

RURAL-URBAN DIVIDE AND LINKAGES: AN EMPIRICAL ANALYSIS IN ASSAM



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RURAL-URBAN DIVIDE AND LINKAGES: AN EMPIRICAL ANALYSIS IN ASSAM

**A thesis submitted to Indian Institute of Technology Guwahati
in partial fulfilment of the requirements for the degree of
Doctor of Philosophy**



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Dedicated to my Parents and Teachers







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Declaration

I, hereby, declare that the thesis entitled “Rural-Urban Divide and Linkages: An Empirical Analysis in Assam” is the result of investigation carried out by me in the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, India under the joint supervision of Prof. S. Borbora and Dr. M.K Dutta.

In keeping with the general practice of reporting observations, due acknowledgements have been made wherever the work described is based on the findings of other investigations.

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Certificate

This is to certify that the thesis entitled “Rural-Urban Divide and Linkages: An Empirical Analysis in Assam” submitted by Ms. Ira Das for the degree of Doctor of Philosophy in Economics in the Department of Humanities and Social Sciences of Indian Institute of Technology Guwahati, embodies bonafide record of research work carried out under our joint supervision and guidance. The collection of materials from the secondary sources and from the field investigations has also been done by Ms. Ira Das herself.

The present thesis or any part thereof has not been submitted to any other University for award of any degree or diploma.

All assistance received by the researcher has been duly acknowledged.

Prof. S. Borbora
Joint Supervisor

Dr. M. K. Dutta
Joint Supervisor



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Abstract

The issue of rural-urban divide and linkages has gained importance in the world in recent years. Reducing the divide through better linkage between sectors has been one of the issues for ensuring balanced development of any country. The United Nations has also emphasised on the issue for simultaneous development of rural and urban areas, of agriculture and industry, for over all development of any country.

The definition and differences of 'rural' and 'urban' areas emerge from the fact that certain economic activities require different spaces to perform. Since certain services are best located and performed in certain space, occupations in both locations are specialized in nature and complementary in serving each other's interest. Therefore, there should be equal opportunities in accessing basic infrastructures and other basic amenities of life in both the locations and there should not be any distinction between rural and urban sectors. This type of positive rural-urban interactions and the virtuous circle of development, fostered by backward and forward linkages between agriculture, industry and service sectors is the major source of economic growth and development for any country.

However, in reality, the virtuous circle of development does not occur and rural-urban divide arises due to inequalities in access to assets for rural and urban areas. Thus, the problem of disparity between rural and urban areas has become one of the major concerns for the policymakers. It is a major challenge for the policy makers to distribute the scarce resources efficiently and in a strategic way to solve development problems and to ensure that solutions for urban-related problems do not result in rural-related problems and vice-versa.

Assam, in the north eastern region of India, has also experienced considerable rural-urban variations in all aspects of development. Acknowledging the existence of rural-urban divide in the state, Assam Human Development Report, 2003, has commented that whatever development has occurred in the selected urban industrial areas, the effect has not spilt over to the surrounding rural agricultural sector. The data shows that rural areas in the state have failed to reap the benefits of the progressing world in this era of economic reforms. According to the Report on the Structures of Assam Economy by the Government of Assam, the inter-sectoral interdependence of production is weak in the state.

The present study has been taken up to assess the nature and magnitude of rural-urban divide, reasons behind this divide and the means to increase the strength of the rural sector to establish fruitful linkage between rural and urban sectors. Both secondary and primary data have been used to carry out the study.

While the issues of rural urban disparity and urban bias in the policy of government have been examined with the help of secondary data, a field study was carried out in an input supplying village near Nilon's industry at Dalgaon in Darrang district of Assam to study the impact of the Food Processing Industry - Nilon's Enterprises Private Limited on the village.

The nature and magnitude of rural-urban disparity in the state has been assessed with respect to three aspects of development, namely, health, education and employment generation by constructing an index, called Rural-Urban Disparity Index (RUDI). Urban bias in the policy of government, linkage between sectors are also examined in the state as literatures have identified these as some major reasons behind rural-urban divide. The sectoral linkage in the state has been examined with the help of Input-Output table of Assam. To see which of the identified factors has contributed significantly to the problem of rural-urban divide in the state, a time series model has been used. Finally, the issue of sectoral linkage at micro level has been verified by constructing a village Social Accounting Matrix (SAM) whereby the impact of a food processing industry on a neighbouring village has been examined. With the help of SAM multiplier analysis suggestions for better rural-urban linkages are suggested to reduce rural urban disparity in the state.

The study has empirically established the existence of rural-urban divide in the state. The divide is found to be more prominent in almost all the indicators in accessing health care facilities, education facilities and in employment generation in the state compared with the national average. Significant urban bias has been noticed in per capita budget allocation for rural and urban areas in health care sector in the state. The data, however, do not show any clear indication of urban bias in the policy making of the government in education sector and employment generation in the state. Weak sectoral linkage in the state is established from the study as only 5 per cent sectors are found to have high value of backward and forward linkages. The sector 'Other Food and Beverages' has high backward but low forward linkages in both with and without import leakages. Since backward linkages are more powerful than forward linkages especially in developing countries, therefore, the sector 'Other Food and Beverages' may have an important role to play in the state economy. One of the significant results inferred from the study is that the total value of the linkages is more in agriculture and agro-based industries than that in other manufacturing industries in the state. This means investing more in these sectors will help to stimulate the economy better through the backward and forward linkage effects.

Although literatures point out to a number of factors responsible for enhanced rural urban disparity, the time series analysis carried out for this purpose has found ‘weak sectoral linkage’ as the only significant factor for rural-urban divide in the state. The factor, ‘urban bias in government policies’ has not come out as a significant factor in the model.

The village SAM analysis has shown that there is sufficient linkage between the food-processing industry and the input supplying neighbouring village. It has also been found that compared to the quantum of vegetables produced in the village, the demand from the industry is much lesser. This indicates that abundant raw materials are available in the neighbouring villages. Thus, there exists huge potential and scope for setting up of more food-processing industries for value addition in that locality so that the farmers can get better remunerative price.

The input supplying village has been able to derive benefits from the food processing industry in many forms, namely in output enhancement, income increase and employment generation. Enhanced income of the villagers, following increase in demand for agriculture activities, results in increase in their expenditures. Significantly, all household groups are found to increase their service expenditures (includes expenditure on health and education) with an increase in their income, followed by expenditure on agriculture.

The study has also shown that the industry has a significant impact in the village in terms of poverty alleviating effects and income redistribution.

Thus, food-processing industries, due to their considerable linkage with the village economy, have the ability to improve the standard of living of the people and thereby help reduce the rural-urban divide in the state to a considerable extent. Keeping in view the positive economic as well as social impact of the food-processing industry on the input supplying village and the potentiality of the locality in terms of abundant production of raw-materials, more such food processing industries may be set up in the locality for balanced development of the region.



Chapter 1

Introduction

1.1 Background of the Study

Over the past few years, the issue of rural-urban divide and linkages has gained importance in the world. The interest on the issue can be observed from the activities of the United Nations. The theme of United Nations Conference on Human Settlements in May 2001, selected by the Economic and Social Commission for Asia and the Pacific (ESCAP) Committee was “Reducing Disparities: Balanced Development of Urban and Rural Areas and Regions within Countries of Asia and the Pacific”. While disparities between the urban and the rural areas have probably always existed, they became a major concern only fifty years ago, when the region decolonized. During the 1950s and 1960s, many governments recognised the need for simultaneous development of agriculture and industry, of rural and urban areas (United Nations, 2001). However, as resources are limited, there is a need for efficient use of natural resources with positive rural-urban interrelationship for sustainable and balanced development of any country.

There always exists an economic, social, political and environmental inter-linkage between rural and urban areas (Okpala, 2003; UNCHS, 2004). Rural-urban linkage can reduce vulnerability of both rural and urban poor by promoting livelihood diversification strategies. The issue deserves and requires renewed attention in view of new developments taking place in different countries of the world in recent years. The important developments include an enhanced understanding of the complexities of poverty, the growing adoption of the free-market economy, urbanisation, intensification of the rural-urban linkages, and decentralisation of government responsibilities to lower levels of the government (Sheng, 2006).

Generally, rural-urban interaction can be defined as linkages across space (such as flows of people, goods etc.) and linkages between sectors (for example, between agriculture, manufacturing and services) (Braun, 2007). The rural-urban linkages are seen as interconnection between rural and urban areas by different types of flows like flows of (i) people (migration) and community, (ii) production,

(iii) goods and services (trade), (iv) capital (private and public), (v) information and technology (ideas and innovations), (vi) natural resources, and (vii) waste and pollution (Douglass, 1999). In economic terms, mainly three types of rural-urban linkages are usually distinguished: consumption linkages (demand for final products), production linkages (backward and forward supply of inputs among businesses) and financial linkages (e.g. remittances by migrants, rural savings channeled through urban institutions). In broad terms, they also include rural activities taking place in urban centers (urban agriculture, village enclaves, access to land for housing through non-monetary traditional forms) and urban activities in rural locations (manufacturing and services, prosperous tourist areas, mining areas, areas with high value crops and many local multiplier links, rural areas with diverse non-agricultural production and strong links to cities) (Tacoli, 1998). Although 'rural' sector comprises of agriculture and non-farm activities and 'urban' sector comprises of industry and informal sector, the spatial term 'rural-urban' is used synonymously with the sectoral term 'agriculture-industry' (Satyasai and Viswanathan, 1999).

A generation ago, mainstream economists hardly thought at all about the location of production within countries (Krugman, 2010). In recent years, however, there has been a focus on regional economics and economic geography¹. These theories have given particular importance on understanding of clustering of economic activities (Maurseth, 2001). Geography was not explicitly treated in a number of growth models (namely, 'learning by doing' models of growth, the 'R&D-based' models and 'technology gap' models). However, there has been lots of empirical evidence that technology spillovers, in particular and technology diffusion, in general are influenced by geography (Maurseth, 2001). The recent models of economic geography incorporate the effects of distance explicitly (Krugman, 1991, Krugman and Venables, 1995). These models emphasize on forward and backward linkages, spillovers and scale economies as centripetal forces, while costs of commuting and congestion, or more generally costs induced by agglomeration, act as centrifugal forces (Fujita *et al.*, 1999). Venables (1996) finds that spatial agglomeration of economic activity takes place only at intermediate price levels. In the other two extreme situations where transport and communication costs are either very high or very low, economic activity tends to

be dispersed, but for different reasons. In case of high costs, economic activity is dispersed because firms need to be closer to consumers, and in the reverse case of low costs, firms will consider other issues such as higher wages and congestion costs besides costs of transport and communications when deciding on location.

In fact, 'rural' and 'urban' are the two areas where the distinction is not very easy to comprehend. 'Rural' and 'urban' areas are parts of a continuous regional, national and international landscape and related through complex economic, social, political and environmental forces (South African Cities Network, 2009). The settlement size, population density, available infrastructure, administrative functions, economic activities are the different criteria to distinguish 'rural' or 'urban' areas². The definitions and differences of 'rural' and 'urban' areas emerge from the fact that certain economic activities require different spaces to perform. Since certain services are best located and performed in certain space, occupations in both areas are specialized in nature and complementary with positive linkages in serving each other's interest. Therefore, occupations in both the spaces ideally should be remunerative. All the resources such as capital and labour etc. should move freely between the two sectors and marginal returns to the factors of production should be equal (Fan *et al.*, 2005). In other words, there should not be any disparity in accessing basic infrastructure and other basic amenities of life in both the areas. Therefore, ideally there should not be any distinction between rural and urban sectors.

The 'virtuous circle model of rural-urban development' portrays an idealistic situation of rural-urban linkages. The model states that urban areas have a positive impact on rural hinterlands by ways of developments of markets for inputs, and supplying extension and production credit which lead to a rise in productivity. Increased income in rural areas generates demand for urban manufactured and marketed consumer goods. This increases urban demand for labour resulting in rural to urban migration. The rise in urban income leads in turn to enhanced demand for superior and income elastic consumer goods which are supplied by the rural sector as it diversifies into rural non-farm activity (Douglass, 1999). This type of positive rural-urban interactions and the virtuous circle of development are fostered by backward and forward linkages between agriculture,

industry and service sectors which is the major source of economic growth and development (Tacoli, 1998).

However, the virtuous circle model assumes that farmers have access to information, inputs and services, including access to technology, land and capital, needed to increase agricultural production. In reality, farmers do not have adequate information and access to inputs so that they can know about and can respond to urban-based or export demand (Garret and Choudhury, 2004). Evans (1992) opined that income elasticity of demand for locally produced goods is low, while that for imported goods is generally higher. The large cities that are the consumer centers of the country are often found to be importing basic goods from abroad. Moreover, the trend of importing goods rather than domestically producing them and the situation that rural areas are overspecialized in one or two primary exports makes the local economy unstable. Dependence on a narrow resource base leads to over exploitation and environmental degradation. Therefore, the model does not operate and rural-urban divide arises due to inequalities in access to assets for rural and urban areas.

Agriculture, though is the mainstay of rural economy in most of the developing economies, is beset with many problems. One such problem is the issue of subsistence farming and lack of diversification to high value crops. Studies have pointed out that to encourage agricultural diversification and thereby address imbalances in agricultural sector in these countries, price interventions should be made (Chand, 2003). However, it is important to note that non-price factors such as technology, public investment in agricultural research and development, extension services, irrigation, rural infrastructure, etc. play more important role in influencing productivity and production than pricing policy. Therefore, people have advocated for more emphasis on non-market price interventions to accelerate growth in agricultural sector (Sharma, 2011). The most common non-market reform strategies are decentralisation to lower tiers of government, and transferring or delegating the responsibility for extension to non-governmental organisations etc. (Rivera, 2001).

Although the main goal of the non-market intervention of all economies is to ensure remunerative price to agricultural products for the farm households, but the growth in agricultural sector in many countries has been found to fall short of

targets and has been well below that of non-agricultural sectors. This has led to a widening gap between rural and urban incomes. Among the emerging economies, Brazil was able to achieve declining inequality. It appears that in Brazil's case (as well as in the case of many other Latin American countries), the decline was helped by macroeconomic stability, which particularly helped the poor, by higher overall economic growth, declining educational inequality and strong programmes of pro-poor redistribution through more progressive government transfer programmes. In particular, the spread of conditional cash transfer programmes such as Brazil's *Bolsa Familia Programme*, under which substantial transfers were made to poor households provided children attend school and participate in health programmes, have played an important role in this pro-poor redistribution. These programmes were possible without endangering macro economic stability because the government was able to significantly increase its tax revenue as a share of GDP, thereby bringing the tax to GDP ratio closer to the level of developed countries (Klasen, 2009). The agricultural support as a share of GDP has increased in Brazil from 0.2 per cent in 1995-97 to 0.6 per cent in 2008-10 (OECD, 2011). The Brazilian case, thus, shows that rising inequality is not inevitable in emerging countries, and that government policies can play an important role in ensuring significant reduction in inequality. However, in China and India, the other two emerging economies, inequality continues to show an upward trend. In practice, government policies in these countries, on balance, promote rising inequality as they favour those regions in which the export sectors are concentrated through undervalued exchange rates, cheap credit, and strong state support for building infrastructure. In contrast, government support for agricultural development, including investments in productivity improvements, rural infrastructure and land reforms, has lagged behind in these countries and this has contributed to the sharply rising rural-urban disparities, the main driver of rising overall inequality (Klasen, 2009).

According to Shankar (1995), the rural-urban disparity aggravates further due to non-remunerative agriculture price maintained by the policy-makers. In most of the developing countries, agriculture is the only productive sector that produces an economic surplus to finance industrial and urban development. Industrial goods are being sold at artificially high prices to support an inefficient

industry and agricultural goods are being sold at artificially low prices to keep the cost of living in the urban areas down (Thirwall, 2006; Shankar, 1995). A portion of the foreign exchange earned by exporting agricultural products is used for the import of goods needed in the industrial sector. The earnings from agriculture are taxed and the proceeds are used to finance industrial development, thereby often burdening agriculture beyond what public investments and government services provided to agriculture (Knudsen and Nash, 1990; Krueger, Schiff, and Valdes, 1991; Rattso and Torvik, 2003). Unfavourable exchange rates of the products produced in rural and urban areas create disparity and inequality in these two differentiated areas (Shankar, 1995).

It is widely accepted that there is growing disparities between urban and rural areas and this disparity creates many development problems. One such problem is the lower poverty reduction response to economic growth by some of the fast growing developing countries which is attributed to their initial low level of human development and large disparities between rural and urban areas (Khan, 2001; World Bank, 2008; UNDP, 2009). Massive rural to urban migration is another problem created by the disparities between rural and urban areas (UNHABITAT, 2009). Rural to urban migration arises mainly because of the income differentials between origin and destination. It is generally thought that as workers move, the labour supply diminishes at the origin, causing wage rates there to rise. At the same time, the pressure of competition among the new workers for job causes the higher wages at migrant's destinations to fall. When the process has gone for some time, the initial wage differentials would diminish until, finally, interregional income inequalities would stub out altogether the incentives that led to internal migration. However, it has not really happen at the present context of developing countries. The problem is that rural-urban wage differentials have not fallen in developing countries. Non-remunerative agriculture price (Shankar, 1995) leads to unattractiveness of the occupations for the youth, basically due to lack of market for their low quality and unattractive products, constraints to access the right market, lack of supportive infrastructure and incapability of the state to adopt right policies. Further, the productivity per farmer is very low implying distress driven population in the sector. With population grows at a faster rate in developing countries and as rural population are more, all of them could not be

absorbed in the agricultural sector. Without opportunities for an adequate livelihood in the rural areas, poverty increases and this forces many rural poor to seek employment elsewhere, leading to massive rural-urban migration. The urban areas and the young industrial sector cannot absorb the new arrivals that end up in the slums where they find employed in the informal sector. The result of this weak sectoral linkage is poverty in both urban and rural areas (United Nations, 2001).

National and local government structures traditionally remain unable to deal with urban and rural linkages. Most decisions about the fate of rural areas are made between government and businesses in metropolitan centers, with little interest in the question of long term local multiplier effects and the means of livelihood in rural areas (Tacoli, 1998). The policy-makers often do not take the rural-urban linkages into account and divide their policies along spatial and sectoral lines. Urban planners concentrate on the development of the urban areas without due attention to its impact on rural development, while rural development planners ignore the urban areas. Consequently, policies reflect either rural or urban biases, overlooking the dynamics and importance of the developmental linkages between the two (UNCHS, 2004). Thus rural and urban areas have traditionally been viewed as exclusive and competing spheres placed in separate areas for planning, development and investment purposes.

Studies of rural-urban linkages indicate that the nature of the linkages differs from one place to another and differs for different sectors in the same place. There is a need to have a better understanding of the relationships between rural and urban areas and the variety in the nature of the linkages. It is equally necessary to re-explore/re-define the relationships and identify successful practices that promote the capacity of rural and urban local governments to review, adapt and replicate such policies. Therefore, it is very important to determine the circumstances in which the virtuous circle model of rural-urban development is applicable, and the conditions under which the local economy might be expected to perform in accordance with the model. The role that a city plays in a rice growing region is different from that at the fringe of an industrialising metropolitan region (Smith, 2003). Therefore, there are some country related or space specific assumptions of virtuous circle model (Kamete *et al*, 2002).

Rural-urban dichotomy was reported in the development literature in 1950s and 1960s and it is expected to continue until there is rural-urban divide (Garret and Chowdhury, 2004). According to Michael Lipton (1977), “The most important class conflict in the poor countries of the world today is not between labour and capital. Nor is it between foreign and national interests. It is between the urban and rural classes.” Although the sharp division between rural and urban areas is becoming increasingly less and less perceptible nowadays with the development of technology, transport and communication systems, but in developing countries, like India, the rural-urban distinction is pronounced (Rao, 1983, Braun, 2007). The problem of disparity between rural and urban areas, particularly in post-reform period, has become one of the major concerns for the policymakers. It is a major challenge for the policy makers to distribute the scarce resources efficiently and in a strategic way to solve development problems and to ensure that solutions for urban-related problems do not result in rural-related problems and vice-versa.

1.2 Statement of the Problem

It is well known that India, a big developing country, is becoming a major power with high growth rate. The affluence in our urban areas is testimony to this. However, the gloomy side of this satisfaction is that our rural areas where more than 70 per cent of people are living are lagging far behind its counterpart urban areas. Therefore, obviously question arises about the sustainability of this overwhelming growth of the economy.

The Approach Papers to the 11th and 12th five year plan of India also states the need to make growth more inclusive in terms of benefits flowing through more employment and income to those sections of society which have been bypassed by higher rates of economic growth witnessed in recent years. Majority of the bypassed poor people are living in rural areas and rural-urban disparity is seen prominent in our country. According to Sen (2007), the necessary condition for inclusive growth is that the disparity in per worker income between agriculture/rural and non-agriculture/urban should not widen. With significant reduction in the incidence of poverty during 80's, income disparities among households might have reduced to some extent within the rural and urban areas in India. But with differential rates of rise in incomes for the non-poor households in

the rural and urban areas, income disparity between rural and urban areas may have increased at varying rates over the states (Sawant and Mhatre, 2000).

Assam, in the north eastern region of India, is a backward state compared to other states of India. The per capita income of the state is one of the lowest in the country. In 2007-08, the per capita Net State Domestic Product (NSDP) of the state at constant prices (1999-00) was Rs.16, 597 against the per capita Net National Product (NNP) for the country of Rs. 24, 295 (Government of Assam, 2008-09). However, the economic condition of the state was much better at the time of independence. In 1950-51, the per capita income of the state was 4.1 per cent higher than the national average. The per capita income of the state lagged behind the rest of the country by 1960's and since then the economy of the state has remained below all India level. By 1980-81, the per capita income of the state was 27 per cent lower than the national average (Government of Assam, 2003) and the same was found to be 46.38 per cent lower than the national average in 2008-09. It indicates that the economy of the state is not going in line with the growing path of the national economy. The state has experienced considerable rural-urban variations in all aspects of developments, viz. in access to services, employment growth, economic activity, access to education, health services, basic amenities etc. (Government of Assam, 2003). Rural poverty in the state has been much higher than urban poverty. As per data available, two out of five people in rural area are below the poverty line while the incidence is less than one in ten in urban Assam in 1999-2000 (Government of Assam, 2003). Urban poverty was 3.3 per cent in 2004-05 whereas rural poverty was much higher at 22.3 per cent (NSSO, 2006a). The average Monthly Per Capita Expenditure (MPCE) of urban people in the state is more than double than that of rural people. In 2005-06, the figure for average MPCE for urban people was Rs.1352 against Rs. 626 for rural people (NSSO, 2008). Rural-urban disparity has worsened in the state during the last four decades as evident from the findings of a study carried out by Chand (2007) for the states of India. He has found that during 1973-2005, the rural-urban disparity has worsened most in Gujarat followed by Punjab, Assam, Haryana, Uttar Pradesh, Rajasthan and Karnataka. The findings also affirm that rural areas in the state have failed to reap the benefits of accelerated growth in the era of economic reforms.

Investment plays a major role in economic development of backward economies. High levels of investment are considered as the precondition for sustained economic growth, especially in developing countries. The relationship between public investment spending and private investment is a matter of controversy both from theoretical and empirical perspective. It also has strong implications for determining the government policy to promote economic growth (Kollamparambil and Nicolaou, 2011). According to the Neo-classical economists, government investment may “crowd out” private investment when the state decides to increase its contribution of investment within the economy. On the other hand, Keynes argued for state intervention as in a state of less than full employment, the interest rate sensitivity of investment is assumed to be low and hence output and income expand. This attracts private investors and “crowding in” of investment takes place. Empirical studies by Easterly and Rebelo (1993), and Argimon *et al.* (1997) have also argued that public investment may “crowd in” private investment specifically when public investment is made in infrastructure of the economy.

In the case of the economy of Assam, the inter-sectoral interdependence of production is considered to be weak (Government of Assam, 1990). In economic sense, the forward and backward linkages of the primary sector (mainly rural) and non-primary sector (mainly urban) is not strong in the state. There are some modern industries operating in the state with few backward or forward linkages. The surplus generated by these industries has not been reinvested in the state (Government of Assam, 2003). Therefore, whatever development has occurred in the selected urban industrial areas, the effect has not spilt over to the surrounding rural agricultural area (as observed by Ramadhyani, 1984 in case of India and Government of Assam, 2003 for Assam). Even though oil and tea industries, which were established before independence, have flourished in the state, neither agricultural nor industrial sector has developed compared to other states of the country. The Vision Document for the North Eastern Region, prepared by the Ministry of Development of North Eastern Region and North Eastern Council, rightly observes that “There is overwhelming dependence for resources on the Central Government, public investment in the region has sub-optimal productivity due to weak forward and backward linkages” (Government of India, 2008).

Therefore, it is imperative to look into the future line of investment (mainly public investment) which can bring development with better sectoral linkages in the state. However, it is ironical to see that the major sector of the economy in the state, i.e. agriculture, has not witnessed adequate investment so far (Chand, 2000).

On the basis of foregoing discussion it is felt that a comprehensive study is required on the strategy of rural-urban linkage to narrow down the rural-urban divide in the state. Accordingly the present study has been taken up to assess the nature and magnitude of rural-urban divide, reasons behind this divide and the means to increase the strength of the rural sector to establish fruitful linkage between rural and urban sectors. This study is also an attempt to explore the ways for better rural-urban linkages for balanced development and inclusive growth in the state.

1.3 Objectives of the Study

The objectives of the study are as follows:

1. To assess the nature and magnitude of rural and urban divide in Assam. This divide is assessed in accessing healthcare services, education facilities, and employment generation in the state.
2. To examine whether there exists urban bias in the process of development or not.
3. To study the nature and strength of sectoral linkages between rural sector (mainly agriculture-farm) and urban sector (mainly industry-non-farm).
4. To suggest how to encourage the strengthening of local rural-urban linkages in a manner that benefits both rural as well as urban sector for balanced development in the state.

1.4 Hypotheses of the Study

The hypotheses of the study are formulated as:

- Weak sectoral linkage and biased policies of the government are responsible for rural-urban divide in the state.
- Region with overriding agriculture sector requires adequate investment in the sector which may help in reducing the rural-urban divide.

1.5 Data Sources

The study is based on both primary and secondary data. The secondary data are collected mainly from Census Reports, National Sample Survey Reports, National Family Health Survey, Sample Registration System, National Institute of Educational Planning and Administration (NIEPA), National Rural Health Mission, Assam; Statistical Handbook of Assam, Economic Survey, Directorate of Health Services Assam, Budget Reports of Government of Assam, Directorate of Secondary and Elementary Education Assam etc. for examining rural-urban divide/urban bias in health, education sector and employment generation. The strength of the sectoral linkages in the state economy is examined on the basis of the updated input-coefficient matrix of the state economy by Goswami (2002). The primary data are collected from a field study conducted at village Batabari, Darrang District, Assam to study the impact of the Food Processing Industry - Nilon's Enterprises Private Limited on the village.

As the comparable and readily available data are found only from 1980-81 for the state, thus the study has tried to examine the issues for the state economy from 1980-81.

1.6 Methodology

To assess the nature and magnitude of rural-urban divide in three aspects of development, namely, health, education and employment, the method used by AIRD (2006) in Afghanistan Rural Development Report is used here. Available literature has identified urban bias, weak sectoral linkage, resource availability etc. as some of the major reasons behind the rural-urban divide. The issues in the context of the state have been verified by examining policies of the government relevant to different sectors and with the help of Input-Output table of Assam.

The factors behind the rural-urban divide in the state are examined with the help of a time series model. To estimate the parameters of the model, the model is tested by stationarity test and necessary regression diagnosis is also done.

To investigate the sectoral linkage, a Social Accounting Matrix (SAM) is constructed to study the impact of the food processing industry on a neighbouring input-supplying village. With the help of SAM multiplier analysis, suggestions are

made for better rural-urban linkages to reduce disparity in the state. Decomposition of the SAM multiplier matrix is also done.

The detailed methodology has been furnished in respective chapters.

1.7 Layout of the Dissertation

The dissertation is comprised of eight chapters including the present one.

The second chapter is the product of a survey of available literature on the issue of rural-urban divide and linkage. The findings of some of the empirical works found relevant in the context of the present study have also been summarised in this chapter.

The third chapter depicts the present status of Assam economy. The rural-urban divide in a few selected sectors of the state is also shown with the help of secondary data in this chapter.

The core of the dissertation begins with the fourth chapter which examines the rural-urban divide in the state empirically in three aspects of development, namely health sector, education sector and employment generation. An index called Rural Urban Disparity Index (RUDI) has been constructed to examine this. Whether there exists urban bias in the policies of the government in ensuring development in the state or not is examined in the fifth chapter of the dissertation. This is done by examining the differences in the public expenditures in urban and rural areas with reference to the above-mentioned three aspects of development. Chapter six examines the nature and strength of the sectoral linkages in the state with the help of input-output framework. After examining the linkage, the factors contributing to rural-urban divide in the state is also examined in this chapter with the help of a time series model. In the seventh chapter, the linkages of a food-processing industry with the peripheral villages have been examined with the help of a micro-level field study. A Social Accounting Matrix has been constructed for the purpose and the results of multiplier analysis have been furnished in details.

In the concluding chapter of the dissertation, findings have been summarised, conclusions have been inferred and on the basis of the findings and conclusions, some policy suggestions have been outlined.

Notes

1. The definition of economic geography given by Truman A. Hartshorn and John W. Alexander (1988) is as follows: "Economic Geography is the study of the spatial variation on the earth's surface of activities related to producing, exchanging, and consuming goods and services." However, the concept can also be defined as "In Economic Geography, we study the (locational, organizational and behavioral) principles and processes associated with the spatial allocation of scarce (human, man-made and natural) resources (which are also distributed spatially) and the spatial patterns and (direct and indirect, social, environmental and economic) consequences resulting from such allocations." (accessed from <http://faculty.washington.edu/krumme/207/concepts/ebg.html> on 05-12-11)
2. In the Census of India 2001, an urban area in India is defined as follows: (i) All places with a municipality, corporation or notified town committee, etc. and (ii) all other places which satisfy the following criteria: (a) a minimum population of 5, 000; (b) at least 75 per cent male working population engaged in non-agricultural pursuits; and (c) a density of at least 400 persons per sq. k.m.

Chapter 2

Review of Literature

To carry out the present study in the context of Assam, a review of studies related to this issue is essential towards the existing knowledge, the approaches and the methods used in those studies, the findings and limitations of those studies etc. A review of literature was done relating to the issue of rural-urban divide and linkages. The literatures reviewed to carry out the present study are presented under the following headings:

- (i) Rural-Urban Linkage;
- (ii) Rural-Urban Divide;
- (iii) Reasons behind the Rural-Urban Divide;
- (iv) Effective Linkage Study (Impact Analysis) to narrow down the Rural-Urban Divide.

2.1 Rural-Urban Linkage Study

‘Rural-urban linkage’ can be studied both from sectoral and spatial point of view. The issue has been studied from sectoral point of view in the development theories since 18th century. The Physiocrats, Adam Smith, Ricardo, Karl Marx, Chenery, Kalecki, Lewis, Hirschman, Gunnar Myrdal, Nurkse, Hymer-Resnick, Fei-Ranis, Taylor, Kaldor, Kuznets, etc. discussed the dual structure of the economy from different viewpoints (Ashra, 2003; Rattso and Torvik, 2003; Thirlwall, 2006; Ray, 2007). In Big Push models of Rosenstein-Rodan, Balanced Growth model of Ragner Nurkse, industry receives higher priority than agriculture. The Unbalanced Growth Strategy of Hirschman was also largely concerned with ‘industry’. Rosenstein-Rodan, Lewis, Scitovsky, Hirschman, Jorgenson and Fei and Ranis pointed to agriculture as a source of an abundant labour supply. The role of agriculture in the transformation of a developing economy was seen as ancillary to the central strategy of accelerating the pace of industrialisation (Vogel, 1994). After the groundbreaking work of Schultz (1964), a host of literature showed that not only agriculture is capable of productivity growth and responsive to technological change (on which the “green revolution” was based), but also the

agricultural sector can have significant multiplier effects and therefore, growth in the agricultural sector could be spread to other sectors in the economy (Roza and Meijerink, 2007).

The debate on the role of agriculture in economic growth is centuries old; yet, the realisation that agriculture is central to the growth process in poor countries is relatively recent (Block and Timmer, 1994). The discussion in recent decades has been shaped by Johnston and Mellor's classic article, in which they identify five types of inter-sectoral linkages that highlight the role of agriculture in economic growth. These forward and backward linkages, operating through both production and consumption, include (Roza and Meijerink, 2007):

1. Providing food for domestic consumption,
2. Releasing labour for industrial employment,
3. Enlarging the market for domestic industrial output,
4. Increasing the supply of domestic savings,
5. Earning foreign exchange.

The economists Kalecki, Kuznets, Mellor, Singer, and Adelman recognised the potential of agriculture to generate sufficient demand to stimulate industrialisation with strong linkages in developing economies (Vogel, 1994). Following the failure of industrialisation-led development strategies of the 50's, economist Mellor argued for agriculture-led strategies in 70's.

However, the main thrust of agricultural/rural-industrial/urban study from spatial view point came during the 1950's (Chakravarty, 1991) and recently the issue has been critically discussed by Mike Douglass (1999; 2001), Cecilia Tacoli (1998; 2004) etc. From the discussions, it is found that governments of developing countries induce economic growth and welfare by investing heavily in capital-intensive industries in large urban centers according to the 'growth pole' theory and it is thought that growth spreads to the rural areas which is called as Myrdal's 'spread effect' or Hirschman's 'trickle-down effect'. In late 1950's, discussions saw an opposite model based on core-periphery relations- the benefits of the core are at the expense of the periphery which is called as Myrdal's 'backwash effect' or Hirschman's 'polarization effect'. The development policy of 1970's proposed to promote rural small towns to fill the gap between rural and urban sector. According to Chatterjee (2007), the development challenge in rural sector is not

about making a choice between the industrial development and agricultural growth; it is essentially about helping the rural sector realise its own potential for development by using the gains of modern science and technology and industrial development as such. Fan *et al.* (2005) mentioned that correcting urban bias and developing sectoral linkage can lead to higher growth in agriculture and therefore to larger poverty reduction in both rural and urban areas as a result of better rural-urban linkages. To bring the healthy relationship between rural and urban sector the role of land reforms, role of non-farm sector etc. were also identified in the literature.

Agriculture can influence non-farm activity in at least three ways: through production, consumption and labour market linkages (Lanjouno and Shariff, 2004). The key factors determining the access by households and individuals in rural areas to non-farm activities are (i) the incentives structure within which they carry out the farming activities and (ii) the capacity of the households to undertake the rural non-farm (RNF) activities. The capacity of the households is determined by the factors including the level of education, income, credit, infrastructure facilities, access to assets including land and other demographic characteristics (Saleth, 1999; Janvry and Sadoulet, 2001; Premarathne and Senanayake, 2004). It can be revealed from these studies that RNF economic activities are a part of the solution to at least three major problems in rural areas in developing countries: modernisation of the farm sector, transformation of the rural environment and alleviation of poverty. All these three are interrelated. However, constraints to access the right market, lack of supportive infrastructures and incapability of the state to adopt right policies-all affects agriculture/non-farm led growth in rural areas. Public investment in physical infrastructure as well as on human and social capital is crucial for the small farms to establish their own business and to access non-farm jobs in the rural non-farm sector. Some studies opined that growth in agriculture is the determinant for the rise of the non-farm sector whereas according to other group it is the micro credit which determines the rise in non-farm sector. It is also said that growth of agricultural surplus is both a necessary and sufficient condition for the growth of non-farm sector in a dualistic economy. Dutta (2004) in his thesis establishes the dynamic role of agriculture in the process of growth of rural economy as a major driver or necessary condition for RNF activities and

entrepreneurship as the sufficient condition. This has reinforced the view that investment in agriculture is the main route to poverty reduction. However, this logic has been refuted in recent years by saying that tourism, urbanisation (Tacoli, 2004) etc. may be the important driver of diversification with three crucial pre-requisites: access to infrastructure, trade relations/markets and market information (Deshingkar, 2004). Thus, agriculture diversification can bring healthy rural-urban linkages.

As rapid urbanisation continues to occur in major cities as well as smaller cities and towns, the rural-urban linkage issues such as the growth of slums, rural land tenure systems, the dynamics of local, national and international markets, etc. become increasingly important (UNHABITAT, 2011).

The theoretical debate is enriched by empirical evidences. In recent times, the issues of rural-urban linkage have been discussed by many economists and geographers from sectoral and spatial point of view for the international and national level data. In one study, Khan (1999) measured sectoral growth linkages for South Africa using multiplier decomposition technique. A study by DFID (2002) in Bangladesh found that estimates of the multiplier effects of increased farm output on other sectors gives values from 1.3 to 1.999. That multiplier effects in turn boosts the demand for agricultural produce and hence increases rural incomes through the virtuous circle of rural-urban development. Roberts (2000) studied impact of rural areas on urban areas and vice-versa for Scotland. Henry *et al.* (1997) and Partridge *et al.* (2005) studied the spread and backwash effects of different sector's growth on its periphery. They observed that well-managed urban and rural change is good for poverty reduction and economic growth. Ratto and Torvik (2003) observed that many countries in Sub-Saharan Africa discriminated against agriculture to promote industry after independence. Policy was formulated to reduce labour costs of industry and was combined with overvaluation of the currency, protection, and priority rationing of imported inputs to industry. As a result those countries got stagnation both in agriculture and industry. On the other hand, the fast growing economies of Southeast Asian countries have shown a synergetic mix of agriculture/rural and industrial/urban activities in the process of economic development (UNDP, 2000).

How policy formulation and implementation at the national levels can best support the role of rural-urban linkages in different states is explained by Douglass (1998) who formulated a combined rural-urban led schematic model of regional development for Thailand based on a more dynamic agriculture sector with diversification of agriculture. According to him, investment would be needed in basic/leading sector to bring the upstream (machineries, agriculture inputs such as seeds and fertilisers) and downstream (crop processing and industrial transformation) linkages into any region. Agriculture alone cannot provide employment for surplus labourers and agriculture has very limited labour absorptive capacity even with rising levels of land and labour productivity (Douglass, 2001; Ellis and Harris, 2004) and hence concern goes for diversification of agriculture since 70's. In many rapidly growing economies of Asia, rural households supplement on-farm employment (i.e., in crop and livestock production activities) with allied sector (forestry, fishing, etc) and other non-farm activities (processing and transporting of farm outputs, trade in farm inputs, provision of different types of services required by the rural farm and non-farm households, construction, small scale manufacturing, etc.) either available locally or in the nearby towns.

To bridge the sectoral and spatial gap, 'Modern Food-Value Chain' (change in the dietary composition of urban consumers in favour of high-value agricultural products) through rural non-farm is also suggested for Bangladesh (Garrett and Chowdhury, 2004). An expansion of NFR activities based exclusively on rural activity is not viable. The growth motor for non-farm rural activity will have to rely more on market expansion and product diversification to urban consumers. Presence or creation of a progressive distribution of land (Ray, 1994), reasonable access to markets and the acquisition of knowhow and market skills are the critical elements in rural economic diversification and social advancement which is experienced by Korea. Rural-urban linkages play an important role in inducing economic diversification depending on the location of the village vis-à-vis large urban centres.

In Eastern and Southern Africa (ESA), the rural people depend upon small towns for agricultural productivity, rural goods and services, distribution centers for commodities and processing of local goods (UNDP, 2000). In Nepal, it is

observed that civil society in collaboration with government can play a potential role in strengthening rural-urban linkages as strength, as tool, as resources, and as a watch dog (Kumar, 2003). The Rural-Urban Partnership Programme (RUPP) of UNDP, executed by United Nations Center for Human Settlements (UNCHS) in Nepal is intended to address the widening gap between the rich and the poor by making use of the internal potential of rural-urban social and economic linkages and increasing access to resources by integrating social mobilisation. Rural-urban partnership flourishes when policies use the existing potentials of rural-urban economic and social linkages. It is based on urban consumption demand. Rural production capitalises on urban needs and encourages the urban centers to transact locally produced goods as well (UNDP, 2000). The government of Indonesia with the support of UNDP and UNCHS initiated a Poverty Alleviation through Rural-Urban Linkages (PARUL) pilot programme to test concepts and approaches for strengthening rural-urban linkages in selected provinces and districts. The programme is attempted to support local economic development by linking small-scale producers to broader markets through collaboration with large-scale enterprises. That study reveals that the efforts needed to strengthen the position of rural areas in the mainstream economy include: (i) Identifying development potentials; (ii) Arranging for promoting production; (iii) Market, and marketing of goods for export to other regions; and (iv) Identifying factors who are involved and could be collaborated with to design and implement the programme with success (UNDP, 2000).

The Rural Village Programme, Parana, in Brazil, is an example of collaboration of several municipalities in the direction of providing cultivable land, shelter, technical support, soft loans, training and development of management skills, inputs and access to the facilities to rural areas that are usually in the urban areas (UNDP, 2000). Similarly, the dramatic reduction of poverty in the Red River Delta in Vietnam through positive rural-urban linkages is mainly the result of increasing opportunities in the non-agricultural sector. The farm shop in Nordic Region and in North America; Consumer or Community- Supported Agriculture (CSA) started in Germany and Switzerland; farmer's market in Sweden, Norway; Self harvest practice in Austria, Germany, Norway; eco-belt or green corridors etc. are some of the successful models of rural-urban linkages (UNDP, 2000).

Recently, Rural Policy Research Institute (RUPRI) (2010) America, in its Composite Report on “Wealth Creation and Rural-Urban Linkages”, has put the initiative to help backward rural areas overcome their isolation and integrate into regional economies in ways that increase their ownership and influence over various kinds of wealth. Zewdu and Malek (2010) studied the implications of land policies for rural-urban linkages and rural transformation in Ethiopia. The negative rural-urban linkages is also depicted in a study carried out by Talbot and Courtney (2011) for European Union pointing out the outflows of young people and the inflows of older people to rural areas and by stating that “rural policy interventions will need to ensure that rural areas are not cast in the role of junior partners which help implement an urban agenda”. While discussing the issue in Romania, Paveliuc-Olariu (2011) argues that urban planners usually concentrate on the importance of urban centers as commerce and transportation nodes in the regional policy giving little attention to agricultural or rural-led development.

In India, the magnitude and nature of agri-industry linkages is studied by Bhattacharya and Rao (1986); Bhattacharya and Mitra (1989); Dhawan and Saxena (1992); Chowdhury and Chowdhury (1994); Satyasai and Viswanathan (1999) in different perspectives. Sawant and Mhatre (2000) stated that the two-sector virtuous model has not worked in many developing economies of Asia characterised by low and worsening land-man ratios and high surplus labour for several reasons. Therefore, the pace of employment generation in the capital intensive industrial sectors in countries like India has proved to be grossly inadequate in accommodating the surplus labour force. This is the reason why despite a sharp decline in the agricultural sector’s share in the national income, large dependence of the labour force on agriculture sector continued.

Dutta (2004) mentioned that proximity of urban areas affect non-farm employment and thereby affecting poverty in the adjoining rural areas in developing countries like India in two different ways: (i) the urban region may generate a demand for goods produced in the adjacent rural area termed as backward linkage; (ii) this may be done inducing the demand for the services available in the urban sector from rural households. In India, *Apni Mandi* (Our Market) of Punjab and Haryana, *Rythu Bazars* of Andhra Pradesh, state-sponsored vegetable farmers’ markets of Tamil Nadu (Rengasamy *et al.*, 2002), PURA

(Provision of Urban amenities in Rural Areas) etc. have been introduced on experimental basis for better rural-urban linkages. According to the former President APJ Abdul Kalam (in his address on National Technology Day, 2003), four critical connectivity can bridge the gap between rural and urban areas and can create a rural-urban continuum in India: physical connectivity, by providing good roads, transport services and quality power; electronic connectivity, by providing reliable communication networks; knowledge connectivity, by establishing more professional institutions and vocational training centers, schools with high quality infrastructure, devoted teachers, production centers for rural artisans, primary health centers, recreation centers etc. and market connectivity, that will help realise the best value for the products and services of rural people, and constantly expand and enrich employment opportunities for them.

In Meghalaya, the linkage of the urban areas can be seen as being of two types: (i) with the neighbouring villages having a dominating effect and (ii) with the rest of the national economy with dependence (Chakravarty, 1991). Borah (1985) and Barthakur (1988) studied the rural-urban interactions/linkages in Assam from spatial point of view. According to Barthakur (1988) one of the major dimensions for the immediate socio-economic uplift of the rural masses is to use agricultural land intensively and diversification of agricultural activities with minimum use of land. Another study worth mentioning in this regard is by Saikia (1995) who studied the impact of urban centre on rural economy in Assam. He found that the nearby villages of the urban centre are comparatively more benefitted.

2.2 Study on Rural-Urban Divide

In reality, instead of vigorous working of the virtuous circle model of rural-urban linkages, rural-urban divide is apparent in developing countries. The problem of rural-urban divide has been discussed by Alege (1990), Knight and Song (1993), Hirasuna and Stinson (2005) etc. at international level and Choubey and Choubey (1998), Datta (2004), Patnaik (2006) etc. at national level. These researchers estimated the nature and magnitude of rural-urban divide in different perspectives. Alege (1990) measured rural-urban differential in consumption in Nigeria while Knight and Song (1993) studied economic disparities and

interactions in China. Hirasuna and Stinson (2005) examined rural-urban differences in welfare policies in the state of Minnesota, USA. The methodology included constructing descriptive statistics, calculating Kaplan-Meier estimates, and performing a Cox Regression analysis. The ratio of per capita disposable income of urban households to rural households in China was recorded at 3.23:1 in 2010 (National Bureau of Statistics of China, 2011). In a study done in Korea, it is suggested that multiple issues along with the rural-urban divide can be addressed by bringing together different levels of government-local, regional, municipal, and rural (UNDP, 2000). Choubey and Choubey (1998) estimated the rural-urban disparity in literacy in India. According to Datta (2004), there is sharp increase in rural-urban disparities in India after decades of planned development. Sharma and Das (2005) examined rural-urban divide in India during 90's in poverty and deprivation and found that the living standards in rural areas lag far behind those in urban areas. Economic reforms could not benefit rural and urban economies uniformly; rather it has deepened the gulf between the two (Smith, 2003; Thakur, 2006; Patnaik, 2006; Kurian, 2007). According to Patnaik (2006), the gap between rural and urban areas which was substantial prior to the introduction of economic reforms in India has increased in post-reform period. However, the report of National Institute of Urban Affairs (2011) says that although not enough effort has been put in to build synergies between the urban and the rural parts of the economy, there is evidence that rising standards of living in India's urban areas in the post-reform period have had significant distributional effects favouring the country's rural poor. Suryanarayan (2009) has estimated intra-state economic disparities in Karnataka and Maharashtra by using some order-based measures like coefficient of income distribution, inclusive coefficient and mean elasticity of median. The issue is examined in five states of India, namely, Gujarat, Haryana, Kerala, Orissa and Punjab by Dubey (2009) with the help of three indicators, viz., consumption, income inequality and incidence of poverty.

There are various literatures regarding rural-urban disparity in different aspects of development like health, education, employment etc. According to ICRIER Report (2003), availability of health care services in rural India is much lower than that in urban India. Since more than 70 per cent of the Indian population live in rural areas, variations in the performances of rural health

systems in different states get reflected in the overall health outcomes of the country. Higher public health expenditure is clearly and unequivocally associated with better health outcomes, and thus productivity, especially in a poor country. Therefore, challenge for equal accessibility of health care services raises serious questions for the policy-makers. A study carried out by Duggal and Amin (1989) shows that although more than 70 per cent people live in rural areas, 70 per cent of government expenditure on health is spent in urban areas and remaining 30 per cent is spent in rural areas. They found that only Rs. 16 was annual per capita expenditure for rural areas against Rs. 111 annual per capita expenditure for urban areas. In addition to this, municipal bodies spend about Rs. 50 per city person per annum. Therefore the total government expenditure is Rs. 161 per city person per year against only Rs.16 per village person per year. The government expenditure per person in rural areas was only one tenth of the same person in urban areas showing urban bias in government expenditure on health in the country (Sarma, 2004). As reported in the Assam Human Development Report, 2003, with 87.1 per cent people living in rural area (as stated by the Census of 2001), there is vast rural-urban divide in accessing the health care services in the state. In 2009, the infant mortality was 55 for rural India and 64 for rural Assam as compared to 34 in urban India and 37 for urban Assam (Registrar General of India, 2011).

Education is considered as the most important instrument of beneficent social change and development in any country. Aicha Bah-Diallo, Deputy Assistant Director General of UNESCO's Education Sector, said "In many cases, legislators don't assess rightfully the importance of education for rural people in the development of their countries". This indifference towards rural people is the result of a strong urban bias on the part of politicians and policy makers (UNESCO, 2003). In developing countries like India there is critical gap in educational attainments across regions, and population segments (Copal Partners, 2007; Panwar, 2011). The largest disparity in educational attainment in India is by rural-urban location (Bajpai and Goyal, 2004). According to Census data, only 46 per cent of females in rural areas were literate as opposed to nearly 73 per cent in urban areas in 2001, a gap of around 27 percentage points. For males, the gap is lower at around 15 percentage points with 71.1 per cent of males in the rural areas and 86.4 per cent in the urban areas being literate in 2001.

Equity in education by gender, caste and socio-economic groups has been the major objectives of educational planning in India (Tilak, 2006). The under investment in education and inter and intra-sectoral pattern of allocation of resources is found to be a source of imbalances in the development of education in the country (Tilak, 2006). Moreover, there is disparity in the allocation of scarce resources between the rural and urban areas (Tilak, 2006). As noticed by Mazumdar (2007), “the most revealing aspect of the various school- related statistics presented here (in a survey) is the stark reality of inequality in public spending....For example, ...a clear difference in the provision of teachers in rural and urban areas”. It is not only the financial resources, but a strong political will that is lacking in this regard (Dreze and Sen, 1995). ‘Elementary Education in India, 2005-06-An Analytical Report’ included a unique Education Development Index (EDI) which ranks the states of India according to elementary provision (the variables asserted to compute EDI are: access, infrastructure, teachers and learning outcomes) and Assam occupied 17th position among the 21 major states. The rural-urban difference in annual average expenditure per student pursuing general education, which was Rs. 506 in rural areas and Rs. 1380 in urban areas in 1995-96 in Assam (NSSO, 1998), has increased as the annual average expenditure per student becomes Rs. 1639 in rural areas and Rs. 4657 in 2007-08 in the state (NSSO, 2010).

Economic development has been redefined in terms of reduction in poverty, inequality and unemployment (Sharma, 2004; Radhakrishna and Rao, 2006). The critics of economic reforms described the process of economic liberalisation as that of ‘jobless growth’ (Datt, 2002). It has not only slowed down of the employment generation and raised inequality that causes serious concern but also the rural-urban disparity within the country that raises questions for sustainability of the high growth of the country. Employment growth rate nearly halved between the two periods 1983-93 and 1993-99 in India and much of the employment expansion occurred in urban areas in the latter period from 1993 to 1999 - employment grew at 0.67 per cent in rural areas and 2.40 per cent in urban areas (Radhakrishna and Rao, 2006). Occupational diversification of the workforce has been taking place during the last few decades: the shifts were more from low productive primary sector to high productive services and manufacturing.

It is therefore clear that in this competitive regime and scarce job market, only highly qualified people are getting jobs. The people of the rural sector are lagging far behind in this competitive world. Policy-makers invested huge resources to create advanced institutes of education and research. However, these institutions are all located in urban areas and are likely to benefit the urban population more. The rural population is at a disadvantage due to the growing need for English language skills in many service sector jobs as well as the emergence of highly skill-intensive employment opportunities (Banik and Bhaumik, 2006).

The unemployment problem in the state continued to be a matter of serious concern. As per result of 60th Round of NSS during the year 2004 the number of unemployed per 1000 persons by broad usual activity in Assam were 18 persons in rural areas and 24 persons in urban areas against 9 persons and 19 persons in rural and urban areas respectively at national level. This clearly shows the greater dimension of unemployment in the state in comparison with the country as a whole (Government of Assam, 2006-07).

2.3 Reasons behind the Rural-Urban Divide

Assessment of rural-urban divide may not be fruitful if it is not substantiated by investigation of the reasons behind the divide. Studies have identified the following factors behind rural-urban divide:

1. Resource Availability - Geographical endowments determining comparative or absolute advantages (Braun, 2007);
2. Urban biases in government policies in taxing, pricing and investment/spending (Mujeri *et al.*, 1993; Yang, 1999; Knight and Song, 1999; Meier and Rauch, 2000; United Nations, 2001; Datta, 2004; Fan *et al.*, 2005; Hofman, 2006; Braun, 2007) which has given rise to the following factors:
 - (i) Lack of availability of Infrastructure.
 - (ii) Slow growth of agriculture in terms of both output growth and price growth.
 - (iii) Lack of nearness or proximity to markets- difference in transaction and transportation cost
 - (iv) Information asymmetry

(v) Uneven Impact of trade openness and globalisation.

3. Absence of required linkages (backward and forward) between rural and urban sectors that causes agglomeration of certain activities (Yiadom, 2004; Braun, 2007) in certain areas. This leads to rural to urban migration (World Bank, 2008; UNHABITAT, 2009).

The first reason is a nature-induced reason and the other two reasons are man-made. Investigating the reasons behind the rural-urban divide, Michael Lipton (1977), first of all strongly established that the rural-urban divide arises when governments in developing countries give preference to the urban sector in policy making. The idea, 'urban bias' sharpened in the late-1960s and 1970s. Michael Lipton is supported by others by stating that 'urban bias' is a moving force behind slow and inequitable development in Less Developed Countries (Mujeri *et al*, 1993; Tacoli, 1998; Thirlwall, 2006). It disrupts the natural economic development process as suggested by the virtuous circle model of rural-urban linkages. The failure of 'growth pole' policies was due to over generalisations of urban centre's development (Tacoli, 1998). Many researchers critically accepted the very existence of 'urban bias' in development policy (Adell, 1999). According to them urban bias can be seen in the gap between urban and rural areas in terms of labour productivity, per capita income and poverty rates. The greater the gap among the indicators, the larger is the bias. The urban bias can also be studied by looking at the investment levels and their redistributive effect both in rural and urban areas in the state (Murthy, 1980).

The other man-made reason of rural-urban divide is weak sectoral linkage. In a multi-sector economy two kinds of measures for the interdependence of the system were found developed in the literature (Heimler, 1991): backward linkages and forward linkages. Backward linkage identifies how a sector depends on others for their input supplies. Forward linkage identifies how the sector distributes its outputs to the remaining economy. The two linkages can indicate a sector's economic pull and push because the direction and level of such linkages present the potential capacity of each sector to stimulate other sectors and then reflect the role of this sector accordingly. The growth inducing potential of the sectors would, therefore, depend on the strength of these stimuli.

Supply or the forward linkage of agriculture arises from two types of dependence of the non-agricultural sector on agricultural sector. First, agriculture supplies raw materials such as cotton, jute, sugarcane, etc. and the production of food grains and horticultural crops to a number of agro-based industries including food processing industries. Another forward linkage of agriculture with the rest of the economy is through production and supply of food grains, the principal wage goods consumed by the labour force employed in the non-agricultural sector. The second important linkage is the demand or backward linkage. The farm sector not only provides a major domestic market for industrial consumer products but additionally also generates the demand for non-traditional agricultural inputs produced in the industrial sector. Non-agricultural inputs provide a backward production linkage because the agricultural sector uses fertilizer, pesticides, irrigation equipment and other mechanical equipment to harvest, plough, weed and transport agricultural commodities. The higher the level of per capita income in agriculture, the higher the percentage of total expenditures spent on non-farm goods and services (Islam, 2005). Thus it simultaneously promotes the growth of non-farm sectors along with its own development.

Ramasamy (1999) observed that there have been several theories explaining the dynamics of sectoral linkages since Lewis propounded the two-sector model in less developed countries. It is the policy failure of the government that has resulted weak sectoral linkages which is mainly responsible for unbalanced development in any country (Tacoli, 1998). According to Livingstone (1991), the weakness of the existing sectoral linkages creates division in rural and urban areas. Agriculture may not create strong demand for purchased capital inputs and supply of raw materials for the development of non-agricultural sector due to weak backward and forward production linkages with the industrial sector (Woldehanna, 2008).

To examine the sectoral linkages for any state, input-output analysis is one of the extensively used methods (Alagh *et al.*, 1980; Suryahadi *et al.*, 2006). With the help of input-output analysis, Agarwal (1996) stated that inter-sectoral relationship between agriculture and industry lacks required strength in India. Some other studies related to linkage analysis in India have been conducted by Bharadwaj (1966); Hashim (1970); Bhalla (1974); Venkatramaiah and Argade

(1979); Alagh *et al.* (1980) and Saxena and Bhatnagar (1987) etc. for different purposes (Dhawan and Saxena, 1992). According to these studies, sectoral relationships did not improved at the desired pace in the country. Prakash *et al.* (1998) have done the study for the appropriate development strategies for the North Eastern Region and highlighted the lop-sided nature of the industrial structure of the regional economy. Goswami (1994) found strong linkages of agriculture sector with other sectors in Meghalaya. A study carried out by the Department of Economics, Gauhati University on behalf of the Planning and Development Department, Government of Assam, based on the Input-Output Table, 1982-83 for Assam found weak linkages among the primary, secondary and tertiary sector of the economy.

2.4 Effective Linkage Study (Impact Analysis) to minimise the Divide.

To narrow down the rural-urban gap and to capture backward and forward linkages, diversification of agriculture and identification of regional potential are required. Investment is needed in basic sectors to capture backward and forward linkages (Douglass, 1998). Agro-processing industries are considered to help narrowing down the rural-urban divide due to their sufficient linkages between sectors (FAO, 1997; Eapen, 2001; Kumar *et al.*, 2006; TIFAC, 2009). These industries have a potentially important role in the economic development of developing countries-directly as a source of income and employment and indirectly for their backward linkages with agriculture. The latter is especially critical for the commercialisation of agriculture in developing countries, which is widely recognised as important for adoption of modern farming technologies, improving agricultural productivity and incomes. Agro-based industries have strong links with other sectors of the economy, both as provider of inputs and as a dependent sector of other industries within and outside the country (FAO, 1997).

A major advantage of rural small-scale industry is its use of locally available raw materials. The local response in the setting up of processing units is generally high (Eapen, 2001). Agro-food processing industries have the potential to generate directly significant employment in production activities and also indirect employment through its forward and backward linkages. This employment will be in rural areas where these industries have to be located near the source of

raw materials, especially perishable agricultural products. These industries would help in reducing post-harvest losses and wastes as well as in using byproducts more efficiently. “Food Processing industry is a ‘sunrise’ industry and it has the potential to dramatically improve rural livelihood opportunities and employment, to bridge the rural-urban divide and to improve farming methods and practices” (The Economic Times, 26th March, 2010).

With a large number of people living in rural areas, it makes a strong case for agricultural-development-led industrialisation (Adelman, 1984). Recent research suggests that there is a more fundamental symbiotic relationship between agriculture and other sectors, to such an extent that when agriculture does well, so does the rest of the economy, and vice-versa (Timmer, 1988; Haggblade, Hazel, and Brown 1989; Vogel, 1994; Suryahadi *et al.*, 2006).

