



32. Empirical model predicting the fuel wood exploitation on the basis of socio-economic and biophysical variables

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Name of Inventor

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Description of Technology

The multiple regression model is a multivariate statistical technique to predict the household fuel wood exploitation on the basis of determinant socio-economic & biophysical variables. The model is statistically expressed as follows:

$$Y = 0.999 - 0.020X_1 - 0.019X_2 + 0.447X_3 + 0.000X_4 + 0.147X_5 + 0.040X_6 - 0.492X_7 + 3.266X_8 + 0.100X_9 + 0.032X_{10} - 0.005X_{11} + 0.177X_{12}$$

Where, Y = Consumption of fuel wood (tons annum⁻¹)

X₁ = Age (year)

X₂ = Education (No. of years undergone in education)

X₃ = Household size (No. of family members)

X₄ = Family labour (No. of workers in the family)

X₅ = Landholding size (Land area under household management)

X₆ = Livestock holding (No. of livestock owned)

X₇ = Primary occupation (Occupation in which an individual is engaged for six months or more in a year)

X₈ = Gross annual income (₹/annum)

X₉ = Proximity to the forests (Distance between forests and house)

X₁₀ = Forest visit (Frequency of forest visits)

X₁₁ = Forest resource possession (No. of trees owned by the households)

X₁₂ = Access to alternative energy source (Accessibility and consumption of alternative energy source)



Fuel wood collection



Fuel wood storage



Fuel wood use

Impact

The magnitude of F value indicated that the R² is statistically significant (p < 0.05) which clearly shows that the model is very strong, reliable and has high predictive ability. It established that 77.80% of fuel wood consumption is induced by the determinant variables. Hence, the model developed is useful to identify the important household variables and estimate the domestic fuel wood exploitation using small data samples from field surveys.

Commercial applicability

The policy makers and planning agencies can design strategies using the regression model to decrease the household fuel wood exploitation from the state forests and enhance utilisation of alternate commercial fuels based on determinant variables rather than focusing on many variables. Further, the model will assist the scientists, planners, extension worker and forest officials to design strategies to retard fuel wood induced forest depletion and strengthen biodiversity conservation with minimum efforts, money, time and confusion.