CHAPTER – I
INTRODUCTION
1.1 Introduction:

Development and equity are the two important macro objectives of all economies. Development without equity will not ensure the welfare of all. Hitherto, reducing regional disparity is one of the objectives of Indian plans (Balogh, 1963). The Regional disparity is now a matter of serious concern in the context of inclusive growth strategy of India’s present plan (GOI, 2010). Generally it has been proved that in a large economy, different regions with different resources bases and endowment would have a dissimilar growth path over time. One of the reasons why centralized planning was advocated earlier was that it could restrain the regional disparity (Bhatt.V.V., 1973). In spite of planning, however, the regional disparity remained a serious problem in India even today. In this context, the new controversy is whether growth rates and standard of living in different regions would eventually converge or not. The convergence theorem postulates that when the economy accelerates, initially some regions with better resources would grow faster than others. But after sometime, where the law of diminishing marginal returns set in, first growth rates would converge, due to different marginal productivity of capital in other words, higher in poorer regions and lower in richer regions; and this in turn would bridge the gaps in the levels of economic across regions. But the empirical evidences on this are however very controversial. It has been observed from the literature that when economy liberated, especially after controls on investment are lifted, then regions with better infrastructure would attract more investment, especially foreign capital, through market mechanism and this in term would lead to regional inequity at least in the early phase of reforms; India is classic example for this (Barro, 1991).

1.2 Concept of Infrastructure:

Infrastructure refers to the facilities, activities and services which support operation and development of other sectors of the economy. In other words, infrastructures are such basic requirements like the railways, roads, ships, railways, communications, energy, banking, finance, science, technology, health, education and other public utility concerns (Agrawal, 2012)

Infrastructure is the basic physical and organizations structures needed for the operation of a society in general and economy in particular (Dictionary, 2010). The infrastructure services and facilities necessary for an economy to function
The term infrastructure typically refers to the technical structures that support a society, such as roads, water supply, sewers, power grids, telecommunications, schools and hospitals (Language, 2010).

There are two types of infrastructure social and physical or economic infrastructure.

Social infrastructure is concerned with the supply of such services which meet the basic needs of a society. In other words, social infrastructure refers to such basic services as education and training, health and sanitation, drinking water, housing, sewage and others. Social infrastructures are known as ‘social overheads’ which supports the economic system indirectly (RuddarDatt, 2007).

Physical infrastructures are those infrastructures which are directly concerned with needs of such production sectors as agriculture, industry, trade and others. In other words, physical infrastructure refers to those facilities which directly support the process of production and distribution of the economy. For example: Energy, irrigation, transport, telecommunication, banking, finance, and insurance, science and technology and others. Physical infrastructure is also known as ‘economic infrastructure (Misra.S.K.Puri.V.K., 2009).

Development of a country depends very much on the availability of its infrastructural facilities. Infrastructure plays an important role in improving a country’s living standards and in contributing to a higher rate of economic growth.

1.3 Importance of Infrastructure:

Infrastructure plays immensely in many ways for the development of the country and the economy and some of the illustrations are given bellow;

- The development of agriculture depends to a considerable extent on the adequate expansion and development of irrigation, power, credit, transport, marketing, education and training, research and development and other facilities.
- Industrial production requires not only machines and equipments but also such economic and social infrastructure as energy, skilled man power, management, banking and insurance, marketing, transport services.
• Infrastructure development is a pre-condition for increasing investment. The areas with sound infrastructure base mega succeed in attracting more capital for investment.

• Infrastructure development such as transport facilities, education and training, development of Science and technology research and development, etc, improves productivity significantly.

• Infrastructures play a significant role in the generation of employment opportunities. They improve mobility, productivity and efficiency of labour larger investment, development of industry and agriculture, etc create more employment opportunities.

• Development of backward regions and removal or regional imbalances is another significant contribution of infrastructural facilities.

• A close link between infrastructure spending and GDP growth has been established studies has revealed that 1 percent growth in the infrastructure stock is associated with 1 percent growth in percapita GDP.

• Infrastructure development is important not only for economic growth but also for all round development of the economy of a country (Agarwal.R.C, 2010).

