# Analysis of Border Regions Competitiveness and Connectivity in India, Bangladesh and Nepal

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## I. Introduction

The goal in this paper is to correct growing regional imbalances within India. One way of doing that was to integrate some of the more remote border areas with neighboring areas in other countries. A common region that is often the focus of lagging border regions is the chicken neck area in the North-eastern part of India. While many papers have done analysed countrywide data, we examine district wide data to assess the competitivness and complementarity of the region. We find that that districts are relatively poor to the richer parts of South Asia. Economically they are very similar. Only the Darjeeling district is relatively better than the rest of districts – Ilam, Jhapa, Panchagarh and North Dinajpur. Benefits of standard regional integration or the new economic theory would be far and few in the district. The districts are agriculture or service oriented. Manufacturing exists very little or not-existent. In that scenario, regional integration should come in the form of services integration. That might help the people deal with the standard border problems and still foster greater integration. India may not benefit in the short run but in the long run, establishing itself as a regional centre for agro-processing especially tea, can help it earn foreign currency which can make region economically better-off.

## II. Background Information

Rapid growth has been accompanied by sharp reduction in poverty in all the South Asian countries. Ahmed, Kelegama and Ghani (2010) show that South Asia's annual gross domestic product (GDP) growth rate was around 5.7 percent during 1980–2000, which increased further to 6.5 percent during 2000–07. However, the South Asian per capita income remains substantially below the world average (Table 1). It is the second poorest region in the world after developing Sub-Saharan Africa (48.5%)[1]. Afghanistan has the lowest GDP per capita in the region closely followed by Nepal. Maldives is the richest. Poverty continues to be very high in Bangladesh.

The low Gini index in Table 1 is deceptive. Economic growth and poverty reduction has been accompanied by rise in income inequality and regional inequality within countries. Kundu and Varghese (2010) find that regional inequality has increased in India after 2003–04. Ghosh (2012) finds increasing regional inequality for India, Bangladesh and Sri Lanka. Often it is found that within region inequality is more of a contributory factor than between region inequality. Ahmed, Kelegama and Ghani (2010) show that in India, "GDP per head in the state where it is highest (Haryana) is five times greater than in the state where it is lowest (Bihar). Nearly half a billion people live in the lagging regions of South Asia with 60 percent of the poor in India live in the lagging states[2]".

Farole (2013) explains that spatial inequality is an important concern as regional imbalances threaten political and social cohesion and contribute to rural urban shifts. Management of the latter is proving to be challenging. Further if output inequality translates to income inequality and in the absence of redistribute tax and transfer policies and fluid factor markets, managing regional inequality may prove to be difficult. Also the peripheral areas anyway are not using

[1] World Development Indicators, World Bank.
[2] Ahmed, Kelegama and Ghani (2010) defines lagging regions as the ones which are growing below their respective national averages.

their resources efficiently and regional imbalances may contribute to their getting caught in a low growth trap.

**Table 1: Background Statistics, 2012**

| | *GDP per capita PPP (constant 2005 international dollars)* | *Headcount Ratio (% of population living below $1.25 a day)* | *GINI Index* |
|---|---|---|---|
| ***Year*** | ***2012*** | ***2010*** | ***2010*** |
| Afghanistan | 1,235[@] | N.A. | 27.8[†] |
| Bangladesh | 1,623 | 43.3 | 32.1 |
| Bhutan | 5,774 | 10.2* | N.A. |
| India | 3,341 | 32.7 | 33.9 |
| Maldives | 7,819 | 1.48[#] | N.A. |
| Nepal | 1,279 | 24.8 | 32.8 |
| Pakistan | 2,491 | 21[†] | 30[†] |
| Sri Lanka | 5,384 | 4.11 | 36.4 |
| South Asia | 3,042 | 31.0 | N.A. |
| World | 10,265 | N.A. | N.A. |

*Notes*: @ Data for 2011, *Data for 2007, # Data for 2004 and † Data for 2008
*Source*: World Development Indicators. World Bank.

Examining the lagging regions, Ahmed, Kelegama and Ghani (2010) find that South Asia's lagging regions are either landlocked countries (for example, Afghanistan and Nepal) or are border districts, states, or provinces of the three larger countries of Bangladesh, India, and Pakistan. Nepal is one of the poorest countries in South Asia and is landlocked. Out of 14 states of India that have borders with neighbors, 12 have per capita income levels that are at or below the national average (Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, Tripura, Manipur, West Bengal, Bihar, Uttar Pradesh, Jammu and Kashmir, and Rajasthan). The only exceptions are Punjab and Gujarat. The authors report that in Bangladesh bordering districts have a lower per capita income than the national average. The firms in the peripheral region are relatively less competitive than the ones in the core region in India (Farole, 2013).

If one goes by the parameters of World Bank (2009) both population density and economic & social distance would predict closer trade ties and high economic growth in these areas. "After Europe, South Asia has the largest concentration of people living close to the border. It has the maximum "city pairs" within 50 kilometers with a population of more than 25,000 people. Almost all the South Asian countries share a common border with the largest regional partner (India)"[3]. However, South Asia is one of the least integrated regions in the world and the border regions the poorest. In 2011, South Asia's intraregional trade was only 4.3 percent whereas corresponding figures for ASEAN and ASEAN+3 were 26 percent and 39 percent, respectively (Moinnudin, 2013). Intra-regional trade flows within South Asia is very low compared to inter-

[3] Ahmed, Kelegama and Gilani, 2010.

regional trade flows with ASEAN with the exception of Nepal (Ahmed, Kelegama and Ghani, 2010)[4]. This is because of its landlocked nature and trade agreement with India.

Farole (2013) explains the rising income inequality due to increasing returns to scale, institutions and new economic geography i.e. the core of the South Asian economies is progressing faster due to agglomeration effects than the peripheral regions. These peripheral regions coincide with the border regions. Ahmed, Kelegama and Ghani (2010) explain the interruption in historical trade ties due to the political history disrupting traditional economic networks thereby contributing to the regions' permanently stagnating status. Ahmed, Kelegama and Ghani (2010) and Farole (2013) examine whether forging trade networks in bordering regions of South Asia may perhaps invigorate the peripheral areas. Ahmed and Gilani (2007) and Farole (2013) argue that trade is important because it is a driver of economic growth. Plus it brings in the benefits of scale, markets and agglomeration.

One particular South Asian border region is of much academic interest. It has been the subject of many World Bank studies because of its peculiar geography. That is the chicken neck area (Siliguri corridor) in the Northeastern part of India (Figure 1). The Siliguri corridor is a narrow congested land corridor between Bangladesh and Nepal connecting the northeastern region of India[5]. Bhutan is close to the corridor and China is not too far away. This region itself is one of the most significant tea producing regions in the country and houses the world famous Darjeeling tea.

The Siliguri corridor is in the state of West Bengal, which Ahmed, Kelegama and Ghani (2010) show is a lagging state. Specifically the corridor falls in the North Bengal region of West Bengal which has been reported as the most backward region for more than two decades (Government of India, 2002, 2010). North Bengal consists of six districts namely Coochbehar, Darjeeling, Jalpaiguri, Malda, Uttar Dinajpur and Dakshin Dinajpur. Except Darjeeling and Malda, all the districts in this region are declared backward by the Planning Commission[6]. The most significant product of the North Bengal economy is tea[7]. West Bengal produces 24.8 percentage of total tea production in India in 2012[8]. It comprises of Darjeeling, Terai and Dooars tea exclusively housed in the North Bengal region.

[4] In 2006, India's share of trade with SAARC was 2.8 percent versus ASEAN (24.9%). Bangladesh share of trade with SAARC was 11 percent versus ASEAN 30 percent. Nepal's share of trade with ASEAN was 12.5 percent as opposed to SAARC (71%).
[5] Subramanian, 2001.
[6] The Planning Commission in 2003 identified 150 backward districts for wage and self employment programs. An index of backwardness was calculated using three variables – agricultural productivity per worker, agricultural wage rate and SC/ST population.
[7] Agricultural products like tea, tourism and timber are the main products that dominate this region.
[8] Tea Board of India.

**Figure 1: Siliguri Corridor**


*Source*: thehindu.com

The North Bengal region neighbors Eastern Terai region of Nepal. The Eastern region of Nepal's per capita income is only slightly higher than that of Afghanistan (Ahmed, Kelegama and Gilani, 2010). Rangpur in north-west Bangladesh is the neighboring division. Khandekar (2009) shows this region has lower income and higher poverty than the rest of Bangladesh. Further, the income of Rangpur division suffers from seasonal variations.

The irony is that despite being a key congested trade route, connecting major states and countries in the region, the North Bengal region is one of the backward regions in South Asia. Due to its unique geography and economy, this region is the focus of our study. What can be done to develop this region? Ahmed, Kelegama and Gilani (2010) recommend that the lagging border regions should use four spatial features: geography, transportation, factor mobility and scale economies. Farole (2013) recommends the following competitiveness policies for peripheral regions with economic mass: targeted foreign direct investment attraction (following comparative advantage and industry lifecycles); support to competitiveness of existing industry clusters; transport connectivity and infrastructure; investment climate reforms; firm-level competitiveness interventions (training, finance, and so forth) and; critical importance of governance[9].

Both are recommending regional cooperation as the way out for developing peripheral lagging border regions. Therefore, we study the Siliguri corridor and the tea industry which is a major economic driver of the North Bengal region and its neighboring districts in Nepal and Bangladesh. We study tea as an illustration to examine whether value chains in tea production may be developed across the region. Our focus is on the Darjeeling district which houses the city Siliguri after which the chicken's neck is named. It is the key city in the area being its

[9] Farole (2013) has recommended different policies for three different types of lagging regions – ones near the core, peripheral ones with economic mass and peripheral ones without economic mass. Given the economic geography of South Asia with so many cities near the border, we are choosing to report the ones with the second option.

commercial hub and the centre of tea production in the region. Darjeeling borders Illam and Jhapa, the centres of tea production in Nepal. In Rangpur divison of Bangladesh, Panchagarh district produces tea which neighbors Uttar Dinajpur, one of the poorest districts in North Bengal.

We study the five districts for possible competitiveness, clusters in the region and its state of infrastructure (transport, energy and water). We examine whether there is any potential to develop value chains across the region. We examine various forms of regional cooperation - formal regional integration in the form of Free Trade Areas, trade liberalization and/or trade facilitation that may help in the growth and development of this sub-region. Trade liberalization is defined as "any act that would make the trade regime more neutral– nearer to a trade system free of government intervention" (Papageorgiou et al., 1990 cited in Shafaeddin, 2005). Trade facilitation is defined as "the simplification and harmonization of international trade procedures' where trade procedures are the 'activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade'" (WTO, 1998 cited in Grainger, 2008). The tea industry is used as a case study to explore the development of regional value chains in this area.

## III. Economic Theory

There is substantial theoretical and empirical evidence which show that open economies tend to grow faster than closed economies. Free trade is the first best solution. Economic integration with a select few countries is the second best solution that countries have turned to promote trade and therefore economic growth in their respective countries. "Economic integration implies differential treatment for member countries as opposed to non-member countries".[10] The theory of economic integration has been examined both under the assumptions of perfect competition and monopolistic completion. Monopolistic competition is combined with increasing returns to scale, and transport costs between regions. Both theories predict that whether the integration will bring increased economic growth or not depends on a variety of factors including elasticity of demand, supply, costs of production etc.

An outgrowth of monopolistic competition and recent changes in supply chains has led to development of another theory which explores the development of global value chains.

### III.1 Perfect Competition

Under the assumptions of perfect competition, economic integration can have both static and dynamic effects. Static effects are of two types – trade creation and trade diversion. Trade creation takes place when "economic integration leads to a shift in product origin from a domestic producer whose resource costs are higher to a member producer whose resource costs are lower. Trade diversion takes place whenever there is a shift in product origin from a nonmember producer whose resource costs are lower to a member-country producer whose resource costs are higher".[11] It is an empirical issue which effect is larger when economic integration takes place.

[10] Appleyard, Field and Cobb (2006), pp 377.
[11] Appleyard, Field and Cobb (2006), pp 377 and Viner (1950).

The literature (Panagariya, 2007 and Winters, 2009) argue that regional integration in the form of free trade area between South-South countries may result in more trade diversion than creation and thereby do not advocate it.

There are also dynamic effects of economic integration[12]. Reduction of trade barriers increases competition reducing monopoly power, if any. Further, access to markets may allow economies of scale for some exports, which may involve specialization thereby triggering intra-industry trade versus inter-industry trade. Integration may promote greater foreign investment from both internal and foreign sources. It also may lead to increased factor mobility of capital and labor, moving from surplus to scarce areas, increasing factor returns in the integrated area.

Winters (2009), Ahmed and Ghani (2007) and Farole (2013) argue that potentially there can be dynamic beneficial impact of regional trade agreement in South Asia in terms of technology transfer, accumulation and agglomeration.

### III.2 Monopolistic Competition

Krugman (1991) shows that the location of agricultural production is fixed in a two region two sector general equilibrium model of location. However, the location of the manufacturing plant will depend on transport costs and economies of scale. If transport costs are infinitely high and there are low economies of scale, monopolistic competitive firms will locate in both the regions to access both the markets. However, if there are zero transport costs and increasing returns to scale, the firms will locate in one region. It will choose the region which has larger demand, creating a cycle where more firms then choose to locate there (agglomeration). Winters (2009) cites Venables (2006) to show that if transport costs are between these two extremes which is the more realistic case, multiple equilibria are possible with one economy maintaining a higher proportion of industry because of agglomeration but there is scope for some industry in the other country. This implies that while one economy flourishes, de-industrialisation may take in the other.

The monopolistic competition may also result in intra-industry trade i.e. countries export and import different varieties of differentiated goods.[13] Further, how much they will trade will depend on close they are to each other in terms of GDP adjusted for distance physical or otherwise (gravity model) and influence of other factors such as transport costs, trade barriers like tariffs, quotas etc.; rules and regulations like time taken to clear customs, payments and insurance; losses and damage; bribes and informal payments; re-engineering and redesign to meet different standards in different markets; and geographic factors like whether they share a border.[14] Moinnudin (2013) has empirically estimated a gravity model for South Asia which predicts high potential for trade.

The empirical literature has estimated the effects of these other barriers on trade and argued for minimizing trade and transaction costs to further trade and regional integration. In other words,

[12] Appleyard, Field and Cobb (2006).
[13] Feenstra and Taylor (2008).
[14] Feenstra and Taylor (2008) and Winters (2009).

trade facilitation is important. Ahmed and Ghani (2007) cite Wilson and Otsuki (2007) to show that countries like Bangladesh have the most to gain from trade facilitation[15]. In contrast India gains more from trade liberalization.

This model has implications for city formation and growth such that certain cities – hotspots or core areas prosper while peripheral areas languish. Ahmed and Ghani (2007) and Farole (2013) find support for the core-peripheral kind of growth in South Asia. However, this has become a cause for concern due to increasing regional imbalances as has been explained in the earlier section. It would be interesting to develop Siliguri as the core city for the region.

Even though standard economic theory does not predict positive welfare impact from regional integration, regional cooperation in the areas of infrastructure including transport, energy and water are perceived to have beneficial impact for the overall region (Ahmed and Ghani, 2007).

### III.3 Global Value Chains

The above set of theories analyzed horizontal intra-industry trade. However, recently the focus has shifted to vertical intra-industry trade i.e. "industries no longer conduct every stage of production in the same country, and have begun to "offshore" production activities, or "tasks", to affiliates and foreign firms. The networks of geographically dispersed firms that supply unique steps of production and interact to produce a final good are called the global value chains (GVCs) or global supply chains".[16]

Jensen and Barfield (2012) analyze why firms would be interested in developing global GVCs? The answer lies in external increasing returns to scale. The authors distinguish between internal and external increasing returns to scale. Internal increasing returns to scale is the per-unit cost of production depended on the size of the firm discussed in the earlier section.

The external increasing returns to scale (EIRS) are of two types – pecuniary and technological (Jensen and Barfield, 2012). Pecuniary EIRS rely on the size of the market like labor market pooling and input sharing. Technological EIRS is knowledge spillovers. Labor market pooling is concentration of suitable workers in an area around an industrial cluster. Knowledge spillover is when firms learn from each other through firm-level interaction or interactions among employees. And the authors show that when forces pull firms together (agglomeration) are higher than forces that tend to pull them apart (dispersal), industries will tend to cluster, external IRS can be exploited, and international specialization will follow. Therefore, EIRS creates comparative advantage due to the existing advantages in factor endowments or technological advantage, which results in vertical intra-industry trade.

Of course technological improvements in Information, Communication and Technology, transport and managerial practices have made this possible. "Efficient production like "just in time" manufacturing where inputs arrive at the next stage of production just in time for that

[15] Given the importance of transport and trade facilitation, this has been extensively examined for South Asia and the Petrapole, India- Benapole, Bangladesh border – Subramanian (2001), Das and Pohit (2006), Roy and Banerjee (2010), De (2013), De and Saha (2013).
[16] Jensen and Barfield (2012).

production to take place make coordination of production across long distance feasible" (Jensen and Barfield, 2012). This, in turn, contributes to a reduction of in-process inventory, and resultantly makes it so that smaller firms can actively participate in GVCs.

However, value of agglomerating or clustering may decline if the geographical dispersion between the international regions increases.

The current focus of empirical literature is exploring the potential formation of regional or global value chains in South Asia which would propel economic growth in the region (Brunner, 2013). Baldwin and Taglioni (2011) criticize the usage of the standard gravity model to predict intermediates trade where GDP of the two countries is the key mass variable. Free trade agreements, cultural ties and immigrant networks are relatively more important as per the authors. Baldwin and Taglioni (2011) empirically show that distance, sharing borders and sharing a common language are better predictors of trade in intermediate goods. The Organization for Economic Cooperation and Development (OECD) places great importance on a good policy environment especially trade, investment and competitiveness matter for developing GVCs[17].

These three sets of theories give us the framework to assess whether regional integration of the districts in the three countries of India, Bangladesh and Nepal is possible and beneficial and if yes, what kind – inter-industry trade, horizontal intra-industry trade or vertical intra-industry trade of goods and services. Both goods and services can either be intermediate or final.[18] Also the latter two theories emphasize on low transport and transaction costs for increased trade and regional integration.

## IV. Assessing Regional Competitiveness and Connectivity

The primary objective in this paper is to assess the potential for developing or joining value chains and therefore we choose pairs of districts – Darjeeling, Uttar Dinajpur, Illam, Jhapa and Panchgarh. This section explores the competitiveness and connectivity of the five districts – Darjeeling and Uttar Dinajpur in India, Jhapa and Illam in Nepal and Panchagarh in Bangladesh. Further trade facilitation is also examined for the districts.

### IV.1 Districts Overview

### IV.1.A Darjeeling, India

The Darjeeling district lying on the foot of Himalayas, with a geographical area of 3,149 square km, shares its international boundaries with Nepal, Bhutan and Bangladesh and state boundary with Sikkim and Bihar[19]. With Darjeeling as the headquarters, there are four subdivisions of

[17] OECD website.

[18] "Producer services are intermediate inputs to manufacturing production, including management services, Research and Development, financial and accounting services, marketing, advertising, personnel and training, legal service, engineering and consulting services, trade services, and the design and trial production of key parts." (Hu, 2000)

[19] This is based on the information given by the District Industrial Center at Siliguri, Darjeeling during interviews with district officials in the region.

Darjeeling district which include Darjeeling, Kalimpong, Kurseong and Siliguri. The district has two different topographic characteristics, which are plain and hills. The hilly tracts of the district include the district headquarters Darjeeling and the two towns Kurseong and Kalimpong while the plain stretches of land include Siliguri at the foothills (Tea Board of India, 2001). The Siliguri subdivision and the surrounding areas of Darjeeling district come under the Terai region.

The district has a population of 1.8 million, based on the 2011 census, out of which 61 percent live in the rural area (Census, 2011). Darjeeling is relatively more urbanized (39%) than other districts in North Bengal and even West Bengal (32%). The population density of Darjeeling is 586 per $km^2$. This is significantly lower than West Bengal as a whole (1,029) but much higher than India (382). In Darjeeling, 76.9 percent of the population are Hindus, 11 percent are Buddhists, 6.2 percent Christians and the rest belong to other religions. Nepali, Hindi, Bengali and English are the prevailing languages in the district. Bengali is the language of the plains, Tibetan is used by the refugees and some other tribal people20.

Siliguri is the largest and main commercial city in North Bengal. It is strategically placed near international and state borders. Three international borders namely Bangladesh, Bhutan and Nepal are connected by Siliguri, which is a very rare position in the world map. Moreover, due to the well connectivity of Siliguri with Kalimpong in Darjeeling district and Sikkim by road, as well as with Darjeeling and Jalpaiguri by rail, Siliguri has become an important trade centre in West Bengal. The whole of North Bengal is also connected by air through the lone airport in Bagdogra (neighbouring town of Siliguri). Thus, Siliguri is a place of both international and national importance in South Asia (Siliguri.co.in, 2010).

### IV.1.B Uttar Dinajpur, India

"The District of Uttar (North) Dinajpur came into existence on 1st April, 1992 after the bifurcation of erstwhile West Dinajpur District[21]. It occupies an area of 3,142 $km^2$ enclosed by Bangladesh on the East (227km long boundary), Bihar on the West, Darjeeling and Jalpaiguri districts on the North and Malda District on the South. Uttar Dinajpur is well connected with the rest of the state through National Highways, State Highways and Railways. The regional topography is generally flat with a gentle southerly slope towards which the main rivers like Kulik, Nagar, Mahananda etc. flow. The district has 2 sub-divisions Raiganj and Islampur. There are 4 municipalities, 9 blocks and 98 panchayats covering 1,516 villages" (Uttar Dinajpur district website).

The population in the district is 30 lakh with 52 percent males and 48 percent females[22]. The population density is 956 people per $km^2$. Although lower than West Bengal, the population density is quite high. Barely 12 percent of the population is urban in this district. Uttar Dinajpur is more heterogeneous as compared to Darjeeling with 51.7 percent Hindus, 47.4 percent Muslims, 0.5 percent Christians and the rest belong to other categories. In contrast to Darjeeling,

[20] Darjeeling website.
[21] The information for this paragraph has come from the official website of the Uttar Dinajpur district.
[22] The source for all the data in the paragraph is Census (2011).

it is linguistically homogenous. Bengali is the main language in the district with a sizeable population also speaking Hindi and Urdu[23].

### IV.1.C Jhapa, Nepal

There are 75 districts in Nepal, among which Jhapa belongs to the Mechi zone of eastern Nepal with area of 1,606 square kilometer ($km^2$). Jhapa district shares its international boundaries with West Bengal to the east and Bihar to the South as well as national boundaries with Morang district to the west and Ilam district to the North (Government of Nepal, 2010). With administrative headquarters at Chandragadi, the district has three municipalities and 47 Village Development Committees (VDCs), all of them lying in the Terai plains.

According to the 2011 Census of Nepal, Jhapa has a population of 8.1 lakh which includes 47percent males and 53 percent females (Government of Nepal, 2012a). The growth rate of the population of Jhapa is the highest within all the Nepalese districts (18.1%). The population density is 506 people per $km^2$. This is much higher than the Nepalese population density of 180 people per $km^2$. Only 18.7 percent of the population lives in urban areas. Jhapa is homogenous by religion but linguistically heterogeneous with 79.8 percent Hindus. The next largest category is Kirat (8.5%). Christians, Muslims and Buddhists form 2.5, 0.08 and 1.29 percent of the population, respectively. The main languages spoken in the district are Nepali (58% of population) followed by Rajbansi (13%), Limbu (5%), Santhali (4%) and Maithali (3%) and other (17%) (Government of Nepal, 2013).

It is considered to be the gateway for India to the eastern region development of Nepal and also is well connected with the hilly regions of eastern Nepal. The main centres of Jhapa district include Chandragadi, Bhadrapur, Mechinagar, Birtamod, Kakarbhitta, Damak, Dhulabari, Surunga, Charali and Budhabare (Government of Nepal, 2010).

### IV.1.D Ilam, Nepal

Ilam district is located in the Mechi zone of eastern region of Nepal with an area of 1,703 $km^2$. It has its boundaries as Panchthar in the North West, Morang in the South West, Jhapa in the South East and Darjeeling District, India in the East. The district is well connected to Charali and the neighboring districts Panchtar and Taplejung in Nepal as well as connected to Darjeeling via a road from Fikkal through Pashupati Nagar (Government of Nepal, 2011). Ilam covers only mountain terrain lying at 140m above sea level. With Ilam bazaar as the district headquarters, the district has 48 VDCs and 1 municipality. Figure 2 shows the location of Jhapa and Ilam districts and their connectivity with the Darjeeling district.

Ilam's population is 2.9 lakh, among which 49 percent are males and 51 percent females. (Government of Nepal, 2012a). The population density is 170 people per $km^2$, lesser than the Nepalese average. Barely 6.6 percent of the Ilam's population is urban. Ilam is more heterogeneous than Jhapa with 44.5 percent Hindus, 35.6 percent Kirat, 2.5 percent Christians, 0.08 percent Muslims, 15.29 percent Buddhists and the rest belong to miscellaneous religions. However, it is linguistically relatively more homogenous than Jhapa – 87 percent of the

[23] Uttar Dinajpur District website.

population of Ilam speaks Nepali, 11 percent speak Rai and Limbu languages and one percent speak Newari. Other local languages are present in small numbers (Government of Nepal,2011)

### IV.1.E Panchagarh, Bangladesh

Panchagarh is a district of the Rangpur division in the northwestern part of Bangladesh with an area of 1,404.63 km$^2$.[24] It is bounded on three sides by 288 km long Indian border, having Darjeeling district on the north, Jalpaiguri and Cooch Behar districts on the northeast, North and South Dinajpur on the west. Panchgarh borders the Bangladeshi districts of Dinajpur and Thakurgaon districts on the south and Nilphamari district on the east. It is 150 feet high from the sea level.

Panchagarh was turned into a subdivision in 1980 consisting of Atwari, Tetulia, Panchagarh Sadar, Boda and Debiganj upazila. Later it was elevated to a district in Panchagarh in February, 1984 with the five areas mentioned above as sub-districts. The district also contains one municipality, nine wards, 32 mahallahs (Islamic parish), 43 Union parishads (Union councils – smallest rural administrative and local government units) and 850 villages.

The total population of Panchagarh was 9.9 lakh in 2011 with males comprising 50.3 percent of the population and females, 49.7 percent.[25] The density of population is 703 people per km$^2$, which is lower than the overall population density of Bangladesh (1,015). The share of urban population in the district is 9.6 percent. Panchgarh is the most homogenous out of the five districts with 83.09 percent Muslims, 16.5 percent Hindus, 0.25 percent Christians, 0.002 percent Buddhists and the rest belong to other categories. Bengali is the official language of Bangladesh.

There are Indian enclaves in Panchagarh whose total area is 4,837 km with a population of 23,963 (Panchagarh website).

### IV.1.F Distance and Density

In sum, Uttar Dinajpur, India is the most densely populated district and Ilam, Nepal the least. All districts show signs of either religious or linguistic heterogeneity with Panchagarh, Bangladesh the most homogenous both in terms of religion and linguistics. Panchagarh is close to Uttar Dinajpur and the plains of Darjeeling in terms of linguistic closeness as they both speak Bengali. They also share a common history especially culturally. Ilam and Jhapa are linguistically closer to the hills of Darjeeling.

Table 2a shows the physical distance between the major cities/district headquarters and major cities. The physical distance between the major cities in the five districts are shown in Table 2a. Siliguri and Darjeeling are the two main cities in Darjeeling with the latter being the district headquarters. Raiganj, Chandragadhi, Illam Bazar, Panchagarh Sadar are district headquarters for the districts Uttar Dinajpur, Jhapa, Ilam and Panchagarh, respectively. Siliguri is within 200km of all the district headquarters. Siliguri is almost equidistant from Darjeeling and Panchagarh Sadar and it is closer to Chandragarhi Jhapa than Ilam Bazar is to the city.

[24] Panchgarh website. http://www.panchagarh.info/.
[25] The statistics in this paragraph are from Government of Bangladesh, 2012.

**Table 2a: Distance from Capital/Major Cities**

| *Country* | *City-Pair* | *Distance (km)* |
|---|---|---|
| India | Darjeeling- Kolkatta | 631 |
| | Darjeeling- New Delhi | 1,401 |
| | Siliguri, Darjeeling - Kolkatta | 579 |
| | Siliguri, Darjeeling- New Delhi | 1,360 |
| | Raiganj, Uttar Dinajpur – Kolkatta | 398 |
| | Raiganj, Uttar Dinajpur -New Delhi | 1,343 |
| Nepal | Chandragadhi, Jhapa- Kathmandu | 559 |
| | Ilam Bazar, Ilam - Kathmandu | 629 |
| Bangladesh | Panchagarh Sadar, Panchagarh- Chittagong | 681 |
| | Panchagarh Sadar, Panchagarh- Dhaka | 441 |

*Source*: Distances website

One crosses from Siliguri into Nepal through the Kakarbhitta border. While from Darjeeling, one enters Nepal through the Pashupati Nagar. On the map Panchagarh and Uttar Dinajpur are neighbors but while driving one takes the NH 31 which is 236 km (Table 2b) and the border crossing is at a place called Changrabandha in the Cooch Behar district of West Bengal (North Bengal).

The physical and linguistic distances and cultural similarities tell us that that the region is remote, distance wise from major cities and ideal for setting up value chain.

**Table 2b: Distance between Cities (km)**

| | ***Siliguri*** | ***Darjeeling*** | ***Raiganj, Uttar Dinajpur*** | ***Chandragadhi, Jhapa*** | ***Ilam Bazaar, Ilam*** | ***Panchagarh Sadar, Panchagarh*** |
|---|---|---|---|---|---|---|
| ***Siliguri*** | | 64.8 | 181.9 | 77.5 | 150 | 69 |
| ***Darjeeling*** | 64.8 | | 233 | 110 | 75 | 132 |
| ***Raiganj, Uttar Dinajpur*** | 181.9 | 233 | | 174 | 247 | 236 |
| ***Chandragadhi, Jhapa*** | 77.5 | 110 | 174 | | 95 | 122 |
| ***Ilam Bazaar, Ilam*** | 150 | 75 | 247 | 95 | | 194 |
| ***Panchagarh Sadar*** | 69 | 132 | 236 | 122 | 194 | |

*Source*: Distances website

## IV.2 Regional Competitiveness

The Global Agenda Council 2013 "defines competitiveness as the set of institutions, policies and factors that determine the level of productivity of a country. The level of productivity, in turn, determines the level of prosperity that can be gained by an economy. The productivity level also determines the rates of return obtained by investments in an economy, which are the fundamental drivers of its growth rates; thus, a more competitive economy is one that is likely to sustain growth"[26]. The World Economic Forum publishes Global Competitiveness Reports (GCR) annually. They assess states on three pillars which are further subdivided in several components.

1. Basic Requirements sub-index
   a. Institutions
   b. Infrastructure
   c. Macroeconomic environment
   d. Health and primary education
2. Efficiency enhancers sub-index
   a. Higher education and training
   b. Goods market efficiency
   c. Labor market efficiency
   d. Financial market development
   e. Technological readiness
   f. Market size
3. Innovation and sophistication factors sub-index
   a. Business sophistication
   b. Innovation

In 2012−13, 144 countries were assessed. The rankings for the index and sub-indices are reported for the three countries in our study in Table 2. Bangladesh and Nepal are ranked at the bottom. The paradox in India's case is that it ranks closer to the top in terms of efficiency enhancers and innovation and sophistication but falls to the bottom in basic requirements.

**Table 2: Global Competitiveness Index, *2012−13***

| | ***GCI*** | ***Basic Requirements*** | ***Efficiency Enhancers*** | ***Innovation and sophistication*** |
|---|---|---|---|---|
| Bangladesh | 118 | 119 | 107 | 122 |
| India | 59 | 85 | 39 | 43 |
| Nepal | 125 | 121 | 126 | 133 |

*Source*: Schwab (2012)

We use the GCR methodology to assess the competitiveness of the districts. Although we do not construct an index, we use the parameters to compare the various aspects. Wherever district level variable, is not there, we use state or division level variable and when this is not available too,

[26] World Economic Forum website. www.weforum.org

we use national level variables[27]. We also supplement with other data wherever available and applicable.

### IV.2.A Institutions

This parameter consists of two components – Public and Private Institutions in the GCR. Public institutions measure property rights, ethics and corruption, undue influence, government efficiency and security. Private institutions measure corporate ethics, accountability, Regional variables are hard to get by in this category. We use national indicators and support more disaggregated data wherever available.

**Public Institutions**

India is ranked substantially better than Bangladesh and Nepal in majority the indicators except in the burden of government regulation in the GCR 2012−13 (Table 3). The public trust in politicians is quite low in all the three countries. The favoritism shown by government officials is quite high in all the three countries. The state of weak governance in all the three countries is also shown by the low rankings of the World Governance Indicators (Table 4). Nepal and Bangladesh is low and India does not even cross 50! Table 5 shows the high incidence of corruption that exists in all the three countries. Percent of firms expected to give gifts to public officials "to get things done" in Bangladesh is a whopping 85 percent. The Indian number is lower at 47 percent.

[27] Martin (2005) discusses the various ways to assess regional competitiveness. This is conceptually different from assessing the national competitiveness. Unlike nations, exchange rate movements and price-wage flexibility either do not work properly or do not exist at the regional level. To the contrary, interregional migration of mobile factors, capital and labor, can be a real threat to regions. There are two major views – one from a macro perspective (Krugman) and another from firms' perspective in the region (Porter). The latter is very difficult to assess given the lack of data in the South Asian countries.

