Symbols used in the analytical section of the text have been explained below in a very descriptive manner. Regerous mathematical treatments are avoided as far as practicable.

A  - Original data matrix of order \( m \times N \).

\( m \)  - Number of variables.

\( N \)  - Number of observations, cities for the present study.

\( r \)  - Correlation co-efficient between any two variables.

\( R \)  - Correlation matrix of all the variables, of order \( m \times m \).

\( R^2 \)  - Multiple co-efficient of determination.

\( U^2 \)  - Unique variance of each of \( m \) variables \((1-h_1^2)\).

\( h_i^2 \)  - Communality. The portion of a variable's total variation that is explained by \( f \) factors. \( \frac{1}{2} \sum \frac{d_{ij}^2}{d_{ij}} \)

\( f \)  - Number of factors or dimensions of variation.

\( F \)  - Factor matrix having \( m \) rows and \( f \) columns.

\( f_{ij} \)  - Correlation co-efficient of a variable \( i \) with factor \( j \), known as the loading of the factor and generally denoted by \( a_{ij} \).

\( K \)  - Number of factors after rotation.

\( S \)  - Factor scores matrix having \( N \) rows and \( K \) columns.

\( s_{ij} \)  - Score given to observation \( i \) on factor \( j \).

\( F' \)  - Rotated factor matrix having \( m \) rows and \( K \) columns. \((K \leq f)\).

\( D \)  - Inter observation (city) similarity matrix of order \( M \times M \).
- Eigenvalue, Amount of variation in \( R \) which accrues to a particular factor. It is obtained by summing the squares of the loadings on each factor over \( n \) variables. \( \sum a_{ij} \)

Conventionally, the number of factors is restricted by giving the values of the eigenvalues equal to or greater than unity. \( \lambda > 1.00 \)

\% of \( \frac{\lambda_i}{\sum \lambda_i} \times 100 \). Percent of total variance. This measures the amount of data in the original matrix \( A \) which can be reproduced by a factor \( f_i \).

\% of \( \frac{\lambda_i}{\sum \lambda_i} \times 100 \) or \( \frac{\lambda_i}{\sum \sum h_{ij}^2} \times 100 \). Since, \( \frac{\lambda_i}{\sum \lambda_i} = \frac{\sum \sum h_{ij}^2}{\sum \sum \sum h_{ij}^2} \)

This is percent of common variance. The figures measure how much of the variation accounted for by \( f \) factors is found in each pattern or dimension.

- Total variation in \( R \), equals to the total number of variables. \( R_T = n \).

- Common variation in \( R \) = \( \sum \lambda_i \) = \( \sum \sum h_{ij}^2 \)

- Proportion of variation in variable \( i \) which accrues to or explained by factor \( j \).