REVIEW OF LITERATURE ON REGIONAL DISPARITIES

For estimating the extent and nature of regional disparities works of researchers have been examined. This chapter reviews important and recent studies which highlight the problem of regional disparities in economic development in India. The issue of convergence has also been examined in some of the research works that were reviewed for the study. The review of these studies also helped in framing suitable methodology for the present study.

2.1 Studies Related To Most Prevalent Indicators of Development

Chand and Puri (1983a) in their study discussed the problem of regional disparities in the world and provided the experiences of developed and developing countries with special reference to India. The main objective of this study was to show the concern of the plans over regional disparities and balanced regional development. In addition it showed inter-state disparities in terms of per capita income, industrial growth, transport, communication and developed banking facilities. To obtain an overall view of interstate disparities it combined indicators and formed a composite index of development. The study also enquired as to whether the industrial licensing policy of the government of India and the policies of the financial institutions and commercial banks actually helped in reducing regional disparities.

In another study, Chand and Puri (1983b) discussed recommendations of the Finance Commissions in terms of transfer of resources from center to states and also described other sources of transfer of resources. Finance Commissions made attempts to incorporate the considerations relating to regional disparities in deciding the share of states in the tax revenue and grants-
in-aid. Among them the important ones are to grant more licenses for the establishment of industries in the lagging region, protection of small entrepreneurs, balanced regional development, grant of direct assistance to backward areas and establishment of commercial banks for the grant of more advances to the backward states.

The whole discussions concluded that the method of devolution adopted by the Finance Commissions benefitted the richer states and not the poorer states both in terms of union excise duties and grants-in-aid, two important sources of transfer of resources.

Raj (1990) attempted to show the disparities in the level of income in the rural and urban sectors and showed slow growth of per capita income in the rural sector. The study covered the period between 1950-51 and 1986-87. Results of the study showed a very low per capita income level in the rural sector and a much higher per capita income level in the urban sector during fifties and explained the reasons for this difference.

Choudhury (1992) in her paper examined in particular the sources of growth and factors affecting growth and structure at the state level for understanding regional variations in levels of economic development and the standards of living of the people. The measured interstate disparity in terms of state domestic product (SDP) and per capita household consumption expenditure gives an idea about the economic status of the states and standard of living of the people. She also made comparisons of ranking of states on the basis of per capita income and per capita consumption expenditure. The comparison gives an idea about standard of level of consumption of the people and level of disparity between the states.

Krishnaji (1993) in his paper examined the inter-state variations in per
capita incomes, output per worker and work participation rate or inter-state in equalities in productivity in the secondary and tertiary sectors and results of the study revealed that correlation between them contributed to widening distances during 1961-81 especially in seventies.

Sarker (1994) made an assessment of the strategies and policies adopted by Planning Commission in various plans for reducing regional disparities. He also provided a brief literature of studies and theories on regional economic problems and examined disparities in the socio-economic development of states and in their plan outlay with the help of coefficient of variation and average Euclidean distance.

This study was confined to fifteen states and covered a period of twenty seven years from 1960-61 to 1986-87 and took fourteen indicators for the study of imbalances. It also showed a strong relationship between the development of states and amount of per capita plan allocation which grew stronger over the years of the plan periods and studied the structural changes in the patterns of development in different states by employing cluster analysis (grouping the states into based on similarity in development process) and principal component analysis (rank the states in accordance with the composite index of development).

Dadabhavi and Bagalkoti (1994) in their study explained disparities in terms of health indicators. It covered the period from 1976-78 to 1990-92 and took major seventeen states for the analysis. They analyzed the impact of per capita income, availability of health infrastructure, literacy rate, public expenditure on the health status of the population and the analysis of the study revealed that disparity across states is increasing and is shown by rising coefficient of variance. He emphasized on government role, expansion of
investment on health infrastructure, universalization of education especially female education in rural areas of backward regions for the reduction of regional disparities in health.

Marjit and Mitra (1996) also focused on the convergence hypothesis over the period 1961-62 to 1989-90 in the Indian context. They focused on the negative relationship between initial incomes and subsequent growth rates and results of their study showed no facts of convergence of income among the Indian states.

Convergence hypothesis was also examined by Hanna who found this convergence hypothesis practically sound and provided considerable evidence to support the convergence hypothesis and substantiated Solovian logic (the rate of economic growth is inversely related to the level of per capita income) followed by Perloff et al. (1960) and by Sala-i-martin (1996).

Das and Barua (1996) examined several dimensions of regional-economic disparities among twenty three states over the period of 1970-92 by Computing Theil’s index a measure of inequality. They showed trends (linear or non-linear) in regional disparities in terms of SDP (state domestic product), agriculture, manufacturing infrastructure and service sector and found that interstate disparities increased in almost all the sectors.

They also explained non-linear relationship between regional inequality and per capita income. A very important conclusion of this study was related with radical policy reforms (radical departure from the previous policies of concentrating the efforts of green revolution only in a few regions of northern India and adopting policies towards horizontal expansion across all the regions)
which could give priority to agriculture, services and unregistered manufacturing for the reduction of inter-regional inequality.

