

# CHAPTER- I

## INTRODUCTION

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### **1.1 Statement of the Problem**

Structural change can give us an idea about the key factors, which determine the speed and direction of development of any country (Johnson & Kilby 1975). Since the inception of industrial revolution, it is observed that as time goes on, the trend of absolute levels of GNP, total consumption, investment, overall employment, are characterised by permanent changes in the long run. Short run changes are reversible and in the long run temporary deviations cancel each other. The genuine structural changes are permanent and irreversible (Pasinetty 1993). To get a genuine structural change an economy has to pass through a number of transitional phases. These transitional phases may be of typical 'U' type. The relevant question in this context is whether under the conception of genuine structural change negative growth of any parameter can be allowed. Apparently with a continuous adjustment between rising aggregate demand and supply the question of negative growth does not arise. If not, then the existence of genuine structural change becomes jeopardized. Developed economy, along with almost consumption saturation and low growth potential is experiencing this problem now-a-days.

The northeast (NE) India's economy is generally identified by low per-capita income, low capital formation, inadequate infrastructural facilities, geographical isolation and communication bottleneck, inadequate exploitation of natural resources like mineral resources, hydropower potential, forests etc, lack of industrial base and investment opportunities. Per capita income in the NE region

is on the average Rs.12,918 against the national average of Rs. 17,947 at current prices 2001-2002.

Eight states in the NE region are considered as "special category states". The "Gadgil formula" during Fourth Five Year plan has made the division of the states into special and general category states. The common identities of special category states are preponderance of hilly and difficult terrain, a low population density, strategic location, economic and infrastructure backwardness. Under the Gadgil formula the special category states get 90% of the central assistance as grants and 10% as loans. Why the question of "assistance" is much more relevant in NE states may be clear if we observe the development experiences of these states. Due to ecological constraints both agriculture and manufacturing sector have not flourished properly. "Jump" of the economy from primary to tertiary sector is the common phenomena of almost all NE states. At the end of March 2004, the credit-deposit ratio for this region was only 29.82 against national average of 58.71. In one sense the chronological order of the stages of development has not been maintained in these states. The average values of government expenditure multiplier are generally low due to high import intensity of expenditure. This is why NE states are generally highly dependent on external aid. Import substitution is not possible due to low profile industrial base and lack of investment opportunities. As a result state money does not generate income and employment within the state and the development experience of NE states may be defined as jobless growth process. The continuous leakage of money to import goods and services may bring macro economic instability in the long run. During 1987-2000 not even one state has shown a continuous trend of fiscal surplus as percentage of Gross State Domestic Product. In comparison with the general category states the performances of special category states are highly insignificant.

Normally typical indigenous people do not participate initially in the modern economy as they take time to achieve the preconditions of participation into that

society. Their activities are not outcome of any structural change and therefore maintain an independent identity from the mainstream economic system. For example making of traditional industrial products by the tribal people in north-east India has no significant forward or backward linkage effects on either agriculture or tertiary sector. From the very first day of civilisation there was a continuous adjustment between economic activities of mankind and the given status of nature. Tribal people of north-east India are habituated in such an adjustment through jhum or shifting cultivation.

Where as NSDP can be rising automatically over time it is quite possible that it may not lead to an increase in per capita income (PCI) significantly in any economy. On the other hand, even if per capita income is rising, successive growth rates of PCI may fall. Traditional stage theories claim falling of agricultural income share accompanied with rising income share of secondary as well as manufacturing sector. The result what we expect at first after the application of liberalisation policy in post-reform period is the growth of manufacturing sector. Sectoral dynamics is like a zero sum game. That is why there must be interrelationships within the sectors. Northeastern states have tendency to flow money into government consumption and expenditure that flourishes the service sector without having forward linkage from industrial sector in a true sense. The other side of this fact is agriculture and secondary sectors have not been properly flourished. Accordingly credit-deposit ratio is bound to be low.

Disappointing role of secondary sector has raised the question of resource-industry linkages in the perspective of north-eastern economy. It is commonly said that an economy is poor because it is poor. But in case of northeastern economy this is not true. In every corner of this region we can observe the affluence of natural resources which may be utilised for economic development. The percentage of total cultivable land in total geographical area of north-east region is 24.17% and that of forest area is 45.82% along with total hydro-

electricity potential of 31857 MW (Das, 2005). Besides the entire north-east region is a store house of crude oil (70.46 mt in Assam), natural gas (48000 mcm in Assam and Tripura), coal (1043 mt in Assam, Meghalaya, Arunachal Pradesh, and Nagaland), clay (28.5 mt in Meghalaya and Tripura), dolomite (247 mt in Arunachal Pradesh) and graphaite (85 mt in Arunachal Pradesh).

No doubt the nature has given enough to the northeastern states which may be effectively utilised for the development purpose of this region. At the same time this region has some natural constraints which go against the development process. Mechanisation or establishment of heavy industry is almost impossible due to sloppy hilly terrain. Northeast India being basically a hilly region, soil erosion, deforestation, landslides and other natural calamities create problems for cultivation. Besides, irrigation in the hills is difficult.

Sectoral interrelationships do not necessarily imply sectoral causality. By the term sectoral causality basically we mean whether any sector has provided inspiration for the growth of another sector, or not. People are supposed to satisfy their basic needs from agricultural sector and gradually they start to consume more and more luxury goods. Empirical study suggests that income elasticity of demand is highest for service sector. This is like wave of demand which passes through primary, secondary and tertiary sector and induces to expand gradually these three sectors. If we say primary sector has to cause secondary sector then the average purchasing power of the economy and consequently average demand for industrial products both are expected to rise. This is possible by two ways. Firstly, agricultural workers will move to the expanding industrial sector with higher wage level. Secondly, the reduced supply of workers is supposed to push up agricultural wage rate and encourage the adoption of labor saving technology. So, there is a strong link between causality within the sectors and labour transfer within the sectors. But before that there should be sufficient mechanisation in traditional sector and sufficient growth of industrial sector.

