Bangladesh University of Engineering & Technology

PLAN 434: Regional Planning Studio

A Report on

Long Run Analysis of Economic Structure of the Selected Regions in Bangladesh: A Shift Share Method

Level-4 Term-1

Department of Urban & Regional Planning, BUET

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LIST OF ABBREVIATION

ADB	Asian Development Bank
ADP	Annual Development Plan
BAIDP	Bangladesh Agricultural Infrastructure Development Program
BBS	Bangladesh Bureau of Statistics
BNP	Bangladesh National Portal
BWDB	Bangladesh Water Development Board
GED	General Economic Division
IFB	Impact Foundation Bangladesh
IM	Industrial Mixture
IMF	International Monetary Fund
LGED	Local Government Engineering Department
MNC	Multinational Company
NGO	Non-Government Organizations
NS	National Share
RDA	Rajshahi Development Authority
RHD	Road and Highways Department
RS	Regional Shift
SRDI	Soil Resources Development Institute

ABSTRACT

Economic growth of a region depends on the composition and progression of economic sectors. Variation occurs in regional growth due to the change in major economic sectors in the long run. Shift share analysis helps to assess regional economic growth over a period, give insights about the region's competitiveness and composition of the industries. There exists disparities among different regions of Bangladesh in terms of economic growth. This study aims to assess economic growth for six selected districts in northwestern regions namely, Rajshahi, Chapai-nawabganj, Naogaon, Meherpur, Kushtia, Chuadanga. We have applied shift share method to compare economic growth of the selected regions in major economic sectors from 2003 to 2013. The study tries to identify the internal and external factors influencing positive or negative shift in economic sectors of the districts. The result shows Kushtia district has negative regional shift due to employment decline in major sectors, while rest of the districts show positive regional growth. Among the sectors, wholesale and retail sector is the robust sector in terms of employment growth of the regions. Analysis of regional economic growth by major economic sectors helps local leaders, policy makers and researchers in decision making for the development of a region.

CHAPTER 1: INTRODUCTION

1.1 Background

After the independence of Bangladesh in 1971, the country was reviving the economic growth by the support of new fiscal and economic policies and foreign aid (Noman and Khudri, 2015; Helal and Hossain 2013). Then, the country reached lower-middle income status in 2015 and aiming for achieving middle-income status by 2031 (The World bank, 2023). The changes in the economy depends on the potentiality and weakness of different industries' location within a region, its dynamic structure and distinctive regional factor. In terms of economic growth, spatial inequality is proponent factor across the different regions of Bangladesh (Rahman, 2005). Thus, the knowledge about the existing pattern of regional economic structure and its economic growth will be required for regional development (Tehsin et al., 2014). The integrated components of regional economic structure are similar settlement structure, labor market, patterns of suppliers, producers and consumers (Hanham and Banasick, 2000). For analyzing the region's economic structure, evaluating the sectoral performance, changes in occupational composition and migration, shift share analysis is a prominent method (Marquez et al., 2009; Rahman et al., 2021). It is widely used because the method requires less data that are generally available and its simplicity nature of interpreting the data (Chunyun et al., 2007). The study aims to find out the regional economic structure of the six selected districts in the northwestern region of the country. In the five-year plans, the northwestern regions of Bangladesh were identified as lagging regions. The outcomes of this study will be helpful for policymakers, planners and regional analyst to have a clear picture of the regional economic characteristics, sectoral performance, disparities and the internal and external factors influencing regional economic growth in the lagging regions of the country.

1.2 Literature Review

The concept of regional economic development came from Joseph Stalin who realized that in any kind of disruption or invasion, the employment of any region might not mutilate (Mithun, 2021). In 1943, Daniel Creamer developed a model named Shift-share approach that analyze the regional economic structure (Nee et al., 2019). It compares the sectoral shifts of the economy compare to national economy. It also helps to determine the sectoral development performance and competitiveness. Moreover, it gives a profound understanding of sectoral changes in two period of time and also gives insight about the locational advantage, lagging industries and leading industries in a particular region (Puri et al., 2016). Hossain and Rahman (2009) found that high level of inequalities exist in different districts of Bangladesh. According

to a report of World Bank (2002), Jamuna River divides the country into two parts. The eastern part consists of Dhaka, Chittagong and Sylhet division, which are flourishing better than the western part that consists of Rajshahi, Khulna and Barisal division. Thus, previous researches have focused on regional economic development (RED) in context of Bangladesh. Rahman and Saha (2021) found the local economy's competitive industries by using shift share component in Pabna district. Another study has assessed spatio-temporal variation of local economies by shift share and location quotient method in Narayanganj district (Parvez et al., 2020). Disparities among eight divisions of Bangladesh in terms of sectoral development are examined by shift share method in a study which explained the internal and external factors of the regions' economic growth (Islam et al., 2018).

1.3 Objective of the Study

- To assess the regional economic growth of selected districts based on the shift share components.
- To examine the effect of the selected economic sectors on the regional growth based on shift share components.
- To find out the possible reason of positive and negative value of the shift share components.

1.4 Scope of the Study

- This study would guide the policymakers and planners to decide any targeted interventions for any particular economic sectors of a region
- It will highlight specific industries and the possible reason for leading and lagging sector that are driving overall economic growth of the region.
- It would potentially determine the linkages and interactions among the economic sectors and the regions and guide towards sustainable regional planning.

1.5 Limitation of the Study

- Inclusion of all the economic sectors in this study is not possible due to some constraints. Thus, only six major economic sectors and their subsectors have been selected for the study.
- In some cases, it could not be possible to identify the exact reason of proportionality and differential shift of a sector in a specific region.

1.6 Theoretical Framework

Shift share analysis is subdivided into three components such as national share component (NS), proportionality shift/ industry mix component (IM) and differential shift component/ regional share (RS). The shift share analysis can be described through this following equation:

Total change in employment = National Share + Industrial Mix+ Regional Share.

National share: The national share components find the regional economic growth if it will increase at the national rate. It measures the regional structural change, which is influenced by the national changes in structure.

$$NS_{ir}^{t} = E_{ir}^{t-1} * \left(\frac{E_{Nation}^{t}}{E_{Nation}^{t-1}} - 1 \right)$$

t = Current time period i= specific industry
t-1 = Previous time period r = Specific Region
Source: Glasson, 1978

Proportional shift: It is also known as an industrial mix; this term refers to a sector's regional gross value added as compared to the national total sectoral value. It reflects variations in the "mix" of industries at regional levels. The mix-factor investigates how changes in a given industry's national performance transfer into changes in that industry's local performance. It estimates the number of jobs that were created or lost in each industry as a result of variations in industry and overall national growth rates. (Parvez et al., 2020)

Source: Glasson, 1978

$$IM_{ir}^{t} = E_{ir}^{t-1} * \left(\frac{E_{iNation}^{t}}{E_{iNation}^{t-1}} - \frac{E_{Nation}^{t}}{E_{Nation}^{t-1}} \right)$$

t = Current time period i= specific industry
t-1 = Previous time period r = Specific Region
Source: Glasson, 1978

Differential shift: It is also referred to as a regional shift, This term describes how a region's sectoral growth differs from sectoral growth at the national level. This percentage of local job growth indicates the amount to which locally specific variables have contributed to an industrial group's regional employment growth or decline. Even during times of widespread prosperity, some areas and sectors grow more quickly than others. reveals the industries that are leading and trailing in the area. (Parvez et al., 2020).

$$RS_{ir}^{t} = E_{ir}^{t-1} * \left(\frac{E_{ir}^{t}}{E_{ir}^{t-1}} - \frac{E_{iNation}^{t}}{E_{iNation}^{t-1}} \right)$$

t = Current time period i= specific industry
t-1 = Previous time period r = Specific Region
Source: Glasson, 1978

Net shift component: The "net shift value" in shift-share analysis is the percentage of overall regional economic growth that can be attributable to the combined impact of two factors: the industry mix effect and the regional competitiveness effect.

Leading sector: A leading sector is an industry experiencing faster growth than the national rate, contributing positively to the region's economic growth.

Lagging sector: Lagging sectors are industries experiencing slower growth than the national average, underperforming and not contributing significantly to economic growth.

