ENABLING ENVIRONMENT for the SUCCESSFUL INTEGRATION of SMALL AND MEDIUM-sized ENTERPRISES in GLOBAL VALUE CHAINS

Country studies of Bangladesh, Nepal and Sri Lanka

STUDIES IN TRADE AND INVESTMENT

70

UNITED NATIONS ESCAP

Economic and Social Commission for Asia and the Pacific

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Preface

Small and medium-sized enterprises (SMEs) have played an important role in South Asia and remain a critical source for employment creation as well as income generation. SMEs occupy an important position in the development strategy for inclusive economic growth and poverty reduction. In this respect, export-oriented SMEs, supplying competitive products and services with greater potential for backward and forward linkages, would substantially contribute towards higher national income and overall socio-economic progress of nations. Therefore, the development of export-led SMEs should be promoted through effective policy options in South Asian countries. However, SMEs in the subregion typically face considerable resource constraints and currently have limited capabilities to compete effectively in global and regional markets. It is thus imperative to further expand SMEs' capacity and competitiveness for survival and sustained development, particularly in the current competitive business environment.

Furthermore, one of the most crucial challenges facing SMEs in South Asia is how to create new business opportunities in the global and regional markets. Recent experiences from a wide range of Asia-Pacific countries, particularly from South-East Asia and China, strongly indicate that domestic SMEs can access international markets through global (and regional) value chains (GVCs), which provide a full range of value added business activities across borders. Such GVCs are expected to help boost SMEs' value added activities in international trade, in which SMEs at present play a limited role. In order to participate in GVCs effectively, SMEs in South Asia must remove entry barriers by developing capacities in a wide range of increasingly stringent international standards with regard to quality, price and timely delivery of products. However, SMEs typically lack an environment that would allow them to improve their capacity and competitiveness. Such environment should include policy and regulatory framework, supporting infrastructure, access to financing, entrepreneurial culture, technology incubation and business development services.

With financial support provided by the Government of Japan, the publication aims to propose practical policy interventions in improving business environment by targeting three South Asian countries, namely Bangladesh, Nepal and Sri Lanka and facilitating SMEs access to global and regional markets, especially through GVCs. Consequently, sector based value chain approach was adapted to focus on a few product groups with high export potential. Bangladesh chose consumer and industrial plastic products, Nepal selected agro-based products, such as ginger and coffee, while industrial rubber products, electrical and electronic goods were the focus of Sri Lanka. National action plans for these products were developed along with operational strategies and the required institutional framework among stakeholders. Constraints and opportunities for the promotion of export-oriented SMEs were identified and a set of policy recommendations with institutional support mechanisms were suggested. It is expected that both the Governments concerned and the private sector would find such action plans and recommendations useful and take the necessary steps in this regard.

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Technical editing was done by Masato Abe, Bhavani P. Dhungana and Bhuban B. Bajracharya. Paradai Adisayathepkul, Fabian Suwanprateep and Natthika Charoenphon formatted the final manuscripts. Napidchaya Pichedtanavanich provided cover and book layout design. Natthika Charoenphon and Napidchaya Pichedtanavanich provided secretarial assistance.

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Acronyms and Abbreviations

AAMO	Asian Association of Management Organizations
ADB	Asian Development Bank
APCTT	Asia-Pacific Centre for Transfer of Technology
APO	Asian Productivity Organization
ASEAN	Association of Southeast Asian Nations
B2B	Business-to-business
B2C	Business-to-households/customers
DANIDA	Danish International Development Agency
DFID	The United Kingdom Department for International Development
ESCAP	Economic and Social Commission for Asia and the Pacific
EPZ	Economic Processing Zone
EU	European Union
FDI	foreign direct investment
GCI	Global Competitiveness Index
GDP	gross domestic product
GNI	gross national income
GSP	Generalized System of Preferences
GTZ	Gesellschaft für Technische Zusammenarbeit
GVC	global value chain
Ha	hectare
HDI	Human Development Index
ICIMOD	International Centre for Integrated Mountain Development
ICT	Information and communications technology
ILO	International Labour Organization
ISFTA	Indo-Sri Lanka Free Trade Agreement
ISO	International Organization for Standardization
ITC	International Trade Centre, Joint Agency of the World Trade Organization and the United Nations
JICA	Japan International Cooperation Agency
JEITA	Japan Electronics and Information Technology Industries Association
Kg	kilogram

LDC	least developed country
LPI	Logistics Performance Index
MNC	Multinational corporation
MT	metric tonne
NGO	Non-governmental organization
NRs.	Nepalese rupees
OAM	Own account manufacturing
OBM	Own brand manufacturers
ODM	Own design manufacturing
OECD	Organization for Economic Co-operation and Development
R and D	Research and development
SAARC	South Asian Association for Regional Cooperation
SAFTA	South Asian Free Trade Agreement
SAPTA	South Asian Preferential Tariff Agreement
SCI	Small and cottage industries
SEZ	Special Economic Zone
SDC	Swiss Agency for Development and Cooperation
SIDA	Swedish International Development Cooperation Agency
SL Rs.	Sri Lanka rupees
SMEs	Small and medium-sized enterprises
SWOT	Strengths, Weaknesses, Opportunities and Threats
TID	Trade and Investment Division
Tk	Taka (Bangladeshi currency unit)
TNC	Transnational corporations
TOT	Training of trainers
UNCTAD	United Nations Conference for Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WEF	World Economic Forum
WTO	World Trade Organization

Chapter 1

INTRODUCTION

Over the past two decades trade and investment have been the driving forces in accelerating economic growth in South Asia. In the recent decade South Asian countries have increased export competitiveness and foreign direct investment inflows. As a result, new business opportunities have opened up for domestic enterprises. Despite their tremendous potential, SMEs[1] in South Asia are still at a disadvantage due to a lack of essential business factors such as capital, profitability, managerial skills, trained labour, brands and networking. Although SMEs account for more than 90 per cent of all private enterprises and employ roughly 60 per cent of the domestic workforce in South Asia, relative share of SMEs production in total domestic output is much smaller, approximately 35 per cent, as is the direct contribution of SMEs to merchandise export earnings, which is around 25 per cent (AAMO 2007).

Broad-based inclusive and sustainable growth with the active involvement of the private sector is one of the most important development strategies in poverty reduction opted by many developing countries, including those in South Asia. To attain this goal, export-oriented SMEs and supporting industries should be recognized for the important role they play in their respective national economies. However, to become successful SMEs should be promoted and supported by not isolated and half-hearted measures but concerted and coordinated policies and institutional efforts. In smaller economies with limited domestic markets, high economic growth and rapid socio-economic transformation can be achieved through export growth, and SMEs, showing

[1] Having recognized their expected contribution to industrialization in developing countries in Asia and the Pacific, this study mainly focused on the development of export-oriented SMEs as well as SMEs in supporting industry, including micro enterprises. Those SME segments are typically characterized by high technology adaptation and backward linkage, which are key success factors for their effective participation in global and regional value chains (Uchikawa and Keola 2009). Other major SME segments, namely domestic market-oriented SMEs and cottage industry, which serve domestic and local markets, were not discussed extensively in this study although they may share some of similar corporate characteristics to export-oriented and supporting industry SMEs. Note that the statistics of SMEs in this study are the aggregate data of all SME segments at the regional, subregional and national levels.

tremendous potential in that respect, should be supported at both regional and global levels.[2]

Within this context, one of the most important challenges facing SMEs in South Asia is creating new business opportunities, targeting the foreign markets. Establishing effective linkages with global and regional markets, including those of major emerging economies in Asia and the Pacific, such as China and India, is a major challenge for SMEs. However, recent experiences from a wide range of countries in Asia and the Pacific do indicate that SMEs could access international markets through global (and regional) value chains (GVCs). They could build efficient networks by establishing linkages with large enterprises or even with other SMEs. Such integration in GVCs are expected to help boost SMEs' value added activities in international trade, in which SMEs, at present, play a limited role due to a lack of proper networking. In particular, the proposed shift would immediately help smaller economies in South Asia, such as Bangladesh, Nepal and Sri Lanka, in accelerating their socio-economic development and poverty reduction.

It should also be noted that the emergence of GVCs has intensified competition in value added activities and required continuous skill development. Such competition could lead to greater economic and development disparities in South Asia at both the company and country levels, unless national policymakers in cooperation with business practitioners and international development agencies create a business environment for the succesful integration of SMEs in GVCs.

Addressing key policy issues for export-driven SMEs in South Asian developing countries, the Trade and Investment Division of ESCAP devised a project to explore new ways and means and provide effective tools for SMEs integration into global and regional markets through participation in global and regional value chains.

The introduction presents all four key topics. The first section discusses research framework, including value chain analysis, research objectives and methodology. The second section reviews the existing SME development approaches of different donor agencies, while the third section briefly describes the recent key developments in the business community in Asia and the Pacific, particularly the emergence of global and regional value chains. The final section explains the overall structure of the publication.

1.1. Research framework

The study was conducted as part of ESCAP initiatives on Business for Development, a comprehensive programme for private sector development in Asia and the Pacific. It was designed as a pilot project adapting value chain analysis to addressing possible areas of policy interventions for strengthening export- led SME development strategy in South Asia. The next section of the chapter provides a brief outline of the value chain analysis.

[2] While reviewing the prospects for SMEs it should be noted that there are a number of bilateral and multilateral agencies involved in developing the private sector in South Asia (e.g., ADB 2000; GTZ 2010; JICA 2006; UNDP 2007; UNIDO 2010; USAID 2010; and World Bank 2002), which often focus on SME development.

Bangladesh, Nepal, and Sri Lanka were included in the study. Based on the outcomes and findings of the study, other technical assistance projects might follow to help policymakers' capacity-building in South Asia and other subregions in Asia and the Pacific with the objective of making SMEs an integral part of global and regional value chains. The study emphasized issues affecting women and youth entrepreneurs, who play an important role in the SME sector in all countries of the ESCAP region.