**Table 3: Ranks of Institutions, 2012–13 (out of 144 countries)**

| | ***Bangladesh*** | ***India*** | ***Nepal*** |
|---|---|---|---|
| Institutions | 127 | 70 | 123 |
| Property Rights | 104 | 61 | 114 |
| Intellectual Property Protection | 131 | 63 | 118 |
| Diversion of Public Funds | 107 | 91 | 105 |
| Public trust in politicians | 124 | 106 | 125 |
| Irregular payments and bribes | 144 | 99 | 129 |
| Judicial independence | 104 | 45 | 89 |
| Favoritism in decisions of government officials | 135 | 92 | 72 |
| Wastefulness of government spending | 71 | 63 | 83 |
| Burden of government regulation | 85 | 98 | 86 |
| Efficiency of legal framework in settling disputes | 101 | 59 | 113 |
| Efficiency of legal framework in challenging regulations | 71 | 52 | 86 |
| Transparency of government policymaking | 101 | 65 | 116 |
| Government services for improved business performance | 120 | 75 | 115 |
| Business costs of terrorism | 103 | 114 | 133 |
| Business costs of crime and violence | 97 | 64 | 124 |
| Organized crime | 106 | 81 | 129 |
| Reliability of police services | 126 | 69 | 108 |
| Ethical behavior of firms | 139 | 81 | 125 |
| Strength of auditing and reporting standards | 127 | 44 | 115 |
| Efficacy of corporate boards | 116 | 75 | 133 |
| Protection of minority shareholders' interests | 131 | 52 | 110 |
| Strength of investor protection, 0–10 (best) | 24 | 39 | 65 |

*Source*: Schwab (2012)

**Table 4: Ranking of World Governance Indicators, 2011**

| ***Country*** | ***Voice and Accountability*** | ***Political Stability & Absence of Violence*** | ***Government Effectiveness*** | ***Regulatory Quality*** | ***Rule of law*** | ***Control of Corruption*** | ***Average*** |
|---|---|---|---|---|---|---|---|
| Bangladesh | 37.09 | 7 | 20 | 22 | 28.6 | 16 | 21.78 |
| India | 59.15 | 13 | 55 | 40 | 52.6 | 35 | 42.46 |
| Nepal | 31.46 | 6 | 23 | 26 | 17.4 | 23 | 21.14 |

*Note*: Ranks range from 0(lowest) to 100(highest)
*Source*: World Bank 2011

**Table 5: Indicators of Corruption**

| *Indicator* | *India* | *Nepal* | *Bangladesh* | *South Asia* |
|---|---|---|---|---|
| ***Year*** | ***2006*** | ***2009*** | ***2007*** | ***2009*** |
| Percent of firms expected to give gifts to public officials "to get things done" | 47.5 | 15.2 | 85.1 | 35.6 |
| Percent of firms expected to give gifts in meetings with tax officials | 52.3 | 14.9 | 54.4 | 27.8 |
| Percent of firms expected to give gifts to secure government contract | 23.8 | 62.2 | 26.7 | 28.5 |
| Value of gift expected to secure a government contract (% of contract value). | 1.0 | 4.4 | 1.2 | 1.6 |
| Percent of firms expected to give gifts to get an operating license | 52.5 | 11.7 | 32.4 | 14.4 |
| Percent of firms expected to give gifts to get an import license | 46.0 | 3.3 | 51.3 | 13.5 |
| Percent of firms expected to give gifts to get a construction permit | 67.0 | 17.8 | 23.5 | 19.3 |
| Percent of firms expected to give gifts to get an electrical connection | 39.6 | 11.0 | 42.4 | 32.5 |
| Percent of firms expected to give gifts to get a water connection | 26.6 | 0.0 | 52.7 | 22.2 |
| Bribery depth (% of public transactions where a gift or informal payment was requested) | ... | 14.4 | 40.8 | 25.1 |
| Percent of firms experiencing at least one bribe payment request | ... | 15.1 | 60.4 | 31.5 |
| Percent of firms identifying corruption as a major constraint | 25.6 | 19.9 | 54.9 | 34.9 |
| Percent of firms identifying the courts system as a major constraint | ... | 0.2 | 18.4 | 14.6 |

*Source*: Enterprise Surveys.org

Data on governance are available for the state of West Bengal. As per the Transparency International (2005) report, West Bengal is ranked the 13$^{th}$ most corrupt state in the 20 states surveyed. Water supply service is ranked the most corrupt service in the country (Table 6).

Table 7 compares the crime statistics of the two districts of India, Siliguri city, India, Nepal and Bangladesh. The city of Siliguri has a relatively high crime rate. Crime against women is also relatively high. India has a relatively high crime rate compared to Nepal and Bangladesh.

**Table 6: Ranking of Public Services in West Bengal (% of respondents), 2005**

| | Direct experience of bribing | | Quality of service is poor | | Using middlemen | | Perception that department is corrupt | | Commitment to reduce corruption | | Perception Increased | | Composite Index Value | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Need Based** | | | | | | | | | | | | | | |
| | West Bengal | India | West Bengal | India | West Bengal | India | West Bengal | India | West Bengal | India | West Bengal | India | West Bengal | India |
| Rural Finance Institutions | 3 | 19 | 5 | 23 | 7 | 14 | 24 | 25 | 24 | 31 | 10 | 29 | 10 | 22 |
| Income tax | 18 | 20 | 22 | 30 | 11 | 23 | 47 | 62 | 34 | 38 | 19 | 38 | 26 | 35 |
| Municipalities | 36 | 23 | 60 | 60 | 7 | 32 | 75 | 75 | 62 | 60 | 53 | 57 | 51 | 47 |
| Judiciary | 48 | 47 | 51 | 62 | 4 | 31 | 79 | 81 | 53 | 58 | 37 | 63 | 53 | 59 |
| Land administration | 59 | 48 | 56 | 58 | 7 | 37 | 74 | 79 | 63 | 63 | 51 | 62 | 59 | 59 |
| Police | 32 | 80 | 70 | 74 | 27 | 12 | 93 | 88 | 74 | 64 | 73 | 77 | 59 | 77 |
| **Basic** | | | | | | | | | | | | | | |
| Schools | 12 | 18 | 16 | 20 | 6 | 9 | 28 | 45 | 21 | 27 | 18 | 31 | 18 | 26 |
| Water Supply | 77 | 9 | 55 | 33 | 16 | 13 | 87 | 56 | 44 | 37 | 36 | 38 | 68 | 29 |
| PDS (Ration Card/ Supplies) | 10 | 16 | 52 | 43 | 4 | 27 | 74 | 62 | 63 | 48 | 55 | 46 | 39 | 37 |
| Electricity (Consumers) | 16 | 20 | 37 | 41 | 6 | 12 | 62 | 67 | 49 | 50 | 43 | 49 | 34 | 39 |
| Govt. Hospitals | 21 | 27 | 52 | 44 | 11 | 18 | 74 | 67 | 57 | 48 | 54 | 50 | 44 | 42 |

*Source*: Transparency International 2005

**Table 7: Crime Statistics per thousand**

| ***Crime Category*** | ***Darjeeling*** | ***Uttar Dinajpur*** | ***Siliguri Police Station*** | ***India*** | ***Nepal*** | ***Bangladesh*** |
|---|---|---|---|---|---|---|
| ***Year*** | ***2012*** | ***2012*** | ***2012*** | ***2012*** | ***2009−10*** | **2010** |
| Total | 0.85 | 1.74 | 5.93 | 1.97 | 0.61 | 0.11 |

*Note*: Population data from 2011 is used for the calculation of per capita figures in all the six cases
*Sources*: Compiled from National Crime Records Bureau website, Source: Central Bureau of Statistics Nepal (2010) and Bangladesh Police (2012)

## Business Institutions

Business institutions in India are more robust (Table 3) despite adverse regulatory inefficiencies (Table 8). Business institutions are substantially more robust in India as per the Global Competitiveness Report (Table 3). Bangladesh falls very low in terms of Intellectual Property

Protection, ethical behavior of firms. Nepal's efficacy of corporate boards is very low. The Heritage Foundation shows the adverse circumstances faced by the business sector in India. It shows indicators of regulatory efficiency. It comprises of four measures – "Business Freedom, Investment Freedom, Labor Freedom and Monetary Freedom. Business Freedom is about individual's right to establish and run an enterprise without the undue interference of the state. Investment freedom is the measure of maximum entrepreneurial opportunities and incentives for expanded economic activity, greater productivity and job creation. Labor freedom is the measure of individuals' ability to work as much as they want and wherever they want. Monetary freedom requires a stable currency and market determined prices" (Heritage Foundation, 2013). Higher the score, greater is the freedom in the respective areas. India scores lower than Bangladesh and Nepal in business freedom. In Investment freedom, India is between Bangladesh and Nepal. India scores highest in labor freedom and Nepal scores higher in Monetary Freedom. The lower score of India in Monetary Freedom is probably a reflection of more recent adverse times in the macroeconomic stability of India in 2012−13 rather than a commentary on India's regulatory efficiency.

**Table 8: Indicators of Regulatory Efficiency, 2013**

| ***Country*** | ***Business Freedom Score*** | ***Investment Freedom Score*** | ***Labor Freedom*** | ***Monetary Freedom*** |
|---|---|---|---|---|
| India | 37.3 | 35 | 73.6 | 65.3 |
| Bangladesh | 68 | 55 | 51.9 | 65.4 |
| Nepal | 57.2 | 10 | 44.3 | 75.1 |

*Note*: Higher score indicates higher freedom in the economy.
*Source*: Heritage Foundation (2013)

Finance statistics for firms show India ranks ahead (Table 9). This supports the Global Competitiveness Report about better quality Indian business institutions. Despite that, Indian capacity utilization is lower than the South Asian average (Table 10). The statistics in Table 10 are worrisome because the Enterprise Survey for India was done in 2006. Since then we have had the Financial Crisis of 2008, recovery and the subsequent slowdown in 2012−13. One would make an intuitive guess with the Index of Industrial Production falling in India, capacity utilization would have come down even further.

## Table 9: Indicators of Firm Finance

| *Country* | *India* | *Nepal* | *Bangladesh* | *South Asia* |
|---|---|---|---|---|
| *Year* | *2006* | *2009* | *2007* | *2009* |
| Percent of firms with a checking or savings account | ... | 73.7 | 95.3 | 81.5 |
| Percent of firms with a bank loan/line of credit | ... | 39.1 | ... | 30.0 |
| Proportion of loans requiring collateral (%) | 74.3 | 80.9 | ... | 82.2 |
| Value of collateral needed for a loan (% of the loan amount) | 126.0 | 259.7 | ... | 211.6 |
| Percent of firms not needing a loan | ... | 50.7 | 28.6 | 39.9 |
| Percent of firms whose recent loan application was rejected | ... | | ... | 8.5 |
| Percent of firms using banks to finance investments | 46.6 | 17.5 | 24.7 | 26.9 |
| Proportion of investments financed internally (%) | 58.0 | 80.7 | 79.1 | 73.1 |
| Proportion of investments financed by banks (%) | 27.9 | 12.4 | 17.1 | 19.0 |
| Proportion of investments financed by supplier credit (%) | 3.9 | 0.3 | 0.2 | 0.6 |
| Proportion of investments financed by equity or stock sales (%) | 0.9 | 3.9 | 1.3 | 3.4 |
| Percent of firms using banks to finance working capital | 36.4 | 32.1 | 43.1 | 30.4 |
| Proportion of working capital financed by banks (%) | 18.0 | 16.3 | 19.6 | 14.8 |
| Proportion of working capital financed by supplier credit (%) | 7.5 | 0.8 | 3.7 | 5.8 |
| Percent of firms identifying access to finance as a major constraint | 15.8 | 5.3 | 42.5 | 27.1 |

*Source*: Enterprise Surveys.org

## Table 10: Indicators of Firm Performance

| **Indicator** | **India** | **Nepal** | **Bangladesh** | **South Asia** |
|---|---|---|---|---|
| ***Year*** | ***2006*** | ***2007*** | ***2009*** | ***2009*** |
| Capacity utilization (%) | 70.9 | 80.7 | 79.7 | 78.0 |
| Real annual sales growth (%) | | 2.1 | 1.5 | 4.1 |
| Annual employment growth (%) | | 7.7 | 4.7 | 7.2 |
| Annual labor productivity growth (%) | | -4 | -2.2 | -1.6 |

*Source*: Enterprise Surveys.org

To get a sense of the business institutions of the five districts we turn to the primary surveys done in the five districts. The caveat is that the sample size is small and it was limited to people dealing with the tea industry. While we talk about the primary survey in detail later, one indicator from the primary survey gives an indicator on doing business in the five districts (Table 11). From this table one can see that electricity is a major obstacle is all regions. In Uttar Dinajpur and Illam, Nepal the percentage of respondents rating it as a problem is the highest. Obtaining Business Licenses and Permits is deemed as an obstacle by approximately 20 per cent of the sample in India. Transport, Corruption, Labor Regulations and skills/education of workforces are deemed as major obstacles for doing business by more than 50 percent of the sample except Bangladesh. Ilam is worse than Jhapa in terms of business institutions. From this sample, one would infer that Panchagarh faces least obstacles in doing business and Ilam, the worst. However, as we discuss in the case study for tea that transport is one major obstacle for doing business even in Bangladesh. Therefore, one needs to be careful in interpreting these numbers.

**Table 11: Share of Respondents facing Different Constraints as a Major Obstacle for Doing Business (%), 2013**

| ***Issues*** | ***Siliguri (Plains), India*** | ***Darjeeling (Hilly), India*** | ***Uttar Dinajpur, India*** | ***Jhapa, Nepal*** | ***Ilam, Nepal*** | ***Panchagarh, Bangladesh*** |
|---|---|---|---|---|---|---|
| Sample Size | 61 | 16 | 30 | 30 | 31 | 30 |
| Electricity | 43 | 43.75 | 86.7 | 100 | 90.32 | 20 |
| Transport | | 37.5 | 10 | 75.9 | 74.19 | 3.3 |
| Customs & Trade Regulations | | | | 31.0 | 41.94 | |
| Practices of Competitiveness in the Informal Sector | | | | 20.7 | 16.13 | |
| Access to Land | | | | 48.3 | 32.26 | |
| Crime, Theft and Disorder | | | 16.7 | 34.5 | 58.06 | 6.7 |
| Corruption | | | 10 | 79.3 | 100.00 | |
| Access to Finance | 1.6 | | 6.7 | 51.7 | 87.10 | |
| Tax Rate | | | 3.3 | 3.4 | 9.68 | |
| Tax Administration | | | 3.3 | 6.9 | 12.90 | |
| Obtaining Business Licenses and Permits | 16.4 | 18.75 | 16.7 | 10.3 | 25.81 | |
| Political Instability | | | | 37.9 | 19.35 | |
| Corruption | | | 3.3 | 93.1 | 96.77 | |
| Courts System | | | | 3.4 | 9.68 | |
| Labor Regulations | | | | 100 | 93.55 | |
| Skills/Education of Workforce | 32.8 | 12.5 | 40 | 89.7 | 96.77 | 3.3 |
| Other Constraints | 15 | | | 69.0 | 9.68 | |

*Note*: The respondents were given the above issues and asked to tick whether these issues are a non-issue or a minor obstacle or a major obstacle, or very severe obstacle

*Source*: Field Survey 2013

In sum, political institutions are weak across all the three countries marked remarkably by a lack of trust in government. Corruption is all pervasive especially in Bangladesh and India. While the national numbers are better for Nepal, the primary survey at the district level indicates corruption as a major obstacle in doing business. The state of West Bengal which houses the Siliguri corridor is the 13$^{th}$ most corrupt state in the country. Crime rates are higher in India and even more so in Siliguri. Business institutions are more robust in India. The slowdown of the Indian

economy in 2012−13 is affecting perceptions about the economy. Business regulations are very restrictive. This is picked up in the business sentiments at the district level. Ilam and Jhapa in Nepal mark infrastructure as a major obstacle in doing business. In contrast, there are no major obstacles in business in Panchagarh except crime and theft.

### IV.2.B Infrastructure

We look at electricity, information, communication and technology (ICT) and transport infrastructure.

#### Electricity

The primary survey conducted in all the five districts (Table 11) list electricity as a major obstacle. It ranges from 20 percent in Panchagarh, Bangladesh to 100 percent in Jhapa, Nepal. In our interviews in Jhapa, the chamber of commerce expressed its dissatisfaction with the state of affairs in electrical power. The quality of supply in Nepal is quite low with blackouts for 12 hours or more. It was felt that the hydropower capacity of Nepal was not being achieved to its potential unlike Bhutan. In the interviews in Darjeeling, electrical power was a non-issue either in the plains or hills.

District wise data on electricity supply are not available for India. In West Bengal, the installed capacity is 8,649.29 megawatts as of June, 2013[28]. 82.3 percent of its energy supply comes from thermal-coal. 71.7 percent of its energy needs are met by the state sector. Hundred percent of its towns are electrified[29]. And 99.5 percent of its villages were electrified in 2010−11. The per-capita consumption of electricity in West Bengal was 550.14 kilowatts in 2009−10, lower than the Indian average of 778.71[30]. The Census 2011 data shows wide differences between neighboring districts of Darjeeling and Uttar Dinajpur (Table 12). The share of households in West Bengal with electricity as their usual source of lighting is 54.5 percent[31]. Darjeeling is way above that and Uttar Dinajpur way below. There is significant rural-urban divide. In rural Darjeeling, 69.5 percent of households and 90.8 percent of urban households use electricity, respectively. Urban Uttar Dinajpur is also well-connected with electricity (74.7% of urban households). Only 27.9 percent of households in rural Uttar Dinajpur use electricity as their primary source of lighting (Census, 2011).

[28] Central Electricity Authority (CEA), 2013.
[29] Central Electricity Authority (CEA), 2012.
[30] Ministry of Power, 2011.
[31] The percentage of households which use electricity as their primary source of lighting in India is 67.3 percent.

**Table 12: Households by Usual Source of Lighting (%), 2011**

| | *Darjeeling, India* | *Uttar Dinajpur, India* | *Panchagarh, Bangladesh* | *Jhapa, Nepal* | *Ilam, Nepal* |
|---|---|---|---|---|---|
| Electricity | 77.74 | 33.32 | 28.8 | 82.10 | 65.54 |
| Solar Energy | 0.88 | 0.62 | 2.7 | 0.54 | 6.82 |
| Kerosene | 20.16 | 65.5 | 68 | 16.21 | 23.07 |
| Others | 1.22 | 0.56 | 0.5 | 1.15 | 4.57 |

*Sources*: Government of Bangladesh 2012; Government of Nepal 2012; Census 2011

The total installed capacity in Bangladesh as of 2010−11 was 7,613 MW[32]. The total per-capita generation in 2010−11 was 252 kilowatts (kw). The per-capita consumption is 170.27 in 2009−10[33]. 96.1 percent of Bangladesh's energy came from oil, gas and coal sources in 2010 with gas being the significant source (WDI). There is a 20 MW gas turbine in Rangpur, Bangladesh (Panchagarh district is in that division). The maximum demand in the division is 92.85 MW[34].

The energy statistics in Nepal are contradictory in different sources. Total energy available in Nepal was 3,180.66 GwH in 2007–08 and hydro generation constituted 56.5 percent of it (Shrestha, 2010). It also shows that 85 percent of Nepal's energy needs were met from traditional sources like firewood, agricultural residue and animal residue. In contrast, WDI shows that 99.9 percent of Nepal's electrical energy came from hydroelectric sources in 2010. Nepal's per-capita consumption was 103 kWH in 2010, lower than Bihar, the poorest state in India (WDI). The latest Nepal Census data in 2011 shows that 82.1 percent of households had electricity in Jhapa and 65.54 percent of households had electricity in Ilam. The Nepal number is 67.3 percent. Jhapa's achievements is far above the national Nepalese number. However, this number is doubtful as Shrestha (2010) discusses the clockwork load shedding schedule. The interviews in Jhapa focused on the poor electricity condition in the state with 12 hour blackouts. In Ilam also we heard about 5 hour blackouts every day. The estimate for hydro potential in Nepal is 43,000 MW but projects are delayed which in turn affects the domestic industrial sector adversely as per the interviews held in Nepal.

In conclusion, one finds that neighboring districts across the borders are similar to each other but neighboring borders within the same country may be different supporting Farole (2013) point on rising regional imbalances within countries. Uttar Dinajpur, India is similar to Panchagarh, Bangladesh. Majority of households in both districts list kerosene as their source of lighting. Jhapa and Ilam districts are more similar to Darjeeling even though they are in a different country. In Jhapa, 82 per cent of its households saying that electricity is their usual source of lighting. The Darjeeling district would fare much better in terms of quality even though the number of households using electricity as their primary source of lighting is lower.

[32] Board of Investment, Prime Minister's Office website.
[33] Bihar, India per capita consumption is 122.11 and Assam is 204.8 kWH in 2009−10 (Ministry of Power, 2011).
[34] Bangladesh Power Development Board, 2008−09.

Both India and Bangladesh have encouraged private sector participation in the power sectors of their countries. Nepal is yet to open up its power sector and Shrestha (2010) makes a strong argument for it. From our interviews in Nepal, we assessed that the government is seriously evaluating private sector participation by organizing hydro conference in the capital city and Indian private sector infrastructure providers like GMR may already be working in the country. There is no independent confirmation of that.

Nepal imports energy from India (13% in 2007−08) as per Shrestha (2010) and it has to pay a huge cost in terms of rising fiscal and current account deficit. India and Bangladesh have signed a bilateral tie in 2010. It would involve the following: "(i) Exchange of power through Grid connectivity between the two countries; (ii) Joint venture (JV) investment in power generation and (iii) Capacity development of Bangladesh Power Development Board"[35]. Several papers including Ahmed, Kelegama and Ghani (2010) have mentioned energy as a possible area of regional cooperation. While the first steps have been taken by India and Bangladesh, this analysis clearly points out to the possibility of even greater cooperation and integration and at the same time contributing to the development of the whole region. Especially since West Bengal comparative advantage is in coal production, by increasing capacity, it can easily supply cheap (although not so green) power to the neighboring countries. Renewable power is hardly being used in the region and there is a great need for coordination and integration on that front.

**Information, Communication and Technology (ICT)**

The phenomenal growth of mobile phones in South Asia in a matter of ten years is a legendary story. The story was driven by a high volume-low tariff model (UNCTAD, 2010). The tariffs in Bangladesh and India were the lowest in the world in 2008[36]. Average mobile cellular prepaid tariff in the world was US$ 10.1 per month. Mobile cellular pre-paid tariff was the lowest in Bangladesh (US $1.3 per month) and India came second (US$1.6 per month) in 2008. Nepal's tariff was $2.9 a month. Pre-paid subscriptions for mobile phones dominate South Asia as they give greatest flexibility to people with low irregular incomes, no permanent address and no credit history (TRAI, 2012, Sinha, 2005 and Waverman et al. 2005). The latter is changing in India with identity requirements becoming more stringent. Further the pre-paid contracts allow exact monitoring of use.

Both Bangladesh and India have vibrant private sector participating in this sector. The Telecom Regulatory Authority of India is the regulator in India and Bangladesh Telecommunication Regulatory Commission in Bangladesh. Indian operator, Airtel operates in Bangladesh. The Nepalese public company, Nepal Doorsanchar Ltd., a public limited company provides all ICT services and there are private players in the wireless market.

Table 13a and 13b indicate the infrastructure of phones, computers and internet. Except mobile phones, ICT infrastructure is quite low in the three countries. India has higher mobile phone subscriptions than either Nepal or Bangladesh. Internet subscriptions are also higher. The number of individuals using internet is highest is India which is then closely followed by Nepal. Bangladesh is significantly lower.

[35] Bangladesh Power Development Board website.
[36] The statistics in this paragraph have been taken from TRAI (2012).

Table 13.b shows the ICT infrastructure by district except for Panchagarh, Bangladesh. The Census data for each of the countries are used. Bangladesh fares the worst in terms of households with computers and internet. Since Panchagarh internet numbers are lower than Bangladesh numbers, one can assume that Panchagarh has lower access to computers too. Although Uttar Dinajpur of India is similar to Panchagarh, its numbers are significantly better. However, compared to Darjeeling even in the ubiquitous category of mobile phones (32.24%), its numbers are abysmally low. The percent of households owning mobile phones is high in Ilam and Jhapa compared to Darjeeling and the numbers are higher in Jhapa (73.66%) versus Ilam (69.24%). Discussions in Siliguri and Nepal confirm that that the mobile phone is a norm in both the countries with no or little issues of connectivity.

**Table 13a: ICT Indicators, 2011**

| *Indicator* | *Bangladesh* | *India* | *Nepal* |
|---|---|---|---|
| Fixed Telephone Subscriptions (per100 inhabitants) | 0.65 | 2.47 | 2.77 |
| Mobile Phone Subscriptions (per100 inhabitants) | 56.1 | 79.9 | 43.8 |
| Percentage of Individuals using Internet | 5.00 | 12.58 | 11.15 |
| Fixed Broadband Subscriptions (per100 inhabitants) | 0.34 | 1.14 | 0.40 |

*Source*: International Telecommunications Union website

Darjeeling has the highest number of households with computer, barely 9.96 percent amongst the five districts. It also has the highest number of households have computers with internet (2.86%). Jhapa and Ilam are lower than Darjeeling and Ilam's number is lower than Jhapa. Mobile phones came to Ilam about five years ago as per our interviews. In Jhapa, internet connectivity was low with most people using internet café to access the net. In India, internet connectivity quality varies across the plains and hills of Darjeeling. In the plains, the access to internet is the norm and there are little connectivity issues as per a tea trader. In the hilly regions of Darjeeling, internet is available but the connection is spotty as per a tea trader.

**Table 13b: Households by Household Facilities (%), 2011**

| *Households* | *Darjeeling* | *Uttar Dinajpur* | *Panchagarh* | *Jhapa* | *Ilam* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|---|---|---|---|---|
| With Land Phone | 6.54 | 2.26 | NA | 7.84 | 4 | 10.0 | 7.3 | NA |
| With Mobile Phone | 60.72 | 32.24 | NA | 73.66 | 69.24 | 59.2 | 64.6 | NA |
| With Computer | 9.96 | 5.22 | NA | 6.57 | 2.56 | 9.5 | 7.3 | 3.0 |
| With Internet | 2.86 | 0.48 | 0.25 | 2.29 | 0.72 | 3.1 | 3.3 | 1.1 |

*Sources*: Census 2011, Government of Nepal 2012 and Government of Bangladesh 2012

Overall, one can say that the mobile phone has only brought the world closer with it bridging gaps. The seminal paper by Jensen (2007) showed that the mobile phone reduced information asymmetries in the fishing market in Kerala and prices converged across regions. However, the access to mobile phones is still quite low in areas like Uttar Dinajpur. The number of households with computers with internet is low. Connectivity issues exist in the hilly areas but their access in the plains is good. Regional imbalances continue to exist between districts in the same country and between rural and urban areas within the same district. For example, in rural Uttar Dinajpur,

28.53 percent of households have mobile phones versus 61.8 percent of households in urban Uttar Dinajpur. International connectivity was not a problem given our personal experiences. Despite the progress, there is much to be achieved. All the three countries need to make massive improvements to the ICT infrastructure.

## Transport

Transport is a key measure for not only potentially measuring the competitiveness and connectivity of the region but is a key element in assessing trade potential. Recent literature on trade is always emphasizing on this particular concept (De, 2013 and De & Saha, 2013). Further, the Siliguri corridor is a key trade route area because it connects the North Eastern region of India with the rest of the country, trade between Bangladesh and Nepal and Bangladesh and Bhutan takes place across this region (Figure 1). Nepal is a land locked country and its exports are carried by road through India. The tea produced in Ilam or Japha is taken to the Indian traders or Indian port for further exporting using this route. The Siliguri corridor is connected through rail and road but is very congested. With limited transit between India and Nepal and no transit facilities between India and Bangladesh, Siliguri corridor continues to be important.

In this section, we explore the state of transport facilities in the five districts. Other than road and rail connectivity, inland water transport is also explored.

### Roads

In India roads carry 65 percent of freight and 80 percent of passenger traffic. It is the most significant transport option in India and this extends to the Siliguri corridor too. As of 31st March, 2011, the total road length in West Bengal was 299,209 kilometers (km) which is 337.13 per 100 square km of area and 327.55 per 1 lakh of population3738. Only 38.6 percent of the roads is surfaced. The primary road network in India consists of Expressways and National Highways (NHs). There has been massive investment in the road sector in India with significant public-private participation (PPP) resulting in tremendous improvement of the road network in India. The National Highways Authority of India (NHAI) is responsible for majority of the primary road network. The states also are responsible for part of the NHs and the secondary road network comprising of State Highways and Major District Roads. The national figures suggest that the primary road network in India carries 40 per cent of all road traffic and the secondary road traffic carries the rest 40 percent.

The total length of National Highways in West Bengal is 2,578 km which is 2.9 per 100 square km and 2.82 per lakh of population[39]. The NHs form only 0.9 percent of West Bengal roads[40]. Hundred percent of the NHs is surfaced but only 21.5 per cent of the roads are four lane and above. Total length of State Highways (SHs) is 4,505 km. Hundred percent is surfaced but 69.3

[37] All the statistics in this paragraph are from the MoRTH (2012a).
[38] These are better than the Indian averages- Road length per 100 square km of area is 142.68 and road length per 1 lakh of population is 387.57.
[39] The corresponding India numbers are: NH is 2.16 per 100 square km and 5.86 per lakh of population.
[40] The corresponding number for India is 1.7 percent.

percent of the SHs are standard single lane. The other types of roads are urban, rural and project roads.

Siliguri and Uttar Dinajpur are well connected to the rest of West Bengal through National Highways and State Highways. NH31 and NH 34 pass through the districts of Uttar Dinajpur. The NH 31 is the main road which connects India to the North-Eastern region and goes via Siliguri. The NH 55 goes from Siliguri to Darjeeling (MoRTH website). Our interviews revealed that the situation of roads has improved since there was a change of hands in state government after thirty years. There has been significant improvement in a part of the Siliguri-Darjeeling road with the quality and road signage equal to western standards.

**Table 14: Roads**

| | ***Darjeeling*** | ***Uttar Dinajpur*** | ***Panchagarh*** | **Jhapa** | ***Ilam*** |
|---|---|---|---|---|---|
| ***Year*** | ***2011*** | ***2011*** | ***2009*** | ***2008*** | ***2008*** |
| Road Length (km) | 4,698.7 | 6,757.3 | 194.7 | 2008.4 | 228.45* |
| Road length in km per lakh population | 255.1 | 225.2 | 19.72 | 247.1 | 78.71* |
| Surfaced Road (%) | 38.1 | 37.5 | 80.9 | 17 | NA |

*Notes*: For Indian districts, we added up roads maintained by PWD, Municipality, Zilla Parishad and Panchayat Samiti & Gram Panchayats. All roads are available up to March, 2011 but the Panchayat Samiti and Gram Panchayat roads are from 2008−09. Therefore, the NHs maintained by NHAI are not included in these calculations.
*This only includes the strategic road network in the district
*Sources*: Government of West Bengal (2012); Department of Roads, Government of Nepal (2008) and; Bangladesh Bureau of Statistics (2010)

West Bengal has seen one of the lowest compounded annual growth rate (CAGR) of 6.8 percent of registered motor vehicles during 2001−11 (MoRTH, 2012b). The corresponding Indian number was 9.9 percent. The Census 2011 shows that in Darjeeling, 32.9 percent of households own bicycles, 10.4 percent own scooters, motor cycles, mopeds and 4 percent own car, jeep or a van. For Uttar Dinajpur the corresponding numbers are: 60.6 percent households own bicycles, 5.3 percent own scooters, motor cycles or mopeds and 1.4 percent own a car or jeep or a van.

Despite low growth in registered vehicles, roads are crowded in Siliguri. There is little public transport in the area as per observing while traveling in the region. However, the North Bengal State Transport Corporation exists[41]. Denizens share autos to travel within the cities of Darjeeling and Siliguri or between them. While the roads within the city are of decent quality with four lane roads, the traffic is disorganized like any other growing town in India. However, it is when one travels outside the city that one realizes the full extent of the quality of the roads. Roads are two lane i.e. one way each direction and therefore overcrowded. Further as per a tea trader, traveling from Siliguri to the tea estate is a pain because the Siliguri to Darjeeling road often gets blocked and one can potentially spend hours travelling that route.

[41] The North Bengal State Transport Corporation had 701 serviceable buses in 2010−11 i.e. 4.1 buses per lakh population which is woefully inadequate. There were 60 percent of buses on road to the average fleet held. Total earning km for the fleet was 402.18 lakh. The vehicle productivity was 235 km per day per bus on average fleet operated and 141 km per day per bus on average fleet held. Load factor was 69 percent. There were 8.46 staff per bus on average fleet operated and 5.05 staff per bus on average fleet held. Staff productivity was 28 km per worker per day. There were 22 depots.

The strategic network is the key part of Nepal's road system and comprises the East West Highway (EWH) running the length of the country in the southern Terai, and feeder roads running off the EWH to connect to district centers and border crossings. Rural roads, typically earth and gravel tracks, link small rural population centres to the strategic network. The remainder of the road system comprises urban roads and rural roads. The Department of Roads is responsible for the strategic network; responsibility for rural and urban roads has been devolved to local government units. PPP in roads is being discussed in Nepal.

Jhapa district has an estimated road network of just over 2,008 km including strategic, urban and rural roads. It has 3 national highways and 5 feeder roads totaling just over 217 km (Government of Nepal, 2013). The majority (65%) are black topped, followed by gravel (18%) and earthen surfaces (17%). These roads are managed by the Divisional Road Office of the Department of Roads based in Damak. When one gets off the strategic roads, the road quality worsens. Roads within areas like Birtamode are wide and crowded showing unorganized urbanisation[42]. There is limited public transport. Although Birtamode got itself a fancy new bus terminal. However, the bus terminal is a off the main road and therefore people still prefer standing on the main street which runs through the town.

Ilam district is linked to Nepal's main road network to East-west Highway at Char Ali. Ilam is crossed by a road that leads to adjoining districts Panchthar and further up to Taplejung (Government of Nepal, 2011). Road from Fikkal through Pashupati Nagar, border town, lead to the city of Darjeeling in India. Interviews with tea traders and business people suggest that roads in Eastern Terai are not an issue. Further, even our own observations while traveling shows that the road between Ilam and Pashupati Nagar was very good. This has been a recent improvement as previously Ilam used to be inaccessible. Public road transport is limited between Ilam and Birtamode with most people using shared jeeps which are in rickety condition. They usually are overcrowded.