1.7 Methodology

1.7.1 Selection of the Study Area

Six districts were selected for the purpose of the study. The long run economic analysis has been conducted on Chapai-nawabganj, Rajshahi, Naogaon, Kushtia, Meherpur and Chuadanga.

1.7.2 Literature Review

Several literatures were reviewed to get an idea of long run analysis of regional economic structure. It was also needed for fixing the method of analysis. Moreover, literatures for the selected districts had been searched to identify the major or potential economic sectors. It gave the conception about the analysis and interpretation also.

1.7.3 Formulation of Objectives

For the purpose of this study, we have formulated three relevant objectives to assess the long run economic structure of the selected regions in Bangladesh.

1.7.4 Data Collection and Processing

Data for this study were collected from the district wise economic census reports of 2003 and 2013. The economic census of 2013 was available in the online but the economic census of 2003 had to collect from the BBS office. Required adjustments were done to get the same numbers of the selected economic sectors.

1.7.5 Selection of Economic Sectors

The major economic sectors were selected based on the total person engaged in that activities and the potential of that sector in the particular regions. We have selected six major sectors namely, manufacturing, wholesale and retail, service, transportation and storage, education and human health. The sub sectors are given in the following table.

1.8 Data Calculation, Analysis and Interpretation

The national share, industrial mix and regional share had been calculated to identify the prosperous regions and depress regions, lagging sectors and leading sectors, sectors which have locational advantage or disadvantage. The inter-regional and intra-regional analysis had been done to show which industries are particularly prominent among the districts and within a district and relates probable reason of this corresponding IM, RS and net shift component value.

CHAPTER 2: ECONOMIC STRUCTURE OF THE REGIONS

2.1 Comparison between National Growth Rate and Regional Growth Rate

Bangladesh is one of the most fastest growing economies, according to the International Monetary Fund (IMF) (Jannat et al., 2020). From our analysis, it is seen that from 2003 to 2013, the national growth rate of total employment in Bangladesh is 69.14%. However, the regions within a country might not follow the same growth rate as national. Regional growth depends on various factors such geographic location, availability human capital and resources (Gennaioli et al., 2014). Thus, some regions have higher employment growth than national growth, while others have lower growth rate. It is necessary to draw a comparative analysis between national growth rate and regions' growth rate. We have determined the regional growth rate for the selected districts.

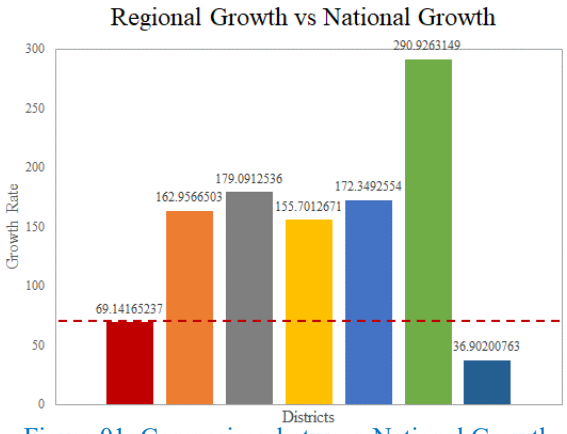

Figure 01: Comparison between National Growth and Regional Growth

Source: Authors, 2023

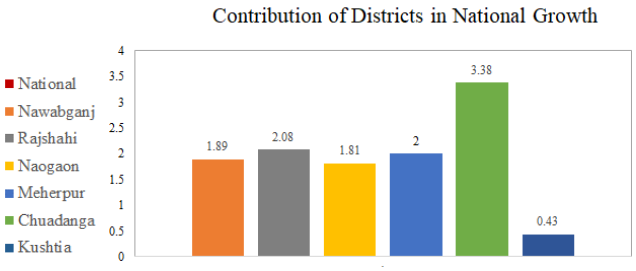

Figure 02: Contribution of Districts in National Growth

Source: Authors, 2023

Figure 01 shows that except Kushtia district, the other five districts have higher regional growth than national growth. Chuadanga district shows the highest growth rate having 290.92% regional growth rate, which implies that the district has concentration of fast growing economic sectors. One of the oldest districts in Bangladesh is Chuadanga, where urban areas are growing rapidly and it influences the growth of economic sectors and employment opportunities (Mahfuza et al., 2019). Also, Chapainawabganj, Rajshahi, Naogaon, Meherpur districts are fast growing regions. Kushtia district shows the lowest regional growth, which is only 36.9%. Hence, the contribution of Kushtia district in national employment growth is much lower than other districts. Kushtia district has been experiencing decline in handloom industry and agricultural production, which impose a negative effect on its regional growth (M. M. Hossain & Rahman, 2013; M. K. Islam & Hossain, 2015). Fast and slow growing regions have been

depicted in map following their regional growth pattern compared to national growth rate (Appendix).

2.2 Inter Regional Analysis of the Districts' Economic Structure Based on Shift Share Components

Figure 3 shows the comparison among the districts based on regional growth, national share and net shift component. Except Kushtia district, the other five selected districts show higher net shift than their national share. This indicates that economic sectors in Meherpur, Chuadanga, Chapi Nawabganj, Rajshahi, and Naogaon districts are nationally fast growing.

The negative differential shift component of Kushtia indicates that the some economic sectors in this district are slow growing and do not have any locational advantages (Biswas et al., 2023). One of the reasons could be there has been reduction in agricultural productivity due to reduced soil fertility in Kushtia (Kutub & Falgunee, 2015). River bank erosion of Gorai in Kushtia has resulted in loss of farmsteads, agricultural lands, and home-based cultivable lands, which have induced local people to migrate from this district (Baki, 2014).

The highest differential shift of Chuadanga district accounts for its competitiveness compared to other districts. For this district, regional shift is higher than national share and proportionality

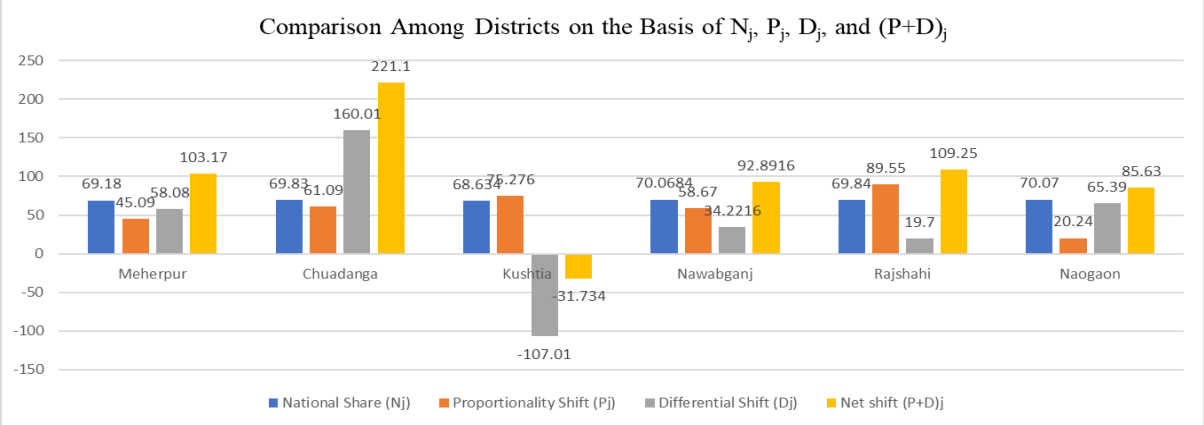

Figure 03: Comparison of the Shift Share Components among Districts

Source: Authors, 2023

shift, which directs economic sectors receive locational advantages from this district. Chuadanga district is situated on the bank of Mathabhanga river which facilitates fish production and marketing in this district (M. A. Islam et al., 2007). Also, Chuadanga is one the leading maize production areas in Bangladesh due to its soil quality (R. Biswas et al., 2023). Other selected districts do not have much suitability for maize production. Besides, country's largest sugar mill and some major industries are situated in Chuadanga district (BBS, 2011).

Rajshahi and Chapai Nawabganj districts show lower differential shift than their national share and proportional shift. This implies that these two districts have less locational advantage for the growth of some economic sectors. Economy of these districts is predominantly agricultural and percentage of non-farm activities is lower (BBS, 2011). Due to land fragmentation and reduced soil fertility, agricultural production is declining (S. Islam, 2014). In addition, these districts have higher number of small and medium enterprise than large industries (BBS, 2011).