What may be the impression of an economy in which income growth is taking place without having employment growth? Our growth policies can not go against our existence. Besides rising application of capital intensive production process and therefore reducing labour employment will affect demand side of any economy which in turn will reduce investment prospects. "Jobless growth is not sustainable either in economics or in politics. The creation of employment would only reinforce economic growth through a circle of cumulative causation" (Nayar 2006). As such public sector is main source of employment in northeastern economy. Secondly, due to high import intensity of expenditure state money goes out without creating income and employment within the economy.

The income shares of primary, secondary and tertiary sectors and corresponding employment shares subject to three time references 1981, 1991 and 2001 have shown economic concentration in favour of non-agricultural workers. Our intuition suggests that higher the shares of agricultural workers higher will be the economic concentration as the share of agricultural sector in total state domestic product is continuously falling.

What may be the source of rural and urban economic disparity? The answer is higher participation of urban people in growing service sector. For many of the northeastern states we have observed a negative trend in the urbanisation process, i.e. growth rate of urban population is decreased. Which implies service sector based urban area has not been able to attract rural people or, rural-urban migration has not been considered lucrative enough. As per conventional development theories non-agricultural employment will rise during economic transition. Structural progression in a true sense needs average productivity of these non- agricultural workers to be increased. Broadly, average productivity of any sector depends on the size of workforce and diversities in that sector. In a developed economy structural progression takes place easily as developed manufacturing and service sector jointly produce various modern fields.

Falling employment elasticity does not necessarily mean structural retrogression as the productivity of labour is supposed to be enhanced over time. On the other hand we have a typical expectation about post-reform period that this phase will at least increase the labour productivity of manufacturing sector.

Financial parameters have crucial links with the structural changes of any economy. With a low profile of manufacturing sector and public sector based service sector the internal economic strength is bound to be low for any economy. Low own tax- NSDP ratio, low own tax revenue-total tax revenue ratio, insignificant trend of buoyancy of own tax revenue are the indicators of the weakness of internal economic system. In terms of these indicators the achievements of northeast Indian states are disappointing compared to any other general category states. We have already noted that state money goes out to buy goods and services without creating income within the states of northeast India. Consequently income-expenditure ratios have become unbelievably low. Besides due to continuous leakage of money financial instability can be invited. So every year there is huge amount of fiscal deficit as a percentage of GSDP. To make up this deficit northeast India is heavily dependent on central transfer in various forms. No doubt huge amount of allocation is the root cause behind respectable amount of per capita income year after year in these states. One vicious circle is clearly understandable. When the huge amount of money is injected into the economy it initially creates moderate per capita income. After that, following the cycle of money leakage and low income/expenditure ratio as described before, north-eastern economy has to face huge fiscal deficit as a percentage of GSDP. To compensate this, again huge money will come and create initially handsome per capita income. The net result is massive dependencies of state income on central resource transfer.

In the microeconomic analysis we say too much consumption may bring negative marginal utility which in turn deteriorates our psychological as well as overall status. The same conception may be inserted into the aggregative analysis also.

Many critics predict that too much economic growth and development will destroy human existence. For instance, normally we say higher the per capita income higher will be the degree of development. But to achieve higher per capita income higher industrial growth is needed which again can affect the environmental balance and jeopardize our life. However let us remember that idea of development can be interpreted with the help of certain variables. In this context per capita income, human development index, inequality in monthly per capita consumption expenditure or development index based on different indicator may represent development status of any region.

Violation of the basic laws of structural changes may be accepted given that we have already considered development with human face. On that matter development process has to face several fundamental questions: 1) Has it taken socio-economic or ecological aspects of development into consideration?, 2) Has it been proved helpful for the overall economic growth?, 3) Has it given indulgence to the economic concentration?, 4) Will this process help to reduce the economic disparity among the rural and urban people?, 5) Is this development process sustainable in the long run without being dependent on the external aid?

The development experiences of northeast India create confusion to some extent. In terms of some common development parameters such as per capita income, percentage of literacy, infant mortality rate, extent of poverty, worker population ratio etc. these states have occupied respectable ranks at all India level. On the other hand, looking at the industrial base and infrastructural facilities these states will be considered as backward states. Similarly, the trends of financial parameters reveal that northeastern economy is basically a dependent economy and its per capita income will show falling trend in the absence of per capita allocation of Central resources.

As the structural changes and development process are the two sides of the same coin, our proposed study has roam enough to clarify all these confusions

keeping in mind the true meaning of development and its basic targets mentioned before.

## 1.2 Conceptual Framework

General models applicable to all countries can be derived from the following assumptions (Meier 1995): "a) Similar variations in the composition of consumer demand with rising per capita income, dominated by a decline in the share of food-stuffs and a rise in the share of manufactured goods, b) Accumulation of capital - both physical and human - at a rate exceeding the growth of the labor force, c) Access of all countries to similar technology, d) Access to international trade and capital in-flows. All these assumptions are hidden in the conceptual theories provided by a number of economists, e.g, Ricardo (1917), Harrod-Domar (1930), Schumpeter (1934), Myrdal (1957), Hirschman (1958), Kaldor (1968). On these theories a number of economists again have provided their comments, e.g Hicks (1965), Nurkse (1953), Rosenstine-Rodan (1943). With a close observation we can say that the same facts of structural changes have been explained from different angles in all these theories. For our present purpose we are considering some of the conceptual theories mentioned below.