There are limited transit facilities between India and Nepal where trucks can go into each other's country but have to return within 72 hours.

Similar to India, Bangladesh has National and Regional Highways and Zila roads. Bangladesh encourages PPP in road construction in Bangladesh. Majority of the available Panchagarh roads are paved (Table 14). However, the length is abysmally small. Panchagarh has no regional highways. 44.5 percent of the roads is National Highways and the rest are Zila roads (Bangladesh Bureau of Statistics, 2010). Inter-city road transport is mainly private. There are no transit facilities between Bangladesh and India. Between Bangladesh and Nepal, transit facilities exist but the literature suggests that the traffic is very low due to India imposing stringent conditions (Ahmed, 2011). Ahmed (2011) also mentions about the possibility of India investing in Bangladeshi roads.

[42] Birtamode is the commercial, educational and transport hub of the Jhapa district. The EW highways passes right through it and it is at the centre of the district. It is 12 km away from the Bhadrapur airport. However, Birtamode is not a declared municipality which has resulted in unplanned urbanization. The main road is good but the link roads are narrow. Road Drainage is minimal which means that people have to go through slush of mud to reach the main road. Bhadrapur, is the centre of the tea trade is a declared municipality and one of the oldest ones in Nepal. It houses the airport. However, the construction of the EW Highway has resulted in its decline as the centre of activities moved away from it towards Birtamode.

Overall, all the three areas need significant investment in road transport to facilitate trade. This does not even require complicated political negotiations. Internal domestic investment or inviting foreign investment in the roads sector will itself go a long way in facilitating trade. Considering that India has developed expertise in developing roads over the last ten years, this can be a boon for other countries given similar institutions.

Railways

This is the second most important transport option after roads in the Siliguri corridor. India has one of the largest railway networks in the world. It has 17 railway zones. The two Indian districts in our study fall in the North-East Frontier Railway (NEFR) zone, the third smallest rail zone in the country[43]. However it is one of the original nine railway zones that India inherited from the British. Comparisons of the three countries show that although India has higher total route length, the rail traffic density of passengers is much higher in Nepal and Bangladesh (Table 15). The railways freight traffic density is higher in India. The NEFR zone route length is higher than Bangladesh but railway traffic density of passengers in Bangladesh is 61 times higher than NEFR zone! The railway network in Bangladesh and Nepal in under tremendous pressure it is obvious that there is pent up demand in the country for railway. Kumar and Mukherjee cite Subramanian and Arnold (2001) that railways in India and Bangladesh suffer from overstaffing, poor maintenance and old rolling stock.

**Table 15: Rail Statistics**

| | ***India*** | | ***Nepal*** | ***Bangladesh*** |
|---|---|---|---|---|
| ***Year*** | ***2010−2011*** | | ***2007*** | ***2011*** |
| | ***North East Frontier Railway*** | ***Total*** | ***Total*** | ***Total*** |
| Total Route Length(km ) | 3,908.02 | 64,460 | 59 | 2,835.04 |
| Passengers km (billion) | 14 | 1,956 | N.A. | 7,305 |
| Railway Traffic Density of Passenger | 256.33 | 10,142 | 21,695 | 15,696 |
| Net Tonne km (million) | 14.6 | 625.7 | N.A. | 710 |
| Railway Traffic Density of Freight | NA | 5,717 | 153 | 1,079 |

*Notes*: Railway Traffic Density of Passenger is the number of passengers transported annually divided by rail route km

Railway Traffic Density of Freight is the tonnes transported annually divided by rail route km

The total length has remained the same as of 2009−10 (Bangladesh Railways website).

*Sources*: Ministry of Railways, 2012; World Bank Transport website and; WDI

India: The North-Eastern Frontier railway zone consists of five sub-divisions – Tinsukia (Assam), Lumding (Assam), Rangiya (Assam), Katihar (Bihar and West Bengal) and Alipurduar (West Bengal). Among the five, the Katihar sub-division covers the railway stations in the two districts**.** Pre-independence, trains would pass through Katihar to go to Nepal and Bangladesh. To this day the trains travel in the same direction but stop at the border. Katihar itself is in Bihar. Further detailed statistics on the Katihar sub-division is not readily available. However, the West Bengal railway statistics give data on the share of the NEFR zone which falls under the state. The total route length of the NEFR in West Bengal in 2010–11 was 975.5 km[44]. Out of that 80.2

[43] The zone covers Bihar, North Bengal and the North-Eastern region of India.

[44] Government of West Bengal (2012).

percent is broad gauge (BG)[45]. The rail line is not electrified at all unlike the three other rail zones present in West Bengal. There are 140 railway stations in the West Bengal part of the NEFR zone[46]. Passengers originating from this section totaled 16,336 thousand in 2010-11[47].

The city of Siliguri is served by three stations- New Jalpaiguri, Siliguri Junction and Siliguri Town. All are fully BG. New Jalpaiguri (located in the neighboring district of Jalpaiguri) is the pre-eminent station in the NEFR zone, located only 5 km from Siliguri and is connected to all major stations in India including Kolkatta, Delhi and Mumbai. It is the gateway to North Eastern part of India and connects the rest of North Bengal. The station handles over 150 trains daily (up/down) and serves about 2,25,000 passengers every day[48]. About 75 trains start/pass from this station. The station also has very good facilities for passengers for them to rest and change.

The famous "toy train" from Siliguri to Darjeeling is a major tourist attraction, a remnant of the British engineering marvel. This is the only remaining narrow gauge (NG) in the NEFR zone of West Bengal. The train line is the highest in India. It is called the Darjeeling-Himalayan railway, with headquarters in Kurseong. It is an UNESCO Worl Heritage site. The line extends from New Jalpaiguri to Darjeeling, which is at a distance of 87.5 kms. Unfortunately the train often breaks down part due to engineering problems and part due to engineering issues. The train was working only till Kurseong at the time of our visit in April. The line is very slow and mostly directed to tourists.

The major railway station in Uttar Dinajpur is at Dalkhola, which is well connected to the major cities of West Bengal. It is situated on the major Kolkata - Guwahati railway line and is linked with the cities like New Delhi, Bangalore, Mysore, Lucknow, Chennai and Puri. The capital city of Raiganj also has its own railway station. Uttar Dinajpur has a transit facility between India and Bangladesh at Radkhikapur (India) and Biral, (Dinajpur district, Bangladesh). It is not working since 2005. On the Indian side, the network is broad gauge whereas on the Bangladesh side it is still meter gauge. The latter is in the process of getting converted.

Overall, train punctuality is 75 percent in India against the goal of 95 percent. Technological readiness has come to the Indian Railways with people able to buy tickets online. Services on mobile have also started. Recently, wi-fi network was made available on an inter-city train. Unlike the roads sector, PPP in the railways is low and in some on-board services. It is envisaged that there will be PPP in passenger coach manufacturing in the 12th Five Year Plan (BR website).

Bangladesh: It has a railway network which publicly owned and divided into the Eastern and Western zones[49]. It offers international (Dhaka to Kolkata), inter-city and sub-urban train services. Bangladesh Railways has allowed private services in selected routes since 1997 (different from India). On-board services on trains have been privatized in selected routes. BG, meter and dual gauge systems (MG and DG) exist in Bangladesh with the MG consisting of 63.5

[45] Broad Gauge both in India and Bangladesh is defined as 1.676meter (m). Meter Gauge is defined as 1m. Narrow Gauge is defined as between 0.61 and 0.762m.
[46] Ibid.
[47] Ibid.
[48] RailEnquiry (2013).
[49] The statistics in this paragraph have been cited from the Bangladesh Railways website unless and until mentioned otherwise.

percent of the total rail network and all of it existing in the Eastern zone. Out of the 1,568.8 km in the Western zone, only 34 percent is MG. Only 44 Civil districts were connected with Bangladesh Railway at the end of 2007−08.

The Panchagarh railway station is in the Rangpur division which is in the western zone of the Bangladesh railways. If one wants to travel to Panchagarh from Dhaka, one takes trains coming from the capital city to Dinajpur or Parbatipur, major cities in the Rangpur division (BR and Panchagarh websites). From there one takes the local train. The train between Dinajpur and Panchagarh runs twice a day (Panchagarh website). There are local trains running from Kanchan to Panchagarh too. Kanchan is located in Saidpur town of Rangpur division which has the largest railway workshop in Bangladesh. The traffic density in the Panchagarh railway station is very low (Table 16). The Parbatipur-Panchagarh line is relatively more important than the Kanchan-Panchagarh. Broad gauge reached Panchagarh in June, 2013 (ekantipur.com, 2013).

During the year 2004–2005, the punctuality i.e. the percentage of trains not losing time to total number of trains was 61.4 (BG) and 69.8 (MG) percent in Intercity trains, 44.3 (BG) and 60.5 (MG) percent in Mail Express trains and 31.7 (BG) and 57.2 (MG) percent in local trains. The punctuality numbers for the Western zone were: 59.6 percent in Intercity train, 77.1 percent in Mail Express trains and 53.4 percent in local trains[50]. Bangladesh Railways also has a website with a wealth of information. The ability to look at train schedule and purchase e-tickets is possible.

**Table 16: Traffic Density in the Bangladesh Railway West Zone (Parbatipur-Panchagarh and Kanchan-Panchagarh), 2008**

| | ***Pass and Mixed Trains per day*** | | ***Freight trains per day*** | | ***Coaching vehicles per day*** | | ***Wagons per day*** | | ***Tonnes per day*** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ***2007-08*** | ***2008-09*** | ***2007-08*** | ***2008-09*** | ***2007-08*** | ***2008-09*** | ***2007-08*** | ***2008-09*** | ***2007-08*** | ***2008-09*** |
| Parbatipur-Panchagarh | 15.3 | 15.2 | 0.1 | 0.06 | 220 | 218 | 17 | 18 | 143 | 146 |
| Kanchan-Panchagarh | 2 | 5.22 | NA | NA | 70 | 70 | 5 | 6 | 31 | 36 |

*Notes*: Both Kanchan and Parbatipur are in the Dinajpur district of the Rangpur division.
*Source*: Bangladesh Railway (2009)

Nepal: Total length in railways was only 59 km in Nepal and none in the Eastern Terai region. New Jalpaiguri Railway station is the nearest railway station to both Jhapa (112.7km by road) and Ilam (178km by road). Traders want the railway network to link up with the Kakarbitta border.

The original railway networks built during pre-independence days especially between India and Bangladesh in this region was divided up between the countries. Railway networks which existed became defunct. There is a renewed focus on them to revive those networks. Currently, there is

[50] The statistics in the website are from the BR website.

one international passenger train between Dhaka and Kolkatta. However, if the Darjeeling and Uttar Dinajpur districts could be linked up with Bangladesh, this would bring great benefits to both the regions. Further, the railway network in Bangladesh is overburdened. Increasingly the border regions are converting to broad gauge. Nepal's Eastern Terai zone is ignored and is not even in anybody's scheme of things to build up the rail network even though rail network exists between Bangladesh and Nepal. Part of the problem lies with Indian behavior (Kumar and Mukherjee). Bangladesh and India do no offer any transit facilities to each other.

Railway travel is relatively environmentally greener than roads and should become the focus of the policymakers. In general, all the three countries need significant investment in rail networks. Public-private participation even in on-board services may improve the quality.

Airports

There are two airports in the five districts that we are studying – one in Jhapa and the other in Darjeeling. They are separated barely by 68 km and an international border. In India, the key international airport for Darjeeling and Uttar Dinajpur is Bagdogra. It is a military international airport where civilian flights are allowed to operate. The airport is well-connected to Kolkatta, Delhi, Guwahati, Bhutan and Thailand. Six domestic flight carriers fly to the airport. The Bhutanese flight carrier, Druk Air also connects this area to two international cities - Paro, Bhutan and Bangkok, Thailand. Bagdogra is 14 km from Siliguri, 90km from Darjeeling, and 169 km from Raiganj, Uttar Dinajpur[51].

In Bangladesh, there are three international airports and five operational domestic airports. The nearest domestic airport to Panchagarh is the Saidpur airport in the Rangpur division (86km). The three international airports are at Dhaka, Sylhet and Chittagong. These three airports are at a distance of 398.6 km, 657.5 km and 665.3 km, respectively from Panchagarh. Bagdogra airport in India is the nearest international airport to Panchagarh (50.1 km). In Nepal, the nearest international airport to Jhapa (69.9 km) and Ilam (148 km) is Bagdogra. The nearest domestic airport to Ilam is Biratnagar (81km). The domestic airport in the Jhapa district is Chandragadhi/Bhadrapur.

Table 17 compares the three airports. While the Saidpur airport handles the largest freight amongst the three, the Chandragadi airport in Nepal handles far more passengers. The air traffic movement in Nepal is also much higher. Bagdogra is the smallest airport amongst the three in terms of both passengers and cargo handled[52]. However, its location is unique. For the five districts in our study, the Bagdogra airport is the nearest international airport. Infrastructure development of this airport has not kept pace with the demand. Bagdogra Airport has experienced a 52.6 percent rise between March 2012 and March 2013 in number of international aircraft movements. However, the management style is messy in Bagdogra. The security takes longer than usual because all the flights arrive or depart at the same time and the airport is

[51] All distances in this paragraph are from the Distances website.

[52] The traffic may seem lower in India probably because of competing transport options in roads and railway. In the case of weaker infrastructure, citizens in Nepal are forced to travel more by plane to Kathmandu. We also saw that the freight carried by Bangladeshi trains is relatively low (Table 15). In that case, air freight may the better option in Bangladesh. However, this requires more in-depth analysis.

overcrowded. After 3pm, there are no flights landing or taking off from the airport. The cab services outside the airport are not very modernized. The road from the airport to Siliguri is both bumpy and overcrowded.

Clearly if one thinks of potential trade in air services or offering Bagdogra as an airport for nearby neighboring regions in other countries, there needs to be an upgradation of the airport facilities. Centre for Perishable Cargo is being built at the airport (SJDA website). This will have a positive impact on the regional economy. NCAER, 2012 and NCAER & Emirates (2012) have shown that airports tend to have a positive impact on the economy. This can be a potential win-win for everybody. Bhutan and Bangladesh have signed an agreement to share their airports with the former being particularly interested in the usage of the Saidpur airport[53]. Bhutan needs land from India for this to be operational. India can offer its airport facilities as an additional option.

**Table 17: Airport Statistics**

| ***Year*** | ***March, 2013*** | ***2011*** | ***2010*** |
|---|---|---|---|
| ***Airport*** | ***Bagdogra Airport, India*** | ***Chandragadi, Nepal*** | ***Saidpur Airport, Bangladesh*** |
| Number of domestic passengers handled (thousand) | 67.6 | 154.8 | 4* |
| Number of international passengers handled (thousand) | 2.1 | N.A. | N.A. |
| Freight Movement (tonnes) | 132 | 230.32 | 2,000,000* |
| Air Traffic Movement Domestic plus International (No.) | 702 | 5,348 | 75 |

*Note*: This is from the year 2009.
*Sources*: Bangladesh Bureau of Statistics (2010); Civil Aviation Authority Nepal 2012; Airports Authority of India (2013)

Seaports

All the five districts in our study are landlocked. They are all located in the Northern part near the foothills of the Himalayas range whereas the port access is down South near the Bay of Bengal, thereby traveling the whole length of either Bangladesh or West Bengal. The Indian and Bangladeshi districts access ports in their respective countries, Nepal accesses the Indian ports in West Bengal. The two major ports in West Bengal are Kolkata and Haldia, which are both river ports. Chittagong and Mongla are the two major seaports in Bangladesh. Kolkata is the nearest port for all the five districts. The distance between Siliguri and Kolkata Port is 578 km[54]. The distance between Uttar Dinajpur and Kolkata Port is 396 km. Jhapa and Ilam are 580 and 641 km away from the Kolkata Port, respectively. Chittagong and Mongla are at a distance of 652.3 km and 592 km from Panchagarh respectively while Kolkata is at a distance of 595 km from Panchagarh. Haldia Port is further 125 km away from Kolkata and by definition, further away from all the five districts. Siliguri is 685 km away from Mongla Port and 748 km away from the Chittagong port. Uttar Dinajpur is 503 km away from Mongla and 682 km from Chittagong.

[53] Daily Star (2011).
[54] All the distance statistics are from Distances website.

Jhapa and Ilam are 816 km and 878 km away from Chittagong, respectively and 687 km and 749 km away from Mongla, respectively.

Chittagong seaport is the main port in Bangladesh which handles around 92 per cent of the export-import trade of the country. In contrast, Kolkata and Haldia handle 2.2 and 6.1 per cent of the total traffic, respectively. All three ports have their own railways. The Haldia port is connected to the South-eastern railway zone of India. They are technologically ready to a degree in the sense they have their websites which are disseminating information. However, it was not clear whether they were offering services online. Kumar and Mukerjee have documented the problems in Chittagong airport – "The port is plagued by labor problems, poor management, and lack of equipment. The cargo yards at Chittagong are severely congested as containers are filled and emptied in port, and cargo-handling equipment is often out of commission for want of spare parts." Table 18 shows that the Chittagong airport performs worse than the worst performers in Indian major ports. For example, the average total turnaround time for India is 3.67 days. Both Kolkata and Haldia have higher turnaround time than the average. The average output per ship per berth day is significantly lower than the Indian average of 13,130 tonnes[55].

**Table 18: Sea Port Statistics**

| ***Indicators*** | ***India*** | | ***Bangladesh*** |
|---|---|---|---|
| ***Year*** | ***2012–13*** | | ***2011*** |
| ***Port*** | ***Kolkata Port Trust*** | ***Haldia Dock Complex*** | ***Chittagong*** |
| Vessels Handled | 219 | 314 | 2,248 |
| Traffic (million tonnes) | 12.23* | 31.01* | 43.1† |
| Average Total Turnaround time (days) | 4.09 | 4.52 | 6.90 |
| Average Output per ship berth day (tonnes) | 3,368 | 5,506 | 1,615.04# |
| Percent of Idle Time to the Total Time at Berth | 32.96 | 32.37 | N.A. |
| Average Pre berthing Detention (Hours) | 0 | 30.38 | 2.61 |
| Total Seaborne Traffic (% of all ports ) | 2.2 | 6.1 | 95.3 |

*Notes*: 1. Statistics for Mongla Port are not available in such detail and therefore are not shown in the table. Plus Kumar and Mukherjee discuss the decline of the Mongla Port.
* 2009–10; # Throughput per ship day of general cargo (tons); † Cargo handled
*Sources*: Ministry of Shipping, Government of India and Chittagong Port Authority websites

Indian and Bangladeshi ports, on average, perform worse than ports in Southeast Asia (Kumar and Mukherjee). The Kolkata and Haldia ports are among the worst performers within Indian ports. The compound annual growth rate (CAGR) of traffic handled at the Kolkata Port between 2005–06 and 2011–12 was approximately 2 per cent whereas all India major ports for the corresponding period were 4 per cent[56]. Haldia has seen a steady fall throughout this period from 42.3 million tones in 2005–06 to 31.01 million tones in 2011–12. Kolkata and Haldia were only utilizing 64.4 and 71.2 percent of their capacity in 2009–10 (Ministry of Shipping website). Silting is a problem in both the ports. However, mismanagement of the assets cannot be blamed on nature. PPP in Haldia port recently ran into political troubles (Roychowdhury, 2012).

[55] In general, the Indian ports sector has seen a decline in terms of cargo handled because of the slowing economy.
[56] The share of Kolkatta sea and air port together in all India exports was 2.77 per cent and imports was 4.85 per cent in 2010−11 (Government of West Bengal, 2012).

In essence, if we want to facilitate trade, the three ports in this region need to improve their productivity. West Bengal does not have any minor ports, which are a state subject. In contrast to major ports (which are a central subject), minor ports have seen the most positive economic activity in the rest of the country[57]. The southern and western states have taken a lead role in developing minor ports in their respective states. No such effort has been seen in West Bengal. Plans to develop a new 3000 acre (river) port-cum-Special Economic Zone in Kulpi are stuck in negotiations with the state government. Labor problems in ports seem to occur on both sides of the border. Unfortunately, that has only harmed rather than benefited the region.

Land Ports

Rodrigue et al. (2013) discusses the on-going development of bimodal/trimodal inland nodes as part of the transport system to smooth inward and outward flow of traffic and facilitate trade. This inland node may be called a dry port, inland port, inland terminal etc. "The three fundamental characteristics of an inland node are: (i) intermodal terminal either rail or barge that has been built or expanded; (ii) a connection with a port terminal through rail through rail, barge or truck services, often through a high capacity corridor and; (iii) an array of logistical activities that support and organize the freight transited, often co-located with the intermodal terminal. The functional specialization of inland terminals has been linked with cluster formation of logistical activities." (Rodrigue et al., 2013)

Bangladesh has been a leader in developing land ports in the region starting in 2005. It built twelve land Customs Stations (LCs) which were declared "Land Ports" by the Bangladesh government (IIFC, 2006). They were built on a Build-Operate-Transfer (BOT) basis. The significant one for this study is the Banglabandha land port located in Panchagarh. The size is 10 acres and it is located on the Bangladesh-India highway. It is used for Nepal transit traffic passing through a small corridor of India. This LC is about 22 meter away from the Bangladesh-Indian borderline. Banglabandha land port is about 57 km north of Panchagarh district headquarter, 5 km from Siliguri, 58 km from Darjeeling, 61 km from Kakkarbhitta, Nepal border and 68 km from the Bhutan border. Bilateral trade between Bangladesh India through the Banglabandha land port began on February 22, 2011 (Panchgarh website).

The Banglabandha port made the Mongla seaport in Bangladesh accessible for Nepal. Bangladesh gives discount on port charges for Nepal-bound goods. A 52 km road over the Indian Territory links Banglabandha land port with Kakarbhitta border point in Nepal. However, India allows only two hours a day for using the road as transit for transporting goods between the two thereby restricting trade between the two countries (Panchgarh website). They have also a warehouse and a trucking stop. Surprisingly for such an important land port, Banglabandha is not e-ready in the sense that it does not have its own website or information on how much trade is actually taking place.

[57] The growth of total cargo traffic in major ports in the last five years has been: 12 per cent in 2007–08, 2.2 per cent in 2008–09, 5.7 per cent in 2009–10, 1.6 per cent in 2010–11 and –1.75 per cent in 2011–12. The growth rates of total cargo traffic in minor ports for the corresponding years are: 11.6, 3.3, 35.5, 9.14 and 12.17 percent, respectively. (Ministry of Shipping, 2013)

On the Indian side, there is an existing land port in Radhikapur, Uttar Dinajpur district, place of the defunct rail head. It borders the Dinajpur district in Bangladesh. This border crossing is called Hilli. More statistics or details are unavailable. There is no website detailing information about land ports in general on the Indian side. "Siliguri Jalpaiguri Development Authority (SJDA) is setting up an Inland Container Depot (Dry Port) near New Jalpaiguri Railway Station, Siliguri on 34 acre of land. The Inland Container Depot has been conceptualized for the local industries and trading communities. This Depot is planned to be set up as a one-stop facility for different services and facilities relating to carriage/transportation of big cargo of manufactures/ produce/products of different kinds as may be growing or produced or being imported by the different regional players for different purposes. Further, it would be possible to obtain all statutory clearances relating to the export/import /transport of cargo at the facility so that it becomes a genuine transfer facility, thus acting like a Dry Port. This facility shall function essentially as an "Enhanced" container freight station with all essential facilities expected at a port" (SJDA website). This is going to be built on a PPP basis and they have invited bids in 2013. Nearness to the main railway station in the Indian region means that the inland port will be connected by rail and the roads are nearby. And the two land ports will be 40 km apart[58].

Roads, railways, inland ports are being built and upgraded by the countries who recognize that increasing trade relations with each other can facilitate economic growth. Competing infrastructure in the same region is an issue where resources are scarce. But perhaps this will increase the quality of the services offered.

### IV.2.C Macroeconomic Environment

Table 19 shows the prevailing district wise macroeconomic conditions. India has had a higher growth rate from 2005 to 2012 than either Nepal or Bangladesh. District-wise per capita GDP estimates show that Darjeeling is the richest[59]. However, Darjeeling per-capita income is still lower than that of the average of India. From the 2005–06 estimates one can see that Panchagarh is the poorest district amongst all. However back of the envelope forecasts for Panchagarh GDP 2010–11, suggest that Panchagarh and Uttar Dinajpur per-capita incomes are similar[60]. Numbers are not available for Jhapa and Illam in Nepal except very dated ones in 2001. However the UNDP (2009) shows the GDP per capita PPP for the Eastern Terai region[61]. One can reasonably

[58] On a side note, the SJDA is significantly trying to upgrade the infrastructure of the region to promote trade activities (Appendix 2).

[59] Converson from Rs to constant PPP 2005 international dollar was done in two steps. First we used the exchange rate of LCU per international $ available in WDI to convert it into current international dollars. Then we calculated the inflating factor from GDP per capita current international dollars (PPP) and GDP per capita constant international dollars (PPP, 2005) and used that to convert the district incomes into GDP PPP constant international dollars (2005). We used the calendar year with the fiscal year i.e. 2005 data was used with 2005–06. These estimates may not be precise but indicate the macroeconomic conditions prevailing in the district.

[60] Estimates for Panchagarh for the latest year were not available and therefore were predicted. For Panchagarh, per-capita income was available for 2005−06 in current US dollars from Masum (2010) and Deb et al. (2008). This was converted to PPP US dollars (using the data from WDI for current dollars and current PPP international dollars) and then to constant PPP US dollars using the. The estimates were predicted using the Bangladeshi growth rate. The GDP per capita in PPP constant 2005 international dollars comes to 1,167.9 in 2010–11. The fiscal and calendar years are adjusted as mentioned in footnote no. 60.

[61] Latest available estimates for Jhapa and Ilam in PPP GDP per capita in USD are available from 2001 from the UNDP (2004). It is not clear whether they are current or constant as they do match either numbers available in WDI.

conclude from that these two districts of Nepal are doing better than the rest of Nepal but are still relatively poorer than Darjeeling and other parts of India. Table 19 reflects the general backwardness of the region.

**Table 19: Income, Prices and Unemployment**

| | *Darjeeling* | *Uttar Dinajpur* | *Panchagarh* | *Eastern Terai* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|---|---|---|---|
| ***Year*** | ***2010−11*** | ***2010−11*** | ***2005−06*** | ***2006*** | ***2012*** | ***2012*** | ***2012*** |
| GDP per capita at constant 2005 PPP US$ | 2,898 | 1,395.4 | 915.64 | 1,696* | 3,340.6 | 1,279 | 1,623 |
| Average Annual Growth Rate of per capita GDP at constant 2005 PPP US$ from 2005−06 to 2010−11 (%) | 7.6 | 6.3 | NA | NA | 6.2† | 3.2† | 5.1† |
| Inflation, Consumer Prices Annual Average (2005–12) (%) | NA | NA | NA | NA | 8.3 | 8.0 | 8.1 |
| Inflation, Consumer Prices Standard Deviation (2005–12) (%) | NA | NA | NA | NA | 2.6 | 2.0 | 1.7 |
| Unemployment Rate (%) | 6.3# | 0.3# | NA | NA | 3.5# | 2.7# | 5# |
| Contribution of Agriculture to GDP (%) | 16.5 | 33.8 | NA | NA | 17 | 36 | 18 |
| Contribution of Industry to GDP (%) | 3.6 | 4.9 | NA | NA | 26 | 15 | 29 |
| Contribution of Services to GDP (%) | 79.9 | 61.3 | NA | NA | 57 | 49 | 54 |

*Notes*: * This number is for GDP per capita international dollars PPP. It is not clear whether this number is current or constant and if the latter, then the base year is not mentioned.
† This is an average for the years 2005 to 2012.
#Unemployment rates of Darjeeling and Uttar Dinajpur are for 2009−10. Indian data is from 2010, Bangladesh from 2009 and Nepalese data from 2008.
*Sources*: UNDP (2009); NSSO (2010), DoSPI (2013) and World Development Indicators, various issues

The agriculture and services sectors need to be examined in detail for these two districts.

## Agriculture

Value added per worker in agriculture was the highest in India in 2012 ($663) compared to Bangladesh ($489) and Nepal ($271) (WDI). In Darjeeling, 17.5 percent of its labor force (Table 22) is using 48.3 percent of its land (Table 21) to produce 16 percent of its GDP (Table 20). And it has devoted majority of its agricultural land to producing horticultural fruits (pineapple, mandarin, other citrus, banana and litchi) and vegetables (cucumbers, brinjal, cabbage,

Assuming they are constant, we use the Nepalese growth rate to forecast the GDP per capita numbers for both the districts. We get $1,248 and $ 1,337 for Jhapa and Illam, respectively for 2010–11. These numbers are close to the Table 19 for the Eastern Terai region.

cauliflower, raddish and ginger)[62]. 13.6 percent of the agricultural land is devoted to producing tea. Rice is the other major crop.

Uttar Dinajpur has very low productivity in agriculture both in terms of land and labor. 88.42 percent of its land and 46 percent of its labor force is devoted to agriculture which contributes only 33.8 percent of its GDP. Most of the agricultural land is devoted to produce field crops and rice is the major field crop in the district.

It is difficult to analyse the other districts because we do not know the GDP decomposition and therefore one cannot comment on the productivity. As stated earlier, we know Indian productivity is higher than the other countries worker wise. Panchagarh is similar in structure to Uttar Dinajpur, using most of its land for agricultural purposes and producing rice. The Panchagarh website suggests that among the upazillas or sub-counties, the share of agriculture can range from 40 percent to 80 percent (Panchagarh website).

Ilam is similar to Darjeeling in the sense that a fair share of its land is under forests (59%). 39 percent of the land is devoted to agriculture. The main crops produced in Ilam are paddy, maize, potato, tea, oil seeds, sugarcane, millet wheat, barley, cardamom and broom grass. Alder and cardamom mix are two other major agro-forestry products. .The rise in the land under agro forestry has resulted in reduction of land under forests and agriculture in Ilam (Government of Nepal, 2011). In our travels to the district we found that hills after hills had been converted to tea gardens. Forests had disappeared.

In Jhapa, 63 percent of the land is devoted to agriculture (Table 21) and majority of that land is used to producing field crops which is rice. Maize, wheat and potato are other crops that are produced. Potato has the highest productivity among the crops mentioned (Government of Nepal, 2011). Cash crops occupy only a small share of agricultural land and tea is the most important cash crop in this district.

In conclusion, other than Darjeeling, all the four districts have a strong agricultural base with majority of land devoted to it and that also producing field crops. Nepalese data is a little dated.

**Table 21: Land Use Statistics**

| ***Sector*** | ***Darjeeling*** | ***Uttar Dinajpur*** | ***Panchagarh*** | ***Jhapa*** | ***Ilam*** |
|---|---|---|---|---|---|
| ***Year*** | ***2010−11*** | ***2010−11*** | ***2011*** | ***2006−07*** | ***2006−07*** |
| Total Area (in thousand hectares) | 325.47 | 312.47 | 117.5 | 159.90 | 139 |
| Area under agricultural use (%) | 48.3 | 88.6 | 82 | 63 | 39 |
| Area under nonagricultural use (%) | 12.5 | 10.7 | 17.9 | 27 | 2 |
| Forest Area (%) | 38.3 | 0.2 | 0.73 | 10 | 59 |

*Sources*: Government of West Bengal (2012), Government of Nepal (2010, 2011) and Panchagarh website

[62] All statistics in this paragraph are from the Department of Agriculture and Cooperation (2011) unless and until mentioned otherwise.

**Table 22: Labor Market Efficiency**

| *Indicators* | *Darjeeling* | *Uttar Dinajpur* | *Panchagarh* | *Jhapa* | *Ilam* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|---|---|---|---|---|
| ***Year*** | ***2009-10*** | ***2009-10*** | ***2005-06*** | ***2008*** | ***2010*** | ***2011*** | ***2011*** | ***2010*** |
| Workforce Participation Rate | 93.7 | 99.7 | 75.59 | 57.95 | 67 | 56 | 84 | 71 |
| Female Workforce Participation Rate | 99.4 | 90.5 | 63 | 41.08 | 30.82 | 29 | 80 | 57 |
| Labor force in Agriculture (%) | 17.8 | 46.02 | NA | 43.56 | NA | 51.1* | 65.7# | 48.1† |
| Labor Force in Industries (%) | 30.72 | 31.88 | NA | 0 | NA | 22.4* | 13.4# | 14.5† |
| Labor Force in Services (%) | 51.48 | 22.1 | NA | 23 | NA | 26.6* | 20.7# | 37.4† |

*Notes*: For Jhapa, 10.10 percent of the labor force is in overseas employment and 23.54 percent is in domestic wage labor (Government of Nepal, 2010).

* indicates data from 2010, # indicates data from 2001 and † indicates data from 2005

*Sources*: WDI, NSSO (2010), Government of Nepal (2010, 2011) and Bangladesh Bureau of Statistics (2010)

## Industry and Services

The industry sector in the two Indian districts is not so productive with 31 percent of labor force in Darjeeling and 32 percent in Uttar Dinajpur producing 3.9 and 4.9 percent of GDP, respectively. Within the relatively small manufacturing sector in Darjeeling, tea manufacturing dominates the area (Table 23a). Grain milling is also important in Darjeeling. Manufacture of precious metals forms a significant share of manufacturing in the area. In Uttar Dinajpur, sawing and planning of wood, rice milling, preparation and spinning of cotton are the major manufacturing industries. From our interviews we learned that there was an apparel company in Jhapa, a joint venture between India and Nepal, which closed down in the aftermath of the Great Financial Recession of 2008. Thousand workers lost their jobs. We also witnessed the closed factory. Essentially the manufacturing activities are related to the agricultural produce of the region.