Meherpur district shows higher net shift than its national share. The reason for this shift might be due to higher agricultural and fish production in this district. Farmers of Meherpur district started fish farming due to the positive result of fish culture (F. K. Islam et al., 2017). Meherpur district has suitable climate, soil quality, topography for agroforestry practice which can be major source of cash income and food security (M. S. Hossain & Islam, 2017).

2.3 Inter Regional Analysis of Economic Structure of Manufacturing Sector

Figure 04 shows that except Rajshai district, other five districts shows positive regional shift in manufacturing sector, which indicates that these districts have locational advantages that led to positive shift of differential component. Among the districts Kushtia and Chapai Nawabganj show higher shift in this sector.

Chapai Nawabganj district' economy is predominantly agricultural and it has special locational advantage of mango production. Chapai Nawabganj district has national importance because one of Bangladesh's most popular fruits, the mango, is primarily grown in this northern district (Akterujjaman & Islam, 2010). Women of Chapai Nawabganj are mostly engaged in agriculture and livestock rearing which led to high manufacturing of crops and animal products (M. K. Ghosh et al., 2021). Farmers of this district show positive attitude towards organic farming and use of modern technology for increasing agricultural production (M. Ghosh et al., 2020). There is seen high yield performance of a Aman rice variety in Chapai Nawabganj due

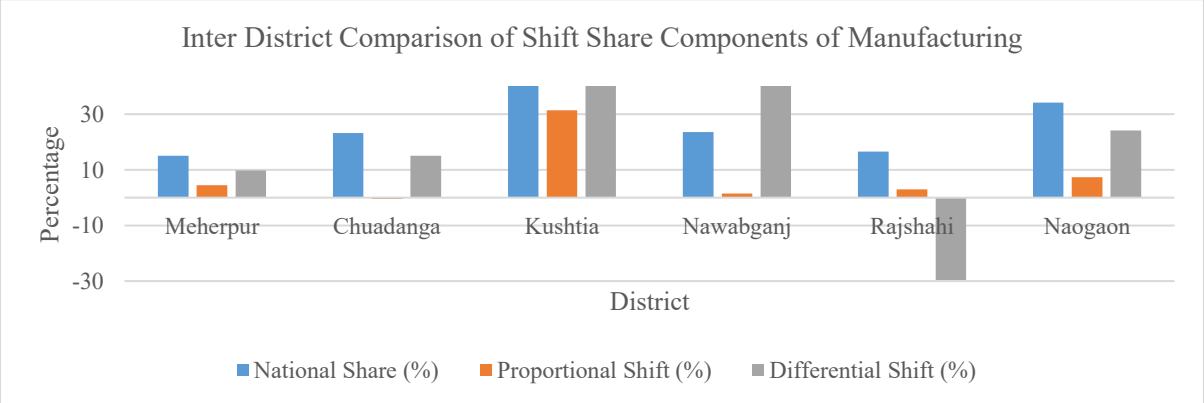

Figure 04: Inter District Comparison of Shift Share Components of Manufacturing Source: Authors, 2023

to its land quality (M. F. Hossain et al., 2021). According to BWDB, the largest rubber dam will be constructed at Chapai Nawabganj, which will provide 8000 hectares of land for effective irrigation and will produce fish worth around 22 crore takas annually (BWDB, 2023).

Rajshahi district shows negative shift in manufacturing due to locational disadvantages of this districts. A study reveals some locational factors for which multinational industries are unwilling to shift to this district. Rajshahi district has concentration of local and domestic industries but lack of multinational industry. This district contains limited potential for local industry expansion, minimal possibilities for large-scale economies of scale, no opportunity to build up local infrastructure for MNC sector, lack of cultural diversity, lack of international ground, lack of employment opportunities globally, and poor export-based industrialization (T. Islam et al., 2022). Only 56% land holdings of this district are farm but amount of cultivable land area, manufacturing of rice and other cereal crops have been decreased in Rajshahi (M. R. Islam, 2019).

On contrary, Naogaon district have positive regional shift in manufacturing due to diverse production of crop and fish products (BBS,2011). 64% land holdings are farm in this district (BBS, 2011). A study revealed that there is high possibility of manufacturing roof tiles from rock dust with red clay of this district due to its high quality and favorable property (Sultana et al., 2015).

Diverse types of economic activities and industries are playing important role in the positive regional shift in manufacturing of Chuadanga district. Some major industries are located in Chuadanga and largest sugar mill of Bangladesh is in this district which led to higher employment growth (BBS, 2011). Khejur palm husbandry is a potential source of rural income in Chuadanga district as highest seasonal income comes from the manufacturing of palm products (Halim et al., 2008). However, proportional shift is negative in Chuadanga district because in 2006-2007, this district was one of the lowest per capita ADP recipient.

Kushtia district has shown higher percentage of regional shift in manufacturing because cultivation of tobacco has grown due to soil suitability and high profitability, and employment in tobacco farming accounts for less than 0.5% of agricultural employment in Bangladesh (M. M. Hossain & Rahman, 2013).

Meherpur district shows positive regional shift in manufacturing because this district has higher agricultural and fish production (BBS, 2011). This district has 73.64% land holdings for farm. Production of carp-tilapia polyculture shows higher suitability and financial benefit in

Meherpur district (M. Islam et al., 2016). Rice production leads the farming system of Bangladesh, accounting for 75% of gross cropped area and the level of technical productivity of aus, aman and boro rice farms in Meherpur district are 87.7%, 86.8% and 89.5%, respectively (Hasnain et al., 2015). A study has been done to predict different industries' contribute towards the percentage changes of GDP loss under the pessimistic climate scenario by 2030. The study shows that for Kushtia district, there will be -.70% growth reduction in manufacturing and -.45% loss in paddy sector (Paul et al., 2018) Unlike other sector, production of vegetables, as well as plant-based fibres (cotton and jute), can positively contribute towards growth for Meherpur district even under the pessimistic scenario.

2.4 Inter Regional Analysis of Economic Structure of Whole Sale and Retail Trade

Figure 05 shows that Chapai Nawabganj has the highest regional shift in wholesale and trade facility, this scenario points out to the fact that this district has some major locational advantages for trading. Chapai Nawabganj is a district in northern Bangladesh and the Ganges, Mahananda, Pagla, Moraganga and Punarbhaba are the main rivers of this district. The Mahananda River runs through the district's heart, which has facilitated trade and commerce (BBS, 2011). Chapai Nawabganj district has 21 growth centers and 196 rural markets (BBS, 2011). Growth centers are well distributed across the district facilitating economic activities. Growth centers with adequate infrastructural facilities play a vital role in boosting rural development and economic growth (Das & Mondal, 2010). Chapai Nawabganj is connected with India through N6 national highway at border, which contributes to the trading facility for this district. Rural periodic markets are developed due to communication facilities and surplus production in this district (Kamruzzaman, 2014).

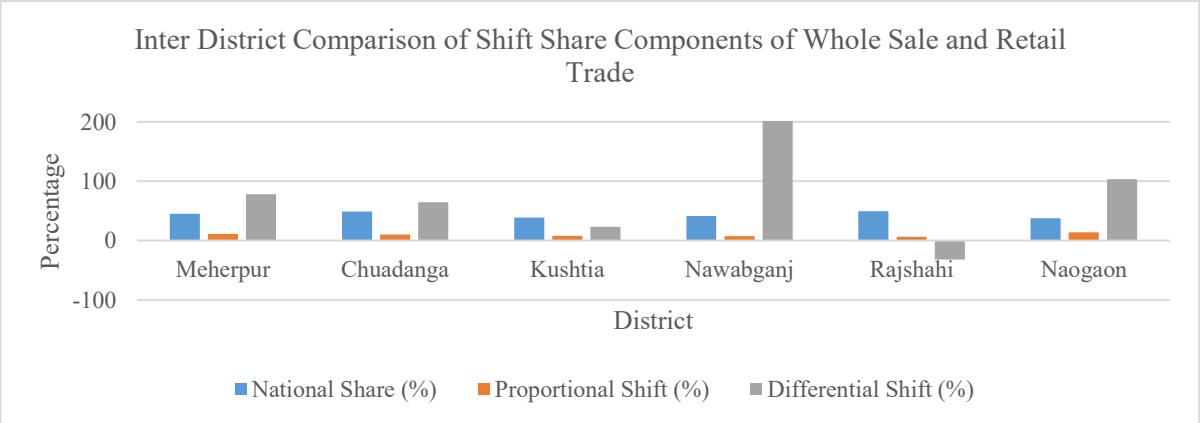

Figure 05: Inter District Comparison of Shift Share of Whole Sale and Retail Trade Source: Authors, 2023

On contrary, Rajshahi district has negative regional shift in wholesale and trade, which indicates it lacks locational advantage for trading. In Rajshahi district, fish markets, both

wholesale and retail, lacked basic infrastructure in terms of the sales area, packaging, hygienic conditions, water supply, drainage, cleaning, washing, maintenance, and repairs, with a few exceptions (Flowra et al., 2013). Mango production is profitable in Rajshahi district but traders face various problems while marketing such as lack of market place, lack of marketing information, and high transportation cost (M. M. Islam, 2017).

