Chapter III

Approach of the Study -
Methodology and Analysis

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"Research is the heart of any results of the given subject"

<div align="right">Furgusan</div>

I. Introduction

Inequalities in income are as old as civilization of mankind. This has been proved in reading and writing about this subject and the need for development and to overcome the problems arising by the inequalities, which may be due to various other factors. When the subject like inequalities in Gujarat needs to be discussed, it becomes pertinent to know various aspects of geographical, physical, geographical, social and economic forms. So, it can be said inequalities are among socio-economic environment, which has a record in the past and needs to be taken up seriously by the persons, ruling powers in the existing political situations. So that any future plans taken up for the purpose, would provide the situation of growth and equalities. So that development with the stability with any form.

Magnitude and complexities are noticed to the very high level so it is quite apparent that such inequalities should be brought down so that the existing population as well as process of development take advantage of the existing level of equalities. One important thing to note is wherever and whenever any economy when stability remains for a longer period the investment would automatically come providing initiative to the private sector for investing in business activities of infrastructure as well as in real estate it is being noticed to the existing form in the economy of Gujarat. The developmental process defers from country to country and by experience of the past. It has been noticed that socialistic countries or communist country like China had its developmental process to the public sector. Countries with democratic set up have developed through private sector initiative where markets have played an important role through scale of demand and supply. The bureaucratic form of rulers for countries with monarchy system have developed by spending on this process majority of the

investment coming from the monarch treasuries. India with the experience of both capitalism as well as socialism took up the cost of development through plans. In the initial plans public sector took up the lead to develop the areas which needed very heavy investments specially for the key sectors viz. iron and ore, chemicals, cement and infrastructure facilities like roads, transportation, education, health, etc. after gaining an experience and laid the foundation of the key sectors by required by the society slowly the investment of public sector in the 1980 were shifted to private sectors by reducing the controls on financial as well as business sectors. In doing so business activities started flourishing and it was the time, when the world was making itself a village through globalization and liberalization. It means the removal of restriction, controls, regulations and giving way to private sector to take decisions on business activities through markets. The new era of globalization started from 9th decade of last century.

The 1990s have seen a renewed interest in issue of capital accumulation and growth. New paradigms for saving, investment and growth have been advanced to address theoretical and empirical puzzles and to guide the design of better policies. This paper provides a policy oriented review of recent theoretical and empirical work on the determinants of saving and investment and on their links to growth. It takes stock of new findings as well as still unresolved questions and gives particular attention to empirical regularities and to the policy issue relevant to developing countries.

The mid 1990s have seen resurgence of interest in themes of capital accumulation, technological progress and economic growth. This renewal 1990s, when macro-economic discussion was dominated by concern with short term adjustment and stabilization, it marks on the other the new consensus among development economies that better living standards and the elimination of poverty must be based on the sustained expansion of output.

Although questions of capital formation, technological progress and saving have been at the core of economic analysis for two or three countries. The connections among them and the directions of causality are still far from clear. Several factors may start and support growth. The transformation of an initial growth spurt into sustained expansion of output requires the accumulation of capital and its corresponding financing. Expansion, in turn, sets in motion a self-reinforcing process by which the

anticipation of growth encourages investment, investment supports growth and increased income raises saving.

II. Globalization and Inequality, Past and Present

The late nineteenth and late twentieth centuries shared more than globalization and economic convergence. The trend toward globalization in both centuries was accompanied by changes in the distribution of income as inequality rose in rich countries and fell in poor ones. Between one-third and one-half of the rise in inequality since the 1970s in the United States and other member countries of the Organization of Economic Cooperation and Development (OECD) has been attributed to global economic forces, about the same as a century earlier. It appears that the inequality produced by global economic forces before World War I was responsible in part for the retreat from globalization after the war. What does this retreat imply for the future? Will the world economy once again retreat from globalization as the rich OECD countries come under political pressure to cushion the side effects of rising inequality?