The Panchagarh website suggests that the sugar mill is a significant industry in the district. Rock lifting industry has also become important. Other than that, there is tea, rice mill, ice factory, garments factory, oil mill, distillery, electric pole production, jute factory and saw mill. Cottage industries in the district include cap making factory, welding, bamboo work, goldsmith, blacksmith, wood work, tailoring. Main exports of the district are organic food, tea, watermelon, pineapple, jackfruit, garlic, papaya and pebble.

In contrast, the services sector in Darjeeling is extremely productive with 51.5 percent of the labor force producing 80 percent of its GDP. Similar is the case in Uttar Dinajpur with 22 percent of the labor force producing 61.3 percent of GDP. Table 23b shows the share of services in Darjeeling and Uttar Dinajpur. The Darjeeling and Uttar Dinajpur are being driven by different components. Transport, storage and communication and other services form the largest service sectors in Darjeeling. The three Ts – tea, timber and tourism used to drive Darjeeling. Timber has fallen because of stricter environmental regulations. Both tea and tourism need good transport linkages. Further all agricultural production requires warehousing especially tea. Communications will continue to remain a sector driving growth because Table 13.b shows that

the number of households which own mobile phones is relatively low in Darjeeling. Other services' share is relatively big at 13 percent. It comprises mostly of health and education services amongst others. The Darjeeling district education sector is quite big since it offers a lot of good quality boarding schools in the hilly regions. Trade, hotels and restaurants, Banking & insurance and Real estate ownership of dwellings and business services form 10 percent each. The last component may be large because of the construction activity taking place in and around Siliguri. Further, large hospitals are opening in Siliguri with the motivation to capture a share of the medical tourism market.

**Table 23a: Manufacturing Industries**:

| ***District*** | ***Five Digit Classification*** | ***Percentage share in total manufacturing*** |
|---|---|---|
| Darjeeling | Other grain milling and processing activities like manufacturing of *poha* (flattened rice) */muri*(puffed rice*)* etc, n.e.c. | 12 |
| | Processing and blending of tea including manufacture of instant tea | 36.2 |
| | Manufacture of all types of textile garments and clothing accessories | 10.7 |
| | Manufacture of basic precious metals and by products (gold, silver & metals of platinum group) | 17.6 |
| Uttar Dinajpur | Rice milling | 17 |
| | Processing and blending of tea including manufacture of instant tea | 1.8 |
| | Preparation and spinning of cotton fiber including blended* cotton | 14.3 |
| | Sawing and planing of wood (other than plywood) | 18.2 |
| | Repair and maintenance of other transport equipment. | 9 |

*Source*: NSSO (2010)

Trade, hotels & restaurants is the largest service sector in Uttar Dinajpur. Other services' share is relatively big at 13 percent. It is not clear as to what is driving that component. The share of other sectors is relatively low.

**Table 23b: Contribution of different sectors to Gross District Domestic Product (%) at constant 2004–05 prices in West Bengal and at 2004–05 prices in 2010–11**

| Districts | Agri-culture & Allied activities | Manu-Facturing | Construc-tion Electricity, Gas & Water Supply | Transport, Storage & Commun-ications | Trade, hotels & Resta-urants | Banking & insurance | Real Estate, Ownership of Dwellings & Business Services | Public administration | Other services |
|---|---|---|---|---|---|---|---|---|---|
| Uttar Dinajpur | 33.8 | 4.9 | 6.9 | 7.1 | 14.6 | 8.2 | 6.7 | 4.5 | 13.3 |
| Darjeeling | 16.5 | 3.6 | 9.1 | 22.0 | 9.3 | 9.3 | 9.7 | 6.7 | 13.8 |
| West Bengal | 19.7 | 9.1 | 7.4 | 10.2 | 18.2 | 9.2 | 7.9 | 5.0 | 13.4 |

*Source*: DoSPI (2013)

Transport, storage and communication form 10.45 and 10.77 percent of Nepal and Bangladesh's GDP, respectively in 2009–10[63]. Other sectors' shares are relatively low in single digits. These are low-value added sectors. The Community, Social and Personal services forms 6.8 percent of GDP in Bangladesh and that is probably because of the thriving NGOs sector in the country.

Consumer Price Inflation has been high in all the three countries between 2005 and 2012. The World average inflation rate is 4.7 percent. Volatility as measured by standard deviation for the world inflation rate has been 1.9. While the Bangladeshi average is marginally lower, the Indian average is higher. On this parameter, this makes India unattractive.

Table 19 also shows us relatively low unemployment rates. Whether these are low because of disguised unemployment rate, will require more in-depth research. Further, both Bangladesh and Indian economies are similar in nature with the dominance of the services sector. The statistics for Darjeeling and Uttar Dinajpur show that the services sector dominates. 80 per cent of the economy in the Darjeeling district is services. Surprisingly Uttar Dinajpur is the same. These are higher than the Indian averages. The share of industrial sector is down in single digits and less than five percent. In Uttar Dinajpur one-third of the economy is agricultural sector.

### IV.2.D Health and Primary Education

District wise statistics are available only for select indicators shown in Table 24 for health and education. Infant mortality rates are very high in all the districts. Darjeeling and Uttar Dinajpur are relatively lower than Panchagarh, Ilam and Jhapa. A casual glance would suggest that the availability of safe drinking water varies as per topography with Darjeeling and Ilam having similar but lower numbers than the ones on the plains. Uttar Dinajpur and Panchagarh have done well in this particular indicator. The coverage falls in Jhapa. Surprisingly in Darjeeling, only 73.4 percent of households have access to safe drinking water. In our observations, this problem is largely felt in the hills of Darjeeling where there is significant water shortage. People line up since morning with whatever they can find to fill water. We also observed that people were trying to fill water from pipes which had broken or rusted. Only recently, there are discussions about rain water harvesting. For an area which hopes to urbanize, this is a significant gap. Panchagarh is the best in terms of number of medical institutions available and Ilam the worst. Uttar Dinajpur also performs very low in this indicator. When it comes to the number of beds, Darjeeling outperforms every other district. This shows that perhaps Darjeeling can offer its health services to the region if trade in services were allowed. Medical tourism can be a big fillip to the regional economy.

[63] Central Bureau of Statistics (2010) and Bangladesh Bureau of Statistics (2010).

**Table 24: Health and Primary Education Indicators**

| *Indicators* | *Darjeeling* | *Uttar Dinajpur* | *Panchagarh* | Jhapa | *Ilam* |
|---|---|---|---|---|---|
| *Year* | *2011* | *2011* | *2011* | *2011* | *2011* |
| Infant Mortality Rate/1000 births | 40.2 | 41.5 | 49 | 51 | 50 |
| Safe Drinking Water Coverage (% of households) | 73.4 | 99.3 | 95.7 | 82.8 | 72.3 |
| Number of medical institutions (per lakh) | 22 | 13.00 | 22.27 | 19 | 7 |
| Number of beds in hospitals (per lakh) | 22.7 | 2.7 | 10.1 | NA | NA |
| Literacy Rate (%) | 79.72 | 60.13 | 51.8 | 75.4 | 78.1 |
| Gross Enrolment in Primary Education (%) | 186.32‡ | 178.35‡ | 105.9† | 119.4 | 99.9 |
| % of Children out of School (age 6-14) | 4.32* | | 18 | NA | NA |

Notes: †Panchagarh Gross Enrolment ratio is for 2007
‡ This data is for 2009–10
* The percentage of children out of school is for Jalpaiguri division which includes all the four districts in North Bengal including Darjeeling and North Dinajpur. This is only for rural areas for the year 2012.
*Sources*: DISE (2010), Census (2011), ASER (2013), Government of West Bengal (2012), Government of Bangladesh (2012), Bangladesh Bureau of Educational Information and Statistics (2011), Ministry of Health and Family Welfare (2012) and Department of Health Services Nepal (2011)

Literacy rates are high in Darjeeling and Jhapa. Uttar Dinajpur is only 60.13 percent and Panchagarh is even lower at 51.8 percent. The Gross Enrolment in primary education is highest for Darjeeling followed by Jhapa. All the others trail behind. The number of students left behind in Darjeeling and Uttar Dinajpur is barely 4.32 percent. It is 18 percent in Panchagarh, Bangladesh.

Our travels indicate that the educational sector is particularly strong in North Bengal. While crossing over from Nepal to India in early morning, we stopped at Pashupati Nagar at the Nepal side of the border to get taxis for Darjeeling. We saw small shops selling Indian and Chinese snacks. Children were just playing around or helping with the shops. Once we crossed over to India, there was a stark contrast. All the children were standing in uniforms with neatly tied up hair in front of their homes with parents. They were waiting to be picked up. It was an amazing sight. Some of the older children were trying to get on the shared jeeps to go to school.

As mentioned before, Darjeeling and Kurseong are known for its boarding schools, the most famous being the St. Paul's School. Boarding schools are extremely popular with the elite in Bengal, Bihar and Nepal. This suggests that there is some trading in educational services already taking place and can perhaps be encouraged.

### IV.3 Efficiency enhancers sub-index

### IV.3.A Higher education and training

Gross Enrolment Ratio (GER) in secondary education is higher in Nepal than either in Bangladesh or India. GER in secondary education is higher in Jhapa and lower in Ilam than the

Nepalese average, respectively (Table 25). In tertiary education, GER is highest in India. Darjeeling is the only district in the region with an University, University of North Bengal. Number of colleges per lakh population is higher in Panchagarh than Darjeeling. Jhapa and Uttar Dinajpur are at the same level. The numbers are very low.

**Table 25: Higher Education and Learning Indicators**

| ***Indicators*** | ***Darjeeling*** | ***Uttar Dinajpur*** | ***Panchagarh*** | ***Jhapa*** | ***Ilam*** | ***India*** | ***Nepal*** | ***Bangladesh*** |
|---|---|---|---|---|---|---|---|---|
| ***Year*** | ***2011*** | ***2011*** | ***2011*** | ***2011*** | ***2011*** | ***2011*** | ***2011*** | ***2011*** |
| Gross Enrolment in Secondary Education (%) | NA | NA | NA | 73.5 | 63.2 | 63 | 70.1 | 52 |
| Gross Enrolment in Tertiary Education (%) | NA | NA | NA | NA | NA | 18 | 14.1 | 14 |
| Number of Colleges (per lakh ) | 1.1 | 0.3 | 1.4 | 0.6 | NA | 2.6 | 4.2 | NA |
| Number of Universities (per lakh) | 0.054 | 0 | 0 | 0 | 0 | 0.05 | 0.03 | 0.06 |

*Note*: All the Bangladesh Gross Enrolment Ratios are for 2010

*Sources*: Department of Higher Education, India 2011, Government of Bangladesh (2012), Bangladesh Bureau of Educational Information and Statistics (2011), Government of Nepal (2012c)

Table 26 shows the number of colleges by discipline in each of the districts. While there may be more colleges in Jhapa, Darjeeling has a wider focus and is relatively more competitive. However, the number of engineering and medical colleges is very low compared to the Southern states of India.

**Table 26: University, Colleges and Research Institutes by Stream**

| *University/ Colleges/ Research Institute* | *Stream* | *Darjeeling* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| University | University of North Bengal | 1 | NA | NA | NA | NA |
| Colleges | Arts & Sciences | 8 | 1 | 10 | NA | NA |
| | Arts/Humanities | 4 | NA | NA | 1 | NA |
| | Arts, Science & Commerce | NA | 3 | NA | NA | NA |
| | Arts & Commerce | 1 | NA | NA | NA | NA |
| | Law College | NA | 1 | NA | NA | NA |
| | Medical | 1 | NA | NA | NA | NA |
| | Engineering | 1 | NA | NA | NA | NA |
| | Pharmacy | 2 | NA | NA | NA | NA |
| | Education | 2 | 3 | NA | 1 | NA |
| | Management | 1 | NA | 16: 5 Colleges and 11 Campuses of Tribhuvan University, Kathmandu | NA | NA |
| | Education, Humanities and Management | NA | NA | NA | 2 | NA |
| | Total | 20 | 8 | 26 | 4 – Campuses affiliated to Tribhuvan University | 14 |
| Research Institutes | Tea | 2 | NA | NA | NA | NA |
| | Sericulture | 1 | NA | NA | NA | NA |

Sources: Indian Education: A Students' Resource website, Panchagarh website, Tribhuvan University website, Nepal Education website, Nepal Colleges website

## IV.3.B Goods market efficiency

Tables 27 and 28 show measures of goods market efficiency at the national level as state or district level data are not available for the countries. Table 27 shows that local competition is very high in India and anti-monopolistic policy very effective. Degree of customer orientation and business sophistication are all higher in India.

Indirect evidence is available for West Bengal. Aggarwal and Archa (2013) shows that West Bengal, a bottom-rung state has 11 Special Economic Zones (SEZ) which form only 2.9 percent of the total and 0.5 percent of the total SEZ area. After the enactment of the SEZ Act 2005, employment and investment in SEZs have jumped but they are a small share of the total. West Bengal has only 81 units which are export oriented versus Tamil Nadu (391). Further, share of FDI received by Kolkatta (capital of West Bengal) is approximately around 5 percent of the total FDI inflow between 1991 and 2002 versus Mumbai which received 35 percent. Overall, the state

has only received 4 percent of the total FDI inflow between July 2000 and July 2011. These numbers show that West Bengal is not so efficient in the goods market versus India at least.
Total tax rates are very high in India and this is confirmed by Heritage Foundation (2013) survey shown in Table 28. In general, the burden of regulations and taxes are higher in India, on average (Table 28). Both Bangladesh and India identify taxes rates and tax administration as major constraints. Income tax rate is the highest in India and Corporate tax rate of 45 percent is the highest in Nepal. Tax Burden as a percent of GDP is the lowest in India at 7 percent. Business environment is relatively low in India compared to its neighbours in terms of number of procedures to start a business and number of days to start a business. Trade tariffs and barriers are high in all three countries but India is ranked better in terms of prevalence of foreign ownership.

**Table 27: Goods Market Efficiency, 2012**

| Indicators | India | | Bangladesh | | Nepal | |
|---|---|---|---|---|---|---|
| | Value | Rank/144 | Value | Rank/144 | Value | Rank/144 |
| Intensity of local competition | 5.4 | 34 | 4.7 | 83 | 4.2 | 122 |
| Extent of market dominance | 4.5 | 27 | 3.2 | 120 | 2.7 | 140 |
| Effectiveness of anti-monopoly policy | 4.6 | 34 | 3.5 | 111 | 3.6 | 102 |
| Extent and effect of taxation | 3.8 | 44 | 4 | 32 | 3.7 | 52 |
| Total tax rate, % profits | 61.8 | 123 | 35 | 56 | 31.5 | 41 |
| No. procedures to start a business | 12 | 121 | 7 | 74 | 7 | 74 |
| No. days to start a business* | 29 | 99 | 19 | 80 | 29 | 99 |
| Agricultural policy costs | 3.7 | 87 | 4.6 | 16 | 3.6 | 94 |
| Prevalence of trade barriers | 4.2 | 78 | 4.2 | 81 | 3.7 | 120 |
| Trade tariffs, % duty* | 12.6 | 126 | 13.1 | 129 | 16.4 | 134 |
| Prevalence of foreign ownership | 4.5 | 84 | 4 | 117 | 3 | 140 |
| Business impact of rules on FDI | 4.7 | 62 | 5.2 | 26 | 4 | 111 |
| Burden of customs procedures | 3.8 | 84 | 3.2 | 124 | 3.5 | 106 |
| Imports as a percentage of GDP* | 34.7 | 101 | 30.3 | 119 | 38.1 | 90 |
| Degree of customer orientation | 4.7 | 60 | 4.3 | 99 | 4.1 | 110 |
| Buyer sophistication | 3.7 | 53 | 3.1 | 94 | 2.9 | 114 |

*Notes*: Values are on a 1 to 7 scale unless otherwise annotated with an asterisk (*).
*Source*: Schwab (2012)

**Table 28: Regulations and Taxes Indicators**

| Indicator | *Bangladesh* | *India* | *Nepal* |
|---|---|---|---|
| **Year** | **2007** | **2006** | **2009** |
| Senior management time spent dealing with the requirements of government regulation (%) | 3.2 | 6.7 | 6.3 |
| Number of visits or required meetings with tax officials | 1.3 | 2.6 | 1.5 |
| If there were visits, average number of visits or required meetings with tax officials | 2.1 | 3.3 | 2.0 |
| Days to obtain an operating license | 6.0 | ... | 14.5 |
| Days to obtain a construction-related permit | 26.1 | ... | 22.8 |
| Days to obtain an import license | 9.1 | ... | 10.4 |
| Percent of firms identifying tax rates as a major constraint | 19.1 | 28.8 | 6.3 |
| Percent of firms identifying tax administration as a major constraint | 30.0 | 21.3 | 8.5 |
| Percent of firms identifying business licensing and permits as a major constraint | 9.3 | 9.9 | 0.4 |
| Tariff Rate* | 12.1 | 8.2 | 13 |
| Income Tax Rate* | 25 | 30.9 | 25 |
| Corporate Tax Rate* | 25 | 34 | 45 |
| Tax Burden % of GDP* | 13.2 | 7 | 9 |

*Note*: * All the data are from 2013
*Sources*: Enterprise Surveys.org (2013) and Heritage Foundation (2013)

## IV.3.C Labor market efficiency

Table 29 shows the national statistics and India outperforms Nepal and Bangladesh in all indicators.

Table 22 shows the indicators for labor market efficiency at the district level. Workforce participation rates are very high in Darjeeling and Uttar Dinajpur. The Darjeeling and Uttar Dinajpur numbers are much higher than the country average for India. In Jhapa it is relatively low at 57.95 percent. Ilam is slightly higher at 67 percent and Panchagarh is 75.59 percent. The stark contrast is the female workforce participation rate in Darjeeling and Uttar Dinajpur. It is close to 90 percent, much higher than India. In contrast, Panchgarh, Jhapa and Ilam seem much lower numbers.

**Table 29: Labor Market Efficiency, 2012**

| ***Indicators*** | ***Bangladesh*** | | ***India*** | | ***Nepal*** | |
|---|---|---|---|---|---|---|
| | ***Value*** | ***Rank/144*** | ***Value*** | ***Rank/144*** | ***Value*** | ***Rank/144*** |
| Cooperation in labor-employer relations | 4.2 | 84 | 4.5 | 50 | 3.2 | 140 |
| Flexibility of wage determination | 4.8 | 85 | 5.1 | 61 | 4 | 126 |
| Hiring and firing practices | 4.7 | 20 | 4 | 71 | 3.5 | 105 |
| Redundancy costs, weeks of salary | 31 | 128 | 16 | 73 | 27 | 115 |
| Pay and productivity | 3.5 | 105 | 4.3 | 43 | 2.9 | 136 |
| Reliance on professional management | 3.5 | 118 | 4.6 | 46 | 3.5 | 120 |
| Brain drain | 2.8 | 113 | 4.5 | 30 | 2.5 | 121 |
| Women in labor force, ratio to men* | 0.69 | 98 | 0.36 | 133 | 0.94 | 13 |

*Source*: Schwab (2012)

### IV.3.D Financial market development

There are 154 commercial bank branches and 12 rural bank branches in the Darjeeling district. The number of bank branches per lakh population in Darjeeling is the the highest amongst all the five districts (Table 30). In Uttar Dinajpur, there are a total of 95 banks (Government of West Bengal, 2012). In Jhapa, there were 14 commercial bank branches, five Agricultural Development Bank units, 150 cooperatives and 29 saving and credit institutions funded by the Local Development Fund, as of 2009 (Government of Nepal, 2010). As of July 2009 in Ilam, there were a total of seven commercial banks and their branches in operation in Ilam, around 350 co-operatives of various interests in the district (Government of Nepal, 2011).According to Central Bureau of Statistics (2003), Jhapa and Ilam are among the most developed districts in Nepal with respect to bank density[64] with ranks of 10 and 22 respectively among the total 75 districts. This is confirmed from our interviews in Jhapa too where the President of the Chamber of Commerce of Jhapa informed us the same. The reason is that high migration from the economies means high remittances, which drives the banking sector of the economy. In Panchagarh, there are 47 local branches for various commercial banks at different parts of the district (Panchagarh website). India and Bangladesh provide substantial domestic credit.

**Table 30: Financial Market Development**

| *Indicators* | *Darjeeling* | *North Dinajpur* | *Panchagarh* | *Jhapa* | *Ilam* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|---|---|---|---|---|
| ***Year*** | ***2011*** | ***2011*** | ***2011*** | ***2006*** | ***2006*** | ***2011*** | ***2006*** | ***2011*** |
| Households Availing Banking Services (%) | 55.2 | 26.5 | NA | 21.3* | | 58.7 | 20.4 | 36.02 |
| Number of bank branches (per lakh population) | 8.36 | 3.17 | 4.76 | 1.72 | 2.41 | 10.6 | 6.7 | 7.8 |
| Domestic credit provided by banking Sector (% of GDP) | NA | NA | NA | NA | NA | 74.1 | 66.7 | 70.4 |

*Notes*:* 21.3 percent of households in Terai region have bank account and no separate data for Jhapa and Ilam are available

*Sources*: WDI, Ferrai et al. (2007), Census 2011, Government of West Bengal (2012), and Panchagarh.website

When one examines households using banking services, Darjeeling is the highest. It is still lower than the Indian average (Table 30). Nepal and Bangladesh are substantially lower. However, Khalily (2011) which makes the point that percentage of households with access to only formal financial services is 36.02. When one counts the households' access to quasi and informal financial services like the micro-finance institutions, the number of households with access to financial services increases to 77 percent. This is substantially higher than that of India. Overall, Darjeeling ranks at the top in terms of formal financial sector development.

### IV.3.E Technological readiness

As per the Networked Readiness Framework, the concept of readiness looks at environment, readiness and usage (Bilbao-Osario, Dutta and Lanvin, 2013). Environment looks at the market environment in ICT, infrastructure environment and political and regulatory environment which will facilitate adoption of ICT. Readiness looks examines the ability of the stakeholders –

[64] Bank density is defined as the Number of banks per 1000 population divided by population distance (CBS, 2003).

Individuals, Businesses and Government to use ICT for value-added production of goods and services. Usage refers to the actual usage data. These data are very find to find at the district level without a formal survey. Internal NCAER research is conducted at the state level. We discuss some results from that to get a sense of the Indian side and a sense of the Nepalese and Bangladeshi side from our observations and experiences.

In terms of market environment, India is thriving because of many teleservice providers in India with twin technologies of GSM and CDMA for wireless services. Infrastructure environment in terms of phones is good in Darjeeling but Uttar Dinajpur falls behind. In terms of infrastructure environment, there is little data on Cyber cafés and Common services centres for access to computers. Common service centres by mandate of the Central Government are being chosen as public cyber café to delivery e-services. It is a key part of the e-Governance infrastructure of India. Home ownership of computers is very low. Electrification rates in Uttar Dinajpur and Panchagarh are very low and therefore the infrastructure to enable ICT readiness would be very low. With the quality of electricity availability in Nepal low, one can say that the infrastructure to enable readiness to use ICT will be lower in the Nepal districts.

On-going NCAER research shows that the state of West Bengal is trying to develop an environment where it is possible to deliver services online. However, they need to do more work on enacting laws which will facilitate and enable ICT environment. It has adopted some technological items like the state wide area network and state date centre but no mandate to use it compulsorily. Policy for ICT training of officials is also missing.

When we look at readiness, the Government of West Bengal and the district has started several websites, at least disseminating ones. While we do not have information on other items for Bangladesh and Nepal, one can safely talk about websites from personal experiences of looking for data. The websites, in general in all districts are good. Panchagarh, Darjeeling and Uttar Dinajpur have their own district websites. Both Bangladesh and Nepal score higher in terms of accessibility because they make their websites available in local languages. However, it makes checking by non-native speakers a little difficult. Ability to use mobiles and computers to access services depend on literacy rates. It is highest in Darjeeling. Given the presence of the University in Darjeeling, ability to use ICT for production purposes may be higher in that district. NCAER calculations show that Business Readiness is relatively low in West Bengal in terms of using ICT for organized or unorganized manufacturing. The state is offering e-services but there is little mobile enablement of eservices in West Bengal.

Overall, technologically wise, Darjeeling may be a leader in the region but it has a long way to go to catch up with southern India, which is a leader in this regard.

### IV.3.F Market size

If one uses GDP as the measure of the market size, then Darjeeling district GDP is the highest and therefore its market is the largest. National indicators tell us (Table 31) that India has the largest market size amongst the three countries.

**Table 31: Market Size, 2012**

| *Indicators* | *India* | | *Nepal* | | *Bangladesh* | |
|---|---|---|---|---|---|---|
| | *Score* | *Rank* | *Score* | *Rank* | *Score* | *Rank* |
| Domestic Market size Index | 6.2 | 3 | 3.0 | 88 | 4.3 | 39 |
| Foreign Market Size Index | 6.4 | 4 | 2.8 | 127 | 4.5 | 63 |

*Notes* : (1) Domestic Market size index is calculated as the sum of gross domestic product plus value of imports of goods and services, minus value of exports of goods and services, normalized on a 1–7 scale where 7 is the best.
(2) Foreign Market Size Index is calculated as the value of exports of goods and services, normalized on a 1–7 scale where 7 is the best
*Source*: Schwab (2012)

## IV.4 Innovation and sophistication factors sub-index

### IV.4.A Business sophistication

Table 32 shows Business sophistication nationally. India is ranked much higher than Nepal or Bangladesh. However, India is still ranked low. Table 11 shows thee business constraints faced by business in the districts. Ilam and Japha business owners cite finance and infrastructure as major obstacles.

**Table 32: Business Sophistication Indicator Scores and Ranking**

| *Indicator* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|
| Local Supplier Quantity | 5.6 | 4.6 | 4.3 |
| Local Supplier Quality | 4.5 | 4.3 | 3.6 |
| Cluster Development State | 4.5 | 3.9 | 3.3 |
| Nature of Competitive Advantage | 3.4 | 2.5 | 3.2 |
| Value Chain Breadth | 4.1 | 3.3 | 2.8 |
| Control of International Distribution | 4.2 | 3.8 | 3.4 |
| Production Process Sophistication | 4.1 | 2.9 | 2.5 |
| Extent of Marketing | 4.4 | 3.3 | 2.8 |
| Willingness to Delegate Authority | 3.9 | 2.8 | 2.9 |
| Total Score for Business Sophistication | 4.31 | 3.21 | 3.50 |
| Overall Ranking for Business Sophistication | 40 | 127 | 108 |

*Notes*: For each indicator, scores range from 1 to 7 with 1= very poor to 7= very good
Rankings are out of 144 economies and lower ranking means the better one.
*Source*: Schwab (2012)

### IV.4.B Innovation

Out of all of the districts, intuitively speaking, Darjeeling is most likely to be the centre of innovation with three research institutes. Others are colleges with teaching as the major goal. With lack of more detailed statistics, we resort to national statistics (Tables 33, 34 and 35) which show that overall India is the best amongst the three. Notably, Bangladesh does better than India in terms of number of design applications filed (Table 34). In India, 39,400 patent applications, 7,589 design applications and 179,317 trademark applications were filed in 2010–11.Among these, 20.46 percent, 66.99 percent and 93.52 percent were by the Indian applicants respectively (Intellectual Property India, 2011). Among the Indian applications for patents, 5.29 percent was filed by West Bengal. 62.1 percent of the total revenue generated for the design activities in 2010–11 was from West Bengal and 7.12 percent of the total trademark applications filed was from the Kolkata branch (Intellectual Property India, 2011).

**Table 33: Innovation**

| Indicators | Bangladesh | | India | | Nepal | |
|---|---|---|---|---|---|---|
| | Value | Rank/144 | Value | Rank/144 | Value | Rank/144 |
| Capacity for innovation | 2.4 | 131 | 3.5 | 42 | 2.4 | 126 |
| Quality of scientific research institutions | 2.5 | 127 | 4.4 | 39 | 2.2 | 137 |
| Company spending on R&D | 2.4 | 130 | 3.5 | 37 | 2.6 | 121 |
| University-industry collaboration in R&D | 2.6 | 131 | 3.8 | 51 | 2.7 | 127 |
| Government procurement of advanced tech products | 2.6 | 134 | 3.4 | 83 | 2.6 | 132 |
| Availability of scientists and engineers | 3.8 | 81 | 5 | 16 | 3.2 | 128 |

*Source*: Schwab (2012)

**Table 34: Indicators of Science and Technology**

| *Indicator* | *India* | *Nepal** | *Bangladesh* |
|---|---|---|---|
| ***Year*** | ***2011*** | ***2009*** | ***2011*** |
| Patent Applications Residents (per lakh) | 0.67 | 0.12 | 0.02 |
| Design Applications Residents (per lakh) | 0.42 | 0.06 | 0.801 |
| Trademark Applications Direct Residents (per lakh) | 13.9 | 63.7 | 5.99 |
| Charges for the use of Intellectual Property Payments(% of GDP) | 0.151 | | 0.009 |
| Charges for the use of Intellectual Property Receipts(% of GDP) | 0.02 | 27.4 | 0.001 |

*Notes*: For Nepal, no data for the filed applications are available. Hence the registered application data is used for Patents, designs and trademarks in the case of Nepal.
*Sources*: Intellectual Property India website, WDI, WIPO IP Statistics data center, UNESCAP.org (2011)

**Table 35: Business Innovation**

| *Indicator* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|
| *Year* | *2006* | *2007* | *2009* |
| Percent of firms with an internationally-recognized quality certification | 22.5 | 3.1 | 7.8 |
| Percent of firms using technology licensed from foreign companies | 5.3 | 0.6 | 3.8 |
| Percent of firms having their own Web site | 31.1 | 23.3 | 15.7 |
| Percent of firms using e-mail to interact with clients/suppliers | 56.7 | 46.2 | 39.7 |
| Percent of firms with an annual financial statement reviewed by external auditors | 59.6 | 70.2 | 37.1 |

Source: Enterprise Survey.org

## IV.5 Competitiveness

The Darjeeling district in India is the most competitive amongst all the five districts, followed by Jhapa and Ilam. Uttar Dinajpur and Panchagarh both come down at the bottom and their economic structure remind us that they were twins. The region lags behind the more developed part of India and Bangladesh. In terms of basic services, Darjeeling is the best. Transport infrastructure is being upgraded on all sides of the border to improve both domestic economic activity and external trade. These upgradations are taking place at or near the site of historical links. Roads in West Bengal, in general are very poor. Electricity supply is poor in Nepal. Bangladeshi railway system is overloaded. The two nearest ports in the region are the worst. Education in the primary sector is very strong in the Darjeeling district. Higher education is also very strong or at least stronger than the competitors. Health infrastructure is better in Darjeeling. Darjeeling's market size is bigger. The commercial hub of North Bengal is located in Siliguri, Darjeeling. Labor participation rates of women are very high there. However, crime rates are also higher in Siliguri. Technological readiness is better in India. Where India miserably fails is business environment. The perception of corruption is very high in the region especially India and Bangladesh. Overall, India ranks better than either Bangladesh or Nepal in terms of competitiveness.

# V. Possibilities for Regional Integration

## V.1 SAFTA

In 1985, South Asia came together to form the South Asian Association for Regional Cooperation (SAARC). Ten years later, it formed the South Asian Preferential Trade Agreement in December 1995. The next step was the South Asian Free Trade Agreement (SAFTA), which started getting implemented in July 2006. The SAFTA will become fully effective for non-least developed countries (LDCs) of SAARC by 2013 and 2016 for LDCs[65]. With the spread of bilateral free trade agreements (FTAs), the relevance of SAFTA has been questioned. The SAFTA generated a lot of debate on its benefits. Mostly economic theory (comparative

[65] The reference for this paragraph is Weerakoon (2010) unless and until mentioned otherwise.

advantage) supported by variety of econometric evidence does not support regional integration for the region. But the dynamic benefits being can be many. The idea of a SAFTA survived despite many misgivings. The concerns with SAFTA are the following:

- Back-loading of tariff reduction process as countries whose tariffs are already below 20 percent do not have to reduce them immediately
- Rules of origin: One of the most restrictive and complicated in the world.
- Requires domestic value addition of 40 percent for non-LDCs, 35 percent for small economies and 30 percent for LDCs
- A negative list of 20 percent of tariff lines and it is reviewed after every four years. Weerakoon (2010) reports that for South Asian countries this would translate to approximately 53 percent of total imports among South Asian countries.
- No commitment to deal with nontariff barriers.
- Very shallow as it is reserved for trade in goods

Weerakoon (2010) analyzes that the India-Sri Lanka Free Trade Agreement is more liberal and successful than the SAFTA.

### V.2 Trade Agreements

India, Bangladesh and Nepal are part of various trade agreements whether bilateral or multi-lateral (Aggarwal, 2008)[66]. India and Bangladesh are part of the Asia Pacific Trade Agreement. India has a trade agreement with Nepal and Bangladesh. Bangladesh has a trade agreement with Nepal. The Bay of Bengal initiative for Multi-Sectoral Technical and Economic Cooperation hopes to forms its own FTA by 2017. Bangladesh, India and Nepal are a part of that amongst others. India has a Double Tax Avoidance Treaty with Nepal and Bangladesh.

Even though India and Nepal have a free trade agreement, we learned from our interviews that Indian cars face some 200 percent duty on motor vehicles. Indian cars are prohibitively expensive in Nepal, almost double of what they cost in India but they are popular especially in Jhapa. The jeeps that ply in Jhapa-Ilam route are in pathetic condition. It was perplexing as to the reason behind the heavy duty on Indian cars unless and until there are political or environmental reasons to do so.

### V.3 Trade Facilitation

Tables 36 to 38 show the low level of trade facilitation in all the three countries especially India. Since India is the biggest trade partner of most of the South Asian countries, this speaks a lot about the low level of regional integration in the region. India takes 15 days for goods to clear from customs whether exports or imports. Bangladesh is much lower. It takes longer to clear customs for imports than exports in Nepal and Bangladesh.

[66] Aggarwal (2008) has been used for the information in the paragraph.