• The prosperity of country depends directly upon the development of agriculture, industry and services sector. Agriculture production, however, requires, power, credit, transport facilities and others. Industrial production requires not only machinery and equipment but also skilled men power, management, energy, banking and insurance facilities, marketing facilities, transport services, which includes railways, roads, and shipping, communication facilities and others. Service sectors also require the good quality infrastructures.

All these facilities and services collectively matters for development and the expansion of these facilities are an essential pre-condition for the faster growth of the economy. Hence, provision of adequate quality and timely infrastructure facilities must be the most important for economic development (Lekhi, 2009).
The provision of quality and efficient infrastructure services is essential to realize the full potential of the growth impulses surging through the economy. Accordingly India could unleash its full potentials, provided it improves the infrastructure facilities, which are at present not sufficient to meet the growing demand of the economy. Failing to improve the country’s infrastructure will slow down India’s growth process. Therefore, the first priority could be the develop the infrastructure according to the needs of the economy (GOI, 2007).

The United Nations development programme, in its methodology to construct the human development index has been used to three dimensions namely, education, health and income. All these are important components of human right. It sustains economic growth by providing basic as well as specialized skills that ensure increased productivity and higher per capita incomes (Jha.A.K, 1991) on the other hand human development is directly depending upon universal access to education, health and income with their implications for equity and social justice. Equal opportunity, equal access to education and equally utilizing these opportunities and access lead to sustainable, healthy, and educated society (UNESCO, 2007). Education is essential for growth and development is a major role in the development of individual construction of society is the key components of human development (Sharma, 2007).

1.4 Statement of the Problem:

The previous studies have been established the relationship between investment in education and development. Some the studies have also analyzed the importance of investment in education. Even here comprehensive studies are further limited. Previous studies have also examined regional disparity issues. Moreover, majority of the studies are concerned with particular aspects such as irrigation, roads, telecommunication, hospital, education and others. However, the previous studies have not attempted to relate the regional disparities to educational development in a comprehensive manner. Hence the present study, “An Economic Analysis of Regional Disparities in Social Infrastructure Development in Karnataka” has been a unique attempt with new approaches and dimensions.
1.5 Objectives of the study:

For the present study the research has set the following objectives;

- To examine the budgetary provisions for educational development in Karnataka.
- To estimate the long-run relationship between resource allocation to education and development in Karnataka.
- To identify the causation between resource allocation to education and development in Karnataka.
- To examine the regional disparity in resource allocation to education in Karnataka.
- To examine the regional disparity in primary education development in Karnataka.

1.6 Hypotheses:

The present study has been set the following hypothesis.

- Total allocation to primary education has long-run relationship with gross state domestic product.
- Gross state domestic product has been significantly caused planned allocation to primary education.
- There is regional disparity in resource allocation to education.
- There is regional disparity in educational infrastructure development.
- Gulbarga division has been suffering from shortage of teachers.

1.7 Methodology:

The present research work has followed the following research methodology.

1.7.1 Collection of Data:

The present study has been used only secondary sources of information.
1.7.2 Secondary data:

The secondary data has been collected from government documents, Economic Surveys of Karnataka, Economic Surveys of India, Karnataka State Education Performance Reports, World Development Reports, Human Development Reports, Indian Development Reports, Plan Documents of India, Karnataka State Government’s Budget Documents, Government of India’s Budget Documents, CMIE Reports, Central Statistical Organization, Journals, Books, Infrastructure Development Reports, etc.

In the fourth chapter an attempt has been made to examine the long-run relationship between investment in education and economic development in Karnataka. As proxy to investment in education, plan allocation for primary education, non-plan allocation for education and total allocation for primary education data for the period from 1990-91 to 2011-12 have been used. Per capita income, gross state domestic product (GSDP), primary sector, secondary sector and tertiary sector income for the period 1990-91 to 2011-12 have been considered as proxy to economic development. The normality tests (Jarque-Bera) have been conducted to confirm the normality of data. Since the time series data have been used in the analysis, the necessary checks were taken to the test of the stationarity of data. The unit root, Philip-Peron (PP) tests have been conducted to find the stationarity of data. The Johansen co-integration techniques are used to estimate the long-run relationship and VEC (Vector Error Correction) models used for short-run analysis.

1.7.3 The Models Used for Unit Root Test:

The unit root, Philip-Peron (PP) test has been conducted to find the stationarity of data with three types of models.

