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Strategies for inclusive growth in Cox's Bazar

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ACKNOWLEDGMENTS

ACRONYMS

BBS	Bangladesh Bureau of Statistics
BEZA	Bangladesh Economic Zones Authority
BSCIC	Bangladesh Small and Cottage Industry Corporation
CEGIS	Center for Environmental and Geographic Information Services
CGD	Center for Global Development
CID	Center for International Devleopment
CoxDA	Cox's Bazar Development Authority
DFID	UK Department for International Development
DVA	Domestic Value Added
EC	European Commission
ECI	Economic Complexity Index
EU	European Union
FAO	Food and Agricultural Organization of the UN
FEP	Female Economic Participation
GDP	Gross Domestic Product
GVA	Gross Value Addition
HIES	Household Income and Expenditure Survey
ICT	Information and Communication Technology
ILO	International Labour Organization
LQ	Location Quotient
NGO	Non-Governmental Organisation
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
RCA	Revealed Comparative Advantage
SAM	Social Accounting Matrix
SET	Supporting Economic Transformation
SEZ	Special Economic Zone
SMEs	Small and Medium Enterprises
TPE	Total Person Equivalent
UK	United Kingdom
UNDP	United Nations Development Programme
UNWTO	World Tourism Organization
WB	World Bank
WDI	World Development Indicators

EXECUTIVE SUMMARY

Cox's Bazar is currently one of the poorest districts in Bangladesh, the situation has been exasperated by the current Rohingya refugee crisis which has highlighted the need to promote inclusive growth in the district. Therefore, the aim of the paper is to assess key potential growth sectors for Cox's Bazar. To achieve this, the report carried out, under significant data and informational constraints, a mixture of economic modelling, secondary data analysis and key stakeholder discussions to achieve these aims. A summary of the findings is reported within this executive summary.

Identifying Key Growth Sectors
With the understanding that the results are of limited robustness and under the basis that results were based on the analysis of existing productive structures (i.e. analysing current patterns of economic activity) the report identified several potential growth sectors in Cox's Bazar. These were then narrowed down to a smaller set of 'key sectors' using selection criteria broadly divided by three areas i.e. current production structures, quantitative analysis outcomes including inclusive growth considerations such as low-skilled employment potential, female participation, the rural/urban divide and employment by skill level and finally sectors identified by key stakeholders. Results suggest the manufacturing, mining, fisheries and tourism sectors as growth sectors in Cox's Bazar in the short to medium term.

The **manufacturing** sector employs a significant number of people, has strong representation in rural areas and exhibits some of the highest female participation rates among the different sectors of the district's economy. The sector is dominated by garment production but there is potential to support other sectors like rubber products or brick production. Labour productivity increases would help the sector growth and employ more people.

The **salt-extraction** (mining) sector exhibits a few employment characteristics which make it a potential growth sector. Employees require low skill levels and are all located in rural areas, whilst having a (relatively) high female employment rate. The domestic value addition of extracted salt is high, meaning that most of the value of the product is kept in-country and is sold at the national level, with potential to export. The mining sector in Cox's Bazar is wholly concentrated in salt-extraction which makes it particularly concentrated and susceptible to shock.

The **fisheries** sector has a strong comparative advantage at the national level in terms of the volume of sea-caught fish and at the international level with a relatively high RCA score. In conjunction with the fact that stakeholder discussions suggest that the caught are both considered high value and are exported internationally; the export potential of the sector could be promising. The sector has the capacity to absorb many low skilled labourers. Although the data does not show the urban/rural divide, it is not beyond doubt to assume that the sector could make significant use of the rural labour force, however it is important to point out that it does not seem to promote greater female employment levels.

The **construction** sector also has the potential to create jobs in Cox's Bazar. It can be a source of low skilled employment and female employment (approximately 40% of employed people in the sector are currently female), with employment concentrated in rural areas. The

construction sector can help support infrastructure projects as SAM results suggest strong growth impacts of investment in construction on other sectors in Cox's Bazar.

Finally, Social Accounting Matrix simulations suggest the investments in the **tourism** sector could have large growth impacts on the region. The sector also has a relatively large concentration of employment compared to the national average and, excluding the public sector, is the highest service sector employment sector in Cox's Bazar. It makes strong use of low skilled workers, specifically in terms of low-skilled female labour when compared to other sectors**.** In addition, the sector has links to local handicraft producers.

Potential Growth Sector Interventions
The only feasible solution is to ensure that these sectors exhibit enough growth so that the demand for employment matches the supply of labour, however ensuring that this outcome occurs cannot be guaranteed, hence interventions should aim to target systemic issues that could affect growth rates.

The first set of interventions revolve on filling the missing data gaps. There is some crucial information missing that hinders a real understanding of current and potential future growth patterns in the district. GDP and trade data, for the district and at the sectoral level is necessary to understand effective growth and labour productivity patterns. Firm level data is also needed to understand firm-level productivity, export orientation and growth constraints issues. At a wider level, more information on the growth constraints affecting the district should also be investigated with emphasis on the challenges affecting female employment participation.

The second set looks at ways to work with existing production structures. The idea is that, for the short to medium terms, it is best to work with existing production structures (i.e. existing sectors) to promote employment opportunities, as new growth sectors would take too long to mature to meet the challenges the district is currently facing. The identification of current value chains in the key sectors would help understand where (and for what specific products) market potential lies, either at the national or international level. This should be accompanied by an evaluation of the type of support structures (i.e. export processing zones, SEZs, creating links with DFIs etc.) that could be strengthened to promote local firm growth and entice national or international firms to locate activities in the district. An identification of what types of skills programmes could be developed to remove potential employment supply-side constraints.

The last set of interventions stresses the need to strengthen local cooperation efforts. Strengthening local government capabilities would help their capability to provide incentives to promote key growth sectors, especially if efforts are focused on improving fiscal revenue stream management capabilities. Improving cooperation between local stakeholders, especially the political and administrative branches of local government, could help reduce rent-seeking activities, help promote investments in infrastructure and allow the channelling towards the most promising sectors, rather than those affected by political capture.

1. INTRODUCTION

1.1 Report background

The district of Cox's Bazar sits within Bangladesh's Chittagong division. It is the southernmost region in Bangladesh. The area is made up of eight sub-districts and shares borders with Myanmar to the south and to the south-east, while bordering Chittagong district to the north and the Bandarban district to the east.

Figure 1: Cox's Bazar Location
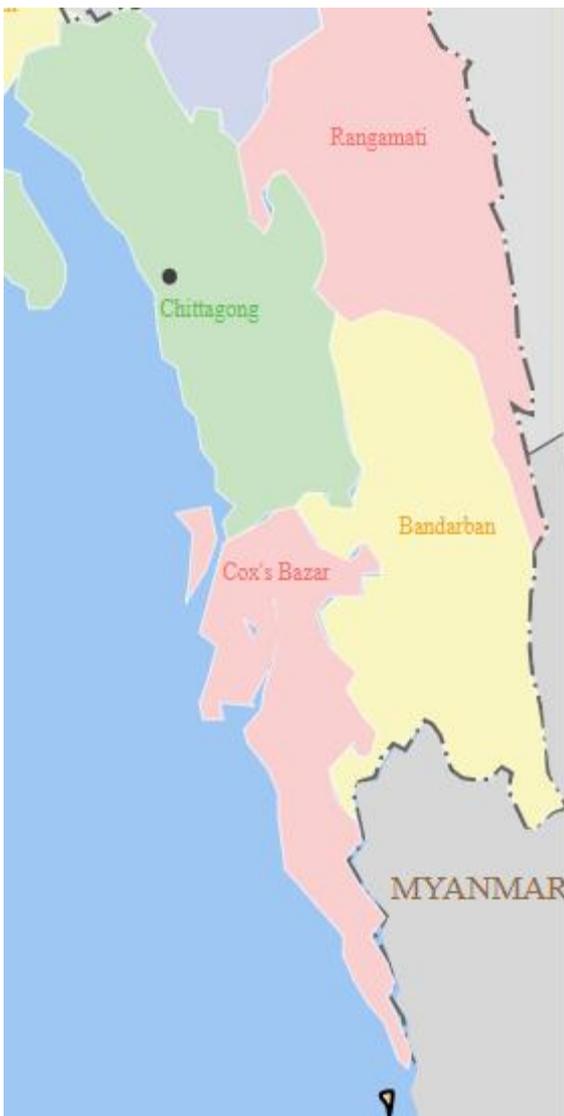
The latest official figures (from the Bangladesh Bureau of Statistics 'District Statistics 2011: Cox's Bazar') state that the district has a population of approximately 2.3 million people,[1] broadly equally divided between males and females. Population literacy rates increased from 18.4% in 1981 to 39.3% in 2011 – hence illiterate citizens still account for a major proportion of the population.

Estimates from the 2016/17 Household Income and Expenditure Survey (HIES) place adult illiteracy rates at 47%. Primary school attendance is at 91%; this figure drops to 57% for secondary school. For 2016, the poverty headcount ratio showed that 17% of the population lived below the upper-bound poverty rate and 8% below the lower-bound poverty rate.

Cox's Bazar is currently dealing with several economic challenges, with approximately 33% of the population living below the poverty line (UN, 2017) and a significant influx of Rohingya refugees from neighbouring Myanmar. The influx of refugees into makeshift refugee camps and local communities in multiple sub-districts of Cox's Bazar has quadrupled a pre-existing Rohingya population of approximately 200,000 in August 2017 to the current (as of mid-2018) population of over 900,000.

Given these issues, the report provides a preliminary and base understanding of potential economic development opportunities that could be available in the Cox's Bazar region of Bangladesh.

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[1] The Household Income and Expenditure Survey (HIES) (2016/17) places the figure at approximately 2.7 million.

1.2 Report structure

The first section of the report introduces the overall aims and methodology of the research. The second section focuses on understanding what sectors could be supported in Cox's Bazar district of Bangladesh. The report represents an initial scoping study to provide a basic identification of potential growth sectors to promote inclusive growth and increased earnings for people in Cox's Bazar. The section port thus first aims to understand what sectors in Cox's Bazar have the potential to create sustainable economic activities for the poor and the types of investments that could support them. Subsequently, it provides a basic political economy analysis of incentives and barriers associated with these sectors. It also attempts to understand which sectors could enhance economic benefits (i.e. employment capacity and incomes) for the poorest citizens of the region. The report then takes a brief look at the kind of interventions that could support such sectors.

1.3 Methodological approach

This report is based on a mixture of desk-based research, quantitative modelling where data was available and stakeholder interviews carried out in both the Dhaka and Cox's Bazar areas of Bangladesh in May and June of 2018. Due to **severe data gaps** and in some cases only the availability of relatively old data, several assumptions had to be made (outlined below), particularly in relation to the quantitative modelling. This means **the findings presented in this report need to be interpreted with care and should not be used as the basis for concrete policy making or used as headline figures**. The findings are suggestive, 'back of the envelope' estimates which **should define more concrete future research, rather than definitive predictions or results**.

The potential growth sector identification is based on the analysis of existing patterns of production to understand what existing sectors could promote inclusive growth and employment creation but cannot use a more pro-active approach to identify future potential sectors outside of existing production structures, as this would have required significantly more resources and time than those made available for this project. The approach does present some advantages in that it can i) make use of existing data and ii) promote sectors where production structures already exist, avoiding recommending support for sectors that would need to be built from the ground up. Less helpfully, it prevents the identification of new sectors where the district could have a comparative advantage were they to be promoted.

Given these limitations, where feasible, and where secondary data was available, we attempted to carry out economic modelling to provide quantitative estimates of the potential for growth for existing sectors in Cox's Bazar, and at the same time disaggregated the employment potential of identified sectors into rural and urban, male and female and high- and low-skill jobs. It is important to note that more sophisticated methodologies were applied in a situation of relative data scarcity, both in quantitative and qualitative terms, hence **a number of strong assumptions were made throughout the analysis** (detailed in each relevant section) which **curtails the robustness of the results**, hence readers should understand that **these results may be overestimating impacts**, even though conservative assumptions were made throughout.

Regarding data, it is important to note that the report is heavily constrained by several structural limitations, which limit its capacity to present strong results with confidence. One of

the major methodological barriers is the extremely limited amount of detailed and up-to-date information on the economic structures of Cox's Bazar. For example, there is no known current estimate of gross domestic product (GDP) by economic activity, with no associated knowledge of gross value addition (GVA) by activity or sector at the sub-district (Cox's Bazar) or even district (Chittagong) level. **This means there is no capacity to estimate the importance of each sector, growth trends over time, changes in labour productivity for the region or sectoral employment creation potential.** There is also no known breakdown of intra-regional trade data or export data specific to the Cox's Bazar sub-district or Chittagong district. As the report also includes a competitiveness-based analysis, this is important for two reasons: i) it effectively limits the use of Revealed Comparative Advantage (RCA) analysis to data at the national level and ii) it eliminates the analysis of growth sectors based on changes in international or intra-regional trade patterns.

In addition, as there is no sub-district or district level access to firm-level data, for example World Bank Enterprise Survey data, and no firm-level productivity analysis, which could help us understand which sectors to support through productivity enhancement. It is thus important to understand that **this first mapping of current economic activities and potential growth sectors in Cox's Bazar can only set the basis for further, more detailed, data-gathering and analysis**, which can be used for a more robust assessment of growth sectors, especially in the medium to longer term, in the region. Parts of our sectoral employment analysis are based on figures stemming from the preliminary (and currently unpublished) analysis of the dataset of a new Labour Force Survey carried out in Cox's Bazar in 2018. The data is provisional and varied; it also presents some incongruities between categories. However, it is also the only source of data currently available that provides up-to-date figures on sectoral employment and can help us disaggregate, at a basic level, employment by education level, wages and gender. Results from the analysis of this data **should not be taken as definitive** but can provide some recent information on topics of interest.

Given the lack of large-scale robust and verified datasets, we were also not able to use several established econometric techniques – such as time series analysis of changes in sectoral employment patterns, etc. – which has limited the report's analytical capacity and its results mainly to comparative analysis, using currently available data. A lack of disaggregated data on incomes, by sector and no labour productivity data have also meant that it has not been possible to evaluate poverty incidence rates among evaluated sectors of Cox's Bazar's economy, hindering assessments of where productivity increases could lead to higher-income outcomes or the identification of sectors that could further absorb low-income workers.

It is also important to note that no environmental sustainability assessment was carried out as part of the analysis process. This means that the identification and recommendation of primary product goods, within the report, does not consider potential environmental side-effects of increased production within these activities.

2. KEY SECTORS FOR DEVELOPMENT IN COX'S BAZAR

This section focuses on the identification of key growth sectors in Cox's Bazar. Section 2.1 uses the currently known production structure of the district's economy, based on publicly available data, to identify where current economic activities are concentrated to understand where job creation could be centred in the short to medium term. Subsequently, section 2.2 uses quantitative techniques to identify where the region has advantages in production and the inclusive growth potential (by gender, skill and location) of each sector.

Section 2.3 identifies key growth sectors based on in-region stakeholder discussions to, superficially, understand potential issues at the sectoral level. The combined picture is then summarised and presented as a single matrix, highlighting selection criteria and the techniques used to evaluate them. Section 2.4 summarises the key potential sectors arising from this analysis. Section 2.5 then looks at the political economy incentives and challenges to the key sectors, based on stakeholder discussions. Finally, Section 2.6 provides some initial thoughts on the types of interventions that could be applied to promote these key sectors.

2.1 Current production structures

This sub-section aggregates data relevant to Cox's Bazar's current economic structure. This is then used to identify potential growth sectors based on existing patterns of production. This approach is used to understand what economic activities, currently relevant to the district, could potentially be supported to promote growth. The sub-section first provides an overview of Cox's Bazar's economy and then looks at the industry and services sectors and the agriculture and fisheries sectors.

Official and up-to-date information on the state of the local economy is extremely limited. For example, there is no publicly available breakdown of the sectoral composition of the district's GDP. Older, broad, sector-disaggregated data (see Table 1) is available in Deb and Bairagi (2008). However, although this data is more than a decade old, it helps us understand the broad composition of the region. The services sector proves the largest of the three, accounting for nearly half of local GDP. Agriculture is marginally more important than industry, although both account for less than a third and a quarter of GDP, respectively. Cox's Bazar represented an extremely small percentage of Bangladesh's total GDP in 2005/06, at 1.4%. It accounted for around 2.1% of national agriculture, 1.2% of services and 1.2% of industry.

Table 1: Cox's Bazar GDP and sectoral breakdown, 2005/06

	Cox's Bazar 2005/06, US$ million, nominal	As a % of Cox's Bazar's GDP	As % of Bangladesh's GDP
GDP	819	100	1.4
Agriculture	233	28.4	2.1
Industry	203	24.8	1.2
Services	383	46.8	1.2

Source: Deb and Bairagi (2008)

Deb and Bairagi (2008) also report that, over 1995/96–2005/06, GDP grew by 3.4% annually, with services and industry both growing at 5.1% and agriculture at 0.2% over the period. In comparison, Bangladesh's total GDP grew by 4.2% a year: services by 5%, industry by 5.2% and

agriculture by 1.1%. Overall, divergence is observed in the agriculture sector, where growth remained stagnant in Cox's Bazar, whereas similar growth rates are observed for both industry and services within Cox's Bazar and nationally.

Growth in industry is encouraging, as industrial sectors have shown significant productivity improvements at the national level. Between 1991 and 2005, productivity across the industrial sectors in Bangladesh (see Table 2) increased by 117%. On the other hand, services productivity decreased by 9.7% in the same period. Given the relative importance of services for Cox's Bazar, the concern is that there was growth in a less productive sector, hence with potentially lower quality of growth in employment and income outcomes.

Table 2: Labour productivity in Bangladesh, 1991–2013 (US$ 2005 constant)

Economic activity	Labour productivity, US$ per worker				
	1991	2000	2005	2010	2013
Agriculture	280	315	396	481	535
Industry: Mining and utilities	2,212	2,603	9,760	8,555	10,073
Industry: Manufacturing	758	1,763	1,400	1,696	2,163
Industry: Construction	3,089	2,341	1,974	1,716	1,773
Services: Wholesale, retail and hotels	670	799	843	1,166	1,249
Services: Transport, storage and communication	2,227	1,804	1,248	1,841	1,982
Services: Other	2,118	2,284	2,440	2,888	2,911

Source: set.odi.org Bangladesh Data (2018)

Khondker and Mahzab (2015) provide some more up-to-date data on some key indicators for the district (see Table 3). We see limited variance between the region and the Bangladesh average. For example, annual GDP per capita in Cox's Bazar is only 6% less than the national average, and monthly expenditure is virtually the same. The main difference is the household electricity distribution rate, which is 16% higher in Cox's Bazar than the national average.

Table 3: Key indicators for Cox's Bazar vis-à-vis Bangladesh average (2010)

	Per capita GDP at current prices, Tk (2010/11)	Per capita monthly consumption, Tk current prices (2010/11)	Household electricity distribution, % (2010)
Cox's Bazar	35,225	2355.2	54.55
Bangladesh average	37,610	2382.5	38.51

Source: Khondker and Mahzab (2015)

Economic activity is concentrated in the central and north-eastern sections of the district (see Annex for a district map of activity and employment), while the north-western, central and southern sub-districts show moderate activity, in terms of both the number of establishments and the total number of employed people.

Provisional data from the 2017 Labour Force Survey shows that 41.78% of workers are in the agriculture sector (crops, livestock, fisheries and forestry) – which hence absorbs a significantly higher amount of the workforce than is shown in the 2005/06 GDP estimate in Table 1. Although this is not surprising, given the low level of labour productivity in agriculture for Bangladesh (see Table 2 above), it nevertheless confirms that close to a majority of the workforce are in a low-value, potentially low-income, sector of the market.

Figure 2: Employment across sectors, Cox's Bazar, 2016/17 (% of workers)
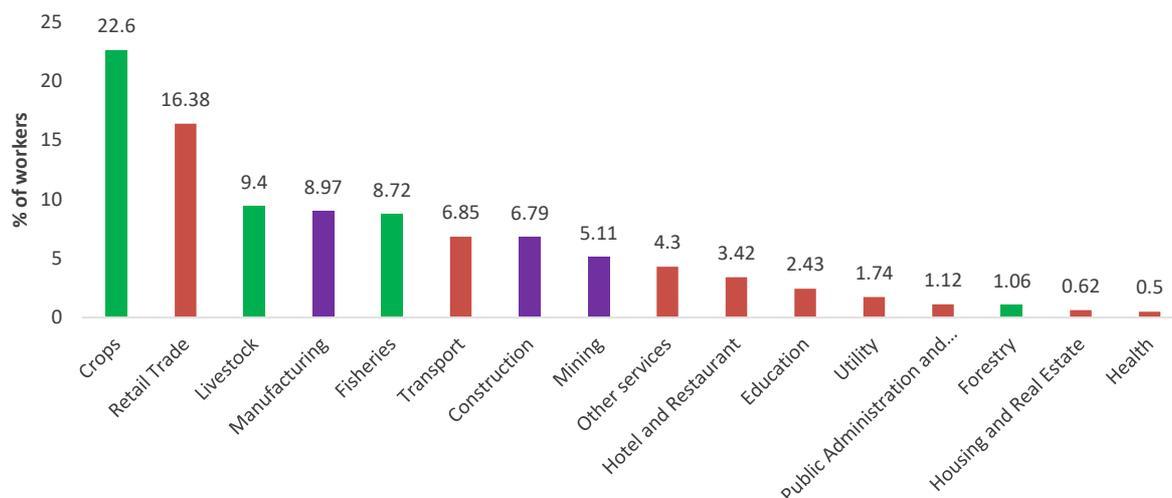
Source: Preliminary Cox's Bazar Labour Force Survey (2018)

The Economic Census of 2013 of Cox's Bazar carried out by the Bangladesh Bureau of Statistics (BBS, 2013) also provides data on employment by working status in non-agricultural sectors. This data shows that most workers in the region are male (91%), and nearly two thirds (60.6%) are classified as full-time workers. Females are divided nearly equally between working proprietors (i.e. they own their own establishment) and full-time workers (Figure 3). Female representation in employment is shown to be particularly low – it is unclear if this is due to the data or due to a real lack of participation of females in formal labour in non-agricultural sectors.

Figure 3: Worker status[2], Cox's Bazar, 2013 (numbers)
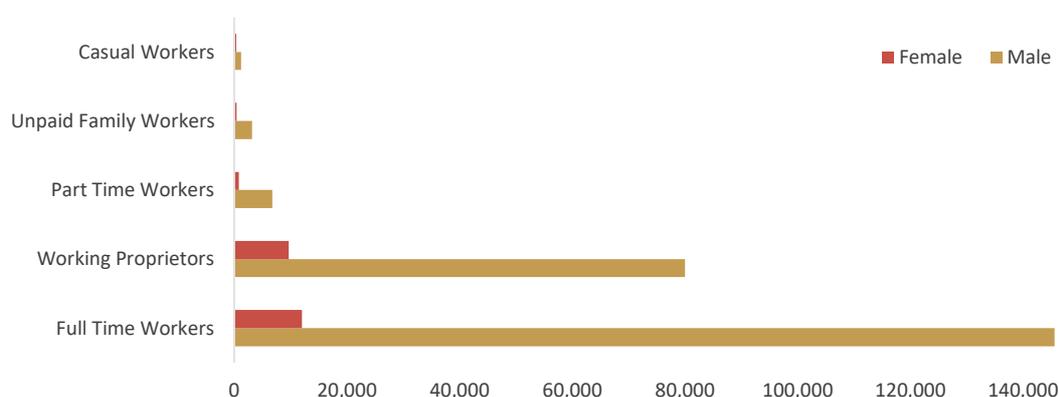
Source: BBS (2013)

[2] According to the definition by the Bangladesh Bureau of Statistics (BBS, 2016), casual workers are those with very limited 'work contracts', although defined as 'precarious employment' the definition does not seem to count them as informal workers and the chart does not include informal employment, figures for which are unavailable.