**Table 36: Trade Indicators**

| Indicator | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|
| **Year** | 2006 | 2009 | 2007 |
| Days to clear direct exports through customs | 15.1 | 5.6 | 8.4 |
| Percent of firms exporting directly or indirectly (at least 1% of sales) | 12.5 | 3.8 | 24.7 |
| Percent of firms exporting directly (at least 1% of sales) | 10.4 | 3.0 | 18.9 |
| Proportion of total sales that are domestic sales (%) | 92.8 | 98.5 | 78.0 |
| Proportion of total sales that are exported directly (%) | 6.2 | 1.0 | 17.3 |
| Proportion of total sales that are exported indirectly (%) | 1.0 | 0.4 | 4.8 |
| Days to clear imports from customs | 15.2 | 13.8 | 10.2 |
| Percent of firms using material inputs and/or supplies of foreign origin | 11.8 | 67.7 | 51.2 |
| Proportion of total inputs that are of domestic origin (%) | 96.2 | 55.8 | 68.7 |
| Proportion of total inputs that are of foreign origin (%) | 3.8 | 44.2 | 31.3 |
| Days of inventory of main input | 18.3 | 41.9 | 24.8 |
| Percent of firms identifying customs and trade regulations as a major constraint | 14.8 | 11.2 | 11.3 |

*Source*: Enterprise Survey.org

Table 37 shows the domestic Logistic Performance Indicators (LPI) for 2012. India performs relatively better in supply chains whether land or port/airport in domestic LPI. India performs better in all criteria than Nepal or Bangladesh except when it comes to physical inspection of import shipments and multiple checking.

**Table 37: Domestic Logistic Performance Indicators, 2012**

| *Type of Chain* | | *India* | | *Nepal* | | *Bangladesh* | |
|---|---|---|---|---|---|---|---|
| | | *Export* | *Import* | *Export* | *Import* | *Export* | *Import* |
| Port or Airport Supply Chain | Distance (km) | 626* | 375* | NA | 286 | 181 | 301 |
| | Lead time (days) | 3 | 3 | NA | 5 | 3 | 6 |
| | Cost (US$) | 918 | 1097 | NA | 1957 | 1257 | 1089 |
| Land Supply Chain | Distance (km) | 197 | 241 | 777 | 712 | NA | NA |
| | Lead time (days) | 3 | 4 | 7 | 8 | NA | NA |
| | Cost (US$) | 1043 | 921 | 1651 | 2322 | NA | NA |
| Number of Agencies | | 3 | 3 | 5 | 5 | 4 | 4 |
| Number of Forms | | 5 | 6 | 5 | 6 | 4 | 5 |
| Clearance time with physical inspection(days ) | | 2 | | 1 | | 3 | |
| Clearance time without physical inspection (days ) | | 4 | | 1 | | 4 | |
| Shipments Meeting Quality Criteria (%) | | 59 | | 69 | | 79 | |
| Physical Inspection of Import Shipments (%) | | 35.23 | | 29.54 | | 9.68 | |
| Multiple Inspection of Shipments Physically Inspected (%) | | 15.76 | | 9.51 | | 5.49 | |

*Note:* Aggregate of the distance indicator for ports and airports.
*Source*: Arvis et al. (2012)

Table 38 shows the international LPI. All the three countries are in similar range and India performs marginally better. India performs better in logistics, tracking and tracing and timeliness. Nepal performs the poorest in all these scores.

**Table 38: International Logistic Performance Indicators (LPI)**

| *Indicators* | *India* | *Nepal* | *Bangladesh* |
|---|---|---|---|
| *Year* | *2012* | *2012* | *2010* |
| Customs Score | 2.77 | 2.20 | 2.33 |
| Infrastructure Score | 2.87 | 1.87 | 2.49 |
| International Shipments Score | 2.98 | 1.86 | 2.99 |
| Logistics Competence Score | 3.14 | 2.12 | 2.44 |
| Tracking and Tracing Score | 3.09 | 1.95 | 2.64 |
| Timeliness Score | 3.58 | 2.21 | 3.46 |
| Overall LPI Score | 3.08 | 2.04 | 2.44 |
| Overall LPI Rank | 46 | 151 | 79 |

*Notes*: (1) The scores for each indicator range from 1 to 5 with 1=very low to 5=very high
(2) Overall LPI is constructed from these six indicators using principal component analysis
*Source*: Arvis et al. (2012)

There are several studies which have examined border issues of India and Bangladesh especially the Petrapole/Benapole border. The literature has examined the data over various periods of time and even a cursory look of the various surveys at various points of time suggests that nothing has changed (Subramanian, 2001 and Das and Pohit, 2006). From our interviews, we know that exporting tea takes up to 12 hours of wait or more at the Indo-Nepal border.

Kumar and Mukherjee detail some of the issues that are faced by traders:

- **Ports**
  - Excessive delays in moving cargoes through the ports of Kolkata and Chittagong in Bangladesh and the associated impact in trade
  - Regional seaports(Kolkata, Haldia and Chittagong) not operating on fixed days of week schedule causing delays and uncertainties in the turnaround time of the ports
- **Transport**
  - Lack of proper cross border transit points and road connections
  - Lack of Integrated Transport network especially for landlocked country like Nepal
  - High Cargo shipping cost
  - Labour problems leading to delays in transport and congestion in land transport network
  - Limited load capacities for many inland road corridor regions
  - High cost of road transport across the borders
  - Lack of proper and direct rail connectivity
  - Problems like overstaffing ,poor maintenance and old rolling stock associated with the railways

- **Border Crossings and Customs**
  - Lack of bilateral agreements for land border crossings
  - Location of customs clearance centres far away from the border leading to high costs and deterioration of product quality (This is what Nepalese exporters of tea told use too that they had to travel up to Siliguri to get the necessary clearances. If lab testing is required, then things take longer because products go to Kolkatta for testing).
  - Delays in the preparation of customs documents and inspections due to the lack of standard documents
  - Very high border documentation requirements
  - Reduced Efficiency and slow customs clearance
  - Lack of online customs IT connectivity to facilitate clearances
  - Lack of transparency and problems in product classifications in trade
  - Administrative Problems with the customs
  - Deficient banking, communication, medical, warehouse, security and fire fighting facilities and absence of wayside amenities (Lack of facilities at the border was a pet complaint of the Nepalese exporters of tea)
  - Lack of Adequate parking areas for trucks (Trucks are just parked on the road side)

In the Ilam interviews we heard that exporters need to get a Central Food Liability Certificate (CFL) from the Indian authorities to export tea. This is valid for six months but it can take up to a month to get it. This certificate is only available from Kolkatta.

Even when the market research agency was trying to go for interviews in Bangladesh, they had to go to the Embassy a couple of times and tons of paper work for a business visa. However, there were no issues while crossing over from India to Bangladesh via road in Changrabandha. In sum, trade agreements exist but trading is itself extremely cumbersome in all the three countries.

### V.4 Is Regional Integration Beneficial?

After extensive examination of the five districts, the pertinent question we ask is regional integration beneficial for the regions? Standard trade theory says no given that all of them are South-South countries with the same comparative advantage producing the same type of product, although probably not homogenous. This logic has been confirmed by the previous empirical research.

Panchagarh and Uttar Dinajpur are largely agricultural with poor infrastructural and mainly producing rice. Uttar Dinajpur has some manufacturing including spinning mill, timber and transport equipment. Panchagarh has some mills related to agriculture and most exports rice, tea, fruits and vegetables. Ilam, Jhapa are similar stories.

Darjeeling is a cut above the rest of the districts. Its physical and human infrastructure is far superior. It is mainly a service driven economy and has got relatively more financial depth. It can be perceived as the “North” of the region.

Can value chains be developed across the region? Yes, in horticultural fruits and vegetables. If regional integration is to be made possible through the formation of value-chains, then agro-food processing is the way out. The West Bengal Government has plans to develop agro-processing zones in Darjeeling and North Dinajpur. It is planned as a centre for pineapple, oranges and flowers (Rabo India Finance Ltd., 2005). Since land and water are not issues in Darjeeling, food processing zones can be the engine of growth for North Bengal. One can even turn rice, the main crop produced in the region to chips and crackers which are popular because they are low-fat. Also other than juice, different types of ice-creams can also be produced. High value added products can be produced. How can the other districts be brought in? Since from our interviews, we know that intermediate inputs in the production of agricultural food i.e. fertilizers, machinery go from India, the country can encourage exports of that. This ensures that quality food is produced in the region. Enclaves or sample farms can be built from where the fruits, vegetables and field crops are sourced. Developing both facilities at customs and improving quality of food can result in these getting integrated in the Indian units. Of course, different agro-processing units can be developed in different districts such that the exchange brings regional development.

Further, there can be exports and imports of services like education at the primary level and higher education. More engineering institutions should be encouraged in the region, which has none and attract foreign students from Nepal and Bangladesh. We heard from Nepal that people from Jhapa drive down to Siliguri for "fun". Tourism activities can actively be encouraged. Health services and medical tourism can all be engines of economic growth. Of course, trading in energy, more investment in green energy can help the region tremendously. Unfortunately, services are left out of regional agreements and trade facilitation measures ensure that lot of time is wasted in transferring food.

With New Jalpaiguri station right there in Siliguri, goods can be transported easily to Kolkatta or other places in India. The North-East Frontier railway zone will also benefit from freight traffic.

Agro-food processing is the value chain possible in the region. Trade in intermediate goods and services accompany that. Trade is not a zero-sum game. All of them will have to exchange for mutual benefit. However, the most important change needed is clearing up home – i.e. developing physical and human infrastructure and the culture of graft that is so pervasive in the three countries. Trade facilitation measures should be implemented.

## VI. Case Study: Tea

The last few sections brought out that the comparative advantages of the five districts are similar in nature and that it lies in agricultural products. Most of them are producing rice, potato, tea and horticultural fruits and vegetables. Although the services form a large share of district GDP of Uttar Dinajpur, the services in which they may have a comparative advantage is non-tradable i.e. Trade, Hotels and restaurants. Only in the case of Darjeeling there is some degree of comparative advantage in services in Transport, storage and communication. Logistics operations in the district may help facilitate trade. Economic theory tells us that the static benefits of integrating these regions are low. However, the more recent economic theory has talked about developing value chains as a way to integrate regions. Since the share of manufacturing is low, at least in Darjeeling and Uttar Dinajpur, the possibility of value chains in the way that we think about

from South East Asia is also low. Therefore, we concluded that regional integration may not be beneficial in the traditional way that we think about when we look at South East Asia as model. The question really is – Is no form of regional integration possible whether in the form of value chains or facilitating traditional trade or FDI? To explore this question, we look at the case of tea specifically to assess whether regional integration in any form can be achieved in the districts. We conducted a primary survey of tea producers, traders and all stakeholders in five districts – Darjeeling, Uttar Dinajpur, Jhapa and Ilam and Panchagarh to identify the possibilities for value chains.

### VI.1 Regional Importance of Tea

Why study tea and not rice? The Darjeeling Hills and the Terai plains (include the Siliguri subdivision and the surrounding areas of Darjeeling district, bounded by Kurseong subdivision on the North, West Dinajpur on the South, Naxalbari and Kharibari on the West and Jalpaiguri district on the West (Tea Board India, 1995)) together produced 10.9 percent of total tea produced in India in 2012 (Table 39). Darjeeling hilly tea is of course well known all over the world. It is GI (Geographical indicated) protected (Tea Board of India website). The Darjeeling hill (referred to as Darjeeling from here on) tea fetched of Rs 1,375 per kg versus the average price of Rs 83.62 in the 26th February, 2011 auction (Tea e-Auction website). The Terai plains produced 10.1 percent of all tea in India in 2012 (Tea Board of India, 2012a, 2013). The tea growing areas in Jalpaiguri district with an annexation of a small tea area in Cooch Behar is known as Dooars which produce 13.1 percent of all tea in India (Tea Board of India, 2012a, 2013). Both the Terai and Dooars mainly produce crush-tear-curl (CTC) tea. Tea in North Bengal is the lifeline of the economy.

**Table 39: Tea Area and Production**

| *Indicators* | *Dooars* | *Terai Plains* | *Darjeeling Hills* | *West Bengal* | *India* | *Jhapa* | *Ilam* | *Nepal* | *Panchagarh* | *Bangladesh* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Year* | *2012* | *2012* | *2012* | *2012* | *2012* | *2010−11* | *2010−11* | *2010−11* | *2008* | *2008* |
| Area(hectares) | 72,920* | 24,360* | 17,820* | 115,100* | 579,350* | 9,179 | 5,417 | 17,451 | 570.77 | 54,106.24 |
| Proportion of National Tea Area (%) | 12.59 | 4.20 | 3.08 | 19.87 | 100 | 52.6 | 31.0 | 100 | 1.05 | 100 |
| Production (Million Kg) | 156.71 | 113.66 | 8.93 | 279.3 | 1,126.3 | 15.2 | 1.7 | 17.4 | 0.4 | 58.7 |
| Proportion of National Tea Produced (%) | 13.9 | 10.1 | 0.8 | 24.8 | 100 | 87.1 | 9.9 | 100 | 0.61 | 100 |

*Notes*: Area for Dooars, Terai, Darjeeling Hills, West Bengal and India is for the year 2011
*Sources*: Tea Board (2012a), Tea Board (2013), Government of Nepal (2012b), Bangladesh Tea Board (2012)

In the case of the Darjeeling district, tea is a major driver of its economy. As mentioned before, 13.6 percent of its agricultural land in the district is devoted to producing tea. The small manufacturing sector is dominated by tea manufacturing (36% of all manufacturing units were in tea as per the NSS0, 2010, Table 23a). Within services, transport, storage and communication is 22 percent of GDP (Table 23b) which is directly or indirectly linked with tea as transport and

storage are important intermediate inputs in the sector. 17 percent of the labor force in the Darjeeling district was employed in the tea industry in 2009–10 (NSSO, 2010).

The Siliguri city is the hub of the North Bengal tea industry (except Darjeeling tea). The tea industry is governed by the Tea Board of India which has headquarters in Kolkatta (capital of West Bengal) and two of its zonal offices are located in Siliguri and Jalpaiguri with the former being slightly more important[67].

All the districts in our study used to traditionally produce rice and this continues to be a major agricultural product for them. Increasingly tea is replacing rice (WBIDC, 2010)[68]. Why are people switching from rice to tea? The answer lies in returns. In 2010–11, a kg of common rice fetched Rs 10 and Grade A rice fetched Rs 10.3 (Minimum Support Price, MSP) in India[69]. A kg of tea in the same year fetched the average price of Rs 104.66 in India (Tea Board of India website). North Indian tea which includes Darjeeling tea fetched the average price of Rs 119.51.

This has the effect that marginal (in the sense that they may not be the best land for producing tea) lands are being increasingly used to produce tea as farmers sense profit and local governments encourage that to uplift poor areas. Panchagarh in Bangladesh and Uttar Dinajpur in India are cases in point. There are seven tea estates in Panchagarh. The district produced 0.6 percent of all tea produced in Bangladesh in 2008 (Table 39). The district was barely using 0.5 percent of its agricultural land for tea in 2008 but has the capacity to use 2 percent (Bangladesh Tea Board website)[70]. It houses 1.05 percent of total tea area in Bangladesh (Table 39)[71]. There are tea gardens in the northern part of Uttar Dinajpur close to the international border (Uttar Dinajpur District website). However, the size is so small that tea statistics from this district are not even reported in the Indian statistical system. We know from NSSO (2010) that 1.8 percent of its manufacturing units are related to tea and 1.75 percent of its labor force work in the tea sector.

While Panchagarh and Uttar Dinajpur are latter additions, Jhapa and Ilam had recognized the higher returns to tea earlier and started on tea production on a large scale in the 2000s. Further the interviews on the Indian side informed us that after the GI was implemented for Darjeeling in February 2000 (WTO website), tea production was strongly encouraged in Nepal with guidance of Western countries as it has the same topography, climate as in the Darjeeling district. The Ilam district which resembles the Darjeeling hills (the two are on the opposite side of the mountains) was especially encouraged for a cheaper source of "Darjeeling tea". Jhapa tea is close to the Terai tea in taste. Ilam and Jhapa became the two centers of production in Nepal with. Jhapa produced 87.1 percent and Ilam 9.9 percent of all tea in Nepal in 2011 (Table 39).

[67] Tea Board of India website.
[68] In an interview, it was explained that tea production is rising in the Terai region not due to productivity increases but due to land being increasing brought in under tea. These areas are marginal and not always best suited for tea production.
[69] DFPD website.
[70] The Panchagarh website indicates that there are 246 tea gardens, including 18 big estates, 13 medium-size and 215 small-scale gardens in Tetulia (sub-county of Panchagarh) and its surrounding areas. Over 7,000 skilled and unskilled workers, mostly women, work in these tea gardens. The Panchagarh tea board only informs us of seven tea estates even in the interviews. One can safely say that tea production is on the rise in Panchagarh.

Tea occupied 6.3 percent of cultivated land in Jhapa in 2006–07 (Government of Nepal, 2011) and 52 percent of total tea area in Nepal. 31 percent of total area devoted to tea in Nepal is located in Ilam. From the interviews in Ilam we assessed that 9.1 percent of agricultural land in Ilam is devoted to tea and 85 percent of people living in the district are involved in tea.

Therefore, tea is important for the Darjeeling, Ilam and Jhapa districts. Panchagarh and Uttar Dinajpur are expanding in the area of tea production.

## VI.2 Background of tea

### VI.2.A History

Tea has been known to China since the fourth century (Banerjee and Banerji, 2008). It has only one species – *Camellia sinesis* and is native to certain areas in the interior of Southern China to the border of Assam. Indigenous tea was discovered in Assam in 1923. Banerjee and Banerji (2008) discuss that the Kolkatta Agricultural Society holds the view that it was recorded in 1788 that indigenous tea was growing wildly in the areas of Cooch Behar (India) and Rangpur (now Bangladesh) districts of Bengal. India, Nepal and Bangladesh have a shared history of tea when it was first planted in the Darjeeling district, now in India. Further, India and Bangladesh had similar British regulation governing the tea sector till the Independence of the region from the British in 1947. Bangladesh tea sector was affected badly due to the war in 1971 but has regained rapidly since then.

<u>India</u>

In 1841, a Scottish surgeon, Dr. Campbell planted the first tea garden in the Darjeeling region. Around the 1830s, it was "discovered" that tea also grew in Assam, India. After the discovery and re-discoveries and experiments, the Indian sub-continent was left with five types of tea planting material – China, China Hybrid, Assam and Assam Hybrid. Out interviews in Darjeeling told us that to this day these are the four types of tea grown in the sub-continent. In India, a fifth variety called Clone has been added.

From the interviews we learned that Chinese tea grows at high elevation, Chinese hybrid at middle elevation, Assam at lower elevation, Assam hybrid at higher/lower elevation. All the three countries including Bangladesh, India and Nepal are essentially producing variations of either the Chinese or the Indian variety.

Tea in North Bengal is divided in two distinct types – the tea grown in the hilly region of Darjeeling (Chinese variety) and tea grown in the Terai and Dooars region (Assamese).

<u>Bangladesh</u>

A pioneer tea garden was established on the slopes of the hills in Chittagong in 1840. First commercial tea garden was established in 1857 at Mulnichera in Sylhet. Production and consumption of tea increased rapidly after 1971 with significant encouragement from the government. The war in 1971 affected the industry badly. After the war the industry soon got a

big push on behalf of the government through a massive development program from the West. (Bangladesh Tea Board website)

Nepal

The history of tea starts form 1862 in Nepal, when Jangapath Rana brought tea from China Oldest tea garden in Nepal came into existence only 7 years after Darjeeling garden and the plants were Chinese. Indian varieties have dominated Nepal since then. In 1862, four to five farmers started tea estate in Ilam. For 100 years, tea mainly remained in an ornamental form which means in non-commercialization form. The commercialization of tea started in 1965 due to the introduction of policies by the Nepal government for doing projects in tea sector. After the 1990s, cooperative movement in tea started in Nepal. The tea estate, which had started in 1862 in Ilam still continues to exist, but has been privatized. . There are 135 green hill cooperatives in Ilam that have come into existence in the last 10 to 12 years. There are 42 cooperatives in Ilam.

**VI.2.B Tea Governance**

India

"Tea is one of the industries, which by an Act of Parliament comes under the control of the Union Government. The genesis of the Tea Board India dates back to 1903 when the Indian Tea Cess Bill was passed. The Bill provided for levying a cess on tea exports - the proceeds of which were to be used for the promotion of Indian tea both within and outside India. The present Tea Board set up under section 4 of the Tea Act 1953 was constituted on 1st April 1954. It succeeded the Central Tea Board and the Indian Tea Licensing Committee which functioned respectively under the Central Tea Board Act, 1949 and the Indian Tea Control Act, 1938 which were repealed. The activities of the two previous bodies had been confined largely to regulation of tea cultivation and export of tea as required by the International Tea Agreement then in force, and promotion of tea consumption" (Tea Board website).

As per the Tea Act 1953, Tea Board was set up in India under the Ministry of Commerce and Industry in continuation with the colonial history[72]. With head quarters in Kolkata, Tea Board has 21 zonal, regional and sub-regional offices. India has two offices in North Bengal, one at Siliguri and the other one at Jalpaiguri, among which the former is the main one. The Siliguri office covers the North Bengal districts of Cooch Bihar, Jalpaiguri, Darjeeling and Uttar Dinajpur and the states of Sikkim & Bihar. There are 336 big growers under the Siliguri office with more than 102 hectares. However, there are varied estimates for small tea growers under the areas in the Siliguri Tea Board. It can vary from 22,000 (Land Reforms Department) to 40,000 (Siliguri Tea Board). A tea estate above 25 acres is considered to be a large tea grower.

According to the Tea Board comprehensive certification scheme based on the Geographical Indications (GI) Act in 1999, out of the 120 tea gardens in the Darjeeling district, only 87 which are registered with the tea board are covered as those to be included in the definition of Darjeeling tea. They are all located in the hilly region. The peculiarities of Darjeeling tea include full gardens, soil conditions, quality of tea bush and topography. "Darjeeling grows tea at

[72] Tea Board website is the source for the information in this paragraph.

altitudes ranging from 600 to 2,000 meters. The cool and moist climate, the soil, the rainfall and the sloping terrain all combine to give Darjeeling its unique "Muscatel" flavor and exquisite bouquet. The combination of natural factors that gives Darjeeling tea its unique distinction is not found anywhere else in the world, hence this finest and most delicately flavored of all teas has over the years acquired such reputation as "Champagne enjoys amongst wine" (Tea Board of India website) The word Darjeeling has been patented by the Tea Board and has a distinct logo under the provision of the Trade Marks Act1999, GI Act 1999 and the Copyright Act 1957. In spite of these, it is reported that the production of Darjeeling tea has come down to 10 million kilos from 12 million kilos in the recent years. The Terai or Dooars tea does not come under the GI protection.

The Tea Board has strict monopoly on the production of tea. It strictly regulates all steps of tea production in India. At present, the permission of Tea Board is needed for planting tea in India. For getting permission to plant tea from the Tea Board, the three main mandatory documents are: the land records, soil analysis report and the survey map. A ban has been imposed since 2001 onwards as there was fear of loosing Advasi land to outsiders. Hence, the state government imposed the conditions of mandatory documents in 2001. However, this has had the reverse effect with many pending registrations reported due to non clearance of the land records by the state government.

All the tea factories whether big or small need to be registered with the tea board. From1998, there are bought leaf factories where the tea leaves are purchased from the small growers and are processed. The Tea Board gives license to form self help groups (SHGs) with subsidies of 40 percent of the unit cost (maximum of Rs 25 lakh). All these are meant to support small growers. For setting up a normal CTC factory of capacity 5 lakh, an investment of Rs 3 to 5 crores is needed. The documents needed for setting up a tea factory are land documents which need to be in the name of society irrespective of whether SHG or not, No Objection Certificate (NOC) from the land department (due to the land conversion problem), no pollution certificate (due to the usage of coal in processing), NOC from the village Panchayat, clearances from the District Industrial Centre (DIC), Central Excise, sales tax office, safety and food security clearances as well as factory license. In this context, a comparison to Kenya is that there only cooperatives can setup a tea factory unlike India. With all the above formalities, the minimum time needed for setting up a factory is 10 months[73]. The Tea Board officials visit the factory site frequently and then give the license. In case of any delay, the tea board has to be informed. The machinery used like the roaster and color sorter are imported from countries like Taiwan and Japan. A machine which produces CTC tea costs Rs 20 lakhs and the machinery are sourced from Howarh, West Bengal and Tinsukia (Assam). The SHGs and the cooperatives are treated at par by the Tea Board. Among the 50 SHGs in North Bengal, three have started factories in tea processing. The Tea Board allots up to 25 per cent subsidies for modernizing and renovating factories. In Uttar Dinajpur, the small growers are not being recognized by the Tea Board.

Tea is sold through three ways – private sales, auctions with auctioneers registered with the Tea Board and exports. The Tea Board of India monitors the public sales, warehousing, packaging of tea etc and settling of finances. Warehousing is governed by the Tea Warehousing Licensing

[73] 10 to 14 clearances are required to set up a bought leaf factory. This is in consonance about India's burdensome regulations which we had reported in earlier sections.

Order 1989 (Tea Board of India website). Packaging comes under the Packaging and Labeling Regulation, 2011 and the tea industry has to abide by that. Brokers, sellers and buyers who all play a part in the tea buying process from the grower have to be registered with the Tea Board. There are seven tea brokers in the Siliguri Auction zone. Because auctioning requires depth of knowledge of tea, each broke has their own taster.

The most recent change that has happened to the industry is the introduction of e-auction of tea in 2009 (Tea e-Auction website). Public tea auctions took place in Kolkatta in 1861. Now e-auctions means that anybody and everybody registered with the Tea Board whether in Siliguri zone or not can participate. This is a big change as originally only people registered with the Siliguri Tea Board could only participate in the auctioning.

There is a general feeling of neglect that the tea industry has from coming under Ministry of Commerce especially since it is no longer a main revenue earner. There was a feeling that they the tea industry would benefit from moving to the Ministry of Agriculture.

Bangladesh

"After 1947, Pakistan Tea Board with a five member Pakistan Tea Licensing Committee was constituted in 1951 under the Pakistan Tea Act, 1950. This Act was repealed by the Tea Ordinance 1959 and an eleven member Tea Board with the provision of a five member Tea Development Committee was constituted. After the independence of Bangladesh, Tea Ordinance, 1977 was promulgated constituting Bangladesh Tea Board of three whole time members with the provision of an Advisory Committee to be formed by the Government with not more than twenty five members. Later the members of the Board were raised to eleven by the Tea (Amendment) Ordinance, 1986.The Head Office of the Board was in Dhaka till it had been transferred to Chittagong in 1984." (Bangladesh Tea Board website)

"Marketing of tea is done through the Chittagong Auction who sell it in the local market or export it to other countries. Some of the teas are also sold privately to exporters or Indian buyers. Tea Auction is held on usually every Tuesday at Chittagong, a major port city with sufficient warehouse and port facilities and well connected by road, railways and air. Tea Traders Association of Bangladesh organizes the weekly tea auction in Chittagong through the appointed tea brokers of Bangladesh Tea Board." (Bangladesh Tea Board website) Tables 2a and 2b show that Panchagarh is 681 km from Chittagong while Siliguri is barely 69 km away.

Nepal

There is a National Tea and Coffee Development Board headquartered in Kathmandu which is under Ministry of Agriculture. Our interviews in Nepal suggest that in contrast to the Indian Tea Board, this is very weak. There are no regulations for anything. Since the farmers in Nepal are converting from producing rice or traditional crops to tea, they do not have any knowledge about its specifics and nobody to help or guide these small farmers. This means that the tea produced is of uncertain quality. The tea growers in Nepal lamented that there were no regulations on warehousing or packaging. As per the interviews in Nepal, the Nepal Tea and Coffee Board just followed what the Indian Tea Board is doing. Actual implementation initiatives are on part of the

growers themselves to assure quality of products to their biggest market, India. Also one sensed a great need for approval of their tea produce by the tea professionals in India.

Therefore, the Indian tea industry is the most tightly regulated amongst the three. It ensures some degree of assurance of quality.

### VI.3 Market Size

**Table 40: Global Tea Production**

| | *Tea Production International Comparison(million kgs)* | | | | *Country wise shares in global tea production (%)* | | | |
|---|---|---|---|---|---|---|---|---|
| ***Countries*** | ***2009*** | ***2010*** | ***2011*** | ***2012*** | ***2009*** | ***2010*** | ***2011*** | ***2012*** |
| China | 1,358.64 | 1,475.06 | 1,623.21 | 1761 | 34.3 | 35.2 | 36.5 | 38.9 |
| India | 979 | 966.4 | 1115.72 | 1,111.76 | 24.7 | 23.1 | 25.1 | 24.6 |
| Sri Lanka | 289.78 | 331.43 | 328.63 | 326.28 | 7.3 | 7.9 | 7.4 | 7.2 |
| Bangladesh | 60 | 59.27 | 59.32 | 62.16 | 1.5 | 1.4 | 1.3 | 1.4 |
| Nepal | 14.70 | 15.07 | 15.82 | NA | 0.4 | 0.4 | 0.4 | NA |
| Others | 327.94 | 334.38 | 329.34 | 330.87 | 8.3 | 8.0 | 7.4 | 7.3 |
| Total | 3,960.49 | 4,192.01 | 4,449.3 | 4,526.98 | 100 | 100 | 100 | 100 |

*Sources*: Tea Board India website and FAOSTAT website

**Table 41: Global Tea Exports**

| | *Tea Exports International Comparison (million kg)* | | | | *Country wise shares in global tea Exports (%)* | | | |
|---|---|---|---|---|---|---|---|---|
| ***Countries*** | ***2009*** | ***2010*** | ***2011*** | ***2012*** | ***2009*** | ***2010*** | ***2011*** | ***2012*** |
| Kenya | 342.48 | 441.02 | 421.27 | 430.21 | 21.3 | 24.8 | 24.1 | 24.9 |
| China | 302.95 | 302.53 | 322.58 | 321.79 | 18.9 | 17.0 | 18.4 | 18.6 |
| Sri Lanka | 279.84 | 296.38 | 301.27 | 304.49 | 17.4 | 16.7 | 17.2 | 17.6 |
| India | 197.9 | 222.02 | 215.42 | 201.08 | 12.3 | 12.5 | 12.3 | 11.7 |
| Bangladesh | 3.15 | 0.91 | 1.45 | 1.51 | 0.2 | 0.1 | 0.1 | 0.1 |
| Nepal | 9.22 | 10.11 | 8.85 | 10.28 | 0.6 | 0.6 | 0.5 | 0.6 |
| Others | 64.6 | 67.9 | 47.9 | 49.0 | 4.0 | 3.8 | 2.7 | 2.8 |
| **Total** | 1,605.1 | 1,777.7 | 1,750.14 | 1,725.67 | 100.0 | 100.0 | 100.0 | 100.0 |

*Sources*: Tea Board website and FAOSTAT website

China and India are the largest producers of tea with India producing 25 percent share of global tea production (2011 and 2012). In comparison, Bangladesh only produced 1.4 percent in 2012 and Nepal produced 0.4 per cent in 2010 (Table 40). India consumes 82 per cent of its tea. Therefore, despite of the being the second largest producer, it is the fourth largest exporter of tea (Table 41). The share of Bangladesh and Nepal in world exports of tea is only 0.1 and 0.6 per cent, respectively.

## VI.4 Tea

Tea is a unique product as it is both agriculture and industry. “It is industry in the sense that tea is processed and manufactured commodity. It is also an agricultural crop because it is grown on land. Agricultural operations like cultivation, plucking, manuring, irrigation, weed control, disease and pest attack, transportation of green leaf and uprooting are undertaken for a growing tea. The final product of tea comes through various processing and manufacturing stages like withering, rolling, fermenting, drying, weighing, sorting, cutting that place it under industry”. (Banerjee and Banerji, 2008) One may go further that services are also involved especially when marketing of tea gets involved with warehousing (storage), transport and selling. It is important to understand the background of all the stages to analyse whether regional integration in the form of value chains can take place in the tea industry or not.

Tea leaf has only one species as discussed earlier. However it has three primary varieties. Out of which the third one (java bush) is not used for commercial tea cultivation. The two primary varieties are – *Camellia sinesis sinesis* (China) and *Camellia sinesis assamica* (Assam and Yunnan province of China). There are 1,500 cultivated varieties out of these two. In our interviews we were informed that in the North Bengal region – there are primarily five varieties – Chinese (sinesis), China Hybrid (sinesis and assamica), Assam (assamica), Assam Hybrid (assamica and sinesis) and Clones of tea varieties. There are certified 32 clones of Darjeeling**,** 25 percent China and 25 percent China hybrid.

“The *Camellia sinesis sinesis* plant grows best in cool temperatures on steep mountain slopes. In fact, it thrives at elevations up to 9,500 feet. Because of the climate and elevation, the China plant will typically grow to between 5 and 15 feet tall, if left unattended, and produce leaves up to two inches long. The short mountain growing seasons yield a smaller crop of more tender leaves that yield a sweeter, less astringent cup. The China plant is typically pruned to be waist high with a flat top surface to allow easier plucking of the new growth. Because of the climate, the growing season is, at most, half of the year, and the plant will generally yield no more than five pluckings in a year. The China plant will be dormant during the winters. During this time, the plant is storing up its energy and nutrients and the first spring "flush" of new growth provides some of the finest teas on earth with the highest concentrations of desirable flavors and essential elements that provide the health benefits in tea. It is usually used to produce green tea and white tea. Some black and oolong tea can also be made from this. In India this is called the Chinese variety which is primarily grown in the Darjeeling hilly areas. There is one tea garden. There is one garden in Ilam which produces the pure *sinesis* variety too. Others are producing its hybrids.

