Pragmatic Perspectives of Agricultural Development Programmes in Present Scenario

STEPWISE REGRESSION ANALYSIS OF INDEPENDENT VARIABLES AND SOCIO-ECONOMIC CONSEQUENCES AMONG TRIBAL BENEFICIARIES AS A RESULT OF WADI PROJECT

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ABSTRACT

The Wadi project mainly involves development of orchard (locally known as Wadi) on degraded lands. Mango, Cashew, Guava, Custard apple, Aonla, Lemon, Sapota and Drumstick are the major fruit crops that are cultivated by the tribal through WADI project. The present study was examined the stepwise regression analysis of independent variables and socio-economic consequences among beneficiaries as a result of Wadi project. The study was conducted in Navsari, Valsad and The Dangs districts purposively, because the Wadi project was started in 1982 in these three districts with maximum number of beneficiaries of the project. A list of all tribal beneficiaries of Wadi project were collected from the BAIF-DHRUV A office of Village Lachhakadi, P.O.Gangpur, Tal.Vansda, Dist. Navsari, Gujarat. The proportionate random sampling method was used for selection of 200 tribal beneficiaries from the 55 villages of 4 talukas of three districts of South Gujarat for the present investigation. The eleven independent variables namely cohesiveness, education, land holding, risk orientation, source of information, aspiration, occupation, training acquired, distance from market, scientific orientation and economic motivation were accounting influence on socio-economic consequences occurred among tribal beneficiaries as a result of Wadi project.

Keywords : regression, socio-economic consequences, tribal beneficiaries, wadi project

INTRODUCTION

The Wadi project mainly involves development of orchard (locally known as Wadi) on degraded lands. Mango, Cashew, Guava, Custard apple, Aonla, Lemon, Sapota and Drumstick are the major fruit crops that are cultivated by the tribal through WADI project. In order to assess the amount of contribution (influence) of each independent variable to the independent variable, the effect of other was held constant. Efroymons (1962) stated that stepwise regression is one such method which has been widely adopted in multiple regression analysis. It has got the added to advantage that at each stage of analysis, every variable is subjected to an examination for its predictive value. The stepwise regression was carried with the help of computer. The stepwise regression analysis was employed to predict the extent of adoption, attitude and socio-economic consequences by independent variables. The contents of the tables revealed that the variables were introduced stepwise in succession depending upon the contribution of each of the independent variables in explaining the variation in the dependent variables. The study was undertaken on following objectives.

OBJECTIVES

(1) To study Stepwise regression analysis of independent variables and socio-economic consequences

(2) To study Stepwise variation accounted by different independent variables on socio-economic consequences

METHODOLOGY

The present study was examined the socio-economic consequences occurred among beneficiaries as a result of Wadi project. The study was conducted in Navsari, Valsad and The Dangs districts purposively, because the Wadi project was started in 1982 in these three districts with maximum number of beneficiaries of the project. A list of all tribal beneficiaries of Wadi project were collected from the BAIF-DHRUV A office of Village Lachhakadi, P.O.Gangpur, Tal.Vansda, Dist. Navsari, Gujarat. The proportionate random sampling method was used for selection of 200 tribal beneficiaries from the 55 villages of 4 talukas of three districts of South Gujarat for the present investigation. The collected data were analyzed by using stepwise regression analysis.
RESULTS AND DISCUSSION

Stepwise regression analysis of independent variables and socio-economic consequences

Stepwise multiple regression analysis with 20 independent variables and extent of socio-economic consequences as dependent variable was carried out. The findings are presented in table 1.

Table 1: Stepwise multiple regression analysis of independent variables and socio-economic consequences

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Independent variables</th>
<th>Partial regression coefficient (b)</th>
<th>Standard error</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Constant)</td>
<td>6.327***</td>
<td>3.971</td>
<td>0.535</td>
</tr>
<tr>
<td>1</td>
<td>Cohesiveness (X₁)</td>
<td>0.482***</td>
<td>0.164</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Education (X₂)</td>
<td>3.361***</td>
<td>0.753</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Land holding (X₄)</td>
<td>3.473***</td>
<td>0.785</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Risk orientation (X₁₀)</td>
<td>0.527*</td>
<td>0.269</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Source of information (X₈)</td>
<td>0.399***</td>
<td>0.106</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Aspiration (X₁₁)</td>
<td>-0.374***</td>
<td>0.130</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Occupation (X₆)</td>
<td>3.938***</td>
<td>0.848</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Training acquired (X₁₅)</td>
<td>-3.083***</td>
<td>0.893</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Distance from market (X₂₀)</td>
<td>0.291***</td>
<td>0.104</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Scientific orientation (X₁₂)</td>
<td>-0.692***</td>
<td>0.248</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Economic motivation (X₁₄)</td>
<td>0.740***</td>
<td>0.278</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 10 per cent  ** Significant at 5 per cent  *** Significant at 1 per cent