Naogaon district has higher number of growth centers than its adjacent districts (BBS, 2011), this may have facilitate trade and whole selling in this district constituting a positive differential shift in this sector.

Meherpur district shows positive regional shift than its adjacent districts in wholesale and trading. Marketing facility and overall market condition of Meherpur district is satisfactory for retailing forest and agricultural products (M. S. Hossain & Islam, 2017). In 2013, Bangladesh Agricultural Infrastructure Development Program (BAIDP) was undertaken in Meherpur and Chuadanga districts for construction of market and collecting center and improvement of rural roads (LGED, 2019). Due to this intervention, economic opportunities for these districts might have grown, resulting in positive regional shift in wholesale and trading. Rural people of this district are involved in small scale border business (Kusakabe, 2013). However, proportional shift component is lower than national share and differential shift component. A study has showed that Meherpur district has the lowest number of hat bazars with respect to total household unit (Salan et al., 2018).

2.5 Inter Regional Analysis of Economic Structure of Service Activities

Figure 06 shows that for Meherpur, Kushtia, Chapai Nawabganj, Naogaon and Rajshai districts, the values of national share are higher than shift components. This indicates that these districts would have more employment if this sector could at national rate. The positive values of proportionality shift indicates that service sector is growing faster than national average is

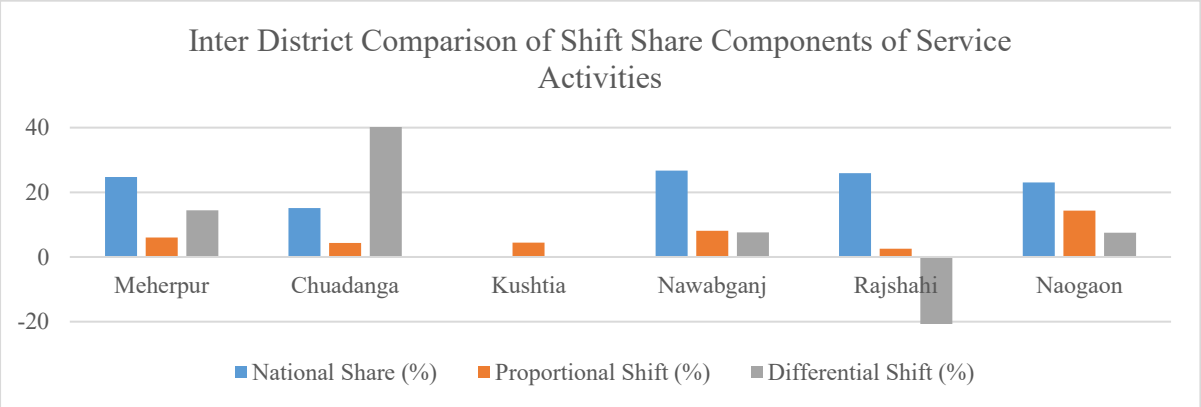

Figure 06: Inter District Comparison of Shift Share Components of Service Activities

Source: Authors, 2023

these districts. Chuadanga district's differential shift shows the highest value implying that this district has locational advantage for growing service sector. Due to implementation of rural development programs in Chudanga, infrastructural development led to the growth of different service activites in this district and enhanced accessibility encouraged small and large NGOs work with the local communities (Ahmed & Eklund, 2019). There are 45 NGOs working in these district which creates job opportunities for local people (BBS, 2011). As a result, these district has seen positive regional shift in this sector.

2.6 Inter Regional Analysis of Economic Structure of Transportation and Storage

Figure 07 shows that national share in transportation and storage of these districts are very low, which denotes that there would be lower employment creation in the districts if this sector followed national growth rate. Therefore positive proportional share of the districts indicates that transportation and storage sector is growing faster than national average. However, there remains disparities in case of regional shift of the districts.

Rajshahi district has the highest positive regional shift in transportation and storage. Rajshahi district has well developed transportation network in terms of road, rail and air connectivity. There have been major investments in development of transportation sector of Rajshahi. In 2006, Greater Rajshahi District Infrastructure Development Project was undertaken by Asian Development Bank (ADB, n.d.). In 2009, roads and highways department proposed to develop 770 km road networks in the road master plan for Rajshahi district for increasing intra and inter regional connectivity (RHD, 2009). In 2010, RHD undertook improvement project for district roads in Rajshahi (RHD, n.d.). For ensuring the sustainable transport RDA has constructed three road projects and added further 8.50 kilometer roads, drains and about 1.00 km four lane overpass to Rajshahi city's road network and drainage system as per recommendation of Rajshahi Metropolitan Development Plan, 2004-2024 (GED, 2020). All these development projects resulted in employment growth in transportation sector for Rajshahi district.

Chapai Nawabganj, Naogaon, Meherpur and Chuadanga districts show negative differential shift in transportation and storage sector, which shows that these districts have locational disadvantages in this sector. Mahananda river flows through northern and south eastern part of Chapai Nawabganj (Z. Hossain et al., 2014). River bank erosion has become one of the crucial problems in this district (M. Islam & Rashid, 2012). A study has shown that seepage can occur through Mahanada embankment and failure can occur if water level will rise up to 25ft high

during monsoon (Alim et al., 2017) . For these reason, development of road network might have been difficult, which resulted in negative regional shift in this sector.

Meherpur district does not any connectivity with national highway and there is no railway network in this district. As a result, there remain locational disadvantages for employment in transport sector. Also during the fiscal years from 2006-07 to 2008-09, Meherpur and Chuadanga districts received the lowest ADP allocation which might have hindered the development of transportation sector (A. M. Khan, 2014). There is lack of national highway and railway connectivity in Naogaon district, which might be one of the reasons of negative differential shift. Percentage of ADP allocation for roads, rails and bridges were 11.76% from fiscal year 2008-09 to 2012-13 (A. M. Khan, 2014).

There is lack of adequate storage facilities in Meherpur, Chuadanga and Chapai Nawabganj, which contributes to lower employment growth in storage (Ali et al., 2020). Lack of cold storage system is one of the main technical constraints experienced by the farmers of Chapai Nawabganj (M. R. Khan et al., 2022). Insufficient storage system is one of the main reasons for declining agricultural productivity in Naogaon district also (M. F. Hossain & Rahman,

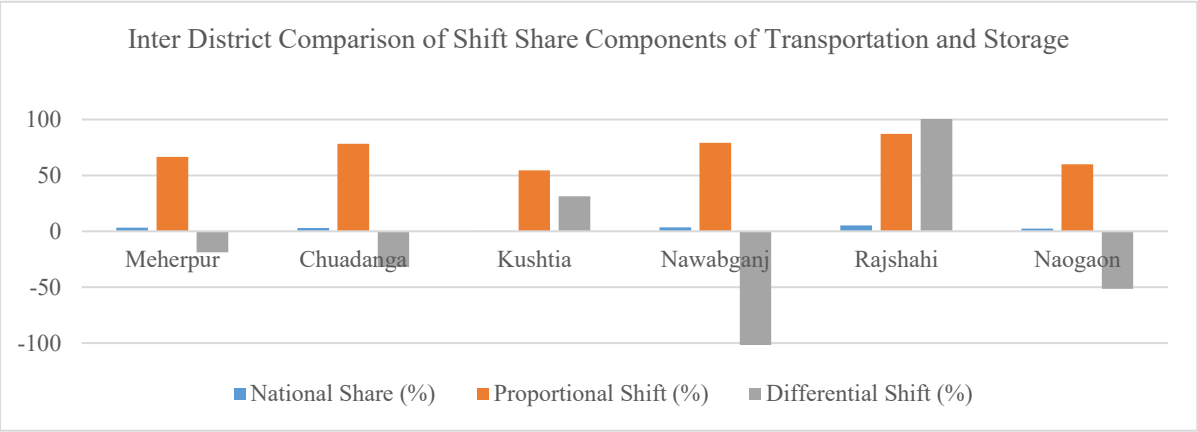

Figure 07: Inter District Comparison of Shift Share of Transportation and Storage Source: Authors, 2023

2016; Quddus & Kropp, 2020). This issue is one of the major concern because these districts are border districts located in northwestern region of the country. Sufficient storage facility is needed for agricultural and fruit products as distribution of products from border districts requires much time. Lack of proper storage facility will ultimately lead to damage of products and lower profit gain by the farmers, imposing a negative impact on employment growth.

