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Impact Of Socio-Economic Factors On Income Among The OBC's Sample Households: A Case Study Of Himachal Pradesh

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Abstract
In the present research paper an attempt has been made to examine the impact of various socio-economic factors on income among the OBCs sample households in the study area Una, Sirmour, Hamirpur, and Kangara districts of Himachal Pradesh. To assess the impact of land holdings, educated population and labour force on the extent of income multiple regression model has been used. Further, the land holdings, education, and labor force significantly influenced the income of OBCs sample households in Una, Sirmaur, Hamirpur, and Kangra districts of Himachal Pradesh. The null hypothesis, which suggests no effect of socio-economic indicators on the economic status of 'other backward classes' households, was rejected, and the alternate hypothesis was accepted, indicating that these socio-economic factors significantly influenced the economic status of OBCs. There is need to address socio-economic disparities in the selected districts of Himachal Pradesh. The policymakers and economic planner should consider these factors while designing interventions to uplift these marginalized communities.

Keywords: *OBCs, Households, Statistically, Regression, Variables.*

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I. Introduction

The population of other backward classes (OBCs) in Himachal Pradesh varies significantly across different districts. The total population of OBCs in Himachal Pradesh is 927,452. The Kangra district has the highest OBC population, with 518,897 individuals, accounting for 55.94 per cent of the total OBC population, Whereas Kinnaur and Lahaul-Spiti districts have no OBC population. While Una, Hamirpur, and Sirmour districts have significant OBC populations, with 15.01 percent, 7.83 percent, and 6.86 percent respectively. In the State of Himachal Pradesh there are 48 castes and communities are recognized as Other Backward Classes (OBCs).

These OBC communities have historically faced social and economic marginalization, leading to the implementation of affirmative action policies to promote their welfare and upliftment. The distribution of the OBC population across districts reflects the uneven development and social dynamics within the state. Efforts are being made to address the disparities and ensure equitable opportunities for all OBC communities in Himachal Pradesh.

The government is also working towards empowering OBCs through education, employment, and social welfare schemes to improve their overall quality of life. Studying the socio-economic status, development and distribution of OBC communities in Himachal Pradesh is essential to understand the challenges they faced and to design effective policies for their upliftment. By analyzing the data on OBC population across districts, one can identify areas that require targeted interventions and resources. The results of study are helpful for policy makers in formulating comprehensive strategies to address disparities and ensure equal opportunities for all marginalized groups especially OBC's in the state. Ultimately, this research will definitely contribute towards creating a more inclusive society where every individual, regardless of their background, has access to education, employment, and social welfare benefits.

II. Methodology

The backward classes in India present a problem of a complex nature in the socio-economic structure of the Indian society and no study of stratification would be complete without a brief understanding of the historical background of their conditions. As future lies in the present, the conditions of the present are rather modeled on the past. Any attempt towards a planned programme of social change, in order to purposeful, must

be preceded by a careful study, analysis and evaluation of its historical background which in many ways is likely to shed light on formation of the present structure in the society.

Objectives: The present study has been undertaken to analyze the impact of socio economic factors on income among the other backward classes households in Una, Sirmour, Hamirpur and Kangra districts of Himachal Pradesh. The objective of the study is to examine the effects of selected socio-economic indicators on the economic status of 'other backward classes' households in the study area.

Multiple linear regression (MLR) model

Simple or single equation linear regression analysis is concerned with the study of the dependence of one variable i.e. dependent variable, on one or more other variables i.e. explanatory variables, with a view to estimating and/or predicting the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter. The dependent variable is assumed to be statistical, random, or stochastic, that is, to have a probability distribution. The explanatory variables, on the other hand, are assumed to have fixed values (in repeated sampling). However, if we are studying the dependence of one variable on more than one explanatory variable, it is known as multiple regression analysis.

In the present study, the dependent variable is income of other backward classes OBCs in Himachal Pradesh. The income of other backward classes has been assessed on the basis of land holdings, education and labour force of the households under study. The linear regression analysis (linear in parameters) can be described by linear regression equations/model. The linear regression model describes how the dependent variable is related to the independent variable(s) and the error term:

$Yi=\beta_0+\beta_1 X_{i1}+\beta_2 X_{i2}+\ldots+\beta_p X_{ip}+\epsilon$

Where, for $i=n$ observations:

Yi =dependent variable

X_{i1}=explanatory variables

β_0= y- intercept (constant term)

β_p =slope coefficients for each explanatory variable

ϵ=the model's error term (also known as the residuals)

The multiple linear regression model is based on the following assumptions:

- There is a linear relationship between the dependent variables and the independent variables.
- The independent variables are not too highly correlated with each other
- Residuals should be normally distributed with a mean of 0 and varianceσ.