According to Suryahadi *et al.* (2006), several types of sectoral linkages may arise from agriculture sector. The most well-known linkages are production and distribution linkages. A production linkage occurs when a sector produces output which is then used as an intermediate input by another sector. There are two types of production linkages: backward and forward linkages. Meanwhile, distribution linkages act as an intermediary between two sectors. A farm may supply its output directly to a food-processing industry, but it may also sell its output to a trader who then re-sells it to the food-processing industry. In this case, the trader plays the role of a distribution linkage. In general, a distribution linkage provides two types of services. First, it provides location value added by transporting a good from one place to meet its demand in another place. Second, it provides time value added by storing good to meet its demand in the future.

Another type of linkage is consumption linkage. This linkage refers to the consumption demand from households for the output of a sector. The extent to which an increase in income in a particular sector induces an increase in income of the whole economy is referred to as the sectoral growth multiplier. Hence, the agricultural growth multiplier quantifies the impact of a certain increase in income in the agricultural sector on the growth of income in other sectors. Earlier, it was thought that this multiplier was small because agriculture was considered a low-linkage sector. This conclusion was later proved wrong because it only looked at

production linkages. Once consumption linkages were taken into account, the multiplier turned out to be quite large (Haggblade *et al.*, 1989).

Apart from production and consumption linkages, there are other linkages such as investment linkage. For example, part of increased income in the agricultural sector may be saved. These savings may constitute an important source of funds for investments in non-agricultural sector. Another possible cross-sectoral linkage in a rural economy is a transfer linkage. This type of linkage occurs whenever a household transfers part of its income to another household for purposes other than production, consumption, or investment (Suryahadi *et al.*, 2006).

Ramadhyan (1984) mentioned that the establishment of a large number of major industrial projects in less developed region has not had any significant impact on the industrial or overall economic growth of these regions and has thus failed in achieving the regional redistributive objective of Central Planning. Among the reasons for this failure has been the lack of integration of these projects with the economies of the regions. As a result of this there has been a substantial leakage of growth impulses or linkage effects out of the region. Although these aspects have received substantial consideration in regional studies in India, the focus has been restricted to the determination of linkages of aggregated industry groups or sectors. The linkage effects of individual firms or plants have received insufficient attention. Taylor and Adelman (2006) mentioned that understanding of the likely impacts of policy, market changes on rural incomes requires understanding of micro responses in household-farms, the complex linkages among household-farms within villages, and the linkages between villages and the outside world (Taylor and Adelman, 2006). Therefore, sufficient attention is required on the impact analysis of any sector on others.

For impact analysis and estimation of sectoral growth multiplier, the studies can be broadly grouped into three types: (i) studies which use micro-econometric approach, (ii) studies which employ macro-econometric approach, and (iii) studies which utilise an input-output table, social accounting matrix, or computable general equilibrium modeling. Each of these approaches has its advantages and disadvantages (Suryahadi *et al.*, 2006). Psaltopoulos *et al.* (2006) measured the

impact of rural areas on urban areas and vice-versa in Greece with the help of social accounting matrix.

Social Accounting Matrix (SAM) is found as the appropriate tool to measure the existing linkages and for impact analysis (Lewis and Thorbecke, 1992; Parikh and Thorbecke, 1996; Sivakumar *et al.*, 1999; Roberts, 2000; Xiaoping *et al.*, 2005; Suryahadi *et al.*, 2006; Agaje, 2008; Subramanian, 2007; Subramanian and Qaim, 2008). SAM measures social effects of production processes along with the economic effect. It includes not only inter-industry transactions but also payments to factors of production, expenditures of households, transfers to and expenditures by government, and transactions with the rest of the world (Subramanian, 2007). The SAM provides a useful framework for analysing the linkages among the different sectors of any economy. Because, all the inter-linkages between the sectors are taken into account, it measures not only the direct effects, but also the indirect and induced effects.

SAM has two principal objectives: First, organisation of information about the economic and social structure of an economy in a particular year; Second, providing a statistical basis to model the economy capable of generating results for policy evaluation (Boisvert, 2002)

2.5 Conclusion

The review of theoretical and empirical literature shows that strong sectoral and spatial linkages are necessary for the balanced development of any economy. However, in reality rural-urban divide is prominent in all development aspects particularly in developing countries. The literature has also shown that urban biased policies of the government (which has again generated the difference in infrastructure in rural and urban areas, slow growth of agriculture etc.) and weak sectoral linkages may be the main reasons behind the rural-urban divide. Diversifying agriculture, capturing backward and forward linkages and identifying regional potential may strengthen the spatial and sectoral linkages and may narrow down the rural-urban gap. Investment may be needed in basic/leading sectors to create sufficient backward and forward linkage effects. Investment in agro-processing industries may help in reducing the rural-urban gap due to its strong linkages across sectors.

Although many spatial and sectoral linkage studies have been found on different perspectives addressing the problem of rural-urban divide at international level, only few linkage studies are found which address the problem of rural-urban divide in India. The problem of rural-urban divide is studied without establishing the linkages between the sectors in most of the studies. It has also been found that rural-urban linkage and rural-urban divide are studied separately in Assam from different viewpoints without giving proper emphasis on the strategy of rural-urban linkage to narrow down the rural-urban divide.

Therefore, a systematic study of the problem of rural-urban divide and the sectoral linkage in the state is required to minimise the divide. It is imperative to look into the current status of the economy of the state from the perspective of the rural-urban disparity and the next chapter will highlight in this regard.

Chapter 3

Present Status of Assam Economy

The available literature on the issue of rural-urban divide and linkage has been discussed in the previous chapter which pointed out the need of a systematic study in these spheres. But before going into empirical aspects, it becomes pertinent to review the present position of Assam economy. In this chapter, it is tried to look into the different aspects of rural and urban areas of the state economy.

3.1 Geographical Location

Assam, a prominent state of North Eastern Region (NER) of India, is located within the longitude 90° E to 96° E and the latitude 24° N to 28° N. The state is connected with the mainland of the country only through a 22 k.m narrow corridor. The geographical area of the state is 78, 438 sq. k.m which constitutes 2.39 per cent of the country's total land area of the country and it provides shelters to about 2.58 per cent (according to 2011 Census) of country's population.

3.2 Demographic Pattern

The state has 266.38 lakhs population with 232.49 lakhs (87.28 per cent) rural people and 33.89 lakhs (12.72 per cent) urban people whereas the rural and urban people in the country are 72.22 per cent and 27.78 per cent respectively as per 2001 census. The growth of rural and urban population during 1901-2001 in the state is presented in Table 3.1.

Table 3.1**Growth of Rural and Urban Population in the State (1901-2001)**

Census Years	Rural population as a % of total Population	Decadal growth rate (%)	Urban population as a % of total Population	Decadal growth rate (%)
1901	97.66	-	2.34	-
1911	97.59	16.91	2.41	20.55
1921	97.26	20.08	2.74	36.8
1931	97.08	19.7	2.92	27.58
1941	96.89	20.16	3.11	28.3
1951	95.71	18.46	4.29	65.73
1961	92.79	30.87	7.21	126.57
1971	91.18	32.62	8.82	65.01
1981	N.A	N.A	N.A	N.A
1991	88.9	49.42*	11.1	92.97*
2001	87.28	16.67	12.72	36.24

Source: Government of India (2001), Census of India, 2001, Provisional Population Totals, Rural-Urban Distribution, Assam, compiled by Pradip Hazarika.

Note: N.A means not available as there was no census in 1981 in Assam.

* relates to growth rate for 1971-1991

It appears from the table that there is a slow trend of urbanisation in the state. The highest growth of urban population (126.57 per cent) has been observed during 1951-61 while the lowest was noticed during 1901-11. The proportion of urban population in the state has increased from 11.10 per cent in 1991 to 12.72 per cent in 2001. The decadal growth of population during 1991-2001 is 18.85 per cent out of which growth of population in rural areas is 16.67 per cent and that of urban areas is 36.24 per cent.

According to 1991 census, rural population density is 257 per sq. k.m and urban density is 3003 per sq. k.m as against 214 per sq. k.m and 3370 per sq. k.m for the national average respectively. Number of towns has increased from 93 in 1991 to 125 in 2001 while the number of villages has increased from 25,590 in 1991 to 26,247 in the state. Sex-ratio is 932 for the state where 940 is rural sex-ratio and 878 is the urban sex-ratio. The literacy rate for the state is 63 per cent in which the rural literacy rate is 60 per cent and urban literacy rate is 85 per cent as per the census report of 2001.

3.3 Occupational Pattern of Population

As per 2001 census, there are 95.39 lakhs total workers in the state where 71.14 lakhs are main workers and 24.24 lakhs are marginal workers. The workforce participation rate and sectoral distribution of workers in rural and urban areas in the state compared with the country average is presented in Table 3.2.

Table 3.2
Workforce Participation Rates (per cent)

	1993-94						1999-00						2004-05					
	Rural			Urban			Rural			Urban			Rural			Urban		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Assam	51.6	15.9	35.3	52.8	9.2	32.1	52.9	15.1	34.9	52.2	11.2	33.2	55	20.9	39.1	55.1	10.9	33.6
India	55.3	32.8	44.4	52.1	15.5	34.7	53.1	29.9	41.7	51.8	13.9	33.7	55	32.7	43.9	54.9	16.6	36.5

Source: NSSO (1997), NSSO (2001), NSSO (2006b)

Note: M=Male, F=Female, T=Total

From the table it is clear that the workforce participation rates are higher in rural areas, particularly for female, than that of urban areas in the state which is in line with the country as a whole. This may be due to the reason that primary sector is the main sector in the economy of the country.

The sectoral distribution of workers in rural and urban Assam is presented in Table 3.3 which also supports the above statement. The table states the dominance of primary sector in rural areas in terms of absorption of labour whereas the secondary and the tertiary sectors are prominent in urban areas in distribution of workers in the state as well as in the country.

Table 3.3
Sectoral Distribution of Workers, 2001 (in per cent)

	Rural			Urban		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Assam	67.7	6.2	26.2	6	13.5	80.5
India	76.3	11.4	12.4	8.8	32	59.2

Source: Census of India, 2001

With the growing population in the state, there arises alarming problem of unemployment with 20.06 lakhs registered job-seekers in the state (Government of Assam, 2009).

3.4 State Income

As stated earlier, the Net State Domestic Product (NSDP) and per capita NSDP of the state is one of the lowest in the country. The per capita NSDP at constant (1999-00) price is Rs.16, 597 in Assam whereas the per capita NNP for the country is Rs.24, 295 in 2007-08 (Government of Assam, 2008-09).

The sector-wise percentage share to the total NSDP of the state during 2008-09 is presented in Table 3.4.

Table 3.4
The Sector-wise Percentage Share to the total NSDP of the State during 2008-09

	Sectors	At constant (1999-00) prices
1.	Primary sector (Total)	29.51
i.	Agriculture	24.48
ii.	Forestry and Logging	0.93
iii.	Fishing	1.16
iv.	Mining and Quarring	2.94
2.	Secondary Sector (Total)	14.70
i.	Manufacturing	8.72
ii.	Construction	5.12
iii.	Electricity, Gas and Water Supply	0.86
3.	Tertiary Sector (Total)	55.79
i.	Transport, Storage and Communication	8.25
ii.	Trade, Hotels and Restaurants	18.08
iii.	Banking and Insurance	4.66
iv.	Real Estate, Ownership of dwelling and business services	2.53
v.	Public Administration	6.27
vi.	Other services	15.99

Source: Government of India (2010)

The table shows that the sectoral contribution of primary sector in the state stands for 29.51 per cent whereas the sectoral contributions of the secondary and tertiary sectors are 14.70 per cent and 55.79 per cent respectively for the state.

The Growth of NSDP of Assam with that of all India NNP at constant 1999-00 prices is compared and presented in Table 3.5.

Table 3.5
Comparison of the Growth of NSDP of Assam (in lakh) with all India NNP (in crores) at Constant 1999-00 Prices

	Pre-reform period			Post-reform period					
	1980-81	1990-91	CAGR (%) from 1980-81 to 1990-91	1991-92	2001-02	2007-08	CAGR (%) from 1991-92 to 2001-02	CAGR (%) from 1991-92 to 2007-08	CAGR (%) from 1980-81 to 2007-08
Assam									
Primary sector	930051	1288020	3.31	1318856	1317076	1342263	-0.01	0.11	1.37
Sectoral Contribution (%)	55.69	53.08	-0.48	51.97	39.12	29.52	-2.8	-3.47	-2.32
Secondary sector	205536	302857	3.95	303235	421095	678767	3.34	5.17	4.52
Sectoral Contribution (%)	12.31	12.48	0.14	11.95	12.51	14.93	0.46	1.4	0.72
Tertiary sector	534569	835717	4.57	915556	1628618	2525212	5.93	6.55	5.92
Sectoral Contribution (%)	32.01	34.44	0.74	36.08	48.37	55.54	2.98	2.73	2.06
Total NSDP (in Lakh)	1670156	2426594	3.81	2537647	3366789	4546286	2.87	3.71	3.78
Per capita NSDP(Rs.)	9334	10915	1.58	11193	12529	15526	1.13	2.07	1.9
India									
Primary sector	243752	347695	3.62	341222	483253	572815	3.54	3.29	3.22
Sectoral Contribution (%)	41.77	35.35	-1.66	34.36	27.39	20.61	-2.24	-3.15	-2.58
Secondary sector	123251	213095	5.63	209907	359566	606553	5.53	6.86	6.08
Sectoral Contribution (%)	21.12	21.66	0.25	21.14	20.38	21.82	-0.36	0.2	0.12
Tertiary sector	216547	422861	6.92	441803	921318	1600280	7.63	8.38	7.69
Sectoral Contribution (%)	37.11	42.99	1.48	44.49	52.22	57.57	1.62	1.62	1.64
Total NDP(in crores)	583550	983651	5.36	992988	1764185	2779690	5.92	6.65	5.95
Per capita NDP(Rs.)	8594.26	11724.1	3.15	11599.7	16962.9	24425.7	3.87	4.76	3.94
Total NNP (in Crores)	583548	967773	5.19	976319	1743998	2764795	5.97	6.72	5.93
Per capita NNP(Rs.)	8594	11535	2.99	11405	16769	24295	3.93	4.84	3.92

Source: Calculated CAGR from www.mospi.nic.in accessed on 18-04-10 and Government of Assam (2008).

The table shows that the Compound Annual Growth Rate (CAGR) of NSDP of Assam in the pre-reform period from 1980-81 to 1990-91 at constant 1999-00 prices was 3.81 per cent whereas the CAGR of NNP for the country was 5.19 per cent with a difference of 1.38 percentage points. Similarly, the CAGR of per capita NSDP of the state was 1.58 per cent against the country average of 2.99 per cent with a difference of 1.41 percentage points during the same period. In the

post-reform period from 1991-92 to 2001-02 the CAGR of NSDP of Assam is 2.87 per cent whereas the CAGR of NNP for the country is 5.97 per cent with a difference of 3.1 percentage points. Similarly, the CAGR of per capita NSDP of the state is 1.13 per cent against the country average of 3.93 per cent with a difference of 2.8 percentage points during the same period. This indicates that the gap between the state economy and the national economy has further widened in the post-reform period. If an economy grows at 2% compound annual rate, the economy doubles in size in 35 years (Ray, 2007). Therefore, such a difference in the growth rates of the state's economy from the national economy will have a long term effect on the economy of the state in future.

When the CAGR of NSDP of Assam is calculated over a long period of 27 years from 1980-81 to 2007-08, it is found that the state figure is 3.78 per cent against the national figure of 5.93 per cent for the same period with a difference of 2.15 percentage points. Similarly CAGR of per capita NSDP of the state in the same period calculated is 1.90 per cent whereas the national figure is 3.92 per cent with a difference of 2.02 percentage points.

The contribution of the primary sector in state's economy has shown a continuous decline against a rising trend of the contribution of the secondary sector and tertiary sector in the economy over the period which is in line with the national trend.

3.5 Agriculture

The economy of Assam continues to be predominantly agrarian. According to 2001 census, the dependence of labour force on agriculture and allied activities was nearly 53 per cent (Government of Assam, 2006-07). Although the soil, topography, and climate in Assam is suitable for cultivation, the mechanisation of agriculture is still very low. About 70 per cent people are engaged in the primary sector, however, its contribution to the NSDP is only one third (29.51 per cent at 1999-00 constant prices) implying very low productivity of the sector (Government of India, 2010). The contribution of primary sector (includes Agriculture, Forestry & logging, Fishing, Agriculture and Allied and Mining & Quarrying) to the total NSDP of the state is found to be decreasing over the years. The contribution was 55.69 per cent in 1980-81 which has fallen to 53.08 per cent

in 1990-91, 39.12 per cent in 2001-02, and 29.51 per cent in 2008-09 (refer Table 3.5).

3.6 Industry

Assam was a pioneer state in industrial development of the country in the pre-independence period with the first oil refinery, the first tea plantation industries and first coal fields. But after independence till now it has less than 2 per cent only of the country's total medium and large scale industries. Except setting up of four oil refineries in the public sector and a paper mill no other major industries have been established in the public sector in the state (Government of Assam, 2008-09). Recently, some small private industries are coming up in the state.

The existing industrial sector in the state has been concentrated on some particular sectors, like tea, petroleum, coal, jute and forests only.

Industries in Assam can be broadly classified into four heads:

- (a) Agro-based industry,
- (b) Mineral-based industry,
- (c) Forest-based industry, and
- (d) Other industries.

Agro-based industries of Assam include - Tea industry, Sugar industry, Grain mill products industry-(Rice, Oil and Flour Mill), Food processing industry and Textile industry.

Mineral-based industries of Assam include - Railway workshop, Engineering industry, Re-rolling mill, Steel Works, Motor Vehicle Workshop, Galvanized wire units, cycle factory, Aluminum utensils industry, Cycle spare parts, Steel Trunk, Tube well pipe, Steel wire net, Barbed wire, cement industry etc. Moreover, the non-metal based industries include oil industry, Natural Gas-based industry etc.

Forest-based industries of Assam include - Plywood industry, sawing mill, Paper and Paper-pulp industry, Match industry, Leather industry, Hard board industry etc.

Other industries of Assam include-Power industry, Fertiliser industry, Printing Press, Brick and Tiles industry, Chemical industry etc. (Vedanti, 2011).

At present, there are 16 industrial Estates, 17 Industrial Areas, 11 Growth Centres under the industries and commerce department of Assam spread over an area of 2857 thousand Sq. m. land in different parts of the state. Besides these infrastructures, there are 11 integrated infrastructure development (IID) projects, 4 industrial growth centres, 6 mini industrial estates, 1 export promotion industrial park, one food processing industrial park spread over an area of 7173 thousand sq. m. land to provide infrastructural facilities to the entrepreneurs of the state. (Government of Assam, 2010-11)

The tea industry, which is around 170 years old, is playing a vital role in the state as well as in the national economy. The number of tea gardens in the state was 49,102 covering land of 301,000 hectares in 2005 as per the report of Tea Board of India. The total area under tea cultivation is accounting for more than half of the country's total area under tea. The total production of tea of the state was 4874.87 lakh kg. against 9459.74 lakh kg. of total tea produced in the country in 2005. The estimated tea produced in Assam in 2007-08 is 5118.85 lakh kg., which is more than 50 per cent of the total production of the country (Government of Assam, 2011). There are about 65,000 small tea-growers in the state and they are increasing in numbers (Government of Assam, 2010-11).

Assam has ample scope for bamboo based industry like paper manufacturing industry. This region has the highest concentration of bamboo of the country and in view of such potentialities, the Ministry of Agriculture, Government of India, has recently launched the National Bamboo Mission and under which it is proposed to take up plantation of selected species of bamboo in the state in an area of 176000 hectares, as a raw material for bamboo based industries.

Assam has the monopoly of production of 'Muga'-the golden thread, in the world and 99 per cent of the Muga Silk is produced in the state. Sericulture, a major cottage industry of the state, is practiced in 9537 villages and provides employment to 2.4 lakh of families.

The total SSI units in the state is 31,315 numbers, which provide employment to 1, 54, 484 persons till the year 2008-09. The number of registered factory in the state was 3,733 in 2008-09 which provide employment to 1, 29, 435 persons.

The number of new units established by type of industries is presented in Table 3.6. The table shows the negative growth of the industrial units in the state. Agro-based, textile-based, forest-based, and engineering-based industries show negative CAGR during 2004-2008 in the state.

Table 3.6
Number of New Units Established by Type of Industries

Sl. No.	Items	2004	2008	Compound Annual Growth Rate (CAGR) (%)
1	Agro Based	324	258	-5.54
2	Forest Based	144	96	-9.64
3	Textile Based	626	353	-13.34
4	Chemical Based	44	49	2.73
5	Engineering Based	536	442	-4.71
6	Electronic Based	59	60	0.42
7	Mineral Based	111	125	3.01
8	Leather	14	15	1.74
9	Rubber/Plastic	16	25	11.80
10	Miscellaneous	184	212	3.60
11	Total	2061	1633	-5.65

Source: Government of Assam (2011); Note: CAGR is calculated from the given data.

The contribution of the industrial sector to the total NSDP of the state is 8.7 per cent in 2008-09 which is not encouraging. The CAGR of the contribution of the secondary sector as a whole (it includes construction and electricity, gas and water supply along with manufacturing) shows 0.14 per cent growth rate in the pre-reform period during 1980-81 to 1990-91. The figure has increased marginally to 0.46 per cent during the post-reform period from 1991-92 to 2001-02 and to 0.72 per cent during 1980-81 to 2007-08 (refer Table 3.5). The growth of manufacturing sector in the NSDP has recorded at 2.56 per cent at constant 1999-00 prices in 2008-09 (Government of Assam, 2011). The growth observed in the

manufacturing sector is the result of the benefits achieved in the production of wheat flour, jute textile, cement etc. On the other hand, production of tea, petroleum, crude oil, fertilizer etc. has exhibited downturn during the year as compared to the production of the previous year. The general index of industrial production of the state recorded a moderate increase to 151 in 2008-09 from 144 in 2007-08 (Government of Assam, 2011).

Lack of private investment, high cost of production, vulnerability of the region, inadequate economic and basic infrastructural facilities, dearth of technical personnel, lack of entrepreneurial motivation on the part of local people and low level of central sector investment etc. are responsible for poor industrial development of the State.

The New Industrial Policy of Assam, 2008 focuses on the State's inherent areas of strength such as bamboo, food processing, plywood, agar, horticulture, agriculture, rubber, minerals, tourism, etc. The Government of India has approved for setting up a Food Processing Industrial Park at Chaygaon in Kamrup District. There are already several fiscal incentives available for industries in North East India under Industrial and Investment promotion Policy, 2007. According to the new Industrial Policy, all micro/small/medium and large manufacturing units will be entitled to exemption of 99 per cent of the tax payable under the Assam Value Added Tax, 2003 and Central Sales Tax Act, 1956 subject to maximum of 200/150/100 per cent of the fixed capital investment for 7 years. The new policy allows interest subsidy to Micro industrial units @ 30% of the amount of interest paid on term loan to Bank/Financial Institutions for a period of 5 years from the date of commercial production subject to a ceiling of Rs. 1 lakhs per unit/year. The new Industrial Policy also permits subsidy up to 25 per cent of the total cost on the drawing up of power line including the subsidies on the transformer to micro and small industrial units subject to a ceiling of Rs. 10 lakhs per unit. The policy also provides 100 per cent re-imbursement of stamp duty and registration fees to encourage setting up of industrial park/ estate through purchase of private/ government land. Government of India is also promoting the food processing sector in the region to utilise its vast potential of raw horticultural produce through its various financial assistance schemes primarily through Ministry of Food

Processing Industries and agencies like Ministry of Micro, Small and Medium Enterprises (MSME), National Horticulture Board (NHB), Agricultural and Processed Food Products Export Development Authority (APEDA), National Bank for Agriculture and Rural Development (NABARD), National Horticulture Mission (NHM) etc. along with the Government of Assam.

Agro- processing industry has a potential to develop in the state. The area under horticulture crops in Assam is estimated at 5.29 lakh hectares which annually produced about 13.72 lakh tones of fruits and about 38.87 lakh tones of vegetables in 2007-08 (Government of Assam, 2009). The state occupies a significant position among the states of India regarding area, production and productivity of horticulture crops (e.g 1st position in the area of pine apple and litchi; 2nd position in the production of pine apple, litchi, orange and areca nut; 3rd position in cabbage; and 1st position in the productivity of lady's finger; 2nd in productivity of orange and tomato) (CMIE, 2006). However, only 30 per cent of the net cropped area in Assam is being used for cultivating crops such as sweet potato, banana, papaya, chilies, turmeric cabbage, cauliflower, brinjal, lemon, orange and pineapple etc. (Government of Assam, 2010-11). According to Assam Development Report, 2002, there is tremendous scope for pushing the acreage under these crops in the state. All these crops are high value crops widely considered to have enormous potential for commercialisation. According to the report, Assam has only 34 regulated markets of all types, whereas Punjab has 667 such regulated markets and even Haryana has 273 in 1994. In this era of liberalisation, marketing will not be a problem if proper qualities are maintained. Besides marketing facilities, Assam is also severely lacking in storage facilities for agricultural products. According to Assam Development, 2002, if due attentions are paid in all these infrastructure related problems then food processing industry can bring positive changes in the economy of the state.

According to Assam Development Report, 2002, development of industries based on locally available resources should naturally get priority. These resources are available mainly in rural areas and the industries located nearby raw-material supplying rural areas may be benefitted through this type of positive rural-urban linkages. Studies show that urban areas often obtain goods not so much from the surrounding rural areas, but either directly from more distant rural areas or through

other urban centres. The reason why urban areas do not to rely on the surrounding rural areas may be the cost of the product, its quality or the availability. The agriculture producers of the state need to ensure the competitiveness of their products in terms of quality, price and availability and to expand their marketing efforts to make the consumers aware of the local products (Sheng, 2006).

3.7 Infrastructure Facilities

One of the main reasons of the underdevelopment of the state is lack of proper infrastructure facilities which are discussed below:

3.7.1 Transport and Communication

3.7.1.1 Roadways

The total road length (P.W.D) in the state is 34,801 k.m including 9, 457 k.m of surfaced (excluding national highways) and 25,344 k.m of un-surfaced roads in 2006-07. The length of roads under PWD become 36,003 k.m in 2008-09 out of which 27, 283 k.m is urban road; 1173 k.m is rural road; 3134 k.m is state highway; 4413 k.m is major district road. The length of national highway is 2755 k.m in the same period (Government of Assam, 2009). However, number of villages connected with pucca roads is 59.79 per cent in the state against all India average of 61.64 per cent (PHDCCI, 2007). Similarly the number of unconnected rural habitations is 15,786 in Assam (Mohapatra and Chadrasekhar, 2007) whereas the figure is only 473 in Kerala (Government of India, 2008).

3.7.1.2 Railways

During 2006-07 Assam's share in the country's railway route length turns out to be 3.61 per cent. The total railway route length in the state is only 2283.71 k.m in 2008-09 comprising 1226.59 k.m under broad gauge and 1057.12 k.m under meter gauge. Railways are not electrified in the state (Government of Assam, 2009). There is no double track railway line in the state.

3.7.1.3 Airways

Assam is connected with the rest of the country through six numbers of airports. Lokpriya Gopinath Bordoloi International Airport, Borjhar, near Guwahati is the only international airport of the region.

3.7.1.4 Waterways

The Brahmaputra (declared as National Waterway No.2) and Barak are the two navigable rivers in the state. Presently, two public sector organisations, the State Directorate of Inland Water Transport (SDIWT) and Central Inland Water Transport Corporation (CIWTC) are operating services between Guwahati and Kolkata exclusively for movement of goods. The total volume of cargo and passengers handled by ferries by Inland Water Transport vessels at different points on the banks of rivers Brahmaputra and Barak are 8,65,148 M.T of cargo and 265,53,151 numbers of passengers (Government of Assam, 2009).

3.7.1.5 Postal and Telecommunication Services

The number of post-offices and letter boxes in the state in 2008-09 is 4006 and 18,485 respectively. The number of telephone exchanges and number of rural telephone connection as on 31-03-09 are 605 and 4, 46, 504 respectively. The number of wireless phones is 58, 10, 958 in the same year (Government of Assam, 2009). Out of 61.62 lakh total telephones in the state 23.07 lakhs are rural telephones and 37.75 lakhs are urban telephones. According to a Survey conducted by NCAER (2007) the percentage of rural households with telephone connection is only 5.15 per cent in Assam whereas the figure is 22.16 per cent for Kerala. No. of public telephone per village is only 0.40 in Assam against 8.50 in Kerala. The following table shows that rural tele-density in the state is much lower than the country average whereas the urban tele-density is higher in the state compared to the national average. However, the mobile connections are increasing in both rural and urban areas in the state. In comparison with Kerala, Assam is lagging behind in providing these facilities to rural areas (refer Table 3.7 and 3.8).

Table 3.7
Tele-Density in Rural and Urban Assam

	Rural Tele-Density (%) Value			Fixed Urban Tele-Density (%) Value	
	2004	2005-06*	2009	2004	2009
Assam	0.56	0.67	9.36	11.37	86.98
Kerala	-	9.76	-	-	-
All India Average	1.58	1.74		10.95	-

Source: Jain , Rekha and G. Raghuram (2007), “Part II: Accelerating Rural Telecom Penetration: A State level analysis”, India Infrastructure Report, 3iNetwork, Oxford University Press; Government of Assam (2009).

* NIRD (2007-08).

Table 3.8
Status of Rural Telephone Services to Wireless in Local Loop (WLL) and Mobile Technology in Assam, as on 29-02-2008

	Global System for Mobile Communication Centres (GSM)	WLL	Total Rural (Public+Private)
Assam	752530	96024	8,48,554
Kerala	2994546	908905	39,03,451

Source: www.indiastat.com

3.7.2 Power

The power supply position in the state is not satisfactory. The installed capacity of generating plant of the Assam State Electricity Board is 401.5 M.W and the generation of power in the state is 1682.82 MU in 2008-09. During the same period the estimated requirement of power for the state is 6433.000 MU while the availability is 4270.764 MU thereby resulting in shortage by 30 per cent. In order to meet the shortage of power supply, the state has continued to purchase power from the other sources (Government of Assam, 2009). The rural power gaps in supply i.e. number of unconnected household is 77 per cent in Assam whereas the figure is 33 per cent for Kerala and 52 per cent for India as a whole (NCAER, 2007). The rural-urban disparity in providing power facilities in the state is presented in Table 3.9. The table shows that the rural-urban gap in electricity connection is relatively more in the state than the country average in all the years under consideration.

Table 3.9
Percentage of Households with Electricity Connections

	1981		1991		2001		2005-06*	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Assam	-	-	12.4	63.2	16.5	74.3	27.3	80.6
India	14.7	62.5	30.5	75.8	43.5	87.6	55.7	93.1

Source: Housing and Amenities, Paper 2 of 1993; Census of India, 1991, 2001, Table No.7.33A.

Note: All India figures exclude Assam in 1981 and Jammu & Kashmir in 1991.

* National Family Health Survey (NFHS) III, 2005-06 Fact Sheet from www.nfhsindia.org/pdf accessed on 07-04-08.

3.7.3 Banking Services

The total number of reporting scheduled commercial bank offices (including Regional Rural Banks) in the state in March, 2009 was 1771. The volume of deposits and credits of these banks stood at Rs. 42467 crores and Rs. 16583 crores respectively in the same period. The credit-deposit ratio in the state in March, 2010 is 37.00 per cent compared to all India average of 72.70 per cent (Reserve Bank of India, 2010). The following Table 3.10 shows that credit and deposit transactions of the scheduled commercial banks are less in rural areas than in urban areas in the state.

Table 3.10
Number of Offices and Distribution of Deposits and Credits of Scheduled Commercial Banks (in lakhs of Rs.) in Rural and Urban Areas in Assam

	No. of Offices		Deposits		Credits	
	Rural	Urban	Rural	Urban	Rural	Urban
1981 (December)	301	247	7,698	33,995	3,399	14,010
1991 (March)	880	356	52,040	1,67,935	33,851	75,432
2001 (March)	818	450	2,31,959	7,53,806	73,071	2,42,916
2009 (March)	775	593	5,25,618	25,79,455	3,16,929	9,98,105

Sources:

1. RBI (1980-81), *Banking Statistics-Basic Statistical Returns*, Vol. II, December.
2. RBI (1991), *Banking Statistics- Basic Statistical Returns*, Vol. 20, March
3. RBI (2001), *Basic Statistical Returns of Scheduled Commercial Banks in India*, Vol. 30, March

Note: Here, urban includes both urban and semi-urban.

3.8 Conclusion

The above analysis indicates that the economy of the state is not growing at par with the national economy and there persists rural-urban disparity in all facets of development in the state. Rural areas are lagging behind its urban counterpart in all aspects of development. Therefore, in order to understand the problem at hand, a detailed analysis of the economy of Assam taking into account both rural and urban areas may help to enhance the existing knowledge as well as provide a better outlook regarding sectoral linkage on the basis of factor endowments of the state economy.



Chapter 4

Assessment of Rural-Urban Divide in Assam

It has been found from the discussion in the third chapter that rural-urban divide is prominent in all the aspects of development in the state. However, there is a necessity to study the problem a little bit deeper by taking a few sectors into account. As social sectors like health and education assumes significance for overall development of the state, these two sectors are taken up for assessment of the problem of rural-urban divide in the state. Besides employment scenario in the state is also considered due to its significance in creating a better linkage across sectors. The selection of these three aspects of development is also guided by the availability of rural-urban break-up data and limited scope of the study. Thus, this chapter attempts to examine rural-urban divide in Assam in the following aspects of development: in accessing the health care services, in accessing the education facilities and in generation of employment in the state.

4.1 Rural-Urban Disparity Index

For assessment of the nature and magnitude of rural-urban divide in the state, an index, called Rural-Urban Disparity Index (RUDI) has been constructed. A straightforward analysis for assessing the effectiveness of policies of providing health care and education facilities in rural and urban areas could have been a cost-benefit analysis. However, for carrying out the cost-benefit analysis, complete information on cost and benefits should be available. In the case of health and education, however, the benefits may spread over a long period of time and it may not be possible to estimate them properly. As such, instead of a straightforward method such as the cost-benefit analysis, an alternative methodology has been used to study the differences between rural and urban areas in terms of health care and education.

The procedure followed for construction of the Rural-Urban Disparity Index (RUDI) is taken from the Proposal for Rural Development Report, 2006,

prepared by Afghanistan Institute for Rural Development (AIRD, 2006). The formula for construction of RUDI is as given below:

$$RUDI = \left(1 - \frac{I_R}{I_U} \right) \times 100 \quad \text{----- (i)}$$

Here, I_R is the composite index of the output/input indicators for rural areas;

I_U is the composite index of the output/input indicators for urban areas.

Equal weights have been given for each of the indicators for calculating the composite index for rural and urban areas.

RUDI is calculated for both output indicators and input indicators separately in the three aspects of development. Indices for the indicators are calculated with the help of the following formula:

$$I = \frac{(\text{Actual Value} - \text{Minimum Value})}{(\text{Maximum Value} - \text{Minimum Value})} \quad \text{----- (ii)}$$

where actual values stand for the observed values for the individual indicators while the maximum values for different output/input indicators represent the values of the best performing states of India with reference to those indicators. Similarly, the minimum values stand for the value of the worst performing state of India in the respective indicators. The maximum and minimum values of equation (ii) for the indicators are furnished in the Appendix Tables. For those indicators, the higher values of which are considered unfavourable to the society, the inverse of the indices are taken for calculating the composite index, following the method used in India's Social Development Report, 2006 (Council for Social Development, 2006).

Before construction of RUDI as shown in (i), rural-urban divide in all the selected indicators is examined by measuring the rural-urban gap in values of the indicators in absolute differences over the years in the respective indicators in the state vis-à-vis India. This provides preliminary idea about the rural-urban divide and its trend over the years in the state in comparison with the national average with respect to the selected indicators.

4.2 Rural-Urban Divide in Accessing Health Care Facilities in Assam

Generally, health care services encompass all the personal and community health services including medical care and related education and research directed towards protection and promotion of health of the community (Sarma, 2004). Equity in health care services means equal access to care; equal utilisation of health care; and equal access to health care according to need (Nanda and Ali, 2006).

Disparity in access to health care between rural and urban areas can be examined by studying variation in health status, health services facility use, expenditure on ailments treatment and sources of financing health care services using selected variables that determine health outcomes (Dilip, 2005). How well a health system accomplishes the goal of good health is reflected in the actual health outcomes (attainments) in relation to its potential (performance) (Shankar and Kathuria, 2004). Performance indicators i.e. health inputs are regarded as the monetary expenditure on health like average public expenditure on per capita health or infrastructure as denoted by per capita beds, doctors and paramedical staff availability, per capita primary health centers etc. Improvements in determinants such as water supply and sanitation have also helped achieve outcomes (IGIDR, 2005). Similarly, promotion of maternal and child health has been one of the most important objectives of Family Welfare Programmes in the countries.

Infant mortality, birth and death rates and life expectancy are normally considered to be the indicators of health attainment level. Therefore, in the present study, following health output variables are considered for examining rural-urban disparity in health outcomes for the state: Crude Birth Rate (CBR), Crude Death Rate (CDR), Infant Mortality Rate (IMR) and Life Expectancy at Birth (LEB).

For attainment of health outcomes, maternal and child health indicators like institutional birth, antenatal care visit to health institutions, recommended vaccines etc. can be considered as the performance indicators or health inputs. Similarly, drinking water facility, good hygiene, health infrastructure etc. can also be considered as performance indicators or health inputs. Therefore, following indicators are considered for examining rural-urban disparity in health inputs:

Percentage of institutional birth (INS) , Percentage of children of 12-23 months who have received all recommended vaccines (VAC), Mothers who had any antenatal care visit for birth in last three years (ANC), Percentage of households which use piped drinking water (WAT) and Percentage of households which have access to sanitation facility (SAN), Number of hospitals per 100,000 population (HOS), Number of beds per 100,000 population (BED), Number of Dispensaries per 100,000 population (DIS).

Here, as mentioned in the previous section, the maximum and minimum values for the indicators represent the values for the best and worst performing states of India in respective indicators for construction of RUDI in health indicators. As there are limitations in availability of data on LEB, therefore, the maximum and minimum values are taken directly from the Human Development Index (HDI), constructed by UNDP.

The results are discussed below:

4.2.1 Rural-Urban Divide in Health Outputs in Assam

Rural-urban divide in the four selected health output indicators for different years is presented in Table 4.1. It is clear from the table that rural-urban disparity is prominent in Assam for all the health outputs taken into consideration. The same is true for the national average as well. Although the rates of CBR, CDR and IMR as well as rural-urban disparity in these health outputs have reduced both for Assam and India, the reduction is not so significant over the long study period. The rural-urban gap in CBR in Assam has reduced only by 15 per cent against national average gets reduced by around 33 per cent during the period from 1981 to 2010. In CDR the rural-urban gap narrows down by 42 per cent in Assam whereas the gap for India as a whole narrows down by 66 per cent. In case of IMR, although there is a significant fall in rural-urban disparity in the national average, the disparity in Assam remains almost stagnant during the study period with only marginal decrease of 12 per cent as against a fall of 63 per cent for the national figure. The LEB during the study period has increased both for the rural and urban areas in Assam and the country as a whole. However, rural-urban disparity in LEB has witnessed a significant fall of 98 per cent in Assam against a fall of 47 per cent for national average. The greater divide in the national average in 2010 is due to

high LEB in urban areas nationwide (not by a low value in rural areas) which may be driven by the largest cities in the country. From the table it is also clear that the rural-urban disparity for these selected health indicators is higher in Assam (except LEB) than for the national average, which is a matter of concern.



Table 4.1

Rural-Urban Divide in the Selected Health Output Indicators in Assam compared with all India Average

Health Output Indicators		1981		1985		1991		1995		2001		2005		2010		Rural-Urban Gap						
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1981	1985	1991	1995	2001	2005	2010
1. CBR per 1000 population	Assam	33.8	23.2	35	25	31.7	21.3	30.2	21.8	28	18.5	26.6	15.3	24.9	15.9	10.6	10	10.4	8.4	9.5	11.3	9
	India	35.6	27	34.3	28.1	30.9	24.3	30	22.7	27.1	20.2	25.6	19.1	24.1	18.3	8.6	6.2	6.6	7.3	6.9	6.5	5.8
2. CDR per 1000 population	Assam	13	8	13.5	8.4	11.8	6.9	10	6.7	9.8	6.6	9.2	5.6	8.8	5.9	5	5.1	4.9	3.3	3.2	3.6	2.9
	India	13.7	7.8	13	7.8	10.6	7.1	9.8	6.6	9	6.3	8.1	6	7.8	5.8	5.9	5.2	3.5	3.2	2.7	2.1	2
3. IMR per 1000 live births	Assam	107	76	112	96	83	42	78	59	78	35	70	35	64	37	31	16	41	19	43	35	27
	India	119.1	62.5	107	59	87	53	80	48	74	44	66	38	55	34	56.6	48	34	32	30	28	21
4. Life Expectancy at Birth (LEB) in years	Assam	51.25	60.3	53	60.9	54.1	63.3	55.6	64.6	57.1	66.6	61.3	64.71	65.5	65.65	-9.05	-7.9	-9.2	-9	-9.5	-3.41	-0.15
	India	53.8	62.85	N.A	N.A	58.1	64.9	N.A	N.A	61.2	67.9	63.62	68.8	65.78	70.6	-9.05	-	-6.8	-	-6.7	-5.18	-4.82

Source: Registrar General of India, Ministry of Home Affairs, Government of India, Sample Registration System Bulletin.

Notes:

The data of LEB for the years 1981, 1985, 1991, 1995, 2001 are taken from 1981-85, 1986-90, 1991-95, 1992-96 and 1998-2002 data respectively.

The data of LEB for 2005 and 2010 are estimated from the two regression equation $LEB = a + b \text{ IMR}$ for 1991 and 2001 respectively as stated by Ram, F. *et al.* (2007).

4.2.2 Rural-Urban Divide in Health Inputs in Assam

As the data pertaining to different selected health input indicators are collected from two different sources, the results on rural-urban divide on these indicators are presented in two tables.

The information for the indicators INS, VAC, ANC, WAT and SAN is obtained from National Family Health Survey Reports I, II and III. The results of rural-urban divide in these selected indicators are shown in Table 4.2a. In case of percentage of institutional birth, the disparity falls marginally both for Assam (by 6.82 per cent) and India (by 7.21 per cent). On the other hand, the indicator of percentage of children in the age group of 12-23 months who have received all recommended vaccines shows significant reduction in disparity (by 86.96 per cent) for the state as against almost stagnant (by 4.04 per cent) disparity for all India average. In case of percentage of mothers who had any antenatal care visits for birth in last three years, the rural-urban disparity narrows down both for the state and the country average - the fall in disparity is more prominent in Assam (by 45 per cent) than for all India average (by 21 per cent). Again the rural-urban disparity, in case of percentage of households which use safe drinking water has witnessed significant increase (12.44 per cent) as against a fall of 23.51 per cent for all India average. However, the rural-urban disparity in percentage of households accessing sanitation facility has reduced significantly for Assam (46 per cent), compared with the national figure, which has come down by only 9 per cent.

The data regarding the health infrastructure indicators HOS, BED and DIS are collected from the Centre for Enquiry into Health and Allied Themes (Cehat). The rural-urban gap in health infrastructure inputs is presented in Table 4.2b. Regarding the number of hospitals per 100,000 population, the disparity between rural and urban areas in Assam has reduced by 18.4 per cent between 1981 to 2001, whereas the disparity increases by 16.97 per cent for the national average. In case of number of beds per 100,000 population, the disparity in Assam narrows down both in the state (by 36 per cent) as well as national average (by 31 per cent). In so far as the number of dispensaries per 100,000 population is concerned, no rural-urban divide is noticed in the state whereas there exists rural-urban gap in the national average.

Table 4.2a

Rural-Urban Divide in Health Inputs in Assam compared with India as a whole

Health Input Indicators		NFHS I (1992-93)		NFHS II (1998-99)		NFHS III (2005-06)		Rural-Urban Gap		
		Rural	Urban	Rural	Urban	Rural	Urban	1992-93	1998-99	2005-06
1. % of institutional birth (INS)	Assam	8	52	15	60	18	59	-44	-45	-41
	India	16	57.6	24.6	65.1	28.9	67.5	-41.6	-40.5	-38.6
2. % of children of 12-23 months old who have received all recommended vaccines (VAC)	Assam	17	40	15	50	32	29	-23	-35	3
	India	30.9	50.7	37	61	38.6	57.6	-19.8	-24	-19
3. % of mothers who had any antenatal care visit for births in last 3 years (ANC)	Assam	50	83	59	89	69	87	-33	-30	-18
	India	59	83	60	87	72	91	-24	-27	-19
4. % of households which use piped drinking water (WAT)	Assam	8.3	29.2	7.1	47.8	6.9	30.4	-20.9	-40.7	-23.5
	India	19.3	69.5	25	74.5	11.8	50.7	-50.2	-49.5	-38.9
5. % of households which have access to sanitation facility (SAN)	Assam	43.4	92.4	59.8	94.9	71.1	97.5	-49	-35.1	-26.4
	India	12.9	75.9	18.9	80.7	26	83.2	-63	-61.8	-57.2

Source: National Family Health Survey (NFHS) Reports I, II, III.

Table 4.2b

Rural-Urban Divide in Health Inputs in Assam compared with India as a whole

Health Input Indicators		1981		1986		1991		1996		2001		Rural-Urban Gap				
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1981	1986	1991	1996	2001
6. No. of hospitals+ per 100,000 population (HOS)	Assam	0.2	3.57	0.24	3.56	0.76	4.7	0.7	3.9	0.65	3.4	-3.37	-3.32	-3.94	-3.2	-2.75
	India	0.35	3.12	0.28	3.21	0.57	3.5	0.67	4.1	0.36	3.6	-2.77	-2.93	-2.93	-3.43	-3.24
7. No. of beds per 100,000 population (BED)	Assam	12.13	382.09	15.33	399.49	20	350.4	18.43	290.47	17.16	253.49	-369.96	-384.16	-330.4	-272.04	-236.33
	India	16.51	261.56	18.09	256.74	22.21	241	19.73	202.34	9.85	178.79	-245.05	-238.65	-218.79	-182.61	-168.94
8. No. of dispensaries* per 100,000 population (DIS)	Assam	2.26	1.47	2.08	1.14	1.49	1.13	1.37	0.93	1.28	0.81	0.79	0.94	0.36	0.44	0.47
	India	2.21	3.23	2.38	6.35	1.86	7.24	1.75	6.37	1.49	3.6	-1.02	-3.97	-5.38	-4.62	-2.11

Source: Cehat (2005)

Note:

+Hospital includes government, local bodies, private and voluntary organisation.

Hospital figures (prior to 1997) are generally inclusive of CHC's.

*Dispensaries include government, local bodies, private and voluntary organization. Dispensaries figures (prior to 1997) are generally inclusive of PHC's

4.2.3 Rural-Urban Disparity Index (RUDI) in Health Indicators

To quantify the rural-urban divide in the state, the Rural-Urban Disparity Index has been constructed. The index is constructed separately for the state and the country as a whole to facilitate comparison. The results are presented in Table 4.3, Table 4.3a and Table 4.3b.

The estimated RUDI values for health outputs as presented in Table 4.3 has clearly established the fact that there is rural-urban disparity in health outputs both for the state as well as for the country. However, the disparity is more pronounced in the state compared with the national average. The disparity is found to decrease both for the state and the country over a long period of 29 years. However, the rate of decline is relatively more for the state (3.29 per cent annual cumulative) compared with the reduction in national average (2.25 per cent annual cumulative). The RUDI value for the country has been found to be negative in 2005 which implies a better performance of the rural areas in health outputs compared to urban areas. This can be explained by the significant reduction in CDR in rural areas of the country in that particular year. The Figure 4.1 also shows the trend of RUDI for health output indicators during the study period for the state vis-à-vis country average. The trend line of RUDI in health outputs for Assam is above the one for India indicating higher values of RUDI for the state in the entire study period except 1995. This also implies that rural-urban disparity in the selected health output indicators in the state is higher than the national average.

Regarding RUDI values for health inputs (Table 4.3a and 4.3b and Figure 4.2a and 4.2b), a falling trend both for the state and the national level is noticed. It has been found from Table 4.3a that RUDI values for the health inputs, namely, INS, VAC, ANC, WAT and SAN are relatively lower in the state compared with the national average during the two periods of 1992-93 and 2005-06. While the disparity has declined both for the state and the country during this period, the rate of decline is much higher in the state (5.31 per cent as compared to 2.22 per cent).

It is evident from Figure 4.2a that the trend line of RUDI for health inputs- INS, VAC, ANC, WAT and SAN for the state and the national average is falling. However the rate of fall in case of the state is more than the national average. The fall in the trend line is below the national average except in 1998-99.

However, regarding the health infrastructure inputs HOS, BED and DIS, the RUDI values are found to be higher in the state compared to the national average (refer Table 4.3b). As in the previous case, the disparity gets reduced both for the state and the country as a whole with a larger rate of fall in case of the national figure (1.34 per cent compared to 0.86 per cent). Figure 4.2b also shows a falling trend of RUDI for health inputs-HOS, BED, DIS both for the state and the national average. However, for these indicators, the disparity is less in the national average than the state except in 1991.

Thus, it is clear that although the disparity in accessing the health care facilities in the state is reducing, the disparity in health outputs and health inputs are still significantly high in the state.

Table 4.3
RUDI for Health Outputs in Assam compared with all India Average

	Values of RUDI for Health Outputs							Compound Annual Growth Rate (%)
	1981	1985	1991	1995	2001	2005	2010	
Assam	100	62.83	44.1	37.76	75.4	76.35	37.93	-3.29
India	32.07	56.74	12.58	41.5	65.53	-19.69	16.56	-2.25

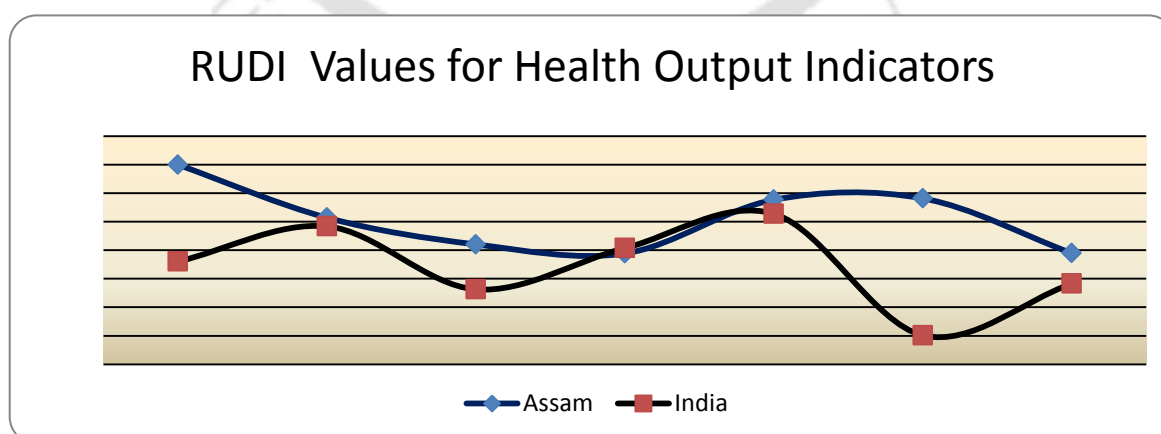


Figure 4.1

Table 4.3a

RUDI for Health Inputs in Assam compared with all India Average

	Values of RUDI for Health Inputs			Compound Annual Growth Rate (%)
	1992-93	1998-99	2005-06	
Assam	57.45	67.74	28.26	-5.31
India	62.3	59.42	46.55	-2.22

Table 4.3b

RUDI for Health Inputs in Assam compared with all India Average

	Values of RUDI for Health Inputs					Compound Annual Growth Rate (%)
	1981	1986	1991	1996	2001	
Assam	86.36	70.83	71.43	68.75	72.73	-0.86
India	81.82	65.38	73.91	61.54	62.5	-1.34

RUDI Values for Health Input Indicators

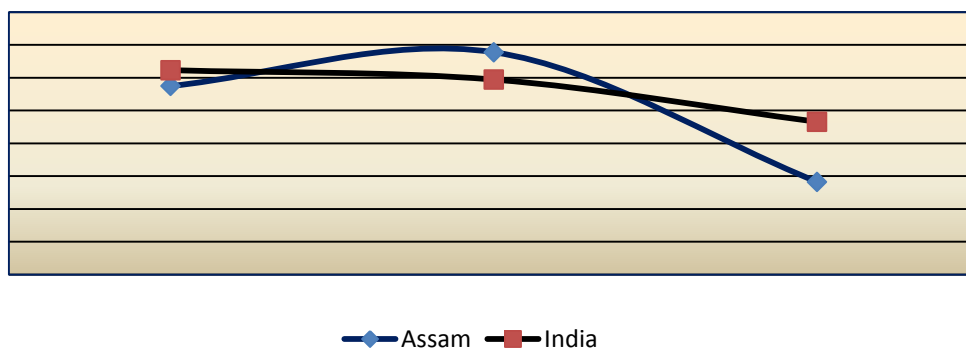


Figure 4.2a

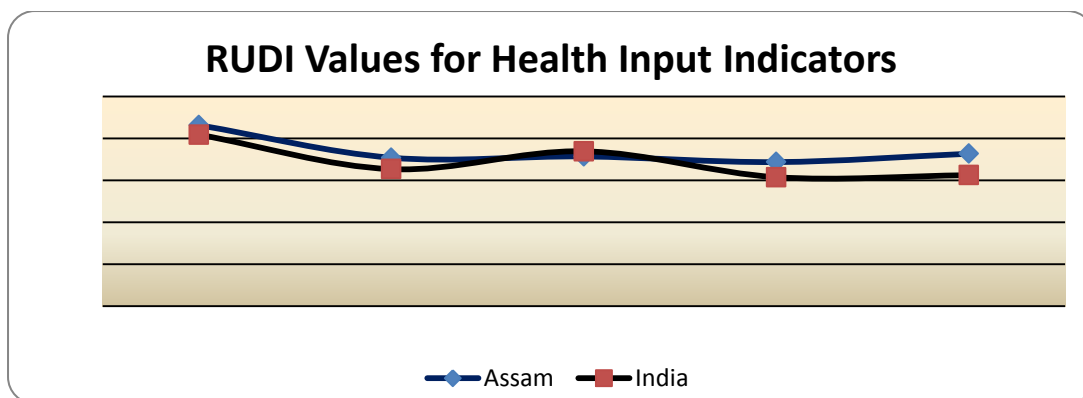


Figure 4.2b

4.3 Rural-Urban Divide in Accessing Education Facilities in Assam

The relationship between economic development and education has been viewed as one of the central issues of economic analysis. Education has long been regarded as an important determinant of economic well-being. Both Adam Smith and Alfred Marshall addressed the question of how individual investments in “education” influence the wealth of nations (Miller, 2007). The vast technical literature on this subject can be sub-divided into two general areas: (a) The micro-economic literature that looks at the relationship between different ways of measuring a person’s educational achievement and what they earn. For individuals, this means that for every additional year of schooling, they increase their earnings by about 10 per cent. (b) The macro-economic literature finds evidence of higher GDP growth in countries where the population has, on an average, completed more years of schooling or attains higher scores on tests of cognitive achievement (Miller, 2007).

The theoretical growth literature emphasises at least three mechanisms through which education may affect long run economic growth. First, education can increase the human capital inherent in the labor force, which increases labor productivity. Second, education can increase the innovative capacity of the economy. Third, education can facilitate the diffusion and transmission of knowledge needed to understand and process new information and to implement successfully new technologies devised by others, which again promotes economic growth (Miller, 2007).

The study carried out by Barro and Martin (2004) shows that year of school attainment at the secondary and higher levels for males of age 25 and over has a

positive and significant effect on the subsequent rate of economic growth. According to them, if the average number of years of schooling for this particular group increases by one year then the rate of economic growth increases by 0.44 per cent per year. This is a significant result since an increase in economic growth of almost half a per cent will have a large impact on the total GDP of a country over time. This is one of the reasons that education has been treated as such a positive investment for governments (Miller, 2007).

However, providing a level playing field in terms of facilities and resource inputs for all the citizens is a major challenge for the government in the developing countries, like India, which are characterised by vast regional, social and economic differentials. Scholars have identified a number of necessary conditions for providing quality education, namely, quality infrastructure, dedicated teachers, relevant curriculum and participatory modes of decision making and monitoring (Aggarwal, 2001). Quality, quantity, equity and efficiency of education are measured by some indicators, namely school related indicators, facilities in schools, enrolment related indicators, and teacher related indicators (Mehta, 2001).

Therefore, in the present study, the nature and magnitude of rural-urban disparity in the education sector in the state is assessed with the help of disparity in education outputs and education inputs representing different students related, school related, and teacher's quality related indicators. Literacy Rate (LTR), Gross Enrolment Rate (GER), Attendance Rate (ATN), Dropout Rate (DRP), and General Education Level (ADL) have been taken as the education outputs. The indicator General Education Level (ADL) comprises of the following variables: not literate; literate up to primary; with education level, middle, secondary, higher secondary, diploma/certificate and graduate. Following are taken as inputs for educational attainment:

- (i) Percentage distribution of schools by type of pucca building (PBL);
- (ii) Average number of classrooms (CLR);
- (iii) Pupil-teacher ratio (PTR);
- (iv) Percentage distribution of trained teachers provided with in-service training (STR);
- (v) Percentage of schools having boundary wall (BWL);
- (vi) Percentage of schools not having building (NBL);
- (vii) Percentage of schools having drinking water facility (DWF);

- (viii) Percentage of schools having separate girls' toilet facility (GTF);
- (ix) Percentage of schools having electricity connection (ELC);
- (x) Percentage of schools having playground (PLG);
- (xi) Percentage of schools having book-bank facility (BOK).

Since dropout rate, not literate above 15 years of age are the negative education output indicators, therefore the inverse of these indices are taken for calculation of RUDI. Similarly, Pupil-teacher ratio, Percentage of schools not having building are also negative education input indicators and inverse of the indices are taken for calculating the composite index.

4.3.1 Rural-Urban Divide in Educational Attainment or Outputs in Assam

The rural-urban divide in education outputs in the state in comparison with India is presented in Table 4.4. The table reveals that the rural-urban divide in literacy level is less in Assam compared with all India average. The rural-urban gap for literacy rate has narrowed down by 45.92 per cent in Assam against 23.79 per cent in the national average during the period from 1993-94 to 2007-08 showing the optimistic picture of increasing literacy rate in rural areas in the state. However, the rural-urban gap in literacy rate still remains significant both for the state and the country as a whole. In case of GER, the rural-urban gap remained at the same level in the state and the country as a whole in 1995-96 (14.9 percentage points). However, the gap has narrowed down considerably in the state (70.47 per cent) during 1995-96 to 1999-00 in comparison with the reduction in the national average (55.70 per cent) during the same period. Regarding the students currently attending the educational institutions, the rural-urban gap was 7 percentage points in Assam in 1993-94 as against a much higher level of 19.1 percentage points for the country. However, while the gap for the state has been completely bridged by 2007-08, there is still some rural-urban gap in the indicator ATN for the country in 2007-08 (2 percentage points). The rural-urban gap was prominent in percentage of dropout students in 1993-94 in the state (7.4 percentage points) as well as in the national average (18.1 percentage points). However, the situation has improved a lot in 2007-08 as evident from the available figures for the state and the country indicating a higher dropout rate in urban areas in comparison with rural areas. In case of the indicator of not literate persons of age above 15, the rural-urban

disparity persists with a significant gap of 13.3 percentage points for Assam compared with national average with a gap of 22.3 percentage points in 2007-08.