2.7 Inter Regional Analysis of Economic Structure of Education

Figure 08 shows that Meherpur, Chapai Nawabganj and Naogaon have positive differential shift, scoring a higher value than their national share and proportional shift component. This

scenario represents that these districts receive some locational advantages for employment growth in education sector. But these districts would lower employment growth if this sector had grown following the national growth rate.

In Meherpur district, several educational programs have been under taken to provide quality education for the people. CARITUS Bangladesh started working in Meherpur in 1972 with view to ensure quality education, health, and social welfare (MZNS, 2011). Manob Unnayan Kallyan Samiti initiated a project in 2013 to ensure primary education in this district (MUK, 2016). Their activities increased the school management system and reduced dropout from school. In 2015, Save the Children started working in Meherpur to encourage children for education and provide additional supports. All these activities help to enhance overall educational situation in the district, which contributed in positive regional shift in education sector. Kushtia district shows negative regional shift in education sector. There is lack of proper facilities in primary and secondary schools of Kushtia (Kabir, 2010) Besides rural people in Kushtia have lower access to education and additional facilities (S. Biswas et al., 2016).

Rajshahi district shows negative regional shift in education sector indicating some locational disadvantages in this district. Though Rajshahi district is called the education city, several factors affect the education system. Rural urban migration has been increased to Rajshahi city, where the educational institutions are concentrated, but there are limitations to provide quality education to the increased population (Haider, 2010; Farhana & Mannan, 2018). There is shortage of quality teachers in the government school of Rajshahi and absence of head teachers (Solamain, 2018). There is high percentage of dropout from schools in rural areas of Rajshahi

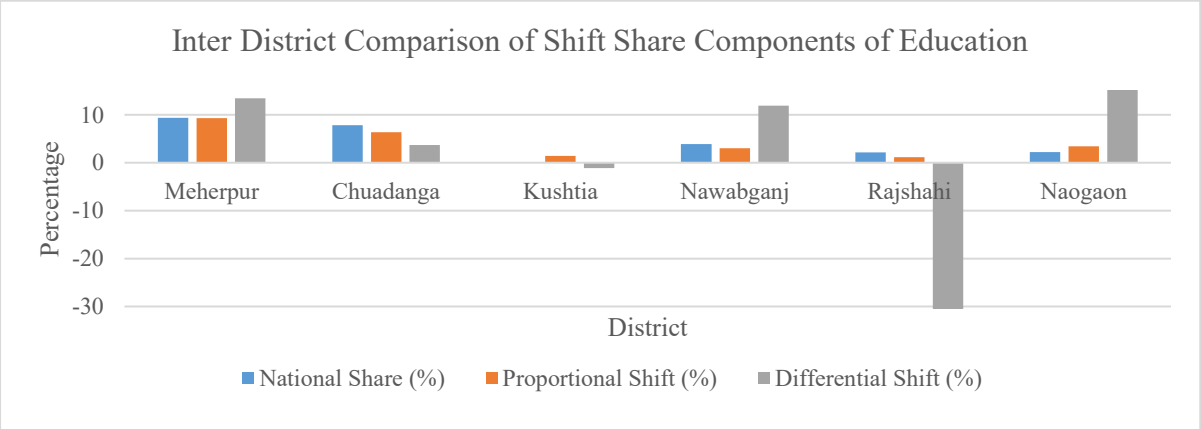

Figure 08: Inter District Comparison of Shift Share Components of Education Source: Authors, 2023

(Ansary, 2017). Moreover, there are shortage of teachers in Rajshahi Univeristy which hampered the education program (Elahi, 2018). These factors could be the reason of negative differential shift of education sectors in this district.

2.8 Inter Regional Analysis of Economic Structure of Human Health

Figure 09 shows that, Chuadanga and Rajshahi districts' national share of health sector is higher than other two components. Hence, these districts would have more employment growth in this sector if it had followed national growth rate. Industrial shift is positive for all the

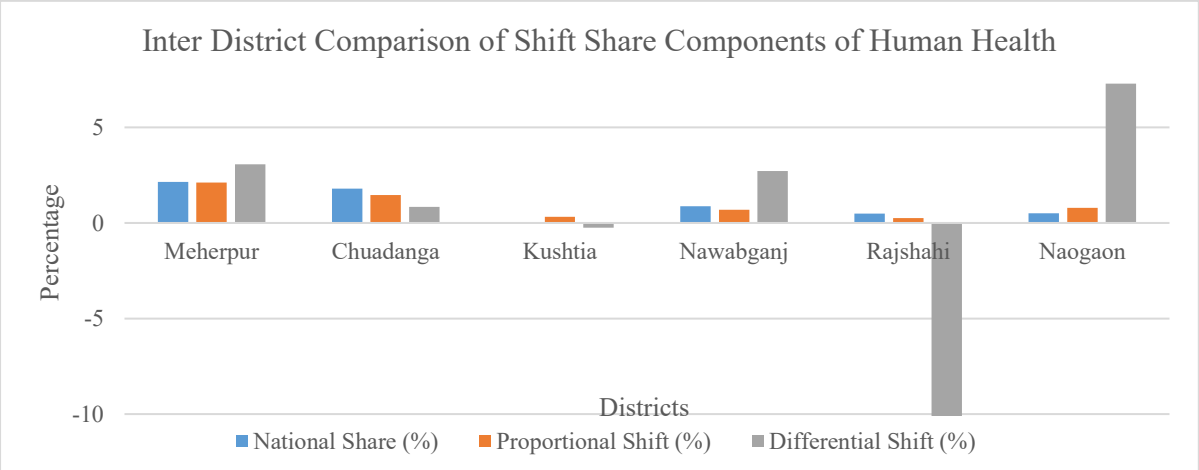

Figure 09: Inter District Comparison of Shift Share Components of Human Health Source: Authors, 2023

districts indicating that this sector is nationally fast growing. However, Kushtia and Rajshahi districts have negative differemtial shift in this sector, some locational disadvantages could be the reason behind this. Although the private healthcare sector has seen a significant development in Bangladesh, they are mainly intended to benefit the wealthy (Ashaduzzaman et al., 2005). As a result, private hospitals are more concentrated in eastern and southern regions such Dhaka, Chittagong districts. In the five year plans, the north western region is identified as lagging region. As a result, there has been lower growth of employment in this sector. In Kushtia district, there has been chronic shortage of doctors in upazila health complex since 2006 (Sobuj, 2022). Besides, this district's sub health centers are deprived of receiving adequate fund (Sobuj, 2022). Health facilities are concentrated around the central southern part of the Rajshahi city for higher population density and 75.3% of total health facilities were private, which are mostly pharmacies and doctors' chambers (Islam et al., 2016). Majority of the doctor's chamber is homeopathic having no formal education and 65% of the health facilities do not have qualified doctors (Islam et al., 2016).In Meherpur, Chuadanga and Naogaon districts, differential shift for health is positive because several health programs have been undertaken in these districts to provide health facilities. Impact Foundation Bangladesh started working in Chuadanga in 1995 to provide health facilities (IFB, n.d.).