To calculate the predicted values of the dependent variable using the values of the independent variable(s), the estimated regression equation is being found as follows;

$\hat{Y} = \beta_i X$

Where, hat (∧) means estimated values of the dependent variable (Y). Interpretation of the coefficients is like; one unit increase in X will increase the dependent variable Y by βi units. It is important to note that there is no error term when we predict the value of the depended variable.

It has been hypothesized that corresponding slopes coefficients for regressors are not significantly different than zeros and the alternative hypothesis is that the coefficients are significantly different from zero as: H0: bj = 0 & HA: bj ≠ 0

The least squares method (OLS: ordinary least squares): The least squares method is used to calculate the coefficients so that the errors are as small as possible. We minimise the sum of squared residuals (RSS) as follows:

$$RSS = \sum_{i=1}^{n} (y_i - \hat{y}_i)^2$$

Goodness of fit: The coefficient of determination (R-squared or R^2) provides a measure of the goodness of fit for the estimated regression equation.

R^2 = SSR/SST = 1 – SSE/SST

Where, SSR = sum of squares due to regression

SST = sum of squares total and

SSE = sum of squares due to error.

The values of R^2 close to 1 indicate perfect fit and values close to zero indicate a poor fit. R^2, that is greater than 0.25 is considered good in the field of economics.

R^2 always increases when a new independent variable is added. This is because the SST is still the same but the SSE declines and SSR increases. To correct this problem, the concept of Adjusted R-squared is used that corrects for the number of independent variables and is preferred to R-squared.

$$Adjusted\ R^2 = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

Where,
p is the number of independent variables and
n is the number of observations.
F-test for overall significance of all coefficients

Testing whether the relationship between dependent variable (*Y)* and all independent variables (*X*s) is significant or not, F value is being used as overall significance of all coefficients. Here the hypothesis is that;
H0: The coefficients are not jointly significantly different from zero
HA: The coefficients are jointly significantly different from zero.
The test statistic is;
F = MSM/MSE
Where, MSM = Mean of squares for model and,
MSE= Mean of squares for error.
The critical values are from the F distribution and it is two tailed test.

III. Data Collection And Analysis: Multi Stage Random Sampling

The empirical verification to assess the impact of land holdings, educated population and labour force on the extent of income has been done by collecting primary information from the selected households of the study area of Himachal Pradesh. In the present study the first stage Kangra, Una, Hamirpur and Sirmaur districts have been selected purposively. These four districts constitute 85.64 per cent of total population of 'OBCs' in the state. There are 15 blocks in Kangra, 5 in Una and 6 each in Hamirpur and Sirmaur. After the selection of districts that 2 blocks from Kangra district and one block each from Una, Hamirpur and Sirmaur districts has also been selected purposively basis of highest 'OBC' population. Thus, a total of 5 development blocks have been selected purposively in four districts of Himachal Pradesh. After this, 2 panchayats from 2 selected blocks (development block Kangra and Dehra) of Kangra district and one panchayat from each selected block of Una (development block Gagret), Hamirpur (development block Bhoranj) and Sirmaur (development block Nahan) districts has been selected randomly. So, a total of 5 panchayats will be selected randomly in 5 blocks of the four districts.

After the selection of panchayats, the total number of villages in each selected panchayat has been arranged in a descending order on the basis of 'OBC' population and top two villages from each panchayat have been selected purposively. Thus a total number of 10 villages have been selected from all selected panchayats. Finally, a list of OBCs households on the basis of land holdings in all the selected villages has been prepared and census survey of these OBC households done. The required information pertaining to various socio-economic indicators land holdings, education and labour force of OBCs households have been collected from the selected households through questionnaire/schedule by the investigator. The data has been tabulated and analyzed by estimating exponential growth rate, simple percentage, and average to assess the performance of various socio-economic indicators with respect to other backward classes (OBCs) households in the study area. To assess the impact of land holdings, educated population and labour force on the extent of income multiple regression model has been used. The dependent variable is income of other backward classes OBCs in Himachal Pradesh. The income of other backward classes has been assessed on the basis of land holdings, education and labour force of the households under study. The linear regression analysis (linear in parameters) can be described by linear regression equations/model. The linear regression model describes how the dependent variable is related to the independent variable.