Economic growth after 1850 in the countries that now belong to the Organization for Economic Cooperation and Development (OECD) can be divided into three periods: the late nineteenth century belle époque, the dark middle years between 1914 and 1950, and the late twentieth century renaissance. The first and last epochs were characterized by rapid growth: economic convergence as poor countries caught up with rich ones; and globalization, marked by trade booms, mass migration, and huge capital flows. The years from 1914 to 1950 are associated with slow growth, a retreat from globalization, and economic divergence. Thus history offers an unambiguous positive correlation between globalization and convergence. When the pre-World War I years are examined in detail, the correlation turns out to be causal: globalization was the critical factor promoting economic convergence (Wiliamson 1976a).

Because contemporary economists are now debating the impact of the forces of globalization on wage inequality in the OECD countries, the newly liberalized Latin American regimes, and the East Asian "tigers".

III. Choice of Study

Research as stated earlier is the heart of thesis, which gives in depth knowhow of the problem one undertakes for study. Research mainly depends upon the purpose of the study and availability of statistics and the way to know the problem and solve it. This study is on regional economic inequalities. Such regional economic inequalities have further shown a wide gap in disparities.

Thus with this in mind the choice of the study is entitled.

"AN ECONOMIC STUDY OF INTER – REGIONAL ECONOMIC INEQUALITIES IN GUJARAT"

Gujarat is a developing state of the Indian sub-continent, where a rich endowment of a physical and natural resources are scares. But with the peaceful political environment and a rich heritage of agriculture sector, industrial sector, infrastructure development, though the state has scarce water resources had generally received a low priority in the process of planned development in the earlier years, is now doing well with operation of Narmada Project through its serpentile like canals reaching 18 districts of Gujarat.

Inter – district inequalities cannot be totally removed largely due to unequal distribution of resources. But, with better planning and deliberate policies, they can be reduced considerably. What is needed is the preparation on sectoral plans prepared for districts which have remained backward in the given sectors, Now it is Gujarat, that is floating its goodwill through vibrant summits every second year, where all the developed countries governments want to take part in this summit of Gujarat.

IV. Objectives

1) To know and analyze population growth dipped down to 19.17% from 22.66% in 2001- 2011 decade and has pushed rapid urbanization in Gujarat, which has created imbalances among rural – urban areas.

2) To find out the gender literacy rate and to know to what extent there is the disparity among districts of Gujarat in literacy. Urbanization has not decreased female child population growth.

3) To know to what extent the unemployed workers are attracted for work, where job opportunities exist, thereby population in the urban areas has increased.

4) To analyze the infrastructure increased in Gujarat with the liberal and growth facilities, facilitated by the Gujarat government's policy of giving priority to the development process.

5) To know agriculture and industrial sector where both have benefitted by the provision of government's policies but, more regional disparities in agriculture and industrial production among different districts has been seen in the post reformative liberalized period.

V. Hypothesis and Hypothesis Testing

1) Rapid urbanization of Gujarat has taken place and there are few cities or developed areas where population has concentrated.

2) Rate of illiteracy has come down in India and Gujarat is no exception both gender-wise and area-wise, female literacy rate and enrolment to schools has increased.

3) Workers migrate to the area (cities) where more employment opportunities exist, higher number of workers are found in specific jobs/work for their livelihood. Agriculture growth in liberalized period have created more imbalances among districts.

4) Gujarat has become the leader by focusing more on infrastructure facilities and providing incentives, loans (financial assistance) and providing inputs to both agriculture and industrial sector at subsidized rates on priority basis.

5) Provision of health services has further improved life expectancy and standard of living of citizens of Gujarat has improved. Different regions have different area potential of growth of different products. Different climate and natural resources have created disparities among different regions of the state.

The following aspects were considered better to derive the hypothetic objectives to prove through hypothesis tests, the viability and sustainability of the study and the objectives with which it is 'knitted'.

1. Population and gender disparities among districts of Gujarat has increased and so is urbanization with growth rate of population of urban areas have increased.

2. Gross Domestic Product, agricultural growth rate and industrial growth through infrastructural technical efficiency has boasted agriculture production and industrial growth.

3. Literacy among children specifically at the age 0-6 enrolment, drop out, and detainment in school years show positive results educational institutions of education.

4. Ruro-urban disparities gender, in education, residential status have widened.

5. Residential status (condition of houses) and provision of services- services like water for drinking, sanitation, light have improved and so are the ownership of assets for comfort and standard of living has increased.