1.1.1. VALUE CHAIN ANALYSIS: A DIAGNOSTIC TOOL

Value chain analysis has been defined by Michael Porter as a diagnostic tool that disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and existing and potential sources of differentiation (Porter 1985). He claims that value chain analysis allows us to diagnose the competitive advantage of a firm or industry and to enhance the advantage by tailoring the value chains. However, there have been significant developments since Porter introduced the concept and the broader approach to value chains includes the complex range of activities implemented by various actors (suppliers, primary producers, processors, traders, service providers, etc.), transforming raw material into the final product and delivering it to retail market. The broad value chain starts at the production stage and moves along the linkages between enterprises engaged in trading, assembling, processing, etc. The wide approach includes not only the activities implemented by a single enterprise but also all the activities of its backward and forward linkages up until the stage at which the raw material, turned into the final product, is linked to the final consumer (Roldan-Prez et al. 2009).

Value chain analysis or commodity chain analysis disaggregates the global structure of fabrication, trade and consumption of commodities and allows for the identification of factors and geographical divisions (Tuvhag 2008). Value chain analysis has been widely adopted by researchers, industry and development practitioners to understand the political economy of contemporary global production systems and has also served as a tool to analyze different aspects of chain coordination and governance.

At the most basic level, value chain analysis systematically maps the actors participating in the production, distribution, marketing and sale of a particular product. While this mapping may be a valuable exercise, it is rather descriptive and, as such, is more of a heuristic device (Kaplinsky and Morris 2001). However, according to Kaplinsky and Morris (2001), by adding and focusing on three key components, such as (a) barriers to entry and rent, (b) governance and (c) value chain type, the value chain approach becomes a powerful analytical diagnostic tool.

The barriers to entry and rent concern the identification and distribution of benefits to different actors in the chain. It also means that through a value chain one can determine who benefits from the participation in the chain and from the government interventions and support.

The governance of the value chain refers to relationship and coordination mechanisms that exist between its various actors. As Schmitz (2005) points out, there is often a powerful lead firm in the chain that wishes to control and govern the

relationships. The question then is: what is the lead firm's motivation to assume such a dominant role in the value chain? The answer to the question is in product definition. Firstly, the lead firm needs its suppliers to understand certain product specifications in great detail and ensure compliance in order to successfully pursue a strategy based on e.g. product differentiation. Secondly, while suppliers are facing steadily increasing performance and quality standards, controlling the value chain decreases the lead firm's own risk of encountering supplier failure (Schmitz 2005).

The third component of the value chain analysis suggests distinguishing between buyer- and producer-driven chains. Kaplinsky and Morris (2001) link the first type to labour intensive industries and deem it very important for developing nations. In producer-driven value chains, a number of key producers have critical resources, such as technology, at their disposal as well as the ability to coordinate the links in the value chain (Kaplinsky and Morris 2001). Furthermore, this type of value chains seems to attract a higher number of foreign direct investment and employs a different kind of production system (Gerefffi 1999b). In general, while the third component of the value chain analysis might not yet be fully explored, it is very valuable as it stimulates the generation of helpful analytical questions (Kaplinsky and Morris 2001).

Value chain analysis was applied in each of the individual country studies in order to assess the selected sectors or products from the respective countries. Particular emphasis was placed on export promotion and linkages to global markets. Based upon the result of the analysis, national action plans, aimed at improving SMEs business environment, were developed. Objectives and expected outcomes are elaborated upon in the subsequent section.

1.1.2. OBJECTIVES AND EXPECTED OUTCOMES OF THE STUDY

The major objective of the study was to assist South Asian countries, namely Bangladesh, Nepal, and Sri Lanka, in developing national action plans for the improvement of their business environments to facilitate SMEs access to regional and global markets, especially through GVCs. Subregional constraints and opportunities in the development of export-oriented SMEs in these three countries were analyzed, resulting in the development of a comprehensive action programme. Specific objectives of the study included: (a) identifying sectors (or products) with a high export potential; (b) evaluating the processes and relationships from the value chain perspective by developing sectors/products best suited for export promotion; (c) reviewing policy and regulatory framework affecting selected sectors and products; (d) identifying constraints for broadening the prospects for the development of effective sector/product value chains for SMEs involvement; and (e) preparing and finalizing national action plans and a subregional action programme for stakeholders' further interventions.

1.1.3. METHODOLOGY

The project included three national studies and a synthesis summary. The work intended bringing out: (a) potentialities for enhancing value added; (b) national action plans; and (c) a subregional action programme for addressing economic cooperation

issues in South Asia. Consequently, the study presented an analytical review of existing policy measures, acts, documents, studies, and other materials on SMEs.

As the project also aimed at addressing participating countries' policy frameworks, institutional arrangements, public-private sector cooperation mechanisms and technical support, additional primary data collection, adopting qualitative research methods, such as semi-structured interviews, site/field visits and observations, focus group discussions and other feedback communications, has been conducted to include the views and participation of all stakeholders. To support the collaboration and improve the overall quality of the study, research teams were established at the national level for each target country by inviting academics, industry experts and/or researchers.

The project activities included: (a) preparing three country research papers on national GVC issues; (b) organizing national workshops on reviewing the country papers and considering the feasibility of national action plans; (c) preparing a synthesis summary of the three country papers, which included a strategic framework and a subregional action programme; and (d) organizing subregional workshops finalizing national action plans and the subregional action programme.

1.2. SMEs development approach and key focus areas

Before shifting the focus to the emergence of global and regional value chains, it is worthwhile to highlight the strategic importance of SMEs in the overall economic development and bring out the role of various development and donor agencies in this context. There are six key focus areas for SMEs that deserve particular attention as they determine SMEs business environment and capability to successfully tap into global markets and access the global value chain.

The crucial role of SMEs in economic development has been widely recognized in the past and became even more evident recently with SMEs fostering job creation, generating incomes, improving performance and competitiveness and contributing to the economies of both developed and developing countries.

Therefore, various agencies have designed and implemented SMEs development interventions in Asia and the Pacific, particularly in South Asia. The strategic approach of 13 major bilateral and multilateral development and donor agencies was reviewed in terms of its focus and modalities. It was determined that specific and detailed interventions, improving the SME sector value added and strengthening its contribution to respective economies, should concentrate on six key issues:

1. Enabling policy and regulatory environment, including introducing effective institutional framework and pro-business fiscal policy;
2. Supporting SMEs business infrastructure;
3. Promoting entrepreneurship, developing managerial skills and human resources;
4. Improving access to financing;

5. Developing and adapting technology; and
6. Developing SMEs business services.

The findings indicate that a comprehensive SME development approach typically includes all or some of the above-mentioned six key areas for detailed intervention. The key factors are presented below.

(1) Enabling policy and regulatory environment

A transparent policy and regulatory environment ensures enterprise facilitation for the establishment, operation, promulgation, access to resources and markets and exit. To a greater extent the sustainability of policy and regulations – such as enterprise registration, corporate governance, fiscal incentives, anti-corruption and labor laws – relies on efficient administrative framework. Efficient policy and regulatory directives, with adequate implementation and operation modalities, would result in building confidence among SMEs entrepreneurs and strengthen their capacity to improve linkages with other enterprises. The availability of specialized and formal institutional resources for SME development is the foundation for creating a level playing field and facilitating their access to finance, skills and knowledge. It must also be noted that availability of SME-related public services would also be a strong support in furthering SME development.

(2) Supporting SME business infrastructure

The basic physical and organizational infrastructure includes, among other things, transportation, water supply and sewerage, power grids, telecommunications and research and training facilities. Quality business infrastructure facilitates the production of goods and services and enhances competitiveness. A number of bilateral and multilateral donors are supporting South Asian countries in building such infrastructure. However, SME specific infrastructure is still insufficient, particularly in the areas of skills development and in providing physical facilities, such as training institutions and SME parks. Supporting SME targeted infrastructure would enhance the productivity of SMEs and improve their competitiveness in international markets.

(3) Promoting entrepreneurial culture

This study defined entrepreneurial culture as a tendency in the society to promote or motivate people to become entrepreneurs. Government provisions helping and supporting entrepreneurs, including developing their technical skills, play a vital role and should become an integral part of entrepreneurship building. An extensive programme for entrepreneurial development, with concomitant support through small business consulting services, would also result in an enterprise setting-up and strengthening. Policy measures, such as entrepreneurship training and education, youth entrepreneurial programmes, new business incubation as well as women entrepreneurship development would stimulate the entrepreneurial culture. Increased donor support would be a significant help in such areas.

(4) Improving access to financing

Improving access to financing means enhancing the degree to which financial services become available to all, through easy and affordable means. The ability of SMEs to grow and strengthen their competitiveness over time largely depends on their ability to invest in restructuring, innovation, improvement and diversification. All these investments require both short- and long-term capital and, therefore, access to financing is very important for them. One of the consistently repeated complaints from SMEs has been the lack of access to finance (cf., AMMO 2007; ESCAP 2009). In attempting to gain access to financial services, SMEs are faced with constraints caused by many factors, such as financial sector ineffectiveness, lack of information on financing availability, lack of collaterals, poor property rights laws and. lack of financial products. Policymakers need to address these issues to make financial resources accessible to small entrepreneurs. Interventions by governments and other regulatory institutions should include: microfinance; commercial loans; public credit guarantees; and SME specialized financial institutions. However, very few donors have directly assisted in these areas. Donor assistance in financing SMEs through business incubation programmes and targeted financing, particularly in rural areas, could bring concrete results.

(5) Developing and adapting technology

One of the critical factors influencing the competitiveness of enterprises is technological capability for quality products and services. Technology is comprised of both the "hardware" of physical assets, and the "software" of know-how and skills. Technology development and adaptation include research and development (R and D), dissemination of information and knowledge, matching technology with current needs and creative adaptation of technologies for new uses. SMEs in developing countries very often produce products and services of moderate quality mostly due to the adaptation of outdated technologies and this has resulted in rejection of their products in competitive markets at both domestic and international levels. In recent years the situation has worsened, because SMEs in developing countries had to survive the intense competition of globalization, where countries had to adapt their trade regimes and phase out of tariff barriers under the World Trade Organization mandate. The best use of technology, no doubt, enables SMEs to reducing cost of production, maintaining consistency in quality and standardization, improving productivity and finally enhancing their competitiveness. The growing interest of Governments in introducing technology policies and bringing up institutional and infrustructural changes is necessary to boost the competitive dimension. However, donor assistance in technological capability building has been rather limited. This is particularly true of SMEs in South Asian countries. Building-up technology related institutions, strengthening R and D facilities and increasing assistance in widening skills development programmes could bring tangible gains in improving SMEs competitiveness both in domestic and international markets.