Nagaraj et al. (1998) supported the convergence hypothesis and examined the hypothesis of convergence for seventeen states over the period 1970-94 by using panel data and per capita income (excluding transfers). They used the regression based approach for testing conditional convergence instead of absolute convergence by taking independent variables such as agriculture’s share in the states’ output, etc. By testing the conditional convergence (The conditional convergence is noticeable only after other factors which may cause variation in steady states among regions are accounted for) they showed a negative coefficient of the initial per capita output and found no evidence for absolute convergence or unconditional convergence (absolute convergence is said to exist if the poorer regions tend to grow faster than the richer ones) hence confirmed the conditional convergence hypothesis among the states of Indian economy.

Ghosh et al. (1998) dealt with literature on convergence/divergence and relation between per capita NSDP (net state domestic product) and the annual average growth rates. They have found in their paper that coefficient of variation (C.V) has been increasing thereby increasing regional disparity and they also discussed the duties of the government regarding distribution of plan funds and relationship between public and private capital in the regional growth process. Later a simple model was developed to highlight the relationship between growth and public investment.

Ghosh (1998) in his study examined the inter and intra state literacy
scenario in rural India, the disparity in literacy rate between male and female, between scheduled and non-scheduled groups of population and between scheduled caste and scheduled tribe population at the state level over the decades of 1971,1981 and 1991 and also identified the determinants of literacy. The study suggested an urgent need of appropriate regional planning for the education system required for the reduction of inter and intra-regional disparities in educational development such as radical changes in public policy and widespread equitable provision of basic education.

Rao, Shand and Kalirajan (1999) in their study “convergence of income across Indian States” over the period since the mid-1960s to 1994-95 examined convergence for the fourteen major states but their analysis showed divergence or disparities among the states. They examined the determinants of interstate differences in growth rates (private sector investment in manufacturing, initial income level, human capital stock, literacy rate, state government expenditure, technological advances in agriculture) and the role of interstate transfers in understanding the causes of divergence. The study considered center-state transfers as not a very important factor or having little effect on interstate inequality and emphasized on the importance of private investment in explaining inter-state differences among states and found that private investment automatically went to higher income states and to states having higher per capita public expenditures.

Bajpai and Sachs (1999) also examined the convergence hypothesis and supported it too. Their study examined data over the period of thirty three years (1961-93) for a sample of nineteen states and they found some evidence of convergence in 1961-71 but not for the later sub periods.
Ahuluwalia (2000) in his study emphasized on the importance of economic performance of the states and examined data by using Gini-coefficient. He compared pre reform and post reform periods and analyzed the performance of states in terms of per capita income, literacy, level of infrastructure, poverty and private investment during the post-reform period and compared it with performance in the previous decade. The study found that disparities increased more in the growth rates of states in the post reform period as coefficient of variation of growth rates increased from fifteen percent in the 1980s to twenty seven percent in the 1990s. He also explained reasons for the superior performance of some states which in turn helped to expand success from one state to other state and identified policy measures required for increasing growth in the poorer states.

The paper noted accelerated growth in the richer states and decelerated growth in the poorer states in the post reform period. The study suggested some policy implications under which growth potential of states can be determined in terms of factors such as investment growth, literacy level, quality of infrastructure, policy environment and governance.

Kurian (2000) in his study “Widening regional disparities in India” estimated disparities in regard of a variety of demographic indicators such as TFR (total fertility rate), IMR (infant mortality rate), urban population, female literacy, SDP (state domestic product), poverty, state government development and non-development expenditure, resource transfer from centre to states, share in plan outlay, investments, banking activities and financial infrastructure development over the period 1980-81 to 1995-96 and made a clear cut classification between forward and backward states. Results of the study
revealed an increasing regional disparity in terms of socio economic indicators in spite of the various measures adopted by the government in backward areas.

Kurian’s estimates showed inter-state economic and social disparities in spite of the measures adopted by the government to improve the condition of the backward states. He also argued that increased economic growth with increased private sector participation increased regional disparities. He made a clear cut classification between the forward group of states and backward group of states. Kurian observed that government measures do not yield much fruit in reducing regional disparities and investment decisions by the private sector further increased regional disparities.

Nagraj et al. (2000) in their analysis found evidence of conditional convergence by using panel data covering the period of thirty five years from 1960 to 1994. They stressed on the implementation of public investment programmes and focused on investment efforts on physical infrastructure (electricity, irrigation, and railways) and social infrastructure (human development) which increases whole efficiency of public investment which in turn would raise growth.

Somra (2000) in his paper attempted to find out the irregular spatial development of the Indian economy and sectoral disparities and made an assessment of regional disparities in terms of per capita net state domestic product data at factor cost. Results revealed increase in regional disparity as coefficient of variation increased in the post liberalization period compared to the pre liberalization period. The paper also examined trends of growth rate among the states and found fluctuation among the states in terms of growth.
rate. He showed his concern about the existence of regional disparities under the economic reforms and showed insensitiveness of the planning commission and union government regarding balanced regional development.

Somra (2000) examined regional disparities in India in terms of per capita net state domestic product, per capita expenditure and infrastructural facilities by using coefficient of variation. Analysis of the study revealed a wide gap between the poorest and richest state. Similar contrast exists between the states in terms of per capita expenditure and infrastructural facilities. He also discussed the efforts taken by the Finance Commissions to tackle the problem and finally concluded that none of the agencies has helped the poorer states.