Fisher & Clark's concept (1940) => Any country is assumed to experience gradual expansion of primary, secondary and tertiary sector. Income elasticity of demand for agricultural goods is lowest and that of service sector is highest. Thus with the growth of the economy, as income grows people will satisfy their basic needs from primary sector and gradually start consumption of industrial products and services more and more. The strength of service sector in a developed economy generally becomes high, because its average consumption level of industrial goods gradually becomes closer to the saturation point. For some less developed countries it is possible to have a large contribution of tertiary sector without having a developed manufacturing sector.

Lewis's (1954) concept => Lewis suggested that the modern industrial sector would attract workers from the rural areas. The wage level offered by the industrial firms would guarantee a higher quality of life. Furthermore, as the level of labor productivity is so low in traditional agriculture sector, people leaving the rural area would have virtually no impact on output. Indeed the amount of food available to the remaining villagers would increase as the same amount of food could be shared amongst fewer people. This may generate a cash economy through selling surplus crops. Those people who moved away from the villages to the town would earn increased incomes and generate savings. Urban migration from the poor rural areas to the relatively richer industrial areas gave workers the opportunities to earn higher incomes and save more providing funds for entrepreneurs to invest. It is expected that income generated by the industrial sector may trickle down throughout the economy. The analysis has to face an obstacle if the capital formation is labor-saving (Renolds 1956). Through the entire process one time may come when all the surplus labor from agriculture sector are absorbed. This is a time of commercialization of this sector (G. Ranis and J.Fei 1961). The assumption of unlimited supplies is the most important assumption of the classical system on the theory of development (Jorgensen 1966).

Rostow's (1960) concept => The transition from underdeveloped to developed status of an economy can be explained in terms of a series of stages which all countries must follow. For Rostow - " It is possible to identify all societies, in their economic dimensions as living within one of five categories : the traditional society, the preconditions for take- off into self sustaining growth, the drive to maturity, and the age of high mass consumption..... These stages are not merely descriptive." In the early stages of development the inspiration for industrialisation must come from the agricultural sector which creates the

demand for industrial good. The path of economic development is characterized by a change in the composition of aggregate output, with a decline in the share of agriculture and the rise of industry to begin with, and then a boost in the share of services at the cost of industry, further on.

Kuznet's (1965) concept => Throughout the transition from primary to secondary sector agricultural employment and output will have a trend of decline in terms of share of total labor force and GDP. Decline in agricultural progress may hamper this process unless the economy is in a situation to export manufactures for imports of foodstuffs and raw materials. A growing urban labor force must be supported by growing supply of foodstuffs. Kazushi Okhawa (1956) suggests the formula  $D = P + ng$ ; where  $D$  is annual growth rate of demand,  $P$  and  $g$  are growth rates of population and per capita income respectively and ' $n$ ' is the income elasticity of demand for agricultural product. In general, the income elasticity of demand for agricultural product is high for LDCs along with high value of ' $P$ ' (Johnston and Mellor, 1961). The contribution of agricultural sector to non-agriculture sector can not be denied in view of agricultural saving and demand for industrial product through selling marketable agricultural surplus. This sector is equally important as a major source of foreign exchange. Although history suggests that an urban bias can exploit agriculture through over employment in this field (Lipton, 1968)

Chenery (1960, 75, 79)=> Chenery in his study, taking development experiences of countries has got some results representing structural changes of those countries. The results are :1) As per capita income rises there is a shift from agricultural production to industrial production 2) The share of secondary sector in GDP is gradually rising at the cost of decline in the share of primary sector. 3) Urbanization caused by concentrated industrialization, migration of

people associated with worsening income distribution. 4) Relative rise in the share of industrial goods in total export and a relative decline in total import.

### **1.3 Objectives of the Study**

The main objective of the proposed research is to analyse structural changes in the economies of the northeastern states. It will be discussed keeping in mind initially the fundamental idea of structural change. In the analysis of conceptual framework of structural change we have seen, it is basically characterised by the changes in the values of different parameters. These changes in the parameters must be guided by the “development with human face”. The disproportionate growth of sectoral income and employment shares provide indulgence to the economic concentration in any economy. Simultaneously there are a number of limitations of these states which go against achieving a standard pace of development. Now, the question may arise about the relevance of fundamental theories on structural change in the light of development experiences of the northeastern states. It is the time to answer the important question: With a low profile of capital formation and manufacturing sector can a structural change as predicted by empirical and theoretical models, take place in the true sense? Or with all ecological factors and diversities of climate, altitudes, soil and topology of northeastern economy, we may have to find out a different dimension of structural change? To discuss these issues, we have set the following objectives of the study:

- a) To derive sectoral growth, intersectoral relationships, and cause and effect relationships among the sectors.
- b) To examine structural progression or retrogression in terms of sectoral growth and corresponding employment growth.
- c) To identify the trend of economic concentration.
- d) To evaluate the long run sustainability of northeastern economy in terms of its financial base.

- e) To measure overall development status subject to selected indicators.
- f) To provide suggestion for the better economic performances in future keeping in mind the past experiences.

#### **1.4 Justification of the Study**

The entire thesis is an effort to bring the totality of northeastern states into a single framework along with their experiences on structural changes and developmental issues. The variables which are discussed in the thesis are interdependent on each other and their interrelationships are logically established gradually in different chapters. In our study we have found many natural limitations in northeast region which can not be removed totally. Besides, we have identified a number of mistakes of policy makers which have gone against a balanced development process in this region. These mistakes can be rectified through a thorough examination of the process of structural change and its pattern. Here lies the main justification of the study. As far as our knowledge goes and information gathered by us, no such work have been done so far.