2.1.1 Services and industry

The 2013 Economic Census (BBS, 2013) also provides a breakdown of the number of establishments by broad sector, excluding agriculture, in Cox's Bazar in 2013 (Figure 4). The data provides a numerical estimate, not GVA, thus is not an ideal representation of the value of a sector. Rather, it is a second-best proxy. In addition, the data does not include the agriculture sector: it is limited to the public sector, services and industry. This constraint means that the retail sector is shown as accounting for nearly half of all establishments in the region. Tourism (as represented by hotels and restaurants) accounts for just less than 8% of establishments, whereas manufacturing shows a stronger presence at 14%. Other significant activities include mining[3] (5.4%) and transportation (7%).

Figure 4: Establishment distribution by non-agricultural sector, 2013 (%)
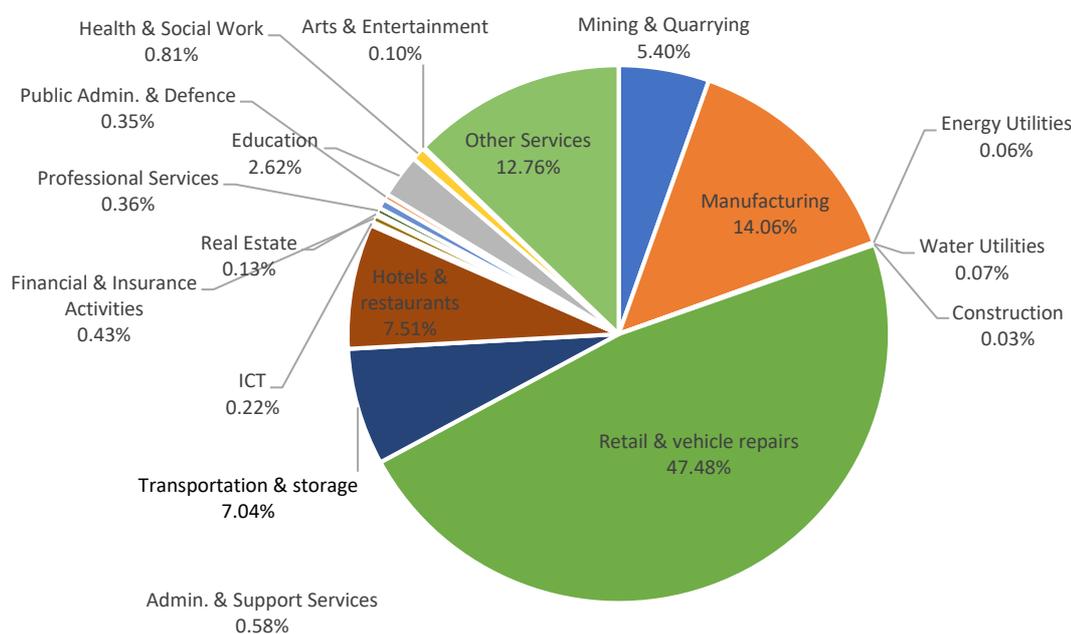
Source: BBS (2013)

The number of establishments more than doubled between 2001 and 2013, representing a yearly growth of 6.5%. In 2013, it reached 260,078, up from 127,272 in 2001. Assessed by the number of Total Person Equivalent (TPE) workers in the sector (Figure 5), the distribution remains broadly equivalent to that exhibited in Figure 4 above. Retail employs around 51% of labour, whereas manufacturing employs around 12.2%. Tourism represents the third-largest employer, with 7.8%, followed by the mining sector (3.9%) and transport (3.2%).

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[3] Which is essentially composed of the salt-extraction sector in Cox's Bazar

Figure 5: Employment distribution by non-agricultural sector, 2013 (%)
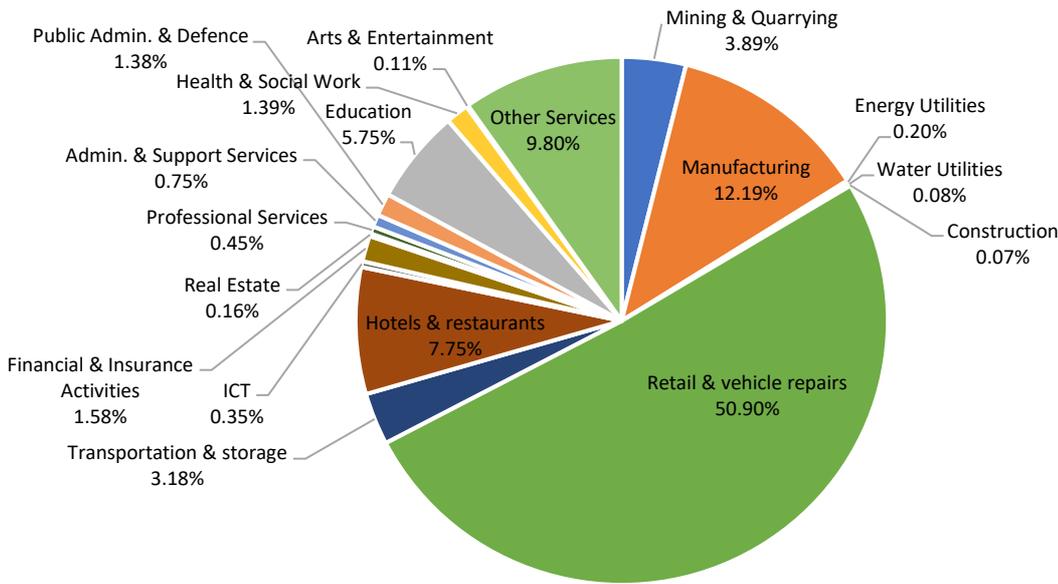
Source: BBS (2013)

Overall services sector activities, as opposed to industry sector activities, seem to take up a significant majority of non-agricultural establishments and employment in the region. This is broadly in line with the older sectoral division data presented in Table 1. Given that, after agriculture, retail activities have the lowest degree of labour productivity (Table 2 above), we can theorise that the predominance of retail establishments and employment in the region posits a high prevalence of low-value and low-productivity service activities in the region.

The representation of around 12% to 14% for the manufacturing sector by, respectively, TPE and number of establishments, may point to the fact that higher-value economic activities are being undertaken in Cox's Bazar. Hence, there (potentially) exists an established productive base that, in conjunction with higher-value services, could be leveraged to create higher-value employment in the region. Going deeper into activities, Table 4 presents the 10 largest areas of economic activity in Cox's Bazar according to number of establishments.[4] It is important to be aware that this data is now more than seven years old and does not illustrate the relative importance of each sector; it is also broad and imprecise in its description of activities. Acknowledging these limitations, the data can still provide a proxy sectoral distribution by presenting the absolute number of establishments.

The data shows that (total) retail services account for 14% of the total number of establishments in the sub-district. Two industrial activities are represented in the top 10. The first is taken up by garment manufacturing establishments, which represent 7% of total establishments, and the second salt extraction, with 5% of establishments.

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[4] A list of the top 20 activities is provided in the Annex as A1.

Table 4: Top 10 economic activities by number of non-agricultural establishments, 2013

Economic activity	No. of establishments	% of all non-agricultural establishments
Retail sale of grocery and general sales	14,248	14.24
Manufacture of wearing apparel, except fur apparel	7,320	7.32
Retail sale of food in specialised stores	6,887	6.88
Tailoring services	6,622	6.62
Retail tea stalls	5,379	5.38
Extraction of salt	5,152	5.15
Retail sale of tobacco products in specialised stores	4,837	4.83
Other non-mechanised road transport	4,567	4.56
Retail sale of pharmaceutical, medical, cosmetic and toiletry goods in specialised stores	3,452	3.45
Activities of religious organisations	2,570	2.57

Note: Please be aware that the percentage column is in relation to all non-agricultural establishments, not just the top 10.
Source: BBS (2013)

Focusing on the manufacturing sector, as it shows the highest degree of labour productivity (in terms of US$ per worker) relative to other sectors of the Bangladesh economy, and because the manufacturing sector tends to illustrate the highest rate of convergence in productivity rates across the world (Rodrik, 2013), it is useful to further specify what manufactured goods are being produced in the region. As trade data is not available, to proxy this measure we can use concentration of manufacturing activity, using number of establishments per activity, as reported in the 2013 Economic Census (BBS, 2013). The top 10 manufacturing sector establishments (see Table 5) illustrate the prevalence of garment manufactures, wooden furniture manufactures and bamboo/cane product manufactures in the region. These establishments form a significant presence, at least in terms of volume (data enabling us to understand the real value of these establishments is not available) and theoretically currently form the backbone of the region's manufacturing.

Table 5: Top 10 manufacturing activities by no. of establishments, 2013

Manufacturing activity	No. of establishments	% of all non-agricultural establishments
Manufacture of wearing apparel, except fur apparel	7,320	7.31
Manufacture of wooden furniture and fixture	1,683	1.68
Manufacture of bamboo and cane products	1,563	1.56
Manufacture of cordage, rope, twine and netting	622	0.62
Manufacture of rice/rice milling	448	0.44
Manufacture of jewellery and related articles	421	0.42
Manufacture of jewellery and related articles	421	0.42
Manufacture of structural metal products	293	0.29
Manufacture of other textiles	205	0.20
Manufacture of cutlery hand tools and general hardware	119	0.11

Note: Please be aware that the percentage column is in relation to all non-agricultural establishments, not just the top 10.
Source: BBS (2013)

2.1.2 Agriculture and fisheries

Data on the agricultural production structures in Cox's Bazar is limited. Discussions with the Cox's Bazar Agricultural Office helped provide some further data on the agriculture and fisheries activities of the region; further information on agricultural production was accessed from the latest available BBS Agricultural and Fisheries Statistics Yearbooks.

Figure 6: Cultivable land by number of crops in Cox's Bazar, 2018 (acres and %)

3,707, 2%   15,073, 7%

49,994, 23%

143,445, 68%

■ One Crop   ■ Two Crops   ■ Three Crops   ■ Four Crops
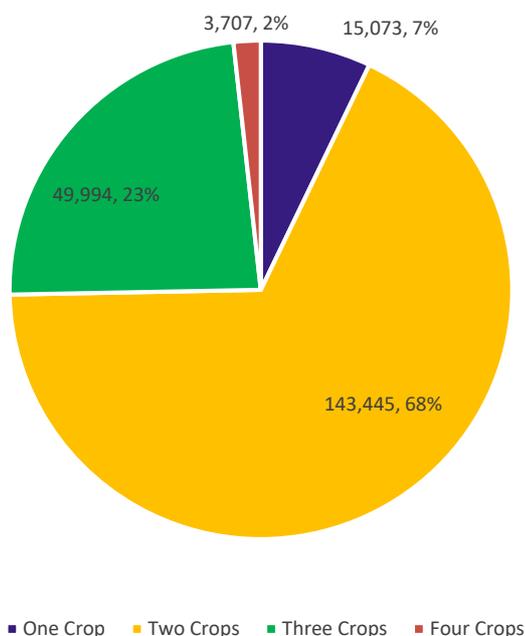
Source: Cox's Bazar Agriculture Office 2018

Figure 6 (above) illustrates the total amount of cultivable land in the region divided by the number of crops grown, illustrating that around 68% of cultivable land is used for two crops, with 23% used for three crops. There is an 83% irrigation rate across cultivable land. This indicates that irrigation systems are prevalent (although the typology is not illustrated) and that monoculture of crops is limited in the region.

The 2013 Economic Census also cites that, in 2013, out of approximately 336,000 holdings, 44.2% were farm holdings[5] (BBS, 2013). Figure 8 shows the composition of farm holdings in the area in 2011: 90% of farm holdings were classified as small, of which 39% were less than 0.5 acres. Around 69% were owner-farmed, with 12% farmed by tenants and 19% by a mixture of owners and tenants.

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[5] Land that is used, in part or in full, for agricultural purposes.

Figure 7: Farm holdings by size (left) and occupancy (right), Cox's Bazar, 2013 (%)

Small — Medium — Large   Owner — Mixed — Tenant
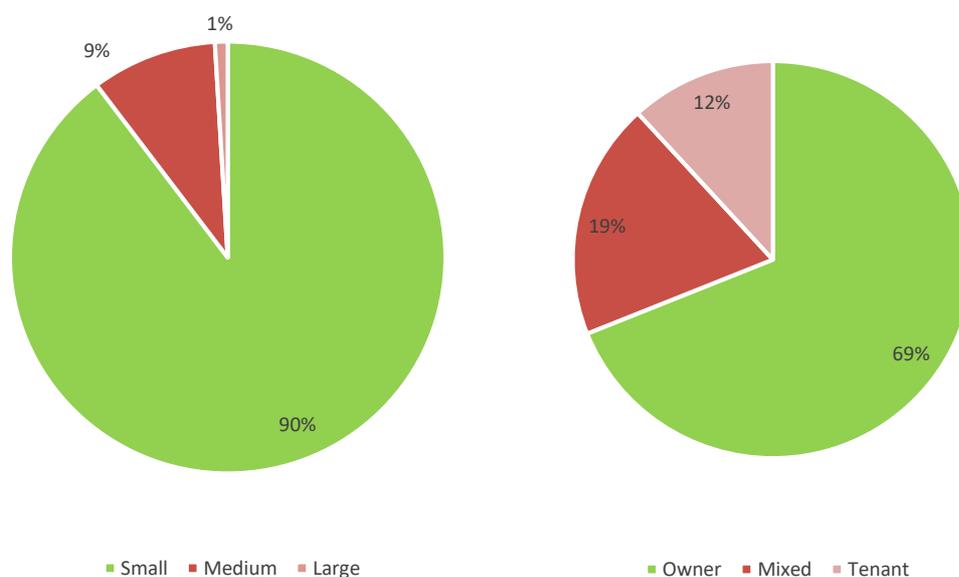
Note: Small = 0.05–2.49 acres, medium = 2.5–7.49 acres, large = 7.5+ acres
Source: BBS (2013)

A recent snapshot of the status of the region's agriculture sector can be gleamed from the Agricultural Yearbook of Bangladesh (BBS, 2017) for 2016. Rice (of the Boro and Aman varieties) is the main produce, both in terms of cultivated acres and by output (in metric tonnes). It accounts for the greatest proportion of agricultural produce in the region. Betel tree products (the betel nut and betel leaves)[6] are also important outputs of the region, as they respectively account for 13.3% and 9.6% of national produce. Other significant products include watermelons (nearly 7% of national production) and coconuts.

Table 6: Agricultural output of Cox's Bazar, 2016

Produce	Acre	Produce	Metric tonnes	Produce	% of national production
Aman rice	188,604	Aman Rice	188,716	Betel Leaf	13.27
Boro rice	119,797	Boro Rice	168,672	Betel Nut	9.64
Betel leaves	13,469	Betel Leaf	28,884	Watermelon	6.72
Betel nut	3,639	Betel Nut	26,670	Sun hemp	4.65
Potatoes	2,198	Watermelon	16,772	Melon	3.58
Chilli	1,927	Coconut	10,275	Pulses	3.13
Watermelon	1,814	Potatoes	9,004	Gherkin	2.90
Groundnut	1,054	Jackfruit	8,320	Tobacco	2.86
Sweet potatoes	1,036	Mango	5,554	Coconut	2.75
Rabi brinjal	996	Radish	4,470	Legumes	2.05

Source: BBS (2017)

Finally, Tables 7 and 8 present a broad summary of data on Cox's Bazar fisheries activities (including catch and processing) as provided by the Cox's Bazar Fisheries Office (2018). We can see there is production of fish and crustaceans in the region, which support more than 5,000

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[6] Betel products are typically used throughout South and South-East Asia as tobacco or in the production of liquors.

commercial establishments (average size unknown) and approximately 95,878 primary sector jobs – approximately 40,000 fish & shrimp cultivators and just under 46,000 fishermen.

Table 7: Summary of fisheries activities/establishments and estimated workers in Cox's Bazar, 2018

Types	Total
Shrimp farms	3,887
Mixed shrimp and fish farm cultivation	673
Fish farms	718
Crab farms	3
Registered shrimp hatcheries	44
Registered fish hatcheries and nurseries	88
Shrimp or fish processing factories	6
Dry fish processing factories	20
Fish food production factories	1

Source: Cox's Bazar Fisheries Office (2018)

Table 8 illustrates the total volume of fish produced in Cox's Bazar for 2018 and as a percentage comparison with the latest annual Bangladesh total, which was for 2017. It shows that Cox's Bazar plays a relatively important role in fish capture and cultivation at the national level, accounting for around 6% of all fish capture. This is especially important for sea-captured fish, where Cox's Bazar represents nearly 22% of the national catch. In addition, shrimp production is also relatively important, as it accounts for 9% of total fish production.

Table 8: Summary of salient fisheries activities production by broad product in Cox's Bazar, 2018

	Production, metric tonnes	% of total Bangladesh production (2017)
Total volume of annual fish production	249,000	6%
Production of fish from sea sources	140,000	22%
Collection of fish from internal water bodies	38,000	1.2%
Demand for fish in Cox's Bazar district	60,000	-
Total production of shrimp	25,000	9%

Source: Cox's Bazar Fisheries Office 2018; BBS (2017)

Overall, the overview of current economic activities in Cox's Bazar highlights a number of salient activities. First, in fisheries, the region seems to have a comparative advantage (in relative production terms) in sea-caught fish and shrimp cultivation. Second, in agriculture, betel leaf and nut production account for a large share (13.3% and 9.6%, respectively) of national production. Finally, we see that the manufacturing sector, clustered around garments, is also important for the region, as it accounts for 9% of total employment.

2.2 Quantitative analysis of the inclusive growth potential of key sectors

This section uses a set of quantitative methods to assess what key sectors in Cox's Bazar could have the potential to create sustainable economic growth, considering outcomes such as productivity, economic complexity, export specialisation, employment disaggregated by gender and the urban–rural divide, etc. To this end, it applies a parallel non-hierarchical approach to achieve independent results by each criterion. The independent results of the parallel activities are then cross-referenced to prove a summary matrix of potential sectors. The sub-section first analyses the overall employment potential of the sectors, and then moves on to inclusive growth issues (gender, skills, location and wages) and finally provides results of applicable quantitative sectoral identification techniques.

2.2.1 Location quotient

We analyse Cox's Bazar location quotient (LQ) to understand how concentrated particular sectors are, in terms of employment, within Cox's Bazar as compared with the national average. This is useful to understand if there are any activities that are unique to or more concentrated in the region *vis-à-vis* the rest of the country.

We calculate Cox's Bazar's LQ based on two sources. The first is a preliminary version of labour force data for Cox's Bazar, which was provided through stakeholder interviews – this dataset provides the sectoral disaggregation seen in Table 9. The data is used in conjunction with data from the 2016 Bangladesh Labour Force Survey (BBS, 2017b) to calculate the LQ. LQs use labour data from a sub-region (Cox's Bazar in this case) compared with data from the national level to assess how concentrated sectors of the economy are within a given region.

Table 9: Location quotient for Cox's Bazar

Sub-Sector	Cox's Bazar % of employment	Bangladesh % of employment	Location quotient
Construction	6.79	5.59	1.21
Crops and livestock	32	40.72	0.79
Education	2.43	3.62	0.67
Fisheries	8.72	1.76	4.94
Forestry	1.06	0.18	5.74
Health	0.5	0.82	0.61
Hotel and restaurants	3.42	1.68	2.03
Housing and real estate	0.62	0.17	3.65
Manufacturing	8.97	14.44	0.62
Mining	5.11	0.15	33.43
Other services	4.3	7.84	0.55
Public administration and defence	1.12	1.66	0.68
Retail, wholesale trade	16.38	13.35	1.23
Transport	6.85	7.72	0.89
Utility	1.74	0.28	6.28

Source: Author elaboration based on data from preliminary Cox's Bazar Labour Force Survey 2018 and BBS (2017a)

The LQ results show that a few sectors score above 1.5 (which indicates a higher concentration of activities). For example, the mining industry in Cox's Bazar is 33 times more important (in employment terms) than it is for Bangladesh. Similarly, utilities (6.28), forestry (5.74), fisheries (4.94), real estate (3.65) and hotels and restaurants (2.03) all exhibit a higher share of employment than the national level. Islam et al. (2016) find similar results highlighting concentration of economic activities, using GDP concentration, in fishing, mining and hotels and

restaurants, for Chittagong district as a whole, in relative concordance with the employment LQ results illustrated above.

2.2.2 Sectoral employment concentration

We first look at employment concentration across activities in non-disaggregated employment terms in order to provide a broad idea of which activities, in Cox's Bazar, tend to generate the most employment. Dividing the number of TPE by establishment, by sector, gives a basic proxy estimation of how labour-intensive each sector is. Figure 9 illustrates this 'labour intensity' of non-agricultural sectors in Cox's Bazar. We can see that the main, non-public, non-utility, sectors where employment intensity is highest are the financial sector, construction, information and communication technology (ICT) and real estate.

Figure 8: TPE per establishment in non-agricultural sectors, 2011
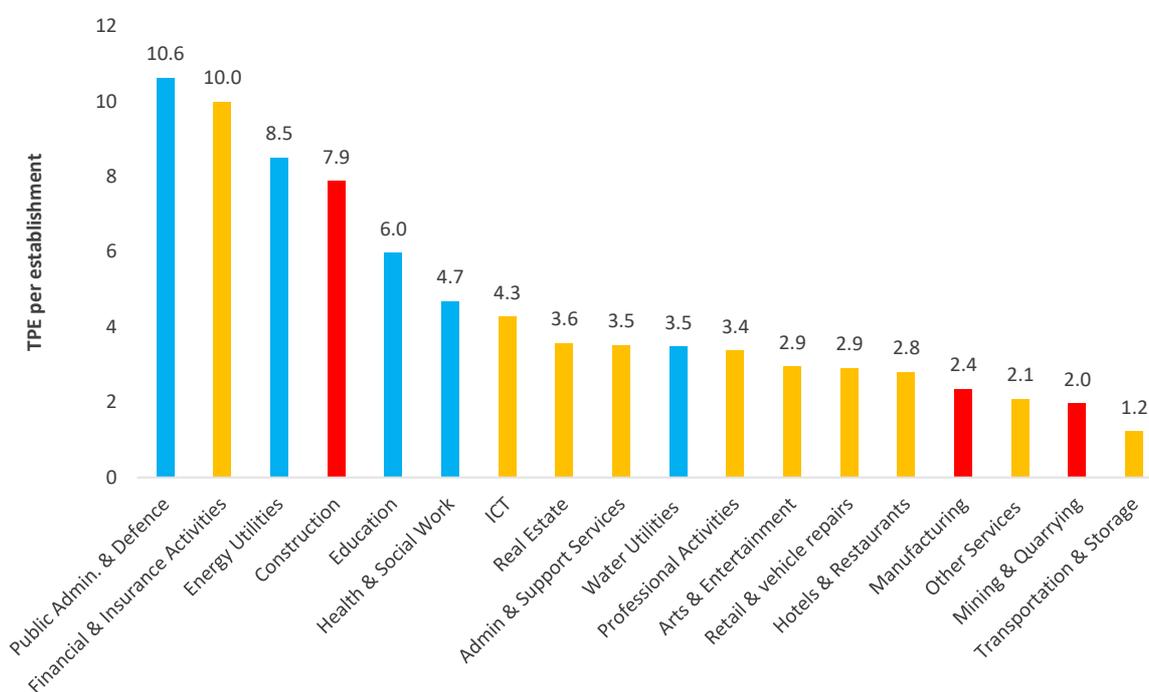
Note: The blue bars represent public and utility sectors, the yellow bars services sectors and the red bars industrial sectors.
Source: BBS (2013)

In terms of those sectors that capture a higher share of establishments and employment, in services, the retail, transport and tourism sub-sectors exhibit relatively low levels of labour intensity (less than three workers per establishment, on average). For both retail services and tourism these figures are broadly in line with the low labour productivity figures for these activities in Bangladesh, as illustrated in Table 1.