Malik (2000) in his study showed the effect of economic reforms on the rate of poverty and poverty trends in the rural and urban sector. It covered the decades of 70’s, 80’s and 90’s. Results revealed an increased poverty in the post reform period. The main focus of this study was to divert more resources to agricultural sector and increasing employment in the unorganized sectors, say through the rapid growth of labour intensive exports for reducing poverty.

Aiyar (2001) examined interstate disparities for a sample of nineteen states over the period 1971-96. He found a weak evidence of absolute convergence for the period 1970’s and divergence in the later sub period especially in the post reform period. He also found evidence of conditional convergence by estimating a panel with fixed effects.

Shaban (2002) examined the growth, volatility and the inter-state disparities in per capita real incomes during 1960-61 to 1996-97 and also showed findings of some of the studies undertaken during this period. He
attempted to test Kuznets’s hypothesis of regional disparities in the Indian context with the help of coefficient of variation and quadratic equations. Solovian hypothesis (The neo-classical economic theory assumes that the poorer regions because their higher growth will ultimately catch up the advanced states. It mean that regional inequalities should decline over the years) of absolute convergence of states was examined in Indian context and Kundall’s index of Rank Concordance analysis (This method find degree of stability in ranks of various states in terms of per-capita income) was also applied to find out ranks of various states in terms of per capita income. 

A very important conclusion of this study was that neither Kuznets hypothesis of ‘inverted-u shaped’ curve of regional inequality, nor neoclassical assumption of absolute convergence of economies, nor Solovian hypothesis was found to be valid in the Indian context.

Dholakia (2003) in his paper examined the trends in regional disparity in India’s economic and human development over the decades of 80’s, 90’s and 2000-01 and found that per capita income did not show any significant trend in regional disparity over the last two decades while social and human development indicators showed a falling trend in regional disparity.

The study showed a marked decline in regional disparities in the social and human development indicators during 1981-91, while in nineties regional disparities showed mixed results, as it increased in terms of poverty and decreased in terms of death and literacy rates. The study emphasized on reducing the regional disparities in economic and human development by discussing the recommendations of the Planning Commission and Finance Commission. He also examined the casualty between economic and human development.
Shetty (2003) in his study used SDP (state domestic product), per capita SDP and sectoral composition of SDP to compare economic performances of states from 1980-81 to 2000-01 and observed that regional disparities did increase whether measured at 1980-81 prices or at 1993-94 prices for the period 1980-81 to 2000-01. It remained stable till about 1986-87 and started increasing thereafter but not as fast as in the 1990s. He observed that after 1986-87 some states showed outstanding performance while some states like Orissa and Madhya Pradesh showed deceleration in growth. The study also compared the share of agriculture, industry and service sectors in GSDP (gross state domestic product) of different states.

Aiyer (2003) examined states’ ranks in terms of agriculture, primary health, investment level, infrastructure, macro economy, consumer markets, law and order and categorized states into big and small. He used aggregation method to obtain a composite score and ranks of the states and on the basis of his observation he categorized the eastern region as depressing, western as stagnant, northern as racing up and southern region as stalling.


Analysis showed that inequality increased dramatically in nineties and it also increased during 70’s and 80’s but not very speedily. In this study states were ranked in terms of human development and showed increasing regional disparity in human development.

Bhattacharya and Sakthivel (2003) in their study estimated growth rate of SDP (state domestic product) and per capita SDP of seventeen major states
during pre-reform period and post reform period and analyzed the disparities in the same. They explained the share of different sectors in SDP growth rate and growth inflation trade off. The study examined the relationship between SDP growth and population growth and established an inverse relationship between population growth and SDP growth.

Results of their study indicated an increasing regional disparity in the post-reform period as compared to pre-reform period which is supported by an inverse relationship between population growth and SDP growth and increased average coefficient of variation based on per capita output in 1990s compared to the 1980s. In their analyses they found no evidence of convergence of growth rates among the states. The article concluded with some policies for the reduction of regional disparities and hence for balanced regional development and stressed on proactive public policy such as efforts to control population growth and to improve quality of governance and encourage more investment in backward states, which in turn would accelerate reforms in backward states.

Krishna (2004) in his working paper ‘Patterns and determinants of economic growth in Indian states’ reviewed the patterns and determinants of growth in major Indian states from 1960 to 2000 and analyzed the interstate differentials in levels and growth of per capita SDP. He commented on the relative position of each state in terms of rate and growth of per capita SDP. The result of the analysis revealed instability and volatility in few states and interstate disparity in income levels.

Bagchi and Kurian (2005) in their study analyzed regional disparities in India in the pre reform and post reform period in terms of income, poverty, electricity consumption per capita, telephones, motor vehicles, urbanization,
female literacy, infant mortality and total fertility. Factors enumerated by various economists which are responsible for widening regional disparities were also reviewed in this study and finally it concluded with some policy challenges such as strengthening the capacity of the poorer states to spend more on social and economic services, large amount of investment in backward states etc.

Cashin and Sahay (2006) in their article examined convergence hypothesis for a sample of twenty states over the period of thirty years. They found some evidence for unconditional convergence and slower speed of convergence in India as compared to other developed countries. They paid special attention to the flow of grants from central government to state governments (center-state transfers) and also examined the role of internal migration in convergence and found internal migration as not a very important factor responsible for the convergence of real state per capita income in India.