#### **1.5 Scope of the Study**

- a) This study includes income shares in state domestic product and corresponding employment shares of the broad sectors, viz. primary, secondary and tertiary. Different sub-sectors under these broad sectors have not been considered in many cases due to unavailability of data.
- b) A number of parameters can take place into the analysis of structural change of any economy. Among those our work has mainly emphasised on the trend of income, per capita income, sectoral income shares, sectoral employment shares and different financial parameters. We have formed composite score of development status with the help of some more parameters like per capita income, literacy, infant mortality rate, extent of poverty, urban population, rural electricity etc. subject to two reference periods 1991 and 2001. This composite

score provides a static status of development which can be compared subject to two different periods.

c) The reference period of this study starts from 1980. On the other hand, post-reform period in India mainly starts from 1990. Thus, there is ample scope to examine the success of reform policies in terms of the trend of income, per capita income, sectoral income shares, employment shares of different sectors etc.

### **1.6 Hypotheses of the Study**

Our study is based on the testing of following null hypotheses:

- (a) NSDP is unchanged over time
- (b) Per capita NSDP is unchanged during 1993-2004
- (c) Growth rate of per capita income is zero
- (d) Growths of income shares of agriculture, secondary, manufacturing and tertiary sectors are zero
- (e) Correlations between agriculture and manufacturing, manufacturing and tertiary, agriculture and tertiary sectors are zero
- (f) The differences between credit-deposit ratio of north-eastern states and all India are zero with respect to three time references 1982, 1992 and 2002
- (g) There are no Granger causes among three broad sectors, viz; agriculture, industry and service.

The above hypotheses have been tested in chapter II.

- (a) Correlation between growth of state income and employment is zero
- (b) Correlation between across state Gini coefficient value and across state employment shares in agricultural sector is zero
- (c) There is no relationship between across state employment share of urban people in service and across state proportion of urban people.

The above hypotheses have been tested in chapter III.

- (a) There is no change of debt-GSDP ratio during 1993-2003

- (b) Buoyancy of own tax revenue has no change over time
- (c) There is no relation between growth rates of own tax revenue and growth rate of net state domestic product
- (d) Aggregate expenditure has no change over time
- (e) There is no correlation between growth rate of NSDP growth rate of aggregate expenditure
- (f) Union tax transfer is unchanged over time
- g) Grants-in-aid is unchanged over time
- (h) There is no correlation between per capita income and per capita central allocation.

The above hypotheses have been tested in chapter IV.

## 1.7 Research Questions

On the basis of essence of fundamental theories of structural change mentioned above, we have made an effort to find out answers to the following research questions in the context of northeast Indian states:

- a) What is the sectoral growth pattern of northeast India and relevance of so-called stage theories in the perspective of development experiences of this region?
- b) Does sectoral employment trend in northeast region imply structural progression?
- c) How regional disparity or economic concentration is brought through the employment share in primary, secondary and tertiary sectors?
- d) What is the role of central resource for the sustainability of north-eastern economy?
- e) How urbanisation and its various dimensions have taken role behind structural change of north eastern economy?

- f) How the analysis of structural change can be extended in the context of development with human face.

## **1.8 A Brief Review of Literature**

Here we present the review of literature briefly relevant to our study. Apart from these literatures many other references have been mentioned in the main body of our thesis. Though the literatures have been explained from different angles in our work, in this section these can be classified into the following categories.

### **Sectoral growth**

Baumol (1967): According to “cost disease” model tertiary activities present lower than average productivity of growth given the technological specificities involved. This leads to cost increases which have to be beared by consumers for such activities find no substitutes, leading to an increasing share in GDP. Thus the rising share is not a result of a greater preference of society; rather, it's an inefficiency problem.

Oberoi and Singh (1983): During the transfer of agricultural labor to non-agricultural sector there is a possibility of the reduction in agricultural output level. To prevent this, productivity of existing agricultural workers should be increased through mechanisation, irrigation or application of any other agricultural inputs. Looking at the trend of agricultural outlay we can examine how much any economy has been able to provide these facilities. Insufficient investment in agricultural field is a major cause of decreasing employment in traditional sector (Rao 1998).

Subba and Upadhyaya (1995): The study has explained how the climatic constraints in northeast India have affected the agriculture crops pattern and thereby primary sector as a whole. There are two types of climate available in

this region- humid to per humid and per humid to humid. Each type of climate restricts the crops pattern and so, the productivity in agriculture sector is very much influenced by natural constraints.

Cicila (2000): Industrial scenario is well reflected by the credit-deposit ratio. As such more the amount of credit more will be developed the industrial world of any economy. But the strength of loan able fund and the conditions of giving loan will be determined by the total amount of deposit. Total amount of deposit may be considered as the independent variable in the total credit function. Higher the amount of total deposit higher should be the amount of total credit as; in that case the conditions of giving loan will be relaxed.

Joseph (2004): Even if the tertiary sector has occupied the lion share in the state domestic product, this sector in northeastern economy is mainly dominated by government jobs. World Economic Forum has formed Network Readiness Index with the help of different indicators representing the status of modern fields of service sector. As per this index value northeastern states are proved as "least achievers". This means service sector has limited scope for employment generation in these states.

Thomas (2003): The study shows an industrially developed society provides scale economies and faster induced technical progress to be more industrially advanced in future. Such forward linkages are observed in western India. This part of India is much more industrially developed compared to eastern India due to initial advantages.

Noland (2004): Inter-industry linkages and presence of key sector are essential for a well balanced industrial growth. Thus the determinant factors of industrial

performances will be endogenous not exogenous and any change of industrial world will not reflect macroeconomic shocks brought by unforeseen factors.

Das, Bhumali and Bagchi, Kuri et al (2005): Development experiences of North-Eastern states have been characterised by some common facts- weak resource-industry linkages, bypassing of secondary sector, poor performances of manufacturing sector. With an insignificant manufacturing sector, the share of primary sector in total GSDP is continuously falling, whereas the share of service sector is continuously rising. However the trend of employment within the sectors did not follow the same direction. All these are not reflections of so-called stage theories of development prescribed by Kuznet, Clark or other economists. The common reasons behind this unusual type of structural change are a) Lack of infrastructural facility like transport, communication, power, banking facility, schooling, health and medical care etc. b) Lack of investment c) Absence of appropriate technology which is ecologically suitable and cost effective for small sector industries d) Insufficient demand and improper market structure e) Restrictions of outsiders in property right and land use f) Lack of local interest in entrepreneurship and g) Socio-political status.