The *Camellia sinesis assamica* strain is native to the Assam region in Northern India. High humidity, generous rainfall, and warm temperatures allow this larger, more robust tea variety to thrive. The *Assamica* plant will grow to between 30 and 60 feet if left unattended and produce much larger (up to 8 inches) leaves. Under perfect conditions with proper fertilization, the *Assamica* plant can be harvested every 8 to 12 days throughout the year. Because of the tremendous yields, it is the preferred crop in Northeast India, Sri Lanka and Africa. The unique climate in Sri Lanka allows the harvest from this hardy bush to continue year-round. The *Assamica* leaf is ideal for producing strong, malty, black teas. Other Chinese teas requiring lengthier production, such as oolong and pu'erh, are also made from the larger leaves of the

*Assamica* plant". (Tea Class website) The other three districts are producing the Assamese tea and its hybrid.

The plants have to be planted correctly. In our interviews we learned that in the Darjeeling hills, there are 22,000 plants per acre. Seed planting style is inherited from the British: 4*4= 3600 to 6000 per hectare. This implies that Indians are still hand plucking their tea and they don't even market it! From our interviews we learned that machinery cannot be used to pluck on the slopes and in the plains the distance between the shrubs are not made for machine plucking. All the varieties have to be planted in the correct slope at the correct height. Slopes which are North facing with respect to the Himalayas have more water while south, east and west facing plants are more subject to drought. One has to give shade plants in the plains. One has to take care of the roots. Every plant has two roots – the main root and the feeder root. Feeder roots are typically on the surface of the soil and supply water, minerals and oxygen to the plant. Due to excessive use of pesticides, feeder roots have dried up leading to drought and moisture tightening. The taproot coming up for moisture, gets the sun and dies. These all affect the productivity of the plant as tap roots and feeder roots wither and soil erosion takes places. Due to the top soil erosion, the forest soil is being put back by working with the forest like planting lemon grass and love grass at the end of each section. This is supposed to stop the flowing of soil. In winter people are asked to take the accumulated soil back.

Tea is mostly grown in plantation style in India. This style has colonial origins where the organization relates more to a factory than to a farm. There is specialization in one crop, which is produced on a large scale for export and for maintenance work (Banerjee and Banerji, 2008). In contrast, the Chinese grow tea along with other crops on the side (Banerjee and Banerji, 2008). Plantation style does not dominate tea farming in other districts of our study. This requires special mention because of the labor involved. The tribals were moved in from Chota Nagpur (Jharkhand) to work in the tea plantations in the 1800s. Four tribes namely Kharia, Bhagta, Oanon and Bhukta are there in the Terai region. The cultivation stops at the Bihar border in the Terai marginal area. The laborers were given pieces of part of land, medical facilities and a house. Employment was for the whole family including men, women and children. Currently, there are three types of wages namely living wage, fair wage and standard wage. The wages and amenities for the tea laborers are based on the Plantation Labor Act in India. The gratuity, bonus and Provident Fund are based on the 1971 Gratuity Act, Provident Fund Act and the payment of bonus act. This style of labor functioning has proved to be burdensome and expensive. When the British opened their tea estates in Kenya, they gave up on this style of farming but in India it has continued to this day.

The shape of the leaf, method of manufacturing, extent of processing helps classify tea (Banerjee & Banerjee, 2008). The authors also mentioned that China produces the most varieties of tea. The Chinese classify tea as per the colour of the tea while the British classified tea as per the color of the dried leaf. There are mainly five varieties of tea as per the British style: White Tea, Green Tea, Oolong Tea, Black Tea and Pu'erh Tea.

India mainly produces black tea. As per tea e-auction data from January to August, 2013, 99.93 percent tea auctioned was black tea and 0.07 percent was green tea (Tea e-Auction website.) Other types of tea are being slowly produced in India as they have fetch higher prices but they

are in very small quantities available to a niche market. In our interviews we heard that in Ilam, Nepal green tea and Oolong tea was being produced with the help of the Chinese. Jhapa and Panchagarh mostly produce black tea.

Black is mainly produced in two ways – Orthodox and CTC (Crush-Tear-Curl) Method. The Orthodox tea production mainly involves five steps (Appendix 3 describes in details the Orthodox and CTC methods of producing black tea).

- Plucking: The leaves are harvested by hand in all the five districts in the study.
- Withering
- Rolling
- Oxidation
- Firing

In CTC production method, all five steps of Orthodox processing are performed, but much more rapidly and in a limited fashion. The three basic differences between Orthodox and CTC teas are (Tea Class website):

- Appearance of the leaf
- Machinery involved CTC is produced on a machine which takes fresh, whole leaves and macerates them. The ground up leaf is rolled into little pellets and oxidized. In Orthodox processing, the leaves are carefully rolled and handled just enough to produce a certain flavor.
- Flavor profile: CTC tea flavor is one-dimensional: bold, powerful and brightly coloring with a pungent astringency. In Orthodox production there are nuanced flavors.

India uses machinery to produce CTC on a large-scale. The machinery is of course "large". However, since the Chinese are helping Ilam develop skills in producing other varieties of tea and as mentioned before, their tea is produced in small scale, the Chinese machinery is "small" and requires different set of skills. Therefore, in Ilam when making black tea, farmers use Indian machinery and Indian production methods. If growers are making tea for China, they use different machinery. The returns on Chinese tea are higher.

The Tea Class website explains that the Green Tea involves only the first three steps of Black Tea i.e. plucking, withering and rolling. Banerjee and Banerji (2008) describe the process chart of Indian Green Tea:

- Freshly plucked leaves: Steaming (up to 2 minutes)
- Curling and drying ( in hot air 90 to 100 degree Celsius for 40 to 50 minutes: the leaf moisture reduces from 76 percent to about 50 percent
- Rolling (without heat for 15 minutes)
- Pressing and drying (hot air at 50 to 60 degree Celsius for 30 to 40 minutes: leaf moisture reduces to about 30 percent
- Curling (drying directly on hot pan at 80 to 90 degree Celsius
- Twisting (for 40 minutes under pressing and rolling by a curling-hand mounted on a pan
- Drying (at 80 degree Celsius until moisture content of 6 percent is achieved)

Banerjee and Banerji (2008) explain that the Chinese make varieties of green tea. From fresh leaves to spreading to de-enzyming to rolling and twisting are common processes. Then they will pan roast dry to make roasted green tea which can be either long shaped or round shaped. Or they will dry using bake drying machine and make baked green tea.

White Tea is unprocessed tea. The name is derived from the fuzzy white "down" that appears on the unopened or recently opened buds - the newest growth on the tea bush. White tea is simply plucked and allowed to wither dry. (Tea Class website)

Oolong Tea utilizes all of the five basic steps described above for black tea, with rolling and oxidizing done repeatedly. It is half-way between green and black tea. These teas are anywhere from 8 percent oxidized to 80 percent. (Tea Class website)

Pu'erh Tea: It first undergoes a process similar to Green tea, but before the leaf is dried, it's aged either as loose-leaf tea or pressed into dense cakes and decorative shapes. Pu'erh is a fermented tea and the aging process lasts anywhere from a few months to several years. (Tea Class website)

Instant tea and tea bags are new products. However, on the supply side, another key element is organic tea i.e. tea produced with no chemicals. The certification process is complex and expensive but the returns are higher. In Ilam, we were told that the price of normal tea is Rs 600 to 700 per kg while organic tea is worth Rs 1,800 to 2,000 per kg. Also there is now certification for sustainable labor practices. Certifications like these gets higher returns for the farmers.

These are the following types of tea auctioned in India: Kolkatta CTC Leaf, Kolkata Orthodox Leaf, Kolkata Dust, Guwahati Leaf, Guwahati Dust, Siliguri Leaf, Siliguri Dust, Jalpiguri Leaf, Jalpiguri Dust, Cochin Leaf, Cochin Dust, Coonoor Leaf, Coonoor Dust, Coimbatore Leaf and Coimbatore Dust (Tea e-auctions website).

The classification of tea depends on the “time of plucking (spring, summer, or autumn), the region of production, scale of production (start farm, agriculture collective or smallholder), final market (domestic or foreign), counter-trade or cash, color, aroma and taste”. (Banerjee and Banerji, 2008)

**VI.5 Survey**

We conducted a field survey in the five districts to understand the value chain in tea production and explore regional integration. The survey included various questions on tea at various stages. It also included background interview on household and enterprise characteristics. The survey was done in the plain and hilly regions of Darjeeling separately and Uttar Dinajpur in India, Jhapa and Ilam districts in Nepal and Panchagarh district in Bangladesh. The sample sizes for these regions are 61, 16, 30, 30, 29 and 31, respectively. Table 41 shows the break-up of the sample. There is a bias towards growers in all the regions surveyed.

**Table 41: Breakup of the Sample (%)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Panchagarh* | *Jhapa* | *Ilam* |
|---|---|---|---|---|---|---|
| Growers Only | 45.90 | 75 | 46.67 | 63.33 | 68.9 | 67.7 |
| Growers and Processors | 8.20 | 18.75 | 13.33 | 16.67 | 27.5 | 12.9 |
| Growers and Exporters | 0 | 0 | 0 | 0 | 3.4 | 3.2 |
| Traders only | 18.03 | 0 | 6.67 | 0 | 0. | 0. |
| Small scale processors Only | 8.20 | 0 | 3.33 | 0. | 0. | 9.68 |
| Large scale processors Only | 9.84 | 0 | 20.00 | 20 | 0 | 3.23 |
| Warehousing only | 0 | 0 | 0 | 0 | 0 | 0 |
| Transport only | 3.28 | 0 | 0 | 0 | 0 | 0 |
| Financing only | 0 | 0 | 0 | 0 | 0 | 0 |
| Blender only | 4.92 | 0 | 0 | 0 | 0 | 0 |
| Exporter only | 0 | 0 | 0 | 0 | 0 | 3.23 |
| Other | 1.64 | 6.25 | 10 | 0 | 0 | 0 |
| Sample Size(Number) | 61 | 16 | 30 | 30 | 29 | 31 |

*Source*: *Field Survey 2013*

Table 42 shows the household and enterprise characteristics from the field survey. The family members of majority of the respondents in all the regions are reported to have secondary education. Uttar Dinajpur and Panchagarh have the lowest position in this regard. Except in Darjeeling hills and Uttar Dinajpur, all respondents have male headed households. The respondents have the highest number of female headed households in Uttar Dinajpur. The average plot size of respondents' household is the highest in Darjeeling plains and Darjeeling hills and the lowest in Ilam. Only a minor proportion of respondents hold a position in their local communities. The highest one is in Darjeeling plains and the lowest in Uttar Dinajpur. Majority of the respondents reported the main occupation of their family head as farmer in all the regions. Unsurprisingly, most of the respondents depend on agricultural produce sales as their main cash income source. Among the agricultural produce sales, respondents from Jhapa and Ilam reported the greater part of their income coming from tea sales. Next came Darjeeling plains and Panchagarh in this regard. However, in Darjeeling hills and Uttar Dinajpur, the respondents' reported their major income as income from other agricultural product sales (87.5% and 55.1%, respectively).

Majority of the respondents in the regions surveyed in India are reported to have registered formally while majority of them in the regions surveyed in Nepal and Bangladesh are reported as not having formal registration. However, none of them are registered as MSME except very few in Darjeeling plains. Most of the respondents in Nepal and Bangladesh are reported to be part of larger firm while this is not the case in India. Most of the enterprises are reported to be in agricultural sector for more than 10 years on an average in all the regions. In Jhapa, Ilam and Uttar Dinajpur, majority of respondents reported their enterprises as having internet access. Moreover, they reported using internet to communicate with buyers and suppliers, while none of the respondents in Darjeeling hills and Panchagarh reported to have internet access in their enterprises. Only very few respondents in Darjeeling plains informed of using emails for

business communication with their buyers and suppliers. Majority of the respondents in Uttar Dinajpur informed their businesses as having internationally recognized quality certification. The worst case in this regard is reported from Panchagarh with none having quality certification for their business, followed by Jhapa. However, we cannot rely on the figure for Darjeeling plains in this regard since 51.5 percent of non response is reported here. Moreover, there is no response in this regard for Darjeeling hills.

**Table 42: Household and Enterprise Characteristics**

| Characteristics | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Panchagarh* | *Jhapa* | *Ilam* |
|---|---|---|---|---|---|---|
| Respondents with household members having secondary education (%) | 100 | 86.7 | 83.3 | 84.2 | 100 | 90.9 |
| Respondents with male headed household (%) | 100 | 73.3 | 63.2 | 100 | 100 | 100 |
| Respondents with female headed household (%) | 0 | 26.7 | 36.8 | 100 | 0 | 0 |
| Average size of plot(acres) | 41.2 | 56.4 | 13.5 | 19.2 | 21.5 | 4.5 |
| Households with farmer as the main occupation of the head (%) | 96.6 | 100 | 85.7 | 89.4 | 100 | 100 |
| Respondents holding a position in the local community (%) | 35.7 | 0 | 7.14 | Missing | 0 | 13.6 |
| Households with agricultural produce sales as the main cash income source (%) | 100 | 100 | 100 | 89.4 | 95.2 | 90.9 |
| Average Proportion of Income from tea sales (%) | 75.8 | 12.5 | 44.9 | 65.9 | 93.3 | 96.5 |
| Average Proportion of Income from other products (%) | 24.2 | 87.5 | 55.1 | 34.1 | 6.7 | 3.5 |
| Respondents who are registered formally (%) | 60.6 | 75 | 60 | 40 | 31.3 | 32.3 |
| Respondents who are registered as MSME (%) | 4.9 | 0 | 0 | 0 | 0 | 0 |
| Respondents who are part of a larger firm (%) | 24.2 | 0 | 43.8 | 88.8 | 62.5 | 55.5 |
| Average number of Years in the Agricultural Sector | 17 | Missing | 12 | 13 | 21 | 13 |
| Respondents with enterprises having Internet Access (%) | 21.2 | 0 | 62.5 | 0 | 75 | 77.7 |
| Respondents whose business use emails to communicate with buyers/Suppliers | 6.1 | 0 | 50 | 0 | 50 | 88.8 |
| Respondents with business which have internationally recognized quality certification (%) | 21.5* | Missing | 62.5 | 0 | 12.5 | 44.4 |

*Notes*: MSME= Micro, Small and Medium Enterprise
*51.5 percent is missing for Darjeeling Plains
*Source*: *Field Survey 2013*

## VI.6 Value Chains in Tea

We extend Banerjee and Banerji (2008) argument that agriculture is both agriculture and industry to saying that agriculture includes elements of agriculture, industry and services. We look at pairs of districts to examine whether regional integration through value chains in tea can be achieved in the districts. The pairs are identified based on the similarity of the tea produced: Darjeeling and Ilam, Terai plains and Jhapa and Uttar Dinajpur and Bangladesh. Appendix 4a to 4f describes the value chains in tea of each district. Figure 2 below describes the generic value chain in the tea industry of the three countries.

**Figure 2: Value Chain in Tea Production**


*Source*: NCAER Conceptuatlization based on Literature Survey, Interviews and Primary Survey

Table 43 gives a comparison of all the six tea production regions for all the elements of the value chain.

**Table 43: Comparison of Tea Value Chains**

| I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|
| | **Category of Growers** | **Intermediate Inputs** | **Type of Tea Leaf** | **Transport** | **Processing** | **Tea Type Produced** | **Transport** |
| Darjeeling Plains | Small Growers, Plantation estates | Machinery, Fertilizers from own country, Plantation style labor | Chinese and Chinese Hybrid | Small transport companies | Bought Leaf Factories and Estate Factories | CTC and Green Tea | Trucks |
| Hilly Region, Darjeeling | | | Assamese and Assamese Hybrid | | | Orthodox and Green Tea | |
| North Dinajpur | | | | | | CTC Tea | |
| Jhapa, Nepal | Small Growers, Tea Estates | Machinery, fertilizers from India, labor | | Donkeys and Human beings | Bought Leaf Factories (India and Nepal) and Own Factories | CTC Tea | Human Beings and Donkeys |
| Ilam, Nepal | Tea Gardens, Small Growers, Tea Cooperatives | | Chinese and Assamese | | | Orthodox and Green Tea, White Tea, Oolong Tea, Various forms of organic tea | |
| Panchagarh, Bangladesh | Tea Estates | | Assamese and Assamese Hybrid | Horse/cows drawn carts | Own Factories | CTC tea | Trucks and Tractors |

*Sources*: Interviews and Primary Survey

**Table 43: Comparison of Tea Value Chains contd.**

| | IX | X | XI | XII | XIII | XIV | XV |
|---|---|---|---|---|---|---|---|
| | ***Warehousing*** | ***Sales*** | ***Transport*** | ***Packaging*** | ***Trading and Marketing*** | ***Domestic Transport*** | ***International Transport*** |
| Terai Region, Darjeeling | Warehouses: Regulated by the Tea Board; Owned by separate set of people | Siliguri Tea e-Auction, (Tasters and Brokers) Private Brokers, Exports (Tasters and Brokers) | Trucks | Regulated Packaging: Jute and Plastic Bags | Domestic Market (Bihar, Madhya Pradesh); Private Players | Roads | Roads, Sea Ports, Air |
| Hilly Region, Darjeeling | | Kolkata Tea e-Auction, (Tasters and Brokers) Private Sales, Exports | | Regulated Packaging: Paper Sacks | Domestic (Urban middle class) and External Markets (70%); Private Players | | |
| North Dinajpur | | Siliguri Tea e-Auction (Tasters and Brokers), Private Brokers, Exports | | Regulated Packaging: Jute and Plastic Bangs | Domestic Market; Private Players | | |
| Jhapa, Nepal | Warehouses: Ownership needed to clarify; Unregulated | Private Sales, Brokers | Trucks | Unregulated Packaging | Domestic (Ilam-5%) and External Markets (Ilam-15%) (Jhapa – 70% and Ilam: 80% is sold to India); Private Players | Roads | Roads, Air |
| Ilam, Nepal | | | | | | | |
| Panchgarh, Bangladesh | Warehouses in Chittagong (655km) P to Siliguri-69 km; No strong regulations | Chittagong Auction (Brokers and Tasters), Direct Sales | Trucks, | Unregulated Packaging | Domestic Market | | Roads, Seaports, Air |

*Sources*: Interviews and Primary Survey

## VI.5.A Category of Growers

Table 44 shows the category of growers in tea. These numbers have been estimated from our interviews and various secondary sources. The main message in this table is that nobody knows how many growers are there, not even in India. The tea boards of the various countries know only about the large tea estates i.e. sizes greater than 25 acres. The estimates for small farmers widely vary. The Tea Board of India which maintains strict control over the production of tea

also has very little idea about the number of tea growers. This question is important because then only one can estimate the supply of tea and where they are sourcing their inputs.

From our survey, we know that there are cooperatives in Darjeeling Plains (Terai) but we do not know the total population. There are 5 cooperatives who are growers in the sample. There is one cooperative in the survey in Ilam.

**Table 44: Category of Growers**

| | ***Darjeeling Hilly*** | ***Darjeeling Plains and Uttar Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|
| ***Tea Estates*** | 87 | 336 | 60 to 70 | | 18 |
| ***Tea Gardens*** | N.A. | N.A. | N.A. | N.A. | 13: Medium size |
| ***Small Growers*** | N.A. | 22,000 to 40,000 | 954 (2010–11)* Small farmers with 10 hectares and below: 12,000 to 13,000 | 5,839 (2010–11)* | 215 |
| ***Tea Cooperatives*** | N.A. | N.A. | | 42 | N.A. |

*Notes*: The definition of a small grower is anybody owning 25 acres and below.
*Sources*: * District Development Committee, Jhapa interview and Interviews from other sources

## VI.5.B Intermediate Inputs for Tea Agriculture and Manufacturing

Labor

Labor is the biggest cost for tea growers and the tea growers face labor problems in Nepal, India and Bangladesh (Panchagarh website). In India, in the big estates in Darjeeling and Terai region, labor is organized in the old, colonial fashioned way of plantation as mentioned before. Tribes were brought in to the tea farms and were given home, land, health and education benefits. To this day, the system continues. In Darjeeling, the wages per week for a worker include Rs 90, food subsidy, free medicines, medical benefits and maternity, thus amounting to Rs 140−150 per worker for a week[74]. Child labor has since been abandoned. It was discovered that women in particular were very good for tea production at various stages. The tea estate owners in India contend that labor is expensive and difficult to manage. In the last ten years, the unorganized sector had been growing faster then the organized sector. In the organized sector, PF is contributory and for bonus the requirement is to work for 300 days. In the unorganized sector, they pay higher cash wages at lump sum amount. Further as the Indian economy expands, improvement in infrastructure is required. There has been a program to build up highways and airports etc due to which there has migration of labor the tea labor does not show up for work and goes outside for work. The accusatory tone of the tea estate owner towards the National Highway Authority of India (NHAI), Airport authority as well other real estate and many

[74] Due to the plantation labor style of functioning, education has strong roots and that can be seen in the literacy statistics of the earlier section. While walking through the tea estate in the Darjeeling hills, we saw children in neat uniforms coming back from school. However, once the children get educated, they do not want to continue as tea labour and want to move to different jobs.

construction activities was ironical. Another factor which is affecting labor in India is NREGA (National Rural Employment Guarantee Scheme) where wages are even lower than the construction sector wages. In the unorganized sector, real wages for unskilled labour in Silguri and within 50 km radius is Rs 200 to 250 per day while in NREGA it is 135 Rs per day and in the organized sector, it is Rs 160-170.Thus, permanent workforce is not going into NREGA and NREGA has thus benefited the tea industry, according to the opinion of some persons interviewed at Siliguri. Some others suggested that NREGA has resulted in labor shortage. NREGA has created some problems like raising the absenteeism rate from 9 percent to 19 percent. The young generation is reported to be reluctant in doing tea business. In Darjeeling, the topography is not for machine plucking and hence there is heavy reliance on labor. There is shortage of labor there due to the rise in the aspirations of labor because of education quality and media.

In Nepal, labor shortage is reported due to migration to the Middle East. Further the argument is that labor in Nepal is more expensive than India. Of course the Indian tea estate owners argue otherwise! In Nepal there is only 5 percent provident fund but in India it is 10 percent. There is no upper limit to wages like India. Nepal has adapted a similar system to India but with a twist. In the sense that labor does not live in the tea gardens. Few old farmers have been given pucca houses and everybody else now gets thatched houses. However, interest free loans are given to labor for once a year for tin housing. Essentially labor in Jhapa gets Rs 158 per day which in INR is 98.80. This is all for 8 hours a day including half an hour lunch. However, effectively the labor ends up working for 4 hours in a day. The tea estate owner has to legally provide school is there no school within 1 km of the tea estate and there are more than 50 laborers.

If these numbers are credible, then Indian labor is cheaper because they are getting Rs 150 per week whereas Nepalese labor is getting Rs 98.8 per day.

Electricity costs Rs 6.5 per unit whereas in Nepal it costs Rs 24.5 per unit.

The Panchagarh website contends that labor problems in Bangladesh exist because workers feel that they are not being given fair wages.

The tea industry is marked labor force participation of women in the tea gardens/estates. This was noticed during the British times itself. Labor force participation of women in Darjeeling district is 18.44 as opposed to males 16.46 in 2009–10 (NSS, 2010). Female labor force participation rate in women is 1.32 percent whereas males are 1.83 (NSS, 2010).

Fertilizers

From the interviews we assessed that the tea growers in Nepal are sourcing their inputs whether machinery or fertilizers from India. From Nepal, we learned that the small farmers just switch to producing tea from rice or other products because they see higher returns. However, they do not in-built knowledge in growing tea. They are either using fertilizers banned in India or over-using

them[75]. The bigger farmers get Indian consultants but the smaller ones in Ilam are just experimenting with little resources.

Overusing of fertilizers is a problem in the tea industry. We heard that even in Darjeeling, tea estate owners in their efforts to increase productivity, overused fertilizers and ended up killing feeder roots as discussed before. Organic tea production methods reduce the volume of tea produced but the returns more than make up for it.

ICT

In our survey we find that all growers have access to mobile phones (100%) except in Ilam where the number is 95.5 percent.

Growing tea is still relatively cheaper in India and the labor force is better off. Trade potential exists in intermediate inputs and this is route that one should focus on. Trading is not just in inputs but also in consultants' services and education. At the end India benefits from better quality Nepalese tea, as growers in Ilam and Jhapa have informed us that the major destination for their market is India. Ilam quotes a number of 85 percent of produce. Testing takes long and trade holds up. Both countries would be better off, if inputs are provided to Nepalsese farmers so that Indian tea drinkers are not drinking pesticide filled tea! Plus trade will increase. Of course as Karki says that Nepal should put in some minimum mandatory food standards which are in harmony with international standards. This will help Nepal only.

Climate Change has significantly affected tea production with erratic rainfall patterns. Rampant de-forestation in Nepal may be responsible for this phenomenon. In the interviews we heard that China is working with Nepal on tea production because it is impossible to increased that within the country due to changing rainfall patterns. In Terai, we heard about rain producing trees i.e. if one plants trees in the plains as shade trees, these attract rains. The problem is that these trees get stolen for timber. In the hilly regions, shade trees are not so important. But trees which do not compete with tea for soil nutrients are encouraged. For example, lemon grass holds the soil together and does not compete with tea.

### VI.5.C Transport from Tea Garden/Estate to Processing or Value addition

The next step in tea is to transfer the product from the garden to the factories for further processing. After plucking the tea leaves have to be processed within five hours. Large estates have processing facilities on their own farms. There is also a concept of a bought leaf factory where leaves are bought from small farms to be processed in the factory. India, there are small transporters who do this job. But they work through mobile phones and are extremely busy. These transporters use bicycle driven transport modes. These small transporters collect leaves from all growers and transport it to the bought leaf factory.

[75] Karki reports the Germany rejected Nepalese orthodox tea because it contained tetradifon ( pesticide) at a level of 0.24ppm, which 24 times the permissible maximum residue level in Germany. The cost of pesticide residue analysis in the EU and the US is approximately USD 200 per sample which the Nepalese bear and a significant cost for them.

In Nepal and Panchgarh, humans and animals are used to transport and there is nothing formal about this.

This is important because informally, tea leaves are being transported to Darjeeling bought leaf factories from Ilam and then processed as Darjeeling tea. This is serious threat to the GI and the USP of Darjeeling tea. However, the point is that a chain can be formed here where leaves from Nepalese farms are processed in India.

A small side note is that the questionnaire has ignored all the previous stages of tea production. It starts at the stage of tea processing which is a significant gap in the questionnaire because of the nature of tea production as we have laid out earlier.

### VI.5.D Processing or Value Addition

Finally the tea reaches the tea processor where it is processed into black or green tea. With black tea either CTC or orthodox method of production is chosen. We asked the buyers as to rank their tea produce suppliers. Farmers and local collectors are the largest category. Local collectors may be the local transporter who is collecting the tea from the leaves to be transferring it to the bought leaf factory for further processing. In Ilam, cooperatives have a large role to play (Table 45a). We know that cooperatives have a strong presence in Ilam from the earlier section. In the Darjeeling plains, cooperatives are also a source for tea produce. In the Darjeeling hills area, cooperatives exist but none are included in the sample. They are not a part of the 87 producers.

**Table 45a: Purchasing Products**
**Ranking of the suppliers of the tea produces; based on their importance (% of Respondents)**

| Suppliers | *Darjeeling Plains* | | *Darjeeling Hills* | | *Uttar Dinajpur* | | *Jhapa* | | *Ilam* | | *Panchagarh* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rank1 | Rank2 | Rank1 | Rank2 | Rank1 | Rank2 | Rank1 | Rank2 | Rank1 | Rank2 | Rank1 | Rank2 |
| Farmers | 36.4 | 27.2 | 100 | 50 | 68.9 | 18.8 | 62.5 | 12.5 | 44.4 | 22.2 | 90.9 | 9.1 |
| Tea Estates | 0 | 3.03 | 0 | 50 | 18.8 | 0 | 0 | 37.5 | 12.5 | 11.1 | 9.1 | 63.6 |
| Local Collectors | 33.3 | 15.2 | 0 | 0 | 6.3 | 31.3 | 12.5 | 37.5 | 0 | 33.3 | 0 | 18.2 |
| Cooperatives | 0 | 3.03 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 11.1 | 0 | 18.2 |
| Small Processors | 0 | 9.09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large Processors | 3.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Traders | 18.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note*: The buyers were asked to rank their tea produce suppliers based on their importance. Those suppliers who were given ranks 1 and 2 by the respondents are considered here. The percentage of respondents who gave ranks 1 and 2 to the various suppliers is shown in the table.
*Source:* Field survey 2013

Table 45b shows the information sources for finding tea produce suppliers. The buyers were asked to rank the various information sources which they use for finding their tea produce suppliers, based on the importance of various sources. Those information sources which were ranked 1 by the respondents are considered here. The percentage of respondents who gave ranks 1 to the various suppliers are shown in the table.

Personal visits play a major role in all the regions except in the Darjeeling Hills. The Darjeeling hills database is not reliable because 12 out of 16 are growers. Personal networks in the South Asian region matter. The tea trade in Darjeeling whether plains or hills is controlled by the business caste, Marwaris. In Jhapa, the President of the Chamber of Commerce belonged to the same caste. The "younger" districts in terms of commercial tea production have a slightly more interesting story where personal visits play a smaller role relative to the plains. Meetings, word of mouth, the mobile phone all play a significant role.

**Table 45b: Ranking of the various information sources for finding the tea produce suppliers (Figures are in percentage of Respondents)**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***North Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| Meetings | 18.2 | 100 | 12.5 | 0 | 66.7 | 0 |
| Word of Mouth | 18.2 | 0 | 12.5 | 0 | 11.1 | 37.5 |
| Radio | 0 | 0 | 0 | 0 | 0.0 | 0 |
| Newspaper | 0 | 0 | 0 | 0 | 0.0 | 0 |
| Personal visits | 51.6 | 0 | 56.25 | 50 | 11.1 | 31.3 |
| Official government sources | 0 | 0 | 0 | 0 | 0 | 0 |
| Landline call | 0 | 0 | 0 | 0 | 0 | 0 |
| Mobile call | 0 | 0 | 12.5 | 50 | 11.1 | 0 |
| Trade newsletter | 0 | 0 | 0 | 0 | 0 | 0 |
| Others | 0 | 0 | 0 | 0 | 0 | 0 |

*Note*: The buyers were asked to rank the various information sources which they use for finding their tea produce suppliers, based on the importance of various sources. Those information sources which were ranked 1 by the respondents are considered here. The percentage of respondents who gave ranks 1 to the various suppliers are shown in the table.

*Source: Field survey2013*

Quantity and Quality are the main provisions in the contract. Again in Nepal and Bangladesh, contracts, written contracts are far more important. Is it because they are not established players in the market? That would definitely seem so.

**Table 45c: Contracts between the Product Suppliers and Buyers**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***North Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| Respondents having contracts with suppliers (%) | 25 | 7.69 | 7 | 63 | 89 | 100 |
| Respondents with written contracts (%) | 25 | 7.69 | 0 | 60 | 88 | 100 |
| Average Number of active contracts | 14 | 6 | 5 | 50 | 172 | 20.73 |
| Typical length of a contract (number of years) | 1 | 1 | 1 | 1 | 1 | 1 |
| Respondents with quantity as the main contract provision (%) | 81.3 | 0 | 100 | 50 | 100 | 100 |
| Respondents with price guarantee as the main contract provision (%) | 0 | 0 | 0 | 0 | 0 | 81.8 |
| Respondents with quality as the main contract provision (%) | 100 | 100 | 100 | 60 | 100 | 90.9 |
| Respondents with frequency of supply as the main contract provision (%) | 0 | 0 | 0 | 0 | 0 | 0 |

*Source: Field Survey 2013*

Table 45d shows that local markets and buying the gate dominates any other market. This table would suggest that there is no scope for developing value chain between the farmer and the processor. Little bit that takes place may be informal in nature. This makes sense also because transporting tea from the farmer to the processor is a time-intensive issue. Trade at the border will cause unnecessary delays and losses. Integration with the current border processes would be difficult to develop and achieve.

**Table 45d: Product Purchasing Locations**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***North Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| **Farm Gate** | | | | | | |
| Persons Buying (%) | 42.4 | 100 | 68.9 | 87.5 | 50 | 9.1 |
| Average Distance(km) | 0.9 | Missing | 5 | 5,432.9 | 4,000 | 6,000 |
| Average quantity buying (in packing unit) | 7050 | Missing | 5,863.7 | 7.3 | 7 | 3 |
| **Own Premises** | | | | | | |
| Persons Buying (%) | 0 | 0 | 6.3 | 8 | 25 | 90.9 |
| Average Distance(km) | 0 | 0 | 8 | 17,500 | 3,500 | 15,750 |
| Average quantity buying (in packing unit) | 0 | 0 | 6,000 | 6 | 5 | 0.25 |
| **Local Market** | | | | | | |
| Persons Buying (%) | 0 | 0 | 18.8 | 4 | 25 | 0 |
| Average Distance(km) | 0 | 0 | 4.2 | 7,671.7 | 6,000 | 0 |
| Average quantity buying (in packing unit) | 0 | 0 | 7,000 | 12.8 | 6 | 0 |
| **District Market** | | | | | | |
| Persons Buying (%) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average Distance(km) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average quantity buying (in packing unit) | 0 | 0 | 0 | 0 | 0 | 0 |
| **Regional Market** | | | | | | |
| Persons Buying (%) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average Distance(km) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average quantity buying (in packing unit) | 0 | 0 | 0 | 0 | 0 | 0 |
| **Across the Border** | | | | | | |
| Persons Buying (%) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average Distance(km) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average quantity buying (in packing unit) | 0 | 0 | 0 | 0 | 0 | 0 |
| **Global Market** | | | | | | |
| Persons Buying (%) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average Distance (km) | 0 | 0 | 0 | 0 | 0 | 0 |
| Average quantity buying (in packing unit) | 0 | 0 | 0 | 0 | 0 | 0 |

*Source: Field Survey 2013*

Average operating costs at the farm gate are the cheapest in the Darjeeling Plains (Terai) and Uttar Dinajpur. It is the highest in Ilam. Again this shows that tea making is cheapest in India in this particular process too.