Dadibhavi and Bagalkoti (2006) estimated the trends in inequalities in the levels of income and growth of the major seventeen states of India during the post-reform period by using the coefficient of variation method. The estimation revealed disparity in the level of state incomes especially in the reform period and these income inequalities have increased as revealed by the increasing value of coefficient of variation. Different measures of convergence and divergence were estimated to measure the regional disparity. The study emphasized on attracting more resources, creating an enabling environment such as overall investment, investment in agriculture, improvement in basic infrastructural facilities like transport in backward states and upgraded governance.
Mathur (2006) showed the scenario of disparities in regional development by examining the trends in growth of per capita SDP (state domestic product), poverty and infrastructure development and explained the behavior of regional disparities in primary secondary and tertiary sectors. The study also explained the effect of economic reforms on regional development.

Radhakrishna and Rao (2006) in their study described interstate variations in rural-urban poverty among scheduled caste and scheduled tribe, incidence and trends in poverty and unemployment level in the post reform period. The study also showed interstate disparity in the HDI (human development index), HPI (human poverty index), and rural poverty reduction.

Kumar (2007) in his paper "Rural-urban disparities in health and education sector of Uttar Pradesh" described rural-urban disparities in terms of health and education sector.

In health and educational infrastructure it covered the disparities in terms of beds, hospitals, PHCs (primary health centers), doctors, average number of teachers, school buildings, student classroom and student teacher ratio etc. Finally the study stressed on increased investment at each level in health and education sectors such as in health insurance schemes, and making health education necessary for all girls.

Dev and Ravi (2007) measured the trends in poverty (rural and urban) and inequality in the pre-reform and post-reform period and changes in poverty scenario for major seventeen states.

Results of the study revealed that changes in poverty rate (ratio) were more in rural areas during the post reform period. The study concluded by
stressing policies that increase growth and equity such as low relative food prices that reduce poverty. It also stressed on higher inclusive growth that increases agricultural and non-farm sector growth and reduction of rural-urban and social disparities for reducing regional disparities.

Gogna (2007) described the proportion of poverty across the states during 1999-2000 and by analyzing the data she found that reduction had taken in poverty ratio but the reduction was not uniform across the states. This study explained poverty alleviation programmes conducted or set up by government and also examined the effectiveness of these schemes in terms of reducing poverty in India. The study concluded with some urgent need required to push the effectiveness of poverty alleviation programmes set up in India from time to time. She concluded with some suggestions needed to reinforce the effectiveness of poverty alleviation programmes such as universalization of education, special employment schemes with the help of NGOs and people and implementation of time bound poverty alleviation programmes.

Goswami and Chakraborty (2007) in their study focused on the sectoral income inequalities and consumption inequalities and their share in the increasing income inequalities in India during the period 1981-2000. Second part of this study was based on Indian experience of trends in inequality and by using theil index (under this measure relative inequality among the regions in any economic indicator is explained by a simple ratio which compares shares of the states in that indicator with their respective shares in population) of inequality it measured inequality in almost all the sectors.

Results of the study revealed that inequality had increased in almost all the sectors but in service, infrastructure and in unregistered manufacturing
sector the increase was more as compared to other sectors. The study suggested that industrial policies should be directed towards the expansion of labour intensive industries which could be achieved through a mix of industrial and trade policies.

Rajan (2007) examined the economic growth of India during the post reform period (1990-91 to 2004-05) in terms of annual growth rates of GNPFC gross national product at factor cost (GNPFC), net national product at factor cost (NNPFC), per capita net national product at factor cost (PCNNPFC) and real gross domestic product (GDPFC) and inter-state disparities in economic growth in India during the post-reform period. He also examined the trends in inequality in India in terms of GSDP (gross state domestic product), per capita GSDP, NSDP (net state domestic product) and per capita NSDP.

Analysis of the study revealed low inequality in consumption level during the post reform period but he also observed that some states were far ahead of others in terms of growth rates. Reforms have resulted in unequal growth rates especially in terms of per capita SDP. Thus, the main focus of this paper was to analyze the effect of reforms on economic growth and disparities. Rajan’s study revealed low level of inequality among the states during the post reform period. The study also explained in detail different methods used for measuring inequality.

Kumar and Priyesh (2007) analyzed the performance of 15 states in terms of net state domestic product, per capita income, life expectancy, infant mortality rate, birth rate, death rate and poverty rate to highlight the extent of regional disparity in India. Results of the study revealed poor and
unsatisfactory status of social and economic indicators in backward states of India as compared to forward states. The second part of the study dealing with the performance of PDS (public distribution system) among the states showed a poor performance of PDS in the backward states. They emphasized on the need for improvement of performance of PDS in backward states.

Pradhan (2007) examined the performance of states in terms of human development indicators (literacy, infant mortality rate, life expectancy at birth) growth rate of the state domestic product and per capita SDP during nineties. He found miserable performance of the social sector in India and a great divergence in the level of SDP and per capita SDP growth.

Second part of the paper examined the position of social sector expenditure in India during nineties and found that social sector expenditure in India was slow in 1990 as compared to the 1980s. The article stressed on social sector expenditure in the poorer states.

Sebastian (2007) examined variation in the standard of living in terms of poverty, cereal consumption, per capita expenditure and employment level. Results of the study revealed growing inequalities between rich and poor in India.