6. Health (provision of health in rural areas and life expectancy, infant mortality shows positive results)

VI. Data collection and Tabulation

Secondary data has been the main source for results in this study

Collection of Secondary Data

Secondary data, pertaining to India, Gujarat has been collected for the research purpose of this study.

Secondary data on equality on NDP on population, Literacy (Education) primary secondary, higher and professional level. This statistical information is from Economic Survey, Reserve Bank of India publication, Annual reports of Central Statistical organization, New Delhi books written by scholars,. economic and political weekly journal of different periods, World Bank Reports, Economic Survey, Journals of National repute and at state level publications like Yojana, Vishleshan, census data 2011, statistical indicators, socio-economic statistics 2012-2013 published by the Director of Economics and Statistic Department, Gandhinagar, Gujarat has been put in use. For agriculture, education department, industry, labour, health and medical data, Commissionerate of Higher Education, Director of Social Security, Registrar of General and Census Commissioner, Animal Husbandry, Addl. DG, State Crime Records, Gandhinagar, office of the registrar, cooperative Societies, Comm. of cottage and village industries, Gujarat state, ASI Factory Sector results, Central Statistical

Office, Kolkatta. Gujarat Urja Vikas Nigam Vadodara and Torrent Power Ltd., Ahmedabad, Commissioner of Transport Gujarat State Road Transport, Gujarat State, Gujarat State Warehousing Corporation and Gujarat State Civil Supplies Corporation, Gandhinagar, Gujarat Telecom circle, Directorate of Industrial Safety and Health, Ahmedabad Data from these departments and there was put in use in this study.

Papers written by scholars and the research undertaken, methodology used computer internet website was put in use for the work done on the subject at international level. World Bank Reports, Economic Review monthly reports, Yojana, Anvesak journal published by Sardar Patel Institute of Economic and Social Research.

To go further deep at the state level, data at the district level chosen for the study in terms of gender disparity, ruo-urban disparities, health statistics, education, infrastructure data was collected from the socio-economic study, expenditure made by the state and various department having relevance to the study were approached for their publication with the officials to share their expertise as the subject. The period taken in the study was 1981 to 2011 specifically in the demographic figure and in a few others, for which published data is available. Other aspects figure are on the availability of such statistics.

Tabulation of Data

Tabulation means to put the collected bulk data in the organized forms of tables, charts or graphs. This would provide the features of the data in respective tables or charts (carried on for the successive tables or independently). The whole data is positioned into a few organized and manageable tables with informative figures to be analysed. Once the data is presented through charts or graphs comparison is made easy.

Statistical tables are formed in various ways. The selection depends upon the purpose to which they are to be put or used, which the data fulfills. The table in statistical form can be classified on the basis of purpose. Such tables can be divided into two types (1) general purpose table (2) special purpose table. The general purpose tables are with the original data on the same subject for reference. Thus it contains actual and absolute figures and not rounded numbers or percentages. Special purpose tables are prepared for the purpose of any study is spread.

VII. Methodology Analytical tools used for findings

Statistical analysis used as discussed earlier calculated performance score was undertaken using appropriate technique. Simple and two way frequency distribution was used to get the pattern of growth development. This was also undertaken to identifying the changed patterns to overcome inequalities. Many of the tables are taken up on ranking basis, based on arithmetic tools usage. The analysis of the gaps was not only done on performance score, but separate analysis was done for individual item for which information was inadequate. Frequency distribution was used to identify the economic and social expenditures during which items were not considered.

The districts were ranked to their average performance score for different factors. Separate chapter for the districts of Gujarat state was allotted for the aspects discussed earlier using the arithmetic equations as well as statistical techniques, whichever proved to give correct results. The main aspects pertaining to Gujarat economy leading to inequalities and again lead to higher inequalities during post liberalization period have made the state government more open aged policy which the government has taken up with 2020 Gujarat vision for faster development and removal of inequalities gap and making Gujarat a role model, making its place as the most developed state of the country

Analytical Tools

The following tools and models are used in the present study.

Mean, Percentage, Average growth rate, Compound growth rate, linear growth rate and Correlation.

Industrial Development Index (IDI)

$$\text{Pk} = \partial_{k_1} X_1 + \partial_{k_2} K_2 + ... + \partial_{k_k} X_k$$

∂_{k_1} is called loadings.