The data posits that leveraging these activates for growth, based on the raw data, may not generate higher-productivity (and higher-value) jobs in the sector. This low employment intensity pattern is also evident for industrial activities where the productivity levels are significantly higher – that is, the manufacturing and mining sectors, which both exhibit low levels of employment intensity, except for construction. This latter, even though it shows high labour intensity, has a very low degree of capture in terms of the share of employment and the number of establishments.

2.2.3 Gender-disaggregated sectoral employment

We now proceed to assess the gender disaggregation among sectors to understand where female participation is currently relatively more important. First, we look at the status of employment by type of commercial establishment (Figure 9), as divided into permanent and temporary establishments and economic households. Female representation is strongest for those working in economic households, accounting for 37% of female workers, lowest in temporary establishments (8%) and slightly higher in permanent establishments (10%). The data seems to suggest that females in Cox's Bazar's industrial and services sectors are engaged either in full-time employment or in micro-entrepreneurship activities, which would be mainly based within their own homes.

Figure 9: Worker status, Cox's Bazar, 2013
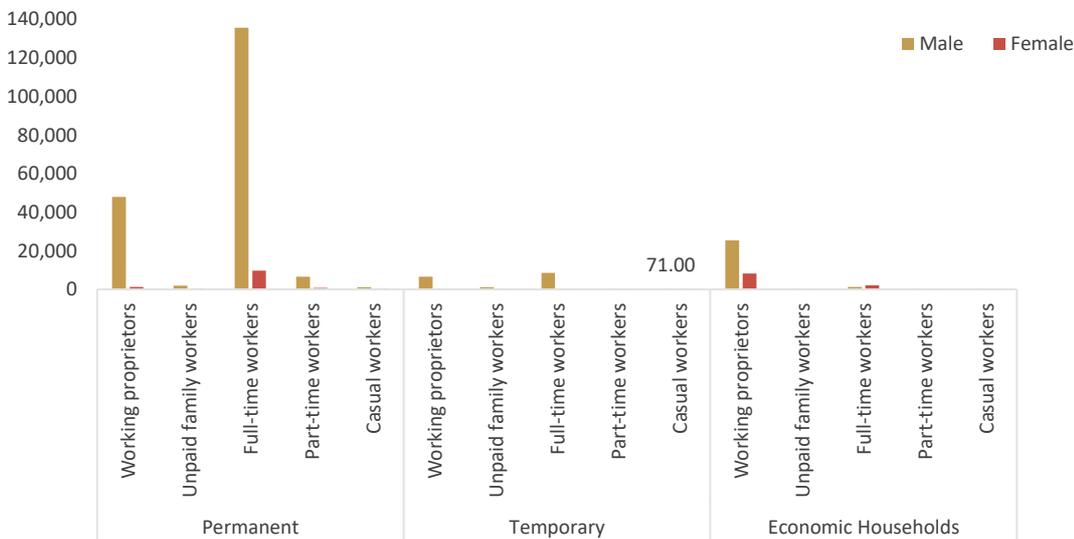
Note: Economic Households are defined as those households that 'have non-agricultural economic activities such as cottage industry, shop or workshop in or within its premise' (BBS, 2013)
Source: BBS (2013)

Assessing the sectors by proportion of females to males (Figure 10), using preliminary (and incomplete) data from the 2018 Cox's Bazar Labour Force Survey, shows there is a significant bias towards male employment participation in the region. Based on provisional 2018 labour force data, 78% of jobs are held by males - this could be in alignment with the low female participation rate shown in previous figures as those exclude agriculture, whilst the figure below also includes agriculture, mining (i.e. salt-extraction) and construction activities. The discrepancy between the 2018 labour force survey data and the 2013 census data is still high for those sectors reported in both datasets – this could be caused by errors in data, possibly due to the preliminary nature of the Labour Force survey results reporting or could be due potential changes in female employment patterns which have seen an increased participation of female workers. In both cases, female employment remains significantly below male employment levels and the causes of such patterns should be further investigated.

Figure 10: Female to male cumulative employment per sector, 2016/17 (%)
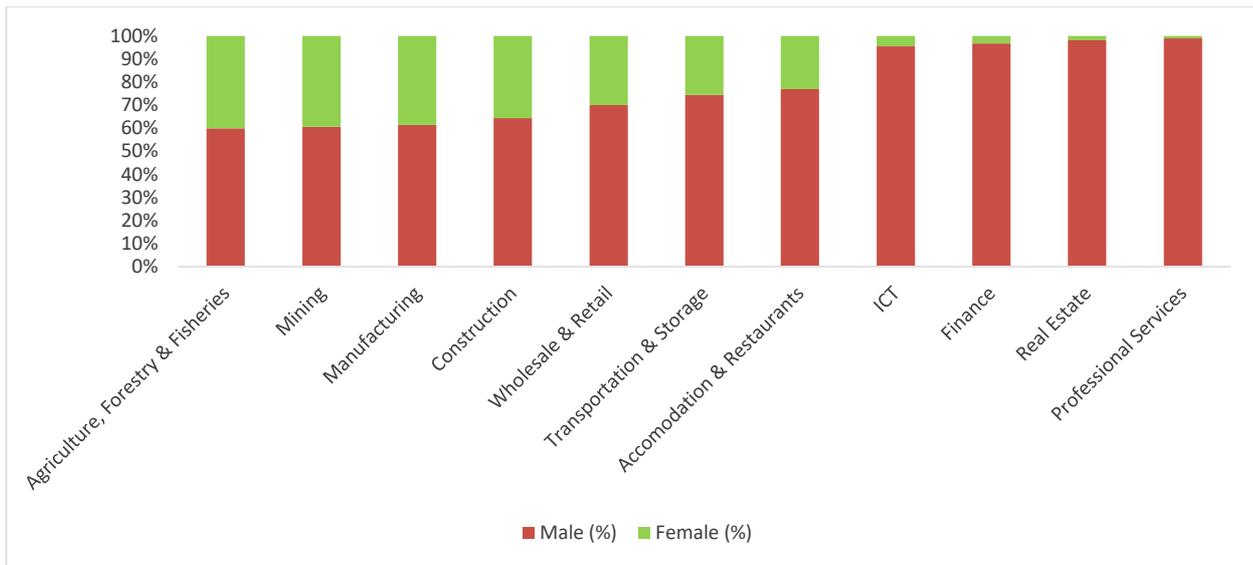
Note: Chart excludes sectors where provisional data was not available.
Source: Preliminary Cox's Bazar Labour Force Survey 2018

Having understood the above caveat, the sectors that show a greater relative proportion of female employment are agriculture, forestry and fisheries (40% female), mining (39%), manufacturing (38% – up from 32% in 2013), construction (36%), transport (25%) and hotels and accommodation (23%).

The remaining sectors show a strong bias towards male domination of the workforce, with a significant change exhibited in the ICT sector. This latter showed 12% female participation in 2011 but this figure dropped to an estimated 4.5% in 2018. From an inclusive growth perspective, the picture below does not provide any indication of which sectors could receive employment creation support to generate jobs specifically targeted at female employment.

Figure 11: Share of male and female employment by sector, 2016/17 (%)
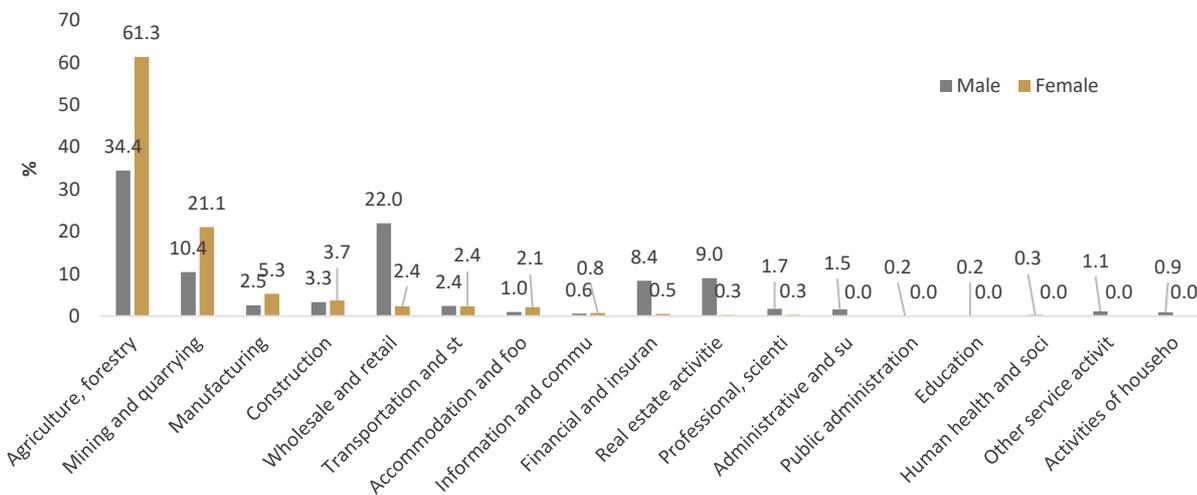
Source: Preliminary Cox's Bazar Labour Force Survey 2018

When looking at employment distribution by gender (Figure 11 above), we see that the majority of females (61.3%) are employed in agriculture, and a significant proportion (21.1%) also in mining, whereas men seem to have a greater degree of distribution between the agriculture, retail, mining, finance and real estate sectors.

Concentrating on manufacturing establishments first, as the sector shows some of the highest concentration of female participation rates and has some disaggregated data from the 2013 Economic Census, female participation averages approximately 20.2% of employees. The top two sectors that exhibit greater participation rates (i.e. above 50%) are garment (apparel) manufactures and imitation jewellery production. Several sectors show less than 50% but higher than average participation, including bamboo/cane production, paper production, packaging material production and tea and coffee processing.

Sales activities (retail and wholesale) make up a significant part of the (presumed) economy of Cox's Bazar. Female participation rates in this sector are illustrated below. The results point to one main activity where female participation dominates: sales through mail order or online houses. It is unclear exactly what this definition entails from the BBS (2013) document; however, we might theorise that these activities are home-based, and could account for the large amount of home-based female economic activities. Unfortunately, without further information on the specifics of these activities, it is difficult to say what kinds of goods are being sold. Three more retail activities are significantly greater than the average: fish and seafood wholesale (linking back to the fisheries sector in the region), market stalls and (excluding generic trade) the wholesale of milk and milk products.

Finally, we look at other activities illustrated in the Economic Census (BBS, 2013), noting a significantly higher rate of female participation (9.4% average) than retail activities, although still less than half the female participation rate in the manufacturing sector. Several sectors seem to have very high participation – such as education (e.g. provision of technical and vocational education and training, with 100% female participation) and higher secondary education, as well as insurance provision and administrative service functions. Once again, it is unclear if there are data or counting errors or if these are accurate representations of the on-the-ground situation.

However, given that the finance sector, education and other professional services account, together, for less than 8% of total employment in the region, these activities, although female-dominated, will likely not be significant sources of jobs for women in the short to medium term in the region.

2.2.4 Sectoral employment by location, skills and wages
We analyse the division in employment, between urban and rural locations, to identify which sectors are more likely to create employment in rural areas. The disaggregation is illustrated in Figure 16 (below) and shoes that 62% of (TPE) employment is, on average, within rural areas. Sectors that are mainly urban are services sector jobs such as utilities, finance, real estate, etc. Industrial jobs, including 80% of manufacturing jobs, are in areas that are classified as rural.

Figure 12: Urban to rural TPE ratios for non-agricultural sectors, 2013 (%)
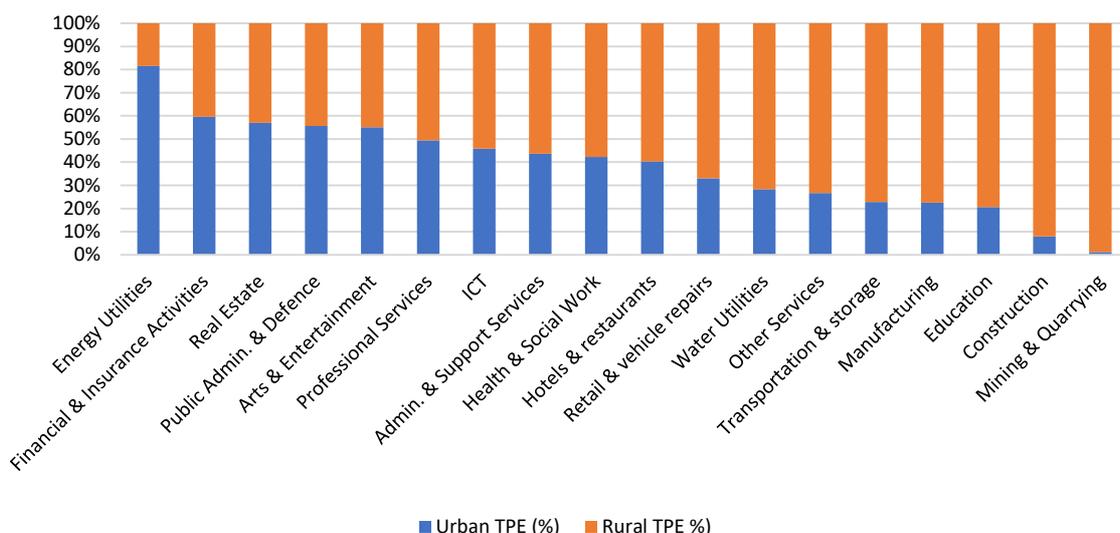
Source: BBS (2013)

The manufacturing sector sees a significantly larger portion of jobs in rural areas (77%) than in urban areas. Similarly, the retail and construction sectors show a greater bias towards rural areas than might be expected. The rural slant could owe simply to the geographic characteristics of the region and the classification of areas, which would place activities largely in rural areas. However, from an inclusive growth perspective, it is interesting to note that there are potentially higher-productivity sectors, such as manufacturing (see Table 2 above), that are in rural areas, which could thus be targeted for employment creation policies.

Figure 13 illustrates the difference in skills by sector, using amount of education received as a proxy. This is an imperfect measure as it does not effectively help us understand whether the nature of the job is skilled or unskilled, but rather gives us merely a basic understanding of the level of education of the workforce in each sector. From the results, we see that, on average, high-education employees account for 35% of the workforce across the sectors. At the individual sector level, we find that it is in services sector jobs that a greater percentage of the workforce has a higher level of education. Industrial sector workers in mining, manufacturing, etc. exhibit 'low' levels (i.e. less than 10 years) of education. This dichotomy essentially singles out two types of sectors to potentially support based on proxy skill levels. For the creation of high-skill jobs, support could be given to services sector jobs, whereas if the preferred outcome is to absorb lower-skilled employment, support to the agriculture, fisheries and industry sectors (mining and manufacturing) could be prioritised.

Figure 13: Sectoral employment distribution by basic education level, 2016/17 (%)
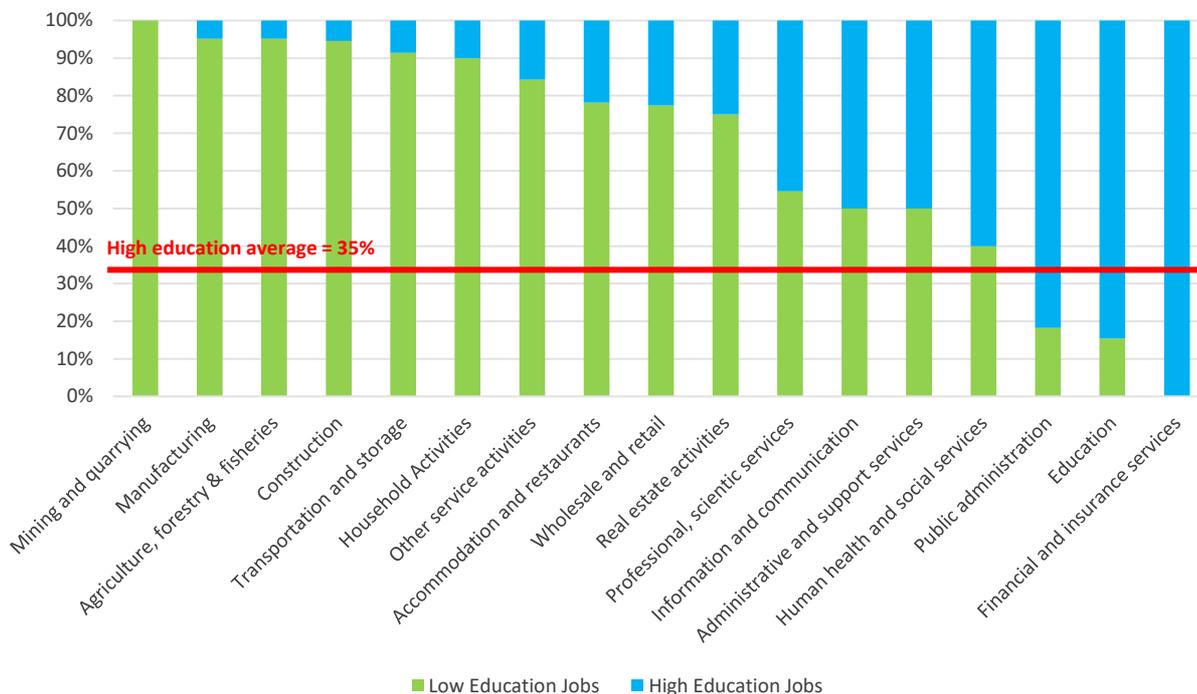
Note: High education = workers who have completed Class 10 or above; low education = workers with less than Year 10 education.
Source: Preliminary Cox's Bazar Labour Force Survey 2018

We also attempted to disaggregates the skills results shown in

Figure 13 above, but the draft nature of the results did not present a clear comparative number that could be matched with total labour figures, by sector, from the same survey. To this end, the results are presented in the Annex for completeness sake but should not be used for comparison.

Finally, in terms of waged employment and incomes, Figure 14 illustrates daily wages, in US$, at the sectoral level, where data is available, using preliminary results from the Cox's Bazar labour force survey (2018). The data shows that, across sectors, the average daily wage is $5.6 per day. As expected, services and public-sector jobs command higher daily wages, in line with the higher average level of education exhibited by the workforce in these sectors. In the industry sector, two key areas are missing – mining and construction (these were excluded from the average as preliminary sectoral wage data was not available) – while manufacturing shows wages just lower than the average ($4.94 per day). Agricultural wages are not significantly below the average; however, what is surprising is that accommodation and restaurant sector (i.e. tourism) wages are the third-lowest across the sector, while real estate wages also exhibit the lowest wage level. These discrepancies can probably be attributed to the preliminary and incomplete nature of the data used, hence should not be taken as authoritative.

Figure 14: Wages disaggregated at the sectoral level, 2016/17 (US$ per day)
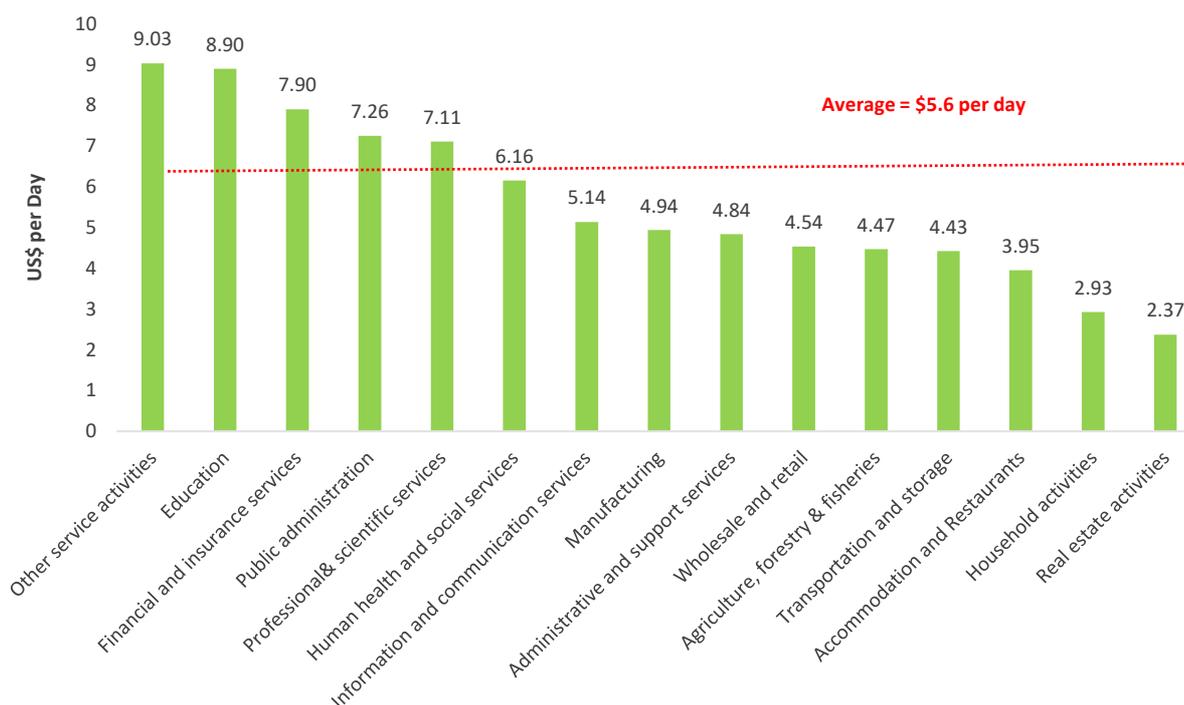
Note: Wages for the mining and construction sectors are not available.
Source: Preliminary Cox's Bazar Labour Force Survey 2018

Essentially, from the currently available preliminary and non-robust data, it is important to note that potential key growth sectors such as manufacturing and, to a lesser extent, fisheries (in conjunction with agriculture) do not exhibit wages significantly lower than the district average.

Some older information is available on the daily wages of agricultural workers in the region, in terms of both the Bangladesh taka and the converted US$ (2013) rate. The figures show that daily wages are, for both males and females, above the $1.90 per day poverty rate (noting, however, that the US$ wage rate is not in purchasing power parity terms). Average female wages are 38.7% lower than average male rates and only marginally (19%) higher than average child daily wage rates. Wage rates between sub-regions show some divergence – that is, between the highest earning sub-region (Cox's Bazar Town) and the lowest (Kutubdia), with a 38% difference for males and a 40% difference for females.