**Table 45e: Average Operating Costs Involved in Tea Product Purchase (PPP US$ per unit)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Farm Gate | 35 | 42.5 | 35 | 54.8 | 90 | 67.5 |
| Own Premises | | | Missing | 34.8 | 80 | 56 |
| Local Market | | | 197.5 | 51.6 | 88 | |
| District Market | | | | | | |
| Regional Market | | | | | | |
| Across the Border | | | | | | |
| Global Market | | | | | | |

*Source: Field Survey 2013*

Therefore, one may ask, is no trade possible at this stage? The answer is yes, trade is possible but again the trade in intermediate inputs becomes important. The machinery used to produce CTC tea in Nepal and Bangladesh are imported from India.

### VI.5.E Production of Tea

The productivity of Terai Plains is significantly higher than either Jhapa or Panchagarh (Table 45). The productivity of Jhapa is higher than Panchagarh too. However, the productivity of Ilam is higher than the Darjeeling hills. This is partly because the tea shrubs in Darjeeling are 80 to 90 years old whereas the ones in Ilam are just ten years old. The Darjeeling Tea Association has created an elaborate system for the 87 tea estates that come under the GI. It has assessed the potential of each estate. The estates are supposed to report production and if it goes higher than that, the Darjeeling Tea Association will check. Passing of Ilam tea as Darjeeling tea is also a phenomena that one has to contend with. Further, tea leaves are brought from Ilam to bought leaf factories in Darjeeling to be processed and then sold as Darjeeling Tea. The GI fetches a higher price.

**Table 46: Productivity of Tea**

| | *Terai Plains* | *Darjeeling Hills* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|
| ***Year*** | ***2011*** | ***2011*** | ***2011*** | ***2011*** | ***2008*** |
| Area(hectares) | 24,360 | 17,820 | 9,179 | 5,417 | 570.77 |
| Production (Million Kg) | 113.66 | 8.93 | 15.2 | 1.7 | 0.4 |
| Productivity(Kg/hectare) | 903 | 105 | 674.9 | 317.3 | 631 |

Sources: Tea Board of India (2012a, 2013), Government of Nepal (2012), Bangladesh Tea Board (2012)

### VI.5.F Transport

Once the tea is processed, it is transported to the warehouses. As mentioned in Table 43, trucks are used in India for transportation. In contrast, humans and animals are used in Nepal while horse/ cows drawn carts are used in Bangladesh. The packaging is done in plastic bags. Darjeeling tea is more carefully packed in lined brown bags.

Table 46 shows that only the Darjeeling plains region has a well-developed transport industry. The Darjeeling hills database is biased. In the newer districts of Uttar Dinajpur, Jhapa and Ilam growers do not have their own transport reflecting the poorer status of growers (probably small growers). Tea traders, processers own their transport fleet because there is no well-developed industry. In Panchagarh, everybody owns transport because of lack of any other option.

We heard in the interviews on the Indian side that how the tea bags are improperly handled by transporters and there pilferage going on from the sacks. This is a significant loss to the grower. While the pilferage is in small quantity from each bag, the total amounts to a lot. In order to control for quantity, growers have started putting extra quantity in the bags.

**Table 46: Number of persons who own their own Transport Fleet (% of Respondents)**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***Uttar Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| Grower | 0 | 66.7 | 35.7 | 47.6 | 22.7 | 100 |
| Trader | 0 | | 100 | | | |
| Small scale processor | 0 | Missing | 100 | 100 | 100 | |
| Large scale Processor | 0 | Missing | 83.3 | 100 | 100 | 100 |
| Warehousing | 0 | | | | | |
| Transport | 100 | | | | | |
| Financing | 0 | | | | | |
| Blender | 0 | | | | | |
| Export | 0 | | | | | |
| Others | 0 | | 100 | | | |

*Source: Field Survey2013*

## VI.5.G Warehousing

Warehousing is an important step in the tea value chain. After the tea is processed it is stored in warehouses. Warehouses are meant to safeguard tea under all circumstances. In our visits to a warehouse in India, we realized the rudimentary form of websites in India. It is one large hall divided in rows and columns by writing on the wall. The tea bags are loaded on a paper and the exact location is remembered by the address of the row and column. There are of course invoices but mostly it is manual. Everything is retrieved and put in by humans. The warehouses have to follow certain norms (specified in the next paragraph) and one of them being that it has to be dry. The Darjeeling Plains sample is biased because it does not cover warehousing owners. There are 45 warehousing owners. They are all registered with the Siliguri Tea Board. Processors tend to have their own warehouses. In Uttar Dinajpur, there aren't any. Growers also have some capacity of ware housing.

**Table 47a: Owned Storage Facilities (OSF) for those involved in Different Activities of Tea Business (% of Respondents)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Grower | 17.8 | 26.7 | 0 | 31.5 | 20 | 26.3 |
| Trader | 36.3 | | 0 | | | |
| Small scale processor | 60 | | 0 | 25 | 66.7 | |
| Large scale Processor | 100 | 66.7 | 0 | 25 | 100 | 100 |
| Warehousing | | | | | | |
| Transport | | | | | | |
| Financing | | | | | | |
| Blender | | | | | | |
| Export | | | | 100 | 100 | 100 |
| Others | | | 0 | 100 | 100 | |

*Source: Field Survey2013*

The warehousing is done through experience and there is no formal course in warehousing. There are lots of specifications about packing by the Tea board. The minimum specification by the Tea Board for a warehouse is 10,000square feet. In Darjeeling, half of the respondents follow these specifications. The warehouse rent is decided by the STAC (Siliguri Tea Auction Committee). Typically it is Rs 19 per 30 kg of tea. The rent is very low but the risk is very high. There are 20 warehouses in Siliguri registered with the Tea Board (as per the interviews) and STAC with an extra of 10 rented ones during the on season (June to December). There are separate rules for auction based brokers and private brokers even in the case of warehouses. The private sector owns most of the warehousing in case of the need for additional capacity in Darjeeling.

There is no major warehousing in Nepal and no regulations for it too, as informed by the officials of tea associations interviewed in Nepal.

The storage is cheapest in the Darjeeling Plains (Table 47b). It is not a surprise the transport, storage and communication form 22 percent of Darjeeling district GDP assessing from these numbers. Own capacity seems to be very high in Bangladesh and Nepal whereas in India, storage is a business of its own and therefore one finds that contracts are written in storage (Table 47c)

## Table 47b: Details of Storage

| | *Darjeeling Plains* | *Darjeeling Hills* | *North Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| **OWNED STORAGE FACILITIES (%)** | 54.5 | 25 | 0 | 24.1 | 19.4 | 90.9 |
| Average length of time in storage(in week**s)** | 5.9 | 50 | 0 | Missing | Missing | Missing |
| Packaging Type (% of Respondents) Jute and Plastic Bags | 48.4 | 100 | 0 | Missing | Missing | Missing |
| Paper Sack Bags | 6.1 | 0 | 0 | Missing | Missing | Missing |
| Capacity(Kg) | 40,971 | 45,750 | 0 | 371,757.1 | 30,300 | 41,600 |
| Average capacity utilization (% of total capacity) | 34.4 | 25 | 0 | 73.8 | 29.4 | 66.5 |
| Average Operating Cost per month(PPP US$) | 32,812.5 | 45,000 | 0 | Self operated | Self operated | Missing |
| **NON-OWNED STORAGE FACILITIES (%)** | 45.5 | 75 | 100 | 75.9 | 80.6 | 9.1 |
| Quantity stored/month (no. of bags) | 1,100 | Missing | Missing | 1000 | Missing | Missing |
| Cost per unit or time of storage (PPPUS$ /month) | 23.25 | 25 | 26.25 | 30000* | Missing | Missing |
| Average length of storage time (months) | 1 | 1 | 2.8 | 1 | 2 | Missing |
| **Ownership** | | | | | | |
| Private | 100 | 100 | 100 | NA | | |
| Government | | | | | | |
| Cooperatives | | | | | | |
| Others | | | | | | |

*Note: * only one response is obtained for this in Jhapa*
*Source: Field Survey2013*

## Table 47c: Contract Details with Providers of Storage Space

| | *Darjeeling Plains* | *Darjeeling Hills* | *North Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| **Ownership of Contract(% of Respondents)** | 26.2 | 31.3 | 16.7 | 0 | | 0 |
| Private | 100 | 100 | 100 | | | |
| Government | | | | | | |
| Cooperatives | | | | | | |
| Others | | | | | | |
| Average Number of Active Contracts | 6 | 1.2 | 1.2 | 0 | | 0 |
| Average Typical Length(Year) | 1 | 1 | 1 | 0 | | 0 |
| **Contract Provisions(% of Respondents)** | | | | | | |
| Space guarantee | 35.3 | 31.3 | 18.9 | | | |
| Price guarantee | 29.4 | 20 | | | | |
| Quality | 35.2 | 20 | 18.9 | | | |
| Other | | 20 | | | | |

Source: Field Survey 2013

Within one or two full mechanization of warehousing is expected in the Siliguri district. The government is planning to construct tea parks near the New Jalpaiguri Railway station where all the warehouses will be working in the future. This will reduce the pilferage of tea. This will be close or in the same place at the land port that is being built.

### VI.5.H. Sale

As mentioned before, tea is sold through auctions or private parties in India and Bangladesh. In Nepal, tea is sold through private parties where domestic or international. While the tea is stored in the warehouse, the system for selling it is rolled in. Brokers who are registered with the Tea Board of India or Bangladesh get involved in the process. The brokers grade the tea, publish the catalogues of tea and send it to all buyers. There are professional tasters who work with the brokers who will taste the tea and grade it. Buyers will then want to taste the tea which is then sent from the warehouse. An extra bag is always kept for tasting at the warehouse. Then at the auction, buyers bid for the tea. After the bidding process is over, tea is sent to the buyers.

In India, the share of tea sold through auctions is 35–40 percent, private sales 50–60 percent and exports 10–20 percent. The whole process of auctioning takes two weeks in India.

The significant change in India came in 2009 when auctions went online or e-auctions. Now anybody and everybody in India registered with the Tea Board can bid for tea. This was a subject of major debate in our interviews with strong opinions on both sides. At the end the e-auction has made bidding a very transparent and fair process. Private selling of tea is influenced by the auction prices. Excess buying of tea can result from bad decisions because the system does not let you withdraw but on the margin, it is beneficial to all stakeholders involved.

Tables 48a and 48b analyze whether the advent of mobile phone and internet had any impact on the number of buyers. Except for Panchagarh, there is no significant response in mobile phones. And there is no impact of Internet. This is because personal networks are still relied upon for buyers.

**Table 48a: Average Proportion of Buyers before and after the introduction of Mobile Phone**

| | Darjeeling Plains | | Darjeeling Hills | | Uttar Dinajpur | | Jhapa | | Ilam | | Panchagarh | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| Another trader or local collector | 72.5 | 75.5 | 78.3 | 90 | 15 | 15 | 60.3 | 57 | | | 1.5 | 17.1 |
| Middleman | 29.7 | 25.7 | 90 | 100 | 97.5 | 97.5 | 100 | 100 | | | | |
| Cooperative | 60.8 | 72.5 | 15 | 20 | | | 70.3 | 78.2 | 100 | 100 | | |
| Private trader in local market/village | 82.9 | 80 | 20 | missing | | | | | | | | |
| Private trader in district market | 84.3 | 80.7 | 67.3 | 65 | | | 50 | 50 | | | | |
| Government/ local government agency | | | | | | | | | | | | |
| Export agent | 0 | 10 | | | | | | | | | 12 | 12 |
| Exporter | | | 100 | 100 | | | 76.3 | 78.6 | 100 | 100 | 81.5 | 70 |
| Other | | | | | | | | | | | | |

*Source*: Field Survey2013

Table 48c shows the price and quantity of tea sold. Ilam, Jhapa and Panchagarh are doing much better than India. Even North Dinajpur outperforms the Darjeeling plains (Terai region). Of course, this year started with a drought in Terai region and production may have been down because of that. Price received per unit is the highest for Ilam followed by Panchagarh. It is the lowest in Uttar Dinajpur followed by Darjeeling plains. Total price is the highest for Panchagarh followed by Jhapa .It is the lowest in Darjeeling hills folowed by Uttar Dinajpur.

Table 48d shows that the sales contracts exist and most of them have the contracts and check is the preferred mode of payment (Table 48e).

**Table 48b: Proportion of Buyers before and after the introduction of Internet (%)**

| | *Darjeeling Plains* | | *Darjeeling Hills* | | *Uttar Dinajpur* | | *Jhapa* | | *Ilam* | | *Panchagarh* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Before*** | ***After*** | ***Before*** | ***After*** | ***Before*** | ***After*** | ***Before*** | ***After*** | ***Before*** | ***After*** | ***Before*** | ***After*** |
| Another trader or local collector | | | | | | | | | | | 10 | 10 |
| Middleman | 0 | 10 | | | | | | | | | 8.3 | 13.3 |
| Cooperative | | | | | | | | | | | | |
| Private trader in local market/village | 100 | 80 | missing | missing | | | | | | | 45 | 37.5 |
| Private trader in district market | | | | | | | 50 | 50 | | | 10 | 10 |
| Government/ local government agency | | | | | | | | | | | | |
| Export agent | 0 | 10 | | | | | | | | | 42.5 | 40 |
| Exporter | | | | | | | 83.3 | 83.3 | 100 | 100 | | |
| Other | | | | | | | | | | | | |

*Source*: Field Survey 2013

**Table 48c: Average Quantity Sold and Average Price Received for the last five Transactions (PPPUS$)**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***Uttar Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| Quantity Sold(Kg) | 1,248.34 | 231.74 | 1,538.34 | 2,996.2 | 1,697.7 | 5,308.9 |
| Price (PPP US$/Kg) | 91.38 | 168.13 | 31.50 | 104.40 | 162.00 | 178.13 |
| Total Revenue (PPP US$) | 114,073.3 | 38,962.45 | 48,457.71 | 312,803.3 | 275,027.4 | 945,674.4 |

*Source:* Field Survey 2013

.

**Table 48d: Details of Contracts for Sales**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Respondents having contracts with suppliers (%) | 21.3 | 81.3 | 13.3 | 13.8 | 0 | 83.3 |
| Average Number of active contracts | 1.3 | 1 | 1.5 | 4.3 | | 1.1 |
| Typical length of a contract (number of years) | 1 | 1 | 1 | 1 | | 1 |
| Respondents with quantity as the main contract provision(%) | 13.1 | | 3.3 | 13.7 | | 50 |
| Respondents with price guarantee as the main contract provision(%) | | 50 | 3.3 | | | 25 |
| Respondents with quality as the main contract provision(%) | 21.3 | 50 | 6.7 | 6.8 | | 25 |
| Respondents with frequency of supply as the main contract provision(%) | | | | | | |

*Source: Field Survey 2013*

**Table 48e: Mode and Period of Payment of Sales (% of Respondents)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| **Mode of Payment** | | | | | | |
| Cash | 7.4 | 56.3 | 33.3 | 2.5 | 10 | 16.7 |
| Cheques | 85.2 | 21.7 | 40 | 96.5 | 90 | 83.3 |
| Bank Transfer | 7.4 | 21.7 | 26.7 | 1.0 | | |
| Other mode of money transfer (e.g. western union) | | | | | | |
| Credit | | | | | | |
| Barter trade | | | | | | |
| Other (specify) | | | | | | |
| **Period of Payment** | | | | | | |
| Less than a week | 9.9 | 18.8 | 20 | | | |
| 1-2 weeks | 19.6 | 6.3 | 23.33 | | | 86.7 |
| 3-4 weeks | 62.3 | 43.7 | 26.67 | 72.4 | 64.5 | 13.3 |
| 5-6 weeks | 8.2 | 32 | 16.67 | | 35.5 | |
| More than 6 weeks | | | 13.33 | | | |

*Source: Field Survey 2013*

### VI.5.I. Transport

After the sale is finalized, transport then comes in again to take the goods from the warehouse to the retailer. Goods are transported for exports via roads and ports for Nepal. In case of Bangladesh, the Chittagong airport is right there. Table 49 shows that the Indian transport sector is relatively cheaper.

**Table 49: Average Transport Charges for Own Transport Fleet and Non Owned Transport Fleet (PPP US$ per unit cargo)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| **Own Transport Fleet** | | | | | | |
| Per load | | | | 2 | | 2.5 |
| Per round trip | 3,500 | | 4,000 | | | 4,500 |
| Per kilometre | | | 50 | | | |
| Per unit | 3.75 | | | | | |
| **Non Owned Transport Fleet** | | | | | | |
| Per load | 125 | | 1,770.5 | 2.4 | | |
| Per round trip | 5,205.9 | 3,730.5 | 4,025 | 6,000 | | |
| Per kilometre | | 187.5 | 565 | 600 | | |
| Per unit | | | | 3.2 | | 2.9 |

*Source: Field Survey2013*

## VI.5.J Marketing

Personal contacts dominate searching for new buyers. The new areas like Jhapa, Ilam and Panchagarh use mobile phones and meetings to search for new buyers. Table 50b shows that people do seek advanced knowledge for sales. Most sales is done at the own premises (Table 50c). Table 50d shows greater cooperation amongst tea traders in Nepal and Bangladesh. This is probably because they are trying to recruit customers and establish markets. Without ready made networks, the traders are the only help to each other.

**Table 50a: Modes of Searching for Buyers of Products(% of Respondents)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Do not search, established relationships | 93.4 | 93.8 | 100 | 89.6 | 96.7 | 30 |
| Own mobile phone | 32.7 | | 3.3 | 75.8 | 80.6 | 100 |
| Meetings | 0.3 | 18.9 | | 42.8 | 58.1 | 70 |
| Word of mouth | | 18.9 | | 51.8 | 51.6 | 90 |
| Radio | | | | | | 4.7 |
| Newspaper | | | | | 3.2 | 20 |
| Other traders | 1.6 | 6.3 | | 6.9 | | 63.3 |
| Internet | 6.6 | | | 10.3 | 9.6 | 10 |
| Other private sector players | | | | | | |
| Others | | | | | | |

*Source: FieldSurvey2013*

## Table 50b: Information on Sales and Number of Markets

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Persons Seeking Advance Information on the Sales (%) | 75.4 | 62.5 | 33.3 | 100 | 100 | 73.3 |
| Persons Sharing Information on the Prevailing Price to the Fellow Traders (%) | 72.2 | 30 | 20 | 100 | 100 | 24.6 |
| Number of Markets on an average | 1.2 | Missing | Missing | 1.2 | 1.3 | 2 |

*Source: Field Survey 2013*

## Table 50c: Channels of Tea Products' Sales

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| **Creditor at Own Premises** | | | | | | |
| Average Proportion Sold (%) | 48.4 | Missing | 96 | 100 | | 100 |
| Availability at Location(%of Respondents) | 26.3 | Missing | 13.3 | 17.2 | | 3.3 |
| Average Distance from Premises(km) | 22.5 | Missing | Missing | Missing | | |
| **Local Cooperatives** | | | | | | |
| Average Proportion Sold (%) | 82.7 | 100 | | 80.2 | 92.7 | |
| Availability at Location(%of Respondents) | 13.1 | 12.5 | | 17.24 | 29.3 | |
| Average Distance from Premises(km) | 35 | Missing | | | Missing | |
| **Local Periodic Market** | | | | | | |
| Average Proportion Sold (%) | | | | 28.3 | 15 | |
| Availability at Location(%of Respondents) | | | | 10.3 | 3.2 | |
| Distance from Premises(km) | | | | Missing | Missing | |
| **General Market** | | | | | | |
| Average Proportion Sold (%) | 97.1 | | | 30 | | |
| Availability at Location(%of Respondents) | 13.2 | | | 3.4 | | |
| Average Distance from Premises(km) | | | | Missing | | |
| **Processor** | | | | | | |
| Average Proportion Sold (%) | 91.8 | 100 | 20 | 100 | 100 | 98 |
| Availability at Location(%of Respondents) | 37.7 | 62.5 | 0 | 24.1 | 29.0 | 66.7 |
| Average Distance from Premises(km) | 25 | 30 | 25 | Missing | Missing | |
| **Exporter** | | | | | | |
| Average Proportion Sold (%) | | | | 67 | 94.4 | 50.1 |
| Availability at Location(%of Respondents) | | | | 27.6 | 0 | 23.3 |
| Average Distance from Premises(km) | | | | Missing | 1230 | Missing |
| **Most Common Market** | | | | | | |
| Average Proportion Sold (%) | 46.1 | Missing | | | | |
| Availability at Location(%of Respondents) | 3.9 | Missing | | | | |
| Average Distance from Premises(km) | Missing | Missing | | | | |

*Source: Field Survey 2013*

**Table 50d: Coordination Between Traders (% of Respondents)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Traders Coordinating with other Traders on which market to go to | 15.2 | 0 | 6.3 | 75 | 44.4 | 45.5 |
| Traders Coordinating with other Traders on the period of selling products | 9.1 | 100 | 43.8 | 75 | 55.5 | 36.3 |
| Traders Coordinating with other Traders on the Quantity of Products to be Sold | **0** | **0** | **0** | **0** | **0** | **0** |

*Source: Field Survey 2013*

## VI.5.K Operating Costs

Table 51 shows the average operating costs for each of the districts. Comparing the pairs – costs are definitely cheaper in the Darjeeling Hills versus Ilam. Costs are higher in Uttar Dinajpur than Panchagarh showing that the operation is not very efficient in the former. When one compares the Darjeeling Plains (Terai) with Jhapa, other than staffing costs, all costs are lower in Terai. The labor costs numbers do not match with the numbers that we got in the interviews. It confirms the Indian side fears that labor costs are relatively lower than Jhapa.

**Table 51: Average Operating Costs in 2011–12 (In lakhs PPP US$)**

| **Breakup of Costs** | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Staffing | 26.625 | 7.55 | 79.825 | 13.24 | 18.46 | 22 |
| Transport | 6.825 | 1.625 | 21.075 | 14.7 | 23.4 | 2.75 |
| Pest Control/Fertilizer | 8.425 | 3.25 | Missing | 7.88 | 20.6 | Missing |
| Communication | 0.2625 | 0.375 | 0.1 | 2.96 | 3.4 | 0.1 |
| Mobile phone service charges | 0.275 | 0.125 | Missing | 0.66 | 2.8 | 0.225 |
| Land line service charges | 0.05 | Missing | Missing | 4.3 | 2.6 | 0.275 |
| Internet charges | Missing | Missing | Missing | 0.8 | 0.28 | Missing |
| Rental of premises | Missing | Missing | Missing | 0 | 30000 | Missing |
| Marketing expenses | Missing | Missing | Missing | 1.4 | 2.58 | Missing |

*Source: Field Survey 2013*

## VI.6 Cross Border-Trade

All respondents in Darjeeling plains, Uttar Dinajpur and Panchagarh reported not selling tea products across the border while only very few in Darjeeling hills reported to sell across the border (Table 52a). Majority (57.2% and 83.3%) of respondents in Jhapa and Ilam, selling products across the border reported bribes and corruption as a major constraint for cross border

trade. Table 52b shows that border crossing costs are a big constraint to trade. Other reasons also got a high response and they include customs policy, customs clearance and lab testing problems.

The main restrictions on exports to India from Nepal as informed by the Nepalese officials include no banks in the customs place, export clearance done only in Silguri, which is about 32 kms from the border Naxalbari in Nepal, jams at customs border, no parking facility, terrible roads and no dry port at Kakarbhitta border. One main constraint was reported as the non acceptance of lab testing done in Nepal by the Indians. For getting accepted; the testing needs to be done at Kolkata, which takes 4 to 5 days. Hence, there is need for an international lab or India lab at the border, according to the Nepalese officials. The lab testing is needed under the WTO's phytosanitary act. Indian trucks can come to Nepal but Nepalese trucks can go only up to Naxalbari without duty and beyond Naxalbari, they need to pay duty, which needs one week for clearance. This is again a constraint for cross border trade. Next are the problems with currency denomination. Indian Currency of denomination 500 and 1000 are not allowed in Nepal. No denomination larger than 100 Indian Rupees is acceptable in Nepal. This is due to the shortage of Indian currency.

In most regions except Darjeeling hills and Uttar Dinajpur, majority reported road condition as the main factor that needs to be improved (Table 53). In Darjeeling hills majority of respondents demanded improvement in licensing and in Uttar Dinajpur, majority demanded the need for improvement in transport service. Jhapa and Ilam talk about improvement in market place which can come by enlarging their market i.e. regional integration with India gives them that opportunity.

**Table 52a: Cross Border Selling of Tea Products**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***Uttar Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| Persons Selling Products Across the Border (%) | 0 | 6.02 | 0 | 51.7 | 41.9 | 0 |
| % of Cross Border Sales to Total sales on an average | 0 | Missing | 0 | 58 | 71.9 | 0 |
| Roadblocks in Cross Border Trade(%) | | 0 | 0 | 46.6 | 46.2 | |

*Source: Field Survey2013*

**Table 52b: Barriers which prevent from sourcing across border (% of Respondents)**

| | ***Darjeeling Plains*** | ***Darjeeling Hills*** | ***Uttar Dinajpur*** | ***Jhapa*** | ***Ilam*** | ***Panchagarh*** |
|---|---|---|---|---|---|---|
| Higher Cost | 0 | Missing | 0 | 25 | 0 | 81.8 |
| Lack of Information | 81.82 | Missing | 43.8 | 12.5 | 11.11 | 18.2 |
| Lack of relationship with sellers | 84.85 | Missing | 81.3 | 50 | 22.22 | 18.2 |
| Transport Costs | 12.12 | Missing | 43.8 | 37.5 | 33.33 | 18.2 |
| Border Crossing Costs | 12.12 | Missing | 62.5 | 87.5 | 77.78 | 18.2 |
| Delays in Border Crossing | 12.12 | Missing | 37.5 | 37.5 | 88.89 | 0 |
| Payment Difficulties | 0 | Missing | 0 | 25 | 22.22 | 9.1 |
| Other Reasons | 0 | Missing | 0 | 100 | 66.67 | 54.5 |

*Source: Field Survey 2013*

**Table 53: Perceptions on Need for Improvement with respect to agricultural logistics (% of Respondents)**

| | *Darjeeling Plains* | *Darjeeling Hills* | *Uttar Dinajpur* | *Jhapa* | *Ilam* | *Panchagarh* |
|---|---|---|---|---|---|---|
| Road Condition | 32.8 | 6.3 | 10 | 58.6 | 30 | 40 |
| Transport Service | 6.5 | 25 | 33 | 3.4 | | 3.3 |
| Storage Service | | | | | | 3.3 |
| Market Places | | | | 24.1 | 53.3 | 3.3 |
| Mobile Phone Service | | | | | | |
| Internet Service | | | | | | 3.3 |
| Licensing | 8.2 | 8.8 | 6.7 | | | |
| Money Transfer | | | | | | |
| Trade Facilitation | | | | | | |
| Input Price Information Services | 3.3 | | 13.3 | | 3.3 | |
| Product Market Information Services | | | 10 | | | 3.3 |

*Source: Field Survey2013*

## VII. Policy Implications and Recommendations

If one uses standard economic theory there is little chance of regional integration between the districts because the regions are producing the same "homogenous" product. The question we asked in the beginning was whether value chains can be developed. The answer is yes and no. Value chains in the standard South East Asian manner cannot be developed because of the nature of the product and just-in-time production cannot take place with the current border constraints. Then how can regional integration take place which might uplift the obviously poorer districts of South Asia.

- Trade in Intermediate Inputs
- Trade in Services

India should provide help to Ilam and Jhapa in tea production especially since the pesticide laid tea is coming to India only. India's incentives are towards healthier populace. Will it harm the Darjeeling district? Unlikely because Darjeeling, on average is cheaper and more efficient than all other districts. India encourages trade in intermediate inputs like fertilizers and machinery. In return India should ask for trade in services i.e. Indian consultant provide guidance to the tea industry in Nepal.

Tea produced in Nepal cannot be brought to the bought leaf factories because of border constraints. Since that is more political in nature, what is the other solution? India opens its markets for Panchargarh, Ilam and Jhapa growers to auction their tea in the Siliguri tea market. Since they are opening a new warehousing area anyway, they can open an international zone where the tea from these regions are kept. Testing can be carried out. The growers or traders pay a fee to participation in the auction. By allowing this relatively tiny small proportion of tea produced in India, the transport, storage and warehousing areas get a further boost. ICT activities get a further boost. The Darjeeling district gets a further boost by making it the hub of international activities. The growers/traders/importers can sell tea under their original brands without hurting Indian consumers. Since the service sector is relatively more productive, India

benefits from trade. Panchagarh does not have to go all the way to Chittagong. Uttar Dinajur can benefit from Panchgarh. There is an exchange of goods and services. The value chain is formed at the service level. Then border constraints are no longer that.

The example of tea can be applied to all the agro-processing goods. If the districts are able to upgrade the value-added of their agro products, the region will benefit. For example, rice crackers, rice chips, fruit juices, ice-creams are all products that can be sold at a higher price rather than just the agro products. The tea tree oil is sold by leading British organic cosmetics as a cure for pimples. Why cannot the region foray into these products? Also Darjeeling should be selling more branded products rather than selling loose tea. Packaged and branded tea gets higher premium. Plus India should expand its varieties of tea. Tea café can be sold as an idea or the Tea Association partners with coffee shops to sell different varieties of tea made from Indian tea products.

However, infrastructure especially road and energy are home work that all countries need to do especially West Bengal. Nepal also needs to impose stricter regulations on food. Nepal and Bangladesh both benefit from the stricter norms in India. The state gains from the integration because its road network and ports are in greater demand and use. If trade is viewed as a positive sum-game, then perhaps there is a chance of a win-win situation between all of the countries.