Dasgupta and Singh (2005): A high R-square for services may be derived from the close relationship between manufacturing and GDP growth. This implies the growth of service sector and growth of manufacturing sector are not independent to each other. If any economy has a high income elasticity of demand for manufactured goods with respect to its present per capita income level, then the significance of secondary sector can hardly be ignored.



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## **Intersectoral Linkages**

Myint (1973): Agricultural workers may not have sufficient demand for industrial products. This fact directly goes against the industrial growth. Actually money economy is almost absent in the rural area and therefore rural agricultural workers are unable to consume industrial products to a large extent. Providing an organised market facility can solve this problem. Cash flow into the rural agriculture based economy is possible through exporting the marketable surplus in an organised market structure which is almost absent in northeastern states.

Gershuni (1987): A developed manufacturing sector generates demand for intermediate services and thus there may be increasing demand for some specialised services. The interpretation of this study is that in a developed society manufacturing and service sector are interdependent on each other.

Eswaran and Kotal (1994): This study explains the possibility of insensitivity of agricultural wage and productivity through industrial progress. Industrial workers are satisfied with their basic needs. Therefore improvement in the income status of industry related workers will not augment the demand for and price of agricultural goods. By this way agricultural wage too remains unchanged. Altogether there is little scope of reallocation of labor inspired by agriculture-industry interlinkages.

Ansari (1996): Granger causality test is applied to examine primary sector has provided any inspiration for the growth of secondary sector or not in the Canadian economy.

Rameezdeen, Zainudeen and Ramchandra: Growth experience of Srilankan economy reveals that the growth of construction sector is highly dependent on

the growth of service sector. Construction sector is identified with high backward linkage and low forward linkage. Tertiary sector has created a huge demand for the output of construction sector. Developed economy has shown a trend of increasing demand for manufacturing input at a diminishing growth rate. Maintaining a high standard of building stock in a highly competitive market structure is responsible for the connection between construction and tertiary sector.

Bon, Birgonul and Ozdogan (1999): Another example is noticed in which construction sector has been claiming a lion's share in total GDP with a strong correlation to the growing service sector. On the other hand, the share of manufacturing sector in total GDP is quite stable in Turkish economy. Clearly, the growth of service sector has a positive impact on the growth of construction industry.

Bathla (2001): Intersectoral relationships in India have been examined during 1950-2000. Throughout the period casual relationships among the broad sectors viz. primary, secondary and tertiary are obtained. Some of the market demand driven sub-sectors like horticulture, fishery, livestock products, transport, storage, communication, trade and financial service activities have taken leading role to achieve equilibrium in the long run.

Timmer (2002): As per this study we can relate the average income of persons to the sectoral labor productivity of agricultural and non-agricultural sectors.

Ortega and Lederman (2005): Agriculture has a direct impact on growth and an indirect impact through spillovers to the rest of the economy. Non-agricultural GDP was regressed on the one year lagged agricultural GDP using panel data of 120 countries for the period 1960-2000. As per this study in developing countries

one percent increase in agricultural growth leads to 0.12% (for Latin America) and 0.15% (for other developing countries) increase in non-agricultural growth.

Agarwal (2004): Simple regression analysis is applied to examine the relationships between the primary & secondary sector and secondary & tertiary sector in terms of their income shares in total state domestic product. It is observed that in the post reform period many food surplus states in India have become failure to flourish their industrial sector.

Ghosh (2006): In the post reform period the growth of Indian service sector has become dependent on the imported hardware & software technology and export of cheap skilled labor. There is no clear evidence of strong interlinkage between manufacturing and service sector. Consequently the growth process of service sector is not highly prospective in terms of employment generation.

### **Employment Growth and Structural Change**

Bhalla (1998): The aggregate output of any sector may fall if the workers are shifted from that sector to another sector and if the productivity of existing workers is not rising. Sometime the workers are not shifted but their productivity is rising through the introduction of more capital. In that case aggregate output will rise. So, increasing labour productivity is a common phenomena and therefore falling employment elasticity does not always indicate rising unemployment. Bhalla estimated that the optimum employment elasticity will lie in between 0.5 to 0.6.

Punzo (2001): There is a crucial role of population growth behind industrial expansion as observed in the growth experience of Japan during 1955-70. Increasing industrial output did not face any problem regarding demand side as

the number of household was continuously rising. Simultaneously during this period the economy has not realised rising unemployment which is generally an obvious consequence of rising population. With fixed or falling employment level average demand will rise with rising population at a diminishing rate.

Flury (2002): Farmers often have to take decisions regarding price, cost, payment etc. of their products. Their decisions become guiding forces behind structural change and this is considered as push force. On the other hand “the speed with which structures can be adjusted depends critically on the mobility of agricultural work force”. In a developed economy alternative employment opportunities are available in manufacturing and service sectors and consequently the degree of mobility of agricultural work force become high. This again is considered as “pull force”.

Hari (2003): Labour productivity of any sector is measured by the ratio of income generated by that sector to the total amount of workers absorbed under that sector. Accordingly growth of labour productivity is measured subject to the reference periods of different NSSO rounds.

Bhattacharyya and Sakthivel (2003): The relationship between growth and employment is studied with the help of NSSO data. It is observed employment elasticity in the post reform period is reduced indicating failures of reform policies.

Mathew (2006): In this study NSSO figures on per thousand distributions of workers are interpolated into Census figures and accordingly employment elasticity of different sub-sectors is calculated. It has been exercised to get absolute number of workers under different sub-sectors subject to the reference periods of different NSSO rounds.