In case of diploma and certificate holders, and in the level of graduate and above, considerable rural-urban gap persists both for the state and the country. The rural-urban gap in case of diploma and certificate holders has reduced marginally for the state but increased for the country average. However, the gap has widened considerably for higher education (i.e. in the level of graduate and above) both for the state (by 44.18 per cent) and the country as a whole (by 58.97 per cent).



Table 4.4

Rural-Urban Divide in Educational Attainments or Outputs in Assam compared with all India Average

Education Outputs (%)			1993-94		1995-96		1999-00		2004-05		2007-08		Rural-Urban Gap				
			Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1993-94	1995-96	1999-00	2004-05	2007-08
1.Literacy Rate(LTR)		Assam	60.2	79.8	N.A	N.A	69	86	69.6***	82.3***	82.7	93.3	-19.6	-	-17	-15.3	-10.6
		India	46.4	69.1	N.A	N.A	56	80	54.5***	75.2***	67	84.3	-22.7	-	-24	-26	-17.3
2.Gross Enrolment Ratio (GER)		Assam	N.A	N.A	55.6#	70.5#	75.1*	79.5*	N.A	N.A	N.A	N.A	-	-14.9	-4.4	-	-
		India	N.A	N.A	46.4#	61.3#	71.6*	78.2*	N.A	N.A	N.A	N.A	-	-14.9	-6.6	-	-
3.Students currently attending the educational institution (ATN)		Assam	74.4^	81.4^	55.1#	70.2#	71.2**	83.8**	54.2+	56.6+	53	53	-7	-15.1	-12.6	-2.4	0
		India	63.3^	82.4^	46.1#	61.1#	69**	81.5**	48.5+	53+	51	53	-19.1	-15	-12.5	-6.5	-2
4. Dropout Rate(DRP)		Assam	22^	14.6^	62.3#	56.4#	N.A	N.A	N.A	N.A	4.64	9.61	7.4	5.9	-	-	-4.97
		India	33.1^	15^	58.1#	51.3#	N.A	N.A	N.A	N.A	1.61	1.97	18.1	6.8	-	-	-0.36
5.Persons of 15+ years old by general education level (ADL)	Not literate	Assam	N.A	N.A	32.7	13.6	N.A	N.A	26.8	11.6	21	7.7	-	19.1	-	15.2	13.3
		India	N.A	N.A	53.6	23	N.A	N.A	45.2	19.6	40.3	18	-	30.6	-	25.6	22.3
	Literate up to primary	Assam	N.A	N.A	17.4	13.7	17.7<	17.3<	38.3	18.1	37.6	19.5	-	3.7	0.4	20.2	18.1
		India	N.A	N.A	13.3	13.8	13.5<	14.7<	23.8	20	24.6	17.9	-	-0.5	-1.2	3.8	6.7
	Middle	Assam	N.A	N.A	18.6	24.7	17.3<	19.7<	20.5	24.8	23.4	23.8	-	-6.1	-2.4	-4.3	-0.4
		India	N.A	N.A	12.6	19	12.3<	16.5<	15.2	18.2	16.9	18.2	-	-6.4	-4.2	-3	-1.3
	Secondary	Assam	N.A	N.A	8.5	16.1	7<	13.7<	8.6	13.1	11.0	17.5	-	-7.6	-6.7	-4.5	-6.5
		India	N.A	N.A	6.5	15.4	6.4<	13.5<	8.2	15.3	9.7	16.9	-	-8.9	-7.1	-7.1	-7.2
	Higher Secondary	Assam	N.A	N.A	3.7	11.1	3<	9.2<	3.9	15.5	5.3	15.8	-	-7.4	-6.2	-11.6	-10.5
		India	N.A	N.A	2.6	8.9	2.8<	8.5<	4.1	10.4	4.7	11.3	-	-6.3	-5.7	-6.3	-6.6
	Diploma/ Certificate	Assam	N.A	N.A	0.1	0.6	N.A	N.A	0.1	1.1	0.2	0.6	-	-0.5	-	-1	-0.4
		India	N.A	N.A	0.2	0.9	N.A	N.A	0.7	2.6	0.6	2.3	-	-0.7	-	-1.9	-1.7
	Graduate and above	Assam	N.A	N.A	1.8	10.4	1.5<	12.1<	1.6	15.7	2.7	15.1	-	-8.6	-10.6	-14.1	-12.4
		India	N.A	N.A	1.4	9.2	1.7<	10.5<	2.5	14	2.6	15.0	-	-7.8	-8.8	-11.5	-12.4

Sources: NSSO (1997a), NSSO (1997b), NSSO (1998), NSSO (2001), NSSO (2006a), NSSO (2010a), NSSO (2010b)

Notes:

The data are for all types of educational institutions- government, local body, private aided, private unaided.

^ For students 5-14 years old

For students 5-24 years old

+For students 5-29 years old

* implies the figure is for Net Enrolment Ratio.

** for the year 1998-99 and for the students 6-17 years old

*** literacy rate is for persons of age 0 years and above.

< data are for the persons of age 7+ by general education level

4.3.2 Rural-Urban Divide in Education Inputs in Assam

The rural-urban divide in the selected education inputs in the state compared with all India average is presented in Table 4.5. The table reveals that the gap between rural and urban schools has widened in case of type of pucca building by 23 per cent during 2004-05 to 2008-09 in Assam whereas the gap has widened by 72 per cent for the country. The disparity in case of average number of classrooms has reduced in the state by 35 per cent, but the disparity has increased in the national average. The rural-urban gap in pupil-teacher ratio is marginally less in Assam compared to the national average. The gap has narrowed down by 18 per cent in the state against a significant fall of 66 per cent in the country average during the study period. Significantly, no rural-urban divide is noticed in the indicator of the percentage distribution of teachers provided with in-service training for Assam as well as for all India average which is a positive indication for rural areas. Although the rural-urban disparity in case of percentage of schools having boundary wall is less in the state compared to the national average, the disparity is significant with 19.28 percentage points in 2004-05 and has further widened to 23.27 percentage points in 2008-09. The disparity in percentage of schools not having building is reduced significantly by 79 per cent for the state against a fall of 38 per cent for the national level during the study period. The rural-urban disparity in percentage of schools having drinking water facility is widened by 60 per cent in Assam during the study period where as the disparity is reduced by 11 per cent in the national average. While the rural-urban disparity in

case of percentage of schools having separate toilets for girls has widened considerably by 447 per cent, the disparity has widened marginally by 0.42 per cent in case of percentage of schools having electricity connection in the state. However, the rural-urban disparity has narrowed down in these two indicators for the national average. No rural-urban disparity is noticed regarding the percentages of schools having playground in the school for the state as against widening disparity for the national average. The rural-urban gap in percentages of schools having book-bank facility has narrowed down by 19.53 per cent during the study period for Assam as against the widening gap in the national average by 48.34 per cent during the same period.

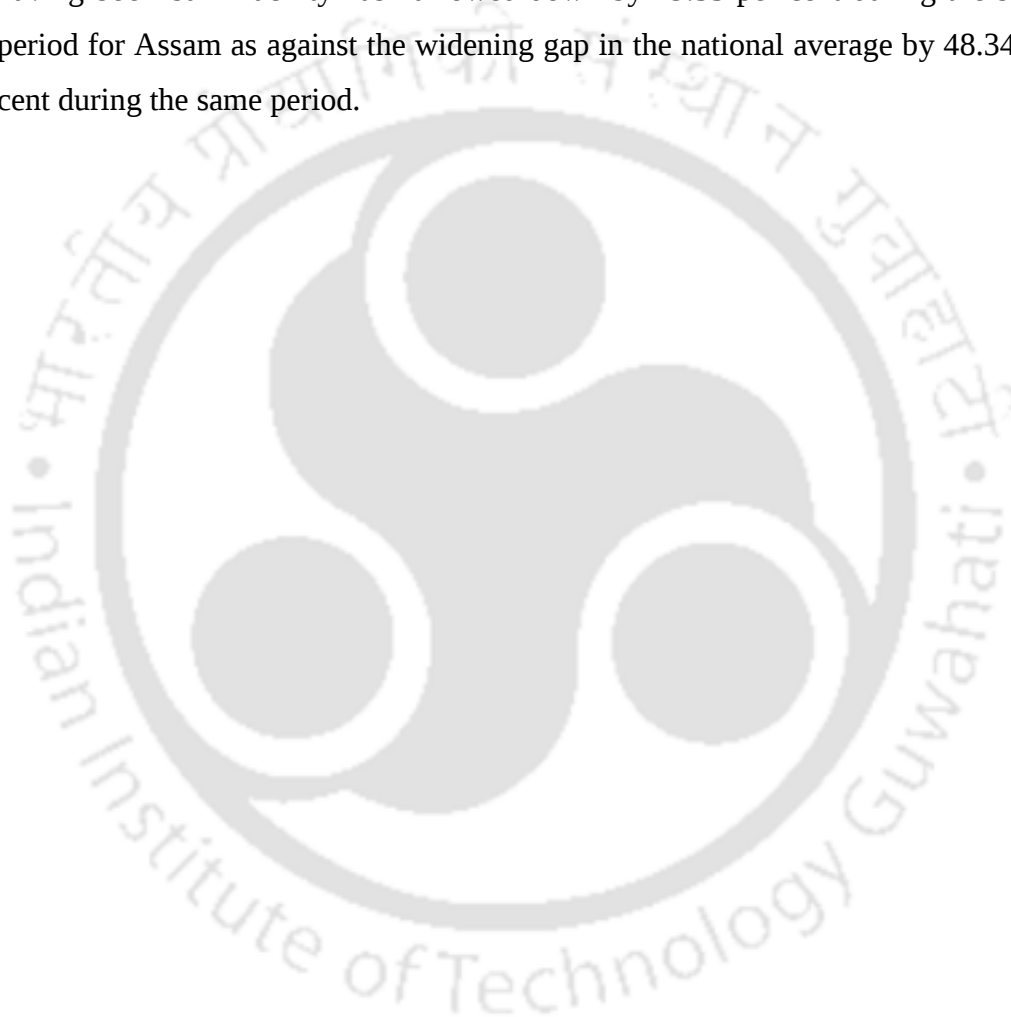


Table 4.5

Rural-Urban Divide in Education Inputs in Assam compared with all India Average

Education Inputs		2004-05		2005-06		2006-07		2007-08		2008-09		Rural-Urban Gap				
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	2004-05	2005-06	2006-07	2007-08	2008-09
1.% distribution of schools by type of Pucca building (PBL)	Assam	38.13	53.41	43.55	60.72	31.93	50.18	32.38	52.77	33.59	52.32	-15.28	-17.17	-18.25	-20.39	-18.73
	India	70.07	74.3	70.36	74.57	69.88	76.84	72.2	79.11	72.55	79.84	-4.23	-4.21	-6.96	-6.91	-7.29
2. Average number of classrooms (CLR)	Assam	2	4.6	2	4.7	2	3.8	2.1	3.9	2.4	4.1	-2.6	-2.7	-1.8	-1.8	-1.7
	India	3.3	6.6	3.5	6.7	3.7	7.3	3.8	7.5	3.9	7.6	-3.3	-3.2	-3.6	-3.7	-3.7
3.Pupil-teacher ratio (PTR)	Assam	26.41	22.74	25.17	20.82	25	22	24	21	23	20	3.67	4.35	3	3	3
	India	38.73	32.92	36.76	32.08	35	31	33	31	33	31	5.81	4.68	4	2	2
4.% distribution of teachers provided with in- service training (STR)	Assam	51.14	43.82	59.32	52.79	32.59	31.31	28.48	29.11	35.28	30.92	7.32	6.53	1.28	-0.63	4.36
	India	42.07	21.12	45.1	25.87	37.87	19.71	41.7	21.45	39.29	19.83	20.95	19.23	18.16	20.25	19.46
5.% of schools having boundary wall (BWL)	Assam	32.7	51.98	29.1	51.97	29.31	48.06	27.12	48.18	25.06	48.33	-19.28	-22.87	-18.75	-21.06	-23.27
	India	47.5	75.87	46.89	75.79	45.35	75.47	46.37	76.71	47.09	78.01	-28.37	-28.9	-30.12	-30.34	-30.92
6.% of schools not having building (NBL)	Assam	0.78	0.45	0.54	0.28	0.65	0.03	31.08	12.34	0.07	0	0.33	0.26	0.62	18.74	0.07
	India	4.19	2.55	4.37	2.54	3.35	1.83	5.12	2.31	2.81	1.8	1.64	1.83	1.52	2.81	1.01
7.% of schools having drinking water facility (DWF)	Assam	63.13	71.29	70.36	74.48	61.32	69.4	61.44	75.65	64.55	77.62	-8.16	-4.12	-8.08	-14.21	-13.07
	India	80.56	87.05	82.59	89.26	84.28	90.07	86.12	91.76	87.05	92.83	-6.49	-6.67	-5.79	-5.64	-5.78
8. % of schools having separate girls' toilet facility (GTF)	Assam	7.44	21.13	8.85	22.65	9.34	21.57	9.64	25.43	11.84	86.7	-13.69	-13.8	-12.23	-15.79	-74.86
	India	29.41	58.85	34.17	61.9	39.52	64.06	47.94	69.19	51.01	71.68	-29.44	-27.73	-24.54	-21.25	-20.67
9.% of schools having electricity connection in school (ELC)	Assam	5.04	43.12	5.38	45.16	4.76	36.68	3.35	41.65	6.47	44.71	-38.08	-39.78	-31.92	-38.3	-38.24
	India	23.2	67.76	25.08	69.2	27.84	70.65	27.85	71.63	30.03	73.7	-44.56	-44.12	-42.81	-43.78	-43.67
10.% of schools having playground in the school (PLG)	Assam	50.45	41.84	50.56	42.53	43.5	35.87	44.42	37.96	46.05	37.86	8.61	8.03	7.63	6.46	8.19
	India	49.69	61.7	50.92	62.87	51.05	62.97	51.29	63.58	51.75	64.11	-12.01	-11.95	-11.92	-12.29	-12.36
11. % of schools having book-bank facility (BOK)	Assam	23.58	30.44	26.2	30.26	20.07	25.17	20.15	25.19	20.6	26.12	-6.86	-4.06	-5.1	-5.04	-5.52
	India	43.12	49.76	46.89	55.52	47.23	57.07	48.34	58.07	46.56	56.41	-6.64	-8.63	-9.84	-9.73	-9.85

Source: Mehta (2005a), Mehta (2005b), Mehta (2006-07a), Mehta (2006-07b), Mehta (2007-08a), Mehta (2007-08b), Mehta (2008-09a), Mehta (2008-09b) from <http://www.dise.in> accessed on 09-04-11.

Note: The data are for all schools which include categories of primary only, primary with upper primary, primary with upper primary and secondary/higher secondary, upper primary only, upper primary with secondary/higher secondary.

4.3.3 Rural-Urban Disparity Index (RUDI) in Education Indicators

To quantify the rural-urban divide in education sector in the state, the RUDI has been constructed for education output and input indicators. The index is constructed separately for the state and the country as a whole to facilitate comparison. The results are presented in Table 4.6a and Table 4.6b.

The estimated RUDI values as presented in Table 4.6a shows negative values for RUDI in education outputs in the state for all the years under consideration except in 2004-05. This can be explained by the better performance of rural areas in the state compared to urban areas regarding some indicators (e.g. dropout rate is low in rural areas in 2007-08 for the state compared with urban areas; attendance rates in rural areas are found same with urban areas in 2007-08 in the state etc.). This also implies a better trend for the state compared to the national average in educational attainments over a period of about 15 years from the available data (refer Figure 4.3). The figure shows that except in 1995-96, the trend line of RUDI for the education outputs of the state is below the trend line of the country as a whole.

The picture is reversed in case of RUDI values for education inputs in the state (refer Table 4.6b). The RUDI remains high for the state in all the years under consideration compared with the national average implying more disparity in the state than the national average. The disparity is not only high in the state but is also rising sharply compared to the national average. The rural-urban gap has widened significantly in the education inputs in the state by cumulative annual of 25.14 per cent from 2004-05 to 2008-09 whereas the disparity has widened by cumulative annual of 3.44 per cent only for all India average. Figure 4.4 also shows that the trend line of RUDI for the education inputs for the state is not only above the trend line of India but also in an increasing trend. As observed by Beteille (2008) disparities in the quality of education provided by different schools are very large

and increasing and the disparities which begin with primary school are carried forward to the level of secondary and higher education. This kind of unjust dual policy can never provide a level-playing field to the poor population. Many rural-based upper middle class parents want to move to urban areas only to provide competitive schooling to their children, which further widen the rural-urban gap.

Thus, the RUDI values for education outputs exhibit a falling rural-urban disparity both for the state and the national average whereas the RUDI values for education inputs show sharp rise in rural-urban disparity for the state over the years compared with the national average.

Table 4.6a

RUDI for Education Outputs in Assam compared with all India average

	Values of RUDI for Education Outputs					Compound Annual Growth Rate (%)
	1993-94	1995-96	1999-00	2004-05	2007-08	
Assam	-9.9	-10.08	-3.64	3.54	-13.41	-2.19
India	26.44	-15.91	11.76	18.06	15.94	-3.55

Table 4.6b

RUDI for Education Inputs in Assam compared with all India average

	Values of RUDI for Education Inputs				Compound Annual Growth Rate (%)
	2004-05	2006-07	2007-08	2008-09	
Assam	40.78	88.99	30.95	100	25.14
India	25.21	69.12	12.98	28.86	3.44

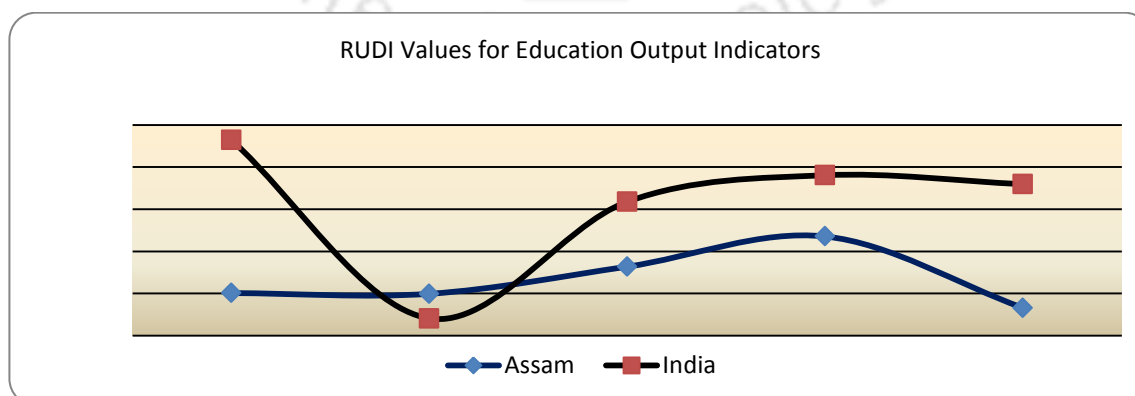


Figure 4.3

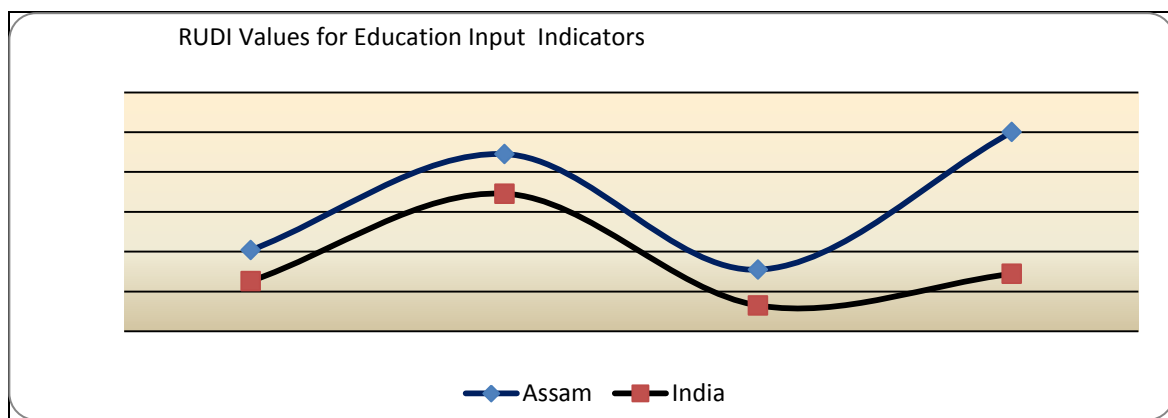


Figure 4.4

4.4 Rural-Urban Divide in Employment Generation in Assam

In order to understand how an economy operates, it is important to know how many jobs are created, what percentage of the work force is actively working, and how many new people are claiming to be unemployed. Employment indicators reflect the overall performance of an economy. Therefore, in this study, rural-urban divide in employment generation is assessed with the help of three indicators, namely, different categories of employment; percentage distribution of working persons in different sectors and unemployment and underemployment rates.

RUDI is constructed only for different categories of employment indicators such as Percentage of employed persons (EMP), Percentage of persons in the labour force by usual status (PLF), Education specific worker population ratio (WPR) (for all categories of education), Regular employees (REM), and Average wage earned by the regular employees (WAG) keeping in view the limited scope of the study. Here the usual status employment includes both the principal and subsidiary status employment¹.

4.4.1 Rural-Urban Divide in Different Categories of Employment in Assam

The rural-urban divide in different categories of employment generation in the state in comparison with all India average is presented in Table 4.7. The table reveals that the rate of employment remains almost stagnant during the period from 1993-94 to 2007-08 both for Assam and the country as a whole. The employment opportunities in rural areas increase marginally by 5.08 per cent during the period

1993-94 to 2007-08 for Assam whereas the employment rate has gone down by 4.95 per cent in rural areas for the country. The rate of employment in urban areas has increased by 4.98 per cent and 2.02 per cent respectively for the state and the country as a whole during the study period. However, employment rates are found to be higher in rural areas than in urban areas both for the state and country. This may be due to lack of diversification of agriculture in rural sector resulting in presence of disguised unemployment in rural agricultural sector.

Regarding the percentage of persons in the labour force by different definition like usual (US), current weekly status (CWS) and current daily status (CDS)², the rates are higher for the country average than that of the state showing more employment generations in the country as a whole than that in the state. The US, CWS and CDS rates are higher for the rural India than for the urban India for all the periods whereas the rates are higher for the urban Assam than the rural Assam for some years. However, the rural-urban divide is not very prominent in this case.

In case of education specific worker population ratios, the ratios are higher for rural areas than for urban areas. Here also, some categories like worker population ratio (WPR) for graduate and above and for diploma/certificate course, the ratios are higher for urban areas than for rural areas in Assam. However, for Indian average, the education specific worker population ratios are always higher for rural areas than for urban areas.

Similarly, the rates of self-employed persons are also higher for rural sector than for urban sector both for Assam and the country as a whole. However, self-employed persons are more in Assam than the country. The striking point here is that the rural-urban disparity is more prominent in case of regular employees in Assam and the disparity has widened more rapidly from the gap of 28.1 in 1993-94 to 36.9 percentage points in 2004-05 (i.e. 31.32 per cent increase) in the state. On the other hand, the rural-urban disparity in the national level has narrowed down marginally for the same indicator for the same period. However, the disparity is reduced in 2007-08 both for the state and the country as a whole. Casual labour workers are more in rural sector than in urban sector both for the state and the country. The results support the view that increased competition in a globalised framework has forced firms to shift towards more capital intensive advanced

technology, thereby restricting employment expansion along with a market trend towards casualisation of workforce (Mundle, 1992; Kundu, 1997).

Rural-urban disparity in average wage per day received by the worker is more prominent for regular wage employees for Assam (Rs.185.67 more in urban areas than in rural areas) than the country. However, the rural-urban wage rate disparity for casual labour workers is more for the country than for the state.



Table 4.7

Rural-Urban Divide in Different Categories of Employment in Assam compared with the National Average

			1993-94		1995-96		1999-00		2004-05		2007-08		Rural-Urban Gap				
			Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1993-94	1995-96	1999-00	2004-05	2007-08
1. % of employed persons(EMP)		Assam	35.4	32.1	N.A	N.A	34.9	33.2	N.A	N.A	37.2	33.7	3.3	-	1.7	-	3.5
		India	44.4	34.7	N.A	N.A	41.7	33.7	N.A	N.A	42.2	35.4	9.7	-	8	-	6.8
2. % of persons in the labour force by different definition (PLF)	Usual status	Assam	37.3	35.2	32.1	33.7	36.4	36.8	40.1	36.2	N.A	N.A	2.1	-1.6	-0.4	3.9	3.5
		India	44.9	36.3	39	32.5	42.3	35.4	44.6	38.2	N.A	N.A	8.6	6.5	6.9	6.4	6.8
	Current weekly status	Assam	35.5	34.8	30.3	33	34.9	36.8	37.2	35.4	35.4	33.1	0.7	-2.7	-1.9	1.8	2.3
		India	41.5	35.5	39	32.5	40	34.7	41.8	37.5	38.4	34.5	6	6.5	5.3	4.3	3.9
	Current daily status	Assam	32.2	33.2	N.A	N.A	31.9	34.5	34.8	34.5	33.1	32.6	-1	-	-2.6	0.3	0.5
		India	38.7	34.3	N.A	N.A	37	33.5	38.7	36.4	34.2	32.9	4.4	-	3.5	2.3	1.3
3. Education specific worker population ratio for persons of age 15 years and above according to usual principal and subsidiary status (WPR)	Not literate	Assam	53.8	40.3	N.A	N.A	49.7	43.2	49.5	44.1	40.5	37.6	13.5	-	6.5	5.4	2.9
		India	68.1	48.8	N.A	N.A	65.3	45.8	67.2	47.2	63.2	43.2	19.3	-	19.5	20.0	20.0
	Literate up to primary	Assam	62.8	45.8	N.A	N.A	61.6	47.9	67.6	51.3	61.1	41.9	17	-	13.7	16.3	19.2
		India	72.7	55.4	N.A	N.A	69.1	52	71	56.1	68.4	52.9	17.3	-	17.1	14.9	15.5
	Middle	Assam	48.6	42.2	N.A	N.A	50.8	38	63.4	40.3	55.6	46.1	6.4	-	12.8	23.1	9.5
		India	61.9	47.9	N.A	N.A	60.1	47.4	64.2	49.5	60.8	48.4	14	-	12.7	14.7	12.4
	Secondary	Assam	41.9	37.5	N.A	N.A	51.4	41.6	51.8	45.4	48.5	38.6	4.4	-	9.8	6.4	9.9
		India	59.6	46.1	N.A	N.A	58.7	44.8	58.4	44.1	54.7	43	13.5	-	13.9	14.3	11.7
	Higher Secondary	Assam	37.9	40.1	N.A	N.A	50.2	40.3	49.9	42.6	47.3	43.8	-2.2	-	9.9	7.3	3.5
		India	58.7	43.6	N.A	N.A	57.5	40.9	55.8	40.8	51.2	38.4	15.1	-	16.6	15.0	12.8
	Diploma/certificate Course	Assam	N.A	N.A	N.A	N.A	N.A	N.A	84.9	88.3	64.8	72.6	-	-	-	-3.4	-7.8
		India	N.A	N.A	N.A	N.A	N.A	N.A	72.9	70.7	65.7	65.6	-	-	-	2.2	0.1
	Graduate and above	Assam	67.8	64.3	N.A	N.A	64.1	65.8	76.7	59.7	52	48.2	3.5	-	-1.7	17.0	3.8
		India	75.6	63.9	N.A	N.A	72.2	60.9	72.5	59.5	56.4	48.4	11.7	-	11.3	13.0	8.0
	All	Assam	54.5	44	N.A	N.A	53.9	45.4	59.9	47.3	56.6	50.1	10.5	-	8.5	12.6	6.5
		India	67.8	50.9	N.A	N.A	64.7	48.6	66.6	50.6	63.9	50.2	16.9	-	16.1	16.0	13.7

			1993-94		1995-96		1999-00		2004-05		2007-08		Rural-Urban Gap				
			Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1993-94	1995-96	1999-00	2004-05	2007-08
4. % distribution of usually employed by category of employment	Self Employed	Assam	57.8	45.3	N.A	N.A	58.2	44.7	71	42.3	26	17.5	12.5	-	13.5	28.7	8.5
		India	58.1	42.4	N.A	N.A	55.8	42.2	60.2	45.4	23.8	15.1	15.7	-	13.6	14.8	8.7
	Regular Employees	Assam	14.4	43.1	N.A	N.A	16.6	42.9	9.1	45.1	4.2	14.2	-28.7	-	-26.3	-36	-10.0
		India	6.6	39.5	N.A	N.A	6.8	40	7.1	39.5	3.1	14.6	-32.9	-	-33.2	-32.4	-11.5
	Casual Labour	Assam	27.8	11.6	N.A	N.A	25.2	12.4	19.9	12.6	6.9	2.01	16.2	-	12.8	7.3	4.89
		India	35.3	18.1	N.A	N.A	37.4	17.8	32.8	15	15.3	5.7	17.2	-	19.6	17.8	9.6
5. Average wage/salary earnings (Rs.) per day received by workers of age 15-59 years	Regular wage/ Salaried employee	Assam	N.A	N.A	N.A	N.A	N.A	N.A	129	233	159.9	345.56	-	-	-	-104	-185.67
		India	N.A	N.A	N.A	N.A	N.A	N.A	134	194	162.9	265.18	-	-	-	-60.0	-102.24
	Casual Labour	Assam	N.A	N.A	N.A	N.A	59.8	N.A	60.2	70.5	70.51	82.68	-	-	-	-10.3	-12.17
		India	N.A	N.A	N.A	N.A	45.6	N.A	48.9	68.7	68.3	95.56	-	-	-	-19.8	-27.26

Sources:

1. NSS Report No.406: Key Results on Employment and Unemployment, 1993-94.
2. NSS Report No.409, 1993-94
3. NSS Report No.440, 1995-96.
4. NSS Report No.455, 1999-00.
5. NSS Report No.458, 1999-00
6. NSS Report No.515, Part 1, 2004-05
7. NSS Report No.531, 2007-08

4.4.2 Rural-Urban Divide in Percentage Distribution of Working Persons in Different Sectors

Rural-urban divide in percentage distribution of working persons in different sectors in the economy is presented in Table 4.8. It is evident from the table that the rural-urban divide is prominent in employment generation of the three main sectors both for the state and the national average. Obviously as a primary sector dependent country for labour absorption, employment generation for rural areas in the state as well as in the country is more in the primary sector. However, a significant rural-urban gap has been noticed in employment generation for secondary and tertiary sector both for the state and the country as a whole. The number of persons engaged in agriculture sector in rural areas has decreased from 79.2 per cent in 1993-94 to 74.3 percent in 2004-05 (by 6.19 per cent) whereas the same has decreased from 81.2 per cent in 1983 to 72.7 per cent in 2004-05 (i.e. nearly 9 per cent) for the national average. In urban areas, the number of persons engaged in agriculture sector has shown a rise from 3 per cent in 1993-94 to 6 per cent in 1999-00 and then a fall to 4.8 per cent in 2004-05 for the state. However, the rates of the persons engaged in agriculture sector have shown a marginally declining trend both in rural and urban India.

The persons engaged in the mining and quarrying sector are more in urban area both for the state and the national level. The structure of population engaged in this sector has not shown any significant change in the state during the study period except a fall in the employment in this sector in urban areas in Assam from 6.1 per cent in 1993-94 to 1.3 per cent in 2004-05.

The employment in the manufacturing sector is significantly lower in Assam than the national average (more than 2 times lower in rural areas and more than 3 times lower in urban areas). The manufacturing employment has shown a falling trend both in rural and urban Assam in the state whereas it has shown a continuously increasing trend in rural areas for the country average which is a positive sign for rural industrialisation. For the electricity, water etc. sector, the rural-urban disparity has increased significantly in Assam whereas the disparity has narrowed down in the national level. For construction sector also, significant rural-urban gap is observed and the gap exists both for the state and the national average. As a whole the rural-urban disparity has increased significantly in the secondary sector for the state by 65 per cent from 1995-96 to 2004-05 whereas a

marginal decrease in the disparity (i.e. by 4 per cent) has been noticed for the national level data for the same period.

Although there appears a marginal decrease in rural-urban disparity in the employment generation in Trade, Hotel and Restaurants sector in Assam, there is still a vast gap between the two areas both for the state and national level. For transport sector, the rural-urban disparity has widened in 2004-05 in Assam whereas the national average shows a marginal decrease in disparity. For Finance, Insurance, Business etc. sector, an increasing trend of rural-urban disparity has been noticed in the national level, whereas the state level data do not show any clear trend. For Public Administration, Education, Commercial services etc. the vast rural-urban disparity is observed while the time series study has not shown any clear trend in the state level and a marginally decreasing disparity trend is noticed in the national average. As a whole, the tertiary sector shows that there still exists a vast rural-urban disparity both for the state and national level.

From the above discussion, it is clear that there exists a vast rural-urban gap in employment generation both for the state and national average. A marginal fall in the disparity in the three main sectors i.e. primary, secondary and tertiary sector is noticed from 1993-94 to 2007-08 both for the state and country as a whole.

Table 4.8
Rural-Urban Divide in Percentage Distribution of Usually Working Persons in the Principal Status and Subsidiary Status taken together by broad Industry Division in Assam compared with National Average

Sector with NIC-98 & NIC-2004 division		1983		1993-94		1995-96		1999-00		2004-05		2007-08		Rural-Urban Gap					
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1983	1993-94	1995-96	1999-00	2004-05	2007-08
1. Agriculture etc.(01-05)	Assam	N.A	N.A	79.2	3	N.A	N.A	67.7	6	74.3	4.8	N.A	N.A	-	76.2	-	61.7	69.5	-
	India	81.2	14.6	78.4	12.3	N.A	N.A	76.4	8.8	72.7	8.8	N.A	N.A	66.6	66.1	-	67.6	63.9	-
Primary sector(01-05)	Assam	N.A	N.A	N.A	N.A	75.3	6.2	77.2*	8.3*	N.A	N.A	70.3	5.9	-	-	69.1	68.9	-	64.4
	India	N.A	N.A	N.A	N.A	78.8	10.4	73.2*	8.8*	N.A	N.A	72.2	7.6	-	-	68.4	64.4	-	64.6
2.Mining and Quarrying(10-14)	Assam	N.A	N.A	0.02	6.1	N.A	N.A	0.03	0.05	0.03	1.3	N.A	N.A	-	-6.08	-	-0.02	-1.27	-
	India	0.5	1	0.06	1.2	N.A	N.A	0.05	0.08	0.05	0.08	N.A	N.A	-0.5	-1.14	-	-0.03	-0.03	-
3. Manufacturing(15-37)	Assam	N.A	N.A	3.5	10.4	N.A	N.A	4	7.2	3.1	9.8	N.A	N.A	-	-6.9	-	-3.2	-6.7	-
	India	6.7	26.7	7	23.6	N.A	N.A	7.4	22.7	8.1	24.6	N.A	N.A	-20	-16.6	-	-15.3	-16.5	-
4.Electricity,water etc. (40-41)	Assam	N.A	N.A	0.03	0.06	N.A	N.A	0.01	0.06	0.01	2.7	N.A	N.A	-	-0.03	-	-0.05	-2.69	-
	India	0.1	0.9	0.02	1	N.A	N.A	0.02	0.07	0.02	0.07	N.A	N.A	-0.8	-0.98	-	-0.05	-0.05	-
5. Construction (45)	Assam	N.A	N.A	0.07	2.8	N.A	N.A	1.8	5.2	2.5	5.5	N.A	N.A	-	-2.73	-	-3.4	-3	-
	India	1.7	4.7	2.4	6.3	N.A	N.A	3.3	8	4.9	8	N.A	N.A	-3	-3.9	-	-4.7	-3.1	-
Secondary sector(10-45)	Assam	N.A	N.A	N.A	N.A	3.2	11	6.3*	19.2*	N.A	N.A	6.8	12.2	-	-	-7.8	-12.9	-	-5.4
	India	N.A	N.A	N.A	N.A	10.2	33.1	13.5*	35.4*	N.A	N.A	14.1	34	-	-	-22.9	-21.9	-	-19.9
6.Trade,Hotel and Restaurants(50-55)	Assam	N.A	N.A	6.9	29	N.A	N.A	8.1	30	9	27.6	N.A	N.A	-	-22.1	-	-21.9	-18.6	-
	India	3.5	18.4	4.3	19.4	N.A	N.A	5.1	26.9	6.1	24.6	N.A	N.A	-14.9	-15.1	-	-21.8	-18.5	-
7.Transport etc.(60-64)	Assam	N.A	N.A	1.3	7.5	N.A	N.A	2.7	8.3	2.4	12.6	N.A	N.A	-	-6.2	-	-5.6	-10.2	-
	India	1.1	8.1	1.4	7.9	N.A	N.A	2.1	8.7	2.5	8.6	N.A	N.A	-7	-6.5	-	-6.6	-6.1	-
8. Finance, Insurance, business etc.(65-74)	Assam	N.A	N.A	0.02	2.3	N.A	N.A	0.03	5.6	0.02	2	N.A	N.A	-	-2.28	-	-5.57	-1.98	-
	India	4.9	25	0.03	3.4	N.A	N.A	0.03	4.1	0.05	5.3	N.A	N.A	-20.1	-3.37	-	-4.07	-5.25	-
9.Public administration, Education, Commercial services etc.(75-99)	Assam	N.A	N.A	7.7	38.6	N.A	N.A	15.1	36.6	8.1	33.4	N.A	N.A	-	-30.9	-	-21.5	-25.3	-
	India	0.3	0.6	5.4	24.8	N.A	N.A	4.9	19.5	4.5	18.7	N.A	N.A	-0.3	-19.4	-	-14.6	-14.2	-
Tertiary sector(50-99)	Assam	N.A	N.A	N.A	N.A	21.5	82.9	16.5*	72.5*	N.A	N.A	22.8	81.9	-	-	-61.4	-56	-	-59.1
	India	N.A	N.A	N.A	N.A	11	56.5	13.2*	55.8*	N.A	N.A	13.8	58.4	-	-	-45.5	-42.6	-	-44.6

Sources:

1. NSS Report No. 319, 38th Round, 1983.
2. NSS Report No.406, 1993-94
3. NSS Report No.409, 1993-94
4. NSS Report No.440, 1995-96
5. NSS Report No.455, 1999-00.
6. NSS Report No.458, 1999-00
7. NSS Report No. 531, 2007-08

Note:

* The figures are for the year 2000-01.

4.4.3 Rural-Urban Divide in Unemployment and Underemployment Rates in Assam

Rural-urban divide in the unemployment and underemployment rates is presented in Table 4.9. The table reveals that the unemployment rates are always higher in urban areas than in the rural areas both for the state and national average. This may be the result of large scale migration of labour from the rural to urban areas in search of better opportunities. On the other hand, the number of underemployed persons is more in rural areas than in urban areas both for the state and national average. This may be due to the presence of disguised unemployment in agriculture sector in the country.

Table 4.9

Rural-Urban Divide in Unemployment and Underemployment Rates in Assam compared with the National Average

				1983		1993-94		1999-00		2004-05		2007-08		Rural-Urban Gap				
				Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	1983	1993-94	1999-00	2004-05	2007-08
1. Unemployment Rates (%)	Usual status	PS	Assam	N.A	N.A	2.4	3.3	1.9	4	3.6	8.2	5.4	9.7	-	-0.9	-2.1	-4.6	-4.3
			India	1.91	6.04	0.07	1.8	0.1	1.8	2.5	5.3	2.2	4.5	-4.13	-1.73	-1.7	-2.8	-2.3
		PS+S	Assam	1.9*	4.8*	5.3*	8.7*	4.0*	9.8*	2.6	7.2	4.7	9.5	-2.9	-3.4	-5.8	-4.6	-4.8
			India	1.13	5.32	1.2*	4.6*	1.5*	4.8*	1.7	4.5	1.6	4.1	-4.19	-3.4	-3.3	-2.8	-2.5
		Current Weekly status	Assam	N.A	N.A	6.5	9.1	5.3	10.4	4.1	8.1	5.2	10.3	-	-2.6	-5.1	-4	-5.1
			India	3.88	6.81	3	5.8	3.8	5.9	3.9	6	3.9	5	-2.93	-2.8	-2.1	-2.1	-1.1
	Current Daily Status		Assam	N.A	N.A	7.8	9.4	7.4	11.9	6.5	9	7	10.8	-	-1.6	-4.5	-2.5	-3.8
			India	7.94	9.52	5.6	7.4	7.1	7.7	8.2	8.3	8.4	7.4	-1.58	-1.8	-0.6	-0.1	1
2. % of employed persons according to principal status of age 15 years and above who did not work more or less regular throughout the year	Usual status	PS	Assam	N.A	N.A	6.8	1.8	7.3	3	7	3.2	N.A	N.A	-	5	4.3	3.8	-
			India	N.A	N.A	13.6	6.7	11	6.9	11.8	6.7	N.A	N.A	-	6.9	-4.4	5.1	-

Sources: Same as for Table 4.8

4.4.4 Rural-Urban Disparity Index (RUDI) in Employment Generation in Assam

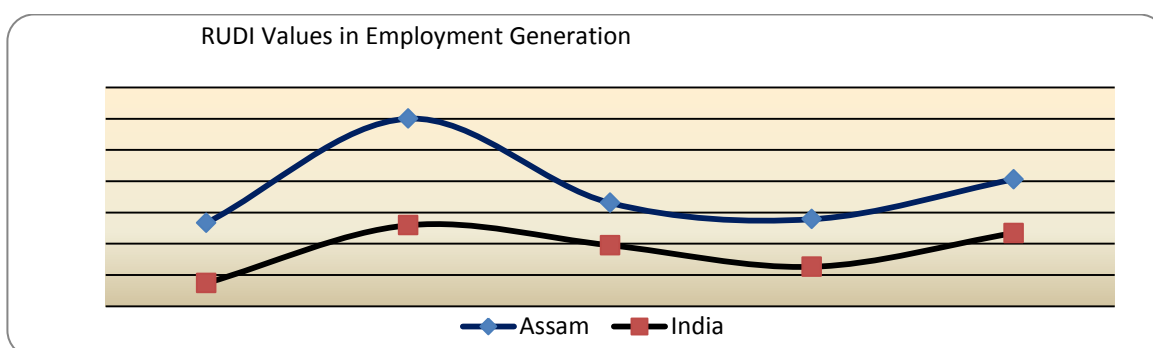
To quantify the rural-urban divide in employment generation in the state, RUDI has been constructed for different categories of employment indicators and the values of the indices are constructed separately for the state and the country as a whole. The results are presented in Table 4.10 and Figure 4.5.

It is evident from the table that the values of RUDI is more for Assam than for the national average for all the selected years implying larger disparities for Assam than for all India average in employment generation. The high values of RUDI for all the selected years in the state are due to vast differences in rural and urban areas in case of regular employees. The sharp rise in disparity in 1995-96 for the state can be explained by the worst performance of the state among the states of India for the indicator of percentage of persons in the labour force (PLF) in that particular year. The negative RUDI value for the national average in 1993-94 is due to the better performance of the rural areas for the country as a whole compared with urban areas for all other indicators except regular employment. Figure 4.5 also shows that the trend line of RUDI for the employment indicators is above the trend line of India in all the study periods showing more disparity in the state.

Although the rural-urban disparity is more for the state than for the national average, the rate of growth of disparity is displaying just an opposite trend. While the CAGR of disparity has increased by 4.44 per cent for the state, the same has increased by 12.54 per cent for the national average during 1993-94 to 2007-08.

Table 4.10**RUDI for Employment Indicators in Assam compared with all India average**

	RUDI values for Employment Indicators					Compound Annual Growth Rate (%)
	1993-94	1995-96	1999-00	2004-05	2007-08	
Assam	33.33	100	46.15	35.71	61.22	4.44
India	-5.13	31.82	19.05	5.26	26.83	12.54

**Figure 4.5****4.5 Conclusion**

The foregoing analysis has empirically established the fact that there is rural-urban divide in the state and this divide is more prominent in almost all the indicators in accessing health care facilities, education facilities and in employment generation in the state compared with the national average.

Although the gap between rural and urban areas in accessing health care services narrows down in case of both health outputs and inputs, the reduction is not significant for a long period of 29 years (from 1981 to 2010) for the state. The RUDI values confirm the findings that the rural-urban divide is more prominent in Assam than the country average during almost all the study years under consideration.

The rural-urban disparity in educational attainments still prevails significantly both for the state and the country. However, the picture of Assam is relatively bright in comparison with all India average. Assam performed comparatively well in respect of education outputs while the state performed poorly in some education inputs. The implications of this result may not be good for development of education for the state in future.

In case of employment generation, the striking point is that the rural-urban divide is more prominent in case of regular employees in Assam and the disparity

has widened more rapidly up to 2004-05. Although disparity has fallen in 2007-08 both for the state and the national average, this is due to the fact that there is a sharp fall in the employment in the regular employee categories irrespective of rural and urban areas both for the state and national average after economic reform started and the fall is more in urban areas. Casual labour is more in rural sector than in urban sector both for the state and national level.

Rural-urban disparity in average wage per day received by the worker is more prominent for regular wage employees for Assam than the all India average.

The change in the occupational distribution of working people in the state is comparatively less than the national average indicating that the economy of the state has remained fairly backward during the post-liberalisation period. The rural-urban divide is prominent in manufacturing sector showing less industrialisation in the rural areas for the state than the national average. The tertiary sector shows that there still exists a vast rural-urban disparity both for the state and the national level.

These findings support the view expressed by Kurian (2007) in the context of India that “there always existed a rural-urban divide in terms of economic and social development and this divide has also been widening in the recent past”.

Notes

1. **Principal Status (PS)** includes those who either worked or were looking for work for a relatively larger part of the 365 days preceding the date of survey.

Subsidiary Status (SS) includes those persons from among the remaining population who had worked at least for 30 days during the reference period of 365 days preceding the date of survey.

2. **Usual Status (US)** includes both PS and SS. **Current Daily Status (CDS)** gives the average picture of the number of person days in the labour force on a day during the survey period.

Current Weekly Status (CWS) provides the number of persons who worked for at least 1 hour or was seeking/ available for work at least 1 hour on any day during the 7 days preceding the date of survey.

Appendix :

Table: 4.11: Maximum and Minimum Values for calculating RUDI for Health Outputs

Indicators		Rural Area							Urban Area						
Health Output Indicators		1981	1985	1991	1995	2001	2005	2010	1981	1985	1991	1995	2001	2005	2010
1. CBR	Maximum Value	39.9 (U.P)	41.1 (Rajasthan)	37.3 (M.P)	36.0 (U.P)	33.9 (U.P)	32.2 (U.P)	29.7 (U.P)	33.9 (Bihar)	33.6 (Rajasthan)	30.3 (Rajasthan)	28.8 (U.P)	27.5 (U.P)	26.6 (U.P)	24.7 (U.P)
	Minimum Value	26.0 (Kerala)	23.1 (Kerala)	18.4 (Kerala)	15.3 (Kerala)	18.1 (Kerala)	16.9 (Kerala)	14.6 (Kerala)	23.2(Assam)	24.1 (Kerala)	18.1 (Kerala)	17.7 (Kerala)	17.7 (Kerala)	14 (WB)	12.1 (Kerala)
2. CDR	Maximum Value	18.0 (M.P)	17.2 (U.P)	14.9 (M.P)	11.9 (M.P)	11.1 (Orissa)	10.4 (M.P)	9.2 (Orissa, M.P)	9.9 (U.P)	9.6 (Rajasthan)	9.2 (M.P)	8.3 (U.P)	8.1 (U.P)	7.1 (M.P)	6.8 (Orissa)
	Minimum Value	6.7 (Kerala)	6.5 (Kerala)	6.2 (Kerala)	6.0 (Kerala)	6.5 (Kerala)	6.4 (Kerala)	4.8 (Delhi)	5.8 (Kerala)	6.6 (Kerala)	5.3 (Kerala)	6.0 (Kerala)	6.1 (Punjab)	5.4 (Andhra P)	4.3 (Delhi)
3. IMR	Maximum Value	157 (U.P)	154 (U.P)	125 (M.P)	104 (M.P)	100 (Orissa, U.P)	86 (Orissa, M.P)	68 (Orissa)	97 (U.P)	79 (M.P)	74 (M.P,U.P)	66 (U.P)	66 (U.P)	55 (M.P, Orissa)	47 (U.P, Chhattisgarh)
	Minimum Value	40 (Kerala)	32 (Kerala)	17 (Kerala)	16 (Kerala)	14 (Kerala)	12 (Kerala)	12 (Kerala)	24 (Kerala)	30 (Kerala)	16 (Kerala)	13 (Kerala)	16 (Kerala)	10 (Kerala)	12 (Kerala)
4. LEB	Maximum Value	85	85	85	85	85	85	85	85	85	85	85	85	85	85
	Minimum Value	25	25	25	25	25	25	25	25	25	25	25	25	25	25

Table: 4.12a: Maximum and Minimum Values for calculating RUDI for Health Inputs

Health Input Indicators		Rural Area			Urban Area		
		1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
1.INS	Maximum Value	88 (Kerala)	91.5 (Kerala)	100 (Kerala)	93 (Kerala)	99.4 (Kerala)	99.3 (Kerala)
	Minimum Value	8 (Bihar, Assam)	10 (Chhattisgarh)	7.5 (Chhattisgarh)	42 (Bihar)	12.1 (Bihar)	47.7 (Bihar)
2. VAC	Maximum Value	60 (TN)	78.4 (Kerala)	80.9 (TN)	73 (TN)	84.9 (Kerala)	83.7 (TN)
	Minimum Value	3.8 (Nagaland)	9.9 (Bihar)	31.1 (Bihar)	17 (Bihar)	22.4 (Bihar)	29 (Assam)
3. ANC	Maximum Value	97.8 (Kerala)	99.4 (Kerala)	95.9 (Goa)	99.3 (Kerala)	100 (Kerala)	98.5 (TN)
	Minimum Value	35 (Bihar)	51 (Chhattisgarh)	14.5 (Bihar)	68 (Bihar)	34.4 (Bihar)	36.2 (Bihar)
4. WAT	Maximum Value	73 (Delhi)	88 (Delhi)	48.6 (Punjab)	84 (Delhi)	76 (Delhi)	83.1 (TN)
	Minimum Value	8 (Kerala)	4.3 (Bihar)	0.9 (WB)	20 (Kerala)	34.6 (Bihar)	6 (Chhattisgarh)
5. SAN	Maximum Value	71 (Kerala)	82.7 (Kerala)	95.1 (Kerala)	83 (Kerala)	96.3 (Delhi)	99.5 (Manipur)
	Minimum Value	12.2 (Orissa)	10.5 (Bihar)	5.6 (Chhattisgarh)	13 (Bihar)	66.5 (Bihar)	65.5 (Chhattisgarh)

Table: 4.12b: Maximum and Minimum Values for calculating RUDI for Health Inputs

Health Input Indicators		Rural Area					Urban Area				
		1981	1986	1991	1996	2001	1981	1986	1991	1996	2001
6.HOS	Maximum Value	9.25 (Lakshadweep)	6.22 (Goa, Daman & Diu)	8.85 (Lakshadweep)	30.89 (Arunachal)	28.85 (Arunachal)	15.92 (Goa etc.)	11.26 (Sikkim)	13.51 (Sikkim)	17.82 (Andhra P)	99.62 (Andhra P)
	Minimum Value	0.2 (Assam)	0 (Mizoram, Sikkim)	0 (Chandigarh etc.)	0 (Chandigarh etc.)	0 (Meghalaya etc.)	1.06 (Delhi)	0 (Lakshadweep etc.)	0 (Lakshadweep etc.)	0 (Lakshadweep)	0.59 (M.P)
7.BED	Maximum Value	232 (Andaman & Nicobar)	317 (Lakshadweep)	309.83 (Lakshadweep)	203.24 (Arunachal)	190.10 (Arunachal)	1048 (Arunachal)	1182 (Sikkim)	1419 (Sikkim)	1151 (Sikkim)	2671.44 (Andhra P)
	Minimum Value	5.93 (Rajasthan)	0 (Sikkim)	0 (Meghalaya)	0 (Meghalaya etc.)	0 (Meghalaya etc.)	0 (Dadra & Nagar Haveli etc.)	0 (Lakshadweep)	0 (Lakshadweep etc.)	0 (Lakshadweep)	67.75 (M.P)
8.DIS	Maximum Value	43.85 (Andaman & Nicobar)	15.93 (Andaman & Nicobar)	36.54 (Sikkim)	44.76 (Andaman & Nicobar)	7.63 (Gujarat)	12.09 (A & N Islands)	24.61 (Maharashtra)	27.52 (Maharashtra)	50.51 (Goa etc.)	30.98 (Andaman & Nicobar)
	Minimum Value	0 (Mizoram)	0 (Sikkim, Lakshadweep)	0 (Lakshadweep)	0 (Rajasthan)	0 (Rajasthan etc.)	0 (Arunachal etc.)	0 (Mizoram etc.)	0 (Mizoram etc.)	0 (Mizoram etc.)	0 (Meghalaya etc.)

Table: 4.13: Maximum and Minimum Values for calculating RUDI for Education Outputs

Education Output Indicators		Rural Area					Urban Area				
		1993-94	1995-96	1999-00	2004-05*	2007-08	1993-94	1995-96	1999-00	2004-05*	2007-08
1. LTR	Maximum Value	83.5 (Kerala)	N.A	89 (Kerala)	88.0 (Mizoram)	93.5 (Mizoram)	86 (Kerala)	N.A	99 (Mizoram)	92.7 (Mizoram)	98.8 (Mizoram)
	Minimum Value	33.5 (Bihar)	N.A	42 (Bihar)	43.7 (Bihar)	56.1 (Bihar)	60 (Rajasthan)	N.A	70 (Bihar, U.P)	63.7 (Rajasthan)	75.8 (U.P)
2. GER	Maximum Value	N.A	68.2 (Nagaland)	N.A	N.A	N.A	N.A	87.3 (Meghalaya)	N.A	N.A	N.A
	Minimum Value	N.A	27.4 (Chandigarh)	N.A	N.A	N.A	N.A	55.8 (TN)	N.A	N.A	N.A
3. ATN	Maximum Value	93.2 (Kerala)	67.8 (Nagaland)	N.A	65.9 (Delhi)	64 (Meghalaya)	94.3 (Kerala)	87.3 (Meghalaya)	N.A	73.9 (Manipur)	74 (Arunachal)
	Minimum Value	53.5 (M.P)	27.4 (Chandigarh)	N.A	41 (Orissa)	34 (Chandigarh)	73 (U.P)	55.7 (TN)	N.A	36.6 (Dadra & Nagar Haveli)	48 (Gujarat, Punjab, Sikkim)
4. DRP	Maximum Value	45.4 (Bihar)	94 (Daman & Diu)	N.A	N.A	4.64 (Assam)	25.6 (U.P)	66.7 (Chandigarh)	N.A	N.A	9.83 (Andhra P)
	Minimum Value	3.3 (Kerala)	14.4 (Lakshadweep)	N.A	N.A	0 (Chandigarh etc.)	2.3 (Kerala)	27.9 (Bihar)	N.A	N.A	0 (Sikkim etc.)
5. ADL (for not literate only)	Maximum Value	N.A	67.5 (Bihar)	N.A	54.5 (Bihar)	54.7 (Rajasthan)	N.A	33.5 (Bihar)	N.A	25.8 (Bihar)	98.5 (Mizoram)
	Minimum Value	N.A	11.8 (Kerala)	N.A	3.3 (Mizoram)	8 (Kerala)	N.A	2.9 (Mizoram)	N.A	0.08 (Mizoram)	72.4 (Bihar)

*literacy rate is for 0 and above 0 years.