Data in table 35 indicate that out of 20 independent variables, eleven variables namely cohesiveness (6.327**), education (0.482***), land holding (3.473***), risk orientation (0.527*), source of information (0.399***), aspiration (-0.374***), occupation (3.938***), training acquired (-3.083***), distance from market (0.291***), scientific orientation (-0.692**) and economic motivation (0.740***) were accounting influence on socio-economic consequences. All the eleven independent variables together accounted 53.50 per cent variation as indicated by adjusted R² value for socio-economic consequences.

As a result of stepwise regression analysis, the following model was obtained:

\[ Y₃ = a + b₁ X₁ + b₂ X₂ + b₄ X₄ + b₁₀ X₁₀ + b₁₂ X₁₂ + b₁₅ X₁₅ + b₁₇ X₁₇ + b₁₈ X₁₈ + b₂₀ X₂₀ + b₃₁ X₃₁ \]

Where,

- \( Y₃ \) = socio-economic consequences
- \( a \) = The intercept i.e. 6.327
- \( b₁ = \) Coefficient of partial regression of \( Y₃ \) on \( X₁ \) i.e. 0.482
- \( b₂ = \) Coefficient of partial regression of \( Y₃ \) on \( X₂ \) i.e. 3.361
- \( b₄ = \) Coefficient of partial regression of \( Y₃ \) on \( X₄ \) i.e. 3.473
- \( b₁₀ = \) Coefficient of partial regression of \( Y₃ \) on \( X₁₀ \) i.e. 0.527
- \( b₈ = \) Coefficient of partial regression of \( Y₃ \) on \( X₈ \) i.e. 0.399
- \( b₁₂ = \) Coefficient of partial regression of \( Y₃ \) on \( X₁₂ \) i.e. 0.692
- \( b₁₅ = \) Coefficient of partial regression of \( Y₃ \) on \( X₁₅ \) i.e. 3.938
- \( b₁₇ = \) Coefficient of partial regression of \( Y₃ \) on \( X₁₇ \) i.e. 3.083
- \( b₂₀ = \) Coefficient of partial regression of \( Y₃ \) on \( X₂₀ \) i.e. 0.291
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\[ b_{12} = \text{Coefficient of partial regression of } Y_3 \text{ on } X_{12} \text{ i.e. } 0.692 \]

\[ b_{11} = \text{Coefficient of partial regression of } Y_3 \text{ on } X_{11} \text{ i.e. } 0.740 \]

\[ X_{17} = \text{Cohesiveness} \]

\[ X_2 = \text{Education} \]

\[ X_4 = \text{Land holding} \]

\[ X_{10} = \text{Risk orientation} \]

\[ X_8 = \text{Source of information} \]

\[ X_{16} = \text{Aspiration} \]

\[ X_6 = \text{Occupation} \]

\[ X_{15} = \text{Training acquired} \]

\[ X_{20} = \text{Distance from market} \]

\[ X_{12} = \text{Scientific orientation} \]

\[ X_{11} = \text{Economic motivation} \]

Therefore, the fitted equation would be as under:

\[ Y_3 = 6.327 + (0.482)X_{17} + (3.361)X_2 + (3.473)X_4 + (0.527)X_{10} + (0.399)X_8 - (0.374)X_{16} + (0.393)X_{12} + (0.740)X_{11} \]

