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Regression Analysis of Pulses in Madhya Pradesh

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ABSTRACT:

Agriculture is being an important sector of state economy; the impact of its performance is not confined to agriculture alone but is felt in all sectors of economy. Madhya Pradesh has been major pulse producing state in India. The primary purpose of this study is to diagnose of the dimensions and magnitude of the problem inhabiting production and productivity of pulses in chief pulse producing state. A retrospect of pulse production at the all- India level reveals that the area under pulses as a proportion of total cropped area started falling even in pre-HYV era.

Key words: Agriculture, production, area, productivity, pulses

INTRODUCTION:

The determinates of pulses calculated at the state and district level for comparison of pre and post green revolution period clearly indicates regional disparities not only, with reference to individual indicators, but aggregate development sufficient reasoning has been provided, in the earlier discussion, for the low level and subsistence agriculture in the state. The agriculture development in general has direct or indirect relationship with social, economic, demographic and institutional factors. The scope of the study limits itself, to explore the relationship in terms of agricultural indices alone. It has been referred and many times taken as determinants of pulses and considered as a pre requisite for agriculture development. The agricultural production and productivity find strongest bearing of physical determinants in which rainfall, land holding, irrigation, fertilizer and agriculture machinery. Power, as necessary input is used in different agricultural operations. The other type of determents of agriculture development includes the technical input and mechanization of agriculture. In this case, the tractors and the pump sets play an important role.

DATA METHODOLOGY:

The study is based on secondary data. The secondary data related with agriculture are acquired state statistical organization and agriculture at a glance, of agricultural department of Madhya Pradesh. To explain the condition of agriculture, large number of independence variables consisting of area, production and yield of crops, fertilizers and irrigation etc. have collected from various sources.

REVIEW OF LITERATURE:

Kahlen et al (1968) studied the growth performance of the selected crops in Punjab for period, 1950-51 to 1965-66. they estimated crop wise and district wise growth rates. **Reddy (1978)** made a detailed exposition about the various types of functional forms commonly employed to measure agricultural determinants by the use of statistics parameters. **Singh and Gangawar (1986)** studied the interaction effects between yield, price and area on the value of pulse production in Haryana by using decomposition 29 models. The price effect was so powerful in case of all the pulse crops that it had offset the negative effect of area and interaction.

Crop Area Response:

The responsiveness of area under gram taken together for the analysis it reveals that land use policy variable and technology affect the production of gram. The three variables that is harvest price, consumption of fertilizer and quality seeds comes out to be explanatory variables for this multiple regression analysis.

Table: 1.1

Multivariate regression analysis of area under pulses (Madhya Pradesh)

DEPENDENT VARIABLE	α	Fertilizer consumption	Hvy coverage	Irrigate area	Electric pumps	Diesel pumps	R ²
GRAM	0.21	0.09	-0.13	-0.53	0.08	21.13	0.74
TUR	-0.01	-0.01	-0.02	-0.04	0.00	2.27	0.88
URAD	0.00	0.0	0.00	-0.02	0.00	1.06	0.87
MOONG	0.00	-0.01	-0.01	-0.07	0.00	4.19	0.39
MASOOR	-0.04	0.03	0.00	0.03	-0.01	0.47	0.88
TEORA	0.04	-0.03	0.08	0.09	0.01	1.64	0.85
PEAS	-0.01	0.02	-0.01	0.04	-0.01	-0.50	0.86
TOTAL PULSES	-0.19	0.36	-0.04	-0.32	0.06	21.35	0.66

SOURCE: Self calculated from original data

The multiple regression equation is estimated to find collective explanation to area under Tur. When variable regressed together only fertilizer consumption emerges as the explanatory variable. Fertilizer consumption has the positive bearing on the area under cultivation of the Tur with 5 per cent level of significance.

Multiple regression function of the area under, Urad provides the coefficients, which are not statistically significant. Though, the coefficient of determination comes out to be high because of consistency of decline in area over the years.

Multiple regression of the area under Moong provides coefficients, which are not statistically significant. Moong is not growing as much as other pulse crop in state as well as district.

Multiple regressions of area under Masoor also reveal similar result as that of the bivariate regression coefficients. Only the technological coefficients are positive i.e., high yielding variety seeds is statistically significant at 5 per cent level of significance.

Teora is also a kind of pulse crop of state. The results of the regression analysis indicate that the area under Teora respond negatively with all agricultural determinates such as quality seeds, irrigation and agricultural machinery.

Area under total pulses does not show any of the agricultural variables as well as technological factors. The regression coefficients that is, the elasticity of area under total pulses is almost zero indicating that there is no relationship between area assign to total pulses. This is mainly because the returns on per unit area are the lowest in agricultural sector.

Crop Production Response:

When these variables taken together for the analysis it reveals that land use policy variable and technology affect the production of gram. The three variables that is harvest price, consumption of fertilizer and quality seeds comes out to be explanatory variables for this multiple regression analysis.