### **Service Sector and Regional Disparity**

Rodrick (1965): The study has established positive correlation between urbanisation and regional economic inequality. As per this study urbanisation means “multiplication of points of concentration and the increase in the size of individual concentrations”.

Davis (1965): As per Davis non-agricultural activities are gradually concentrated in the urban area accompanied with rising rural-urban migration. Datta (2007) measures the degree of urbanisation by the ratio of total number of urban population to the total population.

Drehanan (1990): The study of Drehanan shows the number of towns is gradually decreased in which manufacturing sector is gradually concentrated. Where as the number of towns is increased in which service sector is gradually concentrated. Thus long run sectoral variation can determine the direction of urbanisation process. Along with growing service sector the number of towns becomes the determinant factor behind economic strength of any region.

Annual Report (2004); Government of Japan): The higher the proportion of the number of employees in manufacturing and services, the higher the productivity for the region and the higher the proportion of the number of employees in agriculture, forestry, fisheries, etc. the lower the productivity for any region. A strong correlation is observed between the proportions of population aged 15 years or above which has completed tertiary education and regional productivity. All three factors viz. specialisation in non-agricultural activities, regional productivity and status of human capital have maintained interdependency towards positive direction amongst them.

Azzoni and Andrabe (2005): In Brazil, service sector is considered as high income elasticity sector. The possibility of growth of this sector is much higher in rich region than in the poor region. Study shows that the development process through which a region becomes rich is dependent on some locational factors like income, population density and labour qualification. Regarding these factors south Brazil is much more advanced than other parts of the country. So, number of workers absorbed in modern tertiary sector from south Brazil is proportionately higher than any other region. The problem of regional disparity coming through employment share in growing service sector is not severe in this zone. This implies growing service sector does not necessarily mean a growing regional disparity. Given a growing service sector the trend of employment in this sector can give an idea on this matter.

Gepper Gorning and Werwatz (2006): Knowledge intensive services related with film industry, business, engineering, legal consultancy, arts/theatre, banking etc. have a common tendency to flourish in the urban area. Workers have to be skilled and specialised for these types of jobs. The technical and professional knowledge required for these fields are provided by the urban area based educational institutes. Income elasticity of tertiary sector generally becomes high. Consequently large metropolitan regions maintain better economic status compared to rural area.

### **Measures of Development**

Hagood (1943): The study is one of the pioneering works on the measurement of regional disparity in terms of development status with the help of principal component analysis technique. Development index is formed subject to certain selected indicators. Later on the work was theoretically improved by Berry (1960) and Pal (1968).

Sen (1966): To discuss about the economic approaches to education and manpower planning a result is presented to establish the strong interdependency between income distribution (which is a major outcome of structural change of any economy) and educational status of any society. Harbison and Myres formed a composite index with respect to the enrolment at second and third level of education. It is examined that the index is highly influenced by GNP per capita and the correlation coefficient obtained is .888.

UNRISD (1970): UNRISD (United Nations Research Institute on Social Development) had chosen the following indicators to measure development status- *expectation of life at birth, percentage of population in localities of 20,000 and over, consumption of animal protein per capita per day, primary and secondary enrollment, vocational enrolment ratio, average number of persons per room, newspaper circulation per 1000 population, percentage of economically active population with electricity gas water etc., agriculture production per male agricultural worker, percentage of adult male labor in agriculture, per capita electricity consumption, per capita steel consumption, per capita energy consumption (coal), share of manufacturing sector in GDP, per capita foreign trade, percentage of salaried and wage earners to total economically active population.*

Harvey and Bhardwaj (1973): In this study development has been interpreted in terms of modernization, non-subsistence, traditional crafts, agricultural employment, commerce, literacy, female literacy, circulation, migration and share of schedule caste people.

Rao (1977): Selected indicators in this study mainly represent demographic profile of any economy e.g. birth rate, death rate, general fertility rate and rural-urban fertility rate.

Morris (1979): Physical Quality Life Index (PQLI) is formed on the basis of life expectancy, infant mortality and literacy.

Hicks and Streeten (1979): According to this study development process should emphasis on the basic needs of human being. So, to measure development status the selected factors represented the fields on health, education, food, water supply, sanitation and housing.

Anant, Krishna and Roy Choudhury (10<sup>th</sup> & 11<sup>th</sup> Finance Commission Report): The expert group has formed composite index of economic and social infrastructure for all Indian states. This group has classified infrastructural facilities into three sectors- physical, social and institutional. As per them agriculture, banking, electricity, transport & communications come under economic infrastructure, where as education and health come under social infrastructure and lastly civil administration comes under administrative infrastructure.

Todaro (1987): As per Todaro some of the determinants of development status are quantitative, where as others are qualitative. Among the quantitative determinants there are income status, food availability, educational status etc. The qualitative determinants are cultural and humanistic values, servitude, ignorance etc.

Streeten (1997): The conception of human development index has been justified on several grounds. Income distribution is much more skewed than the distribution of education or any other social parameters. Improvement in the social status is mainly examined in terms of improvement of the income status. Income status maintains a high correlation with the HDI trend. Above all, HDI trend reveals political achievements in different social sectors.

Rao (1981): An effort has been provided to measure inter-regional disparity in development represented by a composite index. This index incorporates Agricultural sector index, Industrial sector index, Banking sector index and Educational sector index. Agricultural sector index parameters are- output per worker, % gross area irrigated of gross area sown, consumption of chemical fertilizer per 1000 hectares and mechanization index. The parameters under Industrial sector index are # factories per lakh population, # factories per 1000km square, % of workers in total population, % of industrial employees, factory workers per 1000 km square, factory employees per 1000 km square, industrial power consumption per factory and value added by manufacturers per capita. It is observed that the states which are advanced in terms of agricultural sector index have not shown trend of improvement in terms of industrial index.