**Stepwise variation accounted by different independent variables on socio-economic consequences**

Stepwise variation accounted by different independent variables on socio-economic consequences was carried out. The findings are presented in table 2. The variable cohesiveness alone contributed 26.50 per cent variation in socio-economic consequences occurred among tribal beneficiaries as a result of Wadi project, followed by cohesiveness + Education accounted for 34.90 per cent, the earlier two variables + land holding accounted for 38.80 per cent, the earlier three variables + risk orientation accounted for 42.20 per cent, the earlier four variables + source of information accounted for 44.00 per cent, the earlier five variables + aspiration accounted for 46.30 per cent, the earlier six variables + occupation accounted for 47.80 per cent, the earlier seven variables + training acquired accounted for 49.90 per cent, the earlier eight variables + distance from market accounted for 51.40 per cent, the earlier nine variables + scientific orientation accounted for 52.00 per cent and earlier ten variables + economic motivation accounted for 53.50 per cent variation in socio-economic consequences occurred among tribal beneficiaries as a result of Wadi project.

Table 2: Stepwise variation accounted by different independent variables on socio-economic consequences (n=200)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Variables included</th>
<th>Multiple regression coefficient ‘R’</th>
<th>Coefficient multiple determination ‘R’</th>
<th>Adjusted R²</th>
<th>Total variation accounted (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cohesiveness(X₁₇)</td>
<td>0.518</td>
<td>0.268</td>
<td>0.265</td>
<td>26.50</td>
</tr>
<tr>
<td>2</td>
<td>X₁₂ + Education (X₂)</td>
<td>0.597</td>
<td>0.356</td>
<td>0.349</td>
<td>34.90</td>
</tr>
<tr>
<td>3</td>
<td>X₁₇ + X₂ + Land holding (X₄)</td>
<td>0.630</td>
<td>0.397</td>
<td>0.388</td>
<td>38.80</td>
</tr>
<tr>
<td>4</td>
<td>X₁₂ + X₄ + X₈ + Risk orientation (X₁₀)</td>
<td>0.659</td>
<td>0.434</td>
<td>0.422</td>
<td>42.20</td>
</tr>
<tr>
<td>5</td>
<td>X₁₇ + X₂ + X₄ + X₈ + Source of information (X₈)</td>
<td>0.674</td>
<td>0.454</td>
<td>0.440</td>
<td>44.00</td>
</tr>
<tr>
<td>6</td>
<td>X₁₇ + X₂ + X₄ + X₁₀ + Aspiration(X₁₆)</td>
<td>0.692</td>
<td>0.479</td>
<td>0.463</td>
<td>46.30</td>
</tr>
<tr>
<td>7</td>
<td>X₁₇ + X₂ + X₄ + X₈ + X₁₀ + Occupation(X₆)</td>
<td>0.705</td>
<td>0.497</td>
<td>0.478</td>
<td>47.80</td>
</tr>
<tr>
<td>8</td>
<td>X₁₇ + X₂ + X₄ + X₁₀ + X₈ + X₁₆ + X₆ + Training acquired (X₁₂)</td>
<td>0.721</td>
<td>0.520</td>
<td>0.499</td>
<td>49.90</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Variables included</td>
<td>Multiple regression coefficient ‘R’</td>
<td>Coefficient multiple determination ‘R^2’</td>
<td>Adjusted R^2</td>
<td>Total variation accounted (%)</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td>-----------------------------------------</td>
<td>--------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>9.</td>
<td>X_{17} + X_{2} + X_{4} + X_{10} + X_{8} + X_{16} + X_{6} + X_{15} + Distance from market (X_{20})</td>
<td>0.732</td>
<td>0.536</td>
<td>0.514</td>
<td>51.40</td>
</tr>
<tr>
<td>10.</td>
<td>X_{17} + X_{2} + X_{3} + X_{10} + X_{8} + X_{16} + X_{5} + X_{15} + X_{20} + Scientific orientation(X_{12})</td>
<td>0.738</td>
<td>0.544</td>
<td>0.520</td>
<td>52.00</td>
</tr>
<tr>
<td>11.</td>
<td>X_{17} + X_{2} + X_{4} + X_{10} + X_{8} + X_{16} + X_{6} + X_{15} + X_{20} + X_{12} + Economic motivation(X_{11})</td>
<td>0.749</td>
<td>0.561</td>
<td>0.535</td>
<td>53.50</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The eleven independent variables namely cohesiveness, education, land holding, risk orientation, source of information, aspiration, occupation, training acquired, distance from market, scientific orientation and economic motivation were accounting influence on socio-economic consequences occurred among tribal beneficiaries as a result of Wadi project.

**REFERENCES**


