Addendum to the thesis

AN ANALYSIS OF SELECTED PHYSICAL AND SOCIO-ECONOMIC DETERMINANTS OF RURAL POPULATION DISTRIBUTION IN BIRBHUM DISTRICT, WEST BENGAL

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The dissertation was undertaken to make an analysis of selected physical and socio-economic determinants of rural population distribution in Birbhum district, West Bengal. All the determinants selected for the study are not equally important. The factors that are most important in explaining the variation of population distribution in the district of Birbhum have been identified through this study. Moreover, the technique of stepwise regression analysis has been employed for developing a model describing a general theory concerning the distribution of rural population in this part of the world.

As suggested by the foreign examiner the following discussions are appended:

1. A discussion on land capability is being incorporated in the study. There is no doubt that land has important bearing on population distribution. Land capability is an estimate of the potential or usefulness of land for agriculture or forestry, based solely on physical environmental factors. The appraisal is heavily dependent upon soil survey, although other factors such as aspect, rainfall, gradient and temperature are also taken into account. The main concept used is that of 'limitations' - the restrictions or constraints known or reasonably assumed, to act upon the type of agriculture or forestry concerned. Temporary restraints are distinguished from permanent limitations. Present land use or agricultural productivity is ignored. Results may be expressed in qualitative terms, i.e. suitability for use, or in quantitative terms, i.e. predicted crop yields, or in economic terms, i.e. as gross or net cash output. Attempts have been made to extend the principles to other types of land use, e.g. recreation, building land and others.

Land capability classification is a scientific appraisal of the physical characters of the land, inherent soil qualities and management practices. Specifically, land capability means productive potentiality and ability of land. Potentiality means latent or existing possibility, whereas suitability means that suits or is fit for a particular use. Though the terms land capability and suitability are often used in a synonymous sense, the second more appropriately reflects the fitness of a given tract for a particular use. For example, a land classed as capable of producing crops in general may be unsuitable for a specific crop.

A potential land may not be suitable due to adverse environmental situation but a suitable land must be potential. For example, a fertile tract of land with water logging is not suitable for cultivation. It should be mentioned in this context that potentiality of land cannot be increased or decreased. It remains unchanged. However a land can be made suitable through required management practices, which vary in time and space.

If the title of the thesis were 'Land capability and population distribution' there would have been more scope to discuss population distribution vis-à-vis land capability in detail. Naturally, the scope for discussion on land capability within the format of the present title of the thesis is limited. However, keeping in mind the importance of land capability to population distribution, some of the parameters of land like relative relief, dissection index, slope, depth of ground water, soil fertility etc. have already been discussed in the thesis. The present write-up is towards the clarification of the distinction between land capability and land suitability.
Selected Physical & Socio-economic Determinants of Rural Population Distribution

2. The following table shows the of correlations between the relief parameters used in this study:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Relative Relief ((x_1))</th>
<th>Average Slope ((x_2))</th>
<th>Dissection Index ((x_3))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Relief</td>
<td>1</td>
<td>0.8900</td>
<td>0.3456</td>
</tr>
<tr>
<td>Average Slope</td>
<td></td>
<td>1</td>
<td>0.1701</td>
</tr>
<tr>
<td>Dissection Index</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

3. The regression line shown in figure 29 is redrawn on page 4.

4. The definition of land available for cultivation has been taken from Village and Town Directory, District Census Handbook, Birbhum, 1991, published by the Govt. of India. It is a category of land use consisting of irrigated area, unirrigated area and culturable waste.

5. The stepwise regression equation has been checked. In the case of stepwise regression it is not a necessary condition that there be a decreasing increase in explained variance as each new variable enters the equation. In this connection the chapter on stepwise regression in book "Statistical Methods for Geographers" by W. A. V. Clark and P. L. Hosking (John Wiley and Sons Inc, New York, 1966) may be mentioned.

In addition to the above discussion the researcher here attempts to clarify a few more points as desired by the foreign examiner as he is of the opinion that consideration of these points will benefit the researcher.

- A number of relief parameters like relative relief, dissection index and average slope have been discussed in the thesis. The theoretical justification regarding the inclusion of these factors to explain the distribution of rural population has been given at the beginning of discussion of each parameter.
- Land capability and land suitability have been discussed above.
- Residuals from regression have been analysed. Keeping in mind the large number of factors, discussion on residuals of any individual factor had to be of limited extent.
- The researcher is aware that multicollinearity is an inherent problem of multiple regressions. The parameters are to be chosen in such a way that they will be independent of each other.
- Regarding drainage, one morphometric variable like drainage density has been considered. To make the present study more elaborate the researcher may include stream order in future study.
- The regression line in figure 29 has been drawn again, taking all the x values, including the zeros, the correlation co-efficient stands out as -0.47. On the other hand, if the zeros are ignored, the correlation co-efficient becomes -0.23. Thus, in the true sense, the impact of forest is becomes weaker, if the zeros are ignored.
- As mentioned above the definition of land available for cultivation was taken from Census of India, 1991. It comprises of irrigated and unirrigated land as well as culturable waste land.
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- The theoretical background regarding literacy and distribution of population has been mentioned in the introductory part of the chapter on literacy. Considering the thesis as a whole there is little scope to go into greater details on this aspect. If this single factor is considered in a future study a more detailed interpretation should result.
Scatter Diagram

BIRBHUM DISTRICT

Fig. 29: Scatter diagram (percentage of area under forest and rural population density)

Dc = 602.87 - 14.01F

Fig. 29 : Scatter diagram (percentage of area under forest and rural population density)

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