1. without intercept and trend (\( \Delta y_t = \delta y_{t-1} + e_t \))……………… (1)
2. with intercept (\( \Delta y_t = \alpha + \delta y_{t-1} + e_t \)) ..........................(2)
3. with intercept and trend (\( \Delta y_t = \alpha + \delta y_{t-1} + T + e_t \))...........(3)

\( \Delta y_t \) represents the variable in consideration for Philip-peron test. The variables are; Total Allocation for Primary Education (TAPE), Plan Allocation for Primary Education (PAPE), Non Plan Allocation for Primary Education(NPAPE), Gross State
Domestic Product (GSDP), Per Capita Income (PCI), Primary Sector Income (PSI), Secondary Sector Income (SSI), Tertiary Sector Income (TSI).

1.7.4 The models used for Co-integration Test:

The co-integration test has been conducted to find the long-run stable relationship between two non-stationary variables with same order of integration. The following model used for co-integration.

The following co-integration tests used the methodology developed in Johansen (1991, 1995) performed using a group object or an estimated (Vector Auto Regressive) VAR object. Consider a VAR of order P:

\[ y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + B x_t + e_t \]  

Where \( y_t \) is a k-vector of non-stationary I(1) variables, \( x_t \) is a d-vector of deterministic variables, and \( e_t \) is a vector of innovations. This VAR model can be rewritten as:

\[ \Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-1} + B x_t + e_t \]  

Where,

\[ \Pi = \sum_{i=1}^{p} A_i - I, \quad \Gamma_i = - \sum_{j=i+1}^{p} A_j \]

Granger’s representation theorem asserts that if the coefficient matrix \( \Pi \) has reduced rank \( r < k \), then there exist \( k \times r \) matrices \( \alpha \) and \( \beta \) each with rank \( r \) such that \( \Pi = \alpha \beta' \) and \( \beta' y_t \) is I(0). \( r \) is the number of co-integrating relations (the co-integrating rank) and each column of \( \beta \) is the co-integrating vector. The elements of \( \alpha \)’s are known as the adjustment parameters in the VEC model. Johansen's method is to estimate the matrix from an unrestricted VAR and to test whether it can reject the restrictions implied by the reduced rank of \( \Pi \).

\bf{Y represents:} Total Allocation for Primary Education (TAPE), Plan Allocation for Primary Education (PAPE) and Non Plan Allocation for Primary Education (NPAPE).

\bf{Xs represent:} Gross State Domestic Product (GSDP), Per Capita Income (PCI), Primary Sector Income (PSI), Secondary Sector Income (SSI), and Tertiary Sector Income (TSI).
1.7.5 Vector Error Correction (VEC) Models Used for Estimation:

A vector error correction (VEC) model is a restricted VAR designed for use with non-stationary series that are known to be co-integrated. The VEC has co-integration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics. The co-integration term is known as the *error correction* term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

The following VEC models used for test:

\[ \Delta y_{1,t} = \alpha_1 (y_{2,t-1} - \beta y_{1,t-1}) + \epsilon_{1,t} \]  
………………………………………………...(7)

\[ \Delta y_{2,t} = \alpha_2 (y_{2,t-1} - \beta y_{1,t-1}) + \epsilon_{2,t} \]  
………………………………………………...(8)

In this simple model, the only right-hand side variable is the error correction term. In long run equilibrium, this term is zero. However, if \( y_1 \) and \( y_2 \) deviate from the long run equilibrium, the error correction term will be nonzero and each variable adjusts to partially restore the equilibrium relation. The coefficient \( \alpha_i \) measures the speed of adjustment of the \( i \)-th endogenous variable towards the equilibrium.

1.7.6 Granger Causality Models used for Estimation:

The Granger (1969) approach to the question of whether \( x \) causes \( y \) is to see how much of the current \( y \) can be explained by past values of \( y \) and then to see whether adding lagged values of \( x \) can improve the explanation. \( y \) is said to be Granger-caused by \( x \) if \( x \) helps in the prediction of \( y \), or equivalently if the coefficients on the lagged \( x \)'s are statistically significant. Note that two-way causation is frequently the case; \( x \) Granger causes \( y \) and \( y \) Granger causes \( x \).