Table: 4.14: Maximum and Minimum Values for calculating RUDI for Education Inputs

Education Input Indicators		Rural Area				Urban Area			
		2004-05	2006-07	2007-08	2008-09	2004-05	2006-07	2007-08	2008-09
1. PKM	Maximum Value	98.02 (Chandigarh)	100 (Daman & Diu)	98.48 (Haryana)	100 (Daman & Diu)	90.54 (Chandigarh)	97.93 (Goa)	100 (Daman & Diu)	100 (Daman & Diu)
	Minimum Value	3.02 (Mizoram)	5.23 (Mizoram)	2.93 (Assam)	2.54 (Mizoram)	25 (WB)	20.93 (Mizoram)	16.01 (Manipur)	16.34 (Mizoram)
2. CLR	Maximum Value	15.9 (Chandigarh)	16.8 (Chandigarh)	17.4 (Delhi)	16.4 (Chandigarh)	24.1 (Chandigarh)	29.2 (Chandigarh)	29.6 (Chandigarh)	28.4 (Chandigarh)
	Minimum Value	2 (Assam)	2 (Assam)	2.1 (Assam)	2.4 (Assam)	4 (M.P)	3.1 (Bihar)	3.1 (Bihar)	4.1 (Assam)
3. PTR	Maximum Value	78.83 (Bihar)	64 (Bihar)	54 (Bihar)	56 (Bihar)	65.66 (Bihar)	65 (Bihar)	50 (Bihar)	52 (Bihar)
	Minimum Value	14.26 (Sikkim)	12 (Sikkim)	13 (A & N)	13 (A & N)	14.51 (Mizoram)	13 (Mizoram)	15 (J & K)	14 (J & K, Mizoram)
4. STR	Maximum Value	54.48 (Kerala)	79.93 (Gujarat)	83.41 (Dadra & Nagar Haveli)	89.18 (Dadra & Nagar Haveli)	50.45 (Kerala)	59.5 (Kerala)	63.30 (Kerala)	53.94 (Dadra & Nagar Haveli)
	Minimum Value	10.27 (Chandigarh)	0.30 (Rajasthan)	7.46 (Manipur)	0.10 (Sikkim)	17.01 (Nagaland)	0.31 (Rajasthan)	0.5 (Sikkim)	1.46 (Haryana)
5. BWL	Maximum Value	100 (Chandigarh)	100 (Chandigarh)	100 (Chandigarh)	98.47 (Delhi)	99.18 (Delhi)	99.11 (Delhi)	100 (Chandigarh)	100 (Chandigarh)
	Minimum Value	11.43 (Tripura)	13.3 (Tripura)	13.48 (Tripura)	12.47 (Tripura)	39.11 (Mizoram)	40.40 (Meghalaya)	39.94 (Bihar)	41.79 (Bihar)
6. NBL	Maximum Value	12.82 (Chhattisgarh)	27.39 (Jharkhand)	31.08 (Assam)	14.77 (Bihar)	14.57 (Bihar)	13.29 (Bihar)	16.48 (Bihar)	16.06 (Bihar)
	Minimum Value	0 (Chandigarh)	0 (Chandigarh)	0 (Chandigarh etc.)	0 (Delhi, TN etc.)	0 (Kerala etc.)	0 (Delhi, Sikkim etc.)	0 (Goa etc.)	0 (Delhi, Assam etc.)
7. DWF	Maximum Value	100 (Chandigarh)	100 (Chandigarh, TN)	100 (Chandigarh, TN etc.)	100 (TN, Delhi etc.)	98.65 (Chandigarh)	100 (Chandigarh, TN etc.)	100 (TN, Chandigarh etc.)	100 (TN, Delhi etc.)
	Minimum Value	37.67 (Meghalaya)	41.64 (Meghalaya)	49.09 (Meghalaya)	49.15 (Meghalaya)	64.12 (Meghalaya)	67.72 (Meghalaya)	72.82 (Meghalaya)	73.38 (Meghalaya)
8. ELC	Maximum Value	100 (Chandigarh)	100 (Chandigarh)	100 (Chandigarh etc.)	100 (Pondicherry, Chandigarh etc.)	98.65 (Chandigarh)	100 (Chandigarh, A & N)	100 (Chandigarh)	100 (Pondicherry, Chandigarh etc.)
	Minimum Value	1.11 (Bihar)	4.76 (Assam)	2.59 (Mizoram)	2.93 (Bihar)	11.13 (Bihar)	14.77 (Bihar)	11.12 (Bihar)	12.47 (Bihar)
9. PLG	Maximum Value	79.98 (Haryana)	80.82 (Haryana)	83.80 (Delhi)	84.02 (Haryana)	90.54 (Chandigarh)	96.50 (Chandigarh)	97.95 (Chandigarh)	98.64 (Chandigarh)
	Minimum Value	13.42 (Mizoram)	9.26 (Mizoram)	5.91 (Mizoram)	9.76 (Mizoram)	9.15 (Mizoram)	15.81 (Mizoram)	15.01 (Mizoram)	14.13 (Mizoram)
10. GTF	Maximum Value	85.71 (Delhi)	94.29 (Chandigarh)	93.33 (Chandigarh)	93.33 (Chandigarh)	88.51 (Chandigarh)	93.71 (Chandigarh)	95.21 (Chandigarh)	93.88 (A & N)
	Minimum Value	4.31 (Mizoram)	7.22 (Meghalaya)	8.58 (Meghalaya)	9.51 (Meghalaya)	20.39 (Mizoram)	21.57 (Assam)	25.43 (Assam, Kerala)	35.14 (Meghalaya)
11. BOK	Maximum Value	90.85 (Maharashtra)	91.95 (Delhi)	89.23 (Maharashtra)	88.06 (Haryana)	79.71 (Haryana)	96.70 (Delhi)	87.34 (Haryana)	87.41 (Haryana)
	Minimum Value	2.46 (Mizoram)	5.13 (Mizoram)	3.85 (Mizoram)	6.77 (Mizoram)	7.21 (Mizoram)	8.95 (Mizoram)	9.72 (Mizoram)	10.07 (Mizoram)

Table: 4.15: Maximum and Minimum Values for calculating RUDI for Employment Generation Indicators

Employment Generation Indicators		Rural Area					Urban Area				
		1993-94	1995-96	1999-00	2004-05	2007-08	1993-94	1995-96	1999-00	2004-05	2007-08
1. EMP	Maximum Value	57.6(Andhra P)	N.A	63.5 (Chandigarh)	N.A	54.4 (Andhra P)	45.5 (Dadra & Nagar Haveli)	N.A	42.2 (A & N Islands)	N.A	41.9 (Sikkim)
	Minimum Value	28.7(Lakshadweep)	N.A	28.5 (Lakshadweep)	N.A	29.4 (Delhi)	26.1 (Nagaland)	N.A	26.6 (Bihar)	N.A	27.7 (Bihar)
2. PLF	Maximum Value	57.8 (Andhra P)	55.1 (Andhra P)	63.9 (Chandigarh)	54.8 (Andhra P)	N.A	45.7 (Dadra & Nagar Haveli)	40.2 (T.N)	45.4 (A & N Islands)	47.4 (Himachal P)	N.A
	Minimum Value	33.8 (Nagaland)	32.1 (Assam)	30.7 (Tripura)	31.7 (Delhi)	N.A	28.0 (Nagaland)	26.4 (Bihar)	27.5 (Arunachal)	29 (Bihar)	N.A
3. WPR	Maximum Value	84.4 (Dadra & Nagar Haveli)	N.A	79.0 (Chandigarh)	82.5 (Meghalaya)	79.1 (Chhattisgarh, Nagaland)	69.3 (Dadra & Nagar Haveli)	N.A	55.3 (Dadra & Nagar Haveli)	62 (Himachal P)	58.6 (Tripura)
	Minimum Value	43.9 (Lakshadweep)	N.A	45.8 (Lakshadweep)	45.2 (Tripura)	51.6 (Goa)	40.8 (Lakshadweep)	N.A	41.4 (J & K)	39 (Tripura)	43.7 (Bihar)
4. REM	Maximum Value	64.3 (Delhi)	N.A	56.3 (Chandigarh)	54.6 (Delhi)	26.3 (Daman & Diu)	69.5 (Arunachal)	N.A	71.7 (Nagaland)	69.3 (Chandigarh)	28.1 (Sikkim)
	Minimum Value	4.0 (M.P)	N.A	3.5 (Bihar)	2.7 (Bihar)	1.1 (Bihar)	26.8 (Kerala)	N.A	29.1 (Kerala)	28.7 (Kerala)	7 (Bihar)
5. WAG	Maximum Value	N.A	N.A	N.A	N.A	329 (Lakshadweep)	N.A	N.A	N.A	298 (Mizoram)	390 (Bihar)
	Minimum Value	N.A	N.A	N.A	88.44 (M.P)	128 (Chhattisgarh)	N.A	N.A	N.A	158 (Haryana)	211 (Haryana)

Sources: The sources of Table 4.11, Table 4.12a, Table 4.12b, Table 4.13, Table 4.14 and Table 4.15 are same as in Table 4.1, Table 4.2a, Table 4.2b, Table 4.4, Table 4.5 and Table 4.7 respectively.

Chapter 5

Urban Bias in the Government Policies of Assam

In the previous chapter, the nature and magnitude of rural-urban divide with reference to health, education and employment generation is assessed for the state. It has been found that there exists rural-urban divide in Assam and this divide is more prominent in almost all the indicators in accessing health care facilities, education facilities and in employment generation in the state compared with the national average. Under the circumstances, it is pertinent to unearth the reasons behind the rural-urban divide in the state.

The literatures have identified two main reasons behind the rural-urban divide in general: urban biased policies of the government and weak sectoral linkages (Mujeri *et al.*, 1993; Tacoli, 1998; Yang, 1999; Knight and Song, 1999; United Nations, 2001; Braun, 2007). As for example, Garg (1998), while carrying out a study on health sector finance in India, has observed that even though rural areas account for about 73 per cent of the population, only 33 per cent of the government health resources have gone to the rural areas in the country. He maintains that in terms of per capita allocations, urban population receives more than 5 times what the rural population receives. This has led to wide disparity between rural and urban areas in the health status indicators.

As stated earlier, the idea of 'urban bias' got sharpened in the late-1960s and 1970s by Michael Lipton and is supported by many others maintaining that 'urban bias' is a moving force behind slow and inequitable development in Less Developed Countries (Mujeri *et al.*, 1993; Tacoli, 1998). Although there are critics of Lipton's Thesis, the issue is considered relevant in the context of the state as in a study, made by Mitra (2007) for the states of India, found an increasing urban bias in Assam. He measured urban bias by a formula based on the per capita rural and urban expenditure. He found an increasing urban bias for Assam from a relatively lower value of 0.70 in 1987-88 to a higher value of 0.82 in 1999-00 (i.e by 17 per cent increase during the period 1987 to 1999). Urban bias is increased mostly in post-reform period in the state.

Thus, in this chapter, an attempt has been made to examine whether urban bias exists in the policies of the government. This has been studied with reference to three aspects of development -- health, education and employment generation in the state.

5.1 Urban Bias in Health Sector

Urban bias in the health sector can be examined by comparing the expenditures incurred by the government in the health sector across rural and urban areas. Accordingly, the total per capita actual expenditures for the rural and the urban areas in health sector in the state is compared in the present study to examine whether there exists any urban bias in the policy making of the government in Assam. The relevant data on health care expenditure by the government for rural and urban areas have been collected from the Budget Reports of Government of Assam from 1985-86 to 2006-07. For comparison, the per capita expenditures on health for rural and urban areas have been estimated from the available data. The results are presented in Table 5.1.

The table and Figure 5.1 show a vast gap between rural and urban per capita health expenditure during the period under consideration. In 1985-86, per capita annual expenditure for urban people (Rs. 78.48) was eight times higher than that of the rural people (Rs. 9.49) indicating a clear bias in favour of urban people. The highest gap of Rs.171.42 was observed in 1988-89 and the gap further widened to Rs.227.69 in 1996-97. However, the gap reduced a little bit by 2006-07. The per capita government expenditure on health care services for rural areas went up by Rs.43.98 only during a long period from 1985-86 to 2006-2007 whereas for urban areas, it increased by Rs.168.32 during the same period. During this period the per capita government expenditure on health care services both for rural and urban areas has increased substantially.

Table 5.1

Per Capita Expenditure for Health Care Services for Rural and Urban Areas of the State

Years	Per Capita Expenditure on Health Care Services (in Rs.)	
	Rural Areas	Urban Areas
1985-86	9.49	78.48
1986-87	11.05	90.64
1987-88	8.22	167.41
1988-89	3.01	174.43
1989-90	2.77	127.58
1990-91	13.27	145.65
1991-92	9.20	131.18
1992-93	13.27	217.02
1993-94	14.07	194.43
1994-95	22.21	183.63
1995-96	27.91	176.20
1996-97	28.86	256.55
1997-98	24.49	246.21
1998-99	27.57	125.57
1999-00	39.05	149.00
2000-01	44.29	190.78
2001-02	46.82	168.18
2002-03	39.30	154.75
2003-04	39.53	193.66
2004-05	45.55	254.32
2005-06	39.24	203.20
2006-07	53.47	246.80

Source: Budget Reports of Government of Assam from 1985-86 to 2006-07.

Notes:

1. The expenditure for the year 2006-07 is taken from revised budget estimate
2. Calculating per capita expenditure, projected population figures are taken for 2002, 2003, 2004, 2005, 2006 from www.censusindia.net/projection-report.pdf
3. No rural urban breakup is found in the budget for the periods 1981-82, 1982-83, 1983-84.
4. To calculate per capita expenditure for the year 1985, 1986, 1987, 1988, 1989, 1990 and 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000 population figures for rural and urban areas are projected by exponential growth projection formula $P_t = P_0 e^{rt}$.
5. The per capita expenditures for the year 1997-98 and 1998-99 exclude expenditure on 6th schedule areas.

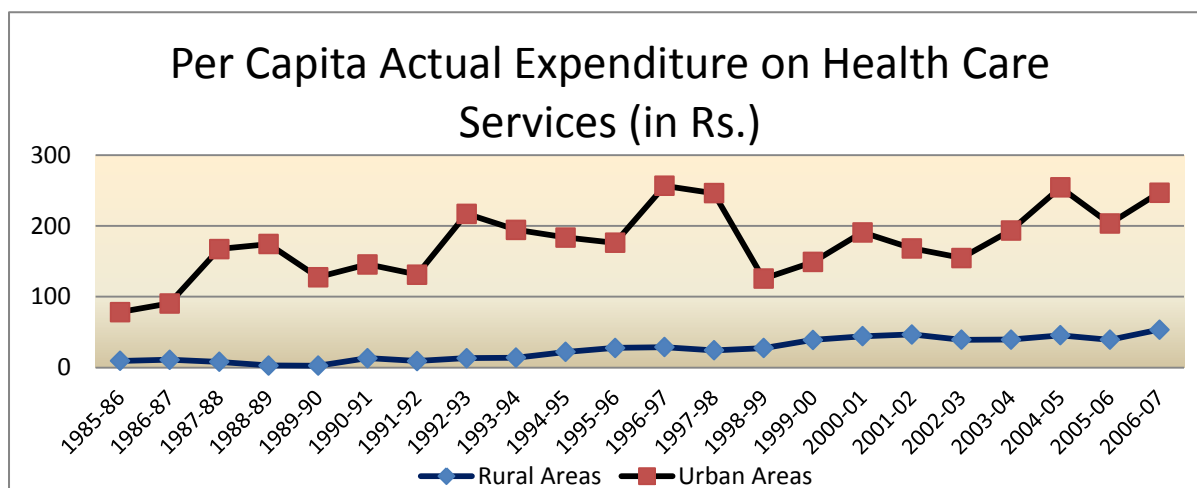


Figure 5.1

Thus, budget allocation on health care services both for rural and urban areas confirms the bias of the policy makers in favour of urban areas in the state. The finding is in line with those of Duggal and Amin (1989), Garg (1998) and Sarma (2004).

5.2 Urban Bias in Education Sector

Urban bias in education sector can be examined by comparing the grants allotted to rural areas and urban areas in education sector by the government. Therefore, to examine whether there exists any urban bias in the policy making of the government in education sector in the state, different types of grants allotted to schools located in rural and urban areas are compared with available data. The relevant data have been collected from the Directorate of Elementary Education, Government of Assam. For comparison, the per capita expenditures on students for rural and urban areas have been estimated from the available data. The results are presented in Table 5.2. As evident from the table, there was clearly an urban bias in granting allocation of 11th Finance Commission grant for the year 2002-03. However, new school building grants for the same year show a different picture. As against a per capita expenditure of Rs.34.38 for rural students, nothing was spent for urban students. While new school building grants per student for urban areas was higher in the years 2003-04 and 2006-07, the grant per student for rural areas was higher in the years 2004-05 and 2005-06. Urban bias has been noticed in the year 2002-03, 2004-05 and 2005-06 regarding the additional class room &

repairing and renovation grants. However, per capita expenditure on rural students is more in the same grants for the year 2003-04 and 2006-07. The 12th Finance Commission grants for supply of blackboard and cooking equipment in 2006-07 show higher expenditure on urban students compared with rural students. However, kitchen shed and store room grants for rural student is found to be higher than that of urban students. Thus, the data do not portray any clear indication of urban bias in the policy making of the government in education sector in the state. No clear indication of urban bias has been noticed in Figure 5.2a and Figure 5.2b also. Moreover, the data available are mainly for elementary education for recent years and in these years, government has given more importance on universal elementary education thereby giving importance to rural areas. Higher educational institutions are located mostly in urban areas, whereas elementary and secondary educational institutions are located in both rural and urban areas. Therefore, examination of urban bias is meaningful mainly for elementary and secondary education.

Table 5.2
Per Capita Expenditure for Rural and Urban Students of Assam in School Grants

Grants	Year	Per Capita Expenditure on Students(Rs.)	
		Rural	Urban
11th Finance Commission grant	2002-03	38.31	321.6
New School Building grant*	2002-03	34.38	Nil
	2003-04	20.1	27.32
	2004-05	19.31	2.39
	2005 and 06	179.78	Nil
	2006-07	29.14	29.65
Additional Class room & Repairing and Renovation grant*	2002-03	186.98	1832.77
	2003-04	35.02	10.36
	2004-05	47.42	65.37
	2005-06	44.79	69.5
	2006-07	800.47	649.42
12th Finance Commission grant for supply of Blackboard (Rs.489.98 per school)	2006-07	2.95	2.81
Kitchen shed and store room grant (Rs.60,000 per school)*	2006-07	170.2	120.28
For Provisioning/Replacement of cooking equipment grant (Rs.5000 per school)*	2006-07	23.72	10.52
12th Finance Commission award for construction of Girls' Common Room (Rs.1 lakh per school)**	2006-07	46.39	36.13
Supply of science Kit Box to ME school (Rs. 42,000 per school)	2006-07	9.29	8.64

Source: Directorate of Elementary Education, Kahilipara and District Office, Kamrup District, Chatribari, Guwahati.

Notes:

Per capita expenditure on rural and urban students is calculated dividing total expenditure on rural and urban students by total rural and urban enrolment of students respectively for respective years. The figure for the year 2005-06 is used to calculate the per capita expenditure for the year 2006-07 due to non-availability of the enrolment figure for the year 2006-07. The enrolment of students figures are collected from Census Report, 2001 from Assam at a Glance, Directorate of Census Operations, Assam, and www.dpepmis.org accessed on 29-10-09.

* The grants are only for elementary education in Kamrup district from Sarba Siksha Abhijan (SSA)

** The grants are for secondary schools in Kamrup district, Assam and due to non-availability of rural-urban break up data for student enrolment in Kamrup district for 2006-07, the per capita rural and urban expenditures are calculated by dividing total grants by the student enrolment in secondary school as given in 7th All India Educational Survey.

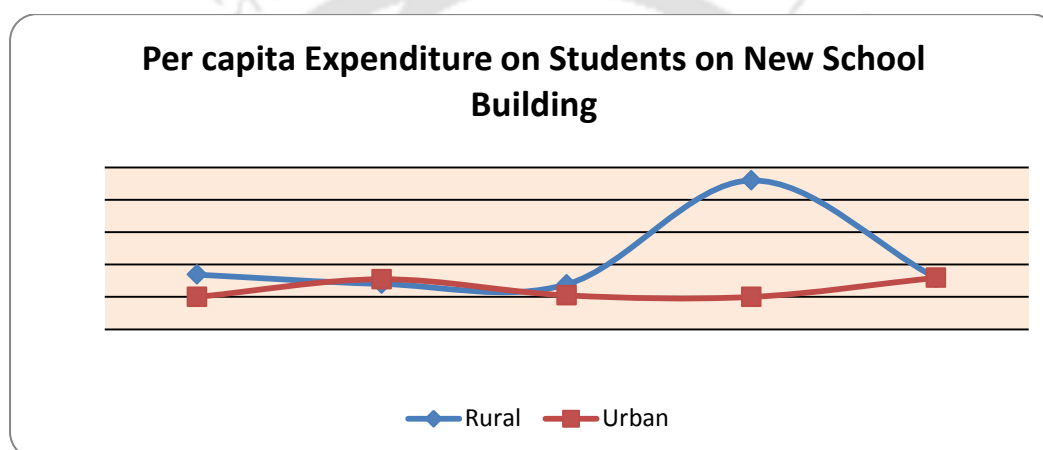


Figure 5.2a

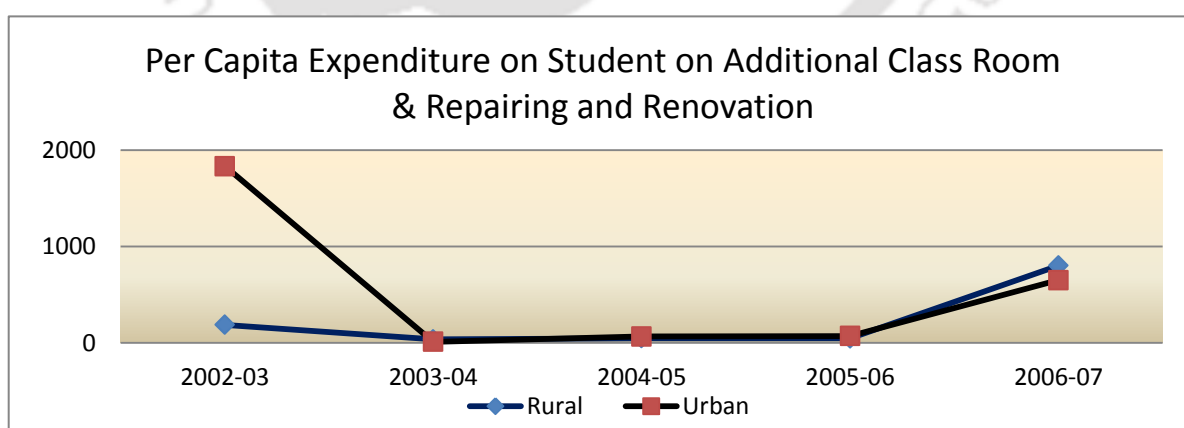


Figure 5.2b

5.3 Urban Bias in Employment Generation

Since data on government spending on creation of employment opportunities could not be obtained separately for rural and urban areas, examining urban bias in employment generation in straight forward manner is not very easy. Therefore, an alternative route has been taken to examine urban bias in employment generation by taking a few proxy parameters such as per capita expenditure on rural and urban areas, wages in agricultural and industrial labourers, investment in agricultural and industrial sectors, social security measures etc.

Since 1930s, Keynes argued about the positive relationship between government spending and employment growth in the economy. Therefore, government spending on basic services for rural and urban areas is compared to examine urban bias in employment generation in the state. Similarly, there is a history of debate about the relationship between wage rates and employment. A familiar conclusion of marginal analysis is that a rise in the wage rate will, *ceteris paribus*, lead to a fall in total employment; and conversely, a fall in the wage rate will increase the level of employment. However, it is criticised by other economists and according to them, this is not valid for developing countries. A rise in the wage rate may increase total employment in some circumstances in developing countries. Although there are criticisms of the relationship between employment and wage rates, in this study, assuming positive relationship between wage rates and employment generation, the wage rates of agricultural labourer and industrial labourer are compared to examine urban bias in employment generation in the state.

Recognising the importance of investment in employment generation, investments in agricultural and industrial sectors are also compared to examine urban bias in employment sector. In this regard, the statement made by IGIDR (2002) is worth mentioning: “since most poor live in rural areas, increasing employment in agriculture through higher investment in irrigation and other infrastructure, for example, roads and electricity can induce growth in the state.”

According to Parthasarathy (2003), the most important social security need of the poor is food security. But, food security cannot be ensured without access to adequate purchasing power for the wage earners. Since the means of obtaining

purchases is employment, employment security is essential for achieving food security. Therefore, “the safety net programmes of the government can be designed so as to create employment opportunities for uneducated youths” (IGIDR, 2002). Keeping in view the relationship between social security measures and employment, urban bias in employment generation is examined by comparing social security provided across rural and urban areas.

Thus, in this study, the four parameters, namely, per capita government expenditure on basic services on rural and urban areas, wages in agricultural and industrial labourers, investment in agricultural and industrial sectors and social security measures are taken as the proxy parameters to examine urban bias in employment generation in the state.

5.3.1 Per Capita Total Government Expenditures in Rural Areas and Urban Areas

To examine the urban bias of the policymakers in per capita total expenditure in rural and urban areas in the state, the relevant data have been collected from the Report of 11th Finance Commission as available in Assam Development Report, 2002. According to the Report, “The local governments in Assam are not developed well particularly in rural areas. For example, as opposed to 2500 people that are served by a rural panchayat on average among all the states in the country, the corresponding number is more than 7000 for Assam. While the numbers served by urban municipalities is lower for this state at 3100 against the all-state average of 5600. ... Rural governments in Assam are much poorer than their urban counterparts and compared to other states, both urban and rural local governments in Assam play a relatively insignificant role in the provision of local services.”

Table 5.3 shows that the rural governments in Assam spend much lesser in comparison with all India average. In 1997-98, per capita total expenditure in rural Assam was a low of Rs. 17 against Rs. 288 in rural India. Even in urban areas, the per capita spending made by local bodies in Assam is Rs. 176 per annum against the average figure for all-states of around Rs 6967. The expenditure on core services in Assam is 38 per cent of the total by urban governments and 27 per cent

by rural governments. This reflects urban bias and to a great extent lack of decentralisation in the state.

The rural-urban gap in per capita government spending during 1990-91 to 2009-10 in the state is calculated from the differences in government spending in rural and urban areas from the Finance Commission reports and the results are presented in Table 5.4. It is evident from the table that urban bias is visible till 2002-03 and the rural-urban gap was widening during this period. However, after the introduction of the various schemes for rural and urban areas, the per capita rural spending has increased than the per capita urban spending indicating negative urban bias.

Table 5.3
Composition of Local Government Finances: 1997-98

Area of Revenue and Expenditure		Rural		Urban	
		Assam	India	Assam	India
Total Revenue (Rs. Lakh.)		1550	1935554	3960	1217879
Total Expenditure (Rs. Lakh)		4057	2093116	5338	15130843
Per capita total revenue (Rs.)		6.4	266.23	130.86	560.8
Per capita total expenditure (Rs.)		16.74	287.9	176.41	6967.39
Revenue Composition (%)	Own Revenue	22	3	60	69
	Tax	22	2	21	51
	Non-tax	0	2	39	18
	Other revenue	78	97	40	31
Expenditure Composition (%)	Exp. on core services	27	7	38	67
	Other exp.	73	93	62	33

Source: Report of the Eleventh Finance Commission from Assam Development Report, 2002

Note: Core services comprise of water supply, street lighting, sanitation and roads.

Table 5.4
Rural-Urban Divide in Per Capita Government Spending in Assam

Year	Rural-Urban Gap
1990-91	103.22
1991-92	107.75
1992-93	94.82
1993-94	99.92
1994-95	111.42
1995-96	108.46
1996-97	134.27
1997-98	152.76
1998-99	136.8
1999-00	126.14
2000-01	152.79
2001-02	156.7
2002-03	170.53
2003-04	N.A
2004-05	N.A
2005-06	-7.39
2006-07	N.A
2007-08	-15.22
2008-09	N.A
2009-10	-23.4

Source: 11th, 12th and 13th Finance Commission Reports [from Government of India (2000a), Government of India (2004)]

Note: The data from 1990-91 to 2002-03 are from the differences of the urban and rural per capita spending by the government through finance commission only. However, the data from 2003-04 to 2007-08 are from the differences of the urban and rural per capita spending through finance commission and various schemes (like SGRY, IAY, SGSY, IWDP etc. in rural areas and SJSRY, IDSMT, UIDSSMT, IHSDP etc. in urban areas.)

N.A means data are not available in the reports.

5.3.2 Wages of Agricultural and Industrial Workers

There is no uniform and comprehensive wage policy for all sectors of the economy in India. Wages in the organised sector are determined through negotiations and settlements between employer and employees. In unorganised sector, where labour is vulnerable to exploitation due to illiteracy and having no effective bargaining power, minimum wage rates are fixed and revised by Central and State governments under the provision of Minimum Wages Act, 1948. Moreover, many agricultural labourers¹ are under-employed and the wages received by them are even lower than the minimum wages.

To compare the wage rates of agriculture workers and industrial workers in Assam, the relevant data have been collected from the various publications of state as well as central government and comparisons are presented in Table 5.5. It is

evident from the table that wage rates for unskilled workers in industrial sector are higher than that of agriculture sector. The compound annual growth rate (CAGR) of wage rate for agricultural labourer increases by 17.90 per cent from 1980-81 to 2004-05 against the CAGR of wage of industrial labourer by 19.23 per cent during the same period in the state.

Table 5.5

Average Daily Wage Rates of Agriculture and Industrial Workers in Assam (in Rs.)

Year	Wages per Agriculture Worker per Day**	Wages per Industrial Worker per Day
1980-81*	5.83	7.75
1981-82*	6.37	N.A
1982-83*	7.83	N.A
1983-84*	9.23	N.A
1984-85*	10.57	N.A
1985-86*	12.13	N.A
1986-87*	13.33	16.36
1987-88*	15.33	17.45
1988-89*	15.93	19.8
1989-90*	17.2	23.28
1991-92*	23.18	N.A
1992-93*	24.36	N.A
1993-94*	26.54	N.A
1994-95*	29.21	N.A
1995-96*	30.63	N.A
1996-97*	34.64	N.A
1997-98*	38.3	N.A
1998-99*	41.29	43.6
1999-00*	43.9	71.36
2000-01*	44.53	81.1
2001-02*	45.54	74.31
2002-03	50.02	87.7
2003-04	54.99	86.81
2004-05	58.45	90.97
2005-06	62.88	N.A
CAGR of wages(%) from 1980-81 to 2004-05	17.90	19.23

Source: Government of Assam's Publications for various years and Ministry of Statistics and Programme Implementation, Government of India.

Notes:

*Data for agricultural labourers are for the year 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002.

** Agriculture labour includes unskilled field labour, herds man and other agriculture labourer Wages for agricultural labourers are from Directorate of Economics and Statistics, Assam from the economic survey of 1981-82, 1989-90, 1997-98, 2004-05 and 2006-07.

Wages for industrial workers are from Annual Survey of Industries, Survey Results (factory sector).

Table 5.6 depicts the annual percentage change in real wages for unskilled agricultural labourers in Assam vis-à-vis India. During the period 1991-92 to 1999-00, the CAGR of real wages for unskilled agricultural labourer in Assam has been found to be negative (-0.12 per cent) against a positive value for the country as a whole (3.36 per cent). This reflects relatively poorer economic condition of the unskilled agricultural labourer in the state compared with their counterparts in the rest of the country.

Table 5.6
Annual % Change in Real Wages for Unskilled Agricultural Labour

	'91-92	'92-93	'93-94	'94-95	'95-96	'96-97	'97-98	'98-99	'99-00	CAGR
Assam	-8.84	0.75	-6.58	-1.67	2.68	1.52	0.77	1.18	-1.02	-0.12
India	-6.15	5.24	5.61	-0.39	0.72	6.37	7.17	1.56	1.15	3.36

Source: IGIDR (2002)

From the analysis it is revealed that the annual growth rate of wages of agricultural labourers has declined during the post-reform period whereas in case of manual non-agricultural wages, there was no decline in the growth. The finding also supports the view expressed by Dev (2006) for the country as a whole that the wage policy historically had an urban bias and liberalisation intensifies this bias.

5.3.3 Investment in Agriculture and Industry

It is well known that higher investment induces higher economic growth and higher economic growth, in turn, induces higher investment. Therefore, there is a virtuous circle between higher investment and higher growth. For overall growth of an economy, balanced development of all the sectors in the economy is required.

Investment in industrialisation is considered to ensure productivity gains that benefit the entire society. The additional advantages of industrialisation include, among others, higher wages, lower sensitivity to economic shocks, positive spillovers between industry and agriculture, etc. However, these positive benefits are subject to a number of pre-conditions and the actual impact varies for different regional economies. As for the case of Assam in the north eastern region of India, returns from investment in industrial sector are subject to a number of factors. Bounded by a number of foreign countries, the state and the region is

connected with the rest of the country with a small land corridor, popularly termed as “chicken’s neck.” Partition of India in 1947 cut all the traditional routes of the state with the rest of India leading to greater transportation cost for raw materials and goods transported from outside the state. The comparative cost advantage of production in a limited number of commodities gets nullified due to the smallness of the market in the region (due to smaller overall population size) and underdeveloped infrastructure facilities. Because of this, investment in industries in the region is not gaining momentum although the state has a long history of industrialisation. The benefits of a limited urban industries, have also not spilt over to the surrounding rural areas in the state.

On the other hand, the agriculture sector is always recognized for ensuring food security and source of employment. The sector assumes greater importance for the developing economies where a vast majority of the population depends upon agriculture for their livelihood. The fast growing economies of the Southeast Asian countries have shown a synergetic mix of agriculture/rural and industrial/urban activities in the process of economic development (UNDP, 2000). Although the returns of industrialisation policies implemented in many developing and emerging economies is well accepted, in a country or a region with overriding agriculture sector need the development of the sector first to generate sufficient demand to stimulate industrialisation with strong linkages in developing economies (Vogel, 1994). Hence, the growth of agriculture is the determinant for the rise of the non-farm sector (Dutta, 2004). However, studies have pointed out that many developing countries have not given sufficient importance to agricultural sector, and have rather given higher priority to industrialisation. According to Meier and Rauch (2000), less than 20 per cent of investment for development has been made in agriculture sector which results rural-urban disparity. Thus, it is implicit that there has been an urban bias in the policies of the government across countries in the world. The Ministry of Agriculture and Co-operation, Government of India has also echoed the same opinion while it stated, “There has been a distinct urban bias injected into development policies by disproportionate political influence of the urban minority that results in the transfer of surpluses from agriculture to the urban-industrial sector” (Government of India, 2000b). In India, agriculture supports almost 60 per cent of the workforce. But the lion’s share of India’s

national resources is directed to the non-agricultural sector. The agricultural investment is only 20 per cent of the budget (Nath, 2007). A study on public investment for the states of India for the period 1974-75 to 1996-97 shows that less investment has been made in the agriculture sector of states like Assam, Tamil Nadu and West Bengal (Chand, 2000).

The economy of Assam is agriculture dependent and relatively backward. While investment in industries in the state is subject to a number of pre-conditions, investment in agriculture, on the other hand, can ensure surplus production resulting in diversification. As the sector has a better linkage with other sectors of the economy, this may help ensure better overall development of the economy. However, not only the agriculture sector has remained backward compared to the rest of the country, investment in the sector has also been not adequate so far (Chand, 2000). In view of this, there is a need to examine the flow of investment to different sectors of the economy.

Accordingly, a comparison of the government investment made in agriculture and industry in the state in the past has been made in this study. The relevant data, for this purpose, have been collected from the Directorate of Economics and Statistics, Government of Assam. Here, the trend of capital investment in agriculture and industry in Assam is presented in Table 5.7. The table shows that the public investment in agriculture and allied services was relatively higher than the public investment in industry and minerals for the entire period except in the years 1995-96, 1996-97 and 1997-98. Apparently this shows a relatively lower level of industrialisation in the state. However, considering a lower overall level of industrialisation and very weak state public sector enterprises in the state, the outcome is not surprising. The CAGR during the period from 1980-81 to 2007-08 shows a relatively higher growth rate for industry and minerals (17.07 per cent) compared with that for agriculture and allied services (14.71 per cent).

Table 5.7
Capital Investment in Agriculture and Industry by Assam Government at
Current Prices (Rs. in lakh)

Year	Agriculture and Allied Services	Industry and Minerals
1980-81	563	25
1981-82	1469	166
1982-83	1566	145
1983-84	1716	274
1984-85	2418	974
1992-93	1356	889
1993-94	2228	1807
1994-95	2584	2019
1995-96	1715	1922
1996-97(RE)	2645	4145
1997-98(BE)	1943	3933
1999-00	4308	297
2000-01	13514	931
2001-02	9626	161
2002-03	10824	151
2003-04	21397	81
2004-05	32373	200
2005-06	27545	197
2006-07	40157	9989
2007-08	22906	1760
CAGR (%) from 1980-81 to 2007-08	14.71	17.07

Source: Directorate of Economics and Statistics, Government of Assam, (from Assam Budget in Brief, 1997-98; 2008-09 and Statistical Handbook, Assam, 1984, 1994, 1995, 2003, 2004, 2006, 2007, 2008, 2009).

Note: (RE) implies Revised Estimate; (BE) implies Budget Estimate.

5.3.4 Safety Net Programmes of the Government across Rural and Urban Areas

Generally, social safety nets programmes are launched by the government to provide economic as well as social security to the weaker section of the society in a welfare state. In India, safety nets are in the form of food subsidy; fertiliser subsidy; free education up to elementary level; free provision of health services through a network of sub centres, primary health centres, community health centres and hospitals; rural development programmes and integrated child development services (ICDS).

To examine urban bias in the policies of the government in the state, rural-urban differences in the provision of social safety nets are examined. The relevant data have been collected from the Statistical Handbook, Assam and NSS Reports.

The following tables show the rural-urban differences in the provision of social safety nets in the state with reference to the following: Number of Fair Price Shops and Beneficiaries of Public Distribution System (PDS).

The distribution of fair price shop in rural and urban areas in the state is presented in Table 5.8. The average numbers of people per fair price shop for rural and urban areas in the state are calculated by dividing number of shops by projected population figures for rural and urban areas of Assam in the respective years.

No urban bias is noticed in availability of fair price shops in the state as average number of people per fair shop is more in urban areas than in rural areas for the period from 1993 to 2008-09.

Table 5.8
Number of Fair Price Shops in Assam

Year	No. of Shops			Average no. of People per Fair Shop		
	Rural	Urban	Total	Rural	Urban	Total
1993	24,197	3238	27,435	855.95	817	840.71
1994	26,313	3408	29,721	798.43	801	798.74
1994-95 (up to 31.03.95)	26,377	3456	29,833	807.94	815	808.74
1997-08	28,687	3660	32,347	775.38	844	784
1998-99	28,687	3660	32,341	786.52	871	795
1999-00	29,496	3,742	33,238	776	879	801
2000-01	29,514	3751	33,265	786.62	904	801
2001-02	29,569	3660	33,229	796.44	956	802
2002-03	29,322	3907	33,229	814.7	924	802
2003-04	29,322	3907	33,229	826.41	953	870
2004-05	29,322	3908	33,230	838.28	983	883
2005-06	29,322	3980	33,302	850.33	995	904
2006-07	29,392	3907	33,299	865.73	1,069	904
2007-08	29,395	3937	33,332	878.97	1,096.88	903
2008-09	29,381	3922	33,303	892.93	1,136	945

Source: Directorate of Food and Civil Supplies, Assam from Statistical Handbook, Assam 1994, 1995, 2003, 2004, 2006.

Note: 4th and 5th column (up to 1995, 6th column) are calculated by dividing shops by projected population figures for rural and urban areas of Assam.

The number of beneficiaries of PDS across rural and urban areas presented from Table 5.9. It is clear from the table that more people have availed the benefits of PDS in rural areas than in urban areas of the state. A relatively larger proportion

of people are found to rely on PDS for rice and wheat in rural Assam (3.90 per cent) than in urban Assam (1.74 per cent). This is in line with the reliance on PDS in the country in rural and urban areas.

Table 5.9
Reliance on the PDS (in %) in Assam, 2004-05

	Rural Sector				Urban Sector			
	Rice		Wheat		Rice		Wheat	
	A and BPL hhs.	All	A and BPL hhs.	All	A and BPL hhs.	All	A and BPL hhs.	All
Assam	26.04	3.90	0.48	0.15	30.27	1.74	0.00	0.08
Kerala	42.37	20.18	40.95	26.67	40.39	15.99	47.98	21.74
India	27.40	13.16	28.16	7.32	34.95	11.24	28.08	3.82

Source: Suryanarayana (2008).

Note: A and BPL hhs+ Households with Antyodaya and BPL cards

From the above analysis it can be inferred that there is no urban bias in providing social safety nets to the people in the state.

5.4 Manifestations of Urban Bias

Urban bias in the policy of the government has been examined in the previous section with respect to three main aspects of development in the state - health, education and employment generation. However, urban bias policies of the government also have some other manifestations for rural-urban divide in the form of differences in infrastructure in rural and urban areas (Braun, 2007), slow growth of agriculture (Government of India, 2007) etc.

In this study, the examination of such manifestations of urban bias policy is considered relevant in the context of the state. Accordingly, whether urban bias policy of the government has given rise to differences in infrastructure in rural and urban areas and slow growth of agriculture in the state is examined below.

5.4.1 Differences in Infrastructure in Rural and Urban Areas

Economic growth and human development are strongly determined by the prevailing infrastructure development scenario (Mahajan *et al*, 2007). Infrastructure in any country is judged by its roads, railways, water ways, electricity supplies, telecom facilities, irrigation systems, water supply and

sanitation, market yards, schools and health centers. According to Braun (2007), lack of proper infrastructure facilities gives rise to divide in rural and urban worlds. In case of Assam also differences in the availability of infrastructural facilities may contribute to rural-urban divide. Accordingly, the provision of infrastructure facilities in rural and urban areas in the state is compared to examine whether urban bias in providing infrastructure facilities across rural and urban areas has contributed towards rural-urban divide in Assam. For this purpose, a Composite Infrastructure Index (CII) is constructed following the procedure adopted by the Ministry of Development of North Eastern Region (DoNER, 2009) for constructing the Composite District Infrastructure Index.

The formula for construction of Composite Infrastructure Index (CII) is as given below:

$$CII_i = \sum w_i x_{ij} \quad (1)$$

where,

CII_i is the composite index for the i^{th} observation;

w_i is the weight assigned to the i^{th} indicator and

x_{ij} is the value of the i^{th} indicator of infrastructure for the j^{th} areas (rural/urban).

Here, x_{ij} of equation (1) is defined as

$$x_{ij} = 100 * (y_{ij} / y_{iA}) \quad (2)$$

where,

y_{ij} is the value of the i^{th} indicator for the j^{th} area (rural/urban);

y_{iA} is the value of the i^{th} indicator for all Assam.

Here, seven broad indicators, namely, (1) transport facilities (road density and road quality), (2) energy, (3) water supply, (4) education, (5) health care facilities, (6) communication infrastructure and (7) banking facilities are taken for assessment. Under some broad indicators, some sub-indicators are taken as explained by DoNER (2009). Data used here are the latest information available with the government². All together 13 indicators are taken as per availability of rural-urban break-up data. Weights are assigned to each indicator following the

methodology of Centre for Monitoring Indian Economy (CMIE) as given in DoNER (2009). The indicators and sub-indicators with their assigned weights are presented below:

- (1) Transport facilities which is represented by the following sub-indicators
 - (a) Road length under PWD per 100 sq. km. in rural/urban areas (weight: 24.0%)
 - (b) Surfaced road as % of total road length in rural/urban areas (weight: 2.0%)
- (2) Energy infrastructure which is represented by percentage of households with electricity connections in rural/urban areas (weight: 15%)
- (3) Water supply facilities represented by percentage of households having piped water connection in rural/urban areas (weight: 15%)
- (4) Education facilities represented by
 - (a) Number of Schools per 100 sq. k.m in rural/urban areas (weight: 6.0%)
 - (b) Average number of class rooms in rural/urban areas (weight: 6.0%)
- (5) Communication facilities which is represented by
 - (a) Number of post offices per 100 sq. k.m in rural/urban areas (weight: 3.5%)
 - (b) Total tele-density/telephone per 100 population in rural/urban areas (weight: 3.5%)
 - (c) Total phones per 100 sq. k.m in rural/urban areas (weight: 5.0%)
- (6) Health facilities represented by
 - (a) Number of hospital per 10,000 population in rural/urban areas (weight: 8.0%)
 - (b) Number of hospital beds per 10,000 population in rural/urban areas (weight: 7.0%)
- (7) Financial infrastructure represented by
 - (a) % of households availing banking services in rural/urban areas (weight: 2.5%)
 - (b) Number of offices of scheduled commercial banks per 100 sq. km. in rural/urban areas (weight: 2.5%)

As evident from above, the indicator transport facilities is considered to be of paramount importance in the infrastructure scenario of the state and accordingly it has been given the maximum weightage. This is followed by the indicators, namely, energy infrastructure, water supply facilities and health facilities.

The relevant data collected from different sources for calculation of CII are presented in Table 5.10.

Table 5.10
Values of Indicators of Infrastructure in Assam

Sl. No.	Indicators	Reference Years	Rural	Urban	All Assam
1	1. Road length under PWD per 100 sq km	2008-09	35.21	121.96	49.41
2	2. Surfaced road as % of total road length*	2008	10.24	63	11.55
3	3. % of households with electricity connections	2005-06	27.3	80.6	38.95
4	4. % of households having piped water connection	2005-06	1.1	25.2	6
5	5.No. of Schools** per 100 sq. k.m	2008-09	83	431	87
6	6. Average number of class rooms	2008-09	2.4	4.1	2.5
7	7. Number of post offices per 100 sq. k.m	2008-09	4.79	30.67	5.11
8	8. Total tele-density/telephone per 100 population	2009	9.36	86.98	20.65
9	9. Total phones per 100 sq. k.m	2009	2970.4	490249	7855.87
10	10. Number of hospitals per 10,000 population	2001	0.07	0.34	0.17
11	11. Number of hospital beds per 10,000 population	2001	1.72	25.35	5.08
12	12. % of households availing banking services	2001	15	53.3	20.5
13	13. Number of offices of scheduled commercial banks per 100 sq. km.	2009	1	77.01	1.74

Sources: 1. Government of Assam (2009)

2. www.nfhsindia.org/pdf accessed on 07-04-08.

3. www.indiastat.com accessed 09-08-08

4. www.rbi.org.in accessed on 02-05-10

5. Mehta (2008-09a), Mehta (2008-09b)

6. <http://www.iussp.org/Bangkok2002/S17Mishra.pdf> accessed on 07-06-10

7. www.mospi.nic.in accessed on 09-12-10

Notes: * Excludes roads constructed under Jowahar Rojgar Yojana (JRY) and Prime Minister's Gram Swaraj Yojana (PMGSY)

** all schools include categories of primary only, primary with upper primary, primary with upper primary and secondary/higher secondary, upper primary only, upper primary with secondary/higher secondary.

The estimated values of Composite Infrastructure Index for rural and urban of Assam areas are presented in Table 5.11.

Table 5.11
Composite Infrastructure Index (CII) for Rural and Urban Areas of Assam

	Rural	Urban	Rural-Urban Gap
Assam	59.07	719.61	660.54

The table shows that there exists vast difference between the available infrastructure facilities in rural areas and urban areas in the state as the CII is only 59.07 in rural areas compared to 719.61 in urban areas (gap is 660.54). Therefore, it can be inferred that there exists policy bias of the government in providing infrastructure facilities to rural and urban areas in the state.

5.4.2 Slow Growth of Agriculture

A relatively higher rate of growth of non-agriculture sector has been noticed in India in comparison with rate of growth of agriculture sector. The growth rate of non-agricultural sector in India was 7.07 per cent during 1995-96 to 2004-05 as against 2 per cent growth rate in agriculture sector during the same period (Government of India, 2007). As reported in the Steering Committee's Report on Agriculture and Allied Sectors, Government of India, value added per worker in the non-agriculture sector has more than doubled (from Rs.28, 430 to Rs.59, 961 at constant 1993-94 prices) whereas in agriculture sector, the increase is less than 12 per cent (from Rs.9, 961 to Rs.11, 496 at constant 1993-94 prices) during the period from 1978-79 to 2003-04. Thus, slow growth in agriculture has created a serious disparity between agriculture and non-agriculture as well as between rural and urban India (Government of India, 2007).

Thus, to examine whether slow growth of agriculture sector has contributed towards rural-urban divide in Assam, the growth of agriculture is compared with the growth of non-agriculture sector for the state. Growth of agriculture and non-agriculture sectors are measured in terms of value added (in Rs.) i.e productivity (as defined by Nayyar, 2005) per agricultural worker and non-

agricultural workers. The value added per agricultural worker is calculated by the ratio of the contribution of agricultural sector to NSDP and total number of agricultural worker for the respective years (The Robinson Rojas Archive, 2008). The value added per non-agricultural worker is also calculated in the similar manner. The results are presented in Table 5.12.

Table 5.12
Value Added Per Worker (Rs.) per annum at Constant 1999-00 Prices

Year	Agriculture	Annual Growth Rate	Non-Agriculture	Annual Growth Rate
1980-81	23,913.49	-	44,378.67	-
1981-82	23,167.82	-3.12	54,285.12	22.32
1982-83	24,257.12	4.7	54,002.19	-0.52
1983-84	25,090.14	3.43	53,725.59	-0.51
1984-85	22,969.71	-8.45	55,036.05	2.44
1985-86	24,168.32	5.22	56,301.50	2.3
1986-87	22,525.38	-6.8	52,667.97	-6.45
1987-88	23,716.50	5.29	52,077.50	-1.12
1988-89	22,837.68	-3.71	51,535.79	-1.04
1989-90	24,223.95	6.07	53,198.11	3.23
1990-91	24,007.85	-0.89	52,908.90	-0.54
1991-92	24,399.33	1.63	52,942.15	0.06
1992-93	24,320.22	-0.32	50,530.52	-4.56
1993-94	24,449.09	0.53	53,519.36	5.91
1994-95	24,494.88	0.19	53,024.42	-0.92
1995-96	24,489.66	-0.02	51,265.86	-3.32
1996-97(P)	24,007.82	-1.97	50,488.35	-1.52
1997-98(Q)	25,357.84	5.62	47,106.97	-6.7
1998-99	24,708.08	-2.56	47,361.56	0.54
1999-00	22,299.97	-9.75	48,917.48	3.29
2000-01	21,661.21	-2.86	48,418.10	-1.02
2001-02	21,248.21	-1.91	47,679.13	-1.53
2002-03	21,116.63	-0.62	48,945.77	2.66
2003-04	21,170.71	0.26	50,043.40	2.24
2004-05	20,598.10	-2.7	49,874.67	-0.34
2005-06	20,897.01	1.45	49,801.91	-0.15
2006-07	20,396.99	-2.39	50,314.76	1.03
2007-08	20,197.57	-0.1	51,112.78	1.59
2008-09	21,390.98	5.91	51,121.37	0.02
CAGR (%) from 1980-81 to 2008-09	-0.40		0.51	

Source: www.mospi.gov.in accessed on 02-05-08 and 23-02-10 for Government of India's publications

Notes:

1. At first, the contribution of agriculture sector (it excludes Forestry and Logging, Fishing, and Mining and Quarrying) and non-agriculture sector (it includes Forestry and Logging, Fishing, and Mining and Quarrying + contribution of all secondary sector + contribution of all tertiary sector i.e it is the sum total of NSDP – contribution of agriculture sector to NSDP) to NSDP at factor cost by industry of origin (constant 1999-00 prices) figures from 1980-81 to 2008-09 are calculated. Then,

the figures are divided by agricultural workers and non-agricultural workers for the respective years. The figures of agricultural and non-agricultural workers from 1981 to 1990 are projected (since 1981 census was not held for Assam) from known figures of 1971 and 1991 by the exponential growth rate formula $P_t = P_0 e^{rt}$. Similarly the figures from 1992 to 2000 and 2002 to 2009 are projected from the known figures of 1991 and 2001.

2. Agriculture workers include cultivators and agricultural labourers and non-agriculture workers include household industries workers and other workers (i.e non-agricultural workers=Total workers – cultivators - agricultural labourer) as stated by the Census Report.

The table shows that during 1980-81 to 2008-09, the value added per worker in agriculture sector has gone down by annual cumulative of (-0.40) per cent whereas the same has gone up by annual cumulative of 0.51 per cent for non-agricultural workers. And, CAGR is (-0.40) per cent for agricultural workers and 0.51 per cent for non-agricultural workers during the same period. The results show the slow growth of agriculture sector over the study period which is in line with the national level observation by Government of India (2007).

5.5 Conclusion

The main findings of the above analysis can be summarised as follows:

1. A vast gap between rural and urban per capita health expenditure is noticed during the study period under consideration in the state.
2. The data does not show any clear indication of urban bias in the policy making of the government in education sector in the state.
3. Urban bias in employment generation in the state is indirectly examined with the help of some proxy parameters, namely, per capita expenditure on rural and urban areas, wages in agricultural and industrial labourers, investment in agricultural and industrial sectors, and social security measures.

It is revealed from the study that urban bias in per capita total rural and urban spending is visible in the state till 2002-03 and the rural-urban gap was widening during this period. However, after the introduction of various schemes for rural and urban areas, the per capita rural spending has increased in relation to the per capita urban spending indicating negative urban bias in the state.

The compound annual growth rate of investment in agriculture and allied services is found less than that of industry and minerals.

The wage rates are relatively higher for unskilled workers in industrial sector than that of agriculture sector. The rate of growth of wage rates for agricultural labourers is much less than the growth rate of the wage rates for non-agricultural labourers.

No urban bias has been noticed in availability of fair price shops in the state, as average number of people per fair price shop is more in urban areas than in rural areas during 1993 to 2008-09. Similarly, no urban bias has been found in providing social safety nets to the people in the state.

4. In so far as availability of infrastructure facilities is concerned, there exists vast difference between rural and urban areas in the state. The estimated Composite Infrastructure Index (CII) for rural areas is only 59.07 as against 719.61 in urban areas. Therefore, it can be inferred that there exists policy bias of the government in providing this basic facility to the rural and urban areas.
5. It is also clear from the analysis that growth of agriculture sector is not only slow but also negative in the state in comparison with non-agriculture sector. During 1980-81 to 2008-09 the value added per worker in agriculture sector increases by annual cumulative of (-0.40) per cent whereas the same increases by 0.51 per cent for non-agriculture workers.

Thus, it can be inferred that there exists urban bias in some aspects, not in all aspects of development in the state.

Notes

1. Out of 229.26 million of agriculture workers, 224.61million are in unorganised sector in rural areas and out of 8.41 million of agri-workers, 8.19 million are in unorganised sector in urban area in 1999-00 in India, as stated in the Social Security for Unorganised Workers' Reports prepared by National Commission for Enterprises, 2006.
2. Some indicators of infrastructure are changed as per availability of rural-urban break-up data in Assam as follows: Percentage of villages electrified to percentage of households with electricity connections; Schools per 1000 population to Average number of class rooms; post and telegraph office per 10,000 population to Number of post offices per 100 sq. k.m; Post and telegraph office per 100 sq. km. to Total tele-density/telephone per 100 population; Telephone exchange per 10,000 population and telephone exchange per 100 sq. k.m to Total phones per 100 sq. k.m; Hospital beds per 100 sq. km. to Number of hospitals per 10,000 population; Banks per 10,000 population to % of households availing banking services; and Banks per 100 sq. km. to Number of offices of scheduled commercial banks.

Chapter 6

Nature and Strength of Sectoral Linkages in Assam

The issue of urban bias in government policies was examined in the previous chapter and it was found that there exists urban bias in some aspects of development in the state. Literatures have identified weak sectoral linkage along with urban biased policies of the government as some of the reasons for emergence of rural-urban divide. To examine why rural urban divide persists in the state, it is, therefore, important to examine the nature and strength of sectoral linkage in the state. The following sections are devoted to this purpose.

The term 'sectoral linkage' implies the existence of interdependence among different sectors in the economy (Pradhan *et al.*, 2006). According to Gaiha and Vashishtha (1972), inter-sectoral linkages can be analysed in two ways: (i) by considering consumption side and (ii) by considering production or technological relations. The former is a Keynesian approach and in order to sustain a whole complex of mutually supporting sectors, it depends on simultaneous creation of effective demand. The second approach identifies the key sectors on the basis of technological linkages between the sectors so that if investment is concentrated in a few sectors with powerful linkages, it can stimulate the expansion of the rest of the economy.

Inter-sectoral linkages determine the nature, spread and depth of the developmental process of any economy (Prakash *et al.*, 1998). The long term sustainability of economic growth and its welfare improving impact largely depend on the magnitude and strength of the inter-sectoral linkages (Agaje, 2008). Generally, lack of interdependence and linkages is one of the most typical characteristics of underdeveloped economies, as stated by Hirschman (Paelinck and Wagenaar, 1981). Subsistence agriculture which is the feature of underdeveloped economy is characterised by the scarcity of linkage effects (Dijck *et al.*, 1987). Weak linkages between the sectors are responsible for deficiency in demand for agricultural products, decline in share of agro-based industries and slow employment growth in underdeveloped countries (Bathla, 2003).

To examine the nature and strength of sectoral linkage in an economy, input-output analysis is one of the extensively used methods (Alagh *et al.*, 1980; Suryahadi *et al.*, 2006). Generally, backward and forward linkage indices are estimated to measure the nature and strength of the sectoral linkages. In India, efforts were made to measure nature and magnitude of sectoral linkages in the economy based on input-output tables by Hashim (1970), Bhalla (1974), Alagh *et al.* (1980), Dhawan and Saxena (1992), Goswami (1994), Agarwal (1996), Prakash *et al.* (1998) etc. According to these studies, although economic development had taken place in the country, sectoral relationships did not improved at the desired pace. Agarwal (1996) argued that state engineered expansion of industrial sector results in a high degree of disproportionality between growth of industry and agriculture resulting in a relatively weak linkage between the two sectors.

The economy of Assam is mostly agriculture dependent. The agriculture sector continues to support about 75 per cent population of the state directly or indirectly providing employment of more than 53 per cent of workforce (Government of Assam, 2008-09). However, the sector is yet to experience adequate modernisation and diversification which is very important for over all development of the economy. Industrial sector has not shown any healthy performance despite the very old history of oil and tea industries in the state. Whatever development has occurred in the selected urban industrial areas, the effect has not spilt over to the surrounding rural agricultural sector (Government of Assam, 2003). A study carried out by the Gauhati University, based on the Input-Output table, 1982-83 for Assam found weak linkages among the primary, secondary and tertiary sectors as only about 17 per cent of the sectors in the state were found to have both high backward and forward linkages (Government of Assam, 1990).

Considering these aspects, the nature and strength of sectoral linkages has been examined for the state in the subsequent sections. Towards the end of the present chapter, an attempt is made to find out the main reasons behind rural-urban divide in Assam with the help of a time series model. The differential impact of various factors on rural-urban divide in the state has been examined with the help of the model.

6.1 Methodology of Measurement of Nature and Strength of Sectoral Linkage

The measurement of sectoral linkages in an Input-Output framework is generally based on either the Leontief technology matrix (the matrix A) or the Leontief inverse $(I-A)^{-1}$. In this context, three different approaches can be distinguished. These are due to Rasmussen (1956) and Chenery and Watanbe (1958), Yotopoulos and Nugent (1973). Rasmussen used the Leontief inverse matrix to include both direct and indirect effects in his analysis and comparison of structures over time. Rasmussen's approach is widely used as it has proved to be superior to other two approaches on several counts (Government of Assam, 1990).

The elements of the Leontief inverse, $(I-A)^{-1}$, provide vital information in estimating backward and forward linkages. Basically, for each of the sectors, given the Leontief inverse, the backward and forward linkages are estimated by:

$$U_j = \frac{\frac{1}{n} \sum_{i=1}^n Z_{ij}}{\frac{1}{n^2} \sum_{j=1}^n \sum_{i=1}^n Z_{ij}}, \quad j = 1, 2, 3, \dots, n$$

$$U_i = \frac{\frac{1}{n} \sum_{j=1}^n Z_{ij}}{\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n Z_{ij}}, \quad i = 1, 2, 3, \dots, n$$

where,

n is the number of sectors

$Z = (I-A)^{-1}$

$\sum_{i=1}^n Z_{ij}$ shows direct and indirect output of sector i required to meet unit

requirement of final demand of sector j . In other words, $\sum_{i=1}^n Z_{ij}$ shows the

column total of the Leontief inverse and indicates total increase in the output of different sectors required for one unit increase in the final demand of sector j .

$\sum_{j=1}^n Z_{ij}$ shows the raw total of the Leontief inverse and indicates the increase in the output of sector i needed to cope with a unit increase in the final demand of all the sectors.

The indices can be interpreted as follows:

$U_j > 1$ means that sector j draws heavily on the rest of the sectors and vice versa if $U_j < 1$. In other words, for this reason the index U_j ($j = 1, 2, \dots, n$) may be called an index of the ‘power of dispersion’ for the sector considered. This index describes the relative extent to which an increase in final demand for the products of sector j is dispersed throughout the system of sectors (Gaiha and Vashishtha, 1972; Alagh *et al.*, 1980; Government of Assam, 1990; Dhawan and Saxena, 1992). Again, $U_i > 1$ can be interpreted to mean that sector i would have to increase its output more than others for a unit increase in the final demand for the outputs of all the other sectors and vice versa if $U_i < 1$. Thus, the index U_i ($i = 1, 2, \dots, n$) may be termed as an index of ‘sensitivity of dispersion’ for the sector considered. The index expresses the extent to which other sectors draw upon sector i or in other words, the extent to which sector i is affected by an expansion in the system of industries.