Hassan, Dasguptanayak and Misra (2007): Regional disparity in terms of development status among the thirty districts of Orissa is measured with the help of principal component analysis. The chosen factors are- urban population (%), literacy rate, male work force in non-agricultural sector (%), yield rate of rice, road density, villages electrified (%), # registered factories (per 1000), percentage occupied census houses as 'factories', 'workshops' and 'work-sheds', # hospital beds (per 1000), ratio between weighted aggregate of students (at primary, middle and secondary levels) and total population.

Most of the works mentioned above are based on the principal component analysis technique which is explained in detail in the main body of our thesis. Briefly, Principal components ( $C_i$  –s) as a set of new variables will be constructed from  $X_j$  such that

$$C_1 = a_{11}X_1 + a_{12}X_2 + \dots + a_{1k}X_k$$

$$C_2 = a_{21}X_1 + a_{22}X_2 + \dots + a_{2k}X_k$$

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$$C_k = a_{k1}X_1 + a_{k2}X_2 + \dots + a_{kk}X_k$$

Here, to be noticed, the principal components are the linear combination of X-s.

a-s are the coefficients of X-s and are called as loadings.

If we add the squares of the loadings of each principal component then we shall get latent root or eigen values or characteristic root.

In general, 
$$\lambda_m = \sum_i^k (l_{mi})^2$$

After getting the loadings of all retained principal components the score of particular observation corresponding to a particular component can be derived by the summation of the products between standardised values of the variables and their corresponding loadings (Johnston 1978) and Hassan, Dasguptanayak & Misra (2007)

Conventionally those components will be retained in the analysis for which eigen values are greater than one; or

$$\lambda_m > 1$$

### **Causality Test**

Granger (1969): A Simple regression analysis in a bivariate framework may reveal the relationship between two variables. Having relationship through simple regression method does not confirm cause and effect relationship between two variables. Granger causality test is applied to find out whether any variable Y has Granger cause to another variable X and vice versa. The method is essentially based on the following equations (Bhandari and Paul 2007) –

$$\Delta X_t = \alpha_1 + \sum_{i=1}^{n_1} \beta_{1i} \Delta X_{t-i} + \varepsilon_{1t} \quad (1)$$

$$\Delta X_t = \alpha_2 + \sum_{i=1}^{n_1} \beta_{1i} \Delta X_{t-i} + \sum_{i=1}^{n_2} \beta_{2i} \Delta Y_{t-i} + \varepsilon_{2t} \quad (2)$$

$$\Delta Y_t = \alpha_3 + \sum_{i=1}^{n_3} \beta_{3i} \Delta Y_{t-i} + \varepsilon_{3t} \quad (3)$$

$$\Delta Y_t = \alpha_4 + \sum_{i=1}^{n_3} \beta_{3i} \Delta Y_{t-i} + \sum_{i=1}^{n_4} \beta_{4i} \Delta X_{t-i} + \varepsilon_{4t} \quad (4)$$

If the prediction error of current Y is reduced after taking into consideration the past values of another variable X along with past values of Y, time series X is said to be Granger cause to another time series Y. The methodologies and various dimensions of Granger causality test in detail have been discussed in the main body of this thesis.

Dicky & Fuller (1979): Dicky Fuller test is utilised to examine the unit roots and stationary properties of the time series data of any variable. In this case the test statistic is “tau” and depending on the obtained values of “tau” null hypothesis is rejected or accepted at chosen level of significance. If we consider the error term is correlated then the test is named as ‘augmented Dicky-Fuller test’.

Lee (1997): Choosing of optimum lag length in the time series data of any variable is a crucial task, otherwise, it can invite estimation bias or estimation inefficiency. To solve this problem Hsiao (1981) followed the approach of Akaike(1969). Under this approach if ‘m’ and ‘n’ are the lag lengths of Y and X in the equations (1) and (2) given before then, Final Prediction Error at the lag lengths ‘m’ and ‘n’ is given by –

$$FPE(m, n) = \frac{T + m + n + 1}{T - m - n - 1} \cdot \frac{RSS(m, n)}{T}$$

Here  $T$  is the number of observations (see Bhandari & Paul 2007). In the last expression 'm' and 'n' will be optimum lag lengths for which FPE (m, n) is minimised.

Engle & Granger (1987): When the two non stationary series are cointegrated error correction mechanism (ECM) is applied for the causality test. Under this mechanism one period lagged value of error term in cointegrating regression is considered as the representative of long run causality. Thus an additional channel to capture causality is provided. Thereafter the coefficient of this error term is tested whether it is statistically significant or not. ECM approach was first introduced by Sargan (1984).

## **1.9 Methodology**

### **1.9.1 Universe of the study**

Economic agents of the eight states of northeast India give us the universe of the study. Under this set the number of workers engaged in primary, secondary, or tertiary sector, percentage of literate persons etc. are incorporated. The economic statuses of these agents and the region as a whole have been brought into analysis with the help of various parameters mentioned before.

### **1.9.2 Source of data**

The data, used in the entire research work are secondary by nature. Getting data of northeast India is much harder than getting data for rest of India. Moreover, some researchers have shown their interest on this matter through books and journals in a scattered manner. Similarly data inconsistencies have been detected in different sources. In some cases it is not properly mentioned whether the given information are based at current price level or at constant price level.

We have not been able to collect employment data for Assam as the census publication for 1981 was unavailable due to political unrest. Mizoram too has not been proved generous enough to provide some essential data. Under this situation among the many sources we had excessive dependence on the data published by respective states and central governments such as Census data, NSSO data, CSO data, EPW Research Foundation data, India Development Report, Finance Commission Reports, data published by NEDFi (North East Development Finance Corporation) journal etc. The other important sources are books, news papers and magazines, journals, reports prepared by scholars, Universities and economists etc. Instead of keeping in mind all limitations regarding data availability we tried our level best to minimise the harmful effects of data inconsistencies on our thesis.

### **1.9.3 Data Processing**

In many cases the original data are used to calculate growth rates, ratios, standard deviations etc. Original data have become also useful for simple regression analysis as well as Granger Causality Test. But in some cases modification of original data was needed for the purpose of analysis. For instance in Chapter III to calculate Gini coefficient measuring income disparity among the workers under sectors, we have taken income shares after cumulative addition. Some times log values of original figures have been taken to calculative compound annual growth or to fit trend line equation  $y=ab^t$ . In the Chapter III again employment elasticity and growth of labour productivity are measured over 1993-2000 on the basis of NSSO data (50<sup>th</sup> and 55<sup>th</sup> round). Now NSSO publications give per 1000 distribution of worker under different subsectors. These figures have been substituted on the total number of main workers in 1993 and 2000. These two figures are obtained on the basis of total number of main workers prescribed by Census data of 1991 and 2001 [through applying

$y_t = y_0(1+r)^t$  CAG formula]. Thus total number of workers under different subsectors in 1993 and 2000 are the combined outputs of NSSO data and census data. Another example of data processing can be observed in Chapter V to compute composite scores on developmental performances in 1991 and 2001 taking into consideration thirteen variables. Different variables represent different units. So for our analysis it was essential to make the variables unit free. For that the original data were converted into standardised figures.

#### 1.9.4 Tools and Techniques

Throughout the thesis several statistical techniques have been utilised. For instance calculations of growth rates, ratios, standard deviations, coefficient of variations, Gini Coefficients etc. have become very useful in different explanations of our work. Calculation of Gini Coefficient is based on the derived formula from its original version:

$$G = 1 - \sum P_i (Z_i + Z_{i-1})$$

Where  $P_i$  = cumulative population shares;  $Z_i$  = cumulative income shares.

Apart from the statistical tools mentioned above we followed some specific methodologies:

- 1) Simple linear trend equations and testing of hypothesis.
- 2) Fitting of the equation  $y = ab^t$  and testing of hypothesis.
- 3) Application of the formula  $y_t = y_0 (1+r)^t$  where  $y_t$  is vale of  $y$  at  $t$  th period,  $y_0$ - initial value  $r$  is the annual compound growth rate.
- 4) Detection of Pearson correlation coefficient and testing of hypothesis.
- 5) One sample T-test.
- 6) Linear regression analysis and testing of hypothesis.
- 7) Causality test within the sectors. We followed the work of Granger (1969), Sims (1972), Engle and Grangers (1987) Hsiao (1981) Akaike (1969) and others.

8) The technique of Principal Component Analysis to get composite score on developmental activities based on some selected variables has been used. This methodology is the output of several efforts made by scholars like Hagood (1943), Berry(1960), Pal(1968), Cattell (1952), Johnston (1978) and others.

The methodologies with item number 7 and 8 above have been applied in chapter II and V respectively and the entire methodologies have been discussed in detail in respective chapters.

### **1.9.5 Reference Period**

The range of the reference period in our study lies between 1980/81 to 2004/05. Although due to non-availability of data, information of all the relevant variables have not covered the entire range. There is a special significance of the decade of 1990's in our reference period, since it is symbolised in the Indian economic history as the post-reform era.

### **1.9.6 Limitations of the Study**

The main constraints in conducting research on the structural change of the northeastern economy are non-availability of consistent data, lack of sufficient literature, communication gaps etc. Data, related with sectoral income and employment shares in Chapters II and III have suffered from the problem of inconsistency with respect to different sources. As we had no option, we have chosen any one of those sources. Some literatures have not properly mentioned the data source and whether they have referred to constant price or to current price. Similarly, we were compelled to utilise data at current market price in some cases. To deflate at least we required continuous series of information, be it at different prices. These too were unavailable for most of the states.

### **1.10 Schematic Arrangement**

**Chapter – I:** In this chapter we have discussed Statement of the problem, Conceptual framework, Objective, Justification, Scope, Hypotheses, Research questions, Review of literature, Methodology and Schematic arrangement of the study.

**Chapter – II:** This chapter at first deals with the trend of Net State Domestic Product, per capita Net State Domestic Product, sectoral income shares. Thereafter the interrelationships and causality test within the sectors are presented.

**Chapter – III:** This chapter firstly finds out the connection between the growth and employment in the context of northeastern economy. After that the direction of economic concentration among the workers absorbed under primary, secondary and tertiary sectors is analysed with the help of sectoral income and corresponding employment shares. We get an idea in this chapter how urbanisation process takes a crucial role in the employment pattern and regional economic disparity. Lastly, employment elasticity and growth of labour productivity of different sub-sectors are calculated for the post-reform phase.

**Chapter – IV:** This chapter presents at first trends of different of financial parameters e.g. fiscal deficit, debt-GSDP ratio, buoyancy of own tax revenue, income-expenditure ratio etc. Next the principles behind the recommendations under different Finance Commission reports are discussed. Simultaneously the amount of central money transferred to the northeastern states under different sub-items and two broad items viz. union tax transfer and grants-in-aids are mentioned. At last the dependencies of state domestic product and per capita income of the northeastern states on the central money are shown.

**Chapter – V:** This chapter firstly reveals the status of northeastern states in terms of different development concepts such as per capita GSDP, inequality

in monthly per capita consumption, Human Development Index, economic and infrastructural index. Thereafter a number of literature reviews on development indices are discussed and lastly composite scores on development status for northeastern states are formed subject to thirteen selected indicators.

**Chapter – VI:** This chapter provides summary of findings, conclusions, suggestions and further scopes of research in connection with our entire study.

**Appendix – I:** This chapter initially presents the brief histories of all northeastern states and thereafter discusses the overall status of these states at all India level in terms of different socio-economic parameters.