Kaushiva (2007) examined disparity among states in the pre reform and post reform periods in terms of growth rate of gross state domestic product, poverty, investment level, human development, and infrastructural development. Findings of the study showed that despite adoption of various policies by the Planning Commission the states of Bihar, Madhya-Pradesh, Rajasthan, and Uttar-Pradesh (BIMARU states) experienced low growth rates,
slow rate of poverty reduction, low infrastructural index, low level of human
development and a very low percentage share in the total foreign direct
investment approvals in the post-reform period. It also gave special attention
to the effect of economic reforms on the economy.

Sharma and Sethi (2007) discussed the problem of regional disparities in
economic and social development and made an effort to analyze regional
disparities in terms of per capita income, poverty, private investment and
infrastructural development. On the basis of this analysis it categorized states
into forward and backward groups and finally highlighted interstate disparities.

Chauhan et al. (2008) examined the trends in inter regional disparities in
the rate of growth of per capita NSDP (net state domestic product) to find whether regional disparities have been increasing or decreasing from
1960 to 2005. The study also discussed the social and demographic factors
responsible for convergence and divergence of per capita NSDP (net state
domestic product) among states. Measures for reducing regional disparities
were suggested such as the creation of new states from the large backward
states, increasing social and economic infrastructure to encourage backward
states, to initiate policies that break the vicious circle of poverty, women
empowerment, good governance and promotion of foreign direct investment in
the backward regions.

Dev (2008) The study examined changes in inter-state and intra state
disparities in growth rate of gross state domestic product (GSDP), per capita
gross state domestic product, income poverty, underweight children, infant
mortality rate (IMR) and net enrolment rate in the pre-reform and post-reform
period and also compared India with Bangladesh, Indonesia and Philippines in
terms of most of these indicators. Result of the study revealed increase regional disparities in the post reform period. Under policy issues the study showed a positive relationship between higher level of infrastructure, per capita income and capital flows (particularly per capita total investment). He concluded with approaches of Tenth and Eleventh Five Year Plans regarding balanced regional development and multipronged strategies which are suggested for the reduction of regional disparities such as for higher growth and reduction in poverty investment should be increased in less developed states, agriculture sector problems have to be solved in backward states, a regionally diversified strategy has to be followed for reducing regional disparities in agriculture.

Mehta and Kumar (2008) examined convergence and divergence of incomes across selected states for the period 1980-81 to 2004-05. They used coefficient of variance (C.V), alpha convergence, and sigma convergence test for showing convergence and divergence of income across states. Results of the study revealed significant divergence in levels of per capita net state domestic product across selected states. The study also emphasized on proper coordination of the public and private sector which would help in reducing divergence of income across states.

Pal (2008) in his study found interstate imbalances in net state domestic product (NSDP) and per capita NSDP on the basis of diversification index, instability index and growth rate. The study also showed inter-sector disparity and intra sector disparity. It concluded that growth divergence among states is relatively more in the post reform period compared to the pre reform one.

Pal and Mitra (2008) in their study examined the trends in inter-state disparities in gross state domestic product (GSDP), per capita gross domestic
product (PCGSDP) and in the shares of different sectors in GDP by using coefficient of variation. Results of the examination revealed more divergence in GSDP and per capita GSDP during the reform periods and finally they suggested that development policies (rigorous development policies of government of India as well as the policies of the state governments) should be formulated for the reduction of regional disparities.

Singh (2008) examined the disparities in the standard of living of different income groups as measured through monthly per capita consumption expenditure in rural and urban areas of states. This study was limited to 18 non-special category states and based on NSSO data and Gini-coefficients. The results of the study revealed disparities in the standard of living across states in different income groups. The study attempted to show a positive correlation between monthly per capita consumption expenditure of different income groups and levels of development.

Choudhary (2008) analyzed regional disparities in terms of educational development in India over the decade of 1981, 1991 and 2001 and selected seven parameters for the measurement of educational development. The study was based on a composite index and ranking method for measuring regional disparities. Educational development index (composite primary and upper primary) and human development index values were calculated for measuring the level of regional disparities in educational development.

Results of the study revealed that only Kerala had a high level of educational development. Karnataka and Maharashtra appeared as moderately developed states while Bihar, Orissa and Uttar Pradesh remained backward. Choudhary considered education as an important component of social sector
and suggested measures to develop the educational sector in a balanced manner by measures such as increasing public expenditure on education, promoting a favourable school environment, giving importance to girls’ education.

Ghasal (2008) examined the level of regional disparities in human development and real per capita income (economic growth) during the liberalization period and took fourteen states for analyzing the disparity level. The study found that inter-state disparity in the growth rate of real per capita income was increasing and in terms of human development it was decreasing during the period of liberalization.

He applied cross state regression analysis which confirmed that it was social sector expenditure by both government and private households which explained disparity in human development across states during the period of reform.

Malhotra and Shweta (2008) in their study analyzed interstate differences in spending and highlighted that interstate differences in per capita health expenditure caused interstate differences in health attainment. They also analyzed the relation between major health indicators and determinants such as literacy rate, per capita health expenditure, per capita NSDP (net state domestic product). The study was based on simple regression analysis which showed direct relation between per capita health public expenditure and level of development as measured by per capita net state domestic product (PCNSDP) and interlinks between the two.