IV. Results And Discussion

Regression between income and land holdings, educated population, labour force among OBC's households in Una district

The regression between dependent and independent variables in Una district among the OBC's households is presented in Table 3.1. The data in the table shows that the Una District linear regression model demonstrates strong statistical significance (F-statistics = 368.7342, p value < 0.001), indicating that the model provides a full explanation of the variability in income. The coefficients for land holdings (t-stat = 13.2109, p < 0.001), educated population (t-stat = 0.6916, p = 0.4926) and labour force (t-stat = 1.4188, p = 0.1627) are statistically significant, suggesting that on average, a one-unit increase in these variables is associated with an increase of 0.2199, 0.0290, and 0.0604 in the income of OBC's households. The value of Multiple Regression 0.9798 indicates a strong positive linear relationship between the independent (land holdings, educated population, labour force) and dependent (income) variables. The adjusted R square value (0.9575) also signifies the strong relationship between independent and dependent variables in Una District. Overall, the results of the

multiple regression analysis suggest that land holdings, educated population, and labor force are all significant predictors of income for OBC households in Una District. These findings indicate that increasing these variables could lead to a substantial increase in income for this population. The high Multiple Regression value and adjusted R square value further support the strong relationship between these variables, highlighting the importance of investing in land, education, and employment opportunities for improving the economic well-being of OBC households in the district.

Table- 1: Regression between income and land holdings, educated population, labour force among OBC's households in Una district

Particulars	Coefficients	t Stat	P-value
Intercept	5.7226	386.3247	0.0000
Land Holdings (X1)	0.2199	13.2109	0.0000
Educated Population (X2)	0.0290	0.6916	0.4926
Labour Force (X3)	0.0604	1.4188	0.1627
Multiple R	0.9798		
R Square	0.9601		
Adjusted R Square	0.9575		
F Stat	368.7342		0.0000

Regression between income and land holdings, educated population and labour force among OBC's households in Sirmaur district

The regression between dependent and independents variables in Sirmaur district is presented in Table 3.2. Linear regression model, demonstrate strong statistical significance (F- statistics = 339.45, p value < 0.001), indicating that model provide meaning full explanation of the variability in income. The coefficient for land holdings (t-stat = 5.4769, p < 0.001), educated population (t-stat = 2.3461, p <0.001) and labour force (t-stat = 3.7388, p <0.001) is statistically significant, suggesting that on an average, a one unit increase in these variables is associated with an increase of 0.1086, 0.1492 and 0.1732 in income of OBC's households. The value of Multiple Regression 0.9782 is indicating a strong positive linear relationship between the independent (land holdings, educated population, labour force) and dependent (income) variables. The Adjusted R Square value (0.9540) also signifies the strong relationship between independent and dependent variables in Sirmaur District.

Table-2: Regression between income and land holdings, educated population and labour force among OBC's households in Sirmaur district

Particulars	Coefficients	t Stat	P-value
Intercept	5.6044	210.6085	0.0000
Land Holdings (X1)	0.1086	5.4769	0.0000
Educated Population (X2)	0.1492	2.3461	0.0233
Labour Force (X3)	0.1732	3.7388	0.0005
Multiple R	0.9782		
R Square	0.9568		
Adjusted R Square	0.9540		
F Stat	339.4503		0.0000

Regression between income and land holdings, educated population and labour force among OBC's households in Hamirpur district

The regression between dependent and independents variables in Hamirpur district is presented in Table 3.3. The data in the table shows that in Hamirpur District linear regression model, demonstrate strong statistical significance (F- statistics = 301.37, p value < 0.001), indicating that model provide meaning full explanation of the variability in income. The coefficient for land holdings (t-stat = 3.9014, p < 0.001), educated population (t-stat = 2.5811, p =0.0131) and labour force (t-stat = 4.4151, p <0.001) is statistically significant, suggesting that on an average, a one unit increase in these variables is associated with an increase of 0.1097, 0.2719 and 0.3368 in income of OBC's households. The value of Multiple Regression 0.9755 is indicating a strong positive linear relationship between the independent (land holdings, educated population, labourforce) and dependent (income) variables. The Adjusted R Square value (0.9484) also signifies the strong relationship between independent and dependent variables in Hamirpur District.