When these variables are taking together for the analysis the result shows that technology and price gives better returns. Electricity consumption and harvest price comes out to be the explanatory variables in this analysis. Both the variables have positive impact on the production of Tur

TABLE: 1.2

Multivariate regression analysis of production of pulses (Madhya Pradesh)

DEPENDENT VARIABLE	α	Fertilizer consumption	Hvy coverage	Irrigated area	Electric pumps	Diesel pumps	R ²
GRAM	0.21	0.18	-0.38	0.18	0.06	5.45	0.63
TUR	-0.01	0.04	-0.03	-0.10	0.01	3.36	0.67
URAD	0.00	-0.01	0.00	-0.01	0.00	1.16	0.28
MOONG	0.00	0.00	0.00	-0.01	0.00	0.36	0.66
MASOOR	-0.04	0.02	0.01	-0.02	0.00	0.62	0.67

TEORA	0.02	0.00	0.09	-0.11	0.01	2.80	0.86
PEAS	0.00	0.01	-0.01	0.01	0.00	-0.24	0.84
TOTAL PULSES	-0.11	0.41	-0.28	0.25	0.03	3.12	0.60

SOURCE: Self calculated from original data

Multiple regression function of the production of Urad provides the coefficients, which are not statistically significant. Though, the coefficient of determination comes out to be high because of consistency of decline in area over the years

Multiple regressions carried out for the production of moong which reveals that all the variables are negatively associated with the production of moong and gives a very high regression coefficient but none of these are statistically significant

Multiple regressions also reveal similar result as that of the bivariate regression coefficients. Only the technological coefficients are positive i.e., high yielding variety seeds is statistically significant.

The multiple regression equation is estimated to find collective explanation to production of Teora. When variable regressed together only fertilizer consumption emerges as the explanatory variable.

Multiple regressions is carried out for the production of total pulses which reveals that although all the variables are positively associated with production of total pulses and gives a very high regression coefficient but none of these are statistically significant

Crop Yield Response:

The yield of Tur shows positive relation between Electric pumps and consumption of fertilizer. This is because in the rural state and particularly in agriculture sector electric pumps used for irrigation and further it enhanced the fertility of the crop. Quality seeds are also emerged explanatory variable.

TABLE: 1.3

Multivariate regression analysis of yield of pulses (Madhya Pradesh)

DEPENDENT VARIABLE	α	Fertilizer consumption	Hvy coverage	Irrigated area	Electric pumps	Diesel pumps	R ²
GRAM	0.99	8.53 (2.17)	-22.49 (-0.86)	0.01 (20.0)	55.61 (0.84)	-1.50 (-5.57)	0.48
TUR	17.10	23.69 (0.50)	-6.84 (-1.63)	-0.08 (-1.17)	-30.79 (-1.21)	5.42 (0.96)	0.62
URAD	-6.62	1.66 (2.31)	2.88 (1.75)	-7.43 (-1.68)	1.19 (1.11)	404.40 (0.50)	0.16
MOONG	1.25	-1.63 (-2.44)	2.24 (2.33)	0.65 (19.90)	-1.57 (-0.87)	297.74 (0.70)	0.39
MASOOR	3.09	5.70 (0.69)	-4.89 (-1.05)	-3.31 (-3.87)	0.72 (1.89)	469.49 (0.44)	0.38
TEORA	27.78	39.69 (0.49)	0.73 (0.03)	-95.76 (-0.66)	1.18 (5.63)	1949.63 (0.52)	0.27
PEAS	-2.96	6.87 (0.54)	-11.78 (-0.41)	7.28 (1.64)	-1.56 (-0.81)	222.59 (0.87)	0.74

SOURCE: Self calculated from original data

The yield of Urad is almost constant and had not increased at desired level because of late introducing the high yielding seeds for these types of crops. To analyzing the responsiveness of the factors to the yield of Urad technological variables are regressed and are found to have the significant relationship with the yield.

Moong yield, though quite low but the regression coefficients show that it has not significant relationship with all the technological variables. All coefficients are statistically significant other than fertilizer consumption. Fertilizer consumption has positive bearing and significant relationship to enhance the productivity of moong in state.

Multiple regressions of the yield of Masoor also reveal similar result as that of the bivariate regression coefficients. Only the technological coefficients are positive i.e., high yielding variety seeds is statistically significant.

The multiple regression equation is estimated to find collective explanation to production of Teora. When variable regressed together only fertilizer consumption emerges as the explanatory variable.

This analysis of yield of total pulses reveals that it responds to only irrigation network. Only three variables that is fertilizer consumption, tractors and diesel pumps are significantly related at 1 per cent level of significance but coefficient determination are very for three variables.

CONCLUSION:

The study of the determinants and correlates of area and productivity of pulses in Madhya Pradesh has the elaborate analysis of basic parameters of area and productivity during pre and post green revolution period with assumptions that the agricultural sector has not been given the place as it desired. The determinants of pulse production during post green revolution period is observed in terms of income accrued output of agriculture for different crops, technological diffusion and food grains availability because the slower growth of these variables reflects neglect of the sector in terms of harvest price.

SUGGESTIONS:

The causes of concern about the agricultural condition in state have led to large number of scholars to suggest measures for overcome the stagnating condition and faster growth and development of agriculture. In this context a number of measures are suggested to improve the existing condition of agricultural sector.

- In this regard the first and for most suggestion comes that the investment in agriculture sector must be enhanced through the allocation of additional funds for creation of pulse production.
- The time and again revelation for withdrawal of subsidy from pulses is supposed to have an adverse impact on agricultural development, because still a large section of society depends on agriculture and majority of them fall under the category of small and marginal farmers.

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