Ghosh and Madhusudan (2008) examined economic performance of fifteen major states. They also examined whether there had been any
convergence or divergence in real per capita net state domestic product across the states over the period 1960-61 to 2001-02, by applying the method suggested by Barro and Sala-I-martin and the univariate non-stationary time series method suggested by Phillips and Karl Pearson. The main finding of the study was related to strong tendencies to diverge in per capita income in the post reform period by the Indian states.

In the end it gave importance to regional policies, inter-governmental transfers, and existing policy modifications in economic reforms for reducing regional disparities or divergence in per capita income.

Rajkumar and Chennakrishna (2008) attempted to study inter-regional disparities in the development of major growing states of India, goals of economic planning in India, and showed efforts that lead to regional development. They also discussed indicators of development and divided the states into forward and backward group. Results of the study revealed a marked difference in growing rates of forward and backward states.

Khomiakova (2008) in his study employed two methods for measuring divergence of income across the states during the post-reform period. Analysis of the study revealed clustering of low and high SDP values and structural divergence which increased divergence mainly caused by industrial sector followed by service sector while agricultural sector showed negative contribution to the aggregate divergence.

Dev (2008) examined economic performance of states and explained regional disparities in important economic indicators in the post-reform period. Discussions on positive correlation between growth rate of average per capita consumption expenditure, infrastructural facilities and investment level are
described in this study and this analysis revealed increase in regional disparity in terms of per capita income, poverty ratios, infrastructural facilities and growth in average per capita consumption expenditure in the post reform period. At the end the study suggested some multi pronged strategies such as increased investment, improvement of fiscal management of states for allocating more expenditure for health, physical infrastructure and education in less developed states for higher growth and for reduction of poverty.

Joland (2009) measured social and economic development of China, South Korea and India with special reference to India in terms of poverty level, education level, population growth and human development.

He also made an analysis of the trends in poverty level, education level, health indicators and human development level and found glaring regional disparities. He suggested policies for ensuring better education level for all states, for spreading awareness about family planning, for ensuring good medical facilities and for reducing poverty level.

Adabar (2009) in his study “Economic growth and convergence in India” made an effort to describe the differences in the steady state and reexamine the hypothesis of convergence and economic growth over the period 1976-77 to 2000-01 among fourteen major Indian states. He considered variables such as per capita investment, population growth rate, human capital, initial level of per capita income as important variables to examine convergence. He found evidence of conditional convergence at the rate of twelve percent per five year span.
2.2 Studies Related to Alternative Indicators of Economic Development

A number of studies have used one or several indicators for the measurement of economic development. Perhaps, per capita income is the best single indicator to examine the level of development but it does not truly represent economic disparities in development. Other indicators in practice perform better as a measure of development and are better indicators of development. Indicators such as availability of natural resources, electric power, investment pattern, density of population also influence the development level of a state. In this section the national and international studies related to alternative indicators of economic development have been discussed. In the previous section we have discussed mainly the studies related to prevalent indicators (income, poverty, infrastructural facilities and social indicators). But these prevalent indicators are not sufficient for a measurement of development. Faced with such a problem efforts have been initiated by various economists for using alternative indicators for the measurement of economic development and for the measurement of level of disparities among states and for ranking, classifying and comparing countries and states.

For efficient comparison of consumption levels and their stage of development in 31 countries Benett (1951) created an index based on nineteen monetary and non-monetary indicators. The important components selected in the study were: food, medical and sanitary services, housing and clothing, education, transport and communication services. Two non-monetary indicators were selected for each component. Total calories per head/per day at the retail level and percentage of calories derived from sources other than flour
and roots were selected for measuring consumption level. Number of physicians and hospital beds per 1000 population indicator was employed in the health component.

For housing and clothing component average wood consumption in cubic meter per 1000 population and per capita consumption of cotton, wool and rayon textiles in metric pounds were accepted as an important indicator while mails circulated per capita, percentage of school age population attending schools, number of moving picture theatres were admitted as standard of education. Finally, transportation and communication were measured by rail freight per capita and number of motor vehicles trucks, buses, automobiles and motor cycles per 10,000 populations. But non-monetary indicators as employed by Benett and others do not help in providing an important measure of welfare.

United Nations (1954) applied ‘human development index’ to reflect economic performance of society or to reflect standard of living of the people. The indicators employed under this index were life expectancy, literacy, and standard of living, economic conditions and increased citizen participation.

McClelland (1961) employed per capita electric power production as an indicator of economic development while some social scientists considered crude birth rate as an important indicator of economic development. The most important limitation of these indicators is that they have limited coverage of the developmental process.

For analyzing the rate of economic development and political structure of Latin America, Hagen (1962) employed a combined index of variables of welfare, communication, urbanization, industrialization and educational
development. The variables employed were:

1. GNP per person
2. Doctors per thousand persons
3. Vehicles per thousand persons
4. Telephones per ten thousand persons
5. Radio per thousand persons
6. Newspaper circulation per thousand persons
7. Energy consumption per person
8. Percentage of labour force employed outside agriculture and service sectors
9. Ratio of enrolment in primary schools to population of school age
10. The percentage of population inhabiting urban centers of more than 100,000 inhabitants at a date within or close to 1950-60.

In 1966 for making international comparison of national income meaningful Beckerman and Bacon in their study estimated national income by using non-monetary development indicators. In the study Beckerman employed several non-monetary indicators namely, steel consumption, production of cement, number of domestic letters sent, stock of radio receivers, stock of telephones, stock of road vehicles, meat consumption on per capita basis on which data were available.