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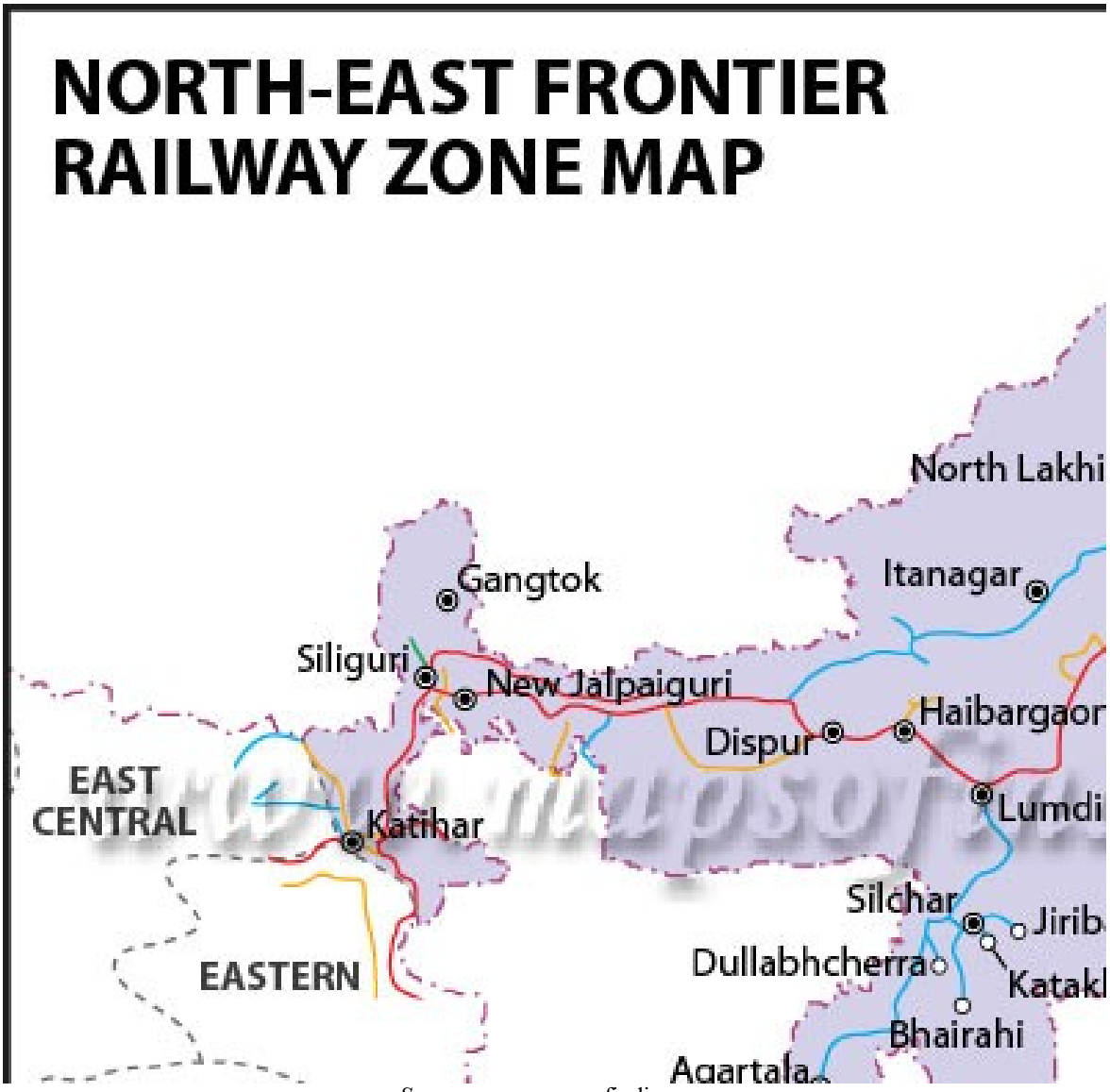
**Appendix 1: North-East Frontier Railway Zone Map**




*Source*: www.mapsofindia.com

## Appendix 2: Status of Infrastructure Projects by Siliguri-Jalpaiguri Development Authority

| *Name of the Project* | *Description* | *Status* |
|---|---|---|
| Parivahan Nagar Truck Terminal-cum-Office Complex (PNOC) | Spread over more than 75 acres, PNOC is designed to provide integrated terminal facilities for long distance goods traffic, warehouses, godowns and container freight station. A number of offices of Central and State Government as well as private organization are coming up in the office complex including IOC, CIL, Income Tax, RPNN Shine Motors, Ganashakti, Bartaman, Ananda Bazar Patrika. | Completed |
| Auditorium Cum Art Gallery, Jalpaiguri | Auditorium Cum Art Gallery, Jalpaiguri was completed in November 1999. This has provided state-of-the-art facilities for of cultural programmes to the people of this area. This project has also opened up avenues for nurturing local talent, and spreading the rich heritage of the region. The auditorium has the facilities of 900 seats, Art Gallery, Exhibit Hall, Library and Reading Room. | Completed |
| 3rd Mahananda Bridge | This work was taken up as per resolution of Siliguri sub committee meeting . Due to rapid urbanization of Matigara and Kawakhali areas during last few years, traffic intensity has been increasing in geometric progression resulting huge wear and tear of both side approach roads. | Completed |
| Construction of Perishable Cargo at Bagdogra Airport | The Center for Perishable Cargo (CPC) is to ensure maintenance of quality for fresh commodities (fruits, vegetables, cut flowers, fish, meat, pharmaceuticals etc.) during its transit to one place to other, maintaining cold chain. CPC is consisting of following areas :-Receiving area, Examination area, Pre staging area, Roller mat area, Ball mat area & Air side area. | Completed |
| Fulbari Land Custom Station | With construction of this rigid pavement connecting road from SH-12A at Fulbari Bazar to zero point of Bangladesh Border, the Fulbari LCS will be the nearest and only 8 k.m away from core of the city area of Siliguri compared to other LCS like Changrabandha (80 km from Siliguri ), Mehedipur ( 250 km from Siliguri ) and Hilli ( 300 km from Siliguri) | Completed |
| Govt. Science College at Himanchalbihar | To fulfill long standing demand of local people Department of Higher Education , Government of West Bengal in association with Siliguri Jalpaiguri Development Authority has taken up this project for construction of a new Government Science College at Himachalbihar , Matigara , Siliguri. | Completed |
| Construction of Pineapple Development Centre | At Bidhannagar, P.S. Phansidewa, District Darjeeling Land area: Total area is 16.50 acre (1st phase 10 acre, 2nd phase 6.5 acre) 10.0 acre vest land settled in favour of SJDA, 3.38 acre resumption proposal from Sayeedabad Tea Estate, 2.39 acre retained land acquired and taken over possession, 0.73 acre retained land proposed for acquisition with consent of the land owner. | Ongoing |
| Construction 4 th. Mahananda Bridge | This major Bridge project had been taken up by S.J.D.A. ,which consist of 5 (five ) nos. of Span each 30 meter long ,having total length of 160 meter (excluding both side approaches) and 7.5 meter wide carriageway with 1.50 meter wide footpath on both sides. Provision has been made in this project with R.C.C Well Sinking type of Foundation with pre-stressed concrete Girders Superstructure. | Ongoing |
| Mahananda Action Plan | Siliguri, a major town having population of about 5 lac (As per 2001 Census), is located on the bank of Mahananda River. The stretches of Mahananda river at and adjacent to Siliguri town get degraded due to contamination from domestic waste water and other waste that are being discharged into river. | Ongoing |
| Construction of Inland Container Depot | SJDA is setting up an Inland Container Depot (Dry Port) near NJP Railway Station, Siliguri on 34 acre of land. The Inland Container Depot has been conceptualized for the local industries and trading communities keeping in mind the extant demand for such a facility as well as the potential for further economic growth in the region. | Ongoing |
| Construction of High Drain from left side of | This project was taken up by SJDA as per resolution of Jalpaiguri Sub committee meeting to execute a portion of High drain under Comprehensive | Ongoing |

| *Name of the Project* | *Description* | *Status* |
|---|---|---|
| 3 no. Ghumti to out fall of Gadadhar Canal in connection with comprehensive drainage scheme of Jalpaiguri town | drainage scheme of Jalpaiguri town . During monsoon Jalpaiguri town area faced severe water logging problem mainly due to high water level of river Tista and Karala and to resolve this huge water logging problem a comprehensive drainage scheme has been prepared where Gadadhar canal has been considered as main out fall of this drainage scheme. Accordingly SJDA has taken up this project for construction of R.C.C high drain from 3 no. Ghumti near Jalpaiguri town Railway Station along left side of Haldibari road up to out fall of Gadadhar river , total length of 600 m . | |
| Construction of RAIL Under Bridge near Kishor Sangha , Siliguri | This include vast area of either side of Buardwan road at Ward No- 4 of Siliguri Municipal Corporation though situated very close to the core area of Siliguri town but isolated due existing Railway trucks .To give an access from either side of Burdwan Road , one from near Howrah Motor and other from locality "Mahananda Para" one RUB has been taken up by SJDA in association with NF Railway under the existing Railway tracks near Kishor Sanga. At present construction of one side of approach and under Bridge proper has been completed and other side approach and remaining works can be taken up after removing of existing encroachments and structures along the alignment of this RUB and its approaches | Ongoing |
| Development of Rehabilitation plots New Township at Kawakhali, Siliguri | In line with the proposed decentralization and to make available of residential, commercial, Institutional, Industrial & other facilities, the New Township Project has been taken up. The area opened up and connected to Siliguri City through 3rd Mahananda Bridge. The main objective of the project is the expansion of Siliguri City by crossing the river Mahananda- Balason. The new township will be developed in 232.4 acres and rehabilitation and other social facilities has been developed in 73.23 acres. | Ongoing |
| Construction of North Bengal Tea Park | Tea Park is being developed by SJDA in 50 acre area near NJP Railway station in collaboration with Tea Board. It has been conceptualized for the Tea Industry keeping in mind the comparative advantage of quality tea growing the state enjoys. This park is being planned to be set up for integration of tea production and tea processing facilities based on the industry cluster concept where the industries would have the provision of support facilities. The park would have (CTC and Orthodox) tea production units for small tea gardens which do not have their own facilities, tea blending units, flavored tea production units, scientific warehouses, etc. | Ongoing |
| Construction of Bridge over River Buri Balason Including Both Sides Apporoach | This major Bridge project had been taken up by S.J.D.A. .which consist of 4( four) nos. of Span each 17.5 meter long .having total length of 70 meter (excluding both side approaches) and 6.0 meter wide carriageway with 1.20 meter wide footpath on both sides. Provision has been made in this project with R.C.C Bored Pile Foundation with R.C Girders Superstructure. The total cost of Rs. 260 lac has been considered for execution of this project. | Ongoing |
| Construction of Bridge over River Karala at Samajpara, Jalpaiguri | This major Bridge project had been taken up by S.J.D.A. .which consist of 3( three) nos. of Span 2 nos of 12.5 meter long and 1 no of 18 m long .having total length of 43meter (excluding both side approaches) and 5.5 meter wide carriageway with 1.50 meter wide footpath on both sides. Provision has been made in this project with R.C.C Bored Pile Foundation with Built up section steel girder and R.C C. Deck slab Superstructure. The total cost of Rs. 160 lac has been considered for execution of this project. | Ongoing |
| Construction of Land Custom Station at Fulbari | Infrastructure development of Land Customs Stations (LCSs) is important for proper and smooth exporting of perishable as well as non-perishable commodities to neighbouring countries - Bangladesh, Nepal, Bhutan etc. Development of the infrastructure in different LCSs have been approved both under Critical Infrastructure Balance Scheme (CIBS) and now under Assistance to States for Infrastructure Development of Exports scheme (ASIDES). Through the LCSs a big boost of India's trade wilhperform with neighbouring countries. | Ongoing |

| *Name of the Project* | *Description* | *Status* |
|---|---|---|
| | The LCSs are primarily gateways for transit of goods, services and human beings between the neighbouring countries. Siliguri Jalpaiguri Development Authority (SJDA) has been taken a thrust project on development of LCS at Fulbari, Siligun along with a truck terminal for boosting up exports to neighbouring country Bangladesh through nearing Fulbari border. | |
| Construction of RCC bridge over River Mahananda near Ramghat. Siliguri | To ensure uniform development particularly on peri-urban areas of Siiiguri town and to build up direct and uninterrupted connectivity from Burdwan road to National Highway, NH-31 through Matigara, SJDA has taken up this project for construction of important Bridge over river Mahananda connecting to S.F road of Siiiguri at one end and NH-31 through Matigara on other end. After construction of this major Bridge over river Mahananda vast area of Matigara will be directly connected to core area of Siiiguri town through S.F. road resulting uniform development and socio-economic growth of this area and more than 100,000 people will be directly benefited from this project. | Ongoing |
| Construction of Road from Samsanghat, Maynaguri to Bye-pass Road | Proposed cost of roads from Samsanghat, Maynaguri to Bypass Roads at Maynaguri. Estimated amount of Rs. 84.00 lac . Placed in Board for decision. | Proposed Project |
| Drainage scheme at Malkani Hut | Proposal for construction of drainage scheme at Malkani Hut, Jalpaiguri ( 350 mt. length). Proposed by Malkani Hut Committee on 26.02.12. Approximate estimated amount of Rs. 10.00 lac. | Proposed Project |
| Construction of Open Stage and Community Hall at Malkani Hut | Proposal for construction of open stage (G.F) and Community Hall including all facility at first floor at Malkani Hut, Jalpaiguri Plinth area = 1000 sq.ft. in ground floor and 1000 sq. ft in first floor . Estimated cost of Rs. 45.00 lac . Placed in board for decision. | Proposed Project |
| Construction of bridge over River Sahu near Kholachand Fapri connecting to eastern by-pass road at Dabgram, Dist-Jalpaiguri | This project has been taken up by SJDA to meet up long standing public demand from Dabgram G.P-1, for implementation of a direct connectivity from Eastern by-pass of Siliguri town towards Kholachand Fapri and surrounding villages with construction of a permanent Bridge over river Sahu. | Proposed Project |
| Construction of RCC Bridge over River Angarijhora and both side approach roads connecting Fakdaibari at Dabgram G.P- II to Eastern by-pass road , Siliguri. | To fulfill long standing demand from inhabitants of villages like Fakdaibari, Mazabari, Hatiadanga and other villages under Dabgram Gram Panchayet No-ll and up to Binnaguri Gram Panchayet , for construction of a direct connectivity of these villages from the Eastern-By-Pass road by overcoming the natural barrier, S.J.D.A has taken up this project for construction of a permanent R.C.C Box type Bridge over existing Jhora along with both side approaches. This Bridge along with both side approaches and connecting roads will not only connect above mentioned villages to the Eastern-By-Pass near Panchanan road at Ward No- 36 of S.M.C and core area of Siliguri town but this will also create a new route up to Binnaguri G.P. | Proposed Project |
| Construction of road from Tea Auction Centre to Champasari main road, Siliguri | To fulfill long standing demand from inhabitants of Grecr.park and some portion of SMC ward no 46 , for construction of a direct connectivity from the Tea auction Centre to Champasari Main Road . S.J.D.A Has taken up this project for construction of a permanent road of 600 metre long and 5.0 m wide with provision of Earthern Embankment, WBM, bituminous macadam premix carpet, seal coat and improvement & widening of 1400 metre long and 5.0 m wide road with provision of WBM bituminous macadam, premix carpet, seal coat. | Proposed Project |

*Source*: SJDA website

## Appendix 3: Orthodox versus CTC Production

**“Orthodox Production**

Step 1. Plucking: The leaves are harvested by hand, usually ranging between just the unopened bud to the top three leaves and the bud, depending on the tea being created. In order to make hand plucking possible, the tea "trees" are pruned into waist-high bushes. After plucking, the leaves are sorted for uniformity and any stems, twigs, broken leaves, etc. are removed.

Step 2. Withering: The leaves are laid out to wilt and wither for several hours to prepare them for further processing. Tea leaves, even fresh tender ones, aren't very pliable. Without withering, they would shatter and crumble when rolled and shaped. During withering, the leaves are very gently fluffed, rotated and monitored to ensure even exposure to the air.

Step 3. Rolling: This is where thousands of varieties in tea appearance are created, and also where the process of developing flavor is started. The softened tea leaves are rolled, pressed or twisted to break the cell walls of the leaf, wringing out the juices inside. This exposes enzymes and essential oils in the leaf to oxygen in the air - the start of oxidation.

Step 4. Oxidation: After rolling, the leaves are laid out to rest for several hours, allowing oxidation to take place. Oxidation is the process in which the oxygen in the air interacts with the now-exposed enzymes in the leaf, turning it a reddish-brown color and changing the chemical composition. This step also has the greatest impact in the creation of the many wonderful and complex flavors in tea. The length of this process depends on the style of tea being produced and the ambient conditions at the time. Depending on the type of tea, from here the leaves could be rolled again and oxidized further, or not.

Step 5. Firing: The final step in the production process is to "fire" or heat the leaves quickly to dry them to below 3% moisture content and stop the oxidation process. A good, even drying with very low residual moisture also ensures the tea will keep well.

**CTC Production**

CTC, or Crush-Tear-Curl production is a very different process. All five steps of Orthodox processing are performed, but much more rapidly and in a limited fashion. CTC was invented specifically for the black tea industry, in an effort to save time (a single batch of tea otherwise can take over a day to produce) and money.

The three basic differences between Orthodox and CTC teas are:

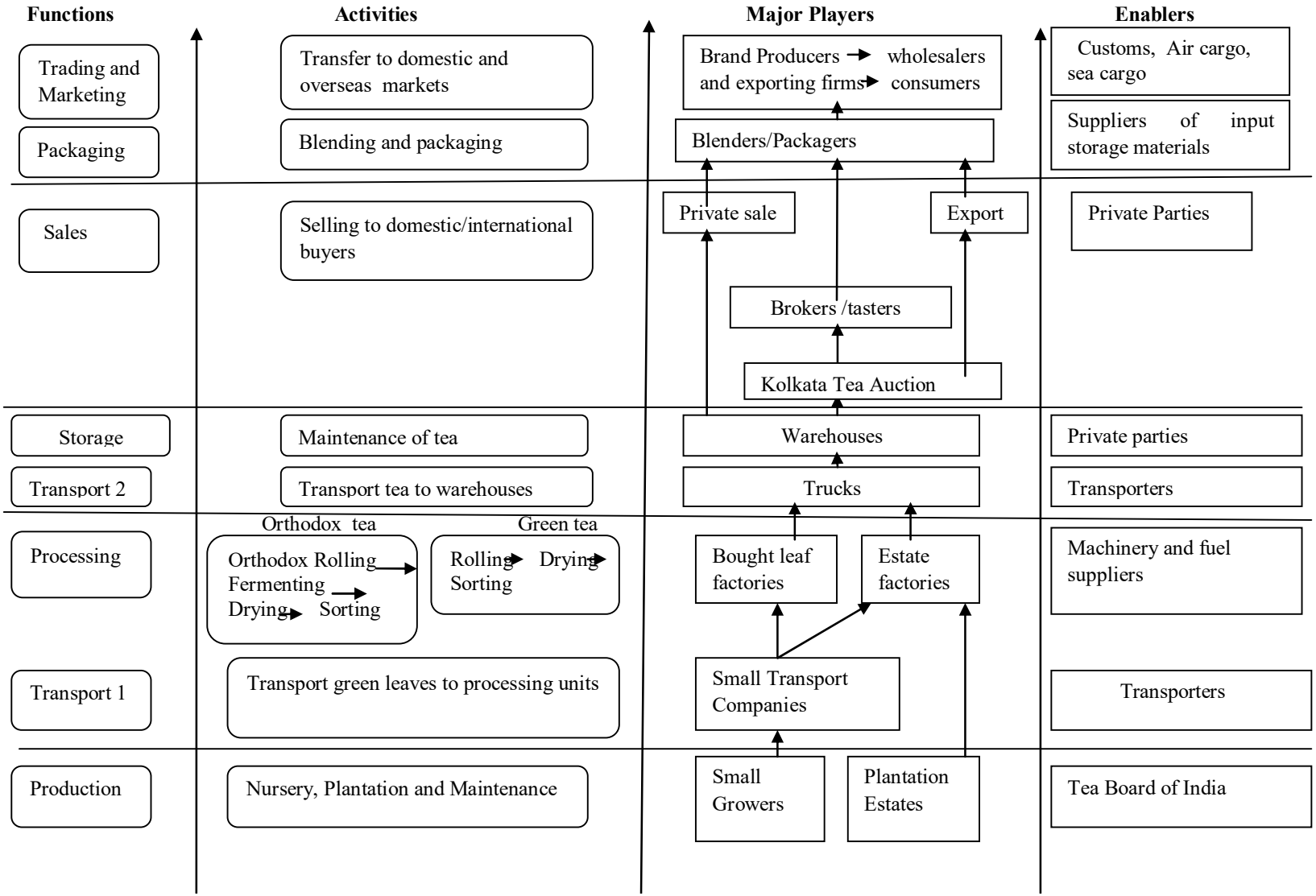
1. The appearance of the leaf: Orthodox production, whether completely hand-made or with assistance from rolling machines and such, seeks to maintain the integrity of the leaf. The tea leaves are not chopped, shredded, minced, etc. The shapes produced vary tremendously, but no matter whether it's green tea, oolong or black, Orthodox processing uses the wholeness of the leaf itself to create a diverse range of flavor in the cup. By contrast, CTC teas do not rely on the wholeness of the leaf.

2. The machinery involved CTC is produced on a machine which takes fresh, whole leaves and macerates them (crushing, tearing and curling them, hence the name). The ground up leaf is rolled into little pellets and oxidized. Because the leaf is completely broken up, every part of the process moves very quickly. A whole batch can take just two hours. In Orthodox processing, while some tea leaves can look very small at the end, the leaves are never intentionally cut or torn apart. They are carefully rolled and handled just enough to produce a certain flavor.

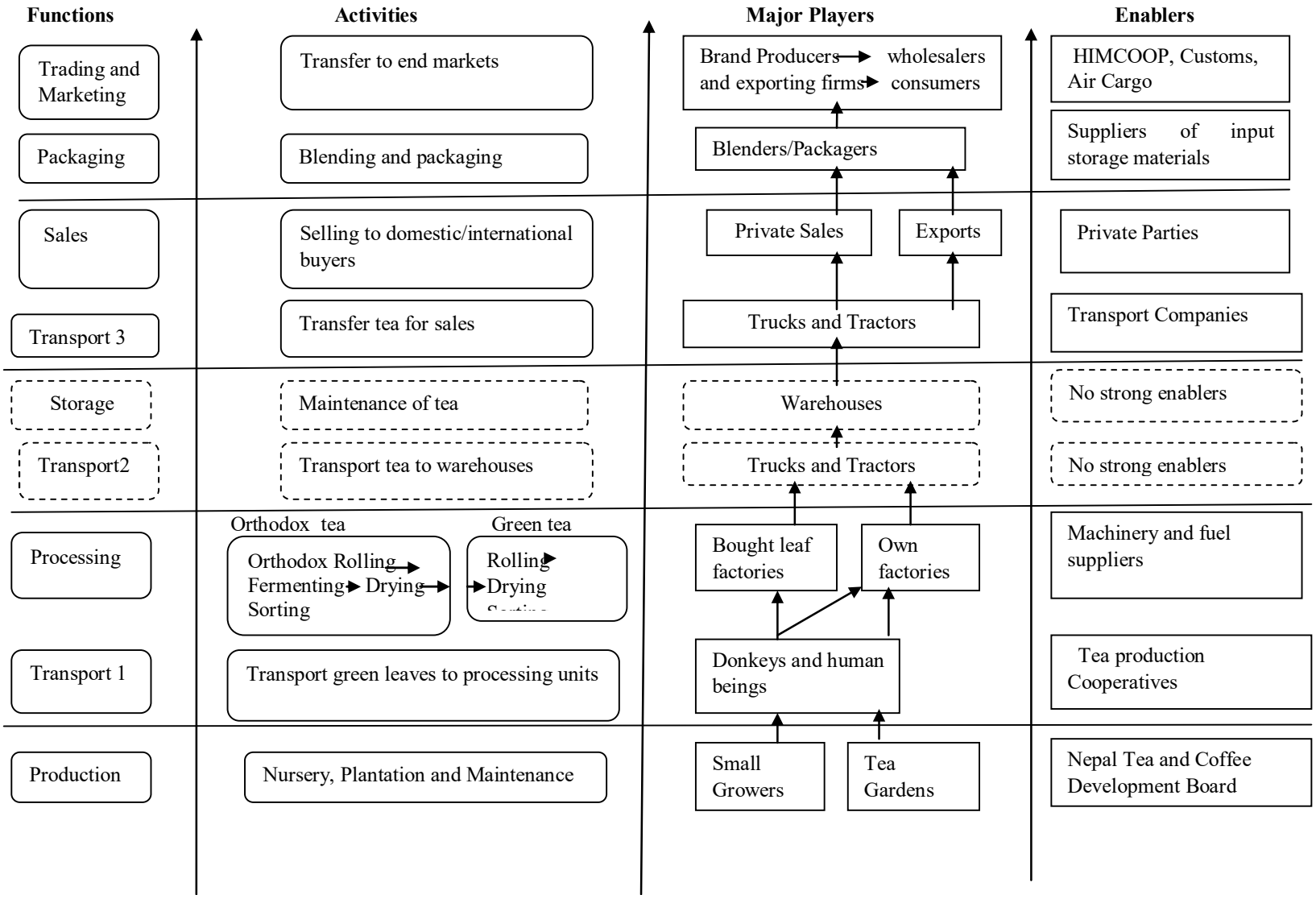
3. The flavor profile As mentioned, CTC was invented specifically for black tea production. Their flavor is very one-dimensional: bold, powerful and brightly coloring with a pungent astringency. Orthodox teas - because the leaf is not treated the same way - don't produce this type of color and body. However, CTC cannot produce the tremendous range of flavor and aroma like Orthodox. The CTC method cannot be used to make white teas, oolongs, etc. because the shredded leaf oxidizes too quickly. There are a few CTC green teas, but this is accomplished by steaming the leaves to prevent oxidation. That's about as elaborate as it gets. Secondly, because Orthodox production requires so much time, the tea maker is able to draw out and develop very nuanced flavors. Everything done to the leaf will alter the flavor of the tea.

**Why roll tea leaves?** The practice of rolling tea leaves helps preserve the essential oils, which contribute to the wonderful aroma of tea. Tightly rolled teas also store better, which was important in the early days of tea trade, as the journey from place to place could take months or years. The CTC process of chopping the leaves into small, uniform pieces makes it impossible for the leaf to hold on these essential oils. CTC teas also loose their flavor and quality much more quickly. Loose tea, if properly stored, can keep for up to 2 years. CTC teas typically keep their best taste for only 4-6 months." (Tea Class website)

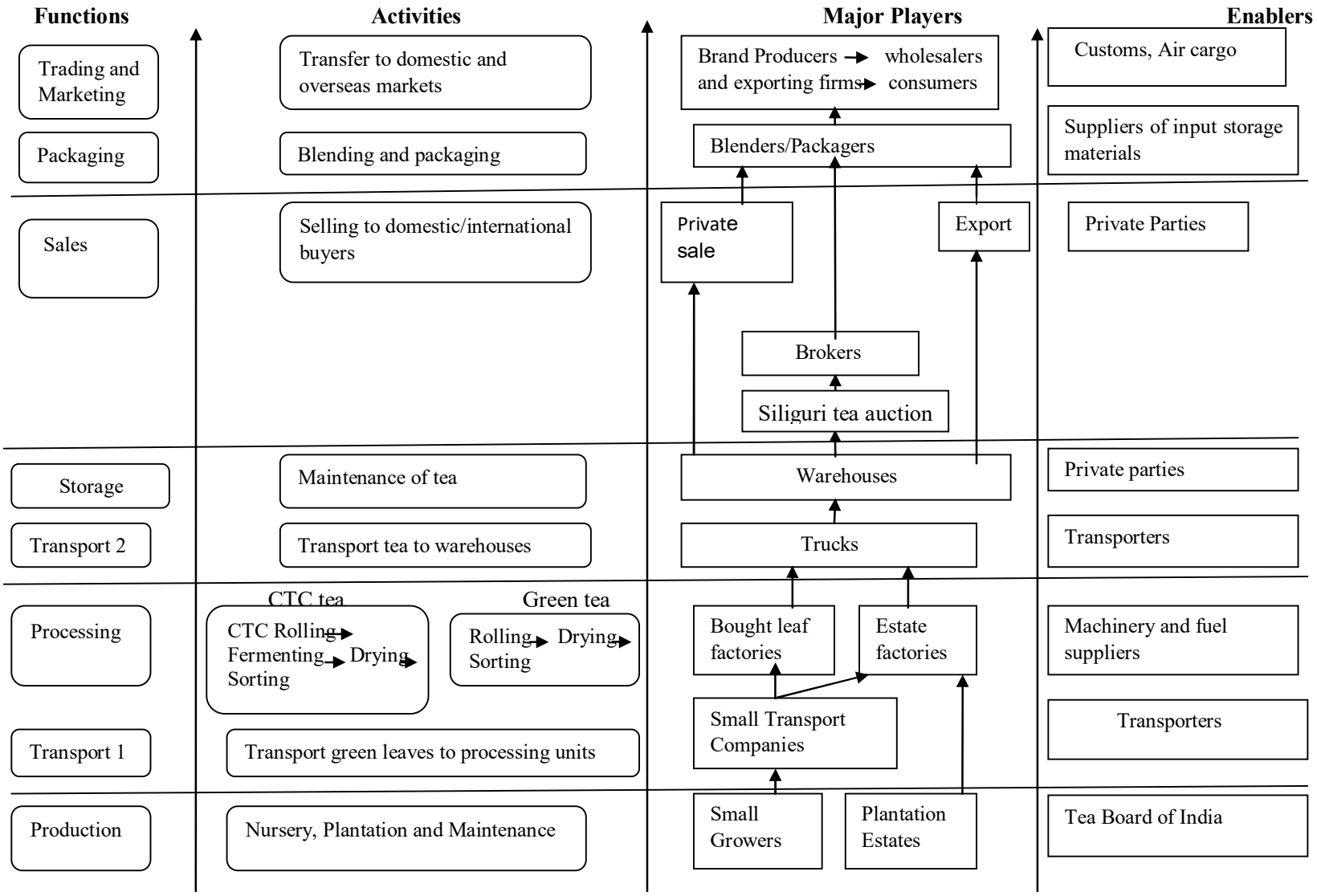
## Appendix 4a: International Value Chain for Hilly Darjeeling Region



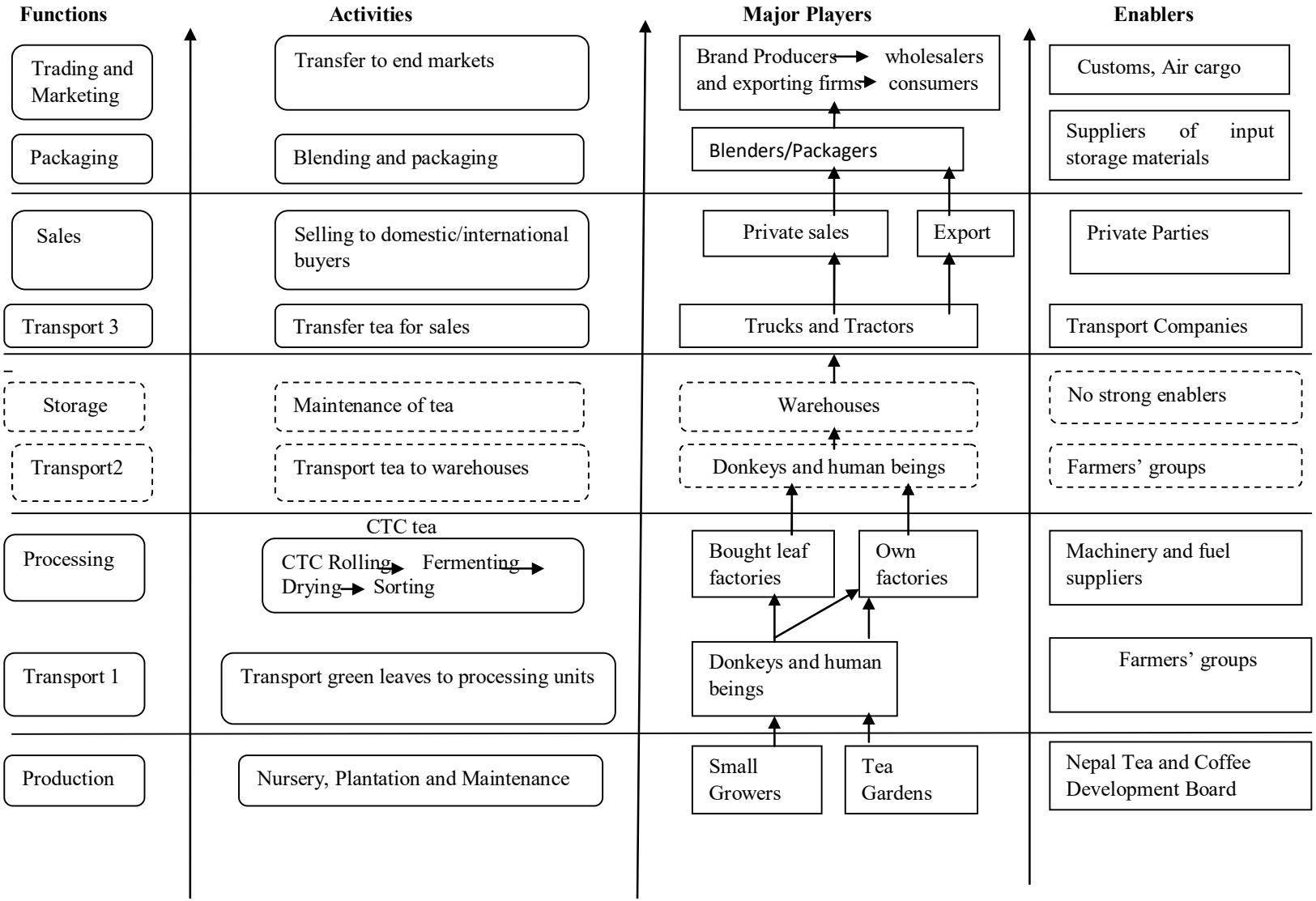
## Appendix 4b: International Value Chain for Ilam



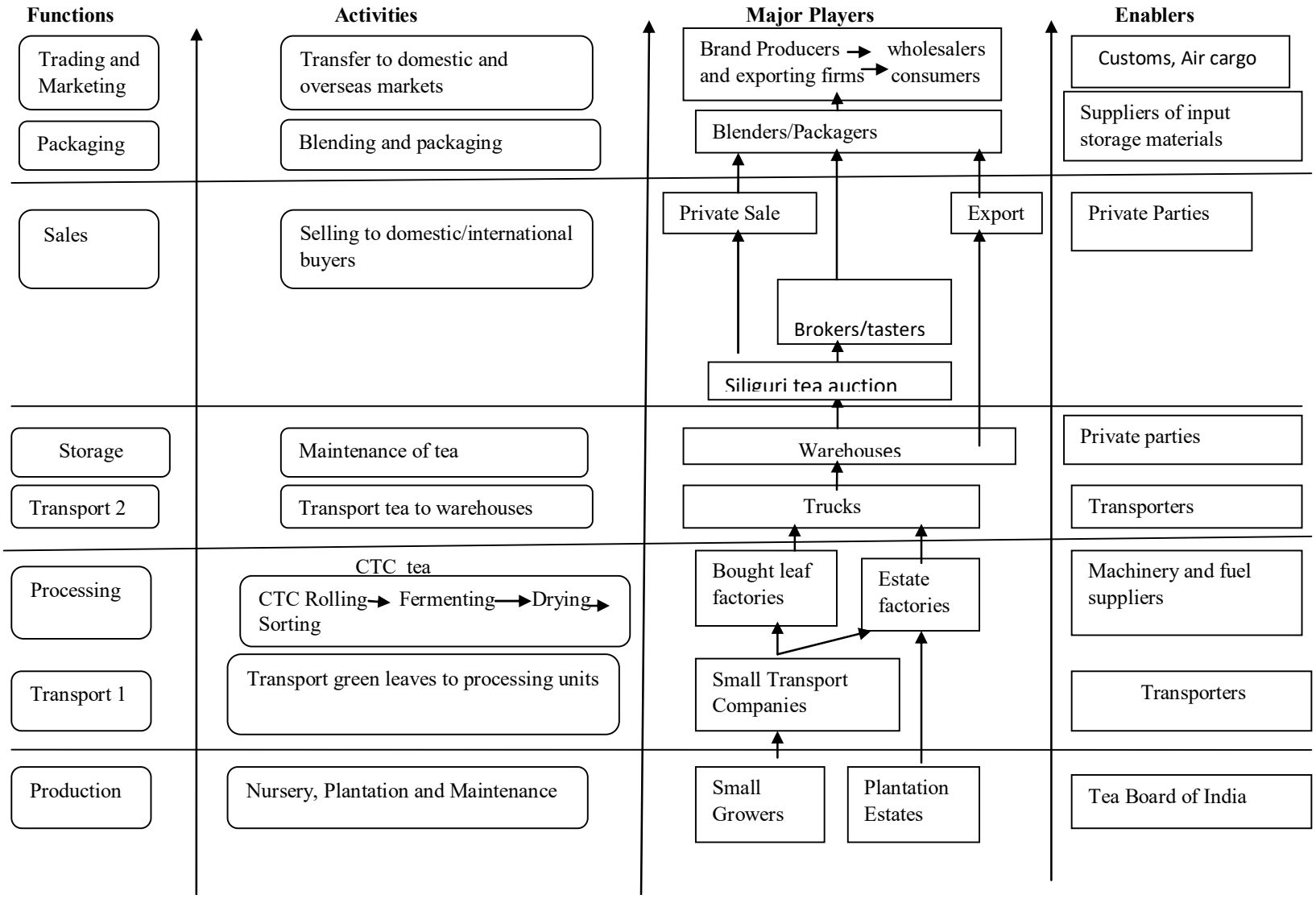
## Appendix 4c: International Value Chain for Plain Terai Region



## Appendix 4d: International Value Chain for Jhapa



## Appendix 4e: International Value Chain for Uttar Dinajpur Region



## Appendix 4f: International Value Chain for Panchagarh, Bangladesh