CHAPTER 3: INTRA REGIONAL ANALYSIS OF THE SELECTED DISTRICTS

From our previous discussion, we have seen that Chuadanga district has the highest total regional growth from 2003 to 2013, which is 290.92%. On contrary, Kushtia district has the lowest regional growth in 10 years, having only 36.9% growth. Therefore, we have selected these two districts for intra regional analysis which will be discussed in this chapter.

3.1 Intra Regional Analysis of Chuadanga District

Table 1: Comparison of Economic Sectors of Chuadanga on the basis of Shift Components

	Industrial Mixture (IM) (+)	Industrial Mixture (IM) (-)
Regional Shift (RS) (+)	1. Manufacture of wood products (except furniture) 2. Manufacture of nonmetallic mineral products 3. Manufacture of fabricated material (Except machineries) 4. Manufacture of Furniture 5. Wholesale of vehicles 6. Wholesale of vehicles (except vehicles) 7. Retail trade except vehicles 8. Accommodation and food service 9. Tailoring 10. Electricity, gas, steam and air conditioning supply	1. Manufacturing of food products 2. Public administration and defense 3. Land transport 4. Warehousing and support activities for transportation 5. Education 6. Human Health 7. Financial service activities (except insurance) 8. Activities of membership organization
RS (-)	Other manufacturing	Textiles

Table 01 groups the economic sectors of Chuadanga having positive and negative value both in industrial mix (IM) and in regional shift (RS). If the IM value is negative and RS is positive, the net shift component could be both positive or negative and vice versa. The sectors having negative net shift component are marked in blue colour.

Table 01 shows that the regional share (RS) value is positive and higher than industrial mix (IM) value for all the economic sectors except textiles and other manufacturing. This scenario implies that these sectors have locational advantages in Chuadanga district. The district is located on the southwestern part of the country and surrounded by Nadia district West Bengal of India, Meherpur, Kushtia and Jhenaidah. Five rivers namely, Mathavanga, Chitra, Nabaganga, Bhairab and Kumar are flowing through the district (BNP, 2023). According to

Soil Resources Development Institute (SRDI), 11 types of soil have been found and the soil of this district is formed by old and new sediments of Padma River (SRDI, 2023). Due to the higher soil suitability, manufacturing of agricultural food products is profitable.

The Chuadanga district is connected with the neighboring districts by regional highways. Jessore, Jhenaidah and Kushtia are connected with Chuadanga by railways (BNP, 2023). It is one of the border districts of Bangladesh, which create numerous trade opportunities with India (Jamwal, 2004). Thus, good connectivity is one of the locational advantages of Chuadanga. The IM value of manufacturing of food products is negative implying that this sector is a nationally slow growing sector. In 7th five-year plan, Chuadanga is considered one of the droughts prone or rain scarce areas of Bangladesh (GED, 2016). Manufacturing of food products such as vegetables and oils, dairy products, bakery products and grain mill products, animal feed might have disrupted by droughts. This factor could be one of the reason for slower growth. However, due to other locational advantages, the net shift component is positive for this sector, which eventually make this sector as a leading sector of the district.

In the 6th five-year plan, it was mentioned that Bangladesh land port authority created 16 land ports to make export and import easier with neighboring countries. One of the land ports is located in Darshana, Chuadanga (GED, 2011). As a result, the land transport sector has the positive RS value. The negative IM value depicts that some external factors make this sector nationally slow growing. The rural roads of Chuadanga get muddy in rainy season and dusty in the dry season which eventually impact the land transport sector (LGED, 2009).

The waterbodies of Chuadanga are brings many opportunities for this district (Islam et al., 2007). The total area of waterbodies is 2849.77 hectare including 11 baor, 63 beels, 12 canals, rivers of 499.5 hectares and floodplains of 330.58 hectares (Anon, 2002a). Therefore, it provides locational advantage for fish production and marketing increasing employment growth as in wholesale and retail trade sector.

United Nations (UN), Food and agricultural organization (FAO) have published a report declaring the Bengal goat is one of the best in the world. Bangladesh stands fourth in goat cultivation. The country possesses 25 million of goats and among them 95% are black bengal which is raised in Chuadanga, according to the livestock department. The leather of black Bengal goat has good market value globally. Therefore, due to positive growth in wholesale and trade of animals, wholesale and retail trade (except vehicles) sector have positive RS and IM value becoming a prosperous sector of Chuadanga.

The ongoing projects of Chuadanga district are Important Rural Infrastructure Rural Development Project (IRIDP-2), Government Key Projects (GKP), Primary Education Development Program (PEDP-3) (BNP, 2023). The RIIP phase-1 was implemented between 2003 and 2010 and designed in such a way that it incorporated both male and female in construction works considering the fact that poverty among woman is higher than the man (Ahmed and Nahiduzzaman, 2016; Global poverty project, 2012). The project was considered as Employment Intensive Infrastructure Programme (EIIP) that created employment opportunities for the marginalized woman (Ahmed, 2007). Working women started to invest in small and medium enterprises such as small shops, food catering services and the project also unleashed the entrepreneurial potential of the rural women. Besides, the food consumption also increased providing better food security (Ahmed and Nahiduzzaman, 2016). It also increased the economically active population almost 3% (LGED, 2009). Because of this project, rural transport is improved and paved roads develop connectivity of market places.

Global recession, unfavorable trade policies, high cost of production due to increase of energy cost are the primary cause of closing the textile industries throughout all the regions of Bangladesh. (Islam et al., 2013)

3.2 Intra Regional Analysis of Kushtia District

Table 2: Comparison of Economic Sectors of Chuadanga on the basis of Shift Components

	Industrial Mixture (IM) (+)	Industrial Mixture (IM) (-)
Regional Shift (RS) (+)	1. Accommodation and food service (Hotel and Restaurants) 2. Electricity, Gas, steam and air conditioning supply	1. Manufacturing of food products 2. Land transport 3. Warehousing and support activities for transportation 4. Education 5. Human Health
Regional Shift (RS) (-)	1. Manufacturing of wood products (Except furniture) 2. Manufacture of nonmetallic mineral products 3. Fabricated material (Except machineries) 4. Furniture, establishment 5. Wholesale of vehicles 6. Wholesale (Except vehicles) 7. Retail trade except vehicles 8. Tailoring	1. Textiles 2. Public administration and defense 3. Activities of membership organization

Table 02 represents that manufacturing of food products, land transport, warehousing and support activities for transportation, education and human health have negative IM value, implying that these sectors are nationally lagging sectors. Manufacturing of wood products, manufacture of nonmetallic mineral products, fabricated material (except machineries), furniture, establishment, wholesale of vehicles, wholesale (except vehicles), retail trade except vehicles and tailoring have negative RS value denoting that there are some locational disadvantages for this sectors. Textile, public administration and defense, activities of membership organization have negative IM and RS value. Among the selected economic sectors, only two sectors accommodation of food service and Electricity, Gas, steam and air conditioning supply have the positive IM and RS value. The net shift component is negative for majority of the selected sectors, which include warehousing and support activities for transportation education and human health, fabricated material (except machineries), furniture and establishment, wholesale of vehicles, wholesale (except vehicles), retail trade except vehicles, tailoring.

Kushtia is located at western part of the country and surrounded by Rajshahi, Natore and Pabna on the north, Jhenaidah on the south, Meherpur and Chuadanga on the west, Nadia and Murshidabad district of India on the east (BNP, 2023). Padma, Gorai, Mathabhanga, Kumar, Kaliganga, Hisna rivers are flowing through the Kushtia district. The construction of Farakka results in declining the water quantity of Padma and Gorai River. As a result, the dependent rivers of Gorai, Kumar and Kaliganga rivers' flow of water is drastically falling (Aman, 2009). Due to this barrage, production of crops, irrigation, ground water table and navigability is decreasing in Kushtia (Mia et al., 2009). During the dry season, water is needed for irrigation purposes, which remains unavailable due to the project named 'Ganges-Kobotak' (Ahmed, 2006). Other causes of dying Kaliganga river is illegal encroachment and absence of dredging (Shah, 2020). The unsystematic sand lifting from Kumar River results into collapsing of roads of the villages of Kushtia and brings severe river erosion (The Daily Star, 2021). The factors can be considered as locational disadvantages for which majority of the sectors are lagging compared to national growth.