Morris and Adelman in 1967 classified seventy four developing countries and applied forty one variables to measure development. Variables were of three types:

i) Those variables for which classification could be based on published statistics.
ii) Those for which it was essential to combine statistical and qualitative elements.

iii) Indicators which were qualitative in nature.

The variables selected were social, political and economic in nature such as political strength of the traditional elite, political strength of the military, degree of social tension, level of effectiveness of the tax system, gross investment rate etc. Factor analysis was used in this study to analyze the interdependence between the social and political variables and economic development level.

United Nations Research Institute on Social Development (UNRISD) study in 1970 was concerned with the selection of the most appropriate indicators of socio-economic development, with the analysis of relationship between these indicators at different levels of development and the construction of a synthetic index of development. The study considered the relationship between social and economic development as more appropriate for measuring development. The study employed 73 social and economic variables which were reduced to 42, and then 18 highly correlated core indicators for making comparisons between countries or for measuring level of development. Nine social and nine economic indicators were included in the core indicators. Thirteen of the indicators were developmental as they show commonly accepted development values such as health and agricultural productivity and the five remaining indicators were structural indicators.

Harbison and his colleagues at Princeton University (1970) explored and applied various methods of ranking, classifying and comparing countries on the
basis of development and modernization indicators. Their study was based on forty variables and emphasis was mainly laid on human development indicator, especially indicators of educational development comprising indicators of stock, flow and expenditure on education. For seven components such as economic, cultural, health, educational effort, high level manpower (2), demographic eight indices were constructed and a composite index was also applied.

Dasgupta in 1971 took twenty four indicators and has applied the principal component analysis to classify the districts in India with respect to their level of development.

Seers (1972) selected indicators of poverty, employment and distribution of income as an important economic measure of development.

Rao (1975) in his study of regional disparities attempted an assessment of the backwardness of districts in each state. He applied fifteen indicators with a view to devoting special attention to the development of such backward areas and the indicators were:

1) Total population and density of population
2) Cultivable area per agricultural worker
3) Number of workers engaged in agriculture etc.
4) Net area sown per agricultural worker
5) Number of commercial vehicles registered
6) Percentage of literate population
7) Number of hospital beds per 100,000 of population
8) Percentage of gross irrigated area to net sown area
9) Percentage of area sown more than once to net sown area
10) Per capita gross value of agricultural output
11) Number of establishments using electricity: (a) total; (b) household; and (c) non-household.
12) Number of workers /thousands of population employed in registered factories
13) Mileage of surfaced roads
14) Percentage of school-going boys and girls in the age group:
   a) 6-11
   b) 11-14
15) Number of seats per million populations for technical training;
   a) Craftsmen
   b) Diploma level

In terms of the above indicators districts were ranked in a descending order in determining the backwardness of districts (excluding first four). No objective method was applied to identify the status of districts and it was left to the state (concerned) for identifying the backward districts. Further, thirty one indicators were evolved for purposes of multilevel planning and these incorporated in themselves fifteen population indicators, five agricultural indicators, three infrastructural indicators, eight indicators concerning banking and credit. These indicators reflected socio-economic conditions of the states more accurately than the previous indicators.

The state of Madhya Pradesh in its publication entitled “District wise economic indicators of Madhya Pradesh” took forty two indicators into consideration for presenting ‘a comparative picture of pace, progress and
pattern of development' in the different districts. These series of indicators covered population, working force, agriculture, industry, electrification, health, roads, and education vital statistics, and twenty three of these indicators may be classified socio-economic. The most useful population indicators were the population growth rate, the birth rate and the death rate. For development planning, internal migration was also included as an indicator and under internal migration the most important indicator was the net rural urban migration rate. Further, for measuring socio-economic development health and nutrition constitute an important indicator; good health is an essential aspect of the quality of life and for achieving high level of productivity. The indicators which are most directly concerned with the objective of improvement of the health status of the people were life expectancy at birth (LEB), Infant mortality rate (IMR), the mortality rate of children aged 1 to 4, maternal mortality rate and the prevalence rate of illness.

In 1977 a study undertaken by Rao, Hemlata used twenty four indicators representing the sectors of agriculture, industry, banking and education for analyzing the trends of regional disparities and for the identification of backward regions. Kulkarni in (1977) employed eight indicators representing education, urbanization, population and occupational distribution sphere for analyzing regional disparities. Graft Johnson (1978) applied social and economic indicators for the measurement of economic development in West Africa. Social indicators incorporated the group of demographic indicators. These were related to the three components of demographic change: fertility, mortality and migration, and there is an associated indicator for each of these components. Fertility component is measured by crude birth rate. The second
demographic indicator is the ‘crude death rate’. The third component of
demographic change is migration which reflects both the social and economic
conditions. A place is classified as socially deficient with net out-migrants. On
the other hand a place with net in migrants can be classified as a more
economically developed place. The study considered non-demographic group
of social indicators and the first component of this indicator was education and
literacy indicators including:

a) Proportion of persons aged 6-14 years who have had any schooling.
b) Proportion of all persons aged 15 years and over who have had any
schooling.
c) Proportion of persons aged 15 years and over who have had any
schooling.
d) The median years of schooling of those aged 15.
e) The literacy rate of those aged 15 and over.