Table-3: Regression between income and land holdings, educated population and labour force among OBC's households in Hamirpur district

Particulars	Coefficients	t Stat	P-value
Intercept	5.2849	96.7921	0.0000
Land Holdings (X1)	0.1097	3.9014	0.0003
Educated Population (X2)	0.2719	2.5811	0.0131
Labour Force (X3)	0.3368	4.4151	0.0001
Multiple R	0.9755		
R Square	0.9516		
Adjusted R Square	0.9484		
F Stat	301.3733		0.0000

Regression between income and land holdings, educated population and labour force among OBC's households in Kangra district

The regression between dependent and independents variables in Kangra district among the OBC's sample households is presented in Table 3.4. The linear regression model, demonstrate strong statistical significance (F- statistics = 1036.45, p value < 0.001), indicating that model provide meaning full explanation of the variability in income. The coefficient for land holdings (t-stat = 4.1807, p<0.001), educated population (t-stat = 6.9927, p <0.001) and labour force (t-stat = 6.9097, p <0.001) is statistically significant, suggesting that on an average, a one unit increase in these variables is associated with an increase of 0.0683, 0.3262 and 0.4150 in income of OBC's households. The value of Multiple Regression 0.9849 is indicating a strong positive linear relationship between the independent (land holdings, educated population, labour force) and dependent (income) variables. The Adjusted R Square value (0.9691) also signifies the strong relationship between independent and dependent variables in Kangra District.

Table- 4: Regression between income and land holdings, educated population and labour force among OBC's households in Kangra district

Particulars	Coefficients	t Stat	P-value
Intercept	5.2161	146.0867	0.0000
Land Holdings (X1)	0.0683	4.1807	0.0001
Educated Population (X2)	0.3262	6.9927	0.0000
Labour Force (X3)	0.4150	6.9097	0.0000
Multiple R	0.9849		
R Square	0.9701		
Adjusted R Square	0.9691		
F-Stat	1036.457		0.0000

Regression between income and land holdings, educated population and labour force among OBC's households at overall level

At the overall level the linear regression model, with the set of variables (land holdings, educated population and labour force), demonstrates strong statistical significance (F- statistics = 2579.31, p value < 0.001), indicating that model provide meaning full explanation of the variability in income. The coefficient for land holdings (t-stat = 24.09, p < 0.001), educated population (t-stat = 8.52, p < 0.001) and labour force (t-stat = 4.28, p < 0.001) is statistically significant, suggesting that on an average, a one unit increase in these variables is associated with an increase of 0.1847, 0.1622 and 0.0505 in income of OBC's households. The value of Multiple Regression 0.9845 is indicating a strong positive linear relationship between the independent (land holdings, educated population, and labour force) and dependent (income) variables. The Adjusted R Square value (0.9688) also signifies the strong relationship between independent and dependent variables.

Table-5: Regression between income and land holdings, educated population and labour force among OBC's households at overall level

Particulars	Coefficients	t Stat	P-value
Intercept	5.6057	614.2596	0.0000
Land Holdings (X1)	0.1847	24.0980	0.0000
Educated Population (X2)	0.1622	8.5252	0.0000
Labour Force (X3)	0.0505	4.2813	0.0000
Multiple R	0.9845		
R Square	0.9692		

Adjusted R Square	0.9688		
F Stat	2579.3099		0.0000

Thus from the above results it can be concluded that the various socio economic indicators plays significant role in economic status of OBCs households in Himachal Pradesh. So our Ist hypothesis is rejected.

V. Conclusions And Policy Implications

At overall level the linear regression model, with set of variables (land holdings, educated population and labour force), demonstrates strong statistical significance (F- statistics = 2579.31, p value < 0.001), indicating that model provide meaning full explanation of the variability in income. The coefficient for land holdings (t-stat = 24.09, $p < 0.001$), educated population (t-stat = 8.52, $p < 0.001$) and labour force (t-stat = 4.28, $p < 0.001$) is statistically significant, suggesting that on an average, a one unit increase in these variables is associated with an increase of 0.1847, 0.1622 and 0.9692 in income of OBC's households. The value of Multiple Regression 0.9845 is indicating a strong positive linear relationship between the independent (land holdings, educated population, labour force) and dependent (income) variables. The Adjusted R Square value (0.9692) also signifies the strong relationship between independent and dependent variables. Thus, it can be concluded that the various socio economic indicators plays significant role in economic status of OBCs households in Himachal Pradesh. So our alternate Hypothesis is accepted.

From the above analysis it can be concluded that the land holdings, education and labour force played significant role in the income of OBCs sample households of Una, Sirmaur, hamirpur and Kangra districts of Himachal Pradesh. So the null hypothesis i.e. there is no effect of socio-economic indicators on the economic status of 'other backward classes' households in the study area is rejected and alternate hypothesis is accepted and it is concluded that various socio-economic indicators viz. land holdings, education and labour force played significant role in economic status of OBCs sample households. There is a need to address socio-economic disparities in the selected districts of Himachal Pradesh. The policymakers and economic planner should consider these factors while designing interventions to uplift these marginalized communities.

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