(6) Developing SMEs business services

Inadequate business development (and support) services or their relatively high cost has hampered SMEs' efforts in improving their competitiveness as service providers,

particularly lawyers, accountants, business consultants and technical consultants do not provide cost effective management solutions required for SMEs. Furthermore, lack of information and accessibility to utilize existing services by SMEs has also resulted in weak demand for such facilities. Obtaining information on commercial law, taxation, customs regulation, market intelligence, business advisory services, training opportunities and financing sources is generally expensive and time consuming; thus, most of the SMEs, particularly in South Asian countries are unable to avail themselves of those provisions. It is therefore most desirable that governments should take the lead in promoting such critical SME development services jointly with business and industry associations. Donors particularly can assist by providing financial assistance and sharing in successful business experience coming from other countries, including professional certificate schemes for service providers.

The six key areas for SME development, where donors' assistance is provided, require further strengthening. With active involvement of all stakeholders, particularly SME associations, chambers of commerce and industry as well as governments soliciting large donor assistance, a supportive environment can be fostered for SME development. This is particularly important, as the emergence of global value chains poses new challenges but also provides opportunities for SMEs.

1.3. The emergence of global and regional value chains

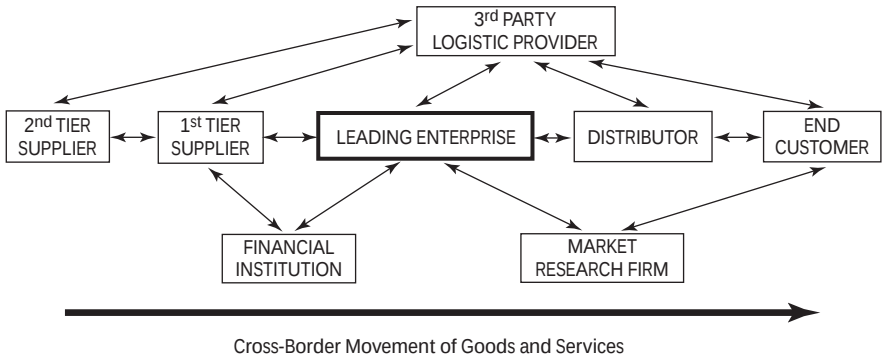
One significant development in the Asia-Pacific business sector has been the emergence of global and regional supply or value chains.[3] A global value chain refers to the full range of cross-border value added business activities, which are required to bring a product or service from its conception through design, sourcing raw materials and intermediate inputs, production, marketing, distribution and support to the final consumer (ESCAP 2007). The rise of these global value chains is the result of two interdependent and complementary dynamics: reorganization and relocation. While the first involves business decisions about what core competencies the enterprise needs to retain and which functions it could outsource, the latter one is about offshoring, i.e. moving the firm's entire or partial operations to another country (ESCAP 2007). Furthermore, global value chains have also grown as a result of some key developments, accompanying the globalization process, and the emergence of international production networks. Such developments include trade and investment liberalization, the development of low-cost and fast logistics systems and ICT applications that enable products and services, including semi-processed outputs, to quickly and efficiently move across the world.

[3] For further details, see United Nations, *Globalization of Production and the Competitiveness of Small and Medium-sized Enterprises in Asia and the Pacific: Trends and Prospects.* Sales No.E.09.II.F.23; United Nations., *Asia-Pacific Trade and Investment Report 2009:Trade-led Recovery and Beyond.* Sales No.E.09.II.F.19; United Nations, *Linking Greater Mekong Subregion Enterprises to International Markets: The Role of Global Value Chains, International Production Networks and Enterprise Clusters,* Sales No.E.07.II.F.2.

The emergence of global value chains is characterized by increased concentration of production and distribution, smaller numbers of tougher competitors and independent suppliers and the potential for taking advantage of complementary comparative advantages among enterprises or economies involved in the value chain. Thereby, the global value chains have spread to various industrial sectors, such as automotive, electronic, food and apparel/garment sectors in the region (ESCAP 2007).

A number of enterprises, including SMEs, participate in global value chains, providing services within their expertise and often collaborating with foreign investors through joint ventures, strategic alliances and other partnerships. The enterprises include, among others, suppliers, distributors and business service providers (e.g., third-party logistics providers, financial institutions and market research firms). Value chains are normally coordinated by a leading enterprise, typically a transnational corporation (TNC), which possesses power through control of business factors, such as: brand recognition, indigenous knowledge and technology, production assets, distribution channels and control over critical inputs (see Figure 1). Since the end of the 1980s, TNCs have invested in the Asia-Pacific region setting up their value chains and building on national export-oriented development strategies matched with the increasing global demands.

Figure 1: A simplified global or regional value chain

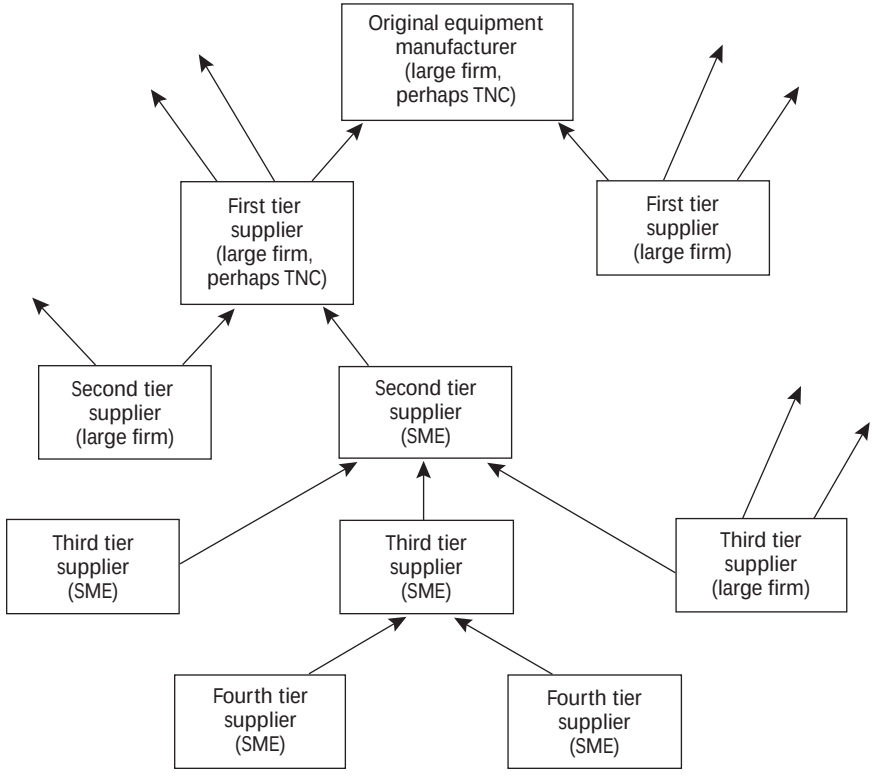


Source: ESCAP (2007).

Global value chains have changed the traditional mode of competition among enterprises that was based on low costs and prices although these factors are continuously important in business-to-business relationships. The new competition is no longer taking place among individual enterprises but rather among global or regional value chains, based on the efficiency of their entire production and distribution networks. Such competition now depends on a wider range of determinants in both export and domestic markets, such as brand power, the capacity to meet a variety of stringent global product and process standards, the level of flexibility and rate of innovation, the speed of design and extent of differentiation, the degree of reliability and level of timeliness and the extent and quality of networks with both horizontally

and vertically linked enterprises.[4] Although many Asian and Pacific enterprises have participated in various global value chains, only a small number of them, mainly in East and North-East Asia, actually control the value chains as leading enterprises; the majority of participating enterprises, typically SMEs, are minor members within the value chains (ESCAP 2009a). As previously mentioned, a transnational corporation usually assumes the role of the lead firm in the global value chain. This lead firm is supported by numerous smaller enterprises, which are categorized as higher and lower tier suppliers of inputs. The higher the tier, the more value is added by the supplying enterprise and thus, the SMEs in the lower tier category contribute rather simple outputs and add less value (ESCAP 2007).

Figure 2: How do SMEs fit into global value chains



Source: United Nations Industrial Development Organization, *Integrating SMEs in Global Value Chains. Towards Partnership for Development*, 2001, p. 60.

[4] See also World Bank,and IFC. *Doing Business 2011: Making a Difference for Entrepreneurs.* Washington, D.C.: IBRD, 2010.

While the development of global and regional value chains in Asia and the Pacific has provided unprecedented business opportunities to export-oriented SMEs and its supporting industry, including those in South Asia, they are facing the challenge of tier mobility. Ideally, SMEs would access the global value chain in the capacity of a higher tier supplier, as the lower tiers are characterized by unstable conditions and one SME could be easily replaced by another. Alternatively, if direct access to a higher tier is not possible, it would be important for the SMEs to have the chance to move up in the global value chain and become a provider of higher value (ESCAP 2007).

The emergence of global value chains emphasized the need for a new technical assistance programme on SME development, particularly in South Asia. Having recognized greatly diversified economic status and conditions, as well as different natural endowments among the countries of that subregion, the one-size-tailored approach may not be workable with all participating countries. However, value chain analysis, with a special emphasis on trans-border issues and a focus on specific sectors and products can effectively address the six key success factors, identified earlier in the chapter. This was done in various sector studies undertaken under the present project in the three participating countries: Bangladesh, Nepal and Sri Lanka.