In the above listing the study avoided other (sophisticated) measures
such as the number of newspapers per 100,000 populations. The third group of
social indicators were related to the facilities of social amenities such as
potable water supply received by the proportion of population, the doctor-
patient ratio, the proportion of population having hospital facilities, proportion
of the population using electricity. On the other hand economic indicators were
divided into agricultural and non-agricultural indicators. The indicators in the
agricultural sector comprised the modernization of that area of economic
activity which leads to the improvement in the quality of life. In the present
world it is difficult to select indicators which can be reliable for the
measurement of improvement in the quality of life. But there are a number of
indicators which measure improvements such as percentage share of agriculture in GDP, yield per acre of three crops, percentage of improved seed production in total annual requirements. Non-agricultural economic indicators included proportion of employed people not in agriculture, extent of underemployment, per capita GNP, the coefficient of variation of income distribution, the output labour ratio, the volume of international trade, the value of exports, and the rate of exports of non-primary commodities.

Suar (1984) applied twenty indicators and developed a composite index by using the principal component analysis for analyzing the regional disparity in Orissa. Malikarjun (2002) on the other hand applied fifty indicators to measure the extent of intra-regional disparity in economic development of Andhra Pradesh. He emphasized on the rate of development of important sectors of the economy which increases the process of economic development and reduces the regional disparities. In India there were great disparities in culture, population, agro climate level of the economy, marketing conditions, political and economic systems. Therefore, definite plans and policies were framed for economic development of different sectors of the economy. Thus, in this case sector specific index was considered as better than a composite index for analyzing the level of economic development. The study measured regional disparities at sectoral level across the states and sectors included in this study were agriculture, industry, basic infrastructure and services, agricultural labour productivity, productivity in Indian agriculture, education and health sector etc. One of the limitations of studies on disparity in India is that they focused on inter-state and inter district within a state and mostly studies have not addressed the problem of disparity below the district level. Therefore it can be said that for measuring regional disparities, either at state level or at district level may be
inappropriate. Therefore, the level of disparity measured with the help of indicators may not approximate the prevalent socio-economic condition.

Sahu and Rajasekhar (2004) they critically analyze the approach and indicators that have used to measure the level of disparity. This paper focused on disparities prevailing between the rural and urban areas and suggested that income is not sufficient indicator to measure the degree of disparity in terms of human resource development and infrastructural facilities that’s why for understanding the growing rural-urban they stressed on the need to develop some other indicators representing human resource development.

Henderson (independent futurist and consultant in over 300 countries) (2009) in her article “Measuring Progress not by GNP alone” selected country future indicators which would not only be used by government but a large number of average citizens would use these indicators. These indicators provide new techniques for the measurement of national progress. The indicators include reformulated GNP (gross national product), education, health, nutrition, basic services, shelter, child development, political participation, democratic process, status of minorities, and ethnic population. In Wikipedia free encyclopedia (2009) various alternatives to GDP (gross domestic product) or measures of economic development are suggested, such as:

1. Human development index which includes life expectancy and education levels.
2. GPI (Genuine progress indicators) or index of sustainable economic welfare.
3. For measuring (GNH) gross national happiness, the center for Bhutanese studies in Bhutan employed a complex combination of subjective and objective indicators for measuring gross national happiness in many spheres: living standards, health, education, economic system diversity and resilience, culture vitality and diversity, time use and balance good governance, community vitality and psychological well-being.

B. Sivarnalatha in her article (2009) “GDP does not give a shit about you so why use it” suggested some alternative measures of development. She employed genuine progress indicator (GPI), gross national happiness (GNH). She also employed human development indicator (HDI) as adopted by UNDP for measuring economic development. This indicator combines life expectancy, literacy and educational attainment.

Furthermore, for analyzing the status of socio-economic development in developed and developing nations latest indicator used is human development index. HDI (human development index) ranks all the countries from 0 to 1 and serves as a good indicator for socio-economic development and gives a broader perspective on progress towards development. To measure the level of economic development there are various studies where a number of physical indicators have been used in India. The important weakness of these studies is that physical indicators do not have the hypothetical justification in constructing the composite index which allotted arbitrary weights. In 1954 such criticism was tracked by the United Nations in the Report of International Committee of Experts on levels of living. After that many studies supported this contention, quotation of which is difficult to make here. Only few studies are mentioned here namely, Harberler, Mydral, Adelman and Morris and UN
experts namely Baster and Subramanian, Drewnewski, and Scott and McGranahan.

In spite of these criticisms some changes have been initiated in the method of measurement of development. One such serious attempt was made by UN research institute for social science in 1970 based on eighteen socio-economic indicators for measuring the development level. This study was an exploratory study of analyzing and measuring development in its economic and social aspects. In this respect it was quite different from the previous studies. In this study most appropriate socio-economic development indicators were used and relationship between these indicators at different levels of development based on implicit weights which were more descriptive and sensitive than combined index was analyzed. In providing a model and framing the methodology these studies are useful. The development indicators do not help much as the problems differ from one place to other and there is inadequate data availability in all the regions. Now, we may conclude that development is a multidimensional process and no single indicator can be used for analyzing the development process hence it can be viewed or measured through various indicators. In this respect, a precise, compact and systematic set of indicators have been selected for measuring the level of development.