Rasmussen (1956) recognised that the indices for backward and forward linkages, as defined above, are based on an average value, which is sensitive to extreme values and may not reflect the real situation of the sector under consideration (Sudaryanto, 2003). A particular sector could have a relatively high value of U_i and U_j , but its effects might be concentrated heavily only on a very few number of sectors. This situation will imply that most sectors of the economy will be left unchanged, if the final demand for the products of that sector increases. High linkages unless accompanied by even spread in the system of industries, can lead to lopsided development (Alagh *et al.*, 1980; Thomas, 1982; Sivakumar *et al.*, 1999). As a corrective exercise, indices V_i and V_j are supplemented with a measure of variability (coefficient of variation), to reflect the degree of skewness of the delivery or the input pattern (Government of Assam, 1990; Sivakumar *et al.*, 1999). Thus, V_i and V_j are calculated by the formula:

$$V_j = \frac{\sqrt{\frac{1}{n-1} \sum_{i=1}^n \left(Z_{ij} - \frac{1}{n} \sum_{i=1}^n Z_{ij} \right)^2}}{\frac{1}{n} \sum_{i=1}^n Z_{ij}}, \quad j=1, 2, 3, \dots, n$$

$$V_i = \frac{\sqrt{\frac{1}{n-1} \sum_{j=1}^n \left(Z_{ij} - \frac{1}{n} \sum_{j=1}^n Z_{ij} \right)^2}}{\frac{1}{n} \sum_{j=1}^n Z_{ij}}, \quad i=1, 2, 3, \dots, n$$

Here,

V_j shows the extent to which sector j draws evenly on the other sectors and

V_i shows the extent to which other sectors draw evenly from sector i .

A high value of V_j can be interpreted as showing a particular sector j draws heavily on one or a few sectors and a low value of V_j is an indication that the sector draws evenly from other sectors. A high or a low value of V_i is also interpreted in a similar way (Government of Assam, 1990). In other words, the smaller these indices, the more evenly distributed would be the spread effect of backward and forward linkages respectively. Hence, the regional planners would have preference for industries with more than unit linkage indices (U_i and U_j) and relatively low coefficient of variations (V_i and V_j) (Alagh *et al.*, 1980).

Domestic linkages may differ widely from potential linkages i.e. linkages inclusive of imported inputs (Dijck *et al.*, 1987). In an open economy, imported products are used in the production process. Hence, while increasing production, it will also generate additional imports to support it. This kind of imports is called an economic leakage in the sense that it represents a leakage to the multiplier effect (Guo and Planting, 2001; Reis and Rua, 2006). To the extent that non-competitive imports are exogenously determined in the above input-output models, the inevitable leakages are already accounted for. All imports of commodities that are not produced within the state have been allocated to noncompetitive imports. The ‘actual linkages’ realised by a system of industries may differ from ‘potential’

linkages where leakages due to competitive imports are taken into account (Alagh *et al.*, 1980). Earlier studies indicated that as leakages due to imports increased, reduction in multiplier effect was observed. Therefore, it is always better to estimate backward and forward linkages with and without import leakages (Sivakumar *et al.*, 1999). A simple methodology is followed for allowing import leakages (Alagh *et al.* 1980; Devi, 1988; Sivakumar *et al.*, 1999). If M is the import coefficient matrix, then the Leontief inverse matrix (R) becomes

$$R = (I + M - A)^{-1}$$

To find the correlations between U_j and U_i , and V_j and V_i , and key sectors from forward and backward linkages, the Spearman's rank order correlation coefficient (r) can be used. The formula for calculating rank correlation is as follows:

$$r = 1 - \frac{6 \sum d^2}{N^3 - N}$$

Here,

d is the differences in ranking and

N is the number of observations.

6.2 Measurement of Nature and Strength of Sectoral Linkage in Assam

In this study, sectoral linkage for Assam is examined with the help of backward and forward linkage analysis with and without import leakages and with the help of rank correlation coefficient. Here, for estimation of sectoral linkages, Rasmussen's approach is followed.

The relevant data for examination of sectoral linkages for Assam have been collected from the input-output coefficient matrix of Assam constructed by Goswami (2002), where coefficients for several sectors are updated on the basis of the 1982-83 Input-Output Table of Assam. The economy of Assam has been divided into 40 economically important sectors by Goswami (2002) clubbing 64 sectors of the original 1982-83 flow matrix. Reformulated input coefficient matrix has been updated at 1999 prices (Goswami, 2002). Out of these 40 sectors, while 13 belong to primary sectors, 21 sectors are from secondary sector and the rest 6 sectors belong to the tertiary sectors. The classification and composition of

different sectors are furnished in the appendix Table 6.7. The basic Input-output table is constructed in terms of purchaser's prices¹.

An attempt is also made to calculate linkage effects with import leakages with the import coefficient matrix constructed by Goswami (2002). Using Rasmussen's indices of backward and forward linkages U_j and U_i as well as the spread effects V_j and V_i , a priority sector is identified as one in which both U_j and U_i are individually greater than unity and both V_j and V_i are relatively low.

Thus, in this study, all the 40 sectors are classified into four categories on the basis of the values of U_j and U_i . Sectors with high backward and forward linkages are included in category 1 while the sectors with high backward but low forward linkages are included in category 2. Sectors with low backward but high forward linkages are included in category 3 and category 4 includes the sectors with low backward and forward linkages. The results are presented and discussed below.

6.2.1 Linkage Analysis without Import Leakages

Based on the updated input coefficient matrix of the state from Goswami (2002), the values of U_j , U_i , V_j and V_i are calculated for Assam and presented in Table 6.1. Additionally, the classification of various sectors based on the value of the linkage indices is presented in Table 6.3. It is evident from the tables that only 5 per cent of the sectors have both high values of backward and forward linkages, while 15 per cent of the sectors have high backward but low forward linkages. Similarly, sectors with low backward but high forward linkages constitute 32.5 per cent of the total sectors and the sectors with both low backward and forward linkages constitute 47.5 per cent of the total sectors. These results are compared with the linkage analysis done by the Department of Economics, Gauhati University. In that analysis it was found that about 17 per cent of the sectors of the state had both high backward and forward linkages; 29 per cent of the sectors had high backward and low forward linkages; 31 per cent of sectors had low backward and high forward linkages and 33 per cent of the sectors had both low backward and forward linkages (Government of Assam, 1990). Hence, comparing the two results it is found that linkage of the sectors of the state is not only weak but also deteriorated over the period.

Table 6.1
Backward and Forward Linkages and the Respective Coefficient of
Variations: Without Import Leakages

Sectors	Backward Linkage (U _j)	Rank	Coefficient of Variation(V _j)	Rank	Forward Linkage (U _j)	Rank	Coefficient of Variation(V _j)	Rank
1.Paddy	0.376348157	36	5.136256463	3	1.07348535	11	2.660672313	29
2.Wheat	11.798878080	1	2.024903085	36	0.54866500	26	4.590071000	11
3.Other Cereals	0.415220531	33	4.536943061	8	0.32765716	38	5.762309077	3
4.Pulses	0.426287836	31	4.487079900	9	0.31526350	39	6.077540705	2
5.Fibre Crops	0.395467777	35	4.788402572	7	0.33162878	37	5.707836172	4
6.Plantation	0.569884398	24	3.337044050	22	0.68608998	23	2.940793291	24
7.Other Crop	0.362619222	38	5.368346357	2	1.30631324	9	2.105870474	39
8.Animal Husbandry	0.458134256	29	4.082588213	14	0.71924051	21	2.711437197	28
9.Forestry and Logging	0.366413825	37	5.002014173	5	1.06321919	12	2.086771808	40
10.Fishing	0.571290787	23	3.250959279	23	0.29117620	40	6.316592049	1
11.Coal and Lignite	0.423957565	32	4.332671581	11	0.68694094	22	3.080193896	22
12.Crude Oil	0.339936490	40	5.400231233	1	1.01752022	14	2.202775436	36
13.Other Minerals	0.357522084	39	5.122395828	4	1.31213189	8	3.378302846	19
14.Sugar Product	0.596074189	22	3.699959729	18	0.35089062	35	5.228683972	6
15. Other Food and Bev. Ind.	1.209027234	4	1.843170158	39	0.58937803	25	3.274336879	20
16.Cotton Textile	0.642836022	18	3.954111597	15	2.35125334	3	2.763123953	26
17.Art Silk and Syn. Fiber	3.282242081	2	1.725526538	40	0.96359253	16	3.443417290	18
18.Craft Items	0.869384907	10	2.258926074	34	0.42686738	31	4.329265212	13
19.Wood Based Industry	0.614121546	20	3.598573457	19	1.36580689	7	2.230395773	34
20.Paper and Paper based Ind.	0.613733309	21	3.059074612	26	0.40797970	32	4.518975393	12
21.Leather and Leather Products	0.620338106	19	2.975489927	27	0.37673692	33	4.923981221	8
22.Plastic and Rubber Products	0.552757633	25	3.362803950	20	1.51398907	5	2.745461842	27
23.Petroleum Products	0.703667868	16	3.186931121	25	1.01107101	15	2.144583676	37
24.Misc. Coal tar Product	0.487564031	28	3.918260644	16	0.43961487	30	4.303282742	14
25.Fertiliser	1.271314100	3	1.902435970	38	0.49640381	27	3.733629923	17
26.Pesticides and Chemicals	0.498137721	27	4.219017719	13	0.82360086	18	2.766374418	25
27.Cement	1.163426014	5	2.098728973	35	5.41903158	1	4.226582242	16
28.Other Non-metallic Min. Products	0.918996129	9	2.567165502	30	0.47541044	28	4.786289449	10
29.Iron and Steel	0.951109232	8	3.342764336	21	1.26792542	10	2.632679955	30
30.Non Ferrous Metal	0.856793980	12	4.421213158	10	0.77743944	19	4.909617147	9
31.Non Electrical Machinery	1.019864110	7	2.330321510	32	0.72572515	20	2.966913745	23
32.Electrical Machinery	1.029442797	6	1.941864469	37	0.44103285	29	4.226651555	15
33.Rail Equipment	0.432995630	30	4.247279295	12	0.36229075	34	5.075096472	7
34.Communication Industry	0.828938815	13	2.386957831	31	0.33696167	36	5.454290576	5
35.Other Metal Product	0.753842161	15	3.212291219	24	1.01801455	13	2.382974339	33
36.Rail Transport Service	0.860876149	11	2.314136158	33	0.59891323	24	3.228983657	21
37.Other Transport Service	0.513371700	26	3.705033309	17	1.41408844	6	2.220153843	35
38.Electricity	0.775698226	14	2.685731779	29	1.60436835	4	2.624773567	31
39.Construction	0.661011028	17	2.833571657	28	0.94096500	17	2.573248301	32
40.Other Services	0.410474291	34	4.927175595	6	3.82131616	2	2.134765148	38

6.2.2 Linkage Analysis with Import Leakages

Linkage analysis including import leakages is carried out to capture the potential linkages and results are presented in Table 6.2. From this table and Table 6.3, it is clear that 42.5 per cent of the sectors have both high values of backward and forward linkages, while 7.5 per cent of the sectors have high backward but low forward linkages. Similarly, sector with low backward but high forward linkages is nil and the sectors with both low backward and forward linkages constitute 50 per cent of the total sectors.

When import leakages are taken into account, the multiplier effects in terms of backward and forward linkages have reduced for 16 different sectors.

The Cement Sector (27) and the Iron and Steel Sector (29) have shown high backward and forward linkages without import leakages. The high backward and forward linkage potential of the Cement Sector (27) is still found, even when allowance is made for import leakages. However, the Iron and Steel (29) sector is no longer in the first category when import leakages are allowed.

Linkages for most of the sectors are sensitive to import leakages. For instance, the sector 1, 5, 6, 7, 8, 9, 12, 19, 23, 28, 30, 36, 37, 38, 39 and 40 appear in the first category, when import leakages are allowed. In other words, the linkage potential for these sectors is enhanced once import leakages are allowed.

When import leakages are allowed, the sectors entering in the first category have increased from 5 per cent to 42.5 per cent. However, the sectors in the second category have reduced from 15 per cent to 7.5 per cent. The sectors, namely, Art, Silk and Synthetic Fiber (17), Fertilizers (25) and Non-electrical Machinery (31) have no longer remained in this category. Similarly, 32.5 per cent sectors of the third category have no longer remained when import leakages are allowed. Again, when import leakages are allowed, the fourth category sectors (with low backward and low forward linkages) have increased marginally from 47.5 per cent to 50 per cent. Therefore, it can be inferred that the following sectors have the potential of high backward and high forward linkages if import leakages are allowed: Paddy (1), Fiber Crops (5), Plantation (6), Other Crop (7), Animal Husbandry (8), Forestry and Logging (9), Crude Oil (12), Wood based Industry (19), Petroleum Products (23), Other Non-metallic Mineral Products (28), Non-ferrous Metal (30),

Rail Transport Service (36), Other Transport Services (37), Electricity (38), Construction (39), and Other Services (40).

Table 6.2
Backward and Forward Linkages and the Respective Coefficient of
Variations: With Import Leakages.

Sectors	Backward Linkage (U _i)	Rank	Co-efficient of Variation (V _i)	Rank	Forward Linkage (U _i)	Rank	Co-efficient of Variation (V _i)	Rank
1.Paddy	1.187506090	14	5.654891580	4	1.3958147615	12	4.824765227	21
2.Wheat	2.844470165	1	2.973909239	39	0.3130074342	33	5.914634249	7
3.Other Cereals	0.653262020	26	5.343513509	9	0.5790756868	24	6.029853665	5
4.Pulses	0.598915100	27	5.303655082	111	0.5112342255	28	6.210675744	3
5.Fibre Crops	1.209099690	13	5.407447356	8	1.0478927904	17	6.233967952	2
6.Plantation	1.378440810	10	4.864675556	14	1.4570876097	10	4.698225802	24
7.Other Crop	1.125526460	16	5.787499499	2	1.5382541410	9	4.217503822	29
8.Animal Husbandry	1.601336400	15	5.170798740	12	1.4388098781	11	4.157179394	30
9.Forestry and Logging	1.214321245	12	5.559839955	5	2.2119645615	2	3.380277634	37
10.Fishing	0.882663801	23	4.706780106	16	0.6538367745	22	6.324012704	1
11.Coal and Lignite	0.547430400	32	4.911293030	13	0.5167552431	27	5.183938078	18
12.Crude Oil	1.017043520	19	5.925939792	1	2.1104467725	3	3.313349658	38
13.Other Minerals	0.429435100	33	5.494774400	7	0.5324405763	25	4.509809353	26
14.Sugar Product	0.148731230	37	3.987566003	29	0.0886973444	40	5.738683472	10
15. Other Food and Bev.Ind.	1.564067000	8	3.379877854	33	0.9731827306	18	5.233620059	17
16.Cotton Textile	0.596646830	28	4.493030380	18	0.8243130206	20	3.292053893	39
17.Art Silk and Syn. Fibre	0.234732404	35	2.865909209	40	0.1169419303	36	4.978983858	20
18.Craft Items	0.660073040	25	4.400316204	21	0.5170867832	26	5.589704948	13
19.Wood Based Industry	1.976392692	3	4.022765924	28	1.8080492299	7	4.243620250	28
20.Paper and Paper based Ind.	0.126376962	38	3.761630719	30	0.0789962249	39	5.917849127	6
21.Leather and Leather Products	0.125128682	39	4.199317856	24	0.0921625800	38	5.693284124	11
22.Plastic and Rubber Products	0.255184110	34	4.426563785	20	0.3081731290	34	3.705198049	34
23.Petroleum Products	1.868069130	4	4.060405989	27	1.9306303634	6	3.481061956	35
24.Misc. Coal tar Product	0.966564370	21	4.352459915	22	0.7016904669	21	5.913033635	8
25.Fertiliser	0.813044970	24	3.199066692	37	0.4676323779	30	4.741195914	23
26.Pesticides and Chemicals	0.915368860	22	4.757318242	15	0.9273982219	19	4.673549342	25
27.Cement	1.026351650	18	3.331924063	33	2.1064227590	4	4.151515806	31
28.Other Non-metallic Min. Products	1.759472470	5	3.719722380	31	1.1756924901	15	5.487758325	14
29.Iron and Steel	0.581451750	29	4.331930649	23	0.4692326221	29	5.340441797	16
30.Non Ferrous Metal	1.103749920	17	5.747543243	3	1.1072568422	16	5.744760515	9
31.Non Electrical Machinery	0.581067280	30	3.237692299	36	0.3469896531	32	4.822808938	22
32.Electrical Machinery	1.010386927	20	3.463002099	32	0.6344578400	23	5.425327915	15
33.Rail Equipment	0.115296920	40	5.305106081	10	0.1087290217	37	5.641746767	12
34.Communication Industry	0.558099460	31	4.079328263	26	0.3759271196	31	6.042062500	4
35.Other Metal Product	0.165561720	36	4.484549957	19	0.1716257048	35	4.299648194	27
36.Rail Transport Service	2.467726105	2	3.009803555	38	1.3246694535	14	5.152858057	19
37.Other Transport Service	1.527775220	9	4.608309372	17	2.0462741294	5	3.449913500	36
38.Electricity	1.617409260	7	3.320692570	35	1.3639731963	13	3.757736227	33
39.Construction	1.640621550	6	4.181709871	25	1.7573536199	8	3.963946715	32
40.Other Services	1.346401460	11	5.539365610	6	3.8698206933	1	1.976032662	40

Table 6.3
Classification of Sectors according to their Linkage Effects

Linkage Effect		Sectors
Category I: Sectors with high backward ($U_j > 1$) and forward ($U_i > 1$) linkages		
Without import leakages:		
1	High backward linkages ($U_j > 1$)	2, 15, 17, 25, 27, 29, 31, 32.
2	High forward linkages ($U_i > 1$)	1, 7, 9, 12, 13, 16, 19, 22, 23, 27, 29, 35, 37, 38, 40.
3	High backward and forward linkages ($U_j > 1$, $U_i > 1$)	27, 29
With import leakages:		
1	High backward linkages ($U_j > 1$)	1, 2, 5, 6, 7, 8, 9, 12, 15, 19, 23, 27, 28, 30, 32, 36, 37, 38, 39, 40.
2	High forward linkages ($U_i > 1$)	1, 5, 6, 7, 8, 9, 12, 19, 23, 27, 28, 30, 36, 37, 38, 39, 40.
3	High backward and forward linkages ($U_j > 1$, $U_i > 1$)	1, 5, 6, 7, 8, 9, 12, 19, 23, 27, 28, 30, 36, 37, 38, 39, 40.
Category II: Sectors with high backward ($U_j > 1$) and low forward ($U_i < 1$) linkages		
Without import leakages:		
1	High backward linkages ($U_j > 1$)	2, 15, 17, 25, 27, 29, 31, 32
2	Low forward linkages ($U_i < 1$)	2, 3, 4, 5, 6, 8, 10, 11, 14, 15, 17, 18, 20, 21, 24, 25, 26, 28, 30, 31, 32, 33, 34, 36, 39.
3	High backward ($U_j > 1$) and low forward ($U_i < 1$) linkages	2, 15, 17, 25, 31, 32.
With import leakages:		
1	High backward linkages ($U_j > 1$)	1, 2, 5, 6, 7, 8, 9, 12, 15, 19, 23, 27, 28, 30, 32, 36, 37, 38, 39, 40.
2	Low forward linkages ($U_i < 1$)	2, 3, 4, 10, 11, 13, 14, 15, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 31, 32, 33, 34, 35.
3	High backward ($U_j > 1$) and low forward ($U_i < 1$) linkages	2, 15, 32
Category III: Sectors with low backward ($U_j < 1$) and high forward ($U_i > 1$) linkages		
Without import leakages:		
1	Low backward linkages ($U_j < 1$)	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 26, 28, 30, 33, 34, 35, 36, 37, 38, 39, 40.
2	High forward linkages ($U_i > 1$)	1, 7, 9, 12, 13, 16, 19, 22, 23, 27, 29, 35, 37, 38, 40.
3	Low backward ($U_j < 1$) and high forward ($U_i > 1$) linkages	1, 7, 9, 12, 13, 16, 19, 22, 23, 35, 37, 38, 40.
With import leakages:		
1	Low backward linkages ($U_j < 1$)	3, 4, 10, 11, 13, 14, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 31, 33, 34, 35.
2	High forward linkages ($U_i > 1$)	1, 5, 6, 7, 8, 9, 12, 19, 23, 27, 28, 30, 36, 37, 38, 39, 40.
3	Low backward ($U_j < 1$) and high forward ($U_i > 1$) linkages	Nil
Category IV: Sectors with low backward ($U_j < 1$) and low forward ($U_i < 1$) linkages		
Without import leakages:		
1	Low backward linkages ($U_j > 1$)	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 26, 28, 30, 33, 34, 35, 36, 37, 38, 39, 40.
2	Low forward linkages ($U_i < 1$)	2, 3, 4, 5, 6, 7, 8, 10, 11, 14, 15, 17, 18, 20, 21, 24, 25, 26, 28, 30, 31, 32, 33, 34, 36, 39.
3	Low backward and low forward ($U_j < 1$, $U_i < 1$) linkages	3, 4, 5, 6, 8, 10, 11, 14, 18, 20, 21, 24, 26, 28, 30, 33, 34, 36, 39.
With import leakages:		
1	Low backward linkages ($U_j < 1$)	3, 4, 10, 11, 13, 14, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 31, 33, 34, 35.
2	Low forward linkages ($U_i < 1$)	2, 3, 4, 10, 11, 13, 14, 15, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 31, 32, 33, 34, 35.
3	Low backward and low forward ($U_j < 1$, $U_i < 1$) linkages	3, 4, 10, 11, 13, 14, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 31, 33, 34, 35.

Moreover, the dispersion of the backward and forward linkages is found to increase with import leakages implying that the sectors have affected fewer sectors in the state than it does on the whole (same as Ramadhyani, 1984 observed in a different study).

In the interaction between domestic linkages and leakages from international trade, it appears to have positive relationship between linkages and leakages (as interpreted by Kamaruddin *et al.*, 2008) in the following backward and forward cases. There is a positive relationship between linkages and leakages with values more than unity for Wheat (2), Other Food and Beverage products (15), Cement (27) and Electrical Machinery (32) in backward cases. Similarly, there is a positive relationship between Paddy (1), Other Crop (7), Forestry and Logging (9), Crude Oil (12), Wood based industry (19), Petroleum Product (23), Cement (27), Other Transport Services (37), Electricity (38) and Other Services (40) in forward cases. This suggests that these sectors have higher dependence on other states of the country and are also related with higher domestic synergies.

From the above discussion it is also clear that Assam is dependent on the other states of the country for different materials for many products /services as the backward and forward linkage effects of the sectors increase with import in the state.

The sectors with a lot of intermediate goods are susceptible to sectoral linkages and any shock is likely to be more widely diffused through the economy. Intermediate goods provide links between sectors that create a productivity multiplier. For instance, low productivity in electric power generation reduces output in banking and construction. But, this reduces the ease with which the electricity industry can build new dams and therefore, further reduces output in electric power generation. Similarly, textile producers require raw materials, knitting machines, a healthy and trained labor force, knowledge of how to produce, security, business licenses, transportation networks, electricity, etc. These inputs enter in a complementary fashion, in the sense that problems with any input can substantially reduce overall output. Without electricity or production knowledge or raw materials or security or business licenses, production is likely to be severely hindered. In the same way, distortions to the transportation sector reduce the output of many other sectors, including car manufacturing and the fuel sector. This in turn

will reduce output in the transportation sector. This multiplier effect is similar to the multiplier associated with capital accumulation in a neoclassical growth model. In fact, intermediate goods are just another form of capital that depreciates fully in production. This vicious cycle is the source of the multiplier associated with intermediate goods (Benson and Clay, 1994; Jones, 2007; Holly and Petrella, 2008)

The trade of intermediate inputs acts as a channel for international technology spillover (Nunez and Belen, 2008). The modern endogenous growth theory establishes the key role of technology as a major driving force of economic growth. The main idea is that innovations developed in one country might be transferred to other economies and have a positive effect over its economic growth. Coe and Helpman (1995) were the pioneers in analysing the international diffusion of technology, focusing in the bilateral trade channel. Coe *et al.* (1997) find similar evidence for developing countries. This finding has been tested by Keller (1998) and Lumenga Neso *et al.* (2005) etc. According to Keller (2002), there are significant positive spillovers of technology in the form of product designs, created through Research and Development (R&D) investments. The technology spillovers are transmitted to other sectors by being embodied in differentiated intermediate goods demanded by these sectors, but they are mainly domestic and inter-industry, although there is a small impact coming from foreign R&D. Hanel (2000) also observed that domestic inter-industry spillovers of new technology have a larger effect on Total Factor Productivity than industry's own R&D expenditures.

Although, the study is confined mainly to examine the intra-state sectoral linkages between the sectors in the state, some sectors have shown higher foreign dependence and higher domestic synergies. This implies that there may be positive spillover of domestic as well as inter-state trade of intermediate inputs and positive spillover of technology as said by Keller in these sectors in the state.

The sector Other Food and Beverages (15) has high backward but low forward linkages both with and without import leakages. Since backward linkages are more powerful than forward linkages especially in developing countries², the sector Other Food and Beverages (15) may have an important role to play in the state economy which is in line with the findings of CMIE (2006).

Other Food and Beverages Industries (15) come under second category of high backward and low forward linkages both with and without import leakages. Although only 5 per cent sectors are having high value of linkages, compared to other sectors, food processing sectors and other agriculture related sectors have shown the potential to rise in the state with significant linkage effect.

One of the significant results coming out from Table 6.1 and Table 6.3 from category I is that the multiplier values when added together show higher backward linkage value (i.e 13.01) for agriculture and agriculture related industries than that for other manufacturing industries (8.7) without import leakages. When the same is analysed with import leakages from Table 6.2 and Table 6.3 in category I, then the total values for both backward (14.1) and forward linkages (10.91) have found higher values in agriculture and agriculture related industries than backward (7.79) and forward linkages (8.44) in other manufacturing industries. Therefore, it can be inferred that the total value of the linkages is more in agriculture and agriculture-related industries in the state than the total value of the linkages in other manufacturing industries which is in line with the findings made by Lewis and Thorbecke (1992) in Kenya; Thaiprasert (2006) in Thailand and Dorosha and Thurlowb (2011) in Uganda etc. This means investing more in agriculture and agriculture-related sectors will help to stimulate the economy better through the backward and forward linkage effects. Compared to the manufacturing industrial sector, agro-industry and livestock sectors in Assam have higher potential to increase domestic production through backward linkage effects.

As observed by Thaiprasert (2006) the development of agricultural sectors should be seriously considered as a new development strategy through establishing new agro-industry in the rural areas. According to him, agro-industry should be promoted in the rural areas for closer input locations, to shift agricultural workers from primary agriculture, to improve the real wage of farmers, and to prevent extensive urban migration.

6.2.3 Rank Correlation between the Linkage Indices for the State

The rank correlation between the linkage indices for the state is calculated and results are presented in Table 6.4.

Table 6.4**Rank Correlation of Linkage Indices: Without Import Leakages**

Variables	Rank Correlation Coefficients
Between U_j and U_i	-0.059099437
Between U_j and V_j	-0.922889306
Between U_i and V_i	-0.818574109

The table shows negative rank correlation between U_j and U_i . Negative rank correlation between U_j and U_i has indicated that the sectors with high backward linkages are not those sectors with high forward linkages. Thus, the sectors with strong backward linkages tend to have weak forward linkages, and vice versa implying weak linkages between the sectors in the state. This finding is in line with the observation made by Mattas *et al.* (2010) for European countries, Bekhat (2010) for Malaysia and Dhawan and Saxena (1992) for India. It is also noticed that the rank correlation coefficient between U_j and U_i has shown a decreasing trend in Assam as it has decreased from 0.1302 in 1982-83 (Government of Assam, 1990) to (-0.059099437) in 2002 indicating increasing weak sectoral linkages and falling development of the state.

It is also revealed from Table 6.1 and Table 6.2 that the sectors with high value of U_j and U_i have relatively low value of V_j and V_i respectively. This is also reflected by the high negative rank correlation coefficient between U_j and V_j (-0.922889306) and between U_i and V_i (-0.818574109) in Table 6.4. “The negative rank correlation between U_j and V_j implies that larger the linkage inducement of a particular sector, the smaller the internal variability of the structure of the inducements over the other sectors. In other words, the high backward linkage effects of a particular sector are well spread out over the rest of the other sectors that receive the inducements” (Government of Assam, 1990).

6.3 Examination of Reasons behind Rural-Urban Divide in Assam

The two main determinants of rural-urban divide as reported in various literatures are urban biased policies (which is reflected in two factors, namely, the difference in infrastructure in rural and urban areas and relative backwardness of agriculture) and weak sectoral linkages.

Urban bias occurs because urban centers in developing countries are better organized politically and thus has greater influence on policy makers than the rural population. Governments favour the urban population, because urban dwellers are educated and in a better position to make their demands known than the rural population. The preferential policies of the policy makers that favour the urban over the rural population result rural-urban divide (Fan *et al.*, 2005).

Rural and urban livelihoods are interconnected economically, financially, and socially. While rural households depend on urban centers for various services like hospitals, banks, and government offices and for the provision of various private and public goods, the urban centres depend on rural demand for their goods and services, supply of raw materials, etc. Urban consumers also benefit from cheap and sustained food supply from rural areas (Fan *et al.*, 2005). Many poor urban households are found to partly depend on rural activities (e.g., farming) for their livelihoods (DFID, 2003). The rural sector can also act as a buffer from the impact of macroeconomic shocks on the urban economy (World Bank, 1999). Links between the rural and urban sectors also include flows of information, such as markets and employment opportunities, as well as flows of people moving between rural and urban centers on a temporary or permanent basis. Thus, the backward and forward linkages between agricultural production and industry and services can foster positive rural-urban interactions and a virtuous circle of development (Tacoli, 1998). On the contrary, a weak linkage between the two sectors may result in development of one sector (industrial/urban) while the other sector (agricultural/rural) may lag behind aggravating the problem of rural urban disparity.

In the present study, an input-output analysis has been carried out to examine the linkages between sectors and it has established weak sectoral linkage between different sectors in the economy. Whether this weak sectoral linkage has an impact on worsening rural-urban divide in the state needs to be examined rigorously. Accordingly, a time series model has been constructed to examine the impact of weak sectoral linkage and other relevant variables on rural-urban divide in the state. It has also been established in the previous chapter that there is an urban bias policy of the government in providing infrastructure facilities across rural and urban areas in the state. Similarly, relative backwardness of agriculture

compared with non-agriculture, which is regarded as the manifestation of urban bias policies of the government, is also established in the previous chapter.

Thus, in the time series model constructed, Rural-Urban Divide is considered as the dependent variable and Rural-Urban Differences in Infrastructure, Relative Backwardness of Agriculture, and Weak Sectoral Linkages are taken as the explanatory variables.

The dependent variable, **Rural-Urban Divide** (denoted by **D**) is measured in terms of the rural-urban differences in Monthly Per Capita Consumer Expenditure (MPCE) for households. The explanatory variables determining the rural-urban divide are explained as follows:

i. Rural-Urban Differences in Infrastructure (I): Urban biased policies are reflected in availability of infrastructure for different areas (Braun, 2007). Therefore, difference in infrastructure facilities in rural and urban areas in the state is regarded as one of the important determinants of rural-urban divide in the state. Composite Infrastructure index (CII) is constructed following the procedure adopted by the Ministry of Development of North Eastern Region for constructing the Composite District Infrastructure Index (DoNER, 2009). The index is calculated both for rural and urban areas in the state with available data and then differences in CII for rural and urban area are calculated. The Rural-Urban Differences in Infrastructure variable in the model has been denoted by **I**. As the rural-urban differences in the index increases there will be widening of the rural-urban divide and therefore, the relationship between **D** and **I** is expected to be positive.

ii. Relative Backwardness of Agriculture (S): Relative backwardness of agriculture has created a serious disparity between agriculture and non-agriculture in India as well as between rural and urban India (Government of India, 2007). Performance of agriculture sector is measured by value added/productivity per agriculture worker. Here, for the state, value added per agricultural worker is calculated by the ratio of the contribution of agricultural sector to NSDP and total number of agricultural worker for the respective years (as Nayyar, 2005 and as The Robinson Rojas Archive, 2008). The value added per non-agricultural worker is

also calculated in the similar manner. Productivity per worker is examined at constant 1999-00 prices for agriculture and non-agriculture sectors and differences of productivity between agriculture and non-agriculture sectors are calculated during the period from 1990-91 to 2007-08. Relative backwardness of agriculture sector (denoted by *S*) compared with the non-agriculture sector implies existence of rural-urban divide (*D*), therefore, the relationship between *S* and *D* is expected to be positive.

iii. Weak Sectoral Linkages (*W*): The absence of required linkages (backward and forward) between rural and urban sectors causes agglomeration of certain activities in certain areas (Yiadom, 2004; Braun, 2007). This leads to rural to urban migration (Rhoda, 1985; United Nations, 2001; Zhang and Song, 2003; Zhao, 2003; Braun, 2007, World Bank, 2008; UNHABITAT, 2009). Thus, weak sectoral linkage is measured by a proxy variable - rural to urban migration and is denoted by *W*. Increase in rural to urban migration implies weak sectoral linkages and widening of rural urban divide. Therefore, the relationship between *D* and *W* is also expected to be positive.

Rural to urban migration figures are calculated for Assam following the procedure adopted by Kali (2007) in the background paper, prepared for World Development Report, 2009. The formula is as follows:

$$M_t = [\{(U_t - U_{t-1})\} - \{(bu_t - du_t) \cdot U_t\} / 1000]$$

Where,

M_t is Rural to Urban Migration data

U_t is the total urban population at time *t*

U_{t-1} is the total urban population at time *t-1*

bu_t is the birth rate per 1000 urban population.

du_t is the death rate of per 1000 urban population.

Thus, the log-linear multiple regression model is constructed as follows:

$$\ln D_t = a_0 + a_1 \ln D_{t-1} + a_2 \ln I_t + a_3 \ln S_t + a_4 \ln W_t + u_t \text{ ----- (i)}$$

Where, $t = 1991$ to 2008

D_{t-1} is the lag variable of D_t variable with one year lag.

The variable S is found non-stationary when the model is tested for stationarity³. Taking first differences the variable is made stationary before estimating the parameters. The method of Ordinary Least Squares (OLS) is applied for estimation of the parameters after making all the variables stationary in the model. Although, the signs of the coefficients of the independent variable D_{t-1} , S_t and W_t have come out as expected, the coefficient of the independent variable Infrastructure (I) has been found negative (which is not expected sign) but insignificant. This can be explained by the fact that the differences in infrastructure in rural and urban areas increase at a decreasing rate over time. In recent years, the government has laid more emphasis on development of rural infrastructure and accordingly, the rate of growth of rural infrastructure is higher than that of urban infrastructure. In view of this, the variable infrastructure (I) is dropped from the model and finally, the model is re-constructed as follows:

$$\ln D_t = a_0 + a_1 \ln D_{t-1} + a_2 \ln S_t^{\wedge} + a_3 \ln W_t + u_t \text{ ----- (ii)}$$

Where $\ln S_t^{\wedge} = (\ln S_t - \ln S_{t-1})$

And, $t = 1991$ to 2008

Here,

D = Rural-Urban Divide which is measured in terms of the rural-urban differences in Monthly Per Capita Expenditure (MPCE) for households.

S = Relative backwardness of agriculture which is measured by the differences in value added per agriculture worker and non-agriculture worker.

W = Weak Sectoral linkage which is measured by a proxy variable - Rural to Urban Migration.

u = Random disturbances or error terms

a_0 , a_1 , a_2 , and a_3 are the parameters to be estimated in the model.

The original variable S was found to be non-stationary which is made stationary by taking the first difference of the variable and has been designated as ΔS .

The time series data on the above variables are collected and presented in Table 6.5. While the raw data on Rural-Urban Divide (D) has been collected from NSS Reports, the data on Relative Backwardness of Agriculture (S) has been collected from the central and state government publications (for contribution of agriculture and non-agriculture sector to NSDP and for number of agriculture workers and non-agriculture workers). The data on weak sectoral linkage is collected from Registrar General of India. From these basic data, relevant variables for the time series model have been computed.

Table 6.5
Values of Dependent and Independent variables for the Time Series Model

Year	D	S	W
1991	45.12	28901.05	44650
1992	68.80	28542.82	47171
1993	116.00	26210.30	41041
1994	211.00	29070.27	47631
1995	164.00	28529.54	48939
1996	221.00	26776.20	51162
1997	225.00	26480.53	53175
1998	242.00	21749.13	56831
1999	389.00	22653.48	63586
2000	388.00	26517.51	66380
2001	332.00	26756.89	53521
2002	346.00	26430.92	62866
2003	355.00	27829.14	63799
2004	476.00	28872.69	74903
2005	515.00	29276.57	72451
2006	726.00	28904.92	73763
2007	648.00	29917.77	73849
2008	653.00	30915.21	73449

Sources:

1. Mondal, D.P (2007)
2. NSS 61st Reports
3. Census Report, 2001
4. Government of Assam (2008), State Domestic Product-back series on new base (1999-2000) from 1950-51 to 2003-04, Directorate of Economics and Statistics, Assam.

6. <http://indiabudget.nic.in/es99-2000/app1.1pdf> accessed on 06-03-08.

7. www.mospi.gov.in accessed on 02-05-08 and 23-02-10

Note:

Rural-urban disparity data for MPCE for 1990-91 is the data of mean consumption per month (in Rs.) data (from 1990-91 to 1993-94) at 1973-74 prices. Due to non-availability of the MPCE data for 1991-92 and 1992-93, MPCE data of 1983 is used for 1991-92 and data of 1987-88 is used for 1992-93.

The table shows an alarmingly high rise of rural-urban divide for the state during the period 1991 to 2008. Similarly, a deteriorating condition of the state can be noticed from the rise in relative backwardness of agriculture sector figures and rise in weak sectoral linkage figures during the study period.

Using the above data, the final model has been estimated by OLS method. In the model, rural-urban divide (D) is regressed on relative backwardness of agriculture (S) and weak sectoral linkages (W). After estimating the parameters, the regression diagnostic test, called the Ljung-Box (LB) or Portmanteau Test is also carried out to test if the residuals of the regression are white noise or that it has some autocorrelation still left⁴.

The results of the transformed regression model are presented in Table 6.5 as follows:

Table 6.6
Results of the Multiple Regression Analysis of Rural-Urban Disparity in Assam

Variables	Estimated Coefficients	t-statistic
Constant	-10.02845* (4.92033)	-2.04
Dt-1	0.5356106*** (0.1243305)	4.31
St [^]	0.2788113 (0.6405763)	0.44
Wt	1.161547** (0.5004281)	2.32
R ²	0.9311	LB statistic=10.2027
Adjusted R ²	0.9152	
F(n ₁ =3, n ₂ =13)	58.56***	

Notes:

Figures in the parentheses show the standard error.

***, ** and * indicate significant at 0.01, 0.05 and 0.10 level respectively.

The value of the coefficient of determination (R^2) value of the model is found to be 0.93 indicating very good fit to the data. The F-statistics for overall regression is also highly significant. Thus, on the whole, the results obtained from the analysis are credible. No autocorrelation has been found in the residual term in the model.

The coefficient of the variable weak sectoral linkage (W) has come out to be statistically highly significant with positive sign. The other factor relative backwardness of agriculture (S) has not come out to be statistically significant. This indicates that weak sectoral linkage is the main factor accentuating the problem of rural-urban divide in the state.

6.4 Conclusion

The above discussion shows that the linkage between different sectors of the state economy is relatively weak. Only 5 per cent of the sectors are found to have high value of backward and forward linkages.

Sectoral linkages with and without import leakages are compared to capture the potential linkages in the state. It has been found that the following sectors, namely, Paddy (1), Fiber Crops (5), Plantation (6), Other Crop (7), Animal Husbandry (8), Forestry and Logging (9), Crude Oil (12), Wood based Industry (19), Petroleum Products (23), Other Non-metallic Mineral Products (28), Non-ferrous Metal (30), Rail Transport Service (36), Other Transport Services (37), Electricity (38), Construction (39), and Other Services (40) have the potential of high backward and high forward linkages if import leakages are allowed.

The sector, Other Food and Beverages (15) has high backward but low forward linkages in both with and without import leakages. Since backward linkages are more powerful than forward linkages, especially in developing countries, therefore, the sector Food and Beverages (15) may have an important role to play in the state economy. Compared with other manufacturing sector units, Other Food and Beverages Industries (15) has shown high values in both with and without import leakages and the sector has shown the potential to grow with significant linkage effect.

One of the significant results of the study is that the total value of the linkages is more in primary and agro-based industries than in other manufacturing

industries in the state. This implies that investment in these sectors will help stimulate the economy through backward and forward linkage effects. Compared to the manufacturing sector, agro-industry and livestock sectors in Assam have higher potential to increase domestic production through backward linkage effects.

It has also been found that the rank correlation coefficient between the indices of backward and forward linkages is negative for the state indicating weak sectoral linkages in the state.

The time series model constructed for examining the reasons behind the observed rural-urban divide has established that weak sectoral linkage is one of the significant factors of rural-urban divide in the state.

Thus, it is clear from the above analysis that to narrow down the rural-urban divide in the state, sectoral linkages in the state should be improved. As agro-industries are found to have strong inter-sectoral linkage, emphasis may be given on development of this sector for establishing a better rural-urban linkage. Thus, to understand the impact of agro-based industries on local economy of the state, a separate study is required. Accordingly, a micro-level village study has been carried out with the help of village SAM approach to examine whether agro-based industries have any significant impact on its neighbouring villages in the state. The findings of the exercise are presented and discussed in the next chapter.

Notes

1. The value of the output in input-output table can be expressed either in terms of producer's prices (the price at which the producers receive for their output) or in terms of purchaser's prices (the price at which the buyers purchase the output). The value of output at purchaser's price is larger than that at the producer's price as the former includes transportation costs, storage charges, wholesale and retail trade margins and the various taxes as well as amounts paid to the producers. It is desirable to construct the table at producer's price. However, in the developing countries, the inter-industry flow matrix has often been constructed in terms of purchaser's prices on the basis of inadequate information about commercialisation margins and a series of proportionality assumptions (Government of Assam, 1990).
2. In underdeveloped countries, the linkages based on demand pressures (backward linkage) are likely to be more predominant than those of supplied pressures (forward linkage) (Government of Assam, 1990).
3. A time series is stationary if the mean, variance and auto covariance (at various lags) remain the same no matter at what point we measure them; i.e they are time invariant (Gujarati, D. N and Sangeetha, 2007)

4. The Ljung-Box (LB) or Portmanteau test is better for small samples than Box-Pierce Q test (Gujarati, D. N and Sangeetha, 2007)

Appendix

Table 6.7

Classification and Composition of the Sectors of Assam Economy

Sector No.	Name of the Sectors	Composition of the Sectors
1.	Paddy	Paddy
2.	Wheat	Wheat
3.	Other Cereals	Jawar, Bajra, Maize, Gram etc.
4.	Pulses	All variety of pulses such as masur, mug, arhar, matikalai etc.
5.	Fiber crop	Cotton, raw jute, mesta.
6.	Plantation	Tea plantation, Coffee plantation.
7.	Other crop	Raw cotton, all types of fruits, all types of vegetables, fodder grass, and all other agricultural crop, except tea plantation not elsewhere classified.
8.	Animal husbandry	Milk and milk product, such as ghee, butter, and other milk Product, cattle farming, goat farming, pig farming, poultry etc., agricultural and animals transport services, by bullocks, horses etc., meat, eggs, hide and skin, wool, honey, bones, dung, hunting and trapping etc. and all types of animal services.
9.	Forestry and logging	Planting, replanting and conservation of forests, production of fuel wood including charcoal, felling and cutting of trees, preparations of poles, blocks etc., transportation of logs up to the permanent lines of transport, industrial wood (timber, match and pulpwood), bamboo, minor forest products such as lacks, gums, herbs, agar, cane, etc. and all other forest products not elsewhere classified.
10.	Fishing	Rearing and catching of fish.
11.	Coal and lignite	Coal, lignite mining.
12.	Crude oil and natural gas	Crude petroleum and natural gas.
13.	Other minerals	Other minerals including limestone, quarries etc.
14.	Sugar product	Manufacturing and refining of sugar, production of indigenous sugar, khansari, boora etc.
15.	Other food and beverage industries	Manufacturing of fruit juice, jams, jelly, pickles etc., bakery product, manufacture of canned dairy products, and baby foods, other beverages, such as distilling, rectifying and blending of spirit, country liquor etc., soft drink and carbonated beverages, soda water etc., manufacture of curry

		powder, corn, wheat and rice flakes, and their product, ice and ice products, all types of confectioneries, manufacture of starch and manufacture of other food products not elsewhere classified.
16.	Cotton textile and textile products	Cotton ginning, finished cotton textile in mills, printing and dyeing of cotton textiles, weaving and finishing of cotton textiles in hand-loom, power loom and khadi and other cotton textile products not elsewhere classified, clothes and tailoring made-up textile garments, readymade garments.
17.	Art silk and synthetic fiber	Spinning, weaving and finishing of hemp and other coarse fiber, other textile products such as bandage, dressing cloth etc. and manufacture of textiles not elsewhere classified.
18.	Craft items	Manufacture of all types of treads, ropes, twines, nets etc. embroidery work and laces, umbrella manufacture, artificial leather and oil cloth, tarpaulin, tent and other made up canvas goods, coir and coir products.
19.	Wood-based industries	Plywood and their products, sawing and planning of wood, wooden and cane products, wooden furniture etc., manufacture of structure such as poles, doors, windows etc., other wood, cane and bamboo products not elsewhere classified.
20.	Paper and paper-based industries	Pulp, paper, paper board, straw board, hard board, packing paper, paper bags, paper containers etc., newsprint and paper products not elsewhere classified, letter press and printing, book binding, printing and publishing newspapers, photographic printing, rubber stamp making, stationary goods making etc.
21.	Leather and leather products	Tannery and leather finishing manufacture and repairs of foot wear, other leather products not elsewhere classified.
22.	Plastic and rubber products	Synthetic resins, and plastic materials, all types of plastic product, manufacture of tyres and tubes, retreading and repairing of tyre and tubes, manufacture of rubber foot wear, miscellaneous rubber, industrial and domestic goods, synthetic rubber and man-made fiber.
23.	Petroleum product	Products of petroleum refining.
24.	Miscellaneous coal tar product	Coke, bitumen etc., coal tar, miscellaneous petroleum products including candle making.
25.	Fertiliser	Inorganic, organic and mixed fertilizers including manure.
26.	Pesticides and Chemicals	Inorganic heavy chemicals, organic heavy chemicals, paints, varnishes, dyestuff, explosives including gunpowder, fireworks etc., match manufacturing.

27.	Cement	Manufacture of cement.
28.	Other non-metallic mineral products	Glassware, earth ware, pottery, asbestos, cement and concrete products, Hume pipes, sanitary ware, manufacture of lime, dressing and stone crushing.
29.	Iron and Steel	Iron and steel casting, forging, iron and steel structural steel pipes, and sheets, manufacture of Ferro-alloys.
30.	Non-ferrous metal	Non-ferrous basic metal products, brass metal products, bell metal products, and other non-ferrous metal products.
31.	Non-electrical machinery	Manufacture of tea machinery, manufacture of agricultural machineries and parts, manufacture of machineries and parts used in construction and mining, industrial machineries for food and textiles, except tea machinery, other industrial machineries, office equipments, manufacture sectoral composition and repair of non-electrical items not elsewhere classified.
32.	Electrical machinery	Manufacture of electrical machinery such as generators, transformers, meters, manufacture of wires and cables, batteries, electrical goods such as bulbs, fans, radio, x-ray machineries, repairs of electrical goods etc.
33.	Rail equipments	Manufacture of railway, rolling stocks, engines, wagons, coaches and repairing, other rail road equipments.
34.	Communication industries	Postal, telephone and telegraph services.
35.	Other Metal products	Manufacture of fabricated metal products such as metal cases from tin plates, metal containers, drums, barrels, steel trunk making, steel furniture and fixtures, welding, safes and vault, bolts and nuts, hand tools and small tools, miscellaneous metal fillings etc., locks, and keys, galvanizing, plating and polishing metal products, metal utensils, cutlery, other metal products not elsewhere classified, miscellaneous manufacturing industries not elsewhere classified and services.
36.	Rail transport services	Railway services
37.	Other transport	All types of mechanised and non-mechanised road transport, water transport by boat, steamer, ferry, air transport, services incidental to transport.
38.	Electricity	Generation and distribution of electricity.
39.	Construction	Construction and maintenance of buildings, roads, bridges, tunnels, ports, harbours, runways etc., telephones, and telegraph lines etc., hydro- electric power, construction of industrial plants, and construction not elsewhere classified, activities

allied to construction.

40. Other services Collection, purification and distribution of water, manufacture and distribution of gas, services of all financial intermediaries such as banks, insurance and other financial institutions, activities of all types of dealers, such as operators, developers, agents connected with real estates, residential housing, purchase and sale agents, brokers etc., medical and health services, education and research services, services by hotels, restaurant, boarding houses, canteens, laundry, barbers, beauty parlours, sanitary services, legal service, advertising service, agency service etc., accounting service, architectural services, news, other personal services, all other services not elsewhere classified, public services in state government, local bodies and central government and quasi government bodies.

Chapter 7

Effective Linkage Study (Impact Analysis): A Social Accounting Matrix Analysis

It has been found from the previous chapter that the linkage between the sectors is weak in the state and this weak sectoral linkage is one of the significant factors for increased rural-urban divide in the state. Keeping in view the potentiality of the agro-based industries in the state, it can be inferred that agro-based industries might have a strong impact on the local economy in the state to narrow down the rural-urban divide. Thus, a micro-level village study has been carried out to examine whether an agro-based industry has any significant impact on its neighbouring villages in the state.

Literatures have identified Social Accounting Matrix (SAM) as an appropriate tool for measuring existing linkages and impact analysis (Lewis and Thorbecke, 1992; Parikh and Thorbecke, 1996; Sivakumar *et al.*, 1999; Roberts, 2000; Xiaoping *et al.*, 2005; Suryahadi *et al.*, 2006; Subramanian, 2007; Agaje, 2008; Subramanian and Qaim, 2008). SAM has been used for impact analysis because it is an organised matrix and is an extension of the Input-Output table to include social effects of production processes along with the economic effects. The great strengths of the SAM are its comprehensiveness and its flexibility in adapting to diverse institutional settings and economic structures and in providing an accounting framework to address diverse policy and planning issues (Taylor and Adelman, 2006).

Sir Richard Stone pioneered the development of the SAM framework in 1954. However, the general shape of a SAM framework was first described by Pyatt and Thorbecke in 1976. Afterwards, Pyatt and Roe published a book in 1977 giving a detailed description of the economy of Sri Lanka. Since then, SAMs have been applied in developed as well as developing countries and regions, and with different goals (Santos, 2005). In the beginning, SAM was developed for a national economy and then SAM has been developed for village level economies. S. Subramanian (1988) modeled the production and distribution in a dry-land village economy of India in a Social Accounting Matrix. Lewis *et al.* (1992) used a SAM

framework to stress economic linkages in a small regional economy in Kenya (Kutus Region). Golan (1996) constructed a SAM for a Senegalese village. Furthermore, the flexibility of the SAM approach allowed researchers to address specific issues such as migration (Adelman *et al.*, 1988), household nutrition and economic linkages (Ralston, 1996), environmental issues (Golan, 1996). However, the first application of SAM to village economic analysis appears in Adelman, Taylor, and Vogel (in 1988) (Taylor and Adelman, 2006). In India, Parikh and Thorbecke (1996) constructed SAM to study the impact of rural industrialisation on village life and economy for two villages of Gujarat. Hirway *et al.* (2004) applied SAM approach in analysing impact of NREGA works on a village in Gujarat. Subramaian (2007) used SAM approach to study the effects of agricultural biotechnology on a village in Maharashtra.

Thus, in the present study, SAM is used to examine whether an agro-based industry has any significant impact on its neighbouring villages in the state with the help of a case study.

7.1 Methodology of Constructing Social Accounting Matrix (SAM)

7.1.1 Structure of SAM

The social accounting matrix is a form of double-entry accounting. The main features of a SAM are three-fold. First, the accounts are represented as a *square matrix*; where the incomings and outgoings for each account are shown as a corresponding row and column of the matrix. Second, it is *comprehensive*, in the sense that it portrays all the economic activities of the system (consumption, production, accumulation, and distribution). Third, the SAM is *flexible*, and therefore, there is a large measure of flexibility both in the degree of disaggregation and in the emphasis placed on different parts of the economic system. Since, it is an accounting framework, not only the SAM is a square matrix, but also the corresponding row and column totals must be equal (Round, 2007). A SAM records transactions that take place during an accounting period, usually one year (Round, 2007). There is no intrinsic reason why income and expenditure accounts aggregated across production-consumption units should balance in the village (Taylor and Adelman, 2006).

Village SAMs depart from national SAMs in specific ways to reflect the unique nature of village economies and institutions. One departure from the national SAM is that specific rest of the world sub accounts of village SAMs do not necessarily balance. For example, a regional or national government may be a net surplus appropriator or a net subsidiser of a village. Remittances to village households from migrants abroad (a foreign account) may not necessarily be used to purchase goods from abroad; they may be used to purchase goods produced in the village or imported into the village from regional or national markets. Methodologically, these inconsistencies are addressed through the use of entries representing payments between rest of the world accounts, the sum of whose transactions with the village must balance (Taylor and Adelman, 2006). Another departure is that in national SAMs all transactions are monetized, whereas in village SAMs, non-monetary transactions typically are important. The non-monetary transactions include production for own consumption, labour lending, interlinked factor and non-factor input markets, and access to all people (Taylor and Adelman, 2006). The rest of the world in village models includes the regional and national economies outside the village. The receipts are valued at producer prices in the activity accounts and at market prices in the commodity accounts.

7.1.2 Village SAM Multiplier Model

Once the SAM is built with all the accounts in a consistent framework, this forms the transaction table providing the basis for the multiplier analysis to be undertaken. It can be used to estimate the effects of exogenous changes and injections, such as increase or decrease in the demand for specific products, on the whole socio-economic system (Okalang, 2008).

Linkages between production and factors, between factors and households, and between households and production shape the impact of exogenous changes on the village economy. The ‘multiplier effect’ appears at three levels (Leeuwen and Nijkamp, 2002). An exogenous increase in the demand for village exports will result the initial direct impact on the production side and there will be an increase in the output of that product; this is the direct effect. As these producers increase their output, there will also be an increase in demand on their suppliers and so on down the supply chain; this is the indirect effect. As a result of the direct and indirect effects the level of household income throughout the economy will increase with

the increased employment. A proportion of this increased income will be re-spent on final goods and services: this is the induced effect.

Here, the first step of construction of SAM multiplier model is to decide which accounts are considered endogenous and which are to be kept exogenous. The framework is used to measure the impact of changes in the exogenous accounts on the whole system. According to Taylor and Adelman (2006), choosing exogenous and endogenous accounts is critical in modeling the impact of change on village economies, because, the modeler is free to change only exogenous variables and model parameters. The endogenous accounts in the model capture the responses of village economic actors to changes in the exogenous accounts or in parameters.

Endogenous accounts are those for which changes in level of expenditures directly follow any changes in incomes, while exogenous accounts are those for which it is assumed that the expenditures are independent of incomes (Okalang, 2008).

Usually, transactions in the government account, the capital account, and the rest-of-the-world account are taken as exogenous accounts. This is because government outlays are essentially policy determined, the external sector is outside domestic control, and because the model has no dynamic features, so investment has to be exogenously determined. The endogenous accounts are therefore, usually limited to those of production (representing activities and products), factors, and households. Defining the endogenous transactions in this way helps focus on the interaction between two sets of agents (production activities and households) interacting through two sets of markets (factors and products). For simplicity, the exogenous accounts may be aggregated into a single account, which records an aggregate set of injections into the system and the leakages from it (Round, 2007).

The next step for a SAM multiplier analysis is that the village SAM transaction matrix is converted into a matrix of average expenditure propensities by dividing each element in the SAM by its respective column total. In designing village models, the simplest assumption is that the responses of village factors to income changes are strictly proportional to the total level of activity in each account (i.e the column totals in the SAM). This means that, on the expenditure side, marginal expenditures by village institutions equal average shares derived

from the SAM and that, on the production side, there is a fixed input-output technology.

Thus, the assumptions of the model are fixed prices, given technology, unitary expenditure elasticities¹, excess capacity in all sectors (i.e. supply is assumed to be perfectly elastic in all sectors and an increase in demand is sufficient to stimulate increases in output and incomes) etc. These assumptions are restrictive, but they are necessary to estimate fixed-priced village SAM multipliers (Taylor and Adelman, 2006)

Dividing each element in the SAM by its respective column total produces a matrix of average shares, S . Let, X denote the exogenous income flows into the rows corresponding to the endogenous accounts of the SAM. Deleting the exogenous rows and columns from S yields a sub matrix of endogenous shares, A . The village SAM multiplier matrix, a square matrix denoted by M , is derived as:

$$M = (I - A)^{-1}$$

Given some exogenous change in X , the effect on endogenous accounts in the village, Y , is determined by this village multiplier matrix:

$$Y = M \times X$$

The matrix M is called the village multiplier matrix because it contains estimated total direct and indirect effects of exogenous income injections on the endogenous accounts in the village SAM. While the diagonal multiplier measures the direct impact of an exogenous expenditure placed on the other sectors, the off-diagonal multipliers measure the indirect impacts of exogenous injections on other sectors (Agaje, 2008).

7.1.3 Decomposition of the Multiplier Effects

Following Pyatt & Round (1979), the multiplier effects are decomposed in three categories of effects: direct, indirect, and induced (Cardenete and Sancho, 2003). According to Cardenete and Sancho (2003), two modeling options may be selected to use SAM. The first is the standard input-output model, for which a Leontief inverse M_L is calculated as

$$M_L = (I - A)^{-1}$$

where A stands for the matrix of direct technical coefficients and its dimension coincides with the number of productive sectors in the economy.

The second option assumes an enlarged linear model where the endogenous sectors include all the accounts in the economy (the production sectors as well as the factor accounts and consumption account).

Let, A_m be the enlarged squared matrix of direct propensities computed from the SAM. The inverse matrix M_n is calculated as

$$M_n = (I - A_m)^{-1}$$

which will measure the direct, indirect and induced effects of the incorporated endogenous links.

The matrix M_n reduces to the Leontief inverse M_L when the dimension m of the matrix A_m corresponds only to the production sectors.

The difference between multiplier matrices, M_n and M_L measures the induced effect, while the direct and indirect effects are measured by A and M_L in the following formula:

Direct effect: $I + A$

Indirect effect: $M_L - I - A$

Induced effect: $M_n - M_L$

Here,

$$M_n = (M_n - M_L) + (I + A) + (M_L - I - A)$$

The SAM multipliers are able to provide the possible effects of an exogenous injection. According to Kabore (2008), an injection of any amount applied to an account in one block (let us say to production sector) may have the following paths: (i) It may move around within the same block and the effects will be similar to the ones measured by the Leontief inverse multiplier; (ii) It may move around and end up in one of the other blocks; or, (iii) Finally, it may move around the whole system (economy) and return to the block from which it started. The results of such movements are called (i) direct, within-accounts, own, transfer or intra-group effects, (ii) indirect, open-loop, spillover or extra-group effects and (iii) between-account, closed loop, circular or inter-group effects, respectively.