It is important to note that the statement “\( x \) Granger causes \( y \)” does not imply that \( y \) is the effect or the result of \( x \). Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term.
Bi-variate regressions of the form of models used for the causality test:

\[
y_t = \alpha_0 + \alpha_1 y_{t-1} + \ldots + \alpha_j y_{t-1} + \beta_1 x_{t-1} + \ldots + \beta_j x_{t-1} + e_t \tag{9}
\]

\[
x_t = \alpha_0 + \alpha_1 x_{t-1} + \ldots + \alpha_j x_{t-1} + \beta_1 y_{t-1} + \ldots + \beta_j y_{t-1} + u_t \tag{10}
\]

Granger causality test have been conducted for all the variables between resource allocation and economic development.

In the fifth chapter an attempt has been made to examine the regional disparities in resource allocation and educational development. Government of Karnataka has been allocated financial resources to primary education on two heads namely; plan allocation and non-plan allocation. The major focus of this chapter is to examine whether the financial resources have been evenly distributed or not, to all regions and divisions of Karnataka. For the purpose of analysis, Karnataka has been identified as South and North Karnataka, based on regional specification as identified by government of Karnataka. Further, there are four divisions in Karnataka and all these divisions have been considered for the disparity analysis; these divisions are Bangalore, Mysore, Gulbarga and Belgaum divisions.

The time series data has been used for the analysis. For the financial variables, comparative data are available from 2001 to 2014 but for human and physical variables comparative data available since 2006 after the introduction of Sarva Shiksha Abhiyana. The financial data have been deflated before use for analysis. In the first part of the analysis trends have been computed to identify the direction of growth and performance of the considered variable. The t-test has been used for the mean comparison of variables between the regions. The F-test has been used for the comparison of variance of the variables between the regions. ANOVA and LSD tests have been used for comparison among the divisions. The major variables used in the analysis are financial, human and physical resources. Each variable represents one or more than one parameters;

Financial variable represents:

- Plan Allocation to Primary Education (PAPE)
- Non-Plan Allocation to Primary Education (NPAPE)
- Total Allocation to Primary Education (TAPE)

**Human variable represents:**

- Teachers in Primary Education
- Students Enrollment in Primary Schools

**Physical variable represents:**

- Number of Primary Schools

Using the above data, the following *ratio parameters* have been constructed:

- Plan Allocation per Student (PAPSTD)
- Non-Plan Allocation per Student (NPAPSTD)
- Total Allocation per Student (TAPSTD)
- Plan Allocation per School (PAPSC)
- Non-Plan Allocation per School (NPAPSC)
- Total Allocation per School (TAPSC)
- Number of Teacher per School (TECSC)
- Number of Students per School (STDSC)
- Number of Students per Teacher (STDTEC)

The secondary data has been used to explain overall picture about regional disparities in social infrastructure development and with special reference to Karnataka.

**1.8 Limitation of the Study:**

Though the study has used the social infrastructure background to make the study more intensive for the present study has been restricted to education within the social sector framework. One more limitation of the study is that the study has been limited to Karnataka only.
1.9 Chapter Scheme:

Chapter I: Introduction

In Chapter I is introductory in nature and it contains, importance of social infrastructure development, statement of the problem, objectives, hypotheses, methodology of the study, sources of data, Limitation of the study.

Chapter II: Review of Literature:

In chapter II, an attempt has been made to develop a conceptual framework based on the review of literature and landmark studies in the subject matter.

Chapter III: Budgetary Provisions for Primary Education Development in Karnataka: In chapter III, an attempt has been made to examine the contribution of government for the promotion of primary education in Karnataka.

Chapter IV: Investment in Education and Economic Development: An Analysis:

Chapter IV analyzed the long-run relationship between investment in primary education and economic development in Karnataka by using co-integration techniques, VEC models and Granger causality tests.

Chapter V: Resource Allocation and Regional Disparity in Karnataka:

In this chapter an attempt has been made to examine the regional disparities in resource allocation and educational development in Karnataka. Time series data used for analysis. t-test, f-test, ANOVA and LSD tests have been used for disparity analysis.

Chapter VI: Major Findings Hypotheses Testing and Policy Imperatives:

Chapter VI presents major findings of the study; it also includes testing of hypotheses and policy imperatives and conclusion.
References:


