EXECUTIVE SUMMARY

TITLE: Statistical Analysis of Regional Disparities in Socio-Economic Development of Maharashtra

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OBJECTIVES OF THE STUDY:

1) To rank the districts of Maharashtra state on the basis of development in Agriculture, industry and overall socio-economic development in the year 2007-2008.
2) To classify the districts on the basis of development in these sectors in 2007-2008.
3) To compare the change in the development level of all the districts from 2002-2003 to 2007-2008.
4) To review the overall regional disparities in the development of different regions of Maharashtra.
5) To analyze the fund allocations by the government to overcome the regional imbalances in Maharashtra

RESEARCH METHODOLOGY

Principal Component analysis :

Consider a multivariate data matrix

$$V = [V_{ij}]$$

$$i = 1, 2, 3, \ldots\ldots\ldots, n$$

$$j = 1, 2, 3, \ldots\ldots\ldots, k$$

Where Vi denote the cases and Vj denote the variables (or indicators)

Let the matrix V be normalized using formula

$$U_{ij} = (V_{ij} - V_j)/\sigma_j$$

Where V_j is Mean of V_{ij} and σ_j is Standard deviation of V_{ij}

Let

$$Z = [z_{ij}] \qquad \text{----------(ii)}$$

where i = 1, 2, 3, …….. k

and j = 1, 2, 3, …….. k

be correlation matrix of U and it is a symmetric matrix of order k.

Consider equation

$$ZW = \lambda W$$

where λ is called eigen value of z and w is **w** called eigenvector or latent vector of Z.

λ is the root of equation

$$\left| Z-\lambda I \right| = 0 \qquad \text{…….. (ii)}$$

Equation (ii) is an equation of degree k in terms of λ and will have k roots

$\lambda_1, \lambda_2, \lambda_3, \ldots\ldots \lambda_k$ be the roots of (i) and $w_1, w_2, \ldots\ldots, w_k$ be the corresponding eigenvectors.

Let

$$W = [w_{ij}]$$

i = 1, 2, 3, …….....k

j = 1, 2, 3, ……..k … (iii)

be the matrix of eigenvectors such that

$$\lambda_1 \geq \lambda_2 \geq \lambda_3 \ldots\ldots\ldots \geq \lambda_k$$

This matrix is also called the matrix of factor loadings.

Let

$\lambda_1, \lambda_2, \lambda_3 \ldots\ldots\ldots, \lambda m$ be the values greater than or equals to 1.

Consider a matrix

$M = [m_{ij}]$ i = 1, 2, 3, …… k

j = 1, 2, 3, ... k be the matrix of first k eigen vectors.

Then first principal Component Score P_{ij} is calculated by the formula

$$p_{ij} = \frac{\sum m_{ij} \cdot y_i^T}{6j}$$

where m_j = factor loading of first component on j the variable.

U_j^T =normalized value of j the variable

σ_j= S.D. of j^{th} variable.(this value is 1 for normalized data)

P_{1j} is called first principal component score.

Similarly P_{i2}, P_{i3}, ……. P_{im} can be calculated as principal Component score for 2^{nd}, 3^{rd}, ……, m^{th} Principal Components .These principal Component scores (PC scores) are used as data for further analysis.

Since these scores carry negative signs, for further analysis to form **Composite principal scores**, a constant, which equals to the maximum magnitude number in the same data, is added in all the respective principal component score.

The composite principal component score (CS) is calculated by the formulas.

$$CS = \frac{\sum_{i=1}^{m} p_i \lambda_i}{\sum_{i=1}^{m} \lambda_i}$$

This value is finally divided by maximum of CS, to obtain the values between 0 & 1.

This method of Principal component analysis is applied in this study taking the selected indicators as the variables and the districts as the unit of analysis or the cases.

CONCULSIONS

The Conclusions obtained from this study are as follows:-

1. There are Disparities in the Socio-economic Development of the different regions of Maharashtra state.
2. In over-all Socio-economic Development, the Districts classifies as Developed Districts are mostly from Western Maharashtra and those which ranked as Low Developed Districts are from Vidarbha and Marathwada. the last three districts in the rankings are from tribal area.
3. The development in Agriculture is not in tune with over-all socio-economic development. The ranking in agricultural development are negatively correlated with all other sectors and over-all socio-economic development.
   The agriculture development which indicates over-all production of all agricultural produce, land holdings etc. does not improve the economic condition and over-all socio-economic status of the farmers
4. The industrial development is largely in Konkan and western Maharashtra.
   There is increase in industrial development all the districts and no district falls under Low Developed category.
5. Infrastructure development is highly correlated with over-all Socio-economic development and it creates impact on the economic condition of the population of the district.
   The infrastructure development is poor in tribal area as last three districts in the ranking are from tribal area.
6. The Correlation analysis indicates that the over-all socio-economic development in the state can be seen from the per capita income and NDDP.
   The agricultural development is negatively correlated with all other sectors and Per capita income and NDDP.
   The over-all socio-economic development can be reached with industrial and Infrastructural development. To make it in tune with agricultural development, the efforts are to be made to make the agricultural development more beneficial to the farmers in financial stability rather than measuring in only productivity.
7. Administrative division-wise analysis is also shows the similar picture of regional disparities in all the sectors
8. There is no significant change in the development of any sector from 2002-2003 to 2008-2009 except the change in the ranking of some of the districts.
   Over-all picture remains same in between these two years.