three decades (from 1989-90 year to 2019-20 years) in agroclimatic zones of Madhya Pradesh.

Zones	Absolute change (in tonnes)	Relative change (in %)
1	4872.0	171.1
2	-12339.0	-100.0
3	63644.0	348.6
4	-23520.0	-14.4
5	253895.6	29.3
6	133728.0	310.6
7	12320.0	47.0
8	840.0	0.3
9	120428.0	88.1
10	189817.6	36.8
11	14616.0	359.6

In case of Gram the highest figure of Absolute Change in Production is 253895.6 tonnes in zone 5th (comprising of district Bhopal, Vidisha, Rajgarh, Sagar, Guna+Ashoknagar, Damoh, Raisen and Sehore) and the lowest is -23520 tonnes i.e decline in production by 23520 tonnes in zone 4th (comprising of district Bhind, Gwalior, Morena+Seopur and Shivpuri).

Whereas the highest figure of Relative Change in Production of this crop is 359.6% in zone 11th (comprising of district Jhabua + Alirajpur) and the lowest is -100 means decline by 100% in zone 2<sup>nd</sup> (comprising of district Khandwa + Burhanpur).

### Conclusion & Policy implication

No doubt the Area and Production of Gram has increased (Relative or Absolute) in general. In all the agroclimatic zones in MP area has increased except 4 zones out of 11. But in terms of Production also it has increased (Absolute or Relative) in all the agroclimatic zones of MP except only 2 zones out of 11.

From the above, this can very well be concluded that there is positive signal of response for raising the Area and Production of Gram if the field research work is concluded by the concerned institutions on Gram cultivation and findings are put on the trial on research field & then transferred to the farmers through various extension & communications methods, programs including effective call centres, exhibitions in fields, Kisan Mela, literature distributions, conduct of farmers training programmes efficiently and effectively well in time etc alongwith various subsidy programmes on inputs purchasing/procurement (Including diesel subsidy) and well established systems assuring purchasing of the crop on minimum support price; (MSP as per Dr. M.S. Swaminathan committee) can also be initiated. Formation of FPOs, may also be done on massive scale ensuring its functionality and effectiveness.

### References

1. [https://aps.dac.gov.in/APY/Public\\_Report1.aspx](https://aps.dac.gov.in/APY/Public_Report1.aspx)
2. [https://en.wikipedia.org/wiki/Madhya\\_Pradesh](https://en.wikipedia.org/wiki/Madhya_Pradesh)
3. [https://link.springer.com/chapter/10.1007/978-981-15-9335-2\\_6](https://link.springer.com/chapter/10.1007/978-981-15-9335-2_6)
4. <https://www.krishakjagat.org/uncategorized/मध्यप्रदेश-में-दलहन-का-वर्ष/>
5. Directorate of Economics and Statistics, Government of India.
6. Economic Survey of M.P. 2020-21
7. <https://farmer.gov.in>