According to Pyatt and Round (1979) and Stone (1981), the multiplier M_n can be decomposed into above four separate effects by multiplier decomposition or additive decomposition. The methodology of deriving the multiplier and additive decomposition formula are as follows:

Following the procedure of Pyatt and Round (1979), the rows and columns of the SAM can be partitioned into endogenous and exogenous accounts as presented in Table 7.1. The table shows the partitioned matrix, where N represents the matrix of SAM transactions between endogenous accounts, X is the matrix of injections from exogenous into endogenous accounts, L is the matrix of leakages from endogenous into exogenous accounts, and R is the matrix of SAM transaction between exogenous accounts.

Table 7.1
SAM Model Summarised by Endogenous and Exogenous Accounts

Receipts (Revenue)	Expenditure (Outlays)		Total
	Endogenous Accounts	Exogenous Accounts	
Endogenous Accounts	N	X (Injections)	Y_n
Exogenous Accounts	L (Leakages)	R	Y_x
Total	Y_n	Y_x	

Let, A_n and A_l be the sub-matrix of the average endogenous expenditure propensity and average propensity to leak respectively. The column sum vectors for the endogenous and exogenous accounts are denoted by Y_n and Y_x . Since expenditure and receipts must tally for each account, the row and column sum vectors are the same. The row sums of N, X, L, and R are denoted by n, x, l, and r.

$$Y_n = n + x = A_n Y_n + x \text{ ----- (1)}$$

$$Y_x = l + r = A_l Y_n + r \text{ ----- (2)}$$

Provided that $(I - A_n)^{-1}$ exists, the fixed price multiplier matrix M_n can be written from equation (1) as -

$$Y_n = A_n Y_n + x$$

$$\text{i.e } Y_n = (I - A_n)^{-1} x = M_n x \text{ ----- (3)}$$

Corresponding to the above partition, the matrix of expenditure propensities is

$$A_n = \begin{bmatrix} A_{11} & 0 & A_{13} \\ A_{21} & 0 & 0 \\ A_{31} & A_{32} & A_{33} \end{bmatrix}$$

Here, the endogenous accounts are segregated under three blocks, where activity and commodity accounts form one block, factor accounts another, and the rest forms the third (Subramanian, 2007).

Let, any matrix A_0 be given by-

$$A_0 = \begin{bmatrix} A_{11} & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & A_{33} \end{bmatrix}$$

From equation (3) for any matrix A_0 of the same size as A_n such that $(I-A_0)^{-1}$ exists, Y_n can be written as -

$$\begin{aligned} Y_n &= A_n Y_n + x \\ \Rightarrow Y_n &= A_n Y_n - A_0 Y_n + A_0 Y_n + x \\ \Rightarrow Y_n &= (A_n - A_0) Y_n + A_0 Y_n + x \\ \Rightarrow (I-A_0)^{-1} Y_n &= (I-A_0)^{-1} (A_n - A_0) Y_n + (I-A_0)^{-1} A_0 Y_n + (I-A_0)^{-1} x \\ \Rightarrow (I-A_0)^{-1} \cdot Y_n - (I-A_0)^{-1} \cdot A_0 Y_n &= (I-A_0)^{-1} \cdot (A_n - A_0) Y_n + (I-A_0)^{-1} x \\ \Rightarrow (I-A_0)^{-1} Y_n \cdot (I-A_0) &= (I-A_0)^{-1} \cdot (A_n - A_0) \cdot Y_n + (I-A_0)^{-1} x \\ \Rightarrow Y_n &= (I-A_0)^{-1} \cdot (A_n - A_0) Y_n + (I-A_0)^{-1} x \\ \Rightarrow Y_n &= A^* Y_n + (I-A_0)^{-1} x \end{aligned}$$

Where, $A^* = (I-A_0)^{-1} \cdot (A_n - A_0)$

And, $A_n - A_0 = \begin{bmatrix} 0 & 0 & A_{13} \\ A_{21} & 0 & 0 \\ A_{31} & A_{32} & 0 \end{bmatrix}$

Thus,

$$A^* = (I-A_0)^{-1} \cdot (A_n - A_0) = \begin{bmatrix} 0 & 0 & (I-A_{11})^{-1} A_{13} \\ A_{21} & 0 & 0 \\ (I-A_{33})^{-1} A_{31} & (I-A_{33})^{-1} A_{32} & 0 \end{bmatrix}$$

Multiplicative Decomposition can be done as follows:

$$M_n = M_3 M_2 M_1 = [1 - (A^*)^3]^{-1} \cdot [I + A^* + (A^*)^2] \cdot (I - A_0)^{-1}$$

Where,

The matrix M_1 is defined as intra-group or transfer effect;

M_2 is the cross effects or extra-group effects;

M_3 is the circular or inter-group effects.

Here,

M_1 matrix is calculated as: $M_1 = (I - A_0)^{-1}$

Similarly, $M_2 = I + A^* + A^{*2}$

And, $M_3 = (I - A^{*3})^{-1}$

Similarly, Additive Decomposition can be done as follows:

$$M_n = I + T + O + C = I + (M_1 - I) + (M_2 - I) \times M_1 + (M_3 - I) \times M_2 \times M_1$$

Where,

I = Identity multiplier, which shows the effect of an injection into one account which amounts to an income increase identical to the original injection;

$T = M_1 - I$, or net transfer multiplier, which measures the net intra-group effect or direct effects;

$O = (M_2 - I) \times M_1$, or open-loop multiplier measures the net extra-group effects or net cross effects;

$C = (M_3 - I) \times M_2 \times M_1$, or the closed-loop multiplier measures the net contribution of circular effects.

7.2 Construction of SAM for the Village Batabari in Assam

Using the above methodology, a village SAM is constructed for Batabari village in Darrang district of Assam.

7.2.1 Study Village, Industry and the Data

As stated earlier, Assam produces huge amount of fruits and vegetables every year. But most of it is sold raw and no major organised food processing industry was established in the state before 2006. Nilon's Enterprises Private Limited, a Maharashtra based industry started a plant in 2006 at Dalgaon in Darrang District, which may provide a linkage with agricultural output of the local farmers. The company is headquartered in Jalgaon, Maharashtra and is promoted by Sanghavi Foods Private Limited. Recently, the company has started sourcing raw materials for its production through its new contract farming venture with farmers of some areas of Maharashtra and Assam on an experimental basis to receive a continuous supply of vegetables and fruits to meet their requirements. As all are aware that absence of employment opportunities in the state is helping insurgent groups to get fresh recruits, *Asom Unnati Xabha*, an NGO, has joined hands to generate self-employment in the state for cultivation of fruits and vegetables by its members as well as local unemployed youths under the 'contract farming scheme'. Therefore, Nilon's Industry has been chosen for present study and it is pertinent to study whether the said industry is able to have any impact on the input supplying neighbouring villages.

Since SAM construction needs the comprehensive details of the village economy, census of one village adjacent to the Nilon's industry will satisfy the purpose of the study. Accordingly, village 'Batabari', one of the input supplying villages to the subject food processing industry has been selected purposively for the study. The data for the construction of the SAM for the research work is based on a village census carried out in the village 'Batabari', under No.5 Barujhar Gaon Panchayat (Bechimari Block) in Darrang district of Assam. The study village is about 4 KM. from the Nilon's industry on National Highway No. 52, the main road link for the north bank of the Brahmaputra River in Assam and it is about 100 KM from Guwahati, the capital city of Assam. There are 208 households in the village with two *Chuba* (Sub-villages): *Pub Chuba* and *Pachim Chuba*. As data collection for such a long schedule (31 pages) for construction of SAM is a cumbersome and extensive procedure, *Pachim Chuba* with 99 households (with total population of 630, out of which 297 are male and 333 are female and 301 voters) of Muslim community is taken for census survey for the study purpose. This *Pachim Chuba* is purposefully selected, as the *Chuba* is inhabited by Muslim

community who are mostly dependent on agriculture growing vegetables and supplying the vegetables to the industry as well. The other *Chuba* is inhabited by 109 households [Bodo community (83 households), Assamese speaking Hindu community (5 households) and Muslim community (21 households)] which have no such direct connection with the said industry.

Nilon's industry is located outside the village. The villagers sell their products not only to the industry but also in the markets outside the village (in nearby local town) from where the products are being traded to other places including the capital city. The market is one of the few biggest markets for vegetables in Assam. The village is mainly an agriculture based village. About 90 per cent people are engaged in agriculture². The crops produced in the village are mainly rice, jute, pulses (beans), vegetables (cauliflower, cabbage, carrot, tomato, potato, onion etc.), fruits (lemon, mango, litchi, sugarcane etc.), spices (chilli, ginger, garlic etc.). The village is supplying mainly carrot, tomato, potato, chilli, pumpkin, bottle gourd, cauliflower, mango, ginger etc. to the two units of the subject industry (one is pickle making unit and other is sauce making unit). The villagers are employed temporarily in the industry. Industry and market are incorporated separately in the rest of the village account of the matrix as villagers sell their products both to the industry and to market.

The data from the field have been collected using a structured schedule prepared for the purpose. The final schedule was prepared after incorporating necessary modifications necessitated after pre-testing of the schedules.

The fieldwork was conducted between March, 2009 and August, 2009. The data collected in the field work pertains to the previous 12 months' activities i.e for the reference period from March, 2008 to February, 2009. The data for household consumption of food was collected for the month of February, 2009.

This household survey has provided information on a number of socio-economic issues including household consumption and structure, education, household assets, production and input use, employment and income, expenditure on health and other activities, savings, investment etc. To support the information obtained at household level and other data, discussions were held with selected elderly people, youths, females and members of the Gaon Panchayat.

On the basis of the collected data, a village Social Accounting Matrix (SAM) is constructed to examine the impact of Nilon's Industry on the neighbouring Batabari village with sectoral linkages of the village economy.



LOCATION MAP OF BATABARI VILLAGE

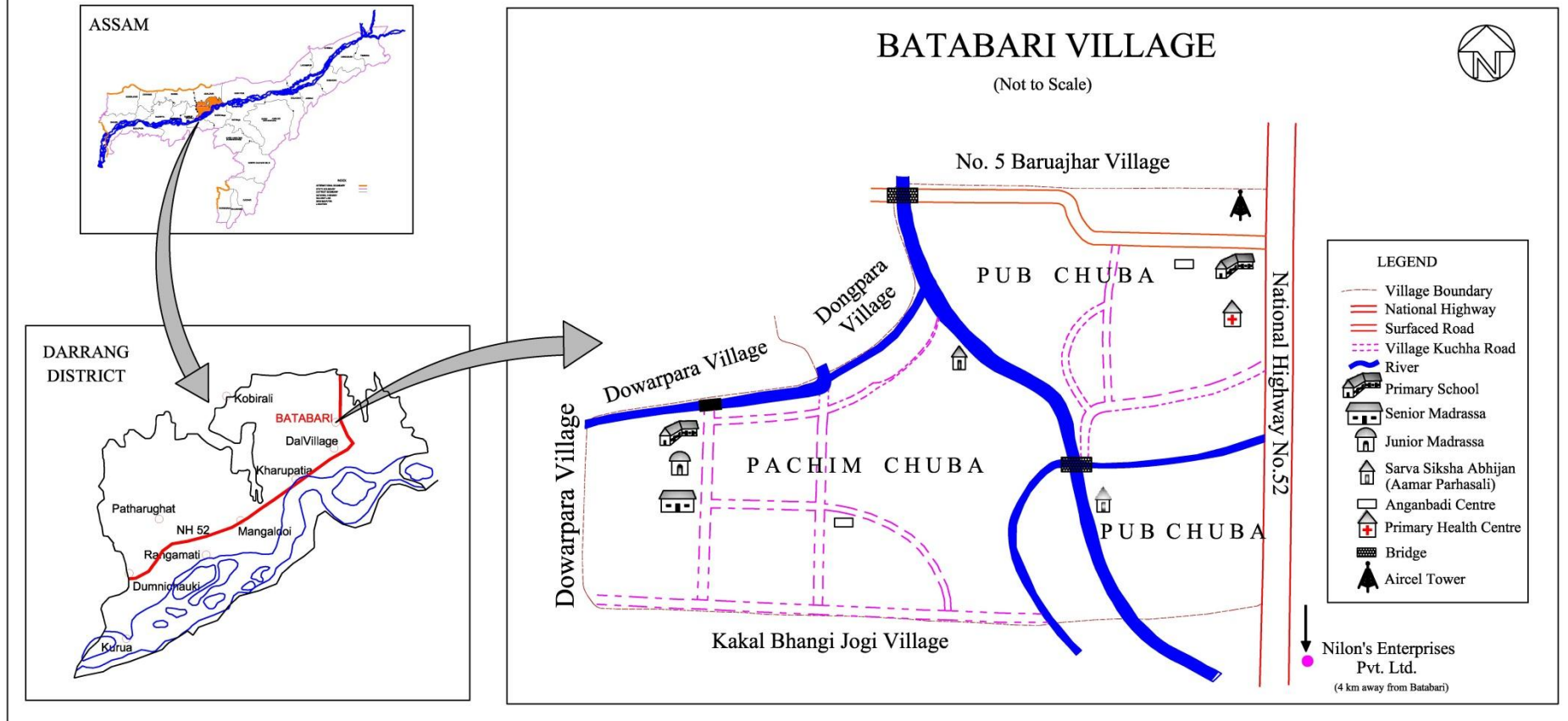


Figure 7a

7.2.2 Elements of the SAM for Batabari

The village SAM for Batabari includes four main accounts- production activities, commodities, factors of production and institutions. The following detailed list gives the clear picture of the SAM elements under different institutions.

Production Activities Account:

1. Agriculture
2. Allied Agricultural activities- sericulture, forestry, fishery, poultry, livestock etc.
3. Trade and petty services - trade like fruit and vegetable vendor; petty businesses; Contracting; bicycle repairing; grocery, pan shop etc.; Private jobs.
4. Government services include teacher, health workers etc.
5. Transportation
6. Construction
7. Miscellaneous activities- land mortgaged out income, income of the beggar, income from selling firewood etc.

Commodities Account: (see details in Table 7.2)

1. Social Expenditure
2. Rice
3. Jute
4. Vegetables
5. Spices
6. Fruits
7. Oilseeds (Mustard Oil, Sesame etc.)
8. Other Crops
9. Agricultural inputs
10. Livestock products
11. Durables
12. Other consumer goods
13. Fodder
14. Services

Factors of Production Account:

1. Land: Rent
2. Family Labour (male + female)
3. Hired Labour (male + female)
4. Credit -Loan (from government bank, other banks or private individual)
5. Salaried workers including workers in the government job, private job etc.
6. Employed at Nilon's

Institutions Account:**A. Households**

1. Agriculture Landless Workers
2. Small Farmers (with land up to 2.5 acres/1 hectare)
3. Medium Farmers (with land from 2.5/1 hectare to 5.0 acres/2 hectare)
4. Large Farmers (with land above 5.0 acres/2 hectare)
5. Self Employed in Non-Agriculture
6. Service Holders

B. Government: Village Government (village panchayat)+state and central government**C. Rest of the Village (ROV)-market etc.: Imports into and exports out of the village.****D. Rest of the Village - Nilon's industry: exports of the commodities to Nilon's****E. Capital Account: Household savings; human capital-on education and health****F. Stocks****G. Maintenance**

Following Hirway *et al.* (2004) and Agaje (2008), the farmers in the study are divided into different categories based on the cultivable land owned.

The list of crops/products produced in the village are presented in Table 7.2

Table 7.2
Crops/Products of the Village

1. Rice	14. Water(bottle) gourd- <i>pani lau</i>	28. Litchi	Other crops/ products
2. Jute	15. <i>Ol Govi</i>	29. Mango	42. Eggs
Oilseeds	16. Brinjal	30. Pineapple	43. Lamb meat
3. Mustard Oil	17. Cucumber	31. Sugarcane	44. Milk and milk products
4. Sesame	18. <i>Jika, Bhol</i> etc. gourd	32. Jackfruits	45. Beef
5. Others	19. Radish	33. Lemon	46. Mutton
Vegetables	20. Bitter gourd	34. Papaya	47. Chicken
6. Potatoes	21. <i>Bhat kerela</i>	35. Other-coconut etc.	48. Hides/skin
7. Onions	22. Beans, Peas	Spices	49. Dung cakes
8. Tomato	23. <i>Lesera, Boot, Mung</i> etc. lentils	36. Chilli	50. Fish
9. White gourd- <i>komora</i>	24. Lady's finger	37. <i>Dhania</i> (coriander)	51. Pig meat
10. Pumpkin- <i>ranga lau</i>	25. Any <i>Shak</i> including <i>jute shak</i>	38. Garlic	52. Other
11. Carrot	Others	39. Ginger	
12. Cauliflower	26.i. Bettle nut etc.; 26.ii. Bamboo	40. Turmeric	
13. Cabbage	Fruits	41. Other - Pepper etc.	
	27. Banana		

7.2.3 Construction of the Village SAM for Batabari

The village SAM presents collected data as a set of consistent accounts in the form of a square matrix. Each row contains receipts coming to that account and the corresponding column shows how that account's total receipts are spent on or distributed to other accounts. For any account, total receipts and total expenditure must tally and so each account's row and column totals are the same. A schematic aggregate SAM of the village Batabari is presented in Table 7.3.

Table 7.3
A Schematic Representation of the Village SAM for Batabari

		Expenditure											
		Endogenous				Exogenous							
		Production Activities(1)	Commodities(2)	Factors of Production(3)	Households(4)	Government(5)	ROV-market etc.(6)	ROV-Nilon's Industry(7)	Capital(8)	Maintenance(9)	Stocks(10)	Row Total	
Income	Endogenous	Production Activities(1)	-	Domestic commodity and service supply(1,2)	-	-	-	-	-	-	-	Total Output	
		Commodities (2)	Intermediate Inputs(2,1)	Composite Commodity (2,2)	-	Consumption demand (2,4)	-	Exports(sale to market)(2,6)	sale to industry/ Industry's consumption from village(2,7)	Investment demand (2,8)	Maintenance on durables(2,9)	Stock changes(2,10)	Total Demand
		Factors of Production (3)	Value-added(wages, interest, salaries, rent) (3,1)	-	-	-	-	Factor income earnings-payments on Govt. and private job(3,6)	Payments to labour(salary)(3,7)	Payments to labour(3,8)	Maintenance on durables(payment s to inside village labour)(3,9)	-	Total receipts from factor income
		Households (4)	Profits(4,1)	-	Factor income-payment to hhs.for labour and capital used in production (4,3)	Inter household transfer(4,4)	Government transfers to households(4,5)	Transfer income (remittances from outside village) (4,6)	-	-	-	-	Total income
	Exogenous	Government (5)	Taxes on production including subsidies as a - ve tax(5,1)	-	-	Any Tax on households income and property, land revenue etc. (5,4)	-	-	-	-	-	-	Total income of the village government
		ROV-market etc.(6)	Imports of agricultural inputs(6,1)	Imports of consumer goods(6,2)	Factor payments to outside village labourers etc.(6,3)	Remittances to outside villager(6,4)	-	-	-	Net Capital outflow-imports of investment goods (6,8)	Maintenance on durables(payment s to outside village labourers)(6,9)	-	Total imports
		ROV-Nilon's Industry(7)	-	-	-	Products of industry purchased by villagers(7,4)	-	-	-	-	-	-	Total income of industry from the village
		Capital(8)	-	-	-	Savings by households(8,4)	Savings of village Govt.(8,5)	Deficit/Surplus/net capital received from ROV(8,6)	-	-	-	-	Total savings
		Maintenance (9)	Maintenance expenses of different activities (9,1)	-	-	Maintenance on durables(9,4)	-	-	-	-	-	-	Total income earned by ROV from the villages on maintenance
		Stocks(10)	-	Supplies from stocks(10,2)	-	Private stocks(10,4)	-	-	-	-	-	-	Total stocks
		Column Total	Total payments	Total supply	Total payments to factors of production	Total current expenditures and savings	Total current exp.s and savings of the village Govt.	Total exports	Total current exp. of the industry on the village	Gross investment	Total exp. of villages on maintenance	Stock changes	-

The details about the accounts of Table 7.3 are explained below:

1. The first row (production activity account) has only one non-zero entry, which describes the commodity and services supplied by the village activities. It (1,2) includes all the output supplied by the village activities including market sales, industry sales, home consumption, gift to neighbours, residue for seeds. Selling firewood income is included as services from miscellaneous activities. Money earned from land mortgaged out is taken as earnings from services to miscellaneous activities. In case of the families with more than one income earning persons, the main person on which income the family mainly depends is categorised on that specific category.
2. The first entry in the second row (commodity account) (2, 1) describes the values of the intermediate inputs used in the production of goods and services. Intermediate consumption in agriculture comprises of home produced seeds, fertilisers-cow dung; agricultural equipments-bullock cart, shallow tube well (STW) for irrigation etc. Own bullocks/equipments/irrigation costs are included under intermediate consumption. The second entry in this row (2, 2) shows the composite commodity which is the combination of commodities (rice, vegetables, etc.) that were jointly consumed by households during marriages, social function etc. The fourth entry (2, 4) shows the consumption demand which includes consumption demand of the villagers (home consumption which includes home production + imported production + home production gifted to the neighbours). The sixth entry (2, 6) shows the export of the goods and services by the villagers to the rest of the village excluding industry. The seventh entry (2, 7) shows the commodities supplied to the Nilon's industry by the villagers. The eighth entry (2, 8) shows the investment demand of the villagers i.e the investment on animal and physical capital purchases including private human capital investment on education and health less capital sold inside the village. The ninth entry (2, 9) shows the maintenance expenses of the villagers on durables. The tenth entry (2, 10) illustrates the stocks of commodities in the hands of private individual e.g stock of rice for seeds, sale and consumption; bamboo; jute etc.
3. The third row is for payments to factors. The accounts making these payments are the production activities (3,1) (which pays wages, rent, and salaries. Here,

rent includes payments to land mortgaged in. Imputed values are calculated for family labourers and the payment is based on 24 hours time allocation of each family member to each of the activities); rest of the village (3,6) (which pays labour employed outside the village except Nilon's); Nilon's industry (3,7) (which pays wages to employed labour); capital accounts (3,8) (which employs labour for creating capital assets and pays payment to labour employed in construction of irrigation assets, bullock cart, cattle shed and house construction); maintenance account (3,9) (which pays labour inside the village for maintenance and repair of durables). Hired labour consists of wage payments to hired workers. These wages include both money wages and some imputed wages (kind payments in terms of food for lunch). Family labour includes imputed wage payments to family members who work in family owned farms and non-farm activities. Children's wage is imputed as half of that of the adults. Cost for hired bullocks/equipments-tractor, thela etc. and irrigation cost are included under land rent.

4. In the first entry of the fourth row (4, 1), household account receives residual profits after deducting expenditures from income. The residual income i.e. profit of the productivity account is distributed among the household groups. Profits/trade balances for each of the household -small, medium and large are based on calculation of total receipts less total expenses. Expenses for each production activity include rent, interest paid, wage payment and maintenance expenses on farm equipment. These are subtracted from total receipts for each production activity including byproducts. Factor payments from the factor accounts to households are included in the third entry (4, 3). Payments made to capital factor accounts include land rents to services of hired bullocks. The fourth entry (4, 4) is for inter-household transfers. The fifth (4, 5) and sixth (4, 6) entry show the government transfers to households and transfers from the rest of the village to the village (i.e the wages received by working outside the village, interest received from deposits).
5. The fifth row is for government account and government receives (5, 1) taxes from production activities (subsidies are included as negative tax). Any tax (interest payments on bank loans made by the village; vehicle insurance paid by owners of tractor services; taxes paid by retail shops; professional tax; fees

etc. for studying outside the village; corruption charges) on households income and property, electricity bill, land revenue etc. are included in fourth entry (5,4). Although gross incomes of some of the households are more than two lakhs, this is the sum total of the income of all the family members and there is no record of paying personal income tax to the government. Fifth entry (5, 5) shows the inter-government transfers. Government includes village, state and central government.

6. The sixth row is for rest of villages. Rest of the village (ROV) implies to everywhere outside the village excluding the industry, because ROV (industry) is taken as another institution. Imports of agricultural inputs are included in the first entry (6, 1) and imports of other consumer goods are included in the second entry (6, 2). The third entry (6, 3) contains factor payments to outside village labourers. Remittances to outside villagers are included in the fourth entry (6, 4). The eighth entry (6,8) is for net capital outflow (it includes investment on imported consumer durables that are used for generating incomes, such as CD player, cassettes, cycles etc. less consumer durables sold outside the village /Investment in bank deposits, insurance policies less bank credit). Payments to outside village labourers for maintenance of durables are included in the ninth entry (6, 9).
7. The seventh row contains products of industry purchased by villagers as the only non-zero entry (7,4).
8. The eighth row is for the capital accounts and contains entries for savings by the households (8, 4) and the village government (8, 5). Since savings should be equal to the investment, therefore the difference between savings and investment is balanced by the account (8, 6) (Agaje, 2008).
9. The ninth row is for maintenance expenditures on maintenance of production assets (9, 1) and spending by the households on maintenance of consumer durables (9, 4).
10. The tenth row is for stocks. Here, Private Stocks=Stocks at the end of the Reference Period - Stocks at the beginning of the Reference Period and Stocks for Shops=Purchases - (sales + self-consumption for each individual item within the village). (10, 2) shows the supplies from the stocks which implies the commodities supply from the village grocery shops. Private stocks (10, 4)

implies the stocks of the commodities unsold in all the household groups as property e.g. bamboo in the homestead; rice; jute etc.

In SAM estimation, both real and imputed productions are incorporated. Unsold outputs and own-consumption are evaluated at market prices.

7.2.4 Aggregate SAM for Batabari

After constructing 99 numbers of SAM for 99 households, all the SAM are added to estimate the final village SAM. The aggregate SAM of Batabari Village for 2009 is presented in Table 7.4.



Table 7.4
The Aggregate SAM of the Village Batabari, 2009

	Production Activities(1)	Commodities(2)	Factors of Production(3)	Households(4)	Government(5)	ROV-market etc.(6)	ROV-Nilon's Industry(7)	Capital(8)	Maintenance (9)	Stocks(10)	Row Total
Production Activities(1)	-	14159010.24	-	-	-	-	-	-	-	-	14159010.24
Commodities(2)	767984.5	92200	-	9120874	-	5054182.55	188779.26	2198532	40530	1884467.5	19347549.24
Factors of Production(3)	4361678.7	-	-	-	-	2342274	9800	183000	2022	-	6898774.7
Households(4)	8265794	-	5738866.7	38697.91	436019	45075	-	-	-	-	14524453.21
Government(5)	8471	-	-	32231	-	-	-	-	-	-	40702
ROV-market etc.(6)	686970	4755081.5	1159908	2277250.7	-	-	-	139678	94545	-	9113433.2
ROV-Nilon's Industry(7)	-	-	-	230	-	-	-	-	-	-	230
Capital(8)	-	-	-	1442974.6	500	1077735.21	-	-	-	-	2521209.86
Maintenance(9)	68112	-	-	68985	-	-	-	-	-	-	137097
Stocks(10)	-	341257.5	-	1543210	-	-	-	-	-	-	1884467.5
Column Total	14159010.24	19347549.24	6898774.7	14524453.21	436519	8519266.8	198579.26	2521210	137097	1884467.5	68626926.95

Source: Own Calculation.

With the help of the constructed SAM matrix of the village Batabari, the entire village economy for one year is captured. The following sections explain the socio-economic characteristics of the village and the impact of the subject industry on the village through multiplier analysis on the basis of the village SAM of Batabari.

7.2.5 Characteristics of the Village Economy of Batabari

7.2.5.1 Selected Socio-Economic Characteristics of the Village

Out of 183.54 hectare (of which 68.94 hectare is government land) total net cropped area in the village, the cultivated land of *Pachim Chuba* of the village is 44.74 hectare of which about 50 per cent, 25 per cent, 10 per cent, 10 per cent and 5 per cent are under rice, vegetables, horticulture, jute and other cultivation respectively. Some other socio-economic characteristics of the village are presented in Table 7.5. The table shows that the average family size in the village is 6.36 with the highest 8.36 number of members in medium farmers. Although the average land holding per family is 0.45 hectare, the land holding per person is only 0.07 hectare. Total number of 99 households comprises of highest small farmers (59.60 per cent) followed by landless workers (22.22 per cent), medium farmers (11.11 per cent), large farmers (3.03 per cent), self-employed in non-agriculture (2.02 per cent) and service holders (2.02 per cent).

Table 7.5
Selected Socio-Economic Characteristics of Batabari

	Agriculture Landless Workers	Small Farmers	Medium Farmers	Large Farmers	Self-employed in Non- Agriculture	Service Holders	Village Average
Average family size	5.45	6.37	8.36	7	6.5	4	6.36
Cultivated land holding (hectare)	0	0.35	1.35	3.08	0.13	0	0.45
Land holding per capita (hectare)	0	0.05	0.16	0.44	0.02	0	0.07
Household Composition (%)	22.22	59.60	11.11	3.03	2.02	2.02	

7.2.5.2 Educational Qualification of the Villagers

The literacy rate of the village is estimated at 67.94 per cent as presented in Table 7.6. The literacy rate is calculated as the ratio of the number of population of age 5 and above 5 years of who enrolled in school to total number of population of the village, multiplied by 100. Out of the total literate persons, only three are graduates.

Table 7.6
Educational Qualification of the Villagers

Educational Qualification	No. of Population	% of Population
Illiterate (excludes 83 numbers of children of age 5 or below 5)	202	32.06
Below primary or informal education	183	29.05
Primary	80	12.7
Middle	53	8.41
Vocational course	6	0.95
High school/secondary	10	1.59
Higher secondary	7	1.11
Technical diploma or certificate below degree	0	0
Technical/ professional degree (medical, engineering, law, management etc.)	1	0.2
Graduate Degree (General)	3	0.48
Post-graduate degree (General)	0	0
Educated in Church/Mosque School	2	0.32
Others	0	0
Total Population	630 (including 83 children i.e 547+83=630)	100

7.2.5.3 Contribution of the Sectors to the Village GDP

The contribution of the different sectors of the village to the village GDP is presented in Table 7.7. The GDP of the village is calculated following the procedure undertaken by Parikh and Thorbecke (1996), Subramanian (2006) and Taylor and Adelman (2006). It is the sum of value added of the production activities in the village SAM of Batabari (i.e agriculture, allied agriculture, trade and pretty services, government services, transportation, construction and miscellaneous activities). To calculate the value additions of the sectors, the value of the intermediate commodities are deducted from the commodities and services supplied by each of the productive activity.

As for example,

The contribution of agriculture to village GDP

= (Supply of Agricultural Products - Intermediate Commodities)*100/ (Total Output of the Village-Total value of the Intermediate Commodities)

= (7022308.24- 760405.5)*100/ (14159010 -1454955)

=6261903*100/12704056

= 49.29 per cent

Where, value addition by the agriculture sector for that reference year is 62,61,903 and total value addition i.e GDP is 127,04,056.

The following table shows that agriculture contributes the major share of 49.29 per cent followed by trade and petty services (16.18 per cent) and miscellaneous activities (14.03 per cent). This is reflected in Figure 7.1 also.

Table 7.7
Contribution of the Sectors to the Village GDP

Sl. No.	Sectors	Contribution to Village GDP (%)
1	Agriculture	49.29
2	Allied agricultural activities-livestock etc	13.34
3	Trade and Petty Services	16.18
4	Government services	1.74
5	Transportation	3.40
6	Construction	2.02
7	Miscellaneous activities	14.03
	Village GDP	100.00

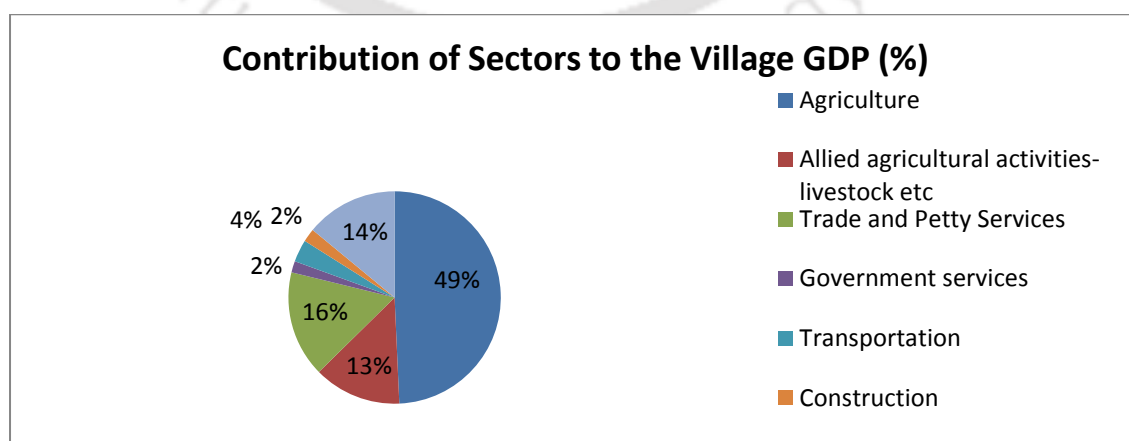


Figure 7.1

7.2.5.4 Contribution of Factors to Total Value Added

The contribution of factors to total income of the village is presented in Table 7.8 and Figure 7.2. It is evident from the table and the figure that the contribution of family labour is relatively higher (42.8 per cent) to the total value addition of the factors than the other factors. The family labour is followed by land (24.47 per cent) and hired labour (16.72 per cent) in the village.

Table 7.8
Contribution of Factors to Total Value Added (%)

Land (Rent)	24.47
Family Labour (M+F)	42.8
Hired Labour (M+F)	16.72
Credit	9.89
Salaried Persons	5.98
Employed at Nilon's	0.14
All Factors	100

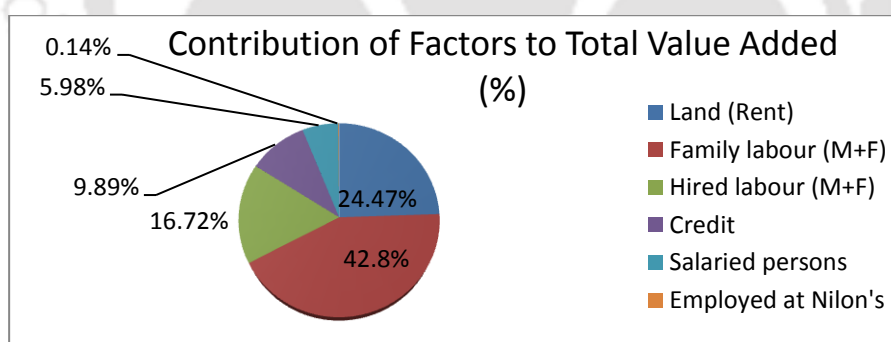


Figure 7.2

7.2.5.5 Composition of Household Income and Per Capita Income across Households

The allocation of factor incomes across different households is presented in Table 7.9 and Figure 7.3. The table and figure show that the daily wage earnings is the main source of income for the agriculture landless workers (56.09 per cent). Family labour gives the highest earnings for the small farmers (86.61 per cent), followed by medium farmers (69.02 per cent), and self-employed in non-

agriculture (50.14 per cent). Land gives highest earnings to the large farmers (66.7 per cent). Obviously service holders get the highest income from the salaried persons.

The pattern of per capita income (it excludes imputed income of the family labour) across different households is shown in Figure 7.4. Although the average per capita income of all the household groups is calculated at Rs.18,367.65, the per capita income of all other households groups are above the average except small farmers with large number of 59.6 per cent of population.

The income coming to per household per day from the government through various schemes (i.e in terms of social sector expenditure) is estimated from the village SAM and found as Rs. 12.08.

Table 7.9
Distribution of Factor Income Shares across Household Groups (in %)

Household Composition	Land (Rent)	Family Labour	Hired Labour	Credit	Salaried Persons	Employed at Nilon's
Agriculture Landless Workers	0	39.88	56.09	3.62	0	0.41
Small Farmers	9.24	86.61	0	2.62	1.36	0.17
Medium Farmers	27.37	69.02	0	3.6	0	0
Large Farmers	66.7	22.88	0	6.14	4.28	0
Self-employed in Non-Agriculture	48.52	50.14	0.25	1.08	0	0
Services Holders	3.29	3.15	0	0.32	93.24	0

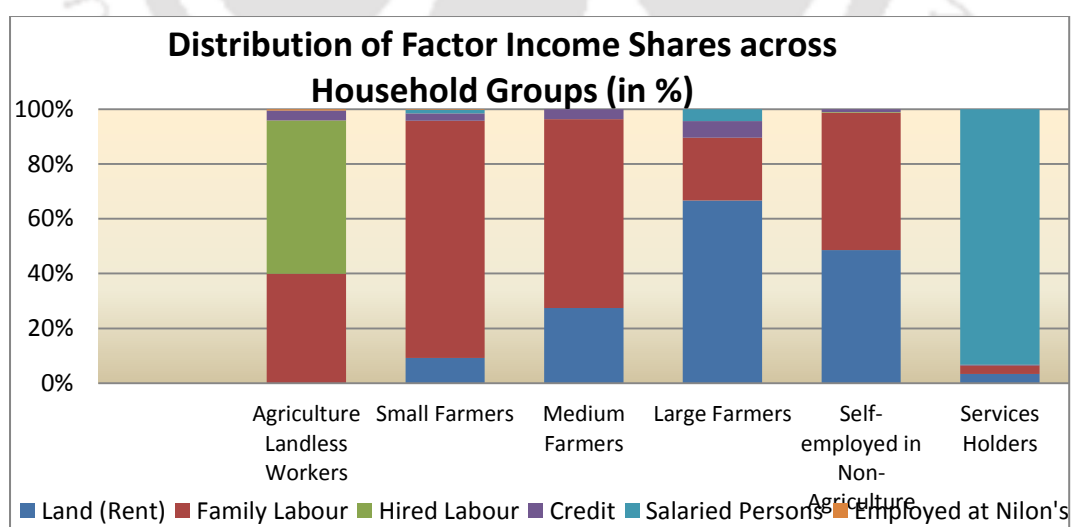


Figure 7.3

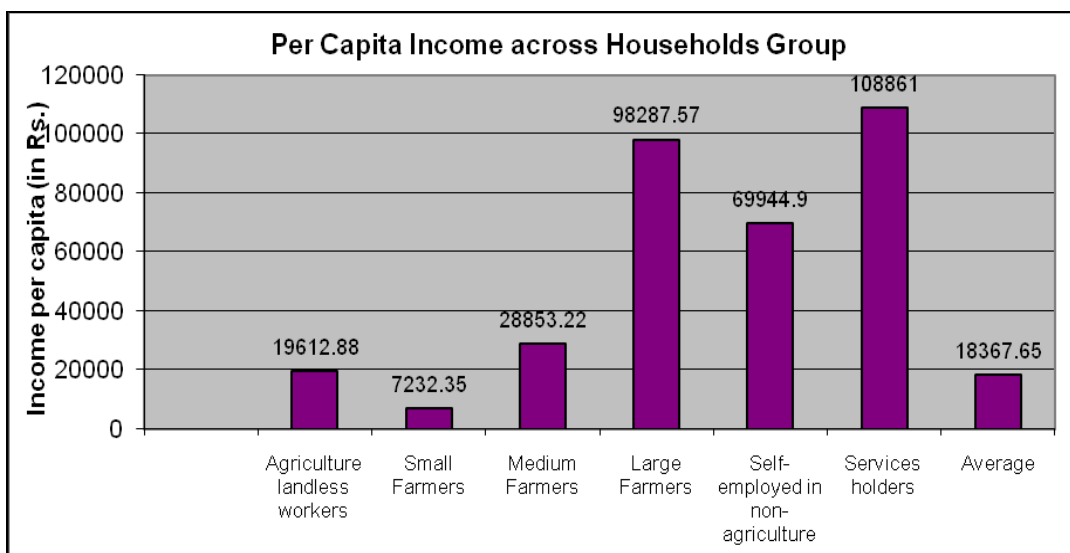


Figure 7.4

7.2.5.6 Household Expenditure and Savings

The households' expenditures and savings are presented in Table 7.10. It is evident from the table that agriculture small farmers spend highest 82.25 per cent on consumer goods and services. Expenditure on human capital is highest for medium farmers. Household savings is highest for service holders and negative for the medium farmers in the reference period. Small farmers spend more in maintenance and stocks are highest in the hands of the medium farmers.

Table 7.10
Household Expenditure and Savings (%)

Expenditures and Savings	Agriculture Landless Workers	Small Farmers	Medium Farmers	Large Farmers	Self Employed in Non-Agriculture	Service Holders
Household Exp. on consumer goods and services(including exp. on human capital)	60.98	83.25	66.04	40.19	58.89	30.13
Exp. on Human capital (Health and Education)	28.16	25.77	29.85	29.26	29.55	6.51
Household savings	4.10	6.05	-0.66	16.05	13.08	66.52
Maintenance	0.28	1.01	0.20	0.45	0.20	0.24
Stocks	1.67	5.92	25.05	18.07	3.50	0.17

7.2.5.7 Import Penetration Ratio (IPR) and Export Intensity (EI) of Trade in Batabari

The relative importance of trade for different commodities and services in the village is calculated with the help of Import Penetration Ratios (IPR) and Export Intensities (EI). The IPR is the share of imports in the value of total demand, and EI is the share of exports in the value of gross output (Breisinger *et al.*, 2009). The formula of IPR and EI are as follows:

$$\text{Import Penetration Ratio (IPR)} = \frac{\text{imports}}{\text{Total Demand}}$$

$$\text{Export Intensity (EI)} = \frac{\text{Exports}}{\text{Gross Output}}$$

Here,

$$\begin{aligned} \text{Total Demand} &= \text{Total consumption demand for own village product} \\ &+ \text{Total Imports} \\ &(\text{Total input imports} \\ &+ \text{Total consumption and investment goods imports} \\ &+ \text{Total factors imports} \\ &+ \text{Remittances to Rest of the village including transportation cost} \\ &+ \text{Net capital outflow/imports of investment} \\ &+ \text{Expenses on maintenance to outside village}) \\ &= \text{Rs.19347549.24} + (\text{Rs. 686970.00} + \text{Rs. 4755081.50} \\ &+ \text{Rs. 1159908.00} + \text{Rs. 2277250.70} + \text{Rs. 139678.00} \\ &+ \text{Rs. 94545.00} = \text{Rs. 9113433.20}) \\ &= \text{Rs. 28460982.00} \end{aligned}$$

And, Total Imports = Rs.9113433.20

Thus, Import Penetration Ratio (IPR) for the village

$$= \frac{\text{imports}}{\text{Total Demand}} = \frac{9113433.2}{28460982} = 0.32 = 32 \text{ per cent}$$

Thus, it is revealed from the above analysis that the village economy is a self-reliant economy as the import is only 32 per cent of their total demand. Out of

32 per cent total imports, 7.54 per cent is the total imports of input for production activities; 52.18 per cent is imports of consumption and investment goods; 12.73 per cent is imports of factors; 24.99 per cent is remittances to rest of the village including transportation cost; 1.53 is imports on investment (investment on banks, post-office; LIC etc.); and 1.04 per cent is expenses on maintenance to outside village.

Again,

$$\begin{aligned}
 \text{Total Exports} &= \text{Total exports to the market} \\
 &+ \text{Factor Income Earnings (payments on Government and private jobs)} \\
 &+ \text{Transfer income from rest of the villages} \\
 &+ \text{Net capital inflow (Deficit/Surplus)} + \text{Total exports to industry} \\
 &+ \text{Payments to labourer by the industry} \\
 &= (\text{Rs. } 5054182.55 + \text{Rs. } 2342274.00 + \text{Rs. } 45075.00 + \text{Rs. } 1077735.21) \\
 &+ (\text{Rs. } 188779.26 + \text{Rs. } 9800.00) = \text{Rs. } 8519266.80 + \text{Rs. } 198579.26 \\
 &= \text{Rs. } 8717846.00
 \end{aligned}$$

$$\text{Gross Output} = \text{Rs. } 14159010.24$$

Thus, Export Intensity (EI) for the village

$$= \frac{\text{Exports}}{\text{Gross Output}} = \frac{8717846.00}{14159010.24} = 61.57 \text{ per cent}$$

Thus, more than 60 per cent of their gross output comes from their exports to the rest of the economy and the Nilon's industry. Out of 61.57 per cent exports, 57.98 per cent is export of vegetables and other products to the market; 26.87 per cent is Factor Income Earnings; 0.52 per cent is Transfer income from rest of the villages; 12.36 per cent is Net capital inflow (Deficit/surplus); 2.17 per cent is Total exports to Nilon's industry; and 0.11 per cent is payments to labourer by the subject industry.

7.2.5.8 Sources of Income for the Households and their Distribution

The sources of income for the households and their distribution are presented in Table 7.11. The table shows that out of the total income, profits from

different production activities give the highest income (56.91 per cent) to the households followed by factor returns (39.51 per cent), government transfers (3 per cent), remittance income from ROV (0.31 per cent) and intra-household transfers (0.27 per cent). Production activities give highest profit to the medium farmers. Similarly, factor returns is highest for landless workers, intra-household transfer receipts and government transfer are highest for small farmers. Remittance income is highest for the medium farmers.

Table 7.11
Sources of Income for the Households and their Distribution

	Profits from different activities	% of total income	Total factor returns	% of total income	Intra-household transfer receipts	% of total income	Government Transfers	% of total income	Remittance income from ROV	% of total income	Total Income
Agriculture Landless Workers	1201727	39.08	1810170	58.86	5644	0.18	56744	1.85	1135	0.04	3075420
Small Farmers	2296852.54	59.38	1326269	34.29	22495.91	0.58	220943	5.71	1530	0.04	3868090.45
Medium Farmers	2286401.5	70.29	867055	26.65	9577	0.29	69938	2.15	20000	0.61	3252971.5
Large Farmers	1439808	64.42	747285	33.43	342	0.02	37604	1.68	10000	0.45	2235039
Self-Employed in Non-Agriculture	556072	45.96	599292.7	49.54	330	0.03	47104	3.89	7000	0.58	1209798.7
Services Holders	484933	54.91	388795	44.02	309	0.03	3686	0.42	5410	0.61	883133
Total	8265794.04	56.91	5738866.7	39.51	38697.91	0.27	436019	3.00	45075	0.31	14524452.7

7.2.6 Government Subsidy to the Industry and its Return to the Locality

Benefits of setting up of Nilon's industry in Dalgaon can be examined from its return to that locality.

Indian government provides a variety of subsidies to industries under rural industrialisation scheme for establishing a factory in a backward region. From the figures given in the government reports, such subsidy is equivalent to 20 per cent of the total cost incurred by the firm (Parikh and Thorbecke, 1996). In North Eastern Region, the total investment subsidy is 30 per cent (IMRB, 2008-09).

As a part of the field work, some information on the investment of the industry, industry's demand for inputs, total production of the industry, employment in the industry etc. has been collected from Nilon's industry. From the questionnaire on Nilon's industry, it is found that the total initial investment of the industry is 16.65 crores.

If government subsidy is 30 per cent of the total cost, then the total amount of subsidy is Rs. 499, 50, 000. Subsidy is given for the benefit of the people [The rationale behind the government incentives is to modifying the social bias against investments and increasing the rates of return on investments that may have a relatively low private profitability but offer externality benefits for society as a whole (Laird and Rinehart, 1967; Keipi, 1997; Singh, 2009)]. If it is assumed that the industry is established for 50 villages (as the industry is taking inputs from about 50 neighbouring villages), then the subsidy given per household of the village Batabari per day can be calculated as follows:

$$\begin{aligned} & (\text{Rs. } 16.65 \times 1,00,00,000 \times 0.3) \div (99 \times 50 \times 15 \times 365) \\ & \quad \text{(assuming that the subsidy is given for 15 years)} \\ & = \text{Rs. } (499, 50, 000 \div 27101250) \\ & = \text{Rs. } 1.84 \end{aligned}$$

Again, the return of the industry per day to each household is calculated from the SAM as Rs.5.50 [the return of the industry to the village = {(the total value of the commodities supplied to the industry + the wages received from the industry by the villagers working as temporary employee) $\div$ 365} $\div$ 99]³.

Thus, the analysis shows that as against an investment of Rs. 1.84 per day per household, the industry provides a return of Rs.5.50 per day per household which can be considered as a substantial amount.

7.2.7 Examination of Scope of Setting up of More Food-Processing Industry in the Locality

The information collected from the industry shows that the daily requirement of raw-materials of the industry is 6.896 tonne.

On the other hand, the daily sale volume of the two nearest markets of the industry, Bechimari and Balugaon, at which the farmers mainly sell their products, is estimated on the basis of information of Gaon Panchayats. The amount of daily transaction of the commodities related to the industry (mainly Carrot, Chilli, Potato/Pumkin, Cauliflower/Ol Govi/Papaya, Tomato/Mango) in the market is 427 tonne. Since, about 50 villages supply raw-materials to the Nilon's industry, the share of each in the total supply is $1/50^{\text{th}}$ i.e 8.54 tonne only.

Therefore, the share of the industry in the daily market transactions of the locality is $(6.896/427) \times 100 = 1.615$ per cent.

Thus, it has been found that the farmers of the villages are selling only a nominal amount of their crops directly to the industry. The supply of the vegetables and spices is much more in that locality than the demand from the industry. Since the supply of inputs for food-processing industry is abundant in that locality, there exists scope for more food-processing industries in the locality for value addition of the products of that locality.

Establishment of more industries in the locality will push up the demand for the crops. This can raise the bargaining strength of the farmers for getting remunerative price for their products.

7.3 Analysis of the Impact of the Industry on the Village through SAM Multiplier Model

The impact of Nilon's industry on the village is shown with the help of different types of multipliers calculated from the village SAM for Batabari.

According to Thorbecke (2000), "For any given injection anywhere in the SAM, influence is transmitted through the interdependent SAM system. The total,

direct and indirect, effects of the injection on the endogenous accounts, i.e. the total outputs of the different production activities and the incomes of the various factors and socio-economic groups are estimated through the multiplier process”.

7.3.1 Results of Output, Income and Employment Multipliers

The three most frequently used multipliers derived from the SAM are - output, income and employment multipliers which estimate the effect of change in the demand for outputs on: (1) outputs of the sectors; (2) income earned by households because of new outputs; and (3) employment generated because of the new outputs.

The multiplier effects work in the following way. If the demand for the vegetables and fruits of the village increases by the food-processing industry then there will be increased output of the village. This is output multiplier. The increase in output tends to increase in income of the villagers. This is income multiplier. This will also create employment opportunities locally and opportunities created by the industry. This is employment multiplier. Since the new employment will also increase the income of households, it leads to an increase in demand for goods produced in the local economy. Thus, the food-processing industry has a multiplied impact on the total output, income and employment of the village economy. Exogenous increase of demand for products of the village is treated as an external shock to the village and social accounting matrix (SAM) is used to generate the direct, indirect and induced impact.

The multiplier matrix of the village Batabari is presented in Table 7.12 and output and income multipliers for the sectors of the village are calculated from the table. The table show that the activity that induces highest output in the economy is allied agricultural activities if it receives economic stimulations, such as an increase in export demand. The activity yields the maximum total output multiplier (2.05) in Batabari, followed by agricultural inputs (2.04), miscellaneous activities (1.81) and construction (1.81) indicating their high integration with other sectors. SAM output multipliers at a local or regional scale are usually lower, and have values between 1.3 and 2.3 (Roberts, 1998; Cohen, 1996; Psaltopoulos *et al.*, 2006 from Leeuwen and Nijkamp, 2002). Since 2.3 is the highest value and 1.3 is the lowest value of the multiplier, therefore, the average of the two extreme values gives 1.8 assuming linear relationship of the variables. In this study, the values

found above the average value 1.8 are taken as high multiplier value and below 1.8 are regarded as the low multiplier values. Agriculture, transportation, trade and petty services, government services etc. yield multipliers below 1.8. Agriculture occupies the seventh position out of 21 production activities account. Salaried Persons contributes only meagre 0.39 as the output multiplier whereas the persons employed at Nilon's contributes 0.89 as the output multiplier.

On the other hand, the households' income multipliers are generally lower compared with output multipliers. This is due to various leakages from the circular flow of income (for instance, import and tax leakages) (Breisinger *et al.*, 2009). At a local scale, the income multiplier values typically range between 1.2 and 1.6 (Leeuwen and Nijkamp, 2002). The average of the two extreme values is found as 1.4. In this study, allied agricultural activities, trade and petty services, government services, construction and miscellaneous activities yield the income multiplier greater than the average value 1.4 whereas agriculture and transportation activities show lower value than the average value 1.4. However, as it will be shown later, the distribution of these total increases in household income is uneven across households. Low income multiplier in agriculture is mainly due to the fact that the farmers who mortgage in land, they spend money in a huge amount however they get returned only a smaller amount in that year. Actually they invest that amount of money not for one year but for 3, 5 or more than 5 years which is not specified in the survey information. In the long run, their return is obviously more which cannot be realised in that survey period. This is the reason why income earned from agricultural activities may be even negative for the survey period. As for example, any farmer can invest Rs. 5, 00, 000 for mortgage in land but the output for that period cannot give him Rs. 5, 00, 000.00 as return. Similarly, in transportation activities also, it is observed that mostly tractors are bought for rent by taking bank loans and they have to pay interest monthly. Till the repayment is not made the profit from these activities cannot be realised. Therefore, the income generated by this activity is shown low. However, the losses to these farmers are offset by gains in allied agricultural activities like livestock sector activities and other activities.

On the basis of Table 7.12, employment multipliers are obtained by multiplying the output multiplier of each sector with the relevant direct

employment coefficient. Direct employment coefficients are defined as employment per unit of output. Thus, direct employment coefficient of each sector is calculated as the ratio between the wages and salaries generated by the production activities and the total outputs of the activities. The estimated employment multipliers are presented in Table 7.13. According to Leeuwen and Nijkamp (2002), the employment multiplier values are more homogeneous compared with the output and household income multipliers: they range between 1.10 and 1.36. The employment multiplier is found to be the highest for transportation sector (0.90) followed by agriculture (0.83), allied agricultural activities (0.35) and trade and petty services (0.10). The employment multiplier for all the activities in the village is low. The sectors do not have high employment multipliers, possibly because these sectors are already labour intensive (as expressed by Leeuwen and Nijkamp (2002) in a different study).

As the study is intended to examine the impact of Nilon's industry on the village, the output, income, employment multipliers have been computed. These show that if demand for agricultural crops by the industry is increased by Re.1 in the village then the production/output in the agriculture sector will be increased by Rs.1.64 (i.e. $\text{Re.1} \times 1.64$); income increases by Rs.1.32 (i.e. $\text{Re.1} \times 1.32$) and employment increases by 0.83 units (i.e. $\text{Re.1} \times 0.83$) in the village.

The output, income and employment multipliers are shown in Figure 7.5, Figure 7.6 and Figure 7.7 respectively.

Table 7.12: Multiplier Matrix for Batabari, 2009

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Agriculture	1.22	0.3	0.27	0.2	0.17	0.28	0.24	0.38	0.76	1.22	1.09	0.88	0.97	0	1.18	0.3	0.23	0	0.48	1.05	0.23
2	Allied agricultural activities-livestock etc	0.07	1.21	0.08	0.07	0.06	0.09	0.08	0.11	0.04	0.07	0.06	0.05	0.05	0	0.06	1.2	0.91	0	0.03	0.06	0.12
3	Trade and Petty Services	0.15	0.22	1.17	0.12	0.17	0.18	0.2	0.08	0.09	0.15	0.13	0.11	0.12	0	0.14	0.22	0.17	0	0.06	0.13	0.56
4	Government services	0.02	0.02	0.02	1.01	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0	0.02	0.02	0.02	0	0.01	0.01	0.06
5	Transportation	0.04	0.06	0.04	0.03	1.04	0.05	0.05	0.02	0.02	0.04	0.03	0.03	0.03	0	0.04	0.06	0.04	0	0.02	0.03	0.14
6	Construction	0.02	0.03	0.02	0.01	0.02	1.02	0.03	0.01	0.01	0.02	0.02	0.01	0.01	0	0.02	0.03	0.02	0	0.01	0.02	0.07
7	Miscellaneous activities	0.14	0.2	0.15	0.11	0.15	0.17	1.19	0.07	0.09	0.14	0.12	0.1	0.11	0	0.13	0.2	0.15	0	0.05	0.12	0.51
	Production/output multiplier	1.64	2.05	1.75	1.56	1.64	1.81	1.81	0.68	1.03	1.64	1.46	1.18	1.31	0	1.59	2.04	1.54	0	0.66	1.42	1.69
8	Social expenditure	0.01	0.01	0.01	0.01	0	0.01	0.01	1	0.01	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0	0	0.01	0.01
9	Rice	0.18	0.26	0.23	0.17	0.15	0.24	0.2	0.28	1.11	0.18	0.16	0.13	0.14	0	0.17	0.26	0.19	0	0.07	0.15	0.2
10	Jute	0	0	0	0	0	0	0.01	0	0	1	0	0	0	0	0	0	0	0	0	0	0
11	Vegetables	0.04	0.06	0.05	0.04	0.03	0.05	0.04	0.12	0.02	0.04	1.03	0.03	0.03	0	0.04	0.06	0.04	0	0.01	0.03	0.04
12	Spices	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.06	0.01	0.02	0.01	1.01	0.01	0	0.02	0.02	0.02	0	0.01	0.01	0.02
13	Fruits	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0.01	0.01	0	1.01	0	0.01	0.01	0.01	0	0	0.01	0.01
14	Oilseeds/Oil	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.06	0.01	0.01	0.01	0.01	0.01	1	0.01	0.02	0.02	0	0.01	0.01	0.02
15	Other Crops	0	0.01	0	0	0	0.01	0.01	0.02	0	0	0	0	0	0	1	0.01	0	0	0	0	0
16	Agricultural inputs	0.01	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0	0.01	0.01	0	0	0	0.01	1.1	0.08	0	0	0	0.01
17	Livestock products	0.06	0.11	0.08	0.07	0.05	0.08	0.07	0.13	0.04	0.06	0.05	0.04	0.05	0	0.06	0.11	1.08	0	0.02	0.05	0.07
18	Durables	0.04	0.07	0.06	0.05	0.04	0.06	0.05	0.42	0.03	0.04	0.04	0.03	0.04	0	0.04	0.07	0.05	1	0.02	0.04	0.05
19	Other Consumer goods	0.09	0.13	0.12	0.09	0.07	0.12	0.11	0.09	0.06	0.09	0.08	0.07	0.07	0	0.09	0.13	0.1	0	1.04	0.08	0.1
20	Fodder	0.02	0.01	0.01	0	0	0.01	0	0.01	0.01	0.02	0.02	0.01	0.01	0	0.02	0.01	0	0	0.01	1.02	0
21	Services	0.39	0.59	0.44	0.32	0.44	0.48	0.53	0.2	0.24	0.39	0.35	0.28	0.31	0	0.38	0.58	0.44	0	0.16	0.33	1.45
	Consumption Multiplier	0.88	1.4	1.06	0.81	0.82	1.12	1.09	2.4	1.54	1.88	1.78	1.62	1.69	1	1.86	2.39	2.04	1	1.35	1.74	1.98
22	Land (Rent)	0.27	0.07	0.07	0.05	0.04	0.06	0.06	0.09	0.17	0.27	0.24	0.2	0.22	0	0.27	0.07	0.05	0	0.11	0.24	0.06
23	Family labour(M+F)	0.14	0.23	0.06	0.04	0.06	0.05	0.04	0.06	0.09	0.14	0.13	0.1	0.11	0	0.14	0.23	0.18	0	0.06	0.12	0.06
24	Hired labour(M+F)	0.18	0.05	0.05	0.03	0.03	0.04	0.04	0.06	0.11	0.18	0.16	0.13	0.15	0	0.18	0.05	0.04	0	0.07	0.16	0.04
25	Credit	0.06	0.05	0.07	0.03	0.55	0.04	0.05	0.02	0.04	0.06	0.06	0.04	0.05	0	0.06	0.05	0.04	0	0.02	0.05	0.1
26	Salaried persons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	Employed at Nilon's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GDP Multiplier	0.65	0.4	0.25	0.15	0.68	0.19	0.19	0.23	0.41	0.65	0.59	0.47	0.53	0	0.65	0.4	0.31	0	0.26	0.57	0.26
28	Agriculture landless workers	0.29	0.29	0.55	0.1	0.29	0.42	0.18	0.12	0.18	0.29	0.26	0.21	0.23	0	0.28	0.29	0.22	0	0.12	0.25	0.34
29	Small Farmers	0.28	0.62	0.41	0.28	0.41	0.5	0.32	0.14	0.17	0.28	0.25	0.2	0.22	0	0.27	0.62	0.47	0	0.11	0.24	0.36
30	Medium Farmers	0.33	0.39	0.19	0.27	0	0.3	0.58	0.13	0.21	0.33	0.29	0.24	0.26	0	0.32	0.39	0.3	0	0.13	0.28	0.31
31	Large Farmers	0.27	0.17	0.11	0.22	0.16	0.24	0.37	0.1	0.17	0.27	0.24	0.2	0.22	0	0.27	0.17	0.13	0	0.11	0.24	0.21
32	Self-employed in non-agriculture	0.11	0.12	0.19	0.04	0.07	0.15	0.11	0.04	0.07	0.11	0.1	0.08	0.09	0	0.11	0.12	0.09	0	0.04	0.09	0.13
33	Services holders	0.04	0.07	0.15	0.56	0.03	0.04	0.05	0.02	0.03	0.04	0.04	0.03	0.03	0	0.04	0.07	0.05	0	0.02	0.04	0.11
	Household Income Multiplier	1.32	1.66	1.6	1.47	0.96	1.65	1.61	0.55	0.83	1.32	1.18	0.96	1.05	0	1.29	1.66	1.26	0	0.53	1.14	1.46

Table 7.12: Multiplier Matrix for Batabari, 2009 (Contd.)

