

# Ethnicity, Exclusion and Globalization: An enquiry into Primary Level Data on India through Graph Theory and Bio-informatics

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Ethnicity-based exclusion is one of the major problems of contemporary Indian society. It obstructs the participation of different social groups into the mainstream society due to their ethnicity based identities. Historical facts have shown that ethnicity has appeared as a tool of political economy to deprive a large section of the Indian society from their due returns. Ethnicity-based exclusion is a manifestation of a systematic exploitation in the name of genetic difference. This study wants to know the historical sequence of political economy to develop ethnicity as a major tool of exploitation. Determining the nature of ethnicity-based exclusion in India is another aim of this work. As exclusion can be explained as capability deprivation this study has taken into consideration health, education and income as the domains of exclusion. This study also wants to develop the optimum policy measures to eradicate the menace of ethnicity-based exclusion from a resource constraint economy. Examining the feasibility of the development paths towards inclusive growth under neo-liberal globalization is also under the purview of this study.

An algebraic model has been developed to deduce the effect of globalization on development programmes on an ethnically hierarchical society. The model is tested on primary level data. Sample has been chosen from 16 Indian villages through multistage stratified sampling. Graph theoretic approach of Network Analysis has been used to determine the nature of ethnicity-based concentration in the capability space. The thoughts of Neural Network have been used to formalize the historical process of ethnicity-based group formation. The idea of Genetic Algorithm has been applied to substantiate the existence of exclusion due to genetic divergence. Hamming Distance is used to find the inter group distances in the exclusion space. To determine the optimum policy mix to achieve inclusive growth the techniques of Knapsack Optimisation have been tried. The developed algebraic model and the collected data are used to find the effect of globalization on inclusive growth.

It is observed that different ethnic groups have different outcomes in our chosen domains. The divergence in outcomes can be attributed to the existence of a strong historical process of subordination through the Brahmanical social order. The hierarchical Hindu social system and its political superstructure developed over thousands of years have developed ethnicity-based exclusion as a tool to sustain the exploitation in the name of ethnic differences. In the face of resource constraints the contemporary political economy has helped to appropriate surplus values by some social groups at the cost of the other groups. Ethnicity-based

exclusion continued to exist as a tool of exploitation in the market. Naturally the lower strata of the ethnically divided Indian society are deeply marginalized. The Brahmanical system developed through thousands of years has provided the social legitimacy about this hierarchical system on the basis of genetic identities. The indigenous people or the scheduled tribe communities (ST) with a distinctly different ethnic and genetic identity are either involuntarily excluded or adversely included. Graph theoretic enquiry through network analysis has distinctly shown the existence of different social concentrations in the development space. The use of neural network has mathematically substantiated the historical process of creating these ethnicity based concentrations. Hamming distance measures show that the inter group distances in the exclusion space is substantial. It is observed through Genetic Algorithm that the capabilities of the lagging ethnic groups can be improved substantially through hypothetical genetic crossovers or through the elimination of ethnicity-based exclusionary trends from the society. At the same time it is also observed that the inter-group distances diminish with subsequent genetic crossovers. In a resource constraint economy the Knapsack Optimizations process has found that the combination of different available policies can substantially supply the required resources to diminish the inter group distances within the exclusion space. But interestingly it is observed that though with the help of different policy mix the level of inclusion can be improved, complete eradication of ethnicity-based exclusion is not possible in a limited resource economy. Fruitful genetic mutation in the presence of resource limitation can enhance the level of welfare significantly through minimizing the level of exclusion but genetic mutation cannot reach the level of full inclusion. So what the genetic mutation with policy mix can do is to enhance the level of inclusion and minimize the inter group distance with respect to exclusion in the face of resource constraints. Further it is observed that the development of bourgeoisie though the current form of globalization and the emergence of capital intensive skill-based market economy have broadened the process of further marginalization of the existing excluded groups. In India the globalization has mainly helped the capitalistic development through skill based market. Naturally this process of globalization has helped the social groups which are endowed with greater level of human capital. Time series data on different social groups of India have shown that the indigenous people or the scheduled tribe community have systematically failed to garner the fruits of development. So the communities with greater capital to utilize the modern skill based market have been benefitted from the current wave of globalization. With a long history of sustained deprivation in all aspects of life inter social group Hamming Distance is certainly going to rise with the current wave of globalization. It can be said that stronger the existence of market oriented forces lesser will be the effects of inclusive growth or the hypothetical genetic crossover. The exclusionary process can gain further momentum with the contraction of the government in the era of globalization. Thus neo-liberal globalization is an extension of the process of elimination which started in the Vedic age thousands of years back. The current process of neo-liberal globalization can best be termed as a catalyst in the existing process of enhancing the distributional shortcomings within the hierarchical structure of Indian economy. So lastly it is to be kept in mind that eradication of all capitalistic traits from the society is an essential pre-requisite for successful inclusive growth with the help of bio-informatics.