1.4. Structure of the publication

The publication is comprised of four research studies – three national studies on Bangladesh, Nepal and Sri Lanka, found in the annex and a synthesis of these studies. Chapter 1 identifies the need for the global value chain analysis, giving specific examples of technical cooperation between selected donor partners and SMEs in these countries. Chapter 2 presents the background information related to the three countries' selected products; the synthesis, summarizing the major points and findings of the national studies; and a proposed subregional action plan that includes measures and tools, enhancing South Asian SMEs' integration in global and regional markets. Chapter 3 concludes the publication providing the direction for research and technical assistance activities in South Asia.

The national study on Bangladesh in Annex I is focused on consumer and industrial plastic product sector, while Annex II covers agro-based industry, particularly coffee and ginger products sectors in Nepal. Annex III covers two industrial sectors in Sri Lanka, namely industrial rubber and electronic goods. The national studies offer action plans for various stakeholders in their respective countries to improve business environment for promoting export-oriented SMEs.

Chapter 2

PROSPECTS OF SELECTED SMES' INTEGRATION IN GLOBAL VALUE CHAINS: A Synthesis of Country Studies on Bangladesh, Nepal and Sri Lanka

Most of the South Asian countries have significantly improved their economic growth rates, with five to six per cent average annual growth during the last decade of earlier century and first decade of this new millennium (ESCAP 2009c). South Asian countries, perhaps with the exception of Nepal, have improved their trade performance, particularly exports, and have been successful in integrating their economies in the regional and global markets. Growing intraregional trade and further enacting trade and investment liberalization measures, new prospects for cross-country industrial linkages within emerging international production networks are providing new impetus to establishment of regional value chains. Such regional value chains, as well as individual enterprises in selected South Asian countries, are also establishing networks in global value chains.

While most enterprises and policymakers in South Asian countries have yet to fully understand certain basic fundamentals of conducting international trade, there is also a growing need for them to be more familiar with the emerging realities of modern business practices and trade transaction procedures as well as realize that higher productivity, better technological capability and time-bound delivery of products and services are the basic tenets of international business. Furthermore, disintegration of production process, either on vertical or horizontal lines, is giving rise to new prospects for enterprises to enter global and regional value chains. In this way, SMEs in South Asia have growing opportunities to form an integral part in value chains – regional or global (UNIDO 2004).

In this chapter, the prospects for promoting value chains for selected sectors and products are analyzed and critical constraints in enhancing value added are identified. The analysis is focused on strengthening the value added in sectors and products domestically, while adopting value chain approach and looking into regional and international perspectives. To address constraints and find opportunities in value chains for the products, it is essential to be a familiar with the prevailing national economic conditions. Therefore, the chapter starts by reviewing socio-economic trends in Bangladesh, Nepal and Sri Lanka, including the status of SME sectors. Then, a synthesis of the three country studies, incorporating the major suggestions evolved

at national and subregional workshops under the project, is presented.[5] Finally, a subregional action programme is proposed to promote sectoral value chains for SMEs in Bangladesh, Nepal and Sri Lanka

2.1. Summary of economic conditions in Bangladesh, Nepal and Sri Lanka and the status of SME sector

Bangladesh, Nepal and Sri Lanka are at different levels of development. Sri Lanka is well ahead of two other countries. Bangladesh and Nepal are categorized as least developed countries, while Sri Lanka is in a category of lower middle-income developing countries. As indicated in Table 1, of the three countries, Sri Lanka has the highest per capita income of $2,290 (or $5,098 in purchasing power parity). The per capita incomes of Bangladesh and Nepal are $640 (or $1,677 in purchasing power parity) and $490 (or $1,255 in purchasing power parity), respectively. In terms of the average growth rate of GDP (in ordinal term) from 2006 to 2010, Bangladesh (6.1 per cent) closely follows Sri Lanka (6.4 per cent), while Nepal shows the lowest rate (4.4 per cent).

Table 1: Macroeconomic indicators

Indicators	Bangladesh	Nepal	Sri Lanka
GDP growth rate (2006-2010)	6.1	4.4	6.4
Per capita GDP at current purchasing power parity (2010) – (in US$)	1 677	1 255	5 098
Per capita GNI at current US$	640	490	2 290
Share of agriculture (2010) – as per cent of GDP	18.8	35	12.8
Share of industry (2010) – as per cent of GDP	28.5	15	29.4
Share of services GDP (2010) – as per cent of GDP	52.6	50.1	57.8
Exports of goods and services (2010) – as per cent of GDP	18.5	9.8	21.7

Source: ADB (2011).

The level of development of these countries is also reflected in their respective shares in agriculture, industry and services as a percentage of GDP – the share of the agricultural sector being the greatest for Nepal (35 per cent) and the lowest for Sri Lanka (12.8 per cent), while Bangladesh is occupying the middle position with 18.8 per cent. As for the industry sector, Sri Lanka has the highest share of 29.4 per cent of GDP, followed by Bangladesh with its 28.5 per cent and Nepal with its 15 per cent. Sri Lanka has the largest share in services sector (57.8 per cent of GDP), whereas Bangladesh and Nepal show 52.6 per cent and 50.1 per cent of GDP, respectively. In terms of exports contributing to higher growth rates, it is noted that exports as per cent of GDP is higher for the countries having higher GDP growth rates and higher per capita income. For example Sri Lanka having the highest GDP growth rate also has the highest exports at

[5] See "Methodology" section in Chapter 1 for the information on national and subregional workshops.

21.7 per cent of GDP, while Bangladesh exports occupy the middle position with 18.5 per cent of GDP and Nepal exports lag behind with just 9.8 per cent of GDP.

While reviewing the economic conditions and SMEs prospects in the value chain process, one should look into poverty level and human development status so that the potentiality of SME sector contributing to high growth and poverty reduction is clearly realized. In terms of poverty and human development indicators, Sri Lanka is clearly the most advanced among the three countries in all categories (Table 2). Human Development Index (HDI) ranking, adult literacy rate, life expectancy at birth and the population living below two dollars a day indicators are all better in Sri Lanka. Broadly these indicators not only point out the ways for improving competitiveness but also suggest the absorption capacity of the economies. Population living below the level of two dollars a day indicator could also be a sign for the need to address employment based on less capital-intensive programmes in devising a strategy emphasizing the need for SME development. From this perspective, Bangladesh and Nepal call for more employment generating development programmes in which SME sector should be accorded a higher priority.

Table 2: Poverty and human development indicators

Indicators	Bangladesh	Nepal	Sri Lanka
Human development index (HDI) – 2010	0.469	0.428	0.658
HDI rankings – 2010 (out of 169 countries)	129	138	91
Adult literacy rate (15 years old and above) – 2009 (in per cent)	55.9	59.1	90.6 (2008)
Life expectancy at birth – 2009 (in years)	66.6	67.1	74.3
Population (million)	146.2	28.3	20.7
Population growth rate	1.3	2.2	1.0
Population below two dollars purchasing power parity per day – in per cent	81.3 (2005)	77.6 (2004)	29.1 (2007)

Source: ADB (2011).

2.1.1. COMPETITIVENESS AND BUSINESS ENVIRONMENT

Given the strategy of private sector led development in the countries under the study it is also necessary to assess their prospects for competitiveness and ease of doing business.

First, with the three countries being at different levels of economic development, their capabilities are reflected in the global competitiveness index (GCI) (Table 3). All the three countries are in the stage 1 category wherein competitiveness is very low and the economy is more factor-driven. Even so, they display a large variation of factors with Sri Lanka having a 62nd ranking among 139 countries while Bangladesh and Nepal are lagging behind having 107th and 130th rankings respectively. These differences will affect the ways by which the competitiveness of the economy, including that of SMEs, is improved and the possibility of SMEs integration in global value chains.

Table 3: Global Competitiveness Index (GCI) 2010-2011

	Bangladesh	Nepal	Sri Lanka
Global Competitiveness Index – 2009-10	3.64 (107th out of 139 countries)	3.34 (130th out of 139 countries)	4.25 (62nd out of 139 countries)
Basic requirement sub index 2009-10	3.71 (114th)	3.52 (125th)	4.42 (73rd)
Efficiency enhancers sub index 2009-10	3.62 (97th)	3.14 (131st)	4.01 (69th)
Innovation factors sub index 2009-10	3.01 (109th)	2.67 (133rd)	3.97 (40th)
Components of basic requirement sub index:			
Institutions	3.24 (115th)	3.03 (130th)	4.06 (55th)
Infrastructures	2.15 (133rd)	1.81 (139th)	3.82 (70th)
Macroeconomic stability	4.49 (80th)	4.41 (86th)	3.60 (124th)
Health and primary education	4.96 (106th)	4.81 (109th)	6.18 (35th)

Source: WEF (2011).

When GCI is decomposed into basic requirements, efficiency enhancers and innovation factors, Sri Lanka shows the prospect for innovation-driven competitive strength, which can be observed in its country study on rubber products sector and more explicitly in its electronic industry. The emphasis on new high value product lines also indicates the trend. Bangladesh looks to be moving towards the efficiency-driven category in which more efficient production processes and increases in quality are relied upon. Nepal looks like a factor-driven economy when a country relies more on its factor endowments – primarily unskilled low-cost labour and natural resources, thus demonstrating dependence on the agriculture sector.

Further decomposition of basic requirement index into two of its four major sub-components (i.e., institutional capacity and infrastructures) shows that Bangladesh and Nepal have severe limitations in these two components to be competitive enough – while Sri Lanka is in a better position. The country studies on Bangladesh and Nepal and their interactions at national workshops had emphasized the need for infrastructure development – particularly electric power and gas lines in Bangladesh and rural roads in Nepal. While Sri Lanka shows the highest ranking in health and primary education among the three countries, Bangladesh and Nepal demonstrate better rankings in macroeconomic stability.

Second, business environment is closely related to the overall development level in these countries. SMEs need to have enabling operational environment, including reasonable legal and institutional frameworks, stable macroeconomic policies and adequate infrastructures. The World Bank's Ease of Doing Business Index focuses on nine topics that aim to measure the regulation and red tape relevant to the life cycle of domestic SMEs. As such, a nation's ranking is based on the average of the following nine sub-indices: starting a business, dealing with construction permits, registering

property, getting credit, protecting investors, paying taxes, trading across border, enforcing contracts and closing a business. The rankings of its various components and values of their sub-indices reflect how enabling and friendly the conditions are for SMEs to operate in these countries.

In so far as ease of doing business is concerned, the three countries show once again similar patterns with Sri Lanka ranked as 102nd out of 183 countries followed by Bangladesh with its 107th ranking and Nepal occupying the 116th position (Table 4). As for some of indicators on the ease of doing business, such as starting a business sub-index, both Bangladesh and Nepal are far behind Sri Lanka – Sri Lanka is ranked 34th while Bangladesh and Nepal are in the 79th and 96th positions, respectively. One of its sub-components, cost of starting a business (as a per cent of income per capita) is also the highest in Nepal – 46.6 per cent of the per capita income, while Bangladesh and Sri Lanka registered at 33.3 per cent and 5.4 per cent of the per capita incomes, respectively. High initial cost generally comes as a discouraging factor to potential investors.

Table 4: Rankings on the ease of doing business 2010

	Bangladesh	Nepal	Sri Lanka
Ease of doing business (rank)	**107**	**116**	**102**
Starting a business (rank)	**79**	**96**	**34**
Procedures (number)	7	7	4
Time (days)	19	31	35
Cost (per cent of income per capita)	33.3	46.6	5.4
Minimum capital (per cent of per capita)	0.0	0.0	0.0
Dealing with construction permits (rank)	116	130	169
Procedures (number)	14	15	22
Time (days)	231	424	214
Cost (per cent of income per capita)	194	100.2	51.1
Registering property (rank)	**172**	**25**	**155**
Procedures (number)	8	3	8
Time (days)	245	5	83
Cost (per cent of property value)	6.6	4.8	5.1
Getting credit (rank)	**72**	**89**	**72**
Strength of legal rights index (0-10)	7	6	4
Depth of credit information index (0-6)	2	2	5
Public registry coverage (per cent of adults)	0.6	0.0	0.0
Private bureau coverage (per cent of adults)	0.0	0.3	18.6
Protecting investors (rank)	**20**	**74**	**74**
Extent of disclosure index (0-10)	6	6	4
Extent of director liability index (0-10)	7	1	5
Ease of shareholder suits index (0-10)	7	9	7
Strength of investor protection index (0-10)	6.7	5.3	5.3

Table 4: *(continued)*

	Bangladesh	Nepal	Sri Lanka
Paying taxes (rank)	**93**	**123**	**166**
Payments (number per year)	21	34	62
Time (hours per year)	302	338	256
Total tax rate (per cent of profit)	35.0	38.2	64.7
Trading across border (rank)	**112**	**164**	**72**
Documents to export (number)	6	9	8
Time to export (days)	25	41	21
Cost to export (US$ per container)	985	1 960	715
Documents to import (number)	8	10	6
Time to import (days)	31	35	19
Cost to import (US$ per container)	1 390	2 095	745
Enforcing contracts (rank)	**179**	**123**	**137**
Procedures (number)	41	39	40
Time (days)	1 442	735	1 318
Cost (per cent of claim)	63.3	26.8	22.8
Closing a business (rank)	**101**	**107**	**43**
Time (years)	4.0	5.0	1.7
Cost (per cent of estate)	8	9	5
Recovery rate (cents on the dollar)	25.8	24.5	47

Source: World Bank (2011a).

One of the critical issues identified by stakeholders in all the three countries was the inadequate access to institutional credit. In this context, Nepal ranked last among these three countries occupying the 89th position while Bangladesh and Sri Lanka both ranked at 72nd. The countries under consideration have particularly low value on the index on depth of credit information.

Trading across border is another important indicator affecting trade potentialities of countries, and in this respect Sri Lanka is ahead with the 72nd ranking, followed by Bangladesh with the 112th and Nepal, a landlocked country, with the 164th ranking, respectively. However, the rankings of Sri Lanka and Bangladesh change when they are viewed from the overall trade facilitation services perspective, as reflected in the Logistics Performance Index (LPI)[6] (Table 5). Besides the availability of infrastructure, it also takes into consideration the quality and cost of logistics services.

[6] Logistics Performance Index (LPI) reflects the overall perception of a country's logistics environment based on 1,000 responses to a survey of logistics performances evaluated on six key criteria – efficiency of customs clearance, quality of transport and transport related infrastructure, ease of arranging competitively priced shipments, quality of logistics services and tracking ability and timeliness of shipments. It thus combines availability of physical infrastructure with their quality and cost.

From this perspective, Bangladesh tops the list followed by Sri Lanka and Nepal, which is understandable with both countries having geographical disadvantages, one as an island country and another as a landlocked country. Nepal comes at the top in the ranking among the three countries in one of its sub-components on domestic transportation costs as a proxy in the diesel price.

Table 5: Logistics Performance Index (LPI) and some of its sub-components related to infrastructures (2006-2009)

	Overall	Quality of transport and IT infra-structures	Logistics competence	Domestic trans-portation costs	Inter-national transport costs
South Asia (trade weighted average)	2.99 (61.1)	2.74 (62.4)	2.96 (57.7)	3.06 (50.6)	3.06 (53.5)
Bangladesh	2.74 (80th)	2.49 (74th)	2.44 (100th)	3.08 (46th)	2.99 (62nd)
Sri Lanka	2.29 (142nd)	1.88 (145th)	2.09 (149th)	3.08 (46th)	2.48 (123rd)
Nepal	2.20 (155th)	1.80 (151st)	2.07 (151st)	3.25 (20th)	2.21 (150th)

Source: World Bank (2010).
Note: This survey covered 211 countries (1 to 5, best). Figures within brackets indicate the country rankings.

Finally, it is noteworthy that the three countries have relatively high rankings in some key factors of the ease of doing business. These include protecting investors for Bangladesh (20th), registering property for Nepal (25th) and closing a business for Sri Lanka (43rd).

2.1.2. TRADE AND INVESTMENT SITUATION

As stated earlier, trade and investment have been the driving forces for steady economic growth in most of South Asian countries. These countries, typically, have increased export competitiveness and have attracted large inflows of FDI, creating better business opportunities for local SMEs and additional employment.

Table 6 presents information on the top 10 export goods of the three South Asian countries. The results of the main export goods indicate two types of export goods portfolios based on different levels of development and supply-side capacity of the countries. The two types of export goods portfolios include: (a) natural endowment driven export (e.g., agro-products and minerals); and (b) light manufacturing export (e.g., textiles, garments and footwear). Within this classification, Nepal belongs to the natural endowment driven export type, while Bangladesh and Sri Lanka are light manufacturing export type countries. It is noteworthy, however, that Sri Lanka has started exporting value added manufacturing goods, such as electronic equipments and parts as well as machineries, indicating its ongoing transition to an exporting country of advanced manufacturing goods.

Table 6: Top 10 export goods of the three South Asian countries by the two digits, 2010

Ranking	Bangladesh	Nepal	Sri Lanka
1	Articles of apparel, accessories, knit or crochet	Iron and steel	Articles of apparel, accessories, knit or crochet
2	Articles of apparel, accessories, not knit or crochet	Manmade filaments	Articles of apparel, accessories, not knit or crochet
3	Other made textile articles, sets, worn clothing, etc.	Carpets and other textile floor coverings	Coffee, tea, mate and spices
4	Fish, crustaceans, mollusks, aquatic invertebrates	Articles of apparel, accessories, not knit or crochet	Rubber and articles thereof
5	Vegetable textile fibres, paper yarn, woven fabric	Manmade staple fibres	Pearls, precious stones, metals, coins, etc.
6	Footwear, gaiters and the like, parts thereof	Edible vegetables and certain roots and tubers	Electrical, electronic equipment
7	Raw hides and skins (other than furskins) and leather	Other made textile articles, sets, worn clothing etc.	Fish, crustaceans, molluscs, aquatic invertebrates
8	Headgear and parts thereof	Coffee, tea, mate and spices	Mineral fuels, oils, distillation products, etc.
9	Mineral fuels, oil, distillation products, etc.	Articles of iron or steel	Milling products, malt, starches, inulin, wheat gluten
10	Tobacco and manufactured tobacco substitutes	Copper and articles thereof	Vegetable textile fibres, paper yarn, woven fabric

Source: ITC (2010).

One interesting phenomenon that deserves further enquiry is the level of FDI inflows in the three countries. FDI is a critical force in the promotion of global and regional integration of economies and industrial activities (Dhungana 2009). Although Bangladesh and Nepal stand close to each other in terms of global rankings of competitiveness and business enabling conditions, Bangladesh has over-performed Nepal (and even Sri Lanka recently) in attracting FDI. One visible reason for this phenomenon is the security factor, as the political volatility in Nepal is creating the unsafe environment and leading to lagging investment and slow policy reforms, particularly related to the manufacturing sector. Bangladesh has lately been experiencing an encouraging inflow of FDI resulting in a FDI inward stock level exceeding that of Sri Lanka. Sri Lanka surpasses the other two countries in the FDI inward stock level as a percentage of GDP (see table 7 for details).

Table 7: Inflow and stock of inward foreign direct investment (FDI) (in million US dollars)

	Bangladesh			Nepal			Sri Lanka		
	2008	**2009**	**2010**	**2008**	**2009**	**2010**	**2008**	**2009**	**2010**
FDI inflows	1 086	700	913	1	39	39	752	404	478
FDI inflows as per cent of gross fixed capital formation	5.6	3.2	3.7	0	1.4	1.0	7.3	4.3	4.0
	1990	**2000**	**2010**	**1990**	**2000**	**2010**	**1990**	**2000**	**2010**
FDI inward stock	478	2 162	6 072	12	72	205	679	1 596	5 008
FDI inward stock as per cent of GDP	1.7	4.8	6.1	0.3	1.3	1.3	8.3	9.5	9.9

Source: UNCTAD (2011).

2.1.3. STATUS OF THE SME SECTOR

Finally, the status of the SME sector in the three South Asian countries is briefly reviewed. Table 8 summarizes operational definitions of SMEs used in the three countries. Researchers generally used these SME definitions for commercial entities with less than 100 employees in Bangladesh, less than 200 employees in Nepal and less than 150 employees in Sri Lanka, although the countries also set such definitions based on the size of investment.[7] The definitions of what constitutes an SME vary quite widely from country to country in Asia and the Pacific (ESCAP 2009b). Both the number of employees and the size of investment are mainly used for such national definitions, and some countries also set separate definitions among different SME segments, such as manufacturing and services. Developing countries in Asia and the Pacific typically define SMEs, including micro enterprises, as commercial entities with less than 100-200 employees, which is in line with the definitions adopted in Bangladesh, Nepal and Sri Lanka.

Table 8: Operational definitions of SMEs in literature

Bangladesh	Nepal	Sri Lanka
Less than 100 employees	Less than 200 employees	Less than 150 employees

Sources: APO (2007); CDR (2006).
Note: Micro enterprises are included.

[7] Research literatures, which aim to compare the status of the SME sector among various countries, mainly use the number of employees to define SMEs to avoid cumbersome calculation for foreign exchange rates among different currencies (cf., AAMO 2007).

It is, however, useful to distinguish between micro enterprises operating in the informal sector and small enterprises in the formal sector – particularly in the context of their access to financing. Microcredit programmes often address the collateral free credit needs of micro enterprises in the informal sector, while small enterprises without the adequate collateral base are the ones suffering from the limited access to collateral free credit, as many financial programmes facilitating access to credit through commercial banks have been unsuccessful because of high operation costs (i.e., high transaction costs) dealing with a large number of small enterprises.

Over the years, SMEs have made significant contributions to the economic development of Asia and the Pacific countries, including Bangladesh, Nepal, and Sri Lanka (AAMO 2007). The SME sector in developing countries of Asia and the Pacific generally:

(a) Makes up more than 90 per cent of all enterprises;
(b) Provides over 60 per cent of jobs in the private sector;
(c) Generates over 30-40 per cent of total employment;
(d) Contributes approximately 50 per cent of sales or value added; and
(e) Generates approximately 30 per cent of total direct exports.

Table 9 illustrates economic contribution of the SME sector in Bangladesh, Nepal and Sri Lanka. SMEs dominated the business community making up more than 95 per cent of all enterprises in the three countries. Also, SMEs created the majority of employment opportunities with more than 80 per cent of private sector jobs in both Bangladesh and Nepal, while 56 per cent of employment depended on SMEs in Sri Lanka. SMEs percentage share in GDP, value added and export in the total output in these countries were also significant.

Table 9: Contributions of SMEs (2001-2003)

SMEs' Share (per cent)	Bangladesh	Nepal	Sri Lanka
Total number of enterprises	98	95	96
Total employment	82	85	56
GDP/Value Added/Export	5 per cent of GDP	90 per cent of export	20 per cent of value added

Sources: AAMO (2007); APO (2007); CDR (2006).

2.2. Synthesis of country studies with a synopsis of main findings

As the project's objective was to identify potential export products and conduct thorough studies on prospects for integration into the value chain process, ESCAP had established regular contacts with the Governments in participating countries. National steering committees were established with representatives of producers, exporters, government officials and business associations members. Senior government officials chaired the steering committees and acted as focal points. National research teams,

coming from leading research institutions, were formed to conduct national studies in the participating countries. Products for national study projects were selected on the basis of the following criteria:

(a) Export potential;
(b) Value added ;
(c) Job creation potential;
(d) Support function in other industrial sectors;
(e) Level of maturity;
(f) Impact on gender empowerment;
(g) Supply-side capacity (e.g., product development and international standards and certificates);
(h) Strategic geographical focus;
(i) Environmental sustainability;
(j) Government identified priority area; and
(k) Government's need for a national action/business plan for future development.

The studies took note of the regional and international trade arrangements relevant to the products selected and the possibility of responding to constraints through appropriate reform measures.

After careful consideration and consultations with government officials and business associations, Bangladesh identified one product, while the other two countries chose two products each. Steering committee in each of the countries facilitated the process based on recommendations made by national research team. As a result, plastic industry product lines were selected in Bangladesh, while agro-industry (ginger and coffee) was chosen for Nepal. Industrial rubber products and electronic/electrics goods were identified for Sri Lanka.

During the preparation of the studies, a comprehensive review of existing government policies and programmes, as well as a review of earlier studies were undertaken. Documents on the products under consideration included the analysis of sectoral/product value chains and SWOT analysis for all three countries. Structured interviews and field visits were undertaken. Focus group discussions were also conducted with farmers and traders in Bangladesh and Nepal.

Draft studies were intensively discussed at national workshops organized in Colombo, Dhaka and Kathmandu attended by policymakers and private sector representatives, including product specific stakeholders. Subsequently, revised studies were presented at a subregional workshop held in Colombo with participation from representatives of the governments and the private sector from participating countries, and international organizations, such as ADB and UNIDO. The recommendations of the subregional workshop were incorporated into the final studies, particularly focusing on the programmes for further subregional actions. One of the major limitations of the

Table 10: Comparison of three country studies on value chain analysis

	Bangladesh	Nepal		Sri Lanka	
	Plastic products	**Coffee**	**Ginger**	**Natural rubber and rubber products**	**Electronics**
Product type	Finished industrial	Agro-processed – high quality coffee	Mostly raw and negligible in semi processed agricultural	Finished industrial	Parts and finished industrial
Market type	Domestic and export	Domestic and export	Export	Domestic and Export	Domestic and Export
Government policy	Not first priority product for export; lower custom duty on pharmaceutical grade plastic raw materials	Priority products for export included in Trade Policy 2009: interest subsidy and subsidy on the cost of machinery equipments	Priority products for export included in Trade Policy 2009: subsidy on the cost of machinery equipments	No export restrictions and licensing requirements	Promotion of more diversified export oriented industries
Sources of raw materials	Domestic and imported	Domestic	Domestic	Not applicable for raw rubber. For rubber products both domestic and imported	Mainly import. Support to global value chain in the electronic industry under contract arrangement
Major raw materials	Granules and additives	Suitable land area, seeds and manures	Suitable land area, seeds and manures	Seed and fertilizer	Electronic components, plastic enclosures, metal fabricators and chemicals
Sources of machinery	Largely imported (first and second hands); some domestic moulds; use of semi automated injection and blow machines; automated ones in the large factories.	Not applicable	Not applicable		Plant and machinery all imported
Production level (MT)	12,761 MT (2007/2008)	270 MT (dry cherry) (2008)	16,1171 MT (2008)	129,243 MT (2008)	

Table 10: *(continued)*

	Bangladesh	Nepal		Sri Lanka	
	Plastic products	**Coffee**	**Ginger**	**Natural rubber and rubber products**	**Electronics**
Production level (in US$)	714 million for domestic market and 234 million for the export market (2006/ 2007)				
Growth rate of production (MT)	14.4 per cent	Started from low base	From 865,000 MT in 1998 to 1,387,000 in 2007	36 per cent (2004 -2008)	
Growth rate of production (US$)	10.0 per cent	Started from low base			
No. of manufacturing units/producers	About 3,000 units	Farming house holds involved: 750 coffee growers' groups	Farming house holds involved; farmers not so well organized; only few districts having farmers' groups	529 manufacturers	171 units involved in export of electronics
No. of employees	One to two million people	20,000 farmers affiliated with Federation (460,000 up to the level of farmers)	66,600	200,000 with 34,000 directly in the industry.	10,000 workers in exporting manufacturing units
Type of labour force	Unskilled and semi skilled: some in-house trained in large factories	Unskilled	Unskilled	Unskilled and skilled	Skilled
Sales in domestic market (US$)	714 million	35 per cent of production sold in domestic market	40 per cent sold in domestic market	62 per cent of natural rubber used in manufacturing industry	

Table 10: *(continued)*

	Bangladesh	Nepal		Sri Lanka	
	Plastic products	**Coffee**	**Ginger**	**Natural rubber and rubber products**	**Electronics**
Sales in export market (US$)	234 million by large manufacturers only; SMEs for domestic market only	65 per cent of production sold in export market; 112,000 kg valued at NRs. 107 million	Fourth largest exporting county in the world; export to India amounting to NRs. 403 million in 2008/2009	USD 543 million in 2008; 38 per cent of natural rubber products exported in raw form	USD 48.9 million; mainly in the form of components to the branded products abroad
Major export market (countries)	China, India, United States, United Kingdom, United Arab Emirates, Germany, Malaysia	Japan, Germany, Canada, some to United States and United Kingdom.	India	Pakistan, European Union, India, Japan, United States, Hong Kong, China	To major electronic hubs of the world
Major export market in SAARC countries	India, Sri Lanka, Nepal		India	Pakistan and India	
Any preferential treatment?	No		Preferential treatment in India; somewhat less in Pakistan; duty free access in other countries.		
Production process	• Imported granules and additives • Collection and recycled waste materials • Moulding – injection, extrusion and blow • Moulds – locally produced (of low quality) and imported (of better quality) • Polishing of finished products	• Planting, growing and harvesting • Picking cherry • Initial processing – dry or wet processing, roasting, grinding and packaging • Export or distribution in domestic market	• Planting and harvesting • Cleaning ginger • Storing without sorting and grading for quality • Grading done at the district level • Collection in Nepal. • Wholesales and retail sales in India	• Plantation and collection of field latex and field coagulum • Conversion to raw rubber and concentrated latex by rubber manufacturers/ compound manufacturers	• Component manufacturing for the branded products

Table 10: *(continued)*

	Bangladesh	Nepal		Sri Lanka	
	Plastic products	**Coffee**	**Ginger**	**Natural rubber and rubber products**	**Electronics**
Marketing linkages	• Makes products for contractor under contractual arrangement • Obtains raw materials also from contractor • Sales and marketing department under own account production • Virgin resin importers organized into one association	• Supplied to intermediary for export • Shipping to importing countries • Importers pass the beans to roasters for retail sales	• Local traders collect and transfer to district level traders and wholesalers • Link to terminal market of India through commission agents	• Domestic sale through agents/dealers • Exports through wholesalers • Export sale by auctioning • International brands operating from the country	• Access to international market through contract manufacturers
Major issues in production	• Delay and hassles at the port while importing • Inefficient services of pre-shipment inspection • Poor collection and recycling methods • No impact/load testing particularly for SMEs • No training facilities: only apprenticeship • High turnover of skilled workforce	• Problems with quality – humidity, black and broken beans, and impurities • Ad-hoc and sporadic coffee cultivation without being quality conscious • Unskilled and untrained labour force • Absence of proper storage • No institutional mechanism for technical support	• Scientific method of cultivation not followed • Inadequate post-harvest management • No good storage for fresh ginger even at the wholesale level • No processing units • Grading and modern packaging methods not practiced • Low quality with high fiber content • Traditional method of drying not suitable for industrial uses	• Lacks expertise on product and compound development • No central rubber/ polymer based product and process testing facilities • Low average days of rubber tapping due to rain	• No own design and brand products • Need for development of die and mould design capability • Insufficient engineers and skilled labours

Table 10: *(continued)*

	Bangladesh	Nepal		Sri Lanka	
	Plastic products	**Coffee**	**Ginger**	**Natural rubber and rubber products**	**Electronics**
	• Life of the machine; inadequate servicing facilities for SMEs and semi-automated machine demanding technology upgradation • Low quality moulds for SMEs • Limited access to institutional credit for SMEs • Poor electricity supply • Poor gas supply • Unclear long term government policy preventing large scale investment	• Inadequate access to institutional credit • Inadequate automation for pulping, washing and drying	• Farmers unaware of processing technology and secondary products of ginger • Market information not available to the farmers		
Major issues in marketing and export for SMEs	• No branded products and poor finishing from SMEs. • No standards to sort plastic wastes; thus, no export potential • Poor quality recycled raw materials • Large producers leading the market	• Problem with quality certification and organic certificate for each of the production steps; high cost of certification abroad. • No market intelligence • No quality and market regulations – no cup testing laboratory	• Inadequate quarantine centres • Imposition of sanitary standards in India • High commission charges by the middlemen due to inadequate market intelligence with the traders	• Potential for new rubber products	• Low value addition as the marketing dominated by brand owners and/or technology leaders

Table 10: *(continued)*

	Bangladesh	Nepal		Sri Lanka	
	Plastic products	**Coffee**	**Ginger**	**Natural rubber and rubber products**	**Electronics**
	• SMEs having less bargaining power against wholesalers • Inadequate laboratory facilities and skilled labour with testing authority • National budget 2009/10 increased import taxes on intermediate products to 25 per cent; custom duty increased and VAT exemption lifted out for plastic	• Extra transportation cost for export • Branding; barriers for entry			
Prospects for value added	• Improvement in recycling management and improved technology • Need for improved mould making facilities and capacities • Skilled workforce	• Improved farming including intercropping • Standardization of coffee, quality laboratory, certification agencies • Exploring new markets	• Training on farming system • Product diversification • Certification centre • Establishment of new quarantine centres	• Use of rain guards for increasing tapping days • Training on new tapping technology	• Producing more components for electronics • Establishing own brand
Global/regional value chain discussed	Yes No	Yes Yes	Yes Yes	Yes No	Yes No
Any quantitative assessment?					

country studies was their use of secondary sources of information and, therefore, quantitative estimates of value added at every stage in processing and distribution chain could not be properly assessed, except in the Nepalese study on coffee and ginger. A brief summary of findings in the studies is presented in table 10.

Based on the respective outcomes in value chain analyses, national action plans were designed with the goal to improve SME business environments and eventually facilitate the access of SMEs to regional and global markets. Brief summaries of national action plans are presented below.

2.2.1. THE PLASTICS INDUSTRY IN BANGLADESH

Bangladesh attaches significant importance to development of plastic products and aims to meet the growing demand of both domestic and international markets. The country has formulated a vision of achieving a market size of $2 billion by 2015 and $4 billion by 2020 from the level of approximately $1 billion in 2008. In order to achieve these targets and create a value chain in plastic products in Bangladesh, an action plan is proposed to improve the performance at a firm, industry and sector levels. The action plan should include the following activities:

- Establishing national brands;
- Collaborating with the Bangladesh University of Engineering and Technology for technological support for quality testing and technical consulting (as a short-term measure). Creating separate institutional arrangement (in the long run);
- Providing business counseling by the SME Foundation and the Bangladesh Small and Cottage Industries Corporation (BSCIC) with separate specialized units for plastic products;
- Conducting feasibility study of high quality local mould-making centres – two such centres should be immediately established;
- Equipping Bangladesh Standards and Testing Institution with modern amenities for proper standardization measures and strengthening its facilities to outreach the SMEs involved in the plastic sector;
- Simplifying different government processes including certification process;
- Setting-up training facilities for developing human resources in plastic manufacturing, plastic engineering, heat treatment, mould making and design, plastic waste management and recycling;
- Enquiring into the possibility of exporting degradable plastic products to the United States of America and the European Union;
- Supplying new industrial high value added plastic components for computers, electronics, machineries and automobiles;
- Including the plastics sector in the highly prioritized export development sector list by Export Promotion Bureau to ensure easier term loans, income tax holidays and other incentives;

- Developing provision on collateral free loans by according priority to the plastics industry; and
- Conducting awareness campaigns for promoting better collection of waste materials/waste management – piloting in Dhaka and Chittagong areas.

2.2.2. THE AGRO INDUSTRY (COFFEE AND GINGER PRODUCTS) IN NEPAL

In order to address some of the major and critical problems in promoting value added in coffee and ginger production and trade, especially export trade in Nepal, several stakeholder actions are proposed at the national level. The action plan aims at reaching coffee production level at 3,000 MT and coffee export level at four per cent of total exports in Nepal in 10 years. Likewise, with ginger products, the aim is to make ginger export five per cent of Nepal's total export in 10 years by increasing production and diversifying the product and, thus, providing full time employment to 200,000 people in the rural areas. The action plan includes the following:

- Conducting research and development on both coffee and ginger products for improved farming system by establishing coffee and ginger resource centres;
- Conducting training of farmers on improved farming system, processing and storing, and on new appropriate technologies;
- Making small farmers aware of quality standards by developing and maintaining their skills;
- Introducing a certification system, including legal and institutional standards and establishing a national accreditation body for agro-products exploring new markets and meeting sanitary and phyto-sanitary standards;
- Strengthening organic certification system;
- Improving processing and storage system;
- Developing rural roads reaching coffee and ginger production centres;
- Encouraging contract and lease farming;
- Ensuring easy access to institutional credit; and
- Fostering auction market.

2.2.3. THE INDUSTRIAL RUBBER AND ELECTRONIC PRODUCTS SECTORS IN SRI LANKA

The industrial rubber sector in Sri Lanka sets a target of increasing supply of natural rubber by 50 per cent, increasing rubber export by 50 per cent and achieving rubber price sustainability by 2014. In order to achieve these targets, several measures are proposed:

- Increasing plantations in non-traditional cultivation areas and launching new inter-cropping programmes;
- Temporarily allowing the import of raw rubber to stabilize the supply for unmet local demand;

Table 11: Crop specific action plan for Nepal

Coffee	Ginger
Implement Coffee Policy 2003.	Encourage and support exporting semi-processed and processed products.
Form Coffee Development Board.	Establish strategic alliance with ginger traders of the region and promote FDI in ginger processing.
Develop logo and brand name for Nepalese coffee.	Improve warehouse facilities at customs points.
Establish commercial nurseries.	Establish additional quarantine centres at customs points.
Support establishing cup testing laboratory.	Develop ginger collection and processing centres.
Reduce freight using Nepal-Bangladesh land route.	
Introduce new technology for pulping, drying, storage, and roasting.	
Develop preliminary processing platforms (warehouses).	
Introduce levy on export to fund research on coffee.	

- Introducing new tapping techniques – improving timing, using mechanical devices and training unskilled tappers;
- Attracting FDI for high value latex based products;
- Promoting crepe rubber products (food and pharmaceutical grade products);
- Developing skilled workers for rubber production processing and manufacturing of rubber based products;
- Strengthening R and D facilities for innovation in rubber industry;
- Expanding present characterization and physical testing facilities at research institutions/universities and providing services to SMEs;
- Establishing a national accreditation body;
- Forming a central rubber recycling unit; and
- Encouraging long-term purchase agreements with importers from major importing countries

Sri Lanka aims at creating its own brands in electronic products by expanding its export markets to neighbouring countries, such as SAARC and ASEAN countries and achieving at least 0.1 per cent of the global market share (equivalent to $2 billion) by 2020. For moving towards this direction the following actions are proposed:

- Attracting FDI for commencing production of basic raw materials (e.g., silicon, gallium, etc.), discrete semiconductors, integrated circuits, electronic components and/or consumer electronics;
- Promoting electronic technology parks;
- Preparing industry for environmental conservation (e.g., lead free soldering);
- Establishing Sri Lankan brands promoting design and manufacture of electronic components for niche markets;
- Establishing design service providers in electronic circuits, die, mould and rapid prototyping; and
- Promoting Sri Lanka as a suitable destination for own design manufacturing in addition to contract manufacturing.

2.3. Subregional Action Programme facilitating SMEs integration in global value chains and the lessons learned for development agencies

This section proposes a subregional action programme, which was designed based on critical areas for action identified by national studies and recommendation and through interactions in national and subregional workshops. Broadly, the programme is categorized as follows: (a) actions based on policy reforming and lobbying carrying no financial implications; (b) actions requiring considerable financial investment in capacity-building, planning, establishing certification/quarantine/accreditation bodies. The activities are outlined in the form of a matrix and are presented in table 12.

In addition, some specific activities under the subregional programme are proposed for immediate action by multilateral development bodies to include:

- Reviewing SMEs and activities for strengthening SMEs, recommending specific actions in relation to (a) enhancing collateral free access to institutional credit, (b) determining value added in products under consideration, (c) improving SMEs business environment, (d) providing business and innovation incubation services and (e) understanding SME trade facilitation and critical infrastructure needs;
- Establishing South Asian Accreditation Council;
- Establishing regional laboratory testing facilities, quarantine centres, and certification bodies;
- Strengthening market information dissemination and the use of ICT down to farmers' groups through the United Nations specialized regional centres;
- Training on die and mould making and promoting subregional cooperation between Sri Lanka and Bangladesh in the field of technology transfer through some regional arrangement;
- Promoting subregional trade in ginger and related products – trade facilitation measures to enhance ginger trade in other South Asian countries;

Table 12: Subregional action plan facilitating SMEs' integration in global value chains

Areas of intervention	Bangladesh	Nepal		Sri Lanka	
	Plastics	Coffee	Ginger	Rubber	Electronics
Policy	• Plastics to be included as high priority export product in the policy documents • Collateral free access to institutional credit	• Collateral free access to institutional credit • Tax subsidy on the import of machinery	• Collateral free access to institutional credit	• Collateral free access to institutional credit	• Policy recognition to provide state support to introducing and achieving brand image
Lobbying/ coordinating infrastructure development	• Lobbying for providing efficient power generation		• Lobbying for Nepal – Bangladesh land route	• Lobbying for FDI for latex based products	• Lobbying for FDI for basic raw materials for electronics • Promoting technology parks
Capacity-building	• Review of SME status to develop concrete proposal on strengthening SMEs, including entrepreneurial culture • Training on improved recycling management • Apprenticeship training to unskilled workers	• Review of SME status to develop concrete proposal on strengthening SMEs, including entrepreneurial culture and business incubation • Training of farmers and workers in product processing	• Review of SME status to develop concrete proposal on strengthening SMEs, including entrepreneurial culture and business incubation • Training of farmers	• Review of SME status to develop concrete proposal on strengthening SMEs, including entrepreneurial culture and business incubation • Training of workers	• Review of SME status to develop concrete proposal on strengthening SMEs, including entrepreneurial culture and business incubation

Table 12: *(continued)*

Areas of intervention	Bangladesh	Nepal		Sri Lanka	
	Plastics	**Coffee**	**Ginger**	**Rubber**	**Electronics**
Standards/ certification/ accreditation centres/brand development	• Strengthening BSTI with quality testing facilities	• Introducingnational standards and certification system	• Additional quarantine centres at customs points	• Establishing an accreditation body • Expanding current facilities of physical testing	• Planning action plan for obtaining own brand for electronic products
Improvement in production and marketing processes	• Establishing mould manufacturing centres • Improving collection and management of waste materials	• Improving processing and storage system • Strengthening flow of production and market information	• Improving warehouse facilities at customs points • Strengthening flow of production and market information		

- Training on improved recycling management for plastic products;
- Training on improved farming systems for coffee and ginger products;
- Training on improved tapping methods for rubber products;
- Strengthening/capacity-building of producers'/farmers' associations by organizing study tours and sharing of best practices; and,
- Establishing a South Asian centre for value chain development that could facilitate coordinating and follow-up activities among countries in the subregion.

In order to implement the subregional actions as suggested above, the following institutional arrangement were recommended:

(i) SME/GVC working group for the programme (at the subregional level)

This group will consist of senior technical experts from countries on specific products to guide the overall direction of the activities of the subregional programme. ESCAP could function as a coordinating body and assist in providing technical assistance to the group.

(ii) Steering committees for the subregional programme (at the country level)

A steering committee led by the focal Government agency with representatives from the private sector, trade promotion agencies and governmental and non-governmental agencies, including academia and research institutions, could be set up. It would guide the country's activities under subregional programme and serve as a follow-up with other governmental and non-governmental agencies concerned to include some of the actions identified in providing policy reforms and coordinating similar activities.

(iii) Review of SMEs and activities for SME strengthening in the three countries

A quick review of SMEs could be made on a regular basis in each of the three countries to evaluate plans and policies regarding (a) enabling environment for SMEs' overall business development including the access to institutional credit and finding the ways to extending collateral free institutional loans, (b) fostering SME sector by providing business and innovation incubation services and (c) identifying critical training needs for enterprise development and value chain development.

(iv) Establishing South Asian Accreditation Council

Access to global market depends on product certification process for ensuring product quality to the buyers. Certification requires highly skilled human resources and well equipped test laboratory facilities acceptable to importing countries. Providing such services in a cost effective manner and making the best use of regional resources would require establishing an accreditation council for South Asia, inviting all counties in the subregion. The proposal is a credible one and a feasibility study could be made in this respect.

(v) Establishing laboratory testing facilities, quarantine centres and certification bodies

The availability of in-country testing of export consignments for the required level of quality and sanitary standards for agricultural products would greatly facilitate and reduce the cost of exports. So, a feasibility study on establishing such facilities at the regional level could be made to assess their eventual effects.

(vi) Strengthening market information dissemination and the use of ICT

The system would provide market information to different actors in the value chain process down to farmers or raw material suppliers so that their awareness level on the quality aspects, timeliness of supply and negotiation strength can be significantly enhanced. It could be achieved through effective use of ICT and, wherever possible, should be coordinated with similar efforts by other agencies. Training would be one important component of this programme, particularly on ICT use in information management. In order to undertake such regional programme, partnerships with private sector businesses and industry associations in countries would be helpful.

(vii) Establishing a South Asian centre for value chain development

This centre could be responsible for (a) carrying out research on value chain development in South Asian countries, (b) networking the institutions of South Asian countries involved in the promotion of value chains and (c) following-up and lobbying respective Governments and other national agencies to implement agreed upon actions. The centre could be stationed in one of the three capital cities. Its establishment would be coordinated by ESCAP and the support is expected from various other development partners. The centre could work under one of the UN regional bodies, preferably under Asia-Pacific Centre for Transfer of Technology (APCTT).

The lessons learned for development agencies

With concrete action plans prepared, where multilateral development and donor agencies could play a significant coordinating and supporting role, there are a few lessons that could be learned for these agencies, particularly important for South Asia. These lessons should be kept in mind in order to provide better and more coherent technical assistance, regardless of the implementation level, subregional or national.

First, there seems to be a commonly agreed approach for SME development, covering the six key success factors, such as policy and regulatory framework; infrastructures; entrepreneurship; access to finance; technology; and business development services. However, such a comprehensive approach has not been fully adhered to among the development agencies and donors. This has resulted in scattered activities in various areas/sectors and the resulting lack of coordination among donors' activities has produced limited success.

Second, collaboration among development agencies has been weak and should be enhanced while developing better coordinated project supporting programmes in

most countries in the subregion. For example in Bangladesh, Katalyst[8] and BICF[9] are large-scale, cost-sharing programmes supported by development agencies, which typically promote enabling business environment, access to finance and direct support to individual enterprises' business development. The joint programmes help the Governments, producers' associations and individual enterprises by providing business development services and financing. Some of them also adopt sectoral development and value chain approaches. A large joint programme also tends to establish an independent secretariat to manage its activities and funds, which sometimes make the projects somewhat isolated from other national stakeholders

Third, direct support of enterprises and priority areas through SME association involvement could be initiated on an experimental basis.

Fourth, entrepreneurial culture has been recognized as one of the key factors for SMEs growth and competitiveness enhancement; however, traditional technical assistance has overlooked this issue. A comprehensive "entrepreneurship training programme," on subregional or national level, should be launched with a focus on rural areas. Special preferences could be given to women and youth entrepreneurs to further their development.

Fifth, conventional technical assistance to SMEs was less focused on technology development and adaptation, and thus SMEs are weak on technical issues and practical solutions.

Sixth, assistance to business development services should be provided for SME strengthening, particularly in offering business consultancy services.

Seventh, donors mainly focus on agro-industry and light-industry. It may be desirable to explore opportunities for manufacturing of other resource-based SME development.

Finally, the usefulness of the value chain approach, including cluster development, has been attracting more attention. However, in the past value chain activities were typically focused on domestic issues. Presently, more attention should be paid to the linkages with existing trade and a FDI-driven development strategy.

[8] Katalyst, which has been funded by SDC, DFID and SIDA, is one of the largest SME development projects in Bangladesh. It started in 2002 and aims at pro-poor growth through market-led SME development. It has worked with more than 30 manufacturing and agriculture sectors in Bangladesh, providing technical assistance in the areas of institutional capacity building, business plan development, technology transfer and business development services. It also works with business associations to improve the enabling environment for businesses (Katalyst 2010).

[9] Bangladesh Investment Climate Fund (BICF) was jointly established by DFID, EC and IFC in 2006, aiming to assist the Government of Bangladesh to promote pro-poor growth for increasing income and employment through improving business environment. BICF has designed and implemented programmes to institute more business friendly policies, laws and regulations (Embassy of Japan and GTZ 2006).

The subregional action plan provides a non-exhaustive number of concrete steps promoting SMEs integration in global value chains. Governments and multilateral development and donor agencies should provide increased assistance based on the lessons learned to enable SMEs to enter and benefit from global and regional value chains.

Chapter 3

CONCLUSION

The three national studies on Bangladesh, Nepal and Sri Lanka covering plastics industry, agro-industry (coffee and ginger products) and industrial rubber and electronics products sectors strongly emphasized that SMEs in South Asia, despite having tremendous potential for growth and employment creation, were still in a precarious situation. Perennial problems such as a lack of financing, inadequate infrastructures, inaccessibility of public services and inadequate market intelligence were still major constraints hindering SMEs in South Asia. Such problems were further aggravated due to a lack of information on the markets, technological backwardness, inadequacy of human resources (both managerial and technical) and an intense competition coming from large domestic and foreign enterprises as a result of openness and economic liberalization measures.

The studies emphasize changing global and regional economic scenarios, showing the emergence of growing networks of industrial production processes. These national and international industrial production networks, which are typically controlled by transnational corporations (TNCs), have offered SMEs from different countries and product groups an opportunity to form global (and regional) value chains. However, to capitalize on such opportunity, SMEs would require strong support from the Governments as