		22	23	24	25	26	27	28	29	30	31	32	33
1	Agriculture	0.15	0.3	0.23	0.07	0.15	0.29	0.26	0.39	0.28	0.13	0.23	0.14
2	Allied agricultural activities-livestock etc	0.05	0.1	0.07	0.02	0.06	0.09	0.08	0.12	0.09	0.05	0.09	0.06
3	Trade and Petty Services	0.13	0.19	0.16	0.05	0.07	0.19	0.19	0.2	0.2	0.17	0.19	0.06
4	Government services	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01
5	Transportation	0.03	0.05	0.04	0.01	0.02	0.05	0.05	0.05	0.05	0.04	0.05	0.02
6	Construction	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01
7	Miscellaneous activities	0.12	0.18	0.15	0.05	0.07	0.17	0.17	0.18	0.18	0.16	0.17	0.06
	Production multiplier	0.5	0.86	0.69	0.21	0.39	0.83	0.78	0.98	0.85	0.59	0.78	0.34
8	Social expenditure	0.01	0.01	0.01	0	0	0.01	0.01	0.01	0.02	0.01	0.01	0
9	Rice	0.12	0.26	0.21	0.06	0.13	0.26	0.24	0.34	0.23	0.11	0.18	0.12
10	Jute	0	0	0	0	0	0	0	0	0.01	0	0	0
11	Vegetables	0.03	0.06	0.04	0.01	0.03	0.05	0.05	0.07	0.05	0.02	0.05	0.02
12	Spices	0.01	0.02	0.01	0	0.02	0.02	0.02	0.03	0.02	0.01	0.01	0.02
13	Fruits	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0
14	Oilseeds/Oil	0.01	0.02	0.02	0	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.01
15	Other Crops	0	0.01	0	0	0	0	0	0.01	0.01	0	0.01	0
16	Agricultural inputs	0	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0	0.01	0
17	Livestock products	0.05	0.09	0.06	0.02	0.06	0.08	0.07	0.12	0.09	0.04	0.08	0.06
18	Durables	0.03	0.07	0.05	0.02	0.04	0.06	0.05	0.09	0.06	0.03	0.06	0.04
19	Other Consumer goods	0.07	0.14	0.1	0.03	0.06	0.12	0.11	0.17	0.13	0.05	0.11	0.06
20	Fodder	0	0.01	0	0	0	0.01	0	0.01	0	0	0	0
21	Services	0.33	0.5	0.43	0.13	0.2	0.49	0.48	0.51	0.52	0.45	0.5	0.16
	Consumption Multiplier	0.67	1.21	0.95	0.27	0.57	1.14	1.07	1.41	1.18	0.74	1.04	0.49
22	Land (Rent)	1.03	0.07	0.05	0.02	0.03	0.07	0.06	0.09	0.06	0.03	0.05	0.03
23	Family labour(M+F)	0.03	1.05	0.04	0.01	0.03	0.05	0.04	0.06	0.05	0.03	0.04	0.03
24	Hired labour(M+F)	0.02	0.05	1.04	0.01	0.02	0.05	0.04	0.06	0.04	0.02	0.04	0.02
25	Credit	0.03	0.04	0.04	1.01	0.02	0.04	0.04	0.05	0.04	0.03	0.04	0.01
26	Salaried persons	0	0	0	0	1	0	0	0	0	0	0	0
27	Employed at Nilon's	0	0	0	0	0	1	0	0	0	0	0	0
	GDP Multiplier	1.11	1.21	1.17	1.05	1.1	1.21	0.18	0.26	0.19	0.11	0.17	0.09
28	Agriculture landless workers	0.1	0.4	1.01	0.14	0.07	0.92	1.15	0.18	0.16	0.12	0.15	0.06
29	Small Farmers	0.18	0.57	0.14	0.1	0.14	0.41	0.16	1.2	0.18	0.13	0.16	0.09
30	Medium Farmers	0.24	0.37	0.13	0.09	0.08	0.16	0.15	0.19	1.16	0.11	0.15	0.07
31	Large Farmers	0.36	0.17	0.09	0.1	0.13	0.11	0.11	0.14	0.11	1.08	0.1	0.05
32	Self-employed in non-agriculture	0.21	0.16	0.05	0.02	0.03	0.06	0.06	0.07	0.06	0.05	1.06	0.02
33	Services holders	0.03	0.04	0.03	0.01	0.9	0.04	0.04	0.04	0.04	0.03	0.04	1.01
	Household Income Multiplier	1.11	1.72	1.46	0.45	1.34	1.7	1.66	1.82	1.72	1.51	1.66	1.3

Table 7.13
Employment Multipliers for Batabari, 2009

Sl. No.	Sectors	Wages and Salaries generated by the Sectors	Total Output	Output Multiplier	Direct Employment Coefficients	Employment Multiplier	Ranking
1	Agriculture	3560049	7022308	1.638234	0.506963	0.830524	2
2	Agriculture and Allied Activities	367325	2162587	2.046078	0.169854	0.347535	3
3	Trade and Petty Services	122290	2074200	1.75312	0.058958	0.10336	4
4	Government Services	0	220500	1.563699	0	0	6
5	Transportation	290715	528144	1.635146	0.550446	0.90006	1
6	Construction	0	256504	1.806979	0	0	6
7	Miscellaneous Activities	21300	1894767	1.812816	0.011241	0.020379	5
	Total	4361679	14159010	12.25607	1.297463	2.201858	

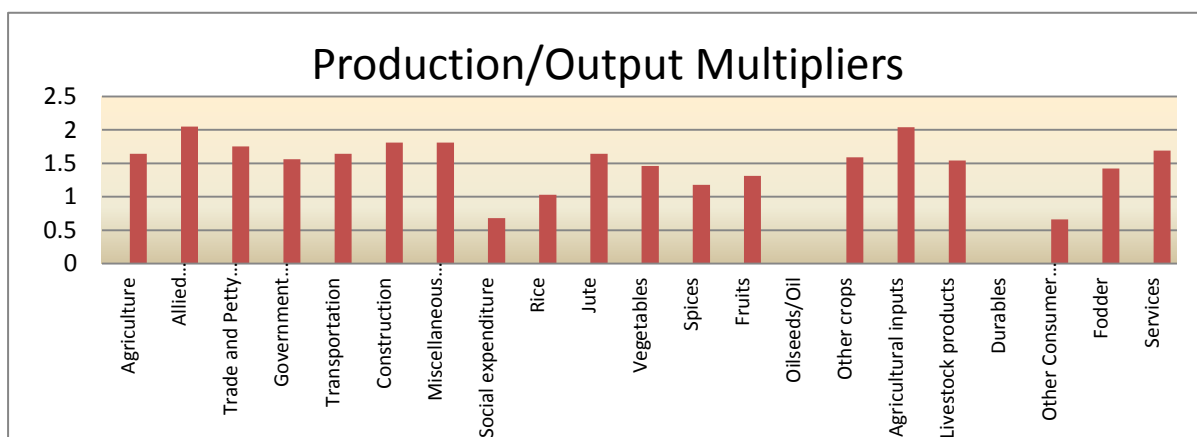


Figure 7.5

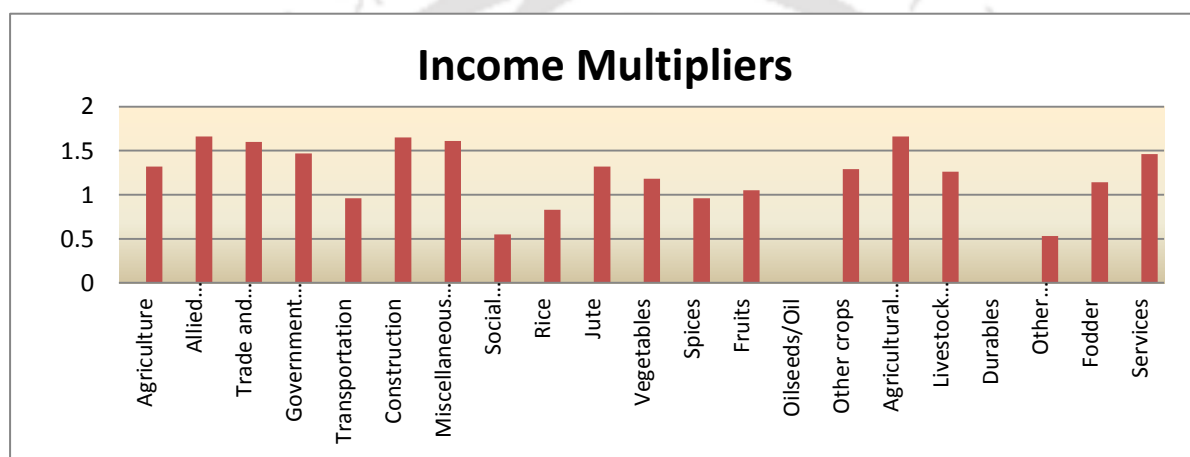


Figure 7.6

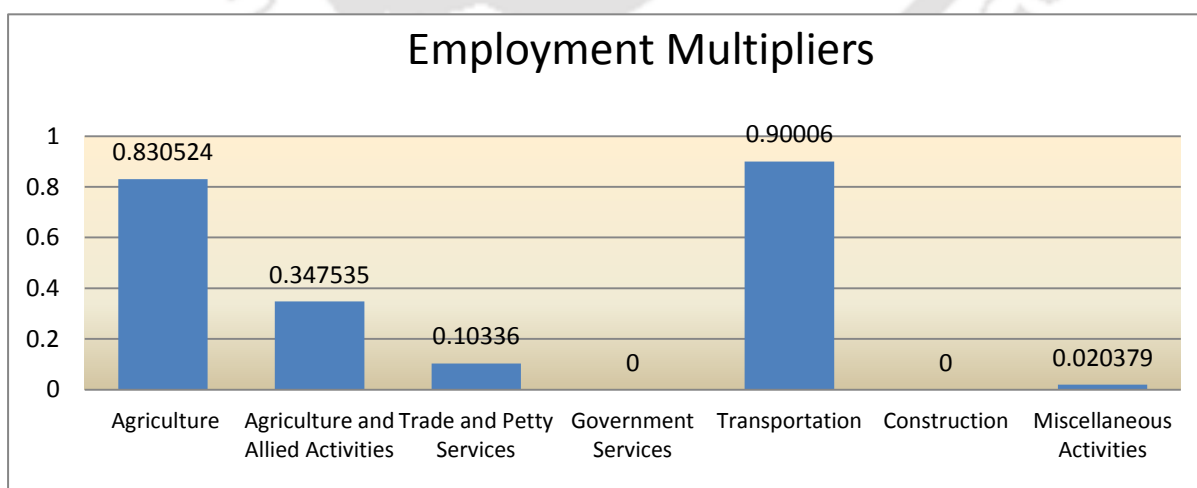


Figure 7.7

Furthermore, GDP multipliers and consumption multipliers for production activities derived from the SAM multiplier matrix are presented in Table 7.14. The values of the GDP multipliers show that the activities that produce high (low) gross output multipliers do not automatically generate high (low) GDP multipliers. For example, while transportation, agriculture, jute, other crops, vegetables have not been found among top five rankings in terms of output multipliers, injection into these production activities produce relatively higher GDP multipliers placing them to be among the top five sectors that produce highest GDP multipliers; which indicate their high contribution in the value additions.

Consumption multipliers are higher for the social expenditure, agricultural inputs, livestock products, services, and other crops.

Table 7.14
Total Multiplier Impact on GDP and Consumption

Sl. No.	1 unit injection into each Production Activities	GDP Multiplier	Consumption Multiplier
1	Agriculture	0.659	0.871
2	Allied agricultural activities-livestock etc	0.405	1.389
3	Trade and Petty Services	0.243	1.048
4	Government services	0.140	0.799
5	Transportation	0.683	0.830
6	Construction	0.195	1.116
7	Miscellaneous activities	0.190	1.093
8	Social expenditure	0.229	2.387
9	Rice	0.412	1.547
10	Jute	0.659	1.871
11	Vegetables	0.589	1.778
12	Spices	0.475	1.628
13	Fruits	0.525	1.697
14	Oilseeds/Oil	0.000	1.000
15	Other Crops	0.641	1.847
16	Agricultural inputs	0.404	2.383
17	Livestock products	0.304	2.043
18	Durables	0.000	1.000
19	Other Consumer goods	0.262	1.352
20	Fodder	0.571	1.754
21	Services	0.256	1.999

7.3.2 Backward and Forward Linkages of Different Sectors

The importance of relations between productive sectors and their impact on economic growth are examined through the backward and forward linkages. The backward and forward linkages of the sectors in the village are calculated from the

Multiplier matrix M_L . If sectoral relationships according to their importance are analysed then it shows how a change in the final demand of a sector, affects the final demand of the economy (diffusion effect or backward linkage). It can also interpret how a change in the rest of sectors influences one in particular (absorption effect or forward linkage).

When the multiplier matrix M_L is read column-wise, the values show the increase of output in each of the 21 endogenous elements due to 1 unit of external injection into the column element via the exogenous accounts. The sum of all the values in a particular column would then show the total backward linkage that is generated due to the 1 unit injection in the corresponding column account. The estimated backward and forward linkages of the sectors along with their rankings are presented in Table 7.15.

Table 7.15
Backward and Forward Linkages of the Sectors

Sl. No.	Activities/Sectors	Backward Linkages	Ranking	Forward Linkages	Ranking
1	Agriculture	0.651352224	16	4.8219594	1
2	Allied agricultural activities-livestock etc	0.903668786	12	2.0082286	2
3	Trade and Petty Services	0.628174525	17	1.0169166	3
4	Government services	0.628174525	17	0.6695002	14
5	Transportation	0.832294641	14	0.7271581	9
6	Construction	0.628174525	17	0.6762480	13
7	Miscellaneous activities	0.704179047	15	0.9869957	5
8	Social expenditure	1.532993736	1	0.6281745	19
9	Rice	1.036798323	11	0.7743063	8
10	Jute	1.279526749	5	0.6281745	19
11	Vegetables	1.209642107	7	0.6911499	12
12	Spices	1.097409889	10	0.6652795	16
13	Fruits	1.148822084	9	0.6281745	19
14	Oilseeds/Oil	0.628174525	17	0.6595833	17
15	Other Crops	1.261388549	6	0.6407380	18
16	Agricultural inputs	1.528604193	2	0.7989958	7
17	Livestock products	1.306995058	3	0.7249332	10
18	Durables	0.628174525	17	0.8794443	6
19	Other Consumer goods	0.890380756	13	0.6657324	15
20	Fodder	1.191736957	8	0.6938195	11
21	Services	1.283333027	4	1.0144865	4

It appears from the above table that the following activities create large diffusion or backward linkage effects: social expenditure, agricultural inputs, livestock products services and jute. Agriculture occupies 16th and vegetables occupies 7th ranking. When the multiplier matrix M_L is read row-wise, the values show forward linkages or absorption effects. The greatest absorption effects are received by agriculture, allied agricultural activities, trade and petty services and services. Vegetables occupy 12th ranking.

From backward and forward linkage analysis of Input-Output system and multiplier analysis of SAM it is found that allied agricultural activities, agriculture, agricultural inputs, services and trade and petty services generate high multiplier values for the village.

7.3.3 Decomposition of the Multiplier Effects

One of the main aims of the SAM-based multiplier analysis is to examine the effects of real shocks occurring in the system on the distribution of income across different groups of households. Multiplier decomposition shows those sectors, factors of production, and commodities whose increase in demand will have the greater direct, indirect and induced effects (Pansini, 2008).

7.3.3.1 Decomposition of the Output Multiplier Effects into Direct, Indirect and Induced Effects

An increase in one unit of final demand in a sector/activity results in an expansion of output and thereby income in that sector. The increase in output will result a chain reaction which will generate in an increase of outputs of all other sectors in Batabari that are directly or indirectly linked to the industry. The decomposition of the output multipliers into direct, indirect and induced effects is presented Table 7.16.

The table shows that over all direct effects (56.09 per cent) dominates the indirect effect (4.86 per cent) and induced effects (39.04 per cent). The largest impact on the village arises from a unit exogenous inflows into allied agricultural activities. These results support the fact that allied agricultural activities is one of the leading activities of the village. Highest direct effect is seen in government service sector followed by transportation and agriculture sector. Social expenditure

shows the highest indirect effect. Highest induced effect is on construction sector followed by trade and petty services and miscellaneous activities.

Table 7.16
Decomposition of the Output Multiplier Effects

Sl. No.		Direct Effects	In %	Indirect Effects	In %	Induced Effects	In %	Total Effects
1	Agriculture	1	61.04	0.016171896	0.99	0.622062211	37.97	1.6382341
2	Allied agricultural activities-livestock etc	1	48.87	0.21421083	10.47	0.831867207	40.66	2.046078
3	Trade and Petty Services	1	57.04	0	0	0.753119529	42.96	1.7531195
4	Government services	1	63.95	0	0	0.563699224	36.05	1.5636992
5	Transportation	1	61.16	0.158573249	9.7	0.476572678	29.15	1.6351459
6	Construction	1	55.34	0	0	0.806978944	44.66	1.8069789
7	Miscellaneous activities	1	55.16	0.058955153	3.25	0.753861008	41.59	1.8128162
8	Social expenditure	0	0	0.41605623	61.2	0.263800065	38.8	0.6798563
9	Rice	0.6271103	61.01	0.01026635	1	0.390486068	37.99	1.0278628
10	Jute	1	61.04	0.016171896	0.99	0.622062211	37.97	1.6382341
11	Vegetables	0.8926892	61.04	0.014446595	0.99	0.555339381	37.97	1.4624752
12	Spices	0.7203688	61.04	0.011667167	0.99	0.448167939	37.97	1.1802039
13	Fruits	0.7989485	61	0.013123516	1	0.497621061	38	1.3096931
14	Oilseeds/Oil	0	0	0	0	0	0	0
15	Other Crops	0.972153	61.04	0.015721558	0.99	0.604739649	37.97	1.5926142
16	Agricultural inputs	0.9973263	48.91	0.21299213	10.44	0.828958728	40.65	2.0392772
17	Livestock products	0.7511829	48.87	0.160911511	10.47	0.624884415	40.66	1.5369788
18	Durables	0	0	0	0	0	0	0
19	Other Consumer goods	0.4000227	60.79	0.007765033	1.18	0.250238149	38.03	0.6580259
20	Fodder	0.8652192	61.04	0.013992235	0.99	0.538220152	37.97	1.4174316
21	Services	0.9531924	56.54	0.043780821	2.6	0.688845823	40.86	1.685819
	Aggregate effects	15.978213	56.09	1.38480617	4.86	11.12152444	39.04	28.484544

7.3.3.2 Decomposition of the Output Multiplier Effects into Four Components

The decomposition has an important economic meaning for a structural analysis of income distribution, inequality and poverty, among and inside the institutions, with particular reference to the households' groups (Pansini, 2008). Decomposition of the multiplier matrix gives the differential effects on the economy.

As already stated, an injection of any amount applied to an account in one block may move around within the same block which is regarded as the direct effects or net intra-group effects. Net Transfer Effects (or Direct Effects) of an exogenous injection on selected production activities are presented in Table 7.17.

The table illustrates that if there is an exogenous injection on a given activity, the inter-activity transactions alone would induce increases in the magnitude of figures of output. For example, an increase in the demand of agricultural commodity of one unit induces the largest net intra-group or direct effect by unit of 0.0160 for agriculture itself, followed by 0.0001 for allied agricultural activities, 0.0043 for rice, 0.0012 for spices, and 0.0138 for fodder. An increase in the demand for social expenditure induces the largest direct (net intra-group) effects in the output of the whole economy by unit of 1.4404. Similarly, agricultural inputs, livestock products, services, jute, other crops, and vegetables induce the direct effects in the output of the whole economy by unit of 1.4334, 1.086, 1.0430, 1.0369, 1.0080, and 0.9256 respectively.

Which farmer group is the best channel for income redistribution in the village to reduce inequality by increased income is also calculated from net transfer effects and results are presented in Table 7.18. The table shows that an exogenous transfer of 1 unit to medium farmers is expected to induce not only one of the largest direct effects on the income of this group (by 0.0004 unit) but also the other five groups by unit of: 0.0003 for agriculture landless workers, 0.0026 for small farmers, 0.0001 for large farmers, 0.0001 for self-employed in non-agriculture. A transfer to any other group performs less in terms of overall effects. Therefore, medium farmers group is the best channel for income redistribution (by 0.0035 units), while the agriculture landless is the poorest one.

An injection of any amount applied to an account in one block may move around and end up in one of the other blocks, which is termed as cross effects or spillover effects. Open loop effects (cross effects or spillover effects) of an exogenous injection on the households are presented in Table 7.19. The table shows that a unitary increase of exogenous demand induces households' expenditures by 1.4620 units for small farmers, 1.2159 units for medium farmers, 1.1046 units for agriculture landless workers, 1.0799 units for self-employed in non-agriculture, 0.7779 units for large farmers and only 0.5347 units for service holders. This clearly shows that the small farmers are overall, more reactive in terms of consumption expenditure to exogenous injection that increases household income. Examining more closely the consumption increase by groups, it appears that all six groups tend to increase their service expenditures (includes expenditure

on health and education also) followed by expenditure on agriculture due to exogenous injection.

Furthermore, an injection of any amount applied to an account in one block may move around the whole system (economy) and return to the block from which it started, which is the inter-group effects. The closed loop effects or inter-group effects for selected activities given a unit increase in corresponding demands are presented in Table 7.20. The table shows that closed-loop effects are the highest for services followed by agriculture over the whole economy; the effects sum up to over 3.8222 units for services against 2.0916 units for agriculture and 1.7963 units for rice, confirming the high absorption capacity of those sectors. Individually taken, agriculture and jute are the most responsive to an external injection: an exogenous injection of Re. 1 in the agriculture and jute sectors induces the same highest inter-group effects by Rs. 1.0385. This effect can also interpret how a change in the rest of sectors influences agriculture and jute in particular. This effect is of Rs. 1.0236 for allied agricultural activities, Rs 1.0210 for agricultural inputs and Rs 1.0096 for other crops.

Table 7.17
Net Transfer Effects (or Direct Effects) of an Exogenous Injection on Selected Production Activities, Batabari Village, 2009

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total*
1	Agriculture	0.0160	0.0003	0.0000	0.0000	0.0000	0.0000	0.0001	0.2939	0.6342	1.0160	0.9068	0.7315	0.8069	0.0000	0.9877	0.0036	0.0002	0.0000	0.3996	0.8791	0.0001	6.6761
2	Allied agricultural activities- livestock etc	0.0001	0.1120	0.0000	0.0000	0.0067	0.0000	0.0025	0.0852	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	1.1054	0.8353	0.0000	0.0072	0.0001	0.0420	2.1969
3	Trade and Petty Services	0.0000	0.0426	0.0000	0.0000	0.0635	0.0000	0.0236	0.0152	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0424	0.0320	0.0000	0.0003	0.0000	0.3991	0.6188
4	Government services	0.0000	0.0045	0.0000	0.0000	0.0067	0.0000	0.0025	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0045	0.0034	0.0000	0.0000	0.0000	0.0424	0.0658
5	Transportation	0.0000	0.0108	0.0000	0.0000	0.0162	0.0000	0.0060	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0108	0.0081	0.0000	0.0001	0.0000	0.1016	0.1576
6	Construction	0.0000	0.0053	0.0000	0.0000	0.0079	0.0000	0.0029	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0052	0.0040	0.0000	0.0000	0.0000	0.0494	0.0765
7	Miscellaneous activities	0.0000	0.0387	0.0000	0.0000	0.0576	0.0000	0.0214	0.0145	0.0030	0.0000	0.0003	0.0004	0.0049	0.0000	0.0000	0.0385	0.0291	0.0000	0.0006	0.0000	0.3624	0.5712
8	Social expenditure	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	Rice	0.0043	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2012	0.0027	0.0043	0.0039	0.0031	0.0034	0.0000	0.0042	0.0000	0.0000	0.0000	0.0017	0.0037	0.0000	0.2326
10	Jute	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Vegetables	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1003
12	Spices	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0503	0.0007	0.0012	0.0011	0.0009	0.0010	0.0000	0.0012	0.0000	0.0000	0.0000	0.0005	0.0010	0.0000	0.0591
13	Fruits	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	Oilseeds/Oil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0500
15	Other Crops	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0200
16	Agricultural inputs	0.0001	0.0944	0.0000	0.0000	0.0006	0.0000	0.0002	0.0073	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0938	0.0709	0.0000	0.0006	0.0001	0.0036	0.2719
17	Livestock products	0.0000	0.0188	0.0000	0.0000	0.0001	0.0000	0.0000	0.1014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0187	0.0141	0.0000	0.0001	0.0000	0.0007	0.1540
18	Durables	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4000
19	Other Consumer goods	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0504	0.0008	0.0012	0.0011	0.0009	0.0010	0.0000	0.0012	0.0000	0.0000	0.0000	0.0005	0.0011	0.0001	0.0598
20	Fodder	0.0138	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0040	0.0086	0.0138	0.0123	0.0100	0.0110	0.0000	0.0134	0.0000	0.0000	0.0000	0.0054	0.0120	0.0000	0.1045
21	Services	0.0000	0.1112	0.0000	0.0000	0.1657	0.0000	0.0615	0.0397	0.0002	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.1105	0.0835	0.0000	0.0007	0.0000	0.0416	0.6150
	Total*	0.0369	0.4386	0.0000	0.0000	0.3249	0.0000	0.1210	1.4404	0.6505	1.0369	0.9256	0.7470	0.8288	0.0000	1.0080	1.4334	1.0806	0.0000	0.4174	0.8971	1.0430	12.4302

*Total is for selected activities only; they are therefore slightly different from totals including all activities; table derived from the (M₁-I) matrix relative to (I-A)⁻¹.

Table 7.18
Net Transfer Effects (or Direct Effects) of an Exogenous Injection on Households' Income, Batabari Village

	Agriculture Landless Workers	Small Farmers	Medium Farmers	Large Farmers	Self-Employed in Non-Agriculture	Services Holders	Total
Agriculture Landless Workers	0.0000	0.0010	0.0003	0.0000	0.0004	0.0000	0.0018
Small Farmers	0.0000	0.0008	0.0026	0.0000	0.0000	0.0125	0.0159
Medium Farmers	0.0000	0.0021	0.0004	0.0000	0.0000	0.0000	0.0026
Large Farmers	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
Self-Employed in Non- Agriculture	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
Services Holders	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Total	0.0000	0.0040	0.0035	0.0001	0.0004	0.0125	0.0206

Table 7.19
Open Loop Effects (Cross Effects or Net Extra-Group or Spillover Effects) of an Exogenous Injection on Households' Income,
for Activities, Batabari Village, 2009

		Agriculture landless workers	Small Farmers	Medium Farmers	Large Farmers	Self-employed in non- agriculture	Service holders	Total
1	Agriculture	0.1543	0.2640	0.1623	0.0489	0.1265	0.0942	0.8502
2	Allied agricultural activities-livestock etc	0.0420	0.0759	0.0567	0.0240	0.0520	0.0438	0.2944
3	Trade and Petty Services	0.1136	0.1059	0.1214	0.1173	0.1195	0.0289	0.6066
4	Government services	0.0121	0.0113	0.0129	0.0125	0.0127	0.0031	0.0645
5	Transportation	0.0289	0.0270	0.0309	0.0299	0.0304	0.0074	0.1545
6	Construction	0.0140	0.0131	0.0150	0.0145	0.0148	0.0036	0.0750
7	Miscellaneous activities	0.1036	0.0969	0.1107	0.1067	0.1088	0.0265	0.5532
8	Social expenditure	0.0039	0.0024	0.0169	0.0054	0.0018	0.0023	0.0327
9	Rice	0.1476	0.2272	0.1304	0.0393	0.0883	0.0826	0.7154
10	Jute	0.0005	0.0026	0.0051	0.0037	0.0004	0.0000	0.0122
11	Vegetables	0.0261	0.0499	0.0273	0.0058	0.0353	0.0160	0.1604
12	Spices	0.0091	0.0193	0.0134	0.0045	0.0048	0.0124	0.0635
13	Fruits	0.0046	0.0072	0.0049	0.0030	0.0051	0.0032	0.0281
14	Oilseeds/Oil	0.0106	0.0169	0.0116	0.0037	0.0074	0.0107	0.0608
15	Other Crops	0.0015	0.0049	0.0037	0.0019	0.0035	0.0001	0.0156
16	Agricultural inputs	0.0036	0.0066	0.0048	0.0020	0.0044	0.0037	0.0252
17	Livestock products	0.0363	0.0780	0.0530	0.0143	0.0477	0.0494	0.2786
18	Durables	0.0308	0.0560	0.0337	0.0153	0.0348	0.0326	0.2032
19	Other Consumer goods	0.0626	0.1140	0.0823	0.0180	0.0674	0.0359	0.3802
20	Fodder	0.0025	0.0067	0.0022	0.0011	0.0023	0.0030	0.0179
21	Services	0.2965	0.2763	0.3168	0.3062	0.3119	0.0754	1.5831
	Total	1.1045	1.4620	1.2159	0.7779	1.0799	0.5347	6.1751

Table 7.20
Closed-Loop Effects (or Net Contribution of Circular Effects) of an Exogenous Injection for Selected Activities, Batabari Village, 2009

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total*
1	Agriculture	0.1438	0.1474	0.1060	0.0758	0.0923	0.1085	0.1028	0.0557	0.0901	0.1438	0.1284	0.1036	0.1147	0.0000	0.1398	0.1470	0.1107	0.0000	0.0575	0.1244	0.0990	2.0916
2	Allied agricultural activities-livestock etc	0.0461	0.0470	0.0342	0.0244	0.0295	0.0350	0.0332	0.0178	0.0288	0.0461	0.0411	0.0332	0.0367	0.0000	0.0448	0.0469	0.0353	0.0000	0.0184	0.0399	0.0319	0.6703
3	Trade and Petty Services	0.1037	0.0980	0.0728	0.0518	0.0646	0.0743	0.0702	0.0395	0.0649	0.1037	0.0926	0.0747	0.0827	0.0000	0.1008	0.0978	0.0736	0.0000	0.0414	0.0897	0.0678	1.4646
4	Government services	0.0110	0.0104	0.0077	0.0055	0.0069	0.0079	0.0075	0.0042	0.0069	0.0110	0.0098	0.0079	0.0088	0.0000	0.0107	0.0104	0.0078	0.0000	0.0044	0.0095	0.0072	0.1557
5	Transportation	0.0264	0.0250	0.0185	0.0132	0.0165	0.0189	0.0179	0.0100	0.0165	0.0264	0.0236	0.0190	0.0211	0.0000	0.0257	0.0249	0.0188	0.0000	0.0105	0.0228	0.0173	0.3729
6	Construction	0.0128	0.0121	0.0090	0.0064	0.0080	0.0092	0.0087	0.0049	0.0080	0.0128	0.0114	0.0092	0.0102	0.0000	0.0125	0.0121	0.0091	0.0000	0.0051	0.0111	0.0084	0.1811
7	Miscellaneous activities	0.0946	0.0894	0.0664	0.0472	0.0589	0.0678	0.0640	0.0360	0.0592	0.0946	0.0844	0.0681	0.0754	0.0000	0.0919	0.0892	0.0672	0.0000	0.0378	0.0818	0.0619	1.3357
8	Social expenditure	0.0056	0.0056	0.0043	0.0031	0.0037	0.0044	0.0041	0.0022	0.0035	0.0056	0.0050	0.0040	0.0044	0.0000	0.0054	0.0056	0.0042	0.0000	0.0022	0.0048	0.0040	0.0816
9	Rice	0.1239	0.1262	0.0907	0.0648	0.0794	0.0927	0.0879	0.0480	0.0776	0.1239	0.1106	0.0893	0.0988	0.0000	0.1205	0.1258	0.0948	0.0000	0.0496	0.1072	0.0847	1.7963
10	Jute	0.0021	0.0022	0.0017	0.0012	0.0015	0.0017	0.0016	0.0008	0.0013	0.0021	0.0019	0.0015	0.0017	0.0000	0.0021	0.0022	0.0017	0.0000	0.0009	0.0018	0.0016	0.0316
11	Vegetables	0.0262	0.0270	0.0193	0.0138	0.0167	0.0197	0.0187	0.0102	0.0164	0.0262	0.0234	0.0189	0.0209	0.0000	0.0255	0.0269	0.0203	0.0000	0.0105	0.0227	0.0180	0.3814
12	Spices	0.0101	0.0106	0.0077	0.0055	0.0066	0.0079	0.0075	0.0039	0.0063	0.0101	0.0090	0.0073	0.0080	0.0000	0.0098	0.0106	0.0080	0.0000	0.0040	0.0087	0.0072	0.1489
13	Fruits	0.0046	0.0046	0.0033	0.0024	0.0029	0.0034	0.0032	0.0018	0.0029	0.0046	0.0041	0.0033	0.0036	0.0000	0.0044	0.0045	0.0034	0.0000	0.0018	0.0039	0.0031	0.0657
14	Oilseeds/Oil	0.0098	0.0100	0.0072	0.0052	0.0063	0.0074	0.0070	0.0038	0.0061	0.0098	0.0087	0.0070	0.0078	0.0000	0.0095	0.0100	0.0075	0.0000	0.0039	0.0085	0.0068	0.1423
15	Other Crops	0.0026	0.0027	0.0020	0.0014	0.0017	0.0020	0.0019	0.0010	0.0016	0.0026	0.0023	0.0019	0.0021	0.0000	0.0025	0.0027	0.0021	0.0000	0.0010	0.0023	0.0018	0.0384
16	Agricultural inputs	0.0039	0.0040	0.0029	0.0021	0.0025	0.0030	0.0028	0.0015	0.0025	0.0039	0.0035	0.0028	0.0031	0.0000	0.0038	0.0040	0.0030	0.0000	0.0016	0.0034	0.0027	0.0575
17	Livestock products	0.0424	0.0443	0.0320	0.0229	0.0274	0.0328	0.0311	0.0165	0.0266	0.0424	0.0379	0.0306	0.0338	0.0000	0.0413	0.0441	0.0333	0.0000	0.0170	0.0367	0.0299	0.6231
18	Durables	0.0318	0.0325	0.0235	0.0168	0.0204	0.0241	0.0228	0.0123	0.0199	0.0318	0.0284	0.0229	0.0254	0.0000	0.0309	0.0324	0.0244	0.0000	0.0127	0.0275	0.0219	0.4624
19	Other Consumer goods	0.0637	0.0657	0.0472	0.0338	0.0409	0.0484	0.0458	0.0247	0.0399	0.0637	0.0569	0.0459	0.0508	0.0000	0.0619	0.0655	0.0493	0.0000	0.0255	0.0551	0.0441	0.9288
20	Fodder	0.0028	0.0030	0.0022	0.0015	0.0019	0.0022	0.0021	0.0011	0.0018	0.0028	0.0025	0.0020	0.0023	0.0000	0.0028	0.0030	0.0023	0.0000	0.0011	0.0025	0.0020	0.0419
21	Services	0.2706	0.2558	0.1899	0.1351	0.1686	0.1940	0.1832	0.1030	0.1694	0.2706	0.2415	0.1949	0.2158	0.0000	0.2631	0.2552	0.1922	0.0000	0.1081	0.2341	0.1770	3.8222
	Total*	1.0385	1.0236	0.7486	0.5339	0.6571	0.7654	0.7241	0.3990	0.6504	1.0385	0.9270	0.7480	0.8282	0.0000	1.0096	1.0210	0.7689	0.0000	0.4152	0.8986	0.6982	14.8938

*Total is for selected activities only; they are therefore slightly different from total including all activities

7.3.3.3 Ranking of Sectors in terms of Poverty Alleviation Effects

The income multipliers present the distribution of total household income increase across households; and tell how sector-wise growth performances impart differential income impacts for household groups; and what would be the ranking of sectors in terms of poverty alleviating effects. These are illustrated in Table 7.21.

Table 7.21
Ranking of Sectors for the Households in terms of Income
Generation in Batabari

		Agriculture landless workers		Small Farmers		Medium Farmers		Large Farmers		Self-employed in Non-agriculture		Service Holders	
		Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking
1	Agriculture	0.291	8	0.2753	12	0.3279	5	0.2739	3	0.1091	8	0.0432	10
2	Allied agricultural activities-livestock etc.	0.289	9	0.6208	1	0.3936	3	0.174	13	0.1162	6	0.0677	5
3	Trade and Petty Services	0.5493	3	0.4065	7	0.1916	17	0.1072	21	0.1943	2	0.1482	3
4	Government services	0.1036	22	0.2845	11	0.2722	12	0.2212	8	0.0401	22	0.5585	2
5	Transportation	0.2934	7	0.4081	6	0.0002	23	0.1594	16	0.0734	16	0.0347	16
6	Construction	0.4157	4	0.504	4	0.296	8	0.2413	6	0.1518	4	0.0382	14
7	Miscellaneous activities	0.1768	18	0.3163	10	0.5801	1	0.3658	1	0.1063	9	0.0519	7
8	Social expenditure	0.1161	21	0.1376	22	0.1343	19	0.0989	22	0.0443	20	0.0208	22
9	Rice	0.1821	17	0.1728	19	0.2064	16	0.1721	15	0.0684	17	0.0271	21
10	Jute	0.291	8	0.2753	12	0.3279	5	0.2739	3	0.1091	8	0.0432	10
11	Vegetables	0.2597	12	0.2458	14	0.2928	10	0.2446	5	0.0974	11	0.0385	13
12	Spices	0.2095	16	0.1983	17	0.2363	15	0.1974	11	0.0786	15	0.0311	20
13	Fruits	0.2319	14	0.2201	16	0.2632	13	0.2193	9	0.0872	14	0.0345	17
14	Oilseeds/Oil	0	25	0	25	0	24	0	25	0	25	0	25
15	Other Crops	0.2828	11	0.2676	13	0.3188	7	0.2663	4	0.1061	10	0.042	11
16	Agricultural inputs	0.2882	10	0.618	2	0.3923	4	0.1739	14	0.1159	7	0.0675	6
17	Livestock products	0.2171	15	0.4663	5	0.2956	9	0.1307	17	0.0873	13	0.0509	8
18	Durables	0	25	0	25	0	24	0	25	0	25	0	25
19	Other Consumer goods	0.1163	20	0.1124	23	0.1317	20	0.109	20	0.0437	21	0.0174	23
20	Fodder	0.2517	13	0.2382	15	0.2837	11	0.237	7	0.0944	12	0.0373	15
21	Services	0.3351	6	0.3637	9	0.3147	6	0.2107	10	0.1317	5	0.1053	4
22	Land (Rent)	0.0951	23	0.1789	18	0.2366	14	0.3619	2	0.2092	1	0.0332	19
23	Family labour (M+F)	0.4044	5	0.5683	3	0.3689	2	0.175	12	0.1636	3	0.0443	9
24	Hired labour (M+F)	1.0092	1	0.1421	20	0.1317	20	0.0933	24	0.0514	19	0.0336	18
25	Credit	0.1358	19	0.0953	24	0.0865	21	0.0958	23	0.025	24	0.0122	24
26	Salaried persons	0.0701	24	0.1377	21	0.0756	22	0.1302	18	0.0271	23	0.8953	1
27	Employed at Nilon's	0.9198	2	0.4057	8	0.1594	18	0.113	19	0.0598	18	0.0391	12

The multiplier values in the table show the increase of income of the respective household groups due to 1 unit increase in the corresponding sectoral exogenous demand. For example, when it is read row-wise, 1 unit increase in the exogenous demand of agriculture increases agricultural landless household's income, as a group, by 0.2910 units, small farmers group's income by 0.2753 unit, medium farmers' income by 0.3279 unit and so on; and resulting in total income increase of household income by 1.3204 units. However, when it is read column-wise, the values show how a particular household group's income increases due to 1 unit injection in different sectors. For example, 1 unit injection in the agriculture sector would increase landless groups' income by 0.2910 units, whereas they increase income by 0.1036 units when injection occurs in the government services sector. Column-wise ranking of values in descending order for each of the household groups would then reveal the ranking of the sectors for corresponding households in terms of income generation, and therefore, ranking of sectors in terms of poverty alleviation. It is evident from the above table that the hired labour generates highest income whereas employed at Nilon's industry ranks second in generating income to the landless workers. Agriculture occupies the eighth ranking for the landless workers. Allied agricultural activities-livestock etc. possess the first ranking followed by agricultural inputs for the small farmers. Miscellaneous activities generate the highest income both to the medium farmers and large farmers whereas salaried person contributes most to the service holders. It is observed that although agriculture plays a very important role in promoting their income, the sector is not so profitable to the farmers. Even though it is a major practice by majority of people, the sector remains as the subsistence sector. Given the large number of people involved, the sector provides food security as well as livelihood to the people. Moreover, subsistence farming is mainly determined by restricted job opportunities. Income generated by this activity is shown low. As explained by Parikh and Thorbecke (1996), the proportion of value added to gross output is very low for crop production activities. Low profitability in crop production activities might be the general characteristic of villages located in the semiarid tropics. However, the losses to these farmers are offset by gains in allied agricultural activities like livestock sector activities and other activities. Impact of

1 unit increase in exogenous demand of vegetables is mostly on the medium farmers in the village with high multiplier value. It is also observed that a household group experiences considerable income increase even in the case that the particular household has minimum integration with that sector.

7.3.3.4 Sectoral Impact on the Factor Returns to Different Labour Categories

The increase of income of each factor category due to 1 unit exogenous injection in different sectors is presented in Table 7.22. This is related to the question of how different labour categories benefit from their linkages with sectors in terms of value additions.

For instance, it is noticed from the table that 1 unit exogenous increase in demand for land leads to 1.0339 units increase in wages for the landless workers, which indicates their high degree of integration with that sector. Similarly, jute, agriculture, other crops, vegetables, fodder are some of the activities/commodities that generate higher benefits for this labour category. The same category is found to be relatively less integrated with salaried persons, transportation and government services. Small farmer category is found to be more integrated with the family labour, allied agricultural activities, agricultural inputs, livestock products and agriculture. Hired labourers, agriculture, other crops, vegetables and fodder appear to be very important accounts for medium farmer categories in promoting their income. However, the ranks show that credit, transportation, services, trade and petty services and agriculture impart higher benefits to the large farmer category in the village. The self-employed in non-agriculture and service holders categories are found to acquire more benefits from the stimuli that originate in salaried persons and employed at Nilon's.

Table 7.22

Ranking of Sectors/Activities for the Labour Groups in terms of Wage Generation in Batabari

		Agriculture Landless Workers		Small Farmers		Medium Farmers		Large Farmers		Self Employed in Non-Agriculture		Service Holders	
		Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking	Multiplier value	Ranking
1	Agriculture	0.2738	2	0.1410	5	0.1826	2	0.0619	5	0	0	0	0
2	Allied agricultural activities-livestock etc	0.0691	13	0.2336	2	0.0530	12	0.0491	10	0	0	0	0
3	Trade and Petty Services	0.0666	14	0.0569	15	0.0467	14	0.0731	4	0	0	0	0
4	Government services	0.0460	21	0.0354	21	0.0312	20	0.0272	18	0	0	0	0
5	Transportation	0.0447	22	0.0643	12	0.0285	21	0.5459	2	0	0	0	0
6	Construction	0.0638	16	0.0473	18	0.0432	16	0.0405	15	0	0	0	0
7	Miscellaneous activities	0.0553	18	0.0432	19	0.0379	19	0.0536	7	0	0	0	0
8	Social expenditure	0.0861	10	0.0601	13	0.0580	10	0.0248	20	0	0	0	0
9	Rice	0.1711	8	0.0882	11	0.1141	8	0.0388	15	0	0	0	0
10	Jute	0.2738	2	0.1410	5	0.1826	2	0.0619	5	0	0	0	0
11	Vegetables	0.2444	4	0.1259	7	0.1630	4	0.0553	8	0	0	0	0
12	Spices	0.1972	7	0.1016	10	0.1315	7	0.0446	12	0	0	0	0
13	Fruits	0.2177	6	0.1122	9	0.1452	6	0.0495	9	0	0	0	0
14	Oilseeds/Oil	0.0000	24	0.0000	25	0.0000	25	0.0000	23	0	0	0	0
15	Other Crops	0.2662	3	0.1371	6	0.1775	3	0.0602	6	0	0	0	0
16	Agricultural inputs	0.0696	12	0.2326	3	0.0532	11	0.0490	11	0	0	0	0
17	Livestock products	0.0519	20	0.1754	4	0.0398	17	0.0369	16	0	0	0	0
18	Durables	0.0000	24	0.0000	25	0.0000	25	0.0000	23	0	0	0	0
19	Other Consumer goods	0.1081	9	0.0570	14	0.0722	9	0.0247	21	0	0	0	0
20	Fodder	0.2369	5	0.1220	8	0.1580	5	0.0536	7	0	0	0	0
21	Services	0.0565	17	0.0553	16	0.0391	18	0.1047	3	0	0	0	0
22	Land (Rent)	1.0339	1	0.0265	23	0.0230	22	0.0266	19	0	0	0	0
23	Family labour(M+F)	0.0697	11	1.0514	1	0.0471	13	0.0427	13	0	0	0	0
24	Hired labour(M+F)	0.0523	19	0.0382	20	1.0354	1	0.0355	17	0	0	0	0
25	Credit	0.0158	20	0.0118	24	0.0107	24	1.0109	1	0	0	0	0
26	Salaried persons	0.0342	23	0.0272	22	0.0232	23	0.0176	22	1	1	0	0
27	Employed at Nilon's	0.0665	15	0.0483	17	0.0450	15	0.0416	14	0	0	1	1

The above analysis gives comprehensive information about all the direct, indirect and induced effects of Nilon's industry on village Batabari. It is evident

from the study that the food-processing industry has been able to improve the economic condition of the villagers, leading to increased expenditure in some social sector, health, education etc. apart from increased investment in agriculture. It has also been found that there is sufficient linkage of the food-processing industry with the neighbouring input supplying villages.

7.4 Conclusion

It is clear from above SAM analysis that there is sufficient linkage between the food-processing industry and the input supplying neighbouring village. The comparative analysis of the subsidy on the industry and the return from the industry shows that the industry returns a substantial return of Rs.5.50 per day per household against an investment of Rs. 1.84 per day per household. It has also been found that compared to the quantum of vegetables produced in the village, the demand from the industry is much lesser. This indicates that abundant raw materials are available in the neighbouring villages. Thus, there exists huge potential and scope for setting up of more food-processing industries in that locality for stabilization of income of the villagers.

The input supplying village has been able to derive benefits from the food processing industry in many forms, namely in output enhancement, income increase and employment generation. If demand for agricultural crops by the industry is increased by Re.1 in the village then the production/output in the agriculture sector increases by Rs.1.64; income increases by Rs.1.32 and employment increases by 0.83 units. The GDP multiplier shows that the production activities, namely, transportation, agriculture, jute, other crops, and vegetables generate high GDP multipliers indicating relatively higher contribution of these production activities in value additions in the village.

Enhanced income of the villagers, following increase in demand for agriculture activities, results in increase in their expenditures. Significantly, all household groups are found to increase their service expenditures (includes expenditure on health and education) with an increase in their income, followed by expenditure on agriculture. The expenditure pattern indicates two significant results. Firstly, increased income results in enhanced expenditure on health, education etc. of the people which ultimately helps improving their standard of

living. Secondly, a portion of the increased income is invested on agriculture (including modernization of agriculture) which is a healthy sign for overall development of agriculture and rural economy. Thus, such food-processing industries have the ability to improve the standard of living of the people and at the same time help modernising agriculture sector which will ultimately help reduce rural-urban divide.

The ranking of sectors in terms of poverty alleviating effects shows that the hired labour generates highest income to the agricultural landless workers followed by those employed at Nilon's industry. This implies that the industry has a significant impact in the village in terms of poverty alleviating effects. The analysis also shows that medium farmer group is the best channel for income redistribution in the village to reduce inequality through increase in income. A transfer to any other group is found to be less effective in terms of overall effects.

Keeping in view the positive economic as well as social impact of the food-processing industry on the input supplying village and the potentiality of the locality in terms of abundant production of raw-materials, more such food processing industries can be set up in that locality. Thus, setting up of food-processing industry may help narrowing down the rural-urban divide in the state to a considerable extent.

Notes

1. When SAM is converted into a matrix of average expenditure propensities by dividing each endogenous element in the transaction matrix by its respective column totals, the matrix is known as accounting multiplier matrix. However, the accounting multiplier matrix assumes that average expenditure propensities are same as marginal expenditure propensities, that is, that all income elasticity of demand is unitary. To make the analysis more realistic, the average expenditure propensities for the household groups are replaced with marginal expenditure propensities. Substituting average expenditure propensities with marginal expenditure propensities would not violate the consistency of the underlying SAM, because, while calculating the multiplier, only the endogenous accounts are considered. As long as the sums of the column totals of endogenous marginal expenditure propensities and exogenous propensities add up to unity, consistency is maintained (Parikh and Thorbecke, 1996). Moreover, theoretically, if expenditure elasticity and average expenditure propensities are known, then marginal expenditure propensities can easily be obtained. Let E , Z and Z^* be, respectively elasticity, average and marginal expenditure propensities, then we have

$$E = \frac{Z^*}{Z} \Rightarrow Z^* = EZ .$$

If $E=1$ is assumed, then obviously Z^* becomes Z i.e. average propensities are same as marginal propensities of expenditure (Agaje, 2008).

2. Although agriculture is the main occupation of 73.74 per cent households, there are joint families in the village where 3 or 4 married sons are consuming from the same kitchen but they are engaged in different activities. If one or two is engaged in agriculture as the main occupation but other one may be in transportation sector (with tractor or thela renting activities), or one may be in trade and petty services. Similarly some are service holders or self-employed in non-agriculture (like driver, shop keepers etc.) and they are having land and are doing agriculture as secondary occupation as well. Hence, total population engaged in agriculture and allied activities in the village will be around 90 per cent.

3. The daily return of the industry to Batabari is verified in the following manner.

From the market information given by Gaon Panchayat, the daily transaction of the commodities related to industry (e.g Carrot, Chilli, Tomato, Potato etc.) is 427 tonne and about 50 villages are supplying vegetables to the Nilon's industry. Therefore, Batabari's share is $1/50^{\text{th}}$ i.e 8.54 tonne.

Again, it is found that daily demand of the industry is 6.896 tonne (from industry's questionnaire)

Thus, industry's share of daily market transactions is $6.896 \times 100/427 = 1.615$ per cent.

And, the vegetables coming from each village (here Batabari) to industry per day is $8.54 \text{ tonne} \times 1.615 \text{ per cent} = 0.137921 \text{ tonne}$.

Next, the average price given by the industry for per kg vegetables (by giving weightage to the different vegetables according to the demand of the industry) is calculated and is found at Rs. 3.75.

Then, the total value of the commodities supplied per day from Batabari for all goods is calculated in the following way:

$$\begin{aligned} &0.137921 \text{ tonne} \times \text{Rs.}3.75 \\ &= 137.921 \text{ kg} \times \text{Rs.}3.75 \text{ per Kg} \\ &= \text{Rs. } 517.20375 \text{ (per day)} \\ &= \text{Rs.}1, 88, 779.36 \text{ (per year)} \end{aligned}$$

Thus, the total value of the commodities supplied per day from every household of Batabari to the industry is $\text{Rs. } 517.20375/99 = \text{Rs. } 5.22$ which is found to be comparable as the figure calculated from the village SAM is Rs.5.50.

Chapter 8

Summary of Findings, Conclusion and Policy Suggestions

United Nations (2001) stated that disparities between people, between urban and rural areas, between areas within countries and between countries are the result of natural differences, socio-cultural conditions and policy decisions. Because of natural, inherent differences, it is difficult, if not impossible, to remove all disparities completely. However, it is possible and necessary to remove at least all “man-made” obstacles, such as social constraints and policy decisions that stop people, areas and countries from developing their full capabilities. Balanced development can thus be defined as the creation of equal opportunities, a level playing field, for all people. The level playing field will enable people to participate in development by contributing to, benefiting from and influencing decision-making about development.

The present study can be viewed as a research contribution to the effort to address the issue of existing rural-urban divide in Assam, a resource-endowed but relatively backward state of India and find out ways to narrow down the divide with effective rural-urban linkages. Before drawing the final conclusion and working out the policy implications, it may be worthwhile to go over the principal findings of the study. A summary of these findings is presented in the following section.

8.1 Principal Findings

1. The analysis has empirically established the existence of rural-urban divide in the state. The divide is found to be more prominent in almost all the indicators in accessing health care facilities, education facilities and in employment generation in the state compared with the national average.

- ❑ One of the important findings of the study is that rural-urban disparity has decreased in both Assam and India in case of both health outputs and inputs. However, the reduction is not significant for a long period of 29 years (from 1981 to 2010) for the state. The Rural Urban Disparity Index (RUDI) values confirm the findings that rural-urban

divide is more prominent in Assam than the country average during almost all the study years under consideration.

- ❑ The rural-urban disparity in educational attainments still prevails significantly both for the state and the country. However, the picture of Assam is relatively bright in comparison with all India average. Assam performed comparatively well in respect of education outputs while the state performed poorly in some education inputs. The implications of this result may not be good for development of education for the state in future.
- ❑ In case of employment generation, the striking point is that the rural-urban divide is more prominent in case of regular employees in Assam and the disparity has widened more rapidly up to 2004-05. Although disparity has fallen in 2007-08 both for the state and the national average, this is due to the fact that there is a sharp fall in the employment in the regular employee categories irrespective of rural and urban areas both for the state and national average after economic reform started and the fall is more in urban areas. Casual labour is more in rural sector than in urban sector both for the state and national level.
- ❑ Rural-urban disparity in average wage per day received by the worker is more prominent for regular wage employees for Assam than the all India average.
- ❑ The change in the occupational distribution of working people in the state is comparatively less than the national average indicating that the economy of the state has remained fairly backward during the post-liberalisation period. The rural-urban divide is prominent in manufacturing sector showing less industrialisation in the rural areas for the state than the national average. The tertiary sector shows that there still exists a vast rural-urban disparity both for the state and the national level.

Thus, the above discussion satisfies the objective of assessing rural-urban divide in accessing health care services, education facilities, and employment generation in the state

2. Significant urban bias has been noticed in per capita budget allocation for rural and urban areas in health care sector in the state. The data do not show any clear indication of urban bias in the policy making of the government in education sector in the state. Urban bias in employment generation in the state is indirectly examined with the help of some proxy parameters, namely, per capita expenditure on rural and urban areas, wages in agricultural and industrial labourers, investment in agricultural and industrial sectors, and social security measures.

- ❑ It is revealed from the study that urban bias in per capita total rural and urban spending is visible in the state till 2002-03 and the rural-urban gap was widening during this period. However, after the introduction of various schemes for rural and urban areas, the per capita rural spending has increased in relation to the per capita urban spending indicating negative urban bias in the state.
- ❑ The compound annual growth rate of investment in agriculture and allied services is found less than that of industry and minerals.
- ❑ The wage rates are relatively higher for unskilled workers in industrial sector than that of agriculture sector. The rate of growth of wage rates for agricultural labourers is much less than the growth rate of the wage rates for non-agricultural labourers.
- ❑ No urban bias has been noticed in availability of fair price shops in the state, as average number of people per fair price shop is more in urban areas than in rural areas during 1993 to 2008-09. Similarly, no urban bias has been found in providing social safety nets to the people in the state.

The above discussion fulfils the objective whether there exists any urban bias in the policies of the government. Urban bias has been noticed in some aspects of development in the state.

3. In so far as availability of infrastructure facilities is concerned, there exists vast difference between rural and urban areas in the state. The estimated Composite Infrastructure Index for rural areas is only 59.07 as against 719.61 in urban areas.

Thus, there exists policy bias of the government in providing this basic facility to the rural and urban areas.

4. It is also clear from the analysis that growth of agriculture sector is not only slow but also negative in the state in comparison with non-agriculture sector. During 1980-81 to 2008-09 the value added per worker in agriculture sector increases by annual cumulative of (-0.40) per cent whereas the same increases by 0.51 per cent for non-agriculture workers.

5. Weak sectoral linkage is established from the study as only 5 per cent sectors are having high value of backward and forward linkages.

- ❑ Sectoral linkages with and without import leakages are compared to capture the potential linkages in the state. It has been found that the following sectors, namely, Paddy, Fiber Crops, Plantation, Other Crop, Animal Husbandry, Forestry and Logging, Crude Oil, Wood based Industry, Petroleum Products, Other Non-metallic Mineral Products, Non-ferrous Metal, Rail Transport Service, Other Transport Services, Electricity, Construction, and Other Services have the potential of high backward and high forward linkages if import leakages are allowed.
- ❑ The sector 'Other Food and Beverages' has high backward but low forward linkages in both with and without import leakages. Since backward linkages are more powerful than forward linkages especially in developing countries, therefore, the sector Food and Beverages may have an important role to play in the state economy. Compared with other manufacturing sector units, Other Food and Beverages Industries has shown high values in both with and without import leakages and the sector has shown the potential to rise in the state with significant linkage effect.
- ❑ One of the significant results inferred from the study is that the total value of the linkages is more in agriculture and agro-based industries than that in other manufacturing industries in the state. This means investing more in these sectors will help to stimulate the economy better through the backward and forward linkage effects. Compared

with the manufacturing industrial sector, agro-industry and livestock sectors in Assam have higher potential to increase domestic production through backward linkage effects.

- The rank correlation coefficient between the indices of backward and forward linkages is found to be negative indicating weak sectoral linkages in the state.

Thus, the above discussion satisfies the objective of examination of the nature and strength of sectoral linkage in the state. The results show weak sectoral linkages in the state.

6. It is established from the time series model that weak sectoral linkage is the main significant factor accentuating the problem of rural-urban divide in the state.

7. Food-processing industry through its better linkages with rural sector can help narrow down the rural-urban divide in the state. From the SAM multiplier analysis based on the field survey, it is found that if demand for agricultural crops by the food processing industry is increased by Re.1 in the village then the Production/output in the agriculture sector increases by Rs.1.64; income increases by Rs.1.32 and employment increases by 0.83 units.

8. The comparative analysis of the subsidy on the industry and the return from the industry shows that the industry returns a substantial return of Rs.5.50 per day per household against an investment of Rs. 1.84 per day per household.

9. If there is increase in demand for agriculture activities, then income of the villagers increases leading to increase in their expenditures. Significantly, all household groups tend to increase their service expenditures (includes expenditure on health and education also) with the increase of their income, followed by expenditure on agriculture. The pattern indicates two significant results. Firstly, with increase in exogenous demand, the villagers may spend more on health and education which will definitely help improving their standard of living and secondly, with increase in exogenous demand the villagers may spend more on

agriculture implying more expenditure on modernising the agriculture. Therefore, it can be inferred that food-processing industry with better productivity in this era of globalisation in that locality can stabilize their income and can improve the standard of living of the people and can bring modernisation of agriculture which will ultimately help reduce rural-urban divide.

10. Agriculture and service are the two most responsive activities with high absorption effect in the village. This effect can also interpret how a change in other activities influences agriculture and service in particular.

11. The ranking of sectors/activities in terms of poverty alleviating effects shows that the hired labour generates highest income to the agricultural landless workers followed by the employed at Nilon's industry. This implies that the industry has a significant impact in the village in terms of poverty alleviating effects. Agriculture occupies the eighth ranking for the agriculture landless workers. Allied agricultural activities-livestock etc. possess the first ranking followed by agricultural inputs for the small farmers. Miscellaneous activities generate the highest income both to the medium farmers and large farmers whereas salaried person contribute most to the service holders.

12. An increase in one unit of final demand in a sector results in an expansion of output and thereby income in that sector. The increase in production will, of course, set in motion a chain reaction which will result in an increase of outputs of all other sectors in Batabari that are directly or indirectly linked to the industry experiencing the change in demand. Decomposition of the total effects shows that over all direct effects (56.09%) dominates the indirect effect (4.86%) and induced effects (39.04%).

13. The analysis shows which farmer group is the best channel for income redistribution in the village to reduce inequality by increase in income. Medium farmers group is the best channel for income redistribution while the agriculture landless is the poorest one. A transfer to any other group performs less in terms of overall effects.

14. The study of the benefits of different labour categories from their linkages with sectors in terms of value additions shows that land, jute, agriculture, other crops, vegetables, fodder are some of the production activities that generate high benefits for landless agricultural worker category. The same category is found to be relatively less integrated with salaried persons, transportation and government services. Small farmer category is found to be more integrated with the family labour, allied agricultural activities, agricultural inputs, livestock products and agriculture. Hired labourer, agriculture, other crops, vegetables and fodder appear to be very important sectors for medium farmer category in promoting their income. However, the rankings show that credit, transportation, services, trade and petty services and agriculture sector impart higher benefits to the large farmer category in the village. The self-employed in non-agriculture and service holder categories are getting more benefits from the stimuli that originate in salaried persons and employed at Nilon's.

15. It has been found that only 1.615 per cent of total vegetables (related to the demand of the industry like potato, tomato, mango, chilli, pumpkin etc.) sold by the neighbouring villages in the market is sold to the industry. This indicates that abundant raw materials are available in the neighbouring villages. Thus, there exists huge potential and scope of more food-processing industries in that locality which can stabilize the income of the villagers.

Thus, the above discussion satisfies the fourth objective. The food-processing industry in closer input locations can be suggested to encourage the strengthening of local rural-urban linkages that benefits both rural as well as urban sector for balanced development in the state.

8.2 Conclusion

The study has assessed rural urban divide in Assam with respect to three aspects, namely, in accessing health care services, education facilities, and employment generation. Although literatures point out to a number of factors responsible for enhanced rural urban disparity, the evidence from the study does

not provide general support to the hypothesis that weak sectoral linkage and biased policies of the government are responsible for rural-urban divide in the state. The time series analysis has established that weak sectoral linkage is a significant factor for rural-urban divide in the state. However, urban bias in government policies has not come out as a significant factor. Thus the hypothesis that “weak sectoral linkage and biased policies of the government are responsible for rural-urban divide in the state” gets only partially accepted.

It has been found from the study that the linkage or multiplier effects of agriculture sector and agro processing sector in Assam are better than those of the other manufacturing sectors. More output in agricultural sector opens opportunities for industry to develop, while there is only limited linkage from industry to agriculture. The impact analysis of Nilon’s Industry on a peripheral village shows the scope of establishment of agro-based industries based on increased agricultural output and better inter-sectoral linkage. This calls for enhanced investment in agriculture sector in the state which may help reduce rural-urban divide in the state. Thus the hypothesis that “Region with overriding agriculture sector requires adequate investment in the sector which may help in reducing the rural-urban divide” gets accepted.

8.3 Policy Suggestions

The main policy suggestions emerging from the findings are summed up as follows:

1. Since urban bias is noticed in policies of the government in certain sectors resulting in larger rural-urban divide, equal emphasis should be given to both rural and urban sectors for balanced development of the state. As more than 85 per cent of the population are still living in rural areas, the overall development of the state cannot be ensured unless rural development takes place. The various schemes initiated by the government for rural health, education and for generation of employment in rural areas need to be implemented properly. Proper monitoring on the part of the government and awareness about the programmes on the part of the common people is needed in this regard.

2. Many countries have now realised the need to examine the links between economic and social development and a Social Accounting Matrix (SAM) offers the necessary tool for examining such links. In the present study, a village SAM is used to analyse the socio-economic impact of agri-industry linkage. A better understanding of the linkages between sectors and its impact on the state is required to minimise rural-urban divide. As a village level SAM is not sufficient to do justice to do this, the state government should give priority for construction of state level SAM for better understanding of the sectoral linkages and its impact on the society. According to Assam Development Report, 2002, inter-sectoral linkages should get due consideration while taking investment decisions for the economy.
3. As agriculture related sectors are found to be the most promising sectors, they should be seriously promoted in the state. Although agriculture is normally considered as a less productive sector with low production multipliers, the results of the SAM and the input-output analysis are quite contrary to that perception. The linkage or multiplier effects of agriculture sector and agro-processing sectors in Assam are better than those of the other manufacturing sectors. This suggests increasing the quantum of investment in agricultural sector for overall development of the state.
4. Establishment of food processing industries in the state should be promoted. The congenial agro-climatic and soil conditions offer a vast scope for development of food processing industry in the state. Saikia (2010) has opined that the use of processed food is becoming popular in the region due to various socio-economic changes such as increase in population, increase in income level of a class of people, urbanisation, changes of taste and food habits etc.

Emphasis on agro-industrialisation with strong rural-urban growth linkage is an important way to absorb surplus labour (Bliven *et al.*, 1997). Agro-industries, mostly being a labour-intensive industry can engage a

good number of workers both male and female. Thus, development of agro-industries would increase the job opportunities for huge number of unemployed in the State. However, the existing policy of transport subsidy given to the industries set up in the north east may have to be revisited to ensure use of available local raw materials in the food processing industries in the region.

In line with the emphasis given by the Government of India on food-processing industries, New Industrial Policy of Assam, 2008 has also focused on food-processing industries for over all industrial development of the state. There are already several fiscal incentives available for industries set up in North East India under Industrial and Investment Promotion Policy, 2007. The New Industrial Policy of the state has also announced some incentives for setting up the necessary infrastructure for food-processing industries in the state. If due attention is paid to the issues of marketing, infrastructure (road connectivity, power supply etc.) etc., then food processing industry can bring positive changes in the economy of the state with its sufficient linkages with the rural economy.

8.4 Limitations of the Study

The study is an attempt to assess the nature and magnitude of rural-urban divide in Assam and to find out the reasons thereof. Although efforts have been made to make the study effective, it is not without limitations. Some of the limitations of the study are mentioned below:

1. The study is based on the available input-output table of the state in which the coefficients for a number of sectors have been updated. The results will be better if the study can be carried out based on a fully updated input-output table for the state.
2. The linkage effect of the manufacturing sector could not be compared with the agriculture sector in this village level SAM study as there is no manufacturing activity in the village Batabari. However, the linkage effect of the manufacturing sector with the agricultural sector is compared for the state as a whole from the input-output table of the state.

3. The SAM tables in excel form are very large and somewhat difficult to interpret but the real focus is on understanding the output from the matrix. The output comes in the form of multipliers from SAM multiplier matrix which is used to analyse the impacts of the said industry on Batabari.
4. Non-availability of rural-urban breakup data for different sectors/activities in the state often created difficulties in carrying out the study.

8.5 Implications for Future Research

The study has thrown light on a number of issues which need to be addressed for a balanced development of rural and urban areas of the state. Intervention in the form of investment in food processing industries may ensure better linkage between sectors and thereby help reduce the disparity between rural and urban areas. Although the study is carried out for the state of Assam, the findings of the work may be equally relevant for economies/regions with similar resource endowments and constraints.

The discussions in the thesis, however, show that there still exists some research gaps which need further investigation. In the present study, rural-urban divide is examined for three aspects of development in the state. However, there is a scope to develop sector specific study to unearth the reasons behind the divide and suggest measures to narrow down the rural-urban divide in the state.

The SAM model is static in nature which does not allow it to account for accumulation effects in the village over time. As long run impacts may be different from short run effects, a dynamic Computable General Equilibrium (CGE) model may be developed to capture long run effects in the state.

Annexure I

Linkage Analysis in BATABARI Village, Darrang District, Assam

HOUSEHOLD SURVEY SCHEDULE, 2009

Reference Period: March, 2008 to February, 2009

Name of the interviewer			
Date of interview	Day	Month	Year
Telephone No. of the household			

I. Household Demographic

ID. No.	Name	1. Sex (M/F)	2. Age (in years)	3. Occupation		4. Education level (highest grade completed) code(b)	5. Usual residential status code (c)
				Primary code(a)	Secondary code(a)		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

6. If **salaried people**, please give **gross income** in last 12 months.

II. a House Property - Facilities:

Assets owned	1. Number owned	2. Value (in Rs.)	3. Repairs and maintenance cost, if any (Value in Rs.) in last 12 months
1. House (Kachha/Semi Pukka/Pukka)/(tin/thatched/others) (please put ✓ mark)			
2. Kattle shed (Kachha/Semi Pukka/Pukka)/(tin/thatched/others) (please put ✓ mark)			
3.Toilet (open/insanitary/sanitary) (please put ✓ mark)			
4. Sources of drinking water (Kachha well/well/hand pump/tap) (please put ✓ mark)			

II.b House Property- Farm Asset/Equipments etc.

Does this household own any following **tools, large household goods or valuables**? If yes, we would like to know how much it is worth.

Item/Asset Description	1. Number owned	2. If you were to sell one, similar item how much would be average price per unit? (imputed value in Rs)	3. How much did you spend on maintenance in last 12 months? (in Rs.)	4. If the item is used for generating income in last 12 months, give the amount(in Rs)
1. Plough, Bullock cart, Tractor, Power tiller etc. agriculture equipment				
2. Weaving equipments/assets				
3. Any equipments related to other activities(specify)				
4. Livestock related assets-pots, ropes, fishing net, cattle shed etc.				
5. Any wooden/steel/plastic furniture like bed, chair, Almirah etc				
6. Sewing machine/Iron/Umbrella				
7. Hand torch/ Watch/Wall clock				
8. Radio/Tape recorder/T.V/CD player/Fan				
9. Jewellery/gold /silver etc.				
10. Spade, axe, Knife				
11. Kitchen utensils (pans, pots, tray, spoons etc.)				
12. Mattress/Blanket				
13. Thela/Bicycle/Rikswa/Motor cycle/Car etc.				
14. Others(specify)				

5. Have you sold any assets in last 12 months? Yes-----1, No----- 0	If yes, give details.
---	-----------------------

Item/Asset Name	Value in Rs.	Location of Sale Code (g)

III. Farm Land Ownership (in Bigha) during the Reference Period (1 bigha = 0.13387 hectare)

1. Own land	2. Own cultivated land	3. Leased in land	4. Leased out land	5. Mortgaged in land		6. Mortgaged out land		7.Total cultivated land(2+3+5)	8. Net Sown area	9. Gross cropped area
				Value (in Rs)	From whom code(g)	Value (in Rs)	To whom code(g)			

10. Have you received any land as a bequest in last 12 months? Give details.

11. Have you received any land as a gift in last 12 months? Give details.

IV. Cropping Pattern and Sales

Sl. No.	1.Area (in Bigha)	2. Crop Name	3. Season (Summer-1, Khariff-2, Rabi-3)*	4.Total Production (in Kg)	5.Crop for Consumption(in kg)			6.Marketable Surplus (in kg)				
					Crop residue for seed(c)	Own Consumption (d)	Gift to the village neighbours/ relatives (e)	Amount sold in market	Revenue (in Rs) (A)	Amount sold in Nilon's industry	Revenue (in Rs) (B)	Total Revenue (in Rs) (A)+(B)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

* 1. Autmn [February (Magh-Fagun) to May (Bahag-Jeth)]; 2. Winter/Khariff [June (Jeth-Aahar) to September (Bhada-Aahin)]; 3. Summer/Rabi [October (Aahin-Kati) to January (Puh-Magh)]

7. Is there any **By-product** (straw, jute products for wall, Bamboo products for fencing etc.) of any crop? If yes give details.

Name of the by-products	Total production (in Rs)	Amount of Home Consumption(in Rs)	Amount Sold(in Rs)	Place of sale code(g)

V. Input Stock

1. If the household store rice, jute or any other food crops or cash crops from own harvest, from purchase, from borrowing/ gift in last 12 months, please give details

Crop name	2. from own harvest/product		3. from purchase				4. from borrowing/gift			
	Quantity	Value in Rs.	Quantity	Value in Rs	Sellers code (h)	Location of Seller code(g)	Quantity	Value in Rs	Lender/Source of gift code(i)	Location of lender/sender Code (g)

VI. Operating Expenses of the Agriculture

We would like to know about labour and related inputs on growing crops in last 12 months.

	Adult males (≥ 15 years old)	Adult females (≥ 15 years old)	Children (< 15 years old)
1. How many hours does a typical working day last on average in your household?			

Crop type	Main activity	Household members only				Hired labour						Labour sharing arrangement (excluding household members)			
		2. No. of adults involved	3.No. of days worked	4. No. of children involved (below 15 years)	5. No. of days worked	6. No. of people hired	7.Source of borrowing code(i)	8. No. of days worked	9. How much was paid in total (in Rs)	10 .Total cost of[...] for hired labour in Rs		11.No. of adults involved	12. No. of days worked	13.Total Cost of [...] for labour sharing in Rs	
										Meals	Drinks			Meals	Drinks
Rice	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc														
Jute	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc.														

Crop type	Main activity	Household members only				Hired labour						Labour sharing arrangement (excluding household members)			
		2. No. of adults involved	3. No. of days worked	4. No. of children involved (below 15 years)	5. No. of days worked	6. No. of people hired	7. Source of borrowing code (i)	8. No. of days worked	9. How much was paid in total (in Rs)	10. Total cost of [...] for hired labour in Rs		11. No. of adults involved	12. No. of days worked	13. Total Cost of [...] for labour sharing in Rs	
										Meals	Drinks			Meals	Drinks
Vegetables	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc														
Spices	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc														

Crop type	Main activity	Household members only				Hired labour						Labour sharing arrangement (excluding household members)			
		2. No. of adults involved	3. No. of days worked	4. No. of children involved (below 15 years)	5. No. of days worked	6. No. of people hired	7. Source of borrowing code(i)	8. No. of days worked	9. How much was paid in total (in Rs)	10. Total cost of [...] for hired labour in Rs		11. No. of adults involved	12. No. of days worked	13. Total Cost of [...] for labour sharing in Rs	
										Meals	Drinks			Meals	Drinks
Fruits	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc														
Oilseeds	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc														

Crop type	Main activity	Household members only				Hired labour					Labour sharing arrangement (excluding household members)				
		2. No. of adults involved	3. No. of days worked	4. No. of children involved (below 15 years)	5. No. of days worked	6. No. of people hired	7..Source of borrowing code(i)	8. No. of days worked	9 .How much was paid in total (in Rs)	10 .Total cost of[...] for hired labour in Rs		11. No. of adults involved	12. No. of days worked	13. Total Cost of [...] for labour sharing in Rs.	
										Meals	Drinks			Meals	Drinks
Others	1.Land preparation including ploughing, levelling land														
	2.Planting/sowing														
	3.Weeding														
	4.Harvesting														
	5.Threshing														
	6.Transporting to storage														
	7.Other activity-fencing etc														

VII. Farm Equipment/Livestock Inputs and Other Expenses

Please give details about farm equipment/livestock input by crop type and activity for the last 12 months.

Crop type		Own Equipment/Animals					Hired/Rented Equipment/Animals				
	Main activity	1. No. of farm equipment/ animals involved	2.Type of equipment/ animal Code (n)	3. No. of days worked	4. Average hours worked per day	5. Value of own animal/ equipment used(Rs)	6 .No. of farm equipment/ animals involved	7. Type of equipment/ animal code(n)	8. Average hours worked per day	9.Whom hired, inside the village-1, outside the village-0	10.Total cost (Rs)
Rice	Land preparation including ploughing, levelling land										
	Threshing										
	Transporting to storage										
	Other activity (specify)										
Jute	Land preparation including ploughing, levelling land										
	Threshing										
	Transporting to storage										
	Other activity (specify)										
vegetables	Land preparation including ploughing, levelling land										
	Threshing										
	Transporting to storage										
	Other activity(specify)										
Spices	Land preparation including ploughing, levelling land										
	Threshing										
	Transporting to storage										
	Other activity(specify)										

Fruits	Land preparation including ploughing, levelling land											
	Threshing											
	Transporting to storage											
	Other activity(specify)											
Oilseeds (mustard oil etc.)	Land preparation including ploughing, levelling land											
	Threshing											
	Transporting to storage											
	Other activity(specify)											
Others	Land preparation including ploughing, levelling land											
	Threshing											
	Transporting to storage											
	Other activity(specify)											

VIII. Land Improvement Activities

1. Did you use irrigation for cultivation? Yes-1, No-0	
2. Type of the irrigation system: STW-1;Canal-2;Others (specify)-3	
3. Irrigation system is:Government-1;Owned-2;Shared-3;Hired-4	

4. If hired/shared, with whom hired/shared and the cost incurred in last 12 months?

Villagers inside the village-1, Villagers outside the village-0	Cost (in Rs.)

5. If owned, please give the cost incurred (in Rs):

6. Have you used chemical fertilisers in any of the plots in last 12 months? Yes-1; No-0

7. If yes, give details of the following chemical fertilisers and other inputs for crops in last 12 months.

Input type	Purchased				Borrowed			From Gift or Other		
	Amount	Value in Rs.	Seller code (g)	Location of purchase Code(h)	Amount	Value in Rs.	Source of borrowing Code (i)	Amount	Value in Rs.	Source of gift Code (i)
UREA										
DAP*										
SSP*										
MOP*										
Other fertilisers										
Insecticide										
Local seed										
HYV										
Rent for bullocks										
Animal dung										
Other (specify)										

*DAP = Di-ammonium Phosphate; SSP=Single Super Phosphate; MOP = Muriate of Potash

8. Please give an estimate of **transport expenses and mode of transport in selling crop output and livestock** in last 12 months.

Transport expenses related to crop/livestock sale		Rice	Jute	vegetables	spices	Fruits	Oilseeds	Other crops	Livestock
	Mode of transport Code (t)								
	Transport expenses in Rs.								

IX. Construction

1. Did you spend anything on constructing a new house or improving your house and other buildings in last 12 months?	Yes-1; No-0	If yes, obtain details
--	-------------	------------------------

Part of dwelling	2. Main construction materials used Code (q)	3. How much did it cost in total? (In Rs)	4. Seller code(h)
Outside walls			
Roof			
Other (specify)- labour cost			

X. a. Livestock Assets

1. type of livestock	2. Number owned and present at your farm	3. If you were to sell one of the live stocks, how much, on average, would you receive from the sale? (in Rs)	4. How many slaughtered for home consumption on last year?	5. Did you buy any livestock in last year?				6. Did you sell any [...] during last year?			
				Number bought (if none, write 0)	Total purchase value of all bought (in Rs)	Where did you buy it? Code (g)	From whom did you buy it? Code (h)	Number sold (if none, write 0)	Total sales value all sold (in Rs)	Where did you sell it? Code (g)	To whom did you sell it? code(h)
Calves											
Bullocks											
Cows											
Lambs											
Pigs											
Goats											
Hen/ chicken											
Ducks											
Pigeons											
Other (specify)											

What was your gross income from household's **livestock products** in last 12 months?

Type	7. Did you sell any product? Yes-1, No-0	8. If no, Amount of home consumption(in Rs)	9. If yes, Amount sold (in Rs)	10. Buyers Code (h)	11. Where did you sale? Code (g)	12. Any taxes and other related payments on this income (in Rs)
Eggs						
Beef/pig						
Mutton/Lamb meat						
Chicken/Duck						
Milk and milk products						
Hides/skins						
Dung cakes						

13 Did you get any income from renting out bull in last 12 months? Yes-----1 No.....0 If yes, give the			
Amount received (in Rs)	If in kind, crop name	Amount in Kind	Estimated value (in Rs)

X: b. Livestock Expenses

1. In last 12 months, give details of the following expenditures related to livestock

Type of expenditure	2. Number of household members involved in last one month				3. Number of hired labour involved in last one month			4. Cost of the purchased item (in Rs)	5. From whom purchased (sellers) code(h)	6. Where did you purchase the input? Code(g)
	adults	children	No of days worked	Average hours worked per day	Payment to hired labour in cash (in Rs.)	If in-kind to hired-labour Amount	Value in Rs.			
Labour for herding										
Purchased feed										
Veterinary services/medicine/ vaccination										
Other expenses										

XI. Income from Self-Employment Activities

1. In last 12 months, did you or any other members of the household work off on someone else's land or in some other employment, against payment in cash or in kind **as part of a labour sharing agreement**? Yes---1 No----0. If 1 is yes, please give details.

2. ID code of household member	3. Kind of work Code (y)	4. location of work(Inside the village-1; Outside the village-0)	5. Total amounts earned in last 12 months. If in kind, give amount, form of payment and its value.			
			Amount	If in-kind		
			in Rs	Crop name	Amount	Value in Rs
-						

We would like to ask you about other income earning activities, such as **crafts, trades and other business**, carried out by you or any other member of the household.

6. In last 12 months, have you or other members of your household been involved in any of the activities listed below? Yes---1 No---0

If 6 is yes, please give details.

Activity	Household member ID code	Days worked by each member in last 12 months	Average hours worked per day	Gross income (sales) earned in last 12 months	Location of sales	Buyers	Any taxes paid on this income in Rs.
				Amount in Rs.	Code(g)	Code (h)	
Weaving/Spinning							
Tailoring							
Carpentry							
Tannery-leather related							
Trade in grain							
Trade in livestock and livestock products							
Traditional healer/religious teacher							
Transport (by pack animals)/tractor/thela/Rikswa/cycle							
Collecting and selling fire wood							
Selling grass and straw							
Selling cow dung							
Selling liquor							
Renting animals/farm equipment like tractor, power tiller/bullock cart etc. for farming							
Land rent							
Other (specify)							

7. Apart from the costs of labour input, please provide other **major inputs** and costs involved in the following activities in last 12 months.

Activity	Input type	Cost in Rs.	From whom purchased	Location of purchase
			Code (h)	Code (g)
Weaving/Spinning				
Tailoring				
Carpentry				
Trade in grain				
Trade in livestock and livestock products				
Traditional healer/teacher				
Transport by pack animals/thela-cycle				
Selling fire wood				
Selling cow dung				
Selling grass and straw				
Selling local liquor				
Renting farm animals				
Land rent				
Other (specify)				

XII. Income Earned from the Employment in Nilon's Industry (as Salary)

1. In last 12 months, did you or any other members of the household work in the industry? Yes-----1 No-----0 If yes, give details

ID of the household member	Type of work (Permanent-1, Temporary-2)	Monthly salary earned (in Rs)

2. Is any product of the industry is bought by the household in last 12 months? Yes -1; No-0; If yes, please give value(in Rs)

XIII. Other Sources of Income: Remittances, Transfers and Gift

1. Has the household **received** any other income (such as remittances from friends/relatives, gifts, food aid/other aid, payment for health, education or any other transfers) in last 12 months? If yes, give details of each transfer Yes----1 No-----0

2.Each transfer received	3.Type of receipt code(b1)	4.ID code of person receiving transfer	5. Who sent you the transfer? Code(i)	6. Where does this person live/ is organisation based? Code (g)	7. Give the amount in Rs; if in kind, please give amount in kind, form of payment.			
					Amount in Rs	If in-Kind		
						Amount	Crop name	Estimated value in Rs
1								
2								
3								
4								
5								

8. Has the household **given anything to another household** (such as remittances to friends/relatives, a gift of food, payment for someone else's health or education, any other transfers- **gift in social functions, marriages etc**) in last 12 months? Yes---1 No---0 If yes, give details for each transfer

9. Each transfer received	10.Type of gift code(b1)	11. To whom did you send the transfer? code(i)	12. Give the amount in Rs; if in kind, please give amount in kind, form of payment and unit.			
			Amount in Rs.	In-kind amount	Crop name	Estimated value in Rs
1						
2						
3						
4						
5						

XIV. Credit

1. In last 12 months, did you take credit from financial institutions, relatives, friends, etc? Yes----1 No---0

If yes, please give details about these loans. Include those you have paid back, as well as loans you have not paid back as yet.

Loan number	ID code of person receiving loan	Loan Amount	2. Source of loan code(i)	3. Location of lender code(h)	4.Reason for loan code(h1)	5. Did you pay interest on the amount borrowed? Yes-1;No-0	6. If you paid interest, please give details.			7. What is the value paid back to lender so far? (principal plus interest) (in Rs)	8. Is there still any part outstanding? yes-1; No-0	9. Amount outstanding (in Rs)
							Rate in %	Time unit Code (i1)	Amount paid (in Rs)			

10. If no, why did you not take a loan?	Code (j1)	
---	-----------	--

11. In last year, have you given any loan in cash or in kind to another household? Yes-----1 No-----0	
--	--

If yes, please give details about all these loans. Include those that have been completely paid back as well as loans that are still outstanding.

Number of loan given	12. Give amount LENT in Rs.	13.Amount received so far from borrower (principal plus interest) (in Rs)	Where does this borrower live? Code(g)	14. If you received interest on this loan, give amount (in Rs.)	15. If there still any part outstanding, give amount (in Rs.)
1					
2					
3					
4					

16. Does any member of the household have a bank account? Yes----1 No----0	
17. How much did you have in your bank account at the end of the reference period?	Rs
18. How much did you receive interest income from your saving account at the end of the reference period?	Rs

XV. Awareness/Participation in the Government Programmes

Sl. No.	Programmes	1. Whether aware (Yes-1; No-0)	2. Whether benefited (yes-1; No-0)	3. Did you pay commission (yes-1; No-0)	4. If benefited, the amount received in last 12 months (in Rs.)
1	Public Distribution system				
2	SGSY etc.				
3	NREGA				
4	Indira Awas Yojana				
5	TSC Swajaldhara				
6	ARWSP (drinking water)				
7	Sarba Siksha				
8	ICDS /Anganwadi)				
9	Old Age/ Widow pension				
10	Maternity Benefit Scheme				
11	Other (specify)				

5. Did anyone in this household receive free food distribution in last 12 months? Yes-1 No-0

6. If yes, please give details.

ID	Amount in-kind				Remark
	Quantity	Crop Name	Estimated value in Rs	Location of sender code(i)	

XVI a. Food Consumption:

We would like to ask you about all food that was bought for consumption or was consumed from your own product/stock [including meals prepared for visitors] in **last week**.

Food type	code	1. Total amount consumed		2. from purchases					3. from your own product or stock.		4. from gift, wage in-kind, or loan		
		Amount	Total expenditure in Rs	Amount	Total expenditure in Rs	For whom purchased Code (h)	Location of purchase code(g)	Means of financing code(o1)	Amount	Total expenditure in Rs	Amount	Total expenditure in Rs Amount	Location of sender code(i)
Rice	1												
Beans/peas/any pulses- masur, mug etc.	2												
Gourds-white, bottle, bitter	3												
Onions	4												
Potatoes	5												
Pumpkin	6												
Tomato	7												
Other vegetables- Lentils- <i>Boot</i> , <i>mung</i> etc.	8												
Spices	9												
Fruits	10												
Cooking oil	11												
Eggs	12												
Fish	13												
Beef/pig/Mutton	14												
Chicken/duck	15												

Milk/Yoghourt /milk products	16												
Wheat	17												
Sugar/honey	18												
Soft drinks/liquor	19												
Tea/coffee	20												
Salt	21												
Bread/biscuits/chira/Muri	22												
Cigarettes/areca nut/ etc. tobacco	23												
Other (specify)	24												

5. Has the household purchased any prepared foods, or paid to eat food outside the household in last week? Yes--1 No----0

If yes, please give details regarding type of food and the total expenditure on prepared foods and food eaten outside the household in **last week**.

Food type	code	6. How much was spent?				
		Amount	Total expenditure in Rs.	Where purchased	From whom purchased	Means of financing
				Code (g)	Code (h)	Code (o1)
Rice	1					
Beans/peas/any pulses-masur, mug etc.	2					
Gourds-white, bottle, bitter	3					
Onions	4					
Potatoes	5					
Pumpkin	6					
Tomato	7					
Other vegetables-Lentils-Boot,mung etc.	8					
Spices	9					
Fruits	10					
Cooking oil	11					
Eggs	12					
Fish	13					
Beef/pig/Mutton	14					
Chicken/duck	15					
Milk/Yoghourt /milk products	16					
Wheat	17					
Sugar/honey	18					
Soft drinks/liquor	19					
Tea/coffee	20					
Salt	21					
Bread/biscuits	22					
Cigarettes/areca nut/ etc. tobacco	23					
Other (specify)	24					

XVIb. Frequently Purchased Services and Consumer Goods

7. Did the household purchase any of the following for its own consumption in **last month**? If so, please give the details.

Household consumables (commodity)	Code	From purchases					From gift, wage in-kind, or loan		
		Amount	Total Expenditure in Rs	Where purchased code(g)	From whom purchased? code(h)	Means of financing code(01)	Amount	Total Expenditure in Rs	Location of Sender Code (i)
Housing expenditures									
Rent	25								
Maintenance and repair expenses of houses	26								
Water	27								
Electricity (bill)	28								
Firewood	29								
Diesel/Petrol	30								
Kerosene/LPG	31								
Personal care									
Matches	32								
Batteries	33								
Candles/lamp etc	34								
Laundry soap	35								
Hand soap/detergents-vim bar, surf etc.	36								
Cosmetics (Hair oil, powder, perfume etc)	37								
Other personal care goods	38								
Other (specify)	39								
Transport and communication									
Tyres, Tubes, spares etc.	40								
Taxi and/or bus fares	41								
Rail fares	42								
Telephone/mobile expenses	43								
Other (specify)	44								

XVIc: Durable Goods and Services

8. Has the household purchased any of the following items in **last 12 months**? If yes, please give details.

Household consumables (commodity)	Code	From purchases					from your own product or stock		From gift, wage in-kind, or loan			
		Amount	Total expenditure in Rs	Where Purchased	From whom purchased?	Means of financing	Amount	Total expenditure in Rs	Amount	Total expenditure in Rs	Source	Location of sender Code (g)
				Code (g)	Code (h)	Code (o1)					Code (i)	
Clothing												
Clothes//fabric for MEN	44											
Clothes/fabric for WOMEN	46											
Clothes for children	47											
Clothing Material and tailoring	48											
Men's Footwear	49											
Women's Footwear	50											
Children's Footwear	51											
Other Footwear and Repairs	52											
Furniture, Carpet, Furnishings etc												
Furniture items (chairs, sofas, tables, beds, wardrobes, bookshelf)	53											
Carpets, Mats, etc.	54											
Bedding Mattresses	55											
Blankets, bed sheets, towels, etc.	56											
Mosquito nets	57											
Other and Repairs	58											
Household Appliances and Equipment												

Electric iron/Kettles/ cooking pots/sewing machine/water Filter etc.	59											
Kerosene stove/LPG stove	60											
Radio/cassette player/ stereo equipment/wall clock	61											
Bicycles , umbrella /watches, jewellery, lock and key etc.	62											
Motorcar/motor cycles, etc.	63											
Ropes, Puja/Namaz items	64											
Fishing equipment-Net for fishing etc.	65											
Other equipment and repairs	66											



Household consumables (commodity)	Code	From purchases					from your own product or stock		From gift, wage in-kind, or loan			
		Amount	Total expenditure in Rs	Where Purchased	From whom purchased?	Means of financing	Amount	Total expenditure in Rs	Amount	Total expenditure in Rs	Source	Location of sender Code (g)
				Code (g)	Code (h)	Code (o1)					Code (i)	
Glass/Table Ware, Utensils & Electric goods												
Plastic Dustbin/Jharu etc.	67											
Plastic plates, Cup-plates, glasses, spoons etc.	68											
Jerry cans and Plastic/Aluminium/Tin buckets	69											
Enamel and metallic utensils	70											
Switches, plugs, cables, bulbs etc	71											
Others and repairs	72											
Other Services												
Housemaids/servants	73											
Expenses in hotels, lodging places	74											
Milling expenses/rice mill charges	75											
Insurance premiums	76											
Ceremonial expenses	77											

Household consumables (commodity)	Code	From purchases					from your own product or stock		From gift, wage in-kind, or loan			
		Amount	Total expenditure in Rs	Where Purchased	From whom purchased?	Means of financing	Amount	Total expenditure in Rs	Amount	Total expenditure in Rs	Source	Location of sender Code (g)
				Code (g)	Code (h)	Code (o1)					Code (i)	
Education												
Schools fees	78											
Boarding and Lodging	79											
School uniform (including maintenance)	80											
Books and News paper	81											
Other educational expenses (including club fees)	82											
Health expenditures												
Consultation Fees	83											
Modern medicines etc.	84											
Hospital/Clinic charges	85											
Traditional medicine and healers	86											
Other (specify)	87											

XVI:c. Non-Consumption Expenditure:

Non-Consumption Expenditure		Total Expenditure in Rs	Whom gave/purchased code(g)
Other contributions to a person	88		
Donations to the Mosque/Mandir	89		
Taxes	90		
Income tax	91		
License fee	92		
Agricultural land tax/land revenue	93		
Other duties paid to the government-penalty etc.	94		
(In)voluntary contributions (e.g. to associations, sports, etc)	95		
corruption charges/any bribes	96		

XVII. 24-Hour Time Allocation

All household members older than 6 years are asked.

Please tell us what you did and the average time you spent for each activity starting from the time you woke up **in last week**. Please start from the recent and proceed to earliest.

		Average time spent in hours										
ID Code of household member												
No.	A. Domestic Work/Marketing											
1	Cooking/meal preparation											
2	Washing dishes											
3	Tea/coffee preparation											
4	Cleaning house/yard											
5	Fetching water											
6	Gathering firewood											
7	Dung cake preparation											
8	Household repairs											
9	Buying and selling crops											
10	Other marketing											
11	Other (specify)											

	B. Farm Work											
12	Land preparation											
13	Planting											
14	Weeding											
15	Harvesting											
16	Fencing											
17	Tending livestock											
18	Milking cows											
19	Herding											
20	Walking to and from farm											
21	Other (specify)											
	C. Other Employment/Work											
22	Agricultural wage labour											
23	Non-agricultural wage labour											
24	Community work											
25	Public works employment											
26	Other self-employment											
27	Travel time to and from work											
28	Other (specify)											
	ID Code of household member											
No.	D. Non-Employment Activities away from home											
29	Attending religious ceremonies											
30	Wedding/funerals/parties											
31	Visiting relatives and friends											
32	Attending meetings											
33	Attending school/studying											
34	Other recreation (e.g. sports)											
35	Other (specify)											
	E. Time for Oneself											
36	Eating											
37	Resting/chatting/relaxing											
38	Praying											
39	Bathing/personal care											
40	Sick											
41	Travelling											
42	Eating and drinking coffee											
43	Other (specify)											

	F. Child Care											
44	Breast feeding											
45	Other exclusive feeding											
46	Bathing/dressing											
47	Teaching											
48	Playing/comforting											
49	Caring for sick child											

Code(a)	Code (b)
1. Farmer;	1. Illiterate;
2. Working as agriculture labourer;	2. Below primary or informal education;
3. Worked in household enterprise (self-employed) as own account worker (tailor,shop-keeper,weaver,trader,contractor etc.)-specify	3. Primary;
	4. Middle;
4. Worked in Govt. job (specify);	5. Vocational course;
5. Worked as helper in household enterprise (unpaid family worker);	6. High school/secondary;
6.a Worked as permanent employee in Nilon's Industry;	7. Higher secondary;
6.b Worked as casual employee in Nilon's Industry;	8. Technical diploma or certificate below degree;
7. Worked in private jobs;	9. Technical/ professional degree (medical, engineering, law, management etc.);
8. Unemployed;	10. Graduate Degree (General);
9. Domestic work;	11. Post-graduate degree (General);
10. Worked in other type of work-specify ;	12. Educated in Church/Mosque School;
11. Renters, Pensioners, remittance recipients etc.;	13. Others (specify).
12. Too old/ too young (unable to work);	Code(c)
13. Beggars;	1 Resident
14. Students	2 Temporary migrant (approximately 3to 9 months out)
15. Others (specify).	3 Daily Commuters

Code (t) Main Mode of Transport		Code (g) Location for seller/borrower/ Location of work/ where does the person live or organization is based/ Location of recipient/borrower	Code (h) Buyers/Sellers
1 Vehicle-bicycle/tricycle/thela/truck etc.	3 Animal	1 Inside the village	1 Buyers/sellers inside the village
2 Human	4 Other (specify)	2 Outside the village (market)	2 Buyers/sellers outside the village(market)
		3. Outside the village-Nilon's industry	3 Nilon's industry

Code (f) Crops/ Products

1 Rice	14. Water(bottle) gourd- <i>pani lau</i>	28. Litchi	Other crops/ products
2. Jute	15. <i>Ol Govi</i>	29. Mango	42. Eggs
Oilseeds	16. Brinjal	30. Pineapple	43. Lamb meat
3. Mustard Oil	17. Cucumber	31. Sugarcane	44 .Milk and milk products
4. Sesame	18. <i>Jika, Bhol</i> etc. gourd	32. Jackfruits	45. Beef
5. Others (specify)	19. Radish	33. Lemon	46. Mutton
Vegetables	20 .Bitter gourd	34. Papaya	47. Chicken
6. Potatoes	21. <i>Bhat kerela</i>	35. Other-coconut etc. (specify)	48 .Hides/skin
7. Onions	22 .Beans, Peas	Spices	49 .Dung cakes
8. Tomato	23. <i>Lesera, Boot</i> , Mung etc. lentils	36 .Chilli	50 .Fish
9. White gourd- <i>komora</i>	24. Lady's finger	37. <i>Dhania</i> (coriander)	51. Pig meat
10. Pumpkin- <i>ranga lau</i>	25. Any <i>Shak</i> including <i>jute shak</i>	38 .Garlic	52. Other (specify)
11.Carrot	Others	39. Ginger	
12. Cauliflower	26.i.Betle nut etc.; 26.ii.Bamboo	40 .Turmeric	
13. Cabbage	Fruits	41. Other - Pepper (specify)	
	27. Banana		

Code (i) Source of Gift/Loan/ Borrowing/(gift) Sender/Lender	Code (n) Type of Livestock/Farm Equipment				
1 Relatives/Friends/individual/agency/money lender/religious organisation/micro credit institution inside the village	1 Calves	4 cows	7 Duck	10 Pig	13 Thela-for transportation
2 Relatives/Friends/individuals/agency (Govt. or Non-Govt.)/money lender/religious organisation/micro credit institution outside the village	2 Bulls	5 goats	8 Fish	11 Tractor	14 Bicycle/Tricycle
3 Others (specify)	3 Lamb	6 Chicken	9. Pigeon	12 Power Tiller	15 Other(specify)-Bullock Cart

Code (q) Construction Materials used for Walls and Roof

1 Sand/earth	7 Concrete/Cement	Code (j1) reason(s) for not taking a loan	Code(b1) Type of receipt/gift
2 Wood	8 Jute fencing etc. (specify)	1. no chance of success	1 Remittances
3 Iron	9. Tin	2. lack of collateral	2 Gift
4 Stone/Brick	10.Other(specify)	3. high interest rate	3 Inheritance
5 Thatch		4. taking long time to process	4 Donation/ aid/relief
6 Bamboo		5. no willingness to take loan	5Dowry
		6. Other (specify)	6 Transfer for school fees
			7 Compensation

Code (y) type of employment/kind of work	
1 farm worker (for pay)	7 driver/mechanic
2 traditional labour sharing (farm work)	8 unskilled non-farm worker
3 professional (teacher, government worker, administration, health worker, clerical)	9 domestic servant
4 skilled labourer (ie Builder, Thatcher, etc)	10 food-for-work
5 trader	11 other
6 soldier	

Code (h1) Reason for loan		Code (i1) Time unit	Code (01) means of financing	
7 to buy food/goods for the household	8 to pay for travel expenses	1 daily	1 Savings	7 transfers/remittances
1 to buy farm or other tools/ implements	9 to pay for health expenses	2 weekly	2 income from crop sale	8 Other(specify)
2 to buy inputs (e.g. seeds/ fertiliser /pesticides)	10 to pay for education expenses	3 monthly	3 sale of livestock and livestock products	
3 to buy livestock	11 for social functions	4 quarterly	4 income from off-farm activity-trade/ village production	
4 to pay for hired labour	12 repay other debts	5 annually	5 income from salary-Govt/Private	
5 to pay rent/taxes	13 other (specify)		6 loan from villagers inside the village/ outside the village/Government institution	
6 to start an off-farm business (like weaving)				

Annexure II

Table A1
SAM of Batabari, 2009-Activity Account (Rs.) (Contd.)

		1	2	3	4	5	6	7	
		Agriculture	Allied agricultural activities	Trade and Petty Services	Government services	Transportation	Construction	Miscellaneous activities	All Activities
1	Agriculture	0	0	0	0	0	0	0	0
2	Allied agricultural activities-livestock etc	0	0	0	0	0	0	0	0
3	Trade and Petty Services	0	0	0	0	0	0	0	0
4	Government services	0	0	0	0	0	0	0	0
5	Transportation	0	0	0	0	0	0	0	0
6	Construction	0	0	0	0	0	0	0	0
7	Miscellaneous activities	0	0	0	0	0	0	0	0
	All Activities	0	0	0	0	0	0	0	0
8	Social expenditure	0	0	0	0	0	0	0	0
9	Rice	29850	0	0	0	0	0	0	29850
10	Jute	0	0	0	0	0	0	0	0
11	Vegetables	230	0	0	0	0	0	0	230
12	Spices	8295.5	0	0	0	0	0	0	8295.5
13	Fruits	0	0	0	0	0	0	0	0
14	Oilseeds/Oil	0	0	0	0	0	0	0	0
15	Other Crops	0	0	0	0	0	0	0	0
16	Agricultural inputs	610	183500	0	0	0	0	0	184110
17	Livestock products	0	36550	0	0	0	0	0	36550
18	Durables	0	0	0	0	0	0	0	0
19	Other Consumer goods	8500	0	0	0	0	0	600	9100
20	Fodder	95600	0	0	0	0	0	0	95600
21	Services	0	208450	0	0	83999	0	111800	404249
	All Commodities	143085.5	428500	0	0	83999	0	112400	767984.5

Table A2
SAM of Batabari, 2009-Activity Account (Rs.)

		1	2	3	4	5	6	7	
		Agriculture	Allied agricultural activities	Trade and Petty Services	Government services	Transportation	Construction	Miscellaneous activities	All Activities
22	Land (Rent)	1573458	0	12000	0	2515	0	0	1587973
23	Family labour(M+F)	733710	353925	24800	0	17500	0	500	1130435
24	Hired labour(M+F)	1045771	12000	11500	0	700	0	700	1070671
25	Credit	207110	1400	73990	0	270000	0	20100	572600
26	Salaried persons	0	0	0	0	0	0	0	0
27	Employed at Nilon's	0	0	0	0	0	0	0	0
	All Factors	3560049	367325	122290	0	290715	0	21300	4361679
28	Agriculture landless workers	84312	122635	825710	0	60000	68000	41070	1201727
29	Small Farmers	589218.5	689362	500970	35000	124320	86132	271850	2296853
30	Medium Farmers	1060967	344135	86000	36000	-80200	36000	803500	2286402
31	Large Farmers	794018	72990	0	32000	20000	33800	487000	1439808
32	Self-employed in non-agriculture	92350	57405	285300	0	9050	24000	87967	556072
33	Service holders	72648	40785	234000	117500	0	0	20000	484933
34	Government	8341	0	30	0	100	0	0	8471
35	Rest of the village (ROV-market)	617320	39450	18200	0	12000	0	0	686970
36	Nilon's industry	0	0	0	0	0	0	0	0
37	Capital Account	0	0	0	0	0	0	0	0
38	Maintenance	0	0	1700	0	8160	8572	49680	68112
39	Stocks	0	0	0	0	0	0	0	0
	All Institutions	3319174	1366762	1951910	220500	153430	256504	1761067	9029347
	Total	7022308	2162587	2074200	220500	528144	256504	1894767	14159010

Table B1
SAM of Batabari, 2009-Commodity Account (Contd.)

		8	9	10	11	12	13	14	15	16	17	18	19	20	21	
		Social expenditure	Rice	Jute	Vegetables	Spices	Fruits	Oilseeds/ Oil	Other crops	Agricultural inputs	Livestock products	Durables	Other Consumer goods	Fodder	Services	All Commodities
1	Agriculture	0	2006300	385775	3139676	459282	83690	0	64375	610	0	0	777000	105600	0	7022308
2	Allied agricultural activities-livestock etc	0	0	0	0	0	0	0	0	185900	1766837	0	12800	0	197050	2162587
3	Trade and Petty Services	0	0	0	0	0	0	0	0	0	0	0	0	0	2074200	2074200
4	Government services	0	0	0	0	0	0	0	0	0	0	0	0	0	220500	220500
5	Transportation	0	0	0	0	0	0	0	0	0	0	0	0	0	528144	528144
6	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	256504	256504
7	Miscellaneous activities	0	9375	0	832	260	500	0	0	0	0	0	600	0	1883200	1894767
	All Activities	0	2015675	385775	3140508	459542	84190	0	64375	186510	1766837	0	790400	105600	5159598	14159010
8	Social expenditure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Rice	18440	0	0	0	0	0	0	0	0	0	0	0	0	0	18440
10	Jute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Vegetables	9220	0	0	0	0	0	0	0	0	0	0	0	0	0	9220
12	Spices	4610	0	0	0	0	0	0	0	0	0	0	0	0	0	4610
13	Fruits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Oilseeds/Oil	4610	0	0	0	0	0	0	0	0	0	0	0	0	0	4610
15	Other Crops	1844	0	0	0	0	0	0	0	0	0	0	0	0	0	1844
16	Agricultural inputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Livestock products	9220	0	0	0	0	0	0	0	0	0	0	0	0	0	9220
18	Durables	36880	0	0	0	0	0	0	0	0	0	0	0	0	0	36880
19	Other Consumer goods	4610	0	0	0	0	0	0	0	0	0	0	0	0	0	4610
20	Fodder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Services	2766	0	0	0	0	0	0	0	0	0	0	0	0	0	2766
	All Commodities	92200	0	0	0	0	0	0	0	0	0	0	0	0	0	92200

Table B2
SAM of Batabari, 2009-Commodity Account

		8	9	10	11	12	13	14	15	16	17	18	19	20	21	
		Social expen- diture	Rice	Jute	Vege- tables	Spices	Fruits	Oilseeds/ Oil	Other crops	Agricul- tural inputs	Livestock products	Durables	Other Consumer goods	Fodder	Services	All Commo- dities
22	Land (Rent)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Family labour(M+F)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Hired labour(M+F)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Credit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Salaried persons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	Employed at Nilon's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	All Factors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	Agriculture landless workers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	Small Farmers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Medium Farmers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	Large Farmers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Self-employed in non- agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	Service holders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	Government	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	Rest of the village(ROV-market)	0	1143404	0	340409	156278	20686	161466	1844	500	582064	1083970	994642.5	16450	253368	4755081.5
36	Nilon's industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	Capital Account	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	Stocks	0	55148	0	37114	22106	500	32372	0	0	3172	0	190845.5	0	0	341257.5
	All Institutions	0	1198552	0	377523	178384	21186	193838	1844	500	585236	1083970	1185488	16450	253368	5096339
		92200	3214227	385775	3518031	637926	105376	193838	66219	187010	2352073	1083970	1975888	122050	5412966	19347549

Table C1
SAM of Batabari, 2009-Factor Account (Rs.) (Contd.)

		22	23	24	25	26	27	
		Land (Rent)	Family labour	Hired labour	Credit	Salaried persons	Employed at Nilon's	All factors
1	Agriculture	0	0	0	0	0	0	0
2	Allied agricultural activities-livestock etc	0	0	0	0	0	0	0
3	Trade and Petty Services	0	0	0	0	0	0	0
4	Government services	0	0	0	0	0	0	0
5	Transportation	0	0	0	0	0	0	0
6	Construction	0	0	0	0	0	0	0
7	Miscellaneous activities	0	0	0	0	0	0	0
	All Activities	0	0	0	0	0	0	0
8	Social expenditure	0	0	0	0	0	0	0
9	Rice	0	0	0	0	0	0	0
10	Jute	0	0	0	0	0	0	0
11	Vegetables	0	0	0	0	0	0	0
12	Spices	0	0	0	0	0	0	0
13	Fruits	0	0	0	0	0	0	0
14	Oilseeds/Oil	0	0	0	0	0	0	0
15	Other Crops	0	0	0	0	0	0	0
16	Agricultural inputs	0	0	0	0	0	0	0
17	Livestock products	0	0	0	0	0	0	0
18	Durables	0	0	0	0	0	0	0
19	Other Consumer goods	0	0	0	0	0	0	0
20	Fodder	0	0	0	0	0	0	0
21	Services	0	0	0	0	0	0	0
	All Commodities	0	0	0	0	0	0	0

Table C2
SAM of Batabari, 2009-Factor Account (Rs.)

		22	23	24	25	26	27	
		Land (Rent)	Family labour	Hired labour	Credit	Salaried persons	Employed at Nilon's	All factors
22	Land (Rent)	0	0	0	0	0	0	0
23	Family labour (M+F)	0	0	0	0	0	0	0
24	Hired labour (M+F)	0	0	0	0	0	0	0
25	Credit	0	0	0	0	0	0	0
26	Salaried persons	0	0	0	0	0	0	0
27	Employed at Nilon's	0	0	0	0	0	0	0
	All Factors	0	0	0	0	0	0	0
28	Agriculture landless workers	0	721875	1015315	65480	0	7500	1810170
29	Small Farmers	122500	1148725	0	34744	18000	2300	1326269
30	Medium Farmers	237340	598475	0	31240	0	0	867055
31	Large Farmers	498405	171000	0	45880	32000	0	747285
32	Self-employed in non-agriculture	290777.7	300515	1500	6500	0	0	599292.7
33	Service holders	12800	12245	0	1250	362500	0	388795
34	Government	0	0	0	0	0	0	0
35	Rest of the village(ROV-market)	526150	0	136878	496880	0	0	1159908
36	Nilon's industry	0	0	0	0	0	0	0
37	Capital Account	0	0	0	0	0	0	0
38	Maintenance	0	0	0	0	0	0	0
39	Stocks	0	0	0	0	0	0	0
	All Institutions	1687973	2952835	1153693	681974	412500	9800	6898774.7
		1687973	2952835	1153693	1153693	412500	9800	6898774.7

Table D1
SAM of Batabari, 2009-Institution Account (Rs.) (Contd.)

		28	29	30	31	32	33	34	35	36	37	38	39		
		Agri landless workers	Small Farmers	Medium Farmers	Large Farmers	Self-employed in non-agri	Service holders	Government	ROV (Market)	Nilon's industry	Capital Account	Maintenance	Stocks	All Institutions	Total
1	Agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	7022308
2	Allied agricultural activities-livestock etc	0	0	0	0	0	0	0	0	0	0	0	0	0	2162587
3	Trade and Petty Services	0	0	0	0	0	0	0	0	0	0	0	0	0	2074200
4	Government services	0	0	0	0	0	0	0	0	0	0	0	0	0	220500
5	Transportation	0	0	0	0	0	0	0	0	0	0	0	0	0	528144
6	Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	256504
7	Miscellaneous activities	0	0	0	0	0	0	0	0	0	0	0	0	0	1894767
	All Activities	0	0	0	0	0	0	0	0	0	0	0	0	0	14159010
8	Social expenditure	12000	9000	55000	12000	2200	2000	0	0	0	0	0	0	92200	92200
9	Rice	449410	870276	408760	85020	105625	69732	0	106300	0	0	0	1070814	3165937	3214227
10	Jute	1522.5	9984	16445	8200	440	0	0	339683.5	0	0	0	9500	385775	385775
11	Vegetables	79102	191604.74	82803	11664	42521	13389	0	2866144.2	184239.26	0	0	37114	3508581.2	3518031
12	Spices	26781	72868.65	40145	9280	5548	10530	0	433481.85	4540	0	0	21846	625020.5	637926
13	Fruits	14009	27882	15810	6770	6210	2780	0	29815	0	0	0	2100	105376	105376
14	Oilseeds/Oil	31850	64764	34684	7592	8814	9152	0	0	0	0	0	32372	189228	193838
15	Other Crops	4340	18565	10895	4075	4150	0	0	19950	0	0	0	2400	64375	66219
16	Agricultural inputs	0	500	0	0	0	0	0	2400	0	0	0	0	2900	187010
17	Livestock products	108132	295053	162930	29814	56364	41940	0	183568	0	1425330	0	3172	2306303	2352073
18	Durables	89870	212605	86920	29375	41170	27380	0	0	0	521000	38770	0	1047090	1083970
19	Other Consumer goods	191371	438032	263008	39434	81173.5	30210	0	213800	0	0	0	705149.5	1962178	1975888
20	Fodder	1100	12100	0	1000	750	1500	0	10000	0	0	0	0	26450	122050
21	Services	866000	996949	971000	654000	357500	57500	0	849040	0	252202	1760	0	5005951	5412966
	All Commodities	1875487.5	3220183.4	2148400	898224	712465.5	266113	0	5054182.6	188779.26	2198532	40530	1884467.5	18487365	19347549

Table D2
SAM of Batabari, 2009-Institution Account (Rs)

		28	29	30	31	32	33	34	35	36	37	38	39		
		Agri landless workers	Small Farmers	Medium Farmers	Large Farmers	Self-employed in non-agri	Service holders	Government	ROV (Market)	Nilon's industry	Capital Account	Maintenance	Stocks	All Institutions	Total
22	Land (Rent)	0	0	0	0	0	0	0	0	0	100000	0	0	100000	1687972.7
23	Family labour(M+F)	0	0	0	0	0	0	0	1816400	0	6000	0	0	1822400	2952835
24	Hired labour(M+F)	0	0	0	0	0	0	0	4000	0	77000	2022	0	83022	1153693
25	Credit	0	0	0	0	0	0	0	109374	0	0	0	0	109374	681974
26	Salaried persons	0	0	0	0	0	0	0	412500	0	0	0	0	412500	412500
27	Employed at Nilon's	0	0	0	0	0	0	0	0	9800	0	0	0	9800	9800
	All Factors	0	0	0	0	0	0	0	2342274	9800	183000	2022	0	2537096	6898774.7
28	Agriculture landless workers	120	3900	1074	50	500	0	56744	1135	0	0	0	0	63523	3075420
29	Small Farmers	0	2975.91	8470	50	0	11000	220943	1530	0	0	0	0	244968.91	3868090.5
30	Medium Farmers	0	8232	1295	50	0	0	69938	20000	0	0	0	0	99515	3252971.5
31	Large Farmers	0	100	192	50	0	0	37604	10000	0	0	0	0	47946	2235039
32	Self-employed in non-agriculture	0	100	180	50	0	0	47104	7000	0	0	0	0	54434	1209798.7
33	Service holders	0	100	159	50	0	0	3686	5410	0	0	0	0	9405	883133
34	Government	7.5	1874	26786.5	3175.5	137.5	250	0	0	0	0	0	0	32231	40702
35	Rest of the village (ROV-market)	1013497	128105	266430	560707	293802.7	14709	0	0	0	139678	94545	0	2511473.7	9113433.2
36	Nilon's industry	0	230	0	0	0	0	0	0	0	0	0	0	230	230
37	Capital Account	126173	233922.15	-21467	358662.5	158223	587461	500	1077735.2	0	0	0	0	2521209.9	2521209.9
38	Maintenance	8735	39230	6420	10130	2370	2100	0	0	0	0	0	0	68985	137097
39	Stocks	51400	229138	815032	403840	42300	1500	0	0	0	0	0	0	1543210	1884467.5
	All Institutions	1199932.5	647907.06	1104571.5	1336815	497333.2	617020	436519	1122810.2	0	139678	94545	0	7197131.5	28221592
		3075420	3868090.5	3252971.5	2235039	1209798.7	883133	436519	8519266.8	198579.26	2521210	137097	1884467.5	28221592	

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List of Publications on the Present Work

1. Das, Ira, M.K. Dutta and S. Borbora (2010), “Sectoral Linkages in Assam: An Empirical Analysis”, *Man and Development*, (ISSN 0258-0438), Vol.XXXII, No.2, June, pp.77-94.
2. Das, Ira (2009), “Rural-Urban Divide in Education Sector in Assam”, *South Asian Journal of Socio-Political Studies*, (ISSN 0972-4613), Vol.9, No.2, Jan-June, pp. 31-35.

