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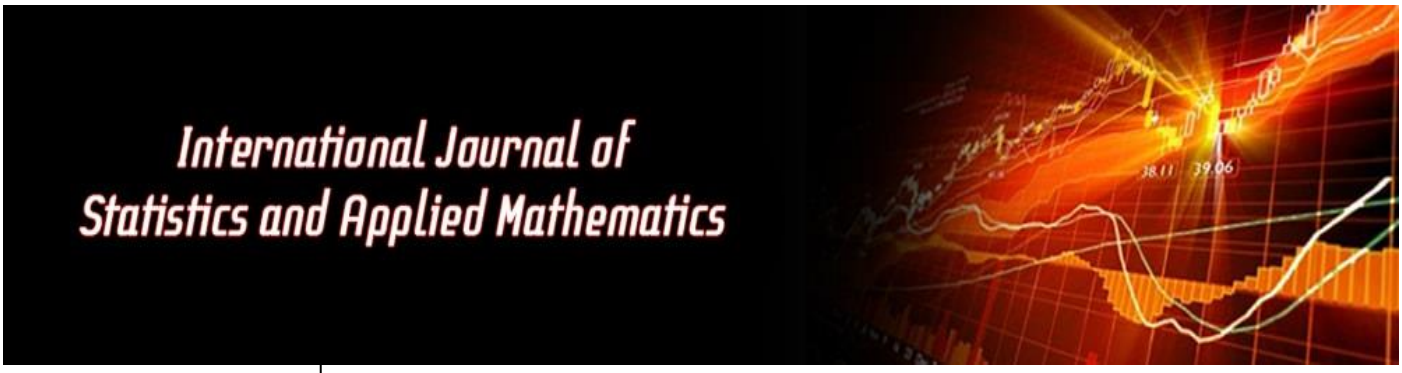

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Ajay Singh Tomar
Research Scholar, Mansarovar Global University, Bhopal, Madhya Pradesh, India

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

Impact of minimum support price of gram on its production in agroclimatic zones of Madhya Pradesh

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

Abstract
This paper is an attempt to assess the impact of minimum support price of Gram production in different agro climatic zones of Madhya Pradesh using three decade time shines data (annual figure) from 1989-90 to 2019-20 on minimum support price and production of Gram. This has been done using Regression analysis where dependent variable is production of gram and independent variable is minimum support price announced by the government. It has been found that these is definite impact of minimum support price on the production of gram but it varies in different agroclimatic zones. There is no impact in only 2 zones (zone 2 & 4) comprising of distt. Khandwa + Burhanpur and Chambal districts - Bhind, Gwalior, Morena & Sheopur and Sivpuri. Highest impact is in zone 5 comprising of districts - Bhopal, Vidisha, Rajgarh, Sagar, Damoh, Guna + Ashoknagar, Raisen and Sehore. In view of this finding it is suggested for the govt. to draft & execute plan differently for different zones while deciding minimum support price and other support services to the farmers for raising production of Gram.

Keywords: Gram, minimum support price, regression analysis, Agrlclimatic zones, production of gram

Introduction
India is the Second largest producer of pulses in the word. 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 when farmer are encouraged to raise the production by enlarging the area under cultivation of Gram of a better improved variety.

Keeping in mind the need & scope to do so, the minimum support price scheme as an incentive to the farmer was launched by the govt. long book, but what has been its impact in general and in Madhya Pradesh in particular is not known to us. This study is an attempt to find the impact of Minimum Support Price on the production of Gram in agroclimatic zones of Madhya Pradesh. The agroclimatic zones of Madhya Pradesh constitutes as given below.

Table 1: Agro-climatic zones of Madhya Pradesh

Zone	Zone Name	Zone District
ZONE-1	Chhattisgarh Plains	Balaghat
ZONE-2	Nimar Plains	Khandwa + Burhanpur
ZONE-3	Satpura Plateau	Betul, Chhindwara
ZONE-4	Gird Region	Bhind, Gwalior, Morena + Seopur, Shivpuri
ZONE-5	Vindhya Plateau	Bhopal, Vidisha, Rajgarh, Sagar, Guna + Ashoknagar, Damoh, Raisen, Sehore
ZONE-6	Bundelkhand	Tikamgarh, Niwari, Chhatarpur, Datia
ZONE-7	Northern Hill Region of Chhattisgarh	Shahdol + Umaria + Anuppur, Sidhi + Singrouli, Mandla + Dindori
ZONE-8	Central Narmada Valley	Jabalpur + Katni, Narsinghpur, Narmadapuram + Harda
ZONE-9	Kymore Plateau & Satpura Hills	Panna, Rewa, Satna, Seoni
ZONE-10	Malwa Plateau	Khargone + Badwani, Dewas, Dhar, Mandsaur + Neemuch, Indore, Ratlam, Shajapur + Agarmalwa
ZONE-11	Jhabua Hills	Jhabua + Alirajpur

Thirty years secondary data (from 1989-90 to 2019-20) on production (in tonnes) of Gram was taken for all the agroclimatic zones of Madhya Pradesh and also the minimum support price of Gram for the same years was taken into calculation and using the standard regression analysis technique the regression functions were calculated where *x* has been the minimum support price and *y* has been the production of Gram.

Table 2: The findings have been presented as given below:-

Zone	Crop Gram
1	$y = 3552.023 + 1.154x$, $R^2=0.871$
2	$y = 10907.492 + (-2.945)\ x$, $R^2=0.852$
3	$y = 24853.220 + 15.076x$, $R^2=0.871$
4	$y = 161323.960 + (-5.572)\ x$, $R^2=0.871$
5	$y = 893130.756 + 60.144x$, $R^2=0.871$
6	$y = 56917.998 + 31.678\ x$, $R^2=0.871$
7	$y = 27491.068 + 2.918\ x$, $R^2=0.871$
8	$y=318528.073 + .199x$, $R^2=0.871$
9	$y = 149253.344 + 28.527\ x$, $R^2=0.871$
10	$y = 535646.103 + 44.965\ x$, $R^2=0.871$
11	$y=5579.068 + 3.462x$, $R^2=0.871$

In case of Gram in all zones except 2 & 4, there is positive impact of MSP on the production and the highest is in Zone 5 (regression coefficient 60.144, comprising of district Bhopal, Vidisha, Rajgarh, Sagar, Guna + Ashoknagar, Damoh, Raisen, and Sehore) and the lowest in Zone 8 (coefficient of regression 0.199 comprising of district Jabalpur+Katni, Narsinghpur and Narmadapuram + Harda).

Conclusion & Policy implication

In Madhya Pradesh there is positive impact of minimum support price on the production of Gram in general since out of 11 agroclimatic zones in 9 the impact is positive and is very significant as values of R^2 in all regression functions confirms the very good fitness of the function and also in term of positive values of regression coefficients in various agro climatic zones.

In view of this finding, it is recommended that govt. must not only continue with the minimum support price programme but also raise the minimum support price of the Gram substantially keeping in mind the calculation of cost of cultivation and minimum support price as per Dr. M.S. Swaminathan committee. It is suggested that the periodic hike

in the minimum support price of Gram must be at least 25 percent above the cost of cultivation to attract the pulse growing farmers to enhance the area, production and productivity of Gram by adopting latest recommended technology package (Variety, cultivation methods etc) of cultivation for the Gram.

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