Due to the unsatisfactory market prices of agricultural products, farmers are rethinking about the cultivated crops and switching to tobacco cultivation because of the lucrative offer of tobacco companies (Hossain, 2016). But this has resulted in the loss of soil's nutrients, human health, poultry and livestock (Akhter, 2011). Tobacco production eventually decreases the fertility of the soil of Kushtia (Akhter, 2010). Though, the manufacturing of food products has

the locational advantage but due to tobacco cultivation, it is lagging nationally but the net shift component is positive because it produces a large number of rices in Khajanagor auto rice mills (BBS, 2011).

The accommodation and food service sector are having both positive IM and RS value. The significance of tourism in Kushtia is high because of Tagore's residence, Shahi Mosque (Mughal period), Mahishkundi Indigo Kuthi, Tomb of Nafar shah (BNP, 2023). Growth of tourism sector has resulted in increased number of hotels and restaurants.

The RS value is negative for human health. In Kushtia, there are lack of government funds regarding health services, lack of qualified doctors and supply of medicines (Sobuj, 2022). Because of high price of textile yarns and lack of transport facilities, the handloom industries in Kushtia are declining and craftsmen of this industry are migrating to bigger cities. Thus, the textile of Kustia is vanishing and therefore the net shift component for negative for Kushtia. Annual development plan is emphasizing budget on the electricity and gas of Kushtia. Thus, IM value is positive for this sector.

3.3 Review of Existing Plans, Policies, projects for the Districts

In 7th Five-year plan, the objectives were to ensure growth of agriculture, industry and service sectors, increase of manufacturing sector to 21% of GDP and develop of export facility with neighboring countries (GED, 2106). There is a development plan for Kushtia sadar upazila and two paurashava master plans for Bheramara and Mirpur paurashava of Kushtia district. In development plan, no interventions are mentioned for manufacturing sector and for addressing the potentiality of the border district (UDD, 2017). The master plan of Bheramara paurashava address specifically the wholesale and retail trade for increasing markets but not manufacturing sectors (LGED, 2011). There is lack of proper linkages among the hierarchy of plans. One of the primary objectives of National Land Use Policy, 2001 to conserve land and restore fertility. But, tobacco cultivation was prominent in Kushtia deteriorating the overall soil quality.

Khulna, Rajshahi and Barisal diviosions are considered lagging regions of Bangladesh (World Bank, 2002). The ongoing projects of these divisions and districts are Greater Rajshahi District Rural Infrastructure Development Project , Khulna Division Rural Infrastructure Development Project, Rajshahi Division (Except Sirajganj District): Rural Infrastructure Development Project, Development of Connecting roads with Shaikh Hasina Bridge over Mohananda River under Chapai Nawabganj.

CHAPTER 4: MAJOR FINDINGS, RECOMMENDATIONS AND CONCLUSION

4.1 Major Findings and Recommendations

Major Findings	Recommendations
Chuadanga: Manufacturing of food product has positive regional growth but has some negative external factor such as lower budget allocation for agriculture, occurance of drought.	1. Sufficient budget allocation for agricultural inputs and use of drought resilient crop varieties. 2. Provision of local agricultural extension services.
Meherpur, Chapai Nawabganj, Chuadanga, Naogaon districts have lower regional growth in transportation and storage facilities due to lack of financial resources which results in lower agricultural productivity.	1. Develop railway network for Meherpur and Naogaon to ensure better regional connectivity. 2. Regular dredging and maintenance of navigation routes to enhance water ways connectivity. 3. Infrastructure investment, provision of cold storage facilities, capacity building of workers for developing warehouse and storage facilities.
Kushtia has the lowest regional growth in majority of the sectors, though it has numerous potentials for economic growth.	1. Develop border connectivity with India for Kushtia district for utilizing opportunity of exports and import via border. 2. Proper dredging for the dying rivers and implementation of strict law to control the illegal encroachment. 3. Increase government support, high quality seed, access to credit for jute cultivation in Kushtia.
Chuadanga has the highest regional growth and only manufacturing of textile is lagging sector in this region.	Considering the negative environmental impact of the textile industry, there should be focus on local industries which have the potentiality to grow.
Kushtia and Rajshahi districts have lower growth in education and health sector due to lack of qualified human resource.	1. Provision of training facilities, ensure adequate remuneration for teachers. 2. Increase government funds for health centers and upazila health complex.

4.2 Conclusion

The study has applied shift share method to identify the regional competitiveness and industrial composition of the selected districts in northwestern region of Bangladesh. The study has tried to distinguish the regions having positive and negative regional growth of the districts. The findings of this study shows that Chapai Nawabganj, Rajshahi, Naogaon, Mehepur and Chuadanga districts show higher regional growth than national growth. Kushtia has lower regional growth than national growth. The study has identified the sectors contributing to positive regional shift for each districts. Kushtia district has locational advantages for potential growth but negative external factors hinder its regional growth. For Rajshahi district, transportation sector contributes more in regional growth. Chapai Nawabganj district has the locational advantages for wholesale and retail trade. For Meherpur district, manufacturing of food products and education sectors are prosperous sectors. Naogaon district has higher regional growth in education and health sector. The study has identified the factors that influence the regional economic growth of the sectors. Finally, the study has recommended some interventions which can help the policy makers and regional planners to take better decision for regional development.

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APPENDIX

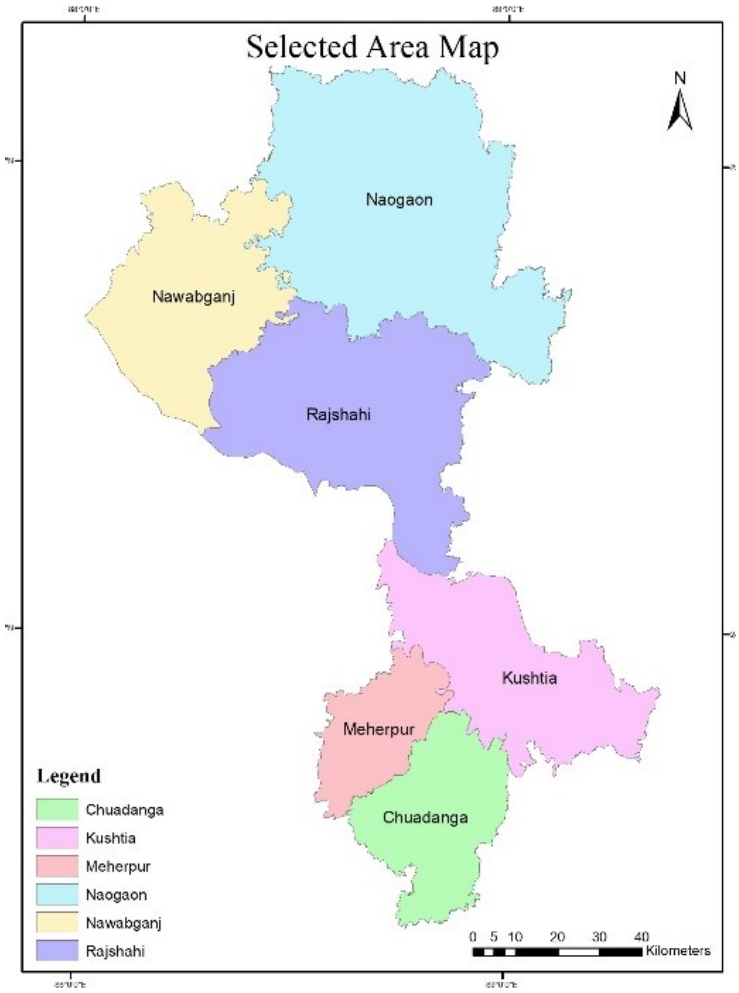
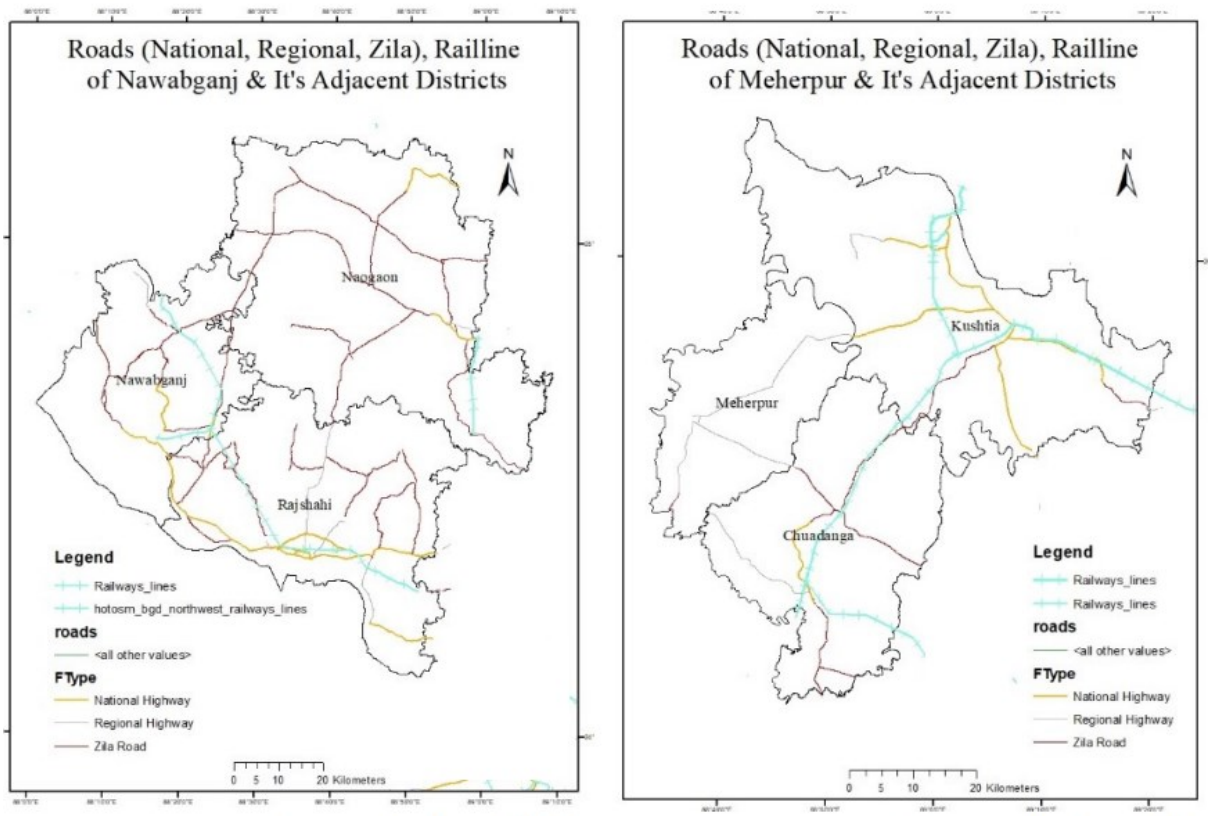