Table 10: Daily agricultural wages in Cox's Bazar, 2011 (Tk and US$)

Region	Male, BDT	Female, BDT	Child (<15 years), BDT	*Male, US$*	*Female, US$*	*Child (<15 years), US$*
Chakaria	300	250	150	3.86	3.22	1.93
Cox's Bazar (Town)	400	250	150	5.14	3.22	1.93
Kutubdia	250	150	100	3.22	1.93	1.29
Mehoshkali	300	250	150	3.86	3.22	1.93
Pekua	350	250	200	4.50	3.22	2.57
Ramu	350	220	120	4.50	2.83	1.54
Teknaf	305	0	250	3.92	0.00	3.22
Ukhia	314	180	150	4.04	2.31	1.93
Average	321	221	159	4.13	2.84	2.04

Source: BBS (2013) and historic exchange rate for US$ to BDT, July 2013

2.2.5 Agricultural productivity

An additional metric that can be used to gauge product growth potential is productivity. This measure can be used only for the estimate of yield per acre productivity of the agriculture sector, as manufacturing labour productivity data is not available. At the national level, the agriculture sector exhibits low productivity rates (Table 2 above) and low relative productivity rates (see Annex 1 for further details).

Identifying and supporting greater production of agricultural goods that exhibit higher productivity[7] rates can help kick-start productivity increases for a region (McMillan et al., 2016), thus increasing growth rates and associated employment levels (Nordhaus, 2005) by moving resources from areas of low productivity to areas of higher productivity, as the gaps represent inefficiencies in production (McMillan and Rodrik, 2011). In addition, increasing productivity rates in agriculture, in the longer term, can act as a push factor for employment, which can move towards higher-productivity sectors (such as manufacturing), further increasing growth rates (Dabla-Norris et al., 2013).

Table 11 shows the most productive goods in Cox's Bazar, by metric tonne per acre produced. From the data we see that the (locally named) ber fruit has the highest productivity rate, with 222.6 metric tonnes produced per acre, followed by the pomelo and palmyra fruits.

Table 11: Top 10 agricultural products by productivity in Cox's Bazar, 2015

Crop	Productivity (metric tonne per acre)	Acres	Metric tonnes produced
High-productivity crops			
Ber (jujube)	222.6	7	1,558
Pomelo	128.2	5	641
Palmyra (coconut)	116.0	3	348
Jackfruit	68.2	122	8,320
Green papaya	56.2	29	1,629
Guava	50.5	31	1,567
Date palm	44.5	2	89
Lime and lemon	30.9	29	896
Lychees	28.8	13	375
Papaya	21.2	94	1,990
High-volume crops comparison			
Aman rice	1.00	188,604	188,716
Boro rice	1.41	119,797	168,672
Betel leaves	2.14	13,469	28,884
Betel nuts	7.33	3,639	26,670

Note: Excludes products (i.e. mango) where acreage was not specified.
Source: BBS (2016a)

It is, however, important to note that the total levels of production of these goods are limited compared with the production of rice in the region. The lack of trade data means that it is unclear whether rice produced in Cox's Bazar is traded (nationally or internationally) or consumed by local markets and, within this subset, how much production would fall under the subsistence farming category. Some preliminary data was made available through stakeholder

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[7] Intended as metric tonne production per acre, data to assess the relative value of production is not available.

discussions (see Table 12). This posits that current food production is in surplus within Cox's Bazar; however, it is unknown to what crops this surplus currently applies.

Table 12: Estimated food demand in Cox's Bazar, 2018 (metric tonnes)

Food demand	Metric tonnes
Total demand for food (metric tonne/rice, 453.5 g/day)	368,650
Total food production (metric tonne/rice)	455,616
Wastage (seed, food for livestock and others) (11.58%)	52,760
Total food production excluding wastage (metric tonne)	402,856
(+) Food surplus or (-) food deficit (metric tonne)	+34,206

Source: Cox's Bazar Agriculture Office 2018

Promoting goods based on their market value is also difficult. Even though there is data on the market price of rice in Bangladesh, comparing rice with other crops or fruits, especially those illustrated above, is hard given the lack of official data for many of these latter. To a degree, this lack of data is mitigated by using FAOSTAT (2018) producer prices, in Bangladesh, for currently produced crops (Table 6), and available data for some of the potential growth crops highlighted throughout the section (Table 11 and Figure 17: Productivity vs. economic complexity comparison, agricultural goods, Cox's Bazar, 2016 show that current activity in betel (i.e. areca) nut production seems to be yielding the highest price per metric tonne.

Figure 15: Producer prices for selected crops, Bangladesh, 2007–2016 (US$ per metric tonne, nominal)
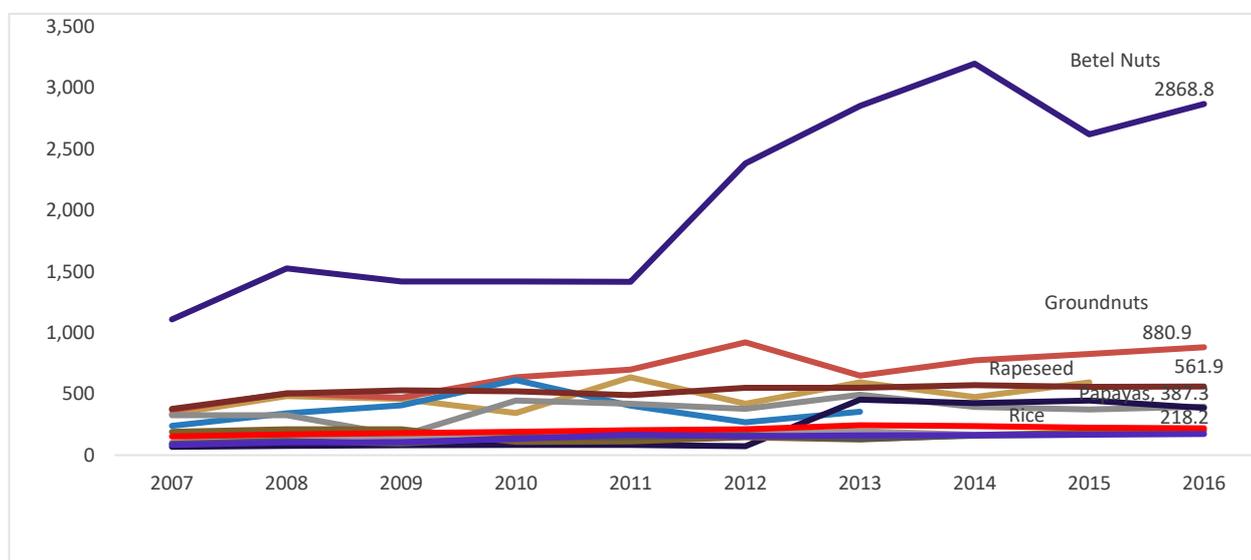
Source: FAOSTAT 2018

Official data on the value of production is missing, however an estimate using FAOStat (2018) crop price data and BBS (2016) crop production data is illustrated in Figure 16 below. It shows that, unsurprisingly, rice production has the highest value, followed by Betelnut production. What is more interesting is the value of production per acre, which highlights Betelnuts, Papayas and coconuts as the highest value per acre crops.

Figure 16: Estimate of Crop Production Value, USD (2016)

Crop	Production Value USD	USD/Acre
Rice	77,982,062	253
Betel Nuts	76,510,896	21,025
Mangoes, Mangosteens & Guavas	2,202,161	
Coconuts	1,998,488	3,023
Potatoes	1,789,995	814
Papayas	1,401,639	11,395
Groundnuts	1,068,532	1,014
Sweet potatoes	761,797	735
Chillies and peppers, green	724,086	376
Rapeseed	62,371	164
Spinach	27,016	246

Note: Only crops for which production and price data is available are included. Data for acreage was not available for mango production.
Source: FAOSTAT 2018 & BBS (2016)

2.2.6 Revealed Comparative Advantage of goods

We can assess the RCA of the goods a country produces to understand if it exports more than its 'fair' share of a given product relative to other countries in the world (Balassa, 1965). For example, if 6% of country X's exports are potatoes but the share of global trade for potatoes is only 2% then country X exports three times its 'fair' share.

Typically, a score over 1 indicates that a country has a comparative advantage in the export of the product. In most cases, RCAs are calculated at the country level; however, if intra-regional trade data is available, it may also be possible to calculate an RCA at the regional level. However, a district-specific RCA score for the goods produced in Cox's Bazar cannot be calculated, as no district-specific trade data is available. On the other hand, RCA scores for goods made in Bangladesh are available for 2015. To this end, Table 13 presents the top RCA scoring products in Bangladesh and their presence in Cox's Bazar. Once again, imperfect data availability limits ideal comparisons – in this case between goods as specified in the computation of the RCA[8] and those reported in the 2013 Economic Census (BBS, 2013).

Given these limitations, the RCA cross comparison (Table 13) shows that Cox's Bazar already has substantial production capacity in one manufacturing sector where Bangladesh has an RCA – that is, garments. It also has limited presence in the textiles and ceramics production sectors.

As the percentage columns (below) illustrate, employment and establishments are not wholly concentrated in RCA areas, as 42.2% of establishments and 70.4% of employment are in non-RCA identified sectors. In addition to manufacturing, Bangladesh has a relatively strong RCA for

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[8] Using the World Customs Organizations, Harmonized System of commodity classification for trade data

the fisheries sector, (Table 14), which, according to the draft labour force survey data for 2018, could already be absorbing around 9% of labour in the region.

Table 13: Manufacturing products with highest RCA at the 2-digit HS code (2015) present in Cox's Bazar (2013)

HS code	Product label	RCA score (2015)	% share in total national exports (2015)	% of all manufacturing establishments in Cox's Bazar (2013)	% of all manufacturing workforce (TPE) in Cox's Bazar (2013)
53	Vegetable textile fibres nes, paper yarn, woven fabric (jute)	58.21	1.61	1.55	0.88
62	Articles of apparel, accessories, not knit or crochet	30.78	43.02	56 (cumulative)	28.5 (cumulative)
61	Articles of apparel, accessories, knit or crochet	30.22	42.63		
65	Headgear and parts thereof	12.20	0.68		
63	Other made textile articles, sets, worn clothing etc.	7.45	2.78		
41	Raw hides and skins (other than furskins) and leather	4.63	0.86	-	-
67	Bird skin, feathers, artificial flowers, human hair	2.72	0.15	-	-
64	Footwear, gaiters and the like, parts thereof	2.58	2.20	0.03	0.05
46	Manufactures of plaiting material, basketwork, etc.	1.64	0.02	-	-
24	Tobacco and manufactured tobacco substitutes	1.35	0.33	0.01	0.05
42	Articles of leather, animal gut, harness, travel goods	1.14	0.53	0.04	0.06
57	Carpets and other textile floor coverings	0.98	0.09	0.01	0.02
78	Lead and articles thereof	0.92	0.04	-	-
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc.	0.62	0.09	-	-
69	Ceramic products	0.42	0.15	0.14	0.06
66	Umbrellas, walking-sticks, seat-sticks, whips, etc.	0.39	0.01	-	-

Source: Adapted from Raihan and Rahman (2017); BBS (2013)

Table 14: Non-manufacturing products with highest RCA at the 2-digit HS code (2015) vis-à-vis Cox's Bazar Presence, 2018

HS code	Product label	RCA score (2015)	% share in total national exports (2015)	% of estimated workforce in Cox's Bazar (2018)
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	2.68	1.66	8.7

Source: Adapted from Raihan and Rahman (2017); draft labour force survey data 2018

2.2.7 Economic complexity of goods

Where goods exhibit a higher Economic Complexity Index (ECI) score, they are easier to trade and help move towards the production of more complex (i.e. potentially more productive and higher-income-gaining) goods. For example, agricultural products tend to have low scores: they are easier to produce, many countries have the capacity to produce them and they have limited links (i.e. knowledge, skills requirements, capital inputs, etc.) to contribute to the production of other goods. However, even between agricultural goods there is variation. For example, Cox's Bazar produces spinach, which has a relatively higher ECI score. It is important to note that the application of a relatively sophisticated sectoral identification method such as the ECI should be understood to be a launching point to identify potential growth sectors which have a higher complexity but would need further investigation to ascertain their real feasibility, another important caveat in this analysis is that it excludes services industries, which is due to the methodology used for the ECI scoring process which only includes traded goods.

However, identifying products based solely on their ECI score is of no benefit to a region if the ideal outcome is sustainable growth. Hence, we look at the juxtaposition between the complexity of a product and some available metrics that can help us understand the productive contribution of a given good that is already being made in Cox's Bazar. In addition, the comparison is based on goods that are already in production in Coz's Bazar, to take advantage of already existing production structures, rather than mandating support towards non-existent industries, as support to these would not benefit the region in the short to medium term.

Figure 17: Productivity vs. economic complexity comparison, agricultural goods, Cox's Bazar, 2016
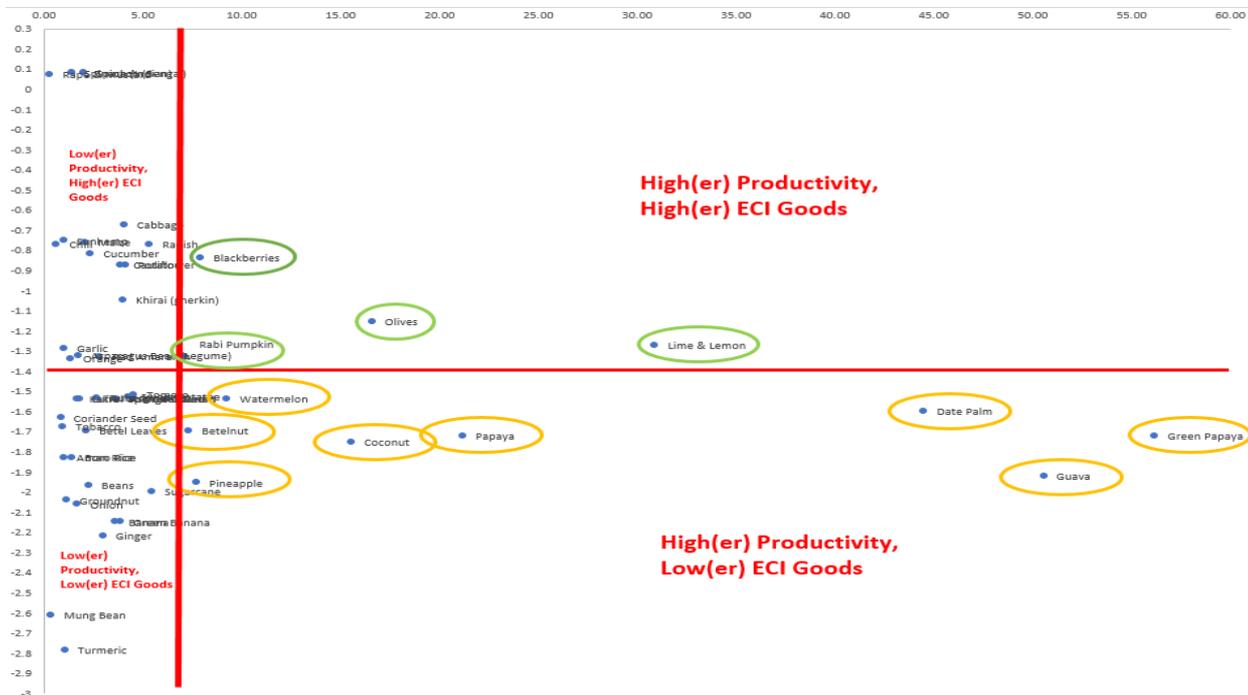
Source: Author elaboration based on BBS (2016a) and CID (2018)

As data is limited and non-uniform, the figures for the agricultural products and manufactured goods use two different comparison metrics. For agricultural products (Figure 20 above), the comparison was between the ECI score and crop productivity, with the idea that concentration of production in more complex and higher-productivity crops can help increase the value of agricultural production in the region, with potential positive knock-on effects on farmer

incomes and livelihoods. Goods ringed in green are the ideal products. These exhibit higher-than-average ECI scores and higher-than-average productivity (for agriculture) and employment (for manufacturing). Goods ringed in yellow exhibit higher productivity or employment outcomes but lower ECI scores, so can be considered second-best options. We therefore see that for agricultural goods, production of blackberries, olives, rabi pumpkins and limes provide the best mix between higher ECI scores and higher crop productivity.

Figure 18: TPE per establishment vs. ECI comparison, manufactured goods, Cox's Bazar, 2011
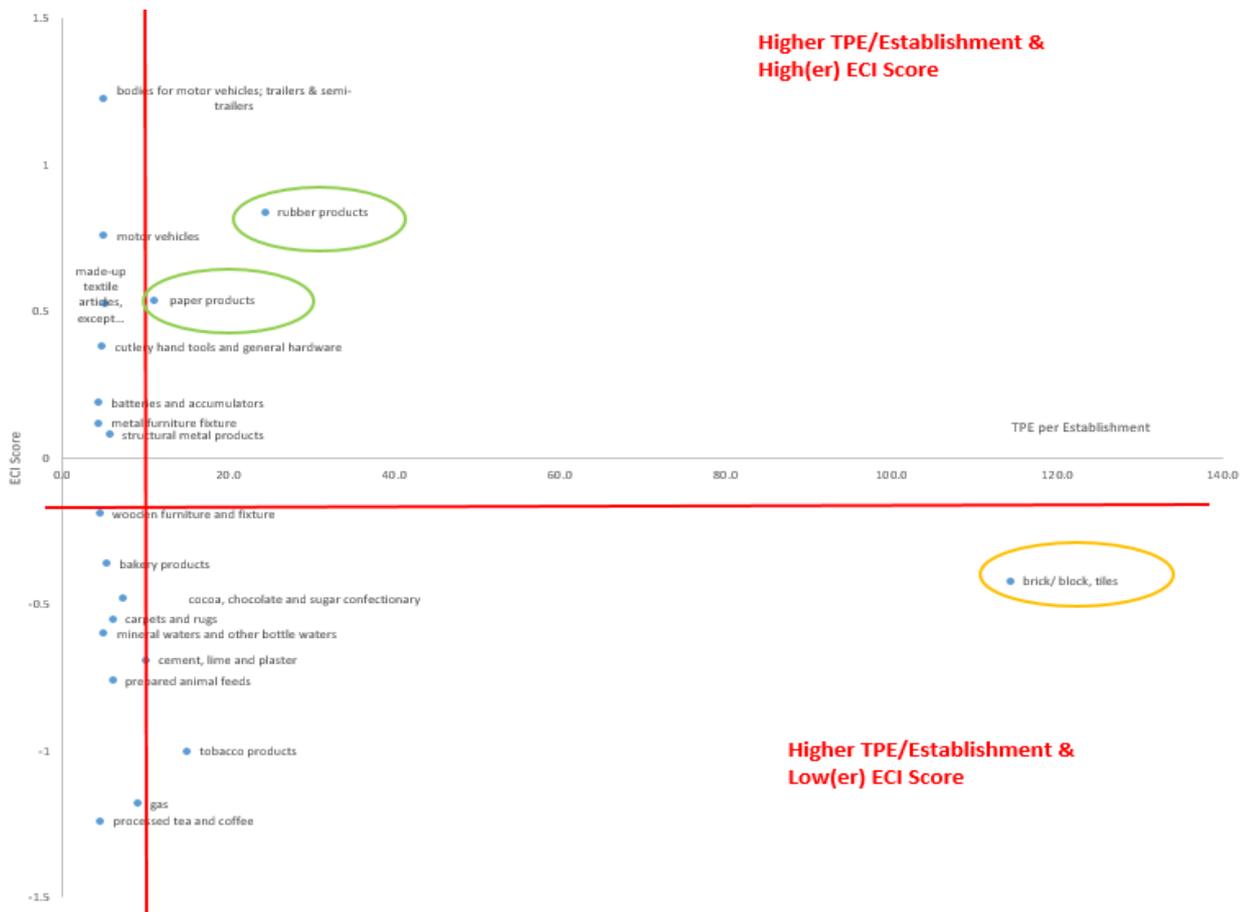
Source: Author elaboration based on BBS (2013) and CID (2018)

For manufactured goods, as productivity data is not available, the comparison is between the ECI score and employment concentration (as measured by TPE) by establishment for manufacturing firms (Figure 18: TPE per establishment vs. ECI comparison, manufactured goods, Cox's Bazar, 2011Figure 18)[9]. This helps understand what products are more complex and have a higher employment creation potential. For these, rubber goods and paper products are the ideal manufactured goods; the brick-making sector could also act as a second-best option. Garment production, whilst having a relatively higher ECI score, are not singled out

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[9] Two additional comparisons are illustrated in the Annex, one between the ECI and total employment for a given manufactured good and the other *vis-à-vis* the total number of establishments for a given manufactured good. This report concentrates on employment per establishment as the best measure to gauge the employment potential (as a growth proxy) for a given manufactured good.

here as their TPE/firm intensity is lower than the average – hence their employment creation potential, from what the data illustrates, seems low.

Future in-depth studies of the district could use the ECI score to locate the identified 'more complex' products within the **Haussman-Hidalgo Product Space** to evaluate what more complex products these existing 'more complex' goods are linked to and to identify a longer-term sectoral development strategy. Such activity is beyond the scope of this report and would best be carried out for the development of a long-term development strategy of the region.

2.2.8 Domestic value addition

The next measure is the growth rate of domestic value addition by broad economic sector. The analysis here **uses national level data rather than Cox's Bazaar data** hence appropriate caution needs to be used when interpreting the results. The data here is used to cross-compare what sectors have a higher degree of DVA in Bangladesh that are being produced in Cox's Bazar. The point of this comparison is not to identify a specific product but to ascertain what broad sectors show an increase in the percentage of domestic value added (DVA). Where DVA increases, the proportionate in-country value added to the product increases, meaning that the country absorbs a bigger share of the value of the good. Bangladesh DVA fluctuates between 80% and 90% across sectors (SET, 2017), hence is already relatively high.