Derivation

X_1 is the first standardized indicators

$$Z_j = (X_j - X)/SD_x$$

Where SD_x is the Standard Deviation of X_l.

Ranking Method (RM)

$$RM = I = \frac{S \times T}{P}$$

Where

I - Indicator of Development

S = percentage of workers in secondary sector

T = percentage of workers in tertiary sector

P = percentage of workers in primary sector

Standard Deviation

The positive square root of average of square deviation from mean is called standard deviation and it is denoted by S. Formula:

$$S = \sqrt{\frac{\sum x_i^2}{n} - \left(\frac{\sum x_i}{n}\right)^2}$$

Co-efficient of Variation (CV): To capture the imbalance between the different states in terms of FIs, this measure as given by yotopoulos and lau is used.

$$\overline{V}_w = \frac{1}{G}\sqrt{\frac{\sum_{i=1}^{n}(g_i - G)^2}{n}}$$

Where

G - is the average rate of growth of sanctions/disbursements over a given period of time.

g_i - is the rate of growth of sanctions and disbursements in the ith state.

Index for Agricultural Efficiency (IAE):

It has been evolved by the following formula

$$AE_r = \frac{P_r}{P}$$

Where AE_r -is the index for agricultural efficiency of the state

P_r - is the per hectare production of total food-grain in the state

P - is the per hectare production of total food-grain in India

Factor Analysis

Factor analysis resulted into four components for both the periods (based on **Kaiser's** criteria to **Eigen** value to be higher than 1. It may be concluded that a broad and fair representation of the whole continuum of inter district disparities for the selected indicators can be made in a simple structure of four orthogonal factors for both the periods which accounted for about 78 to 89 per cent of the total variance. The results for each period are presented separately in Table 2 and 3 respectively.

The factor analysis begins by a model which assumes that the variance in the materials is explained by an underlying structure composed of certain smaller number of variables. The first component/factor is obtained on the basis of correlation matrix R, the factor loading being the eigen vector f corresponding to the maximum eigen value of the correlation matrix. It is linearly dependent on the constituent variables and has the maximum sum of squared correlation with the variables. The composite index for the purpose was obtained as under by linearly combining the variables X_{ij} (j=1,2,…m), the weight for the jth variable being the jth element in the vector f.

$$Y_{ij} = \sum_{j=1}^{m} X_{ij} f_{ij}$$

Regionalization was done on the basis of a single but most significantly correlated factor. More than one factor can also be used for the purpose.

The factor analysis was used to derive factor loadings and component scores for all the sectors. In the calculation of the scores, however, we did not use standardized variables as is the usual practice, for it distorts the dispersion of the original indicators, instead we divided each indicator by its mean in order to remove the scale bias in the data. The aggregate index of development for each district was derived by summing up

the component scores for each of the four sectors. This method takes care of multi-collinearity as weights used directly depending on the correlation between variables. Factor score is multiplied with percentage variance explained to get value of indices.

After working out the index using factor analysis, grouping of the districts into high, medium and low development was done employing the following formula.

Level of development $= \overline{x} \pm 0.5\,S$

The districts having the index values of less than equal to $\overline{x} - 0.5\,S$ are grouped as low developed; the districts having index values in between and are classified as medium developed and the districts having index values higher than are considered as high developed districts for the respective period. This analysis was done separately for both the periods pre and post liberalized era and the indices were finally constructed.

Statistical analysis used as discussed earlier calculated performance score was undertaken using appropriate technique. Simple and two way frequency distribution was used to get the pattern of growth development. This was also undertaken to identifying the changed patterns to overcome inequalities. Many of the tables are taken up on ranking basis, based on arithmetic tools usage. The analysis of the gaps was not only done on performance score, but separate analysis was done for individual item for which information was inadequate. Frequency distribution was used to identify the economic and social expenditures during which items were not considered.

The districts were ranked to their average performance score for different factors. Separate chapter for the districts of Gujarat state was allotted for the aspects discussed earlier using the arithmetic equations as well as statistical techniques, whichever proved to give correct results. The main aspects pertaining to Gujarat economy leading to inequalities and again lead to higher inequalities during post liberalization period have made the state government more open aged policy which the government has taken up with 2020. Gujarat vision for further development and removal of inequalities gap and making Gujarat a role model, making its place as the most developed state of the country.

VIII. Chapter Scheme

The chapter scheme followed has been based on the importance and follow-up of the respective factors which would give the study the shape of real reference. They are:

The first chapter focusing on the following emerging structure of Indian economy (Growing inter sectoral imbalances) The theoretical aspects as well as other practical changes leading to structural changes have brought increased growth in the economy leading to higher economic imbalances.

The second chapter is on Study literature in which various writers views are provided, which had led towards poverty and inequality. There are various other aspects on which different writers have written say on agriculture, industry, services and other factors like infrastructure inputs, socio – economic aspects, demographic and standard of living of people including consumption has been discussed in this chapter.

The third chapter highlights the approach of the study and research methodology used in the study in which the main heads discussed in second chapter as socio economic aspects, infrastructure and others are taken as factors showing us the development of the area in the study. This chapter shows other aspect like choice of the study, objectives as well as hypothesis and thereafter method used for hypothesis and for finding out the results, using different statistical as well as arithmetic tools found to be fit for true results with the data provided by the government published figures from various departments.

The fourth chapter discusses on inequalities in Indian economy focusing more on demographic, gender inequalities, residential aspects, literacy (education) and/or which would prove to be useful in the chapter to follow for pointing out the real scenario of the subject.

The chapter to follow is on different aspects pertaining to various factors of Gujarat economy. The various factors like social, infrastructure are sub divided for better and true results to show the occurrence of inequalities among different regions which this study has taken up as districts of Gujarat state.

Next chapter shows the pre and post liberalised area results and to what extent regional inequalities have arisen. No doubt in the post liberalised period the role of open market is appreciated but, difference between have and have not appears to have increased in post liberalised era is discussed in this chapter This chapter is embedded with the results or hypothesis testing, which are the results of the study.

Last chapter is on the conclusion of the study which recapitulates all the previous chapters discussed above along with the suggestions in the form of recommendations which the government or authorities or the society would be benefited. Limitations of the study are in the form of undone work in the study and lastly the scope of other research would fill the gap of the work not done.

Most of the comparison among different aspects was made on the basis of latest available data. The researcher though is with the government college, has an upper hand to be equipped with latest data available from the government sources at Gandhinagar from different departments. Population for the year 2011 is available from Census 2011, Department of Gujarat. The figures may also have a change, when final figures are formulated by the census. The difference may be 1 to 2.5 per cent. But in such a big exercise of calculation and tabulations of the census figures and with the increase in population such figures are also not so high. Hence whatever figures are published or provisions are taken in the study to be correct on which the results are the outcome. Thus quick (Q) or provisional (P) are the data figures accepted in the study as final and put in use as true which may be a limitation of the study.

The study is related to regional inequalities i.e. economic inequalities among districts of Gujarat. Here it is worth stating that the natural endowment among districts is vast which the secondary data (the published information) has been made available, at the local level as well as from Gandhinagar, use of computer-internet has been an added advantage in getting the latest figures. In this case the appropriate population demography, stage domestic product, literacy figures levels of education and employment gender-wise information sectoral growth and their share in the SGDP, infrastructure and a special attention was given to the agricultural sector. Agriculture sector in particular did not do well in the eighth as well as the ninth decade of the last century. The millennium century particularly, when the Narmada project reached

various districts of Gujarat. The problem of drinking water and its use for irrigation replaced the shortage of underground water as well as dependency on wells has not only be reduced, some rivers those were dried up in summer, have become full of water as and when required. Such arrangements have been made by the continuous flow of Narmada canals of Sardar Dam Water project that provide water needs for the areas from where it pass.

All the above discussed matters are used for comparison among Gujarat with states and with different districts of Gujarat, to know their stand or number of through ranking system.

IX. Limitation and Scope of Another Research

Secondary data has been used to derive results (findings) as primary data would not have had given true results in form of scatteredness of the Gujarat economy. Different aspects would lead to different results and use of different methods, like use of surplus or deficit among financial aspects of regions – or lessening of socio economic aspects or further use of skilled labour would increase productivity and development would be at higher not has not been put in use in this study is the limitation of this study. There is a wide open phase, where scholars and researchers can do further study on this subject – as knowledge specifically in economics is just a drop in the full ocean of this faculty.