Figure 01: Map of the Study Area

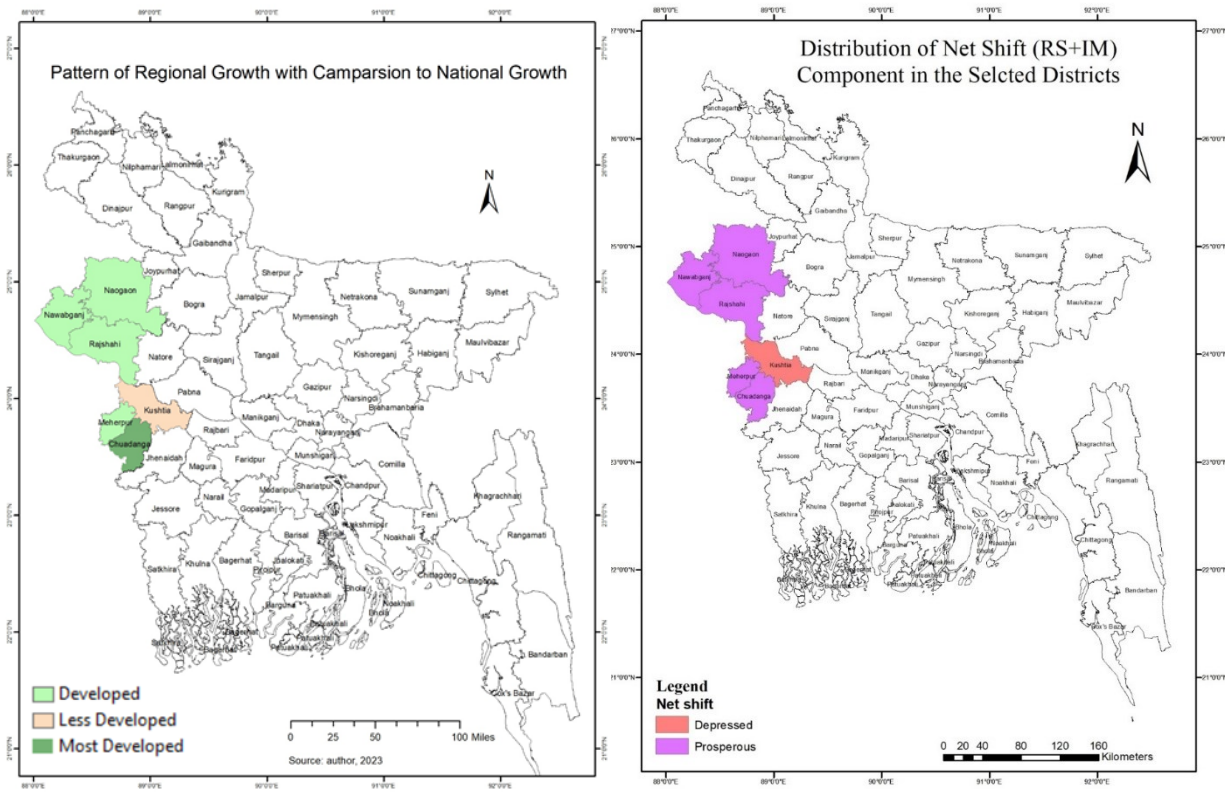
Table 3: Selected Sub Sectors for the Study

1. Food Products	12. Public administration and defense
2. Textiles	13. Tailoring
3. Wood Products (Except Furniture)	14. Electricity, Gas, Steam and Air Conditioning Supply
4. Non Metallic Mineral Products	15. Financial Service Activities Except Insurance
5. Fabricated Material (Except Machineries)	16. Activities of Membership Organization
6. Furniture Establishment	17. Other service activities
7. Other Manufacturing	18. Land Transport
8. Whole Sale and Retail of Vehicles	19. Warehousing and support activities for transportation
9. Whole Sale Except Vehicles	20. Other Transportation and storage
10. Retail Trade Except Vehicles	21. Education
11. Accommodation and Food Service	22. Human Health



Source: Author, 2023 Source: Author, 2023

Figure 6: Existing Transportation Network in the Districts



1. Shift Share Componets at a Glance

District's name	Shift Share Components	Percent Change	Explanation
Meherpur	National Growth	69.14	Most Progressive
	Regional Growth	172.35	
	Proportionality shift	-4.03	Having concentration of nationally slow growing industry
	Differential Shift	107.24	Local Advantageous divisio
Chuadanga	National Growth	69.14	Most Progressive
	Regional Growth	290.93	
	Proportionality shift	-4.74	Having concentration of nationally slow growing industry
	Differential Shift	226.53	Local Advantageous divisio
Kushtia	National Growth	69.14	Slow growing
	Regional Growth	36.90	
	Proportionality shift	24.92	Having concentration of nationally fast growing industry
	Differential Shift	-57.16	Local Disadvantageous divisio
Nawabganj	National Growth	69.14	Most Progressive
	Regional Growth	162.96	
	Proportionality shift	-5.94	Having concentration of nationally slow growing industry
	Differential Shift	99.76	
Rajshahi	National Growth	69.14	Most Progressive
	Regional Growth	179.09	
	Proportionality shift	-7.72	Having concentration of nationally slow growing industry
	Differential Shift	117.67	Local Advantageous divisio
Naogaon	National Growth	69.14	Most Progressive
	Regional Growth	155.70	
	Proportionality shift	-2.87	Having concentration of nationally slow growing industry
	Differential Shift	89.43	Local Advantageous divisio

2. Contribution of Subsector in Regional Growth