Figure 19: Compound annual growth rate of DVA embodied in gross Bangladesh exports by sector, 2006–2011 (%)
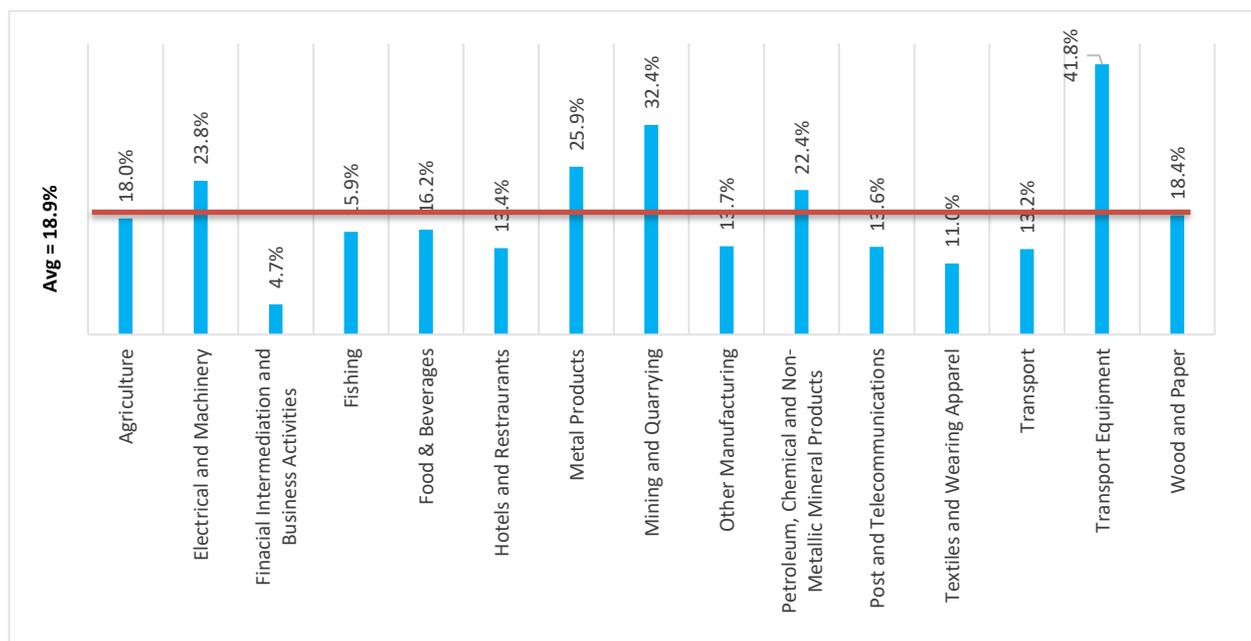
Source: SET (2017) computations using Eora26 database

Figure 22 shows the rate of growth of DVA by broad sector, at the national level, using SET (2017) elaborations. From the results we see that a few sectors stand out (i.e. with growth rates above the annual average of 18.9%): electrical and machinery, metal products, mining and quarrying, transport equipment and the petroleum-chemical sector. Expanded production in these manufacturing areas may be a good future option as the proportion of domestic value addition in these is growing, allowing more gains from their production to be kept locally and illustrating expanded local capabilities in their production i.e. local producers are getting better at domestically adding value to these products.

2.2.9 Input–output analysis

The final analytical technique used is a 15-sector Social Accounting Matrix (SAM) of Cox's Bazar for the year 2012. The SAM is constructed from the regional SAM developed by Khondker (2018) **for the Bangladesh economy** and therefore **uses proxy data** hence **results should only be interpreted as indicative and not authoritative**. The **results do not indicate effective impacts but broadly show the direction of impact**, hence **investment decisions should not be made on the back of these results**. The sectoral shares in output, exports, imports and investment, and households' share in consumption are derived using different data sources, including the HIES and the Labour Force Survey, and also using some assumptions based on consultation with relevant stakeholders (see Annex 2 for the full SAM construction methodology).

The SAM of Cox's Bazar has the following accounts:

- Sectors: crops, livestock, fishing, forestry, manufacturing, construction, utility, mining (primarily salt), trade, transport, housing and real estate services, social services, public administration and defence, hotel and restaurant, services
- Factors: labour and capital
- Other accounts: household, rest of world, consolidated capital account and rest of Bangladesh

Table 15: Aggregate SAM of Cox's Bazar, 2012 (million BDT)

	Com	Fact	HH	ROW	CCA	RBGD	TTDD	TTSS	Diff
Com	105276		68447	5173	32390	25897	237183	237183	0.00
Fact	101799						101799	101799	0.00
HH		101799		-962			100837	100837	0.00
ROW	4212						4212	4212	0.00
CCA			32390				32390	32390	0.00
RBGD	25897						25897	25897	0.00
TTSS	237183	101799	100837	4212	32390	25897			

Note: Com = commodity; F = factor; HH = household; ROW = rest of world; CCA = consolidated capital account; TTDD = total demand; TTSS = total supply; Diff = difference.
Source: Author Elaborations

We attempt to undertake an analysis of the economy-wide impact in Cox's Bazar of shocks on exports, investment and demand from the rest of Bangladesh using the SAM multiplier model. A satellite employment matrix is used to explore the impact on employment in Cox's Bazar. In the constructed SAM multiplier model, we conduct the following simulations:

> Simulation 1: 10% rise in exports of fishing
> Simulation 2: 10% rise in investment in manufacturing
> Simulation 3: 10% rise in investment in construction
> Simulation 4: 10% rise in demand for mining (primarily salt) from the rest of Bangladesh
> Simulation 5: 10% rise in exports of services (primarily tourism)
> Simulation 6: 10% rise in demand for hotels and restaurants from the rest of Bangladesh

Simulation 7: 10% rise in the demand of forestry from the rest of Bangladesh
Simulation 8: 10% rise in the export of crops
Simulation 9: 10% rise in the export of transport
Simulation 10: 10% rise in the demand for livestock from the rest of Bangladesh
Simulation 11: 10% rise in the exports of manufacturing from Cox's Bazar

From these simulations the following results are found:

- A 10% increase in exports of fishing from Cox's Bazar would increase the output of the fishing by 1.37% and total gross output by 0.41%. The GDP of Cox's Bazar would increase by 0.44% and household income would increase by 0.45%.
- A 10% increase in investment in the manufacturing sector in Cox's Bazar would increase the output of the manufacturing by 0.37% and total gross output by 0.06%. The GDP of Cox's Bazar would increase by 0.02% and household income would increase by 0.02%.
- A 10% increase in investment in the construction sector in Cox's Bazar would increase the output of the construction by 9.86% and total gross output by 4.53%. The GDP of Cox's Bazar would increase by 4.58% and household income would increase by 4.42%.
- A 10% increase in demand for mining from the rest of Bangladesh would increase the output of the mining by 7.44% and total gross output by 0.71%. The GDP of Cox's Bazar would increase by 0.75% and household income would increase by 0.74%.
- A 10% increase in the exports of services (tourism) from Cox's Bazar would increase the output of the services by 0.67% and total gross output by 0.18%. The GDP of Cox's Bazar would increase by 0.23% and household income would increase by 0.24%.
- A 10% increase in demand for hotels and restaurants from the rest of Bangladesh would increase the output of the hotels and restaurants by 3.18% and total gross output by 0.19%. The GDP of Cox's Bazar would increase by 0.18% and household income would increase by 0.19%.
- A 10% increase in the in the demand of forestry from the rest of Bangladesh would increase the output of the forestry by 7.44% and total gross output by 2.06%. The GDP of Cox's Bazar would increase by 2.03% and household's income would increase by 2.06%. Total employment in Cox's Bazar would increase by around 149452 out of which 3147 would be of trade and 445 would be of manufacturing.
- A 10% increase in the export of crops from Cox's Bazar would increase the output of the crops by 0.34% and total gross output by 0.07%. The GDP of Cox's Bazar would increase by 0.06% and household's income would increase by 0.07%. Total employment in Cox's Bazar would increase by around 387 out of which 230 would be of crops.
- A 10% increase in the export of transport services from Cox's Bazar would increase the output of the transport services by 0.39% and total gross output by 0.08%. The GDP of Cox's Bazar would increase by 0.09% and household's income would increase by 0.09%. Total employment in Cox's Bazar would increase by around 304 out of which 96 would be of transport services.
- A 10% increase in the in the demand for livestock from the rest of Bangladesh would increase the output of the livestock by 0.28% and total gross output by 0.03%. The GDP of Cox's Bazar would increase by 0.03% and household's income would increase by 0.03%. Total employment in Cox's Bazar would increase by around 172 out of which 78 would be of livestock.
- A 10% increase in the export of manufacturing from Cox's Bazar would increase the output of the manufacturing by 0.11% and total gross output by 0.02%. The GDP of

Cox's Bazar would increase by 0.01% and household's income would increase by 0.01%. Total employment in Cox's Bazar would increase by around 64 out of which 41 would be of manufacturing.

The simulation results therefore suggest that, given the existing economic structure in Cox's Bazar, the prospects of gains could be significant under exports of mining, fishing and tourism (hotels & restaurants). Investment in the construction sector could also generate large multiplier effects on other sectors in the economy, and especially on manufacturing and services (tourism). It is important to note that the above SAM estimates provide some figures related to employment creation. These should not be taken as employment creation estimates for the key sectors as the proxy data for Cox's Bazar is based on a previously carried out national level SAM, hence it provides an indication of what sectors show potential, rather than the effective magnitude of growth.

2.3 Key stakeholder views

A dialogue on opportunities for the economic development of the Cox's Bazar region was organised in partnership with the Cox's Bazar Development Authority (CoxDA) in May 2018. Representatives from the government, the private sector and non-governmental organisations (NGOs) involved in socioeconomic development of Cox's Bazar participated. The major issues arising were as follows.

2.3.1 Fisheries

In Cox's Bazar district, an estimated 18% of rural farm households earn their livelihood through fishing using a trawler or a boat. The fish collected from this district is distributed across the country as well as internationally. Many farm households also depend on collecting shrimp eggs near the coast for their livelihood. The fish collected in Cox's Bazar is of high economic value and unique because of the district's geographical location, characterised by channels such as Kutubdia and Maheshkhali. Notably, the salt water of the area is appropriate for the cultivation of various types of fish. More employment opportunities in addition to increased exports of fish are possible if special attention is given to development of the fish industry in Cox's Bazar.

A large amount of shrimp is cultivated on the coastal land of Cox's Bazar district. Both bagda- and golda-type shrimp are exported and also consumed locally. As a result, growth of the local production chain (hatcheries) and the food industry based on shrimp cultivation has intensified in recent times, with enormous potential for employment creation in this area. Production of crab has huge potential since there is growing demand for crab meat both domestically and internationally. In terms of exportable goods, crab comes right after shrimp in Cox's Bazar. Of late, crab-fattening activities in between the collection and distribution phases have appeared as one of the most important agriculture-led economic development initiatives in the area.

A large volume of dry fish is also produced every year in Cox's Bazar. Cox's Bazar Sadar sub-district, Sonadia, Maheshkhali and St Martins' Island of the Cox's Bazar district are well known for dry fish production. In recent years, the solar tunnel drier method has been adopted in these areas for producing dry fish, resulting in higher production. Dry fish from Cox' Bazar is usually exported to South-East Asia and the Middle East. Notably, 25–30% of the fish collected from the Bay of Bengal is processed as dry fish. In addition, a large amount of foreign currency can be earned by exporting dried shark fin and fish liver oil produced in the district. The

establishment of high-tech firms in fish processing, particularly frozen and dry fish processing and shrimp cultivation and export, could contribute to the region's economic development.

2.3.2 Salt Extraction

Salt extraction in Cox's Bazar district can be traced back to the 15th century. However, its commercialisation began in 1947, following a long-term private initiative taken by an individual to cultivate salt on 120 acres of land in Gomatoli Mouza of Cox's Bazar. Salt cultivators are mostly poor and do not have their own land for cultivation. According to the Bangladesh Small and Cottage Industry Corporation (BSCIC), there are a total of 63,532 salt fields in Cox's Bazar district. The number of cultivators in the area is approximately 43,500. The BSCIC has started to cultivate salt using the polythene method, which can increase production by 30% compared with traditional methods.

2.3.3 Tourism

With the longest sandy sea beach in the world, the city of Cox's Bazar has the potential to become one of the world's greatest tourism centres. In addition, there are many archaeological sites in the area, which could attract a large volume of tourists. The growth of hotels, motels, and restaurants in the district in recent years has been spectacular. However, infrastructural facilities and improved communication system are yet to be developed to the required level to foster the district's potential to become a tourism hub. Cox's Bazar would see significant development if 50% of the National Tourism Policy of 2010 could be implemented. Special incentives could further foster tourism's performance. The development of a local tourism bureau could also promote development of the sector and help promote the area nationally and globally.

Recreational & infrastructure facilities should be improved to foster tourism and business activities in the region. An increased focus on tourism could also help develop the local handicrafts sector. Traditionally, Cox's Bazar district is characterised by rich presence of handicrafts. Many Rakhains are involved in handloom industries, which could benefit from tourism support. They produce various types of clothing, towels, bags, etc., which are popular across the country as well as in international markets. There is also considerable demand for the various types of sculptures and snail and oyster products produced mainly by Rakhains.

2.3.4 Construction & Infrastructure

In recent years, various public-sector authorities including CoxDA, Department of Public Works, Road Transport and Highways Division have given particular attention to development of physical capital in the district. In addition, greater volume of construction activities that are taking place in the special economic zones (SEZs) in Cox's Bazar is likely to create substantial positive externality.

In the urban areas of Cox's Bazar, several construction activities led by CoxDA are currently underway. The major initiatives are the Cox's Bazar Development Authority's office building construction project, the expansion of road and bus terminal with a view to resolving the traffic congestion in the city of Cox's Bazar and the Alternate Road Development Project along the green basin adjacent to the Bankkhali River. Other projects include the implementation of the

Cox's Bazar Development Authority Housing Project, the Eco-Friendly Walkway on the island of St. Martin in Cox's Bazar district and several other small developments to foster tourism in the district[10].

2.3.5 Agriculture & Forest resources

The betel leaf of Maheshkhali Island is very popular in the country. Betel leaf and betel nut is cultivated in almost every area of the district. There is high demand for these products in Pakistan and the Middle East. The district has enormous potential to earn foreign currency in addition to creating employment opportunities by increasing the production of betel leaf and nut and exporting these goods through a modernised processing system.

Various forest resources with the potential for large export earnings are available in Cox's Bazar district. There is an abundant supply of various types of timber, honey, rubber products and other forest resources, which, if given proper attention, could provide employment opportunities in the area. In addition, more revenue from forest resources can be mobilised by protecting coastal forest lands in Kutubdia and Maheshkhali.

2.4 Summary of priority sectors

Table 16 provides a summary of the strategic sectors identified throughout the analysis. The Annex also presents a set of metrics that could have been used to identify potential growth sectors but had to be excluded because of data availability issues. Of these, the most egregious missing metrics are those revolving around GDP and GVA, both of which are unavailable for the region, namely the capability to determine growth patterns at the regional and sectoral level, which (in turn) makes it impossible to either robustly predict or even loosely estimate, the employment creation potential of the identified key sectors.

The summary table suggests multiple potential focus sectors. In order to narrow these down to a more focused set, they are categorised according to different selection criteria divided into three areas: sectoral selection based on current production structures; sectoral selection based on quantitative analysis outcomes, including inclusive growth considerations such as low-skilled employment potential, female participation, the rural–urban divide and employment by skill level; and, finally, sectors identified by key stakeholders.

Table 16: Summary of selected sectors, associated techniques and identified sectors

Criteria for inclusion of sector	Technique used	Identified sector
Current production structures: Mapping the current economy to understand the structure of current production processes to identify which ones have potential for growth and could be further promoted.		
Current general production structures	Qualitative review of productive sectors of the economy	Review suggests relative strengths in betel nut and betel leaf production, sea-based fisheries, salt extraction and garment manufacturing.
Current agricultural production & fisheries	Qualitative review of agricultural production, focus on quantity of production	Re. volume of production = rice, betel and leaf, sea-caught fish. Re. comparative advantage at national level (production %) = betel nut and leaf,

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[10] http://coxda.gov.bd/en/coxda-plan-with-coxs-bazar/

Criteria for inclusion of sector	Technique used	Identified sector
		watermelons, sea-caught fish.
Current industrial production	Manufacturing and industrial activity establishment shares used as a proxy of GVA	Garment manufacturing, salt extraction (mining), construction, furniture manufacturing, bamboo and cane product manufacturing.
Current services production	Services sector establishment shares used as a proxy of GVA	Hotels and restaurants (tourism), transportation and storage.
Quantitative outcomes: Using quantitative analysis to determine which sectors can contribute to employment (disaggregated by gender, skills and location), productivity and economic complexity.		
Investment outcome simulations	Simulation of investments across sectors, using compiled SAM for Cox's Bazar	Large direct growth impacts through investments in fishing and tourism. Indirect impacts on tourism and manufacturing through investments in construction.
Employment concentration	LQ analysis to identify employment concentration sectors	LQ results suggest concentration of employment in mining, tourism, fisheries, forestry and real estate.
Low-skilled employment potential	Concentration of low-education workers by sectoral employment	Generally high across all activities in district. Sectors with relatively higher concentration of low-education workers are mining, manufacturing, agriculture and fisheries), construction and hotels and restaurants.
Female employment potential	Current employment patterns & female employment concentration	For higher volume employment = agriculture, mining, construction and manufacturing. For higher female employment concentration (but low volume) = education, professional services and finance. For manufacturing specifically = garment manufacturing and paper products.
Rural employment potential	Current employment patterns and rural–urban employment concentration	High concentration of activities rurally in mining, construction, manufacturing and transport.
Sector by wage potential	Basic analysis of current wage patterns and by sector distribution.	Higher earning sectors (relative to district average) are education, financial services, public and professional services and ICT.
Past export specialisation	Cross-reference Bangladesh RCA with identified goods produced in Cox's Bazar to assess prevalence of high RCA scoring sectors in Cox's Bazar	Garment manufacturing, vegetable textiles, ceramics and fisheries.
Promoting existing, more economically complex products	Cross-reference productivity and employment measures with economic complexity scores of goods produced in region	Rubber product manufacturing, paper product manufacturing and (second tier) brick production.
Competitive agricultural production structures	Agricultural productivity (using metric tonnes per acre & value per acre)	Re. quantity of production = Ber fruit, pomelo fruit, palmyra fruit, spinach, rape and mustard seeds. Re. value of production = betel nut, mangoes, rice & papaya
DVA contribution to exports	EORA database for trade in value added in conjunction with identified products in Cox's Bazar to identify broad sectors exhibiting higher than average DVA growth	Electrical and machinery, metal products, mining and quarrying, transport equipment and petroleum-based chemical goods.
Stakeholder views: Identification of sectors based on discussions with key stakeholders in Cox's Bazar		
Key stakeholder sectoral suggestions	Qualitative identification based on key in-district stakeholder discussions	Fisheries, salt extraction, infrastructure, tourism, handicrafts, betel nut and leaf production.

2.4.1 Manufacturing

The manufacturing sector seems to meet several important criteria. In addition to the historic productivity-enhancing (and related growth) effects associated with growth in manufacturing, the sector employs a significant number of people and accounts for a good proportion of existing establishments in Cox's Bazar, while also being firmly located in the rural areas of the district and showing some of the highest female participation rates (in absolute terms) among the sectors.

Within the manufacturing sector, there are some options to consider. A significant number of **garment manufacturing** establishments seem to operate in the area. Bangladesh exhibits a strong relative comparative advantage in garments and strengthening their connections to national and global value chains may further contribute to growth in employment and exports and possibly the emergence of larger firms. However, further promotion of garments would not help diversify the local economy away from the sector, in addition the garment manufacturing sector in Cox's Bazar shows very low employee-per-establishment figures (2.4 employees per establishment), hence why larger garment firms have not been established in Cox's Bazar would need to be further investigated before the sector is promoted to see what growth constraints have held the sector back in the sub-district. Two other manufacturing sub-sectors exhibit a higher concentration of employees per establishment and, at the same time, also produce more economically complex goods: **rubber goods** and **paper goods**. Supporting such industries could can help increase economic capabilities (in turn potentially creating opportunities to further specialise in higher-value manufacturing products) in the region while potentially employing more people per emerging firm. However, they currently do not have a significant presence in the region and it would be important to understand the value chain systems under which these firms operate in order to gauge the growth potential of these activities before any significant support is provided.

Additional manufacturing sectors to also consider in future development plans would be **furniture production**, given its relatively large size (second to garments) in terms of the number of manufacturing establishments and the fact that key stakeholders identify local wood resources as a potential primary input, as well as **brick production**, as it exhibits the highest concentration of employees per establishment in the sector.

2.4.2 Salt Extraction

Mining activities in Cox's Bazar revolve specifically around **salt extraction**. At the basic level, mining activities in Cox's Bazar exhibit several desirable employment characteristics. Employees are all, essentially, low-skilled, hence the entry requirement into the labour force is low. The sector is wholly located in rural areas and has a relatively high rate of female participation. At the national level, DVA of mining products is relatively high, which means that most of the value of the final goods is kept in country (although it is not known if this also applies specifically to salt extraction). The mining sector also shows a high concentration of employment *vis-à-vis* the national average, which means it has a national comparative advantage

According to stakeholder discussions, an estimated 43,500 people work on approximately 63,500 salt fields in the district. Results from the SAM suggest that promoting the use of Cox's

Bazar salt at either the national or the international level could have a significant growth impact on the sector.

Some caution is advised. The mining sector seems to be made up entirely of the salt extraction industry, hence additional support would further concentrate the mining sector into this single product, with associated employment risks if the demand for the product declines and environmental risks if extraction levels or practices become unsustainable. In addition, salt extraction seems to be located at the two ends of the district (i.e. north of Cox's Bazar city and in the southern sub-district of Teknaf). As such, it could not absorb employment throughout the whole region. On the other hand, given its relative concentration, the establishment of processing facilities would benefit from economies of scope.

2.4.3 Fisheries

The fisheries sector exhibits a strong comparative advantage at the national level in terms of the volume of sea-caught fish. This means that there is capacity (and capabilities) to sell the produce at the national level and, potentially, also at the international level. Stakeholder discussions suggested that the fish caught in the region were considered high value and that both fish and locally cultivated shrimp (**bagda** and **golda**) were exported internationally.

The sector also shows a higher concentration of employment *vis-à-vis* the national average, which means the district exhibits some potential to further specialise in the sector. SAM (estimated) simulation results suggest investments in the sector could have a significant impact on the district's growth prospects.

Workers in the sector have a relatively low educational level, which suggests it has capacity to absorb a large volume of low-skilled labour. Although the data does not show the urban–rural divide, it is not improbable that the sector could make significant use of the rural labour force. Stakeholder discussions suggested that approximately 18% of rural farm households were involved in this activity, though further investigation is required. However, it is important to note that the sector does not seem to promote greater female integration into the workforce.

2.4.4 Tourism

The tourism sector meets several criteria that could make it a relatively important growth sector in Cox's Bazar. SAM simulations suggest that investments in tourism could have large (estimated) impacts on the growth of the district. The area also has a relatively large concentration of employment in tourism if compared with the national average, and tourism is the highest services sector employer.

The sector makes significant use of low-education labour, which means it could absorb a larger volume of low-skilled employees. In addition, preliminary results from the 2018 labour force survey suggest the sector makes use of a larger proportion of low-skilled female labour than do other sectors.

Key stakeholder discussions suggested that the sector had significant growth potential, should government support (especially in terms of infrastructure) be provided to foster its growth. The sector has links to the local handicrafts sector and would also be able to support local agricultural production by generating demand for locally produced goods.

2.4.5 Construction

The **construction** sector seems to meet a few important criteria. The sector seems to generate substantial employment, is concentrated in rural areas, could promote female employment participation and has low skill requirements. In addition, SAM results show a potential growth impact on the region where the sector grows – although it is important to remember that the SAM results are based on proxy data.

However, it is important to note that growth in the construction sector is led by demand for its services, which is dependent on growth in other economic activities; it cannot generate self-sustaining growth. In addition, the sector does not have export market capacity. This means activities are likely to be sustained only by means of demand within the Cox's Bazar region itself, rather than being able to tap into national or global demand for goods as services as the other identified key sectors could.

Given this caveat, the infrastructure gap in Cox's Bazar, which was highlighted by key stakeholders as a significant issue, should be revolved. Investments in construction could help fill these gaps with the potential of positive knock-on effects as these infrastructure investments help other sectors grow as their needs are met – as the SAM analysis on the growth impact of construction on other sectors shows. In addition, stakeholder discussions point out that the tourism sector could also benefit from investments in recreational & infrastructure facilities.

2.4.6 Agriculture

In addition to these five key sectors, we need to acknowledge the contribution that the **agriculture sector** could play. The main production crop in Cox's Bazar is **rice**; however, in national terms, this production is relatively low. On the other hand, the region shows a comparative advantage at the national level in the production of **betel nuts and leaves**. Stakeholder discussions suggested that these products were cultivated across the whole district and that there was international demand for these goods.

The agriculture sector also shows potential to cultivate more complex crops, such as **ber and pomelo** fruits and **spinach** and **rape/mustard** seeds. The sector shows relatively high female participation and low education rates; however, it also has low wages and very low labour productivity levels *vis-à-vis* other sectors, which limit it in terms of sustainable growth potential. Hence, although the sector is not identified as a *key* growth area, some support could also be considered for the cultivation of specific products, such as betel nuts and leaves, rather than wholesale support to the sector.

The various analysis methods used thus seem to lead to a focus on five potential key sectors: **manufacturing, construction, salt-extraction, fisheries and tourism.** These sectors (and certain specific activities within them) meet multiple key inclusive growth criteria, such as potential to create a high volume of jobs; not requiring specific high skills levels (as proxied by the education level of workers); higher female concentration in employment; exhibiting higher concentration of activities in rural areas; and having the capacity for sustainable growth by being able to produce goods and services to meet national or international demand.

2.5 Political economy considerations for identified key sectors

Based on several qualitative and quantitative criteria, this report has identified four potential key sectors – manufacturing, mining, fisheries and tourism – for investment and/or support. From an economic perspective, these sectors seem to be reasonable bets to contribute to the economic development of Cox's Bazar. However, on-the-ground realities also need to be considered. To this end, this sub-section provides a brief political economy analysis of Cox's Bazar, viewed through the lens of economic development, and then presents a brief analysis for the four key sectors.

At the general level, it is important to consider that regional development in Bangladesh has been uneven, resulting in high economic disparity across the country. Recent increases in the Gini coefficient of the country demonstrate the realities of regional inequality in the country. Despite various types of development interventions in Cox's Bazar, undertaken by public, private and non-governmental actors, the weak performance of the district in terms of economic activity is characterised by various types of demand- and supply-side bottlenecks. In addition, the political-administration dichotomy, conflicts of interest among local government representatives, inefficient use of resources and weak and ineffective legal and institutional practice further block the development pathway of the district.

One salient example of these issues is the lack of coordination between government agencies within the district – that is, weak collaboration between CoxDA and other district- and sub-district-level administrations and public organisations. Such an issue could jeopardise the sectoral development planning process and on-the-ground implementation efforts. Another critical issue is the fact that local government representatives, politicians and elite groups are often found to operate profit-making enterprises, which could potentially result in ineffective regulation and law enforcement in the case of violation of rules and regulations.

There are also important political economy issues related to the planned Special Economic Zones (SEZs) in the Cox's Bazar region. As Raihan (2017) argues, SEZs are geographically delineated 'enclaves' in which regulations and practices related to business and trade differ from the rest of the country and therefore all the units therein enjoy special privileges. SEZs can generate both static and dynamic benefits. Static benefits include employment creation, export growth and rise in government revenues; dynamic benefits include economic diversification, innovation and transfer of technology through foreign direct investment, and skills upgrading. The basic idea of SEZs emerges from the fact that, while it may be very difficult to dramatically improve the infrastructure and business environment of the district's economy 'overnight', SEZs in Cox's Bazar can be built in a much shorter time, and they can work as efficient enclaves to solve these problems. With these objectives in consideration, the Bangladesh Economic Zones Authority (BEZA) was instituted by the government in November 2010, based on the Bangladesh Economic Zones Act, 2010, with the aim of establishing 100 SEZs across the country by 2030. Four are planned for Cox's Bazar district (see Box 1).

Box 1: Special Economic Zones in Cox's Bazar

Bangladesh's Prime Minister's Office has approved four SEZs to be located in Mahesh Khali sub-district of Cox's Bazar. Work on establishment is ongoing. Information on the four SEZs is as follows:

1. Cox's Bazar Free Trade Zone: three locations – Hamidardia Mouza, Kutubjom Mouza and Ghatibanga Mouza – on a total of 11,784 acres of land;
2. Maheshkhali 1: four locations – Mohasakhali Mouza, Pahar Thakurtala Mouza, Thakurtala Mouza and Gorakhghata Mouza – on a total of 1,438 acres;
3. Maheshkhali 2: one location – North Nalbila Mouza – on a total of 827 acres;
4. Maheshkhali 3: one location – Dhalghata Mouza – on a total of 671 acres.

In addition, two tourism-centred economic zones are located in the district. The first is **Sabrang Exclusive Tourist Zone** in Teknaf sub-district, with 1,139 acres of land under management by BEZA. The compatibility and feasibility studies for this project were carried out by the BEZA; the Water Development Board, the Local Government and Engineering Department, the Roads and Highway Department and the Rural Electrification Board are carrying out implementation. A second tourism zone, the **Jalaria Island Exclusive NAF Tourism Park**, covers 271 acres of land and is managed by the BEZA.

The role of international migration and remittances *vis-à-vis* the district's development should also be considered. A significant number of people from Cox's Bazar emigrate every year, particularly to the Middle East, to seek employment opportunities. As a result, the district receives a large volume of remittances, which have contributed to rural household development in the area. If provided with improved training facilities and adequate information on foreign employment opportunities and safe migration, migrants from Cox's Bazar will be able to contribute more to local socioeconomic development by sending more remittances.

We must also reiterate that Bangladesh's future economic development depends on the implementation of certain proposed projects, including setting up SEZs and construction of a deep seaport in the Chittagong and Chittagong Hill Tracts regions. There is a possibility of larger domestic and foreign investment in these projects. Security problems in the region as a result of the unresolved Rohingya crisis, as well as escalated tension with Myanmar, may discourage investment by local and foreign actors in projects that are important for the development of Bangladesh.

Another important aspect of Bangladesh's future development relates to increased trade, investment and regional cooperation more broadly with East and South-East Asian countries. There is great potential in this regard, including in roads and railways – all of which are proposed to go through Cox's Bazar and Myanmar. Therefore, the Rohingya issue could disrupt Bangladesh's efforts towards regional cooperation with countries of East and South-East Asia.

After considering these general political economy factors, the report now presents an analysis for the five (potential) key sectors, of which the key actors are illustrated in Figure 20 below.

Figure 20: Mapping of the actors of development in the key sectors

Fisheries
• Department of Fisheries
• Bangladesh Marine Fisheries Academy
• Cooperative Societies of Fisher Communtiies

Salt mining
• BSCIC
• Ministry of Industry
• Salt Farmers' Cooperative Society

Tourism
• Bangladesh Tourism Board
• Bangladesh Parjatan Corporation
• Ministry of Civil Aviation and Tourism
• Local Administration
• CoxDA

Construction
• Local Administration
• BEZA
• CoxDA
• Bangladesh Investment Board Authority
• Ministry of Civil Aviation and Tourism

Manufacturing
• BEZA
• Bangladesh Investment Board Authority
• Cox's Bazar Chamber of Commerce and Industry

Source: Author elaboration

2.5.1 Fisheries

Given the current context of the fish industry in Cox's Bazar, economic activity based on fish collection and marketing can be intensified through concerted efforts from both public and private sector entities. While public sector agencies such as the Department of Fisheries of the Ministry of Fisheries and Livestock can provide policy support to modernise fish processing, thereby adding value to fish products in both domestic and international markets, private sector enterprises can expand the marketing channel in a competitive manner. It is, however, important to note that institutional frameworks that govern the local development initiatives in the district must work coherently with macro-level guiding principles or policy initiatives so the value chain in fish industry in Cox's Bazar operates in an efficient manner.

With regard to sectoral stakeholders, fisher communities will be the primary stakeholders of any development interventions undertaken in the fisheries sector. Given the current social and economic structure of the district, it is unnecessary to say that planned interventions to promote the fish industry in Cox's Bazar will result in welfare gains for rural households. In addition to fisher communities, actors involved in local value chains in the fish market – such as local and international business people, workers or entrepreneurs involved in fish processing (dry or frozen) and domestic consumers – will reap the benefit of strategies for the growth of the sector. As discussed earlier, relevant national agencies such as the Department of Fisheries can take the lead in advancing the sector by shifting policy regimes, while local concerned authorities, including both public and private entities, can foster the implementation of the new programmes and strategies. This will help reduce the influence of actors that pose a challenge to the efficient functioning of the sector, such as middlemen in the supply chain, moneylenders to poor fisher communities and the like.

It is also important to note that there have been allegations of contamination of both fish and dried fish through the use of toxic chemicals.[11] There is a need to create awareness among fishers on the use of such chemicals. Also, unscrupulous businesspersons, with the help of local political actors, are using such practices. Law-enforcing agencies and relevant overseeing organisations are unable to stop such practices because of corrupt linkages between such businesspersons and local political elites. There is a need to break this vicious cycle by showing

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[11] https://www.dhakatribune.com/uncategorized/2015/04/11/chemical-use-to-dry-fish-rises-in-coxs-bazar

strong political commitment from the centre as well as by engaging efficient people in law-enforcing and relevant overseeing organisations.

2.5.2 Salt Extraction

There are supply-side capacity constraints in the operation and management of salt industries. Challenges, including the short evaporation season, limited mechanisation, lack of profitability and inadequate production *vis-à-vis* increased demand, have long remained unaddressed. While the BSCIC has attempted to modernise the process of salt cultivation, salt farmers are still lagging in terms of developing a profitable business case in the industry. Planned supply-side incentives such as conducive financing strategies for the sector are required to enable small and medium enterprises (SMEs) to achieve their full potential.

With new initiatives from the BSCIC, the salt industry in Cox's Bazar has received wider attention in recent times, resulting in a rise in the prospects of SME development in the sector. Salt cultivators have found it difficult to advance in the absence of policy guidance or incentives. New moves made by the BSCIC have provided these farmers with new hope, which, in turn, will help meet the growing demand for salt across the country. However, the Ministry of Industry has yet to come up with particular policy agenda for the sector. Concerted efforts from both the public and the private sector are required to deal with the current challenges facing the salt industry in the district, such as those related to financing for small salt enterprises. Immediate measures to incentivise enterprises are necessary to enable them to function in a sustainable manner.

2.5.3 Tourism

Cox's Bazar has the potential to become a great tourism centre. However, challenges remain in this regard in terms of infrastructure and communication systems. Special incentives could further foster the performance of tourism, including development of a tourism cell. In addition, various social problems, such as inadequate sanitation and drug addiction, pose serious challenges to the region's overall development. Infrastructural as well as recreational facilities must be improved to foster tourism and business activities in the region.

Tourism in Cox's Bazar has been characterised by inefficient management, despite the availability of various policy provisions. The reasons for inefficiency in the sector include absence of effective marketing strategies to promote tourism products, lack of infrastructural facilities and utilities, lack of diversification, inadequate budgetary resources and problems associated with coordination between relevant government departments and agencies. It is important to note that promoting private investment in the sector is crucial to overall development of the industry. However, the scope for increased private investment is somewhat blocked by imperfect competition in tourism in the district. For instance, the few investors – mainly politicians or powerful elites and business actors – in the tourism market in Cox's Bazar impose direct or indirect barriers to the entry of new investors or entrepreneurs in the sector. It is the imperfect nature of this market structure that causes many of the problems outlined above, particularly the lack of diversification of tourism services in the district.

As indicated above, there exists enormous potential for the development of new and innovative tourism products and services in Cox's Bazar. To tap this potential fully, underperformance in the sector must be reduced by providing new and attractive opportunities

for investors, creating adequate facilities for tourists and taking effective measures to deal with local socioeconomic and political issues.

It is also important to note that the Rohingya crisis is likely to have a prolonged negative impact on the tourism industry in Cox's Bazar. If there a security crisis arises as a result of the unresolved Rohingya issue, Cox's Bazar tourism will have some adverse effects, as both local and foreign investors will shy away from big investments in the industry.

2.5.4 Construction

In addition to the prospect of tourism, manufacturing, and agriculture sectors, the district of Cox's Bazar has enormous potential for construction-induced increased economic growth. However, the process of construction-led growth in the district, like elsewhere in Bangladesh, has been characterized by tensions between the local residents and concerned public agencies. For instance, it is often observed that the process of land acquisition for most of the public construction projects results in lengthy disputes between the land owners and the government with a consequential rise in transaction cost. Local elites and politicians are also found to have vested interest in the process. On the other hand, time-intensive resolution to such disputes over land acquisition causes delay in project implementation and thus result in cost overruns.

It is important to note that whilst the CoxDA has well-articulate plan of action for its planned construction projects, successful implementation of them requires effective coordination between relevant public agencies. However, responsibilities of the administrative agencies often overlap resulting in inefficiency and bureaucratic inertia in the process of project implementation. Given the potential for diversified tourism together with the operation of SEZs and the prospect of blue economy, Cox's Bazar will experience large-scale construction activities in the near future. Concerted effort from the stakeholders, particularly from the government in overcoming the current challenges, e.g. problems associated with the process of land acquisition, distribution of responsibilities of the administrative agencies, will be required for facilitating the construction projects efficiently.

2.5.5 Manufacturing

The overall prospects for the manufacturing sector in Cox's Bazar in terms of existing local production, trade and market access is largely contingent on several issues. First is the identification of current and future market opportunities within and outside the dominant industries. Second, a comprehensive mapping is necessary of the possible skill shortages and unmet labour demand that may hinder the development of the sector, particularly initiatives undertaken in the SEZs. Third, in addition to devising new channels, it is necessary to streamline existing channels through which private or foreign investment might flow into the sector. Finally, the provision of innovative and evidence-based policy incentives to facilitate capital formation – that is, adoption of a preferential tax regime – is critical. However, the implementation of these activities requires high-level political commitment as well as efficient channelling of budgetary resources. Under the current macro-level manufacturing development policy, there may exist lack of coordination between national agencies and local actors or institutions in implementing provisions. This poses challenges to the promotion of the manufacturing sector in Cox's Bazar.

The geographical advantage the district offers suggests that manufacturing projects or initiatives will be profitable financially and will foster socioeconomic development in the area.

In view of this, the establishment and functioning of SEZs in the district have seen increased momentum of late, resulting in potential for employment creation and local economic development. Primarily, it is well recognized that entrepreneurs and investors in the sector will be willing to undertake new projects when they are provided with adequate infrastructural facilities and an enabling business environment. Since the district is lagging on these two indicators, owing to conspicuous lapses in regional planning by the authorities, competitiveness in the sector has yet to grow in the district. Strong coordination between several actors, both public and private, such as the Bangladesh Investment Development Authority, the BEZA, the Ministry of Industry, CoxDA and Cox's Bazar Chamber of Commerce and Industry, must be ensured in order to achieve the full potential of the manufacturing sector in the district. There is also a need to reduce the incidence of clientelist practices, by local politicians, administrators and elite groups, arising because of unethical behavior and conflicts of interests, to make it possible to foster the sector sustainably.

2.5.5 Agriculture

Although agriculture has not been defined as one of the key sectors a political economy analysis of the sector could provide some interesting contextual information that may be of relevance to when considering the district's growth process. Despite the district's rising potential for development of tourism and small and medium industries, economic activities in Cox's Bazar still largely revolve around agricultural farming. Statistics suggest that about 44 percent of the total 335,825 holdings in the district are farms that produce a variety of crops and fruits such as local and high yield variety (HYV) rice, wheat, vegetables, spices, pulses, betel leaves, banana, jackfruit, guava, coconut, etc. However, the inability of smallholder farmers to produce crops in a sustainable manner has been a cause for serious concern over the performance of agriculture in the district. Transformation of smallholder agriculture did not receive adequate policy incentives in the recent past signalling the lack of political wisdom to give attention to the development of agriculture in the district. This is also generally true for the country's performance in agriculture sector at the national level since both the rate of growth in agriculture and the sector's contribution to gross domestic product (GDP) have been persistently declining of late.

With the long-lasting challenges of weak political commitment and consequential limited capacity of the public-sector organizations to support and transform the small-scale agricultural enterprises in the district, the prospects for greater adoption and intensification of low-cost cultivation practices can fade away unless the relevant government institutions, e.g. Department of Agricultural Extension (DAE), act accordingly to meet the needs of smallholder farmers. It is important to note that the uneven competition between smallholder farmers and large-scale commercial farmers over resources and services in terms of extension, credit and marketing poses further challenge to the sustainability of agriculture in the district. The commercial farmers being politically capable of acquiring more services from the public sector agricultural institutions thus limit their ability to generate necessary technical change for the smallholder farmers in the district. Therefore a comprehensive assessment of the needs of smallholder farmers across the subsectors of agriculture in Cox's Bazar is necessary while strong institutional commitment to meet those needs may be sufficient for agricultural growth and sustainability in the district.

2.6 Interventions to promote strategic sectors

Having identified key potential sectors, some of the political economy considerations that should be considered, this sub-section looks at what kind of interventions could be used, at a broad level, to support such sectors. It does not discuss intervention support at the sector level, as the identification of issues that would require support for each sector is beyond the scope of the report's capabilities. As a result, it focuses on broader interventions. The sub-section also provides, to a limited extent, a brief consideration of the potential role of international donors and national actors in supporting such investments and policies.

It is useful to illustrate interventions that could have an impact on several systemic conditions that this report's analysis has explored. These are issues that could affect the general growth potential of the district, shed light on areas that require further investigation and help plan a roadmap of required outcomes that need to be achieved to promote growth at district level.

Understand the value of the economy: The lack of data on the value of economic activities for the district severely undermines any understanding of what products have the most growth potential. While information on the quantity of industrial and services sector establishments, the amount of agricultural produce and the volume of employment, by activity, can be useful, these figures lack value, in terms of their contribution to both the district's GDP and trade. This means that it is impossible to confidently state whether an activity has high or low labour productivity, to identify potential comparative advantages or productivity gaps, or to ascertain what type of growth trajectory it is on. At a more granular level, firm productivity data is also missing, which makes it difficult to understand how well local establishments are performing, what issues they are facing and what their potential links to national and global value chains effectively are.

Potential international community role: Contribute to funding the collection and analysis of GDP contribution statistics at district level. Initial efforts should concentrate on establishing a GDP per sector baseline. The collection of trade data at the district level may prove too problematic, given the number of logistical issues involved. Donors could provide funding to the World Bank to undertake an initial Enterprise Survey data collection effort at the district level, so as to create a baseline for firm-level performance metrics.

Identify wider growth constraints at the district level: Identifying potential growth sectors represents only a proportion of the work required to evaluate their long-term sustainable growth potential. An important sister component is a growth constraint diagnostic, for example using Hausmann et al.'s (2005) approach to growth diagnostics, which identifies *binding constraints* to growth for key sectors. The approach looks at the key blocks to growth and then attempts to analyse what factors may stop these from being resolved. For example, a lack of electricity for manufacturing would lead to an investigation on electricity production and distribution, etc. There is value to these diagnostics when they are undertaken for specific sectors as they can help pave the way for any parallel interventions at the overarching business environment level.

Potential international community role: Provide funding to carry out an in-depth analysis of binding growth constraints in the district, focusing on identified intervention or priority sectors. This should probably be undertaken in conjunction with firm-level data-gathering if focusing on

issues at the sectoral level. A strong collaborative approach with local key stakeholders (e.g. CoxDA) is needed to ensure flagged issues are acknowledged, as these issues often require interventions at the regional or national government level.

More specifically, understand constraints to female employment: It is clear in the data that female workers are under-represented in Cox's Bazar district. It is thus important to understand the binding constraints to female participation in employment in the district. This will require the opportunity to access, for example, employment or entrepreneurship opportunities, so women can sustain themselves and any dependants.

Potential international community role: Studies on female economic participation (FEP) in Bangladesh are already being carried out with support from the international donor community. Smaller studies that focus on the region would help tailor FEP activities to local realities and potentially identify, in a more granular fashion than this report is able to do, specific activities and solutions that could promote FEP. However, it is important to understand that, if FEP constraints are based on societal norms, then a medium- to long-term approach will be needed – hence donors should be prepared to sustain programmes on a long-run basis.

Work with existing production systems: If sustainable growth in the short to medium term is sought, promoting relatively small or inexistent sectors will neither create local employment opportunities nor raise income levels in the district. Hence, it is probably better to work with currently established sectors in Cox's Bazar, with a view to expanding activities to future growth sectors at a later stage. In theory, the analysis could be taken further, to scope out future competitive growth sectors in the district. However, such a plan posits a long-term development strategy that is beyond the scope of this research and would not help alleviate the current crisis. At this point, the identification of manufacturing, tourism, fisheries and mining as potential growth sectors will not come as a surprise, as the analysis was carried out based on current production structures. However, it is in these production structures that short- (or even longer-) term opportunities for employment creation can be created.

Potential international community role: Based on the identification of binding growth constraints at the sectoral (and firm) level for existing production systems, the next steps for the donor community would hinge on the identification of specific interventions that could help promote sectors. Essentially, these would fall under three basic categories:

1. **Follow the current value chain:** Enhancing the links between existing firms and the national or international market can help sectors grow beyond their local demand limits and help create new entrepreneurship opportunities. For each key growth sector, there should be an evaluation of where the goods are ultimately being sold and the potential for these goods to reach national and international markets. Identifying the reach of products helps us see where there could be future demand, possible competition and potential branding opportunities. It is important to understand that not all sectors are likely to have global market reach; however, reaching regional (South Asian) or national markets can still provide ample opportunities for growth for industries in the district.

2. **Identify potential enterprise promotion activities:** The report identifies manufacturing and tourism as potential growth sectors. National or international firms could consider setting up facilities in the district; however, they would need support to ensure the removal of constraints to locating in the region. Understanding the types of facilities

that could help firms locate in the region – for example a unified investor facility that helps firms register, access energy, facilitate tax payments and provide solutions – could be an important step in attracting firms to Cox's Bazar. Support could also be provided to existing initiatives (i.e. SEZs in the longer-term) or set up structures that require shorter term investments to operationalise such as export processing zones to ensure that any issues impeding their effective operation are resolved. Creating links between development finance institutions and local stakeholders could also help in assessing investment opportunities for international firms. Finally, the identification of potential capital constraints in key sector firms can help us understand what type of support could help local firms invest in productive capital, which would be of use in improving labour productivity levels.

3. **Understand the role of training and skills development:** The report has presented existing, but incomplete and preliminary, data on skills and sectoral skills requirements in the district. We cannot be clear on what proportion of current growth constraints owe to labour skill supply constraints. It is understood that most current activities are low-skill labour-intensive; however, the promotion of sectors such as tourism and manufacturing, and value addition in sectors like salt extraction and fisheries, will hinge on a proportion of the labour force having the necessary skills to undertake more complex tasks. Further action should therefore be taken to identify whether the provision of training on key sector-specific skills can enhance growth in key sectors.

But keep an eye on the future: There are many sectors where higher-value employment could be created. Although the present priority is to create enough jobs to suit the skillsets of the existing workforce, there are some key sectors that over time could present opportunities for higher-skilled, higher-productivity employment. The report identifies a few 'more' economically complex products that could be supported in the district. Growth in such sectors would be well served by the formulation of a (locally owned) medium- to long-term development plan. The district is well placed to access international markets, given its proximity to Chittagong's harbour, hence growth sectors with strong export potential should be prioritised in the longer term.

Potential international community role: Support national and local government bodies to develop a medium- to long-term development plan for the district, which should be in line with activities identified in the national five-year development plans and consider district-specific future growth sectors. A holistic analysis of the resource endowments available, coupled with a skills, infrastructure and business environment development roadmap, could help set the agenda for longer-term growth in the district.

Strengthen local government: Local government bodies in Bangladesh are generally dependent on the central government for the mobilisation of financial resources to implement development initiatives. As a result, there is limited scope for innovative governance solutions and there are few incentives (or motivations) aimed at local sectoral priorities. Identifying existing capabilities and skills (including gaps) and subsequently strengthening the capacity of local government agencies to plan and enact development strategies (i.e. infrastructure gaps) as well as generate and use revenue in an efficient manner is a prerequisite for fostering local economic development in Cox's Bazar.

Potential international community role: Provide support to understand local government capabilities, in terms of skills and qualifications that can foster local economic development and provide support (through training, skills and education support services) to bridge such gaps. In addition, donors can also provide support to undertake an analysis of revenue flows, how these are generated and how they are used in the district could help in understanding how sectoral priorities could be financed. This kind of work would require a significant degree of ownership by local authorities, hence donor interventions should be aimed at strengthening local capacity to manage and monitor these revenue flows.

Enhance local cooperation: The dichotomy between political and administrative institutions poses serious challenges, particularly to the process of implementation of local development strategies. Rent-seeking practices are common among local politicians and elite groups and result in inefficient channelling of resources into sectors. For instance, given its geographical characteristics, Cox's Bazar, as stakeholder discussions also emphasised, has huge potential for, among others, tourism and fish processing. However, projects associated with infrastructural development, industrialisation and human resource development have yet to gain momentum, owing to inefficiency in development management and prioritisation.

Potential international community role: Donor activities could focus on the identification of particular (local) agencies that can act as lynchpins between political and administrative stakeholders. For example, strengthening the capacity of CoxDA could help it take up a more proactive role in engaging local (and national) politicians, by providing demonstrations of potential growth firms, highlighting local success stories and helping resolve growth constraints issues, etc. Such a proactive role could help increase engagement (and ownership) by local politicians in the local development process.

4. CONCLUSIONS

Cox' Bazar presents a challenge to Bangladesh policy makers and the international donor community. It's current economic situation, exacerbated by the Rohingya refugee crisis, highlights the need to implement some form of economic stimulus. However, understanding what specific interventions are required remain vague due to the lack of critical economic information. The work set out to identify the potential growth sectors in the district.

Given the fact that data was limited (and in some cases out of date). Hence several strong assumptions were made throughout the analysis which limits the robustness of the results. This means that results may be overestimating impacts. It is therefore important that policy makers understand that many findings presented in this report should be taken with extreme care and not be used as the basis for concrete policy making or used as headline figures. Even though several relatively sophisticated economic measures were used, the findings need to be thought of as suggestive estimates. These provide some insight but should be used to define more concrete future research, rather than definitive predictions or results.

Key Growth Sectors
The research helped understand that there is potential for inclusive growth in the manufacturing, construction, salt-extraction, fisheries and tourism sectors. The agricultural sector, especially the cultivation of betel nuts and leaves, was also considered but was not classified as a key sector due to its limited longer term inclusive growth potential. It found that these sectors provide the best 'inclusive' growth potential as their activities could help generate employment in rural areas, work for low-skilled (and low-educated) people and would be fairly gender neutral in terms of employment creation. We acknowledge that geographic disparities amongst these sectors do exists i.e. tourism & fisheries activities will mainly take place on coastal area etc. however as there are multiple key sectors, together they should have a broadly comprehensive geographic coverage of the district.

To promote employment creation in the key sectors three sets of interventions are proposed. The first set revolves around the missing data gaps. There is some crucial information missing that hinders a real understanding of current and potential future growth patterns in the district. The second set looks at ways to work with existing production structures. The idea is that, for the short to medium terms, it is best to work with existing production structures (i.e. existing sectors) to promote employment opportunities. The last set of interventions stresses the need to strengthen local cooperation efforts. Strengthening local government capabilities would help their capability to provide incentives to promote key growth sectors. At the moment the understanding of the political power structures in Cox's Bazar, and how these affects local development, is limited and would need further investigation in order to help maximise sectoral development efforts.

Next Steps
The findings have therefore provided some interesting (interim) conclusions, however, many unknowns remain, areas where future research would be beneficial. The report highlights several data gaps and steps needed to fill them as part of the priority action points that policy makers and the international donor community could start to enact. However, there is also additional future research that could prove to be beneficial.

The first of these is whether the promoted key sectors insert themselves into regional and global value chains? Will investments in infrastructure and skills be made available to support key growth sectors? If the promoted sectors find their most effective place within domestic, regional or international level employment creation could generate enough jobs as they are moved to the Cox's Bazar region.

This however raises another important question that should be assessed through future research, i.e. whether employment is being displaced from other regions of Bangladesh to Cox's Bazar by focusing on existing production structures and whether more effort should be made to identify new sectors that Cox's Bazar could specialise in. The identification of 'new' growth sectors should take a more pro-active approach to identify what future potential sectors could exist outside of current production structures and help Cox's Bazar find its competitive productive niche, not just at the national level but also at the global level.

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ANNEX 1: ADDITIONAL TABLES & FIGURES

A 1: Overview of Cox's Bazaar no. of establishments (left) and employment (right) by sub-district (2011)
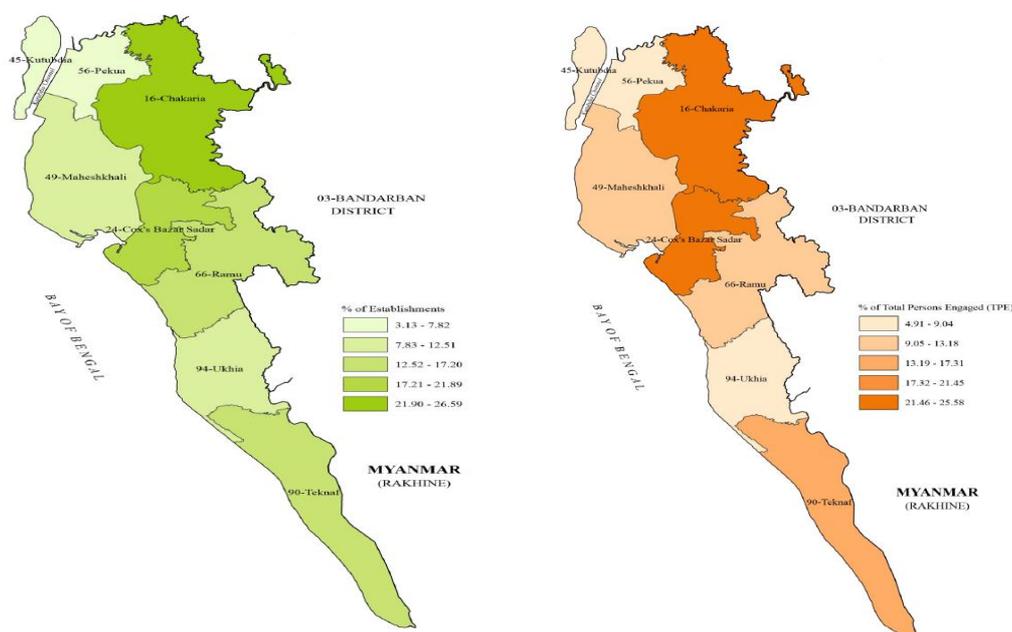
BBS (2013)

A 2: Top 20 Establishments by Economic Activity, Cox's Bazar, 2011

Top 20 Establishments by Economic Activity in Cox's Bazar	No. of Establishments	% of Establishments
Retail sale of grocery and general sales	14248	14.24
Manufacture of wearing apparel, except fur apparel	7320	7.32
Retail sale of food in specialized stores	6887	6.88
Tailoring services	6622	6.62
Retail tea stalls	5379	5.38
Extraction of salt	5152	5.15
Retail sale of tobacco products in specialized stores	4837	4.83
Other non-mechanized road transport	4567	4.56
Retail sale of pharmaceutical, medical, cosmetic and toiletry goods in specialized stores	3452	3.45
Activities of religious organizations	2570	2.57
Retail sale of clothing, footwear and leather articles in specialized stores	2319	2.32
Wholesale trade, except of motor vehicles and motorcycles**	2263	2.26
Other retail sale not in stores, stalls or markets	2247	2.25
Wholesale and retail trade and repair of motor vehicles and motorcycles, auto-rickshaws and rickshaws	1755	1.75
Hairdressing and other beauty treatment	1753	1.75
Manufacture of wooden furniture and fixture	1683	1.68
Manufacture of bamboo and cane products	1563	1.56

Wholesale of fish and seafood	1514	1.51
Retail sale of timber and lumber	1446	1.45
Pre-primary and primary education	1157	1.16

BBS (2013)

A 3: Bangladesh productivity gap, 2013 (%)
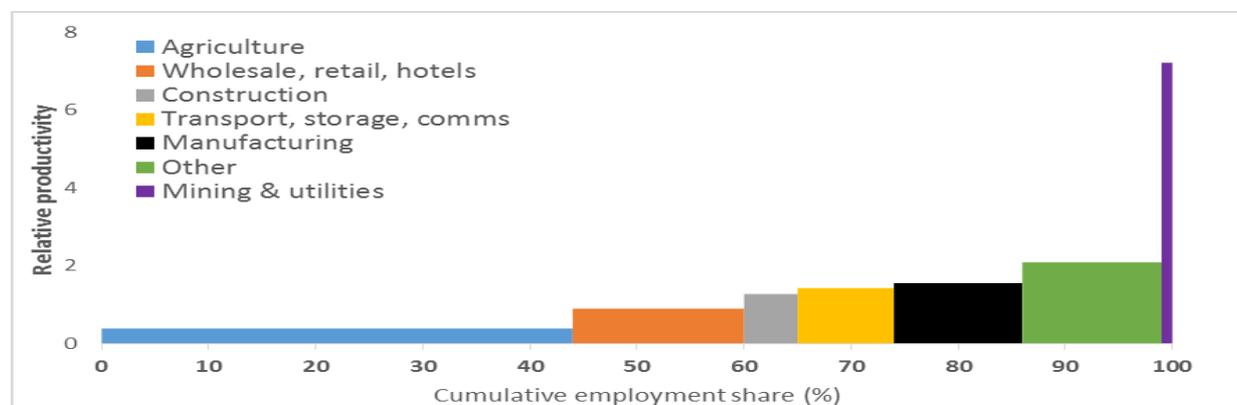
Raihan et al. (2017)

A 4: Top 10 agricultural products by Economic Complexity in Cox's Bazar

	Economic Complexity Score
Spinach	0.081
Rape & Mustard	0.075
Cabbage	-0.672
Hemp	-0.752
Maize	-0.76
Radish	-0.77
Chili	-0.77
Cucumber	-0.815
Blackberries	-0.836
Cauliflower	-0.871

BBS (2016) & CID (2018)

A 5: % of Establishments vs. Economic Complexity comparison, Manufactured Goods, Cox's Bazar (2011)
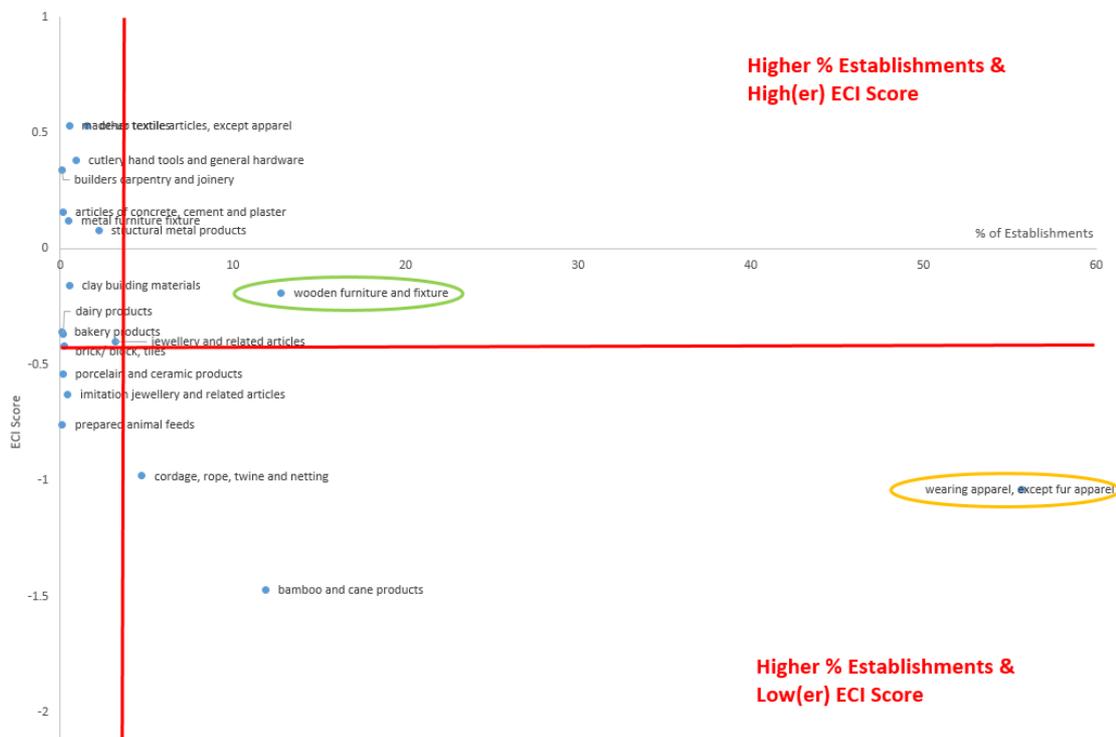
Author elaboration based on BBS (2013) & CID (2018)

A 6:% of Employment vs. Economic Complexity comparison, Manufactured Goods, Cox's Bazar (2011)

Author elaboration based on BBS (2013) & CID (2018)

A 7: Female employment in manufacturing activities, 2013 (%)
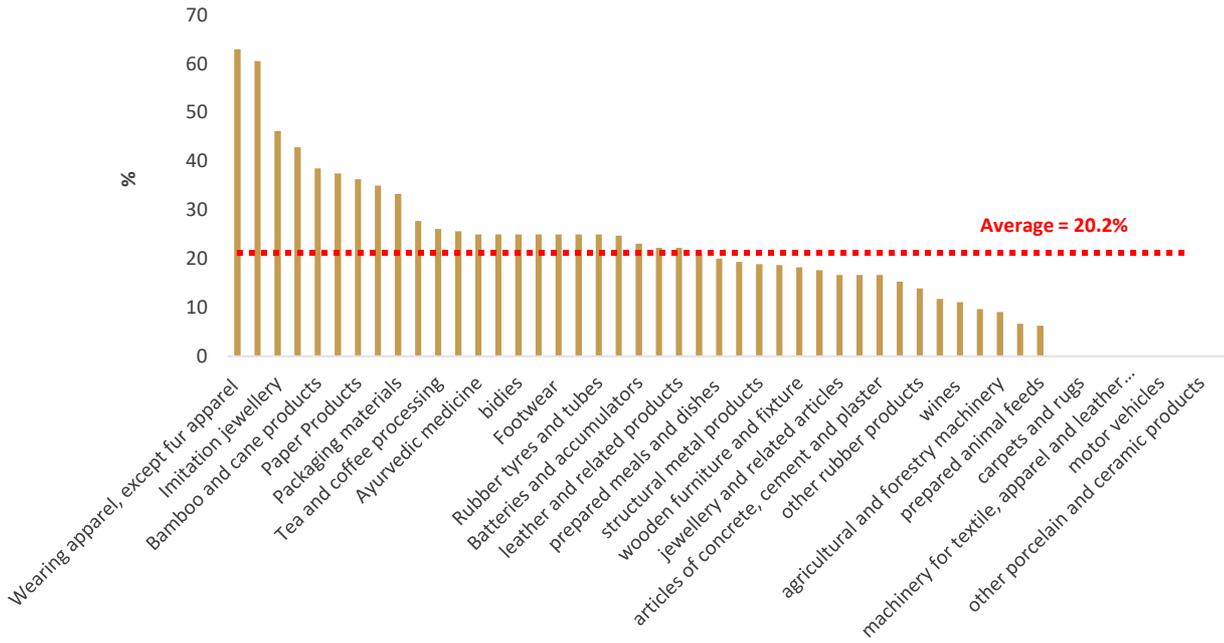
Source: BBS (2013)

A 8: Female employment in retail, sales and wholesale activities, 2013 (%)
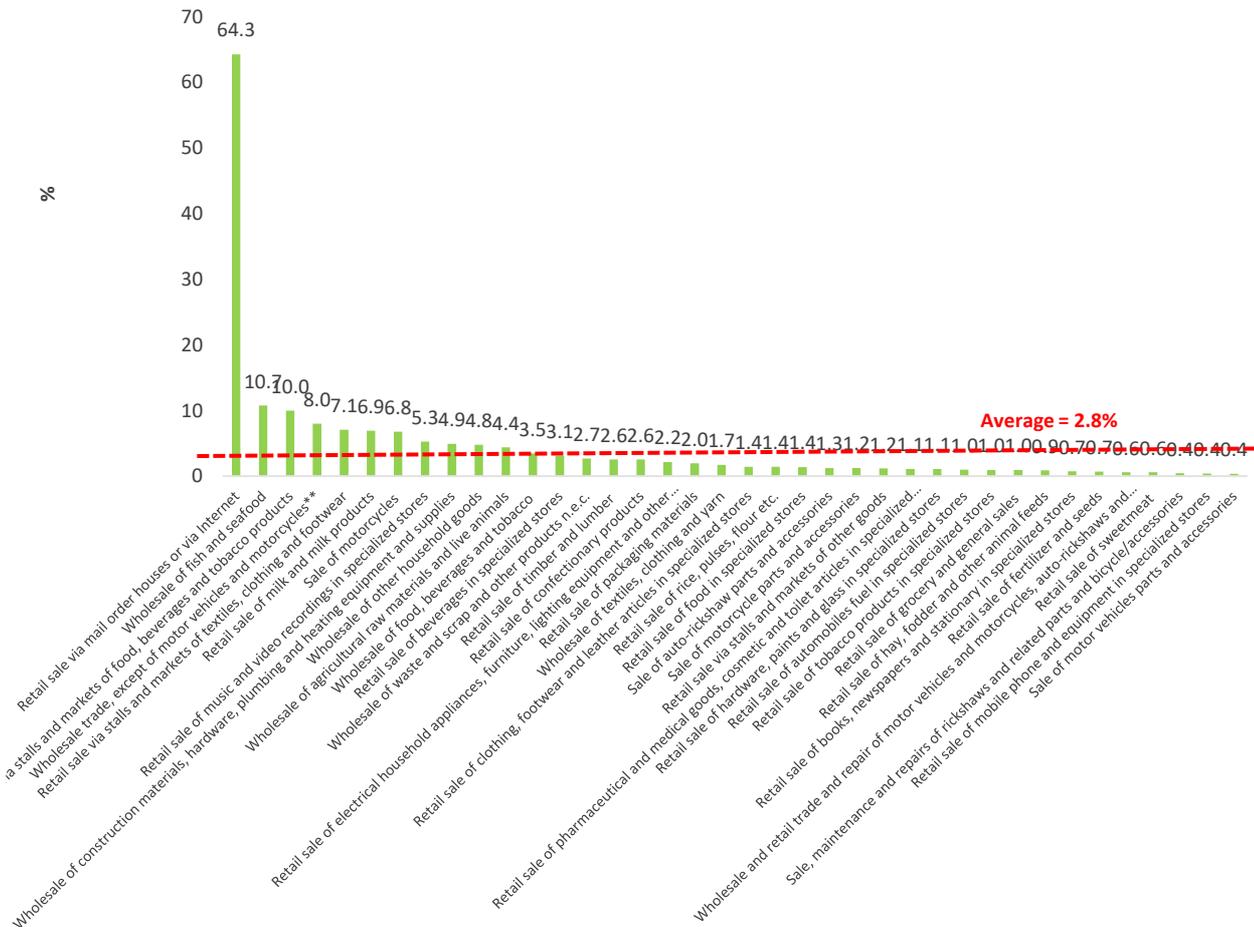
Note: Excludes visual representation of activities with no female participation. Average includes such activities.
Source: BBS (2013)

A 9: Female participation in non-retail (sales) services and non-manufacturing industrial sector activities, 2013 (%)
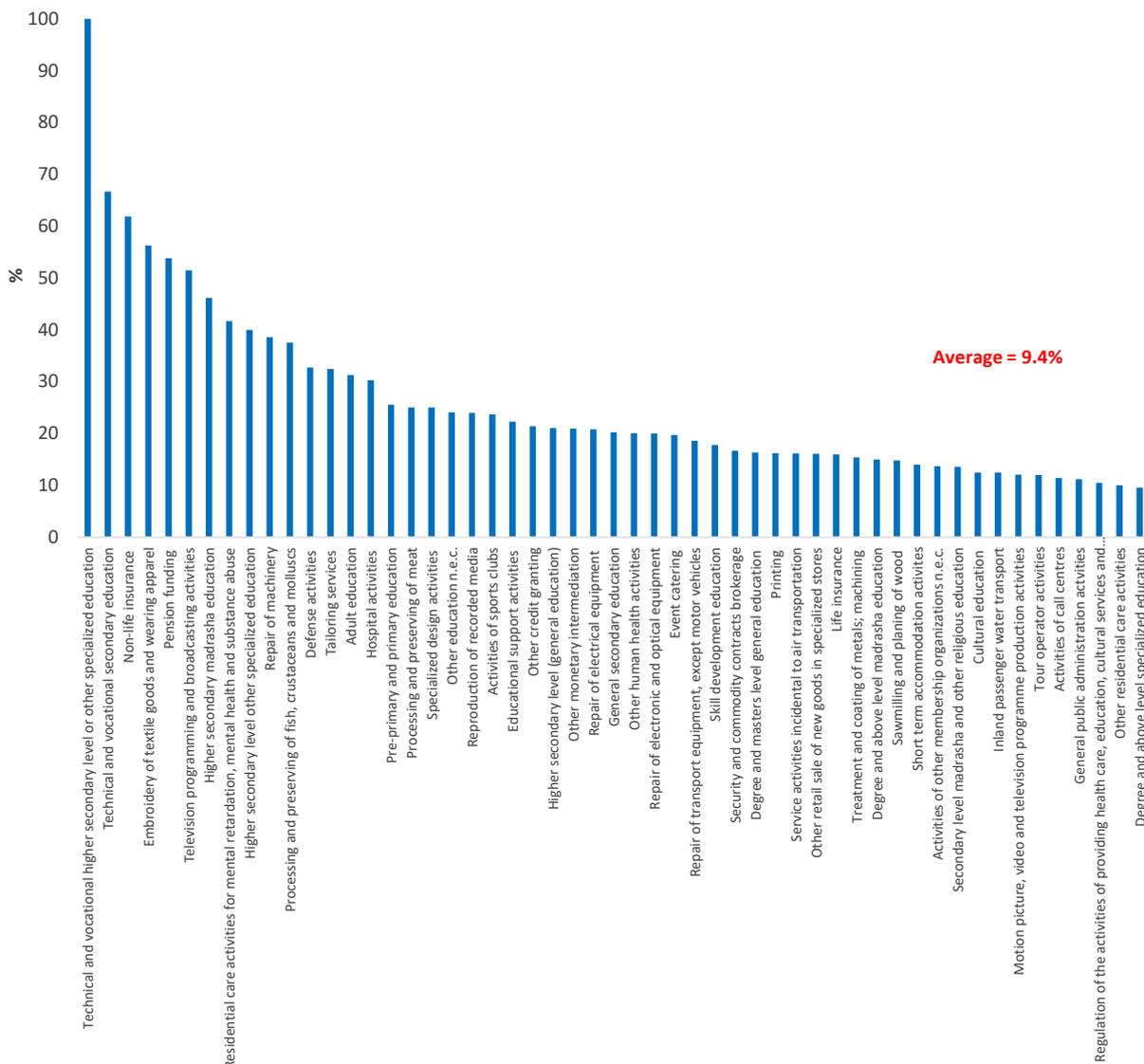
Note: 1) owing to the number of activities reported in BBS (2013), the chart presents only activities where female participation is above the average of 9.4% for the category. For a full visualisation of activities please see Annex; 2) the reported average includes all visualised and non-visualised activities.
Source: BBS (2013)

A 10: % Female Participation in Service Sector Activities, excluding sales, retail & wholesale (2011)

	0	10	20	30	40	50	60	70	80	90	100

Technical and vocational higher secondary level or other specialized education
Technical and vocational secondary education
Non-life insurance
Embroidery of textile goods and wearing apparel
Pension funding
Television programming and broadcasting activities
Higher secondary madrasha education
Residential care activities for mental retardation, mental health and substance abuse
Higher secondary level other specialized education
Repair of machinery
Processing and preserving of fish, crustaceans and molluscs
Defense activities
Tailoring services
Adult education
Hospital activities
Pre-primary and primary education
Processing and preserving of meat
Specialized design activities
Other education n.e.c.
Reproduction of recorded media
Activities of sports clubs
Educational support activities
Other credit granting
Higher secondary level (general education)
Other monetary intermediation
Repair of electrical equipment
General secondary education
Other human health activities
Repair of electronic and optical equipment
Event catering
Repair of transport equipment, except motor vehicles
Skill development education
Security and commodity contracts brokerage
Degree and masters level general education
Printing
Service activities incidental to air transportation
Other retail sale of new goods in specialized stores
Life insurance
Treatment and coating of metals; machining
Degree and above level madrasha education
Sawmilling and planing of wood
Short term accommodation activites
Activities of other membership organizations n.e.c.
Secondary level madrasha and other religious education
Cultural education
Inland passenger water transport
Motion picture, video and television programme production activities
Tour operator activities
Activities of call centres
General public administration activities
Regulation of the activities of providing health care, education, cultural services and other...
Other residential care activities
Degree and above level specialized education
Medical and dental practice activities
Fast food shops/restaurants
Primary level madrasha and other religious education
Outdoor clinics, dispensaries and rural health centers
Water collection, treatment and supply
Real estate activities with own or leased property
Regulation of and contribution to more efficient operation of businesses
Importers and exporters
Other social work activities without accomodation
Courier activities
Activities of non-government and non-profit organisations
Steam and air conditioning supply
Activities of religious organizations
Postal activities
Legal activities
Public order and safety activities
Unani ayurvedic medical practice activities
Extraction of salt
Other publishing activities
Other retail sale not in stores, stalls or markets
Renting and leasing of other personal and household goods
Other information technology and computer service activities
Tea stalls
Library and archives activities
Homeopathic medical practice activities
Hairdressing and other beauty treatment
Maintenance and repairs of motorcycles
Operation of sports facilities
Restaurants and mobile food service activities
Veterinary activities
Washing and dry cleaning of textile and fur products
Compulsory social security activities
Electric power generation, transmission and distribution
Computer consultancy and computer facilities management activities
Other personal service activities n.e.c.
Warehousing and storage
Service activities incidental to land transportation
Photocopying, document preparation and other specialized office support activities
Freight transport by road
Repair of consumer electronics
Repair of computers and peripheral equipment
Other passenger land transport
Repair of other personal and household goods
Real estate activities on a fee or contract basis
Other non-mechanized road transport
Urban and suburban passenger land transport
Maintenance and repairs of auto-rickshaw
Repair of communication equipment
Maintenance and repair of motor vehicles
Photographic activities

BBS (2013)

A 11: Gender skills disaggregation by sector (2018)

Preliminary Cox's Bazar Labour Force Survey (2018)

A 12: Excluded Selection Criteria

Criteria for Inclusion of Sector	Technique Used	Technique Exclusion Basis
Sectoral Growth Trends	Time series sectoral growth trend analysis	Real & Nominal GVA & GDP data missing
Sectoral Firm Level Productivity Analysis	Firm Level productivity aggregated at the sectoral level to identify which sectors exhibit higher productivity levels.	Firm level productivity data, disaggregated between sectors, not available.
Goods with regional Comparative Advantage	Region specific RCA to see which goods Cox's Bazar has a comparative advantage in production vis-à-vis other Bangladesh regions.	Region specific RCA not possible due to unavailability of intra-regional trade data;
Uniqueness vs. Ubiquity of Sector at national level	Shift Share Analysis to identify which sectors exhibit strong growth unique to Cox's Bazar & which sectors are buoyed by national growth patterns.	Real & nominal sectoral GDP/GVA growth data missing
Export Orientated Sectors	Propensity to Export at Sectoral & Firm Level	Trade data missing at sectoral level; Firm level export data missing;
Exports in the Context of World Demand	Using trade data for Cox's Bazar to compare demand for regional exports vis-à-vis world demand and focus on products where world demand is high or growing.	Trade data for Cox's Bazar is missing at the goods level.
Sector by Skills Level	Assessing skill level concentration of jobs by sectors.	Lack of effective skills by employment & sector data.

Mahapatro (2017) Note: Percentages will not add up to 100% due to a single household's engagement in multiple occupations; foresting is not reported as it was common across all settlements and households

ANNEX 2: INPUT-OUTPUT ANALYSIS

The below presents the full details of the SAM constructed for the paper.

A 15-sector Social Accounting Matrix (SAM) of Cox's Bazar for the year 2012 is constructed from the 15-sector National SAM of Bangladesh for the same year. The SAM of Cox's Bazar has the following accounts:

- Sectors: Crops, Livestock, Fishing, Forestry, Manufacturing, Construction, Utility, Mining (primarily salt), Trade, Transport, Housing and Real Estate Service, Social Service, Public Administration and Defence, Hotel and Restaurant, Services
- Factors: Labour and Capital
- Other accounts: Household, Rest of the World, Consolidated capital account and Rest of Bangladesh

*A 13: **Aggregate SAM of Cox's Bazar for 2012 (million taka)***

	Com	Fact	HH	ROW	CCA	RBGD	TTDD	TTSS	Diff
Com	105276		68447	5173	32390	25897	237183	237183	0.00
Fact	101799						101799	101799	0.00
HH		101799		-962			100837	100837	0.00
ROW	4212						4212	4212	0.00
CCA			32390				32390	32390	0.00
RBGD	25897						25897	25897	0.00
TTSS	237183	101799	100837	4212	32390	25897			

Note: Com = Commodity; F = Factor; HH = Household; ROW = Rest of the World; CCA = Consolidated capital account; TTDD = Total demand; TTSS = Total supply; Diff = difference

We attempt to undertake an analysis on the economy-wide impact in Cox's Bazar due to shock on exports, investment and demand from the rest of Bangladesh using the SAM Multiplier Model.

The shift from a 'data' SAM structure to a SAM Multiplier Module requires the introduction of assumptions and the separation of the SAM accounts into 'exogenous' and 'endogenous' components.

A 14: General SAM Modular Structure

		1a-PA	1b-CM	2-FP	3a-HH-OI	4-KHH-OI	5-ROW	TDD
1a	PA		T1a, 1b		0			Y1a
1b	CM	T1b, 1a			T1b, 3	T1b, 4	T1b, 5	Y1b
2	FP	T2, 1a					T2, 5	Y2
3	HH-IO	T3, 1a	T3, 1b	T3, 2	T3, 3		T3, 5	Y3
4	KHH-OI	T4, 1a			T4, 3a		T4, 5	Y4
5	ROW		T5, 1b	T5 2	T5, 3	0	0	Y5
	TSS	E1a	E1b	E2	E3	E4	E5	

*Where: by definition $Y_i = E_j$ and **1 Production (1a PA** = Production Activities and **1b CM** = Commodities); **2 FP** = Factors of Production; **3 HH-IO** = Households and Other Institutions (incl. Government); **4 KHH-OI** = Capital Account Households and Other Institutions (incl. government); **5 ROW** = Rest of the World (Current and capital account). **Blank entries** indicate that there are no transactions by definition.*

The separation is needed to gain entry into the system, allowing some variables within the SAM structure to be manipulated exogenously (via injection instruments) to assess the subsequent impacts on the endogenous accounts as well as on the exogenous accounts.

Generally, accounts intended to be used as policy instruments are classified as exogenous and accounts specified *a priory* as objectives (or targets) are classified as endogenous.

Three accounts are designated as endogenous accounts: (1) Production (Production Activities and Commodities) account, (2) Factors of Production account, (3a) Households and Other Institutions (excl. the Government).

The exogenous accounts comprises (3a) Government (expenditure, transfer, remittances); (4) Capital account of institutions (savings and demand for houses, investment demand, infrastructure and machinery and equipment); and (5) ROW transfers, remittances, export demand and capital. The SAM Flows and the categorization into endogenous and exogenous accounts are shown below.

A 15: Endogenous and Exogenous Accounts

		1a-PA	1b-CM	2-FP	3a-HH-OI	3b-Gov	4-KHH-OI	5-ROW	TDD
1a	PA		$T_{1a, 1b}$		0				Y_{1a}
1b	CM	$T_{1b, 1a}$			$T_{1b, 3a}$	$T_{1b, 3b}$	$T_{1b, 4}$	$T_{1b,5}$	Y_{1b}
2	FP	$T_{2, 1a}$						$T_{2, 5}$	Y_2
3a	HH-OI			$T_{3a, 2}$	$T_{3a, 3a}$	$T_{3a, 3b}$		$T_{2, 5}$	Y_3
3b	Gov	$T_{3b, 1a}$	$T_{3b, 1b}$		$T_{3b, 3a}$	$T_{3b, 3b}$		$T_{3a, 5}$	
4	KHH-OI	$T_{4, 1a}$			$T_{4, 3}$			$T_{4, 5}$	Y_4
5	ROW		$T_{5, 1b}$	$T_{5, 2}$	$T_{5, 3a}$	$T_{5, 3b}$	$T_{5, 4}$	0	Y_5
	TSS	E_{1a}	E_{1b}	E_2	E_{3a}	E_{3b}	E_4	E_5	

*Where Endogenous: **1 Production (1a PA** = Production Activities and **1b CM** = Commodities); **2 FP** = Factors of Production; **3a HH** = Households and Other Institutions (excl. Government);*
*Where Exogenous: **3b** Government; **4 KHH-OI** = Capital Account of Households and of Other Institutions (incl. government); **5 ROW** = Rest of the World (Current and capital account).*
Blank entries indicate that there are no transactions by definition.

A 16: Endogenous and Components of Exogenous Accounts

	PA	CM	FP	3a HH&OI	EXO	INCOME	Exogenous Accounts (EXO) used as injections Column Vectors
1a PA		$T_{1a\,1b}$		0	X_{1a}	Y_{1a}	$X_{1a} = 0$
1b CM	$T_{1b\,1a}$			$T_{1b\,3a}$	X_{1b}	Y_{1b}	X_{1b} = Government Consumption Subsidies - Taxes + Exports + Gov. Investment (capital formation in infrastructure and machinery and equipment) + Gross Capital Stock formation
2 FP	$T_{2\,1a}$				X_2	Y_2	X_2 =Factor Remittances from ROW
3a HH&OI			$T_{3a\,2}$	$T_{3a\,3a}$	X_{3a}	Y_{3a}	X_{3a} = Factor Remittances from ROW
3b Leaks	L_{1a}	L_{1b}	L_2	L_{3a}	$L_{3b} = X_{3b}$	Y_{3b-5}	3b =Aid to Government from ROW
EXPN	E_{1a}	E_{1b}	E_2	E_{3a}	E_{3b-5}		Where $E_i = Y_j$
L_{1a} = Activity Tax				L_{3a} = Income Tax + Household Savings + Corporate Savings			
L_{1b} = Commodity Tax + Import Duty + Imports				L_{3b-5} X_{3b-5} and Y_{3b-5} falls out of the model			
L_2 = Factor Remittances to ROW				Blank entries indicate that there are no transactions by definition.			

Note on Injection: For any given injection into the exogenous accounts X_i (i.e. instruments) of the SAM, influence is transmitted through the interdependent SAM system among the endogenous accounts. The interwoven nature of

the system implies that the incomes of factors, institutions and production are all derived from exogenous injections into the economy via a multiplier process. Multiplier models may also be built on the input-output frameworks. The main shortcoming of the IO model is that the feedback between factor income generation (value added) and demand by private institutions (households) does not exist. In this case the circular economic flow is truncated. The problem can be partly tackled by endogenising household consumption within the I-O framework; this is typically referred to as a 'closed I-O model'. In this case, the circular economic flow is only partially truncated. A better solution is to extend the I-O to a SAM framework which captures the full circular economic flow

SAM coefficient (A_{ij}) are derived from payments flows by endogenous accounts to themselves (T_{ij}) and other endogenous accounts as to the corresponding outlays ($E_i = Y_j$); similarly, the leak coefficients (B_{ij}) derived from flows reflecting payments from endogenous accounts to exogenous accounts. They are derived below.

A 17: Coefficient Matrices and Vectors of the SAM Model

Account	1a - PA	1b – CM	2 – FP	3a - HH&OI	3b … 5 EXO	Income
1a – PA		$A_{1a,1b}$ $= T_{1a,1b} / Y_{1b}$			X_{1a}	Y_{1a}
1b - CM	$A_{1b,1a}$ $= T_{1b,1a} / Y_{1a}$			$A_{1b,3a}$ $= T_{1b,3a} / Y_{3a}$	X_{1b}	Y_{1b}
2 - FP	$A_{2,1a}$ $= T_{2,1a} / Y_{1a}$				X_2	Y_2
3a - HH&OI			$A_{3a,2}$ $= T_{3a,2} / Y_2$	$A_{3a,3a}$ $= T_{3a,3a} / Y_{3a}$	X_{3a}	Y_{3a}
3b … 5 Leaks	B_{1a} $= L_{1a} / Y_{1a}$	B_{1b} $= L_{1b} / Y_{1b}$	B_2 $= L_2 / Y_2$	B_{3a} $= L_{3a} / Y_{3a}$		
Expenditure	$E_{1a} = Y_{1a}$	$E_{1b} = Y_{1b}$	$E_2 = Y_2$	$E_3 = Y_{3a}$		

The multiplier analysis using the SAM framework helps to understand the linkages between the different sectors and the institutional agents at work within the economy. Accounting multipliers have been calculated according to the standard formula for accounting (impact) multipliers, as follows:

$$Y(t) = A\,Y(t) + X(t) = (I - A)^{-1} X(t) = M_a\, X(t)$$
Where:

> **t** is time
> **Y** is a vector of incomes of endogenous variables
> **X** is a vector of expenditures of exogenous variables
> **A** is the matrix of average expenditure propensities for endogenous accounts
> $M_a = (I - A)^{-1}$ is a matrix of aggregate accounting multipliers (generalized Leontief inverse).

The aggregate accounting multiplier (M_a) will be further decomposed to separately examine the direct and induced effect. In order to generate the direct and induced effects the M_a multiplier will be decomposed using both multiplicative and additive forms. These are shown below.

<u>Multiplicative Multipliers</u> for three endogenous accounts (Production (Act-Com), FP, HH-OI) are the following:

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

The corresponding additive multipliers are the following:

$$M_a = I + T + O + C = I + (M_1 - I) + (M_2 - I).M_1 + (M_3 - I).M_2.M_1$$

The direct and induced effects will be captured by multipliers (I + T) and (O+C) respectively. More specifically, there are represented as:

A 18: Multiplier Types capturing Direct and Induced Effects

Multiplier Types	Additive Form	Multiplicative Form
Intra Transfer M_a =	I +T	$I + (M_1 - I)$
Induced M_a =	O+C	$(M_2 - I).M_1 + (M_3 - I).M_2.M_1$

Variations in any one of the exogenous account (i.e. in this case ΔX due to ΔI) will produce total impacts (ΔY) of endogenous entries via the multipliers. The total impact will be decomposed by direct and induced impacts for capturing the strengths of the transmission channel. More specifically they are expressed as:

Intra Transfer Impacts $_{Intra\ Transfer}$ ΔY(t) = $_{Direct}$ M_a x ΔX(t).

Induced Impacts $_{induced}$ ΔY(t) = $_{Induced}$ M_a x ΔX(t).

The total effect is thus ΔY(t) = $_{Intra\ Transfer}$ ΔY(t) + $_{induced}$ ΔY(t). The total effect must equal to ΔY(t) = M_a x ΔX(t)

Thus ΔY(t) captures the total impacts (intra transfer + indirect) on the four endogenous accounts namely: (i) gross output; (ii) activity; (iii) factor returns and (iv) household.

A 19: Description of the Endogenous and Exogenous Accounts and Multiplier Affects

Endogenous (y)	Exogenous (x)
The activity (gross output multipliers), indicates the total effect on the sectoral gross output of a unit-income increase in a given account *i* in the SAM, and is obtained via the association with the commodity production activity account *i*.	
The consumption commodity multipliers, which indicates the total effect on the sectoral commodity output of a unit-income increase in a given account *i* in the SAM, is obtained by adding the associated commodity elements in the matrix along the column for account *i*.	Intervention into through activities (x = i + g + e), where i= GFC + ST (GFCF) Exports (e) Government Expenditure (g) Investment Demand (i) Inventory Demand (i)
The value added or GDP multiplier, giving the total increase in GDP resulting from the same unit-income injection, is derived by summing up the factor-payment elements along account *i*'s column.	Factor Income Remittances from RoW.
Household income/Corporation multiplier shows the total effect on household and enterprise income, and is obtained by adding the elements for the household groups along the account i column.	Intervention via households (x = r + gt + ct), where Remittance (r) Government Transfers (gt) Corporation Transfers (ct)

The economy-wide impacts of exports, investments and external demand are examined by changing the total exogenous injection vector. More specifically, the total exogenous account is

manipulated to estimate their effects on output (through an output multiplier), value-added or GDP, (through the GDP multiplier), and household income (through household income multiplier).

*A 20: **Demand side accounts in the 15-Sector SAM of Cox's Bazar (million taka)***

Sectors	ROW	CCA	ROBGD	TTDD
Crops	420	-433	0	18065
Livestock	2	226	175	8789
Fishing	2415	253	9262	25588
Forestry	0	671	10627	19573
Manufacturing	304	1029	0	29710
Construction	0	30713	0	31499
Utility	0	0	0	3121
Mining	24	-68	4754	6424
Trade	0	0	0	18693
Transport	535	0	0	17110
Housing and Real Estate Service	0	0	0	11600
Social Service	0	0	0	10951
Public Administration and Defence	253	0	0	6875
Hotel and Restaurant	0	0	1078	3528
Services	1220	0	0	25656

Note: ROW = Rest of the World; CCA = Consolidated capital account; TTDD = Total demand

A 21: Table: Impact on sectoral output, total gross output, GDP, household income and total employment (% change from the base)

	Sim 1	Sim 2	Sim 3	Sim 4	Sim 5	Sim 6	Sim 7	Sim 8	Sim 9	Sim10	Sim11
Crops	0.43	0.04	4.48	0.73	0.22	0.30	1.94	0.34	0.09	0.06	0.01
Livestock	0.42	0.02	4.01	0.68	0.21	0.44	1.86	0.07	0.09	0.28	0.01
Fishing	1.37	0.01	1.80	0.31	0.09	0.12	0.84	0.03	0.04	0.01	0.00
Forestry	0.05	0.00	1.71	0.08	0.02	0.02	7.44	0.01	0.01	0.00	0.00
Manufacturing	0.31	0.37	5.72	0.70	0.12	0.16	1.18	0.06	0.06	0.02	0.11
Construction	0.01	0.00	9.86	0.02	0.01	0.00	0.06	0.00	0.01	0.00	0.00
Utility	0.40	0.03	4.43	1.10	0.23	0.18	1.90	0.06	0.09	0.03	0.01
Mining	0.06	0.00	2.21	7.44	0.01	0.01	0.09	0.00	0.00	0.00	0.00
Trade	0.49	0.03	2.85	0.49	0.13	0.14	3.64	0.10	0.07	0.03	0.01
Transport	0.50	0.03	3.33	0.51	0.16	0.15	2.80	0.08	0.39	0.03	0.01
Housing and Real Estate Service	0.43	0.03	4.34	0.76	0.29	0.18	2.11	0.07	0.09	0.03	0.01
Social Service	0.44	0.02	4.38	0.75	0.24	0.19	2.06	0.07	0.10	0.04	0.01
Public Administration and Defense	0.39	0.02	4.25	0.82	0.20	0.16	2.12	0.06	0.09	0.03	0.01
Hotel and Restaurant	0.31	0.02	2.97	0.51	0.17	3.18	1.48	0.05	0.09	0.02	0.01
Services	0.33	0.02	4.73	0.96	0.67	0.15	1.70	0.05	0.08	0.02	0.01
Gross output	0.41	0.06	4.53	0.71	0.18	0.19	2.06	0.07	0.08	0.03	0.02
GDP	0.44	0.02	4.38	0.75	0.23	0.18	2.03	0.06	0.09	0.03	0.01
Household income	0.45	0.02	4.42	0.75	0.23	0.18	2.05	0.07	0.09	0.03	0.01
Total employment	0.25	0.04	2.45	0.54	0.10	0.17	1.09	0.06	0.05	0.03	0.01

Source: SAM Multiplier model for Cox's Bazar
Note: We assume employment elasticity of output to be 0.5 for agriculture, 0.7 for industry and 0.6 for services sectors

A 22: Increase in employment (number)

	Sim 1	Sim 2	Sim 3	Sim 4	Sim 5	Sim 6	Sim 7	Sim 8	Sim 9	Sim10	Sim11
Crops	289	30	3039	492	148	201	1313	230	61	41	9
Livestock	118	7	1130	192	60	125	525	21	25	78	2

Fishing	359	3	471	80	25	31	219	7	10	4	1
Forestry	2	0	54	2	1	1	237	0	0	0	0
Manufacturing	116	140	2155	263	46	60	445	24	22	8	41
Construction	3	0	2811	4	2	1	17	0	1	0	0
Utility	25	2	277	69	14	11	119	4	5	2	1
Mining	11	1	407	1369	2	2	17	1	1	0	0
Trade	288	19	1683	291	74	82	2147	56	43	19	6
Transport	124	7	820	127	40	38	690	19	96	8	2
Housing and Real Estate Service	10	1	97	17	7	4	47	1	2	1	0
Social Service	47	3	462	79	26	20	217	7	11	4	1
Public Administration and Defense	16	1	171	33	8	6	86	2	4	1	0
Hotel and Restaurant	38	2	365	62	21	390	182	6	11	3	1
Services	50	3	732	149	104	24	263	8	13	4	1
Total	1495	218	14675	3232	576	997	6523	387	304	172	65

Source: SAM Multiplier model and employment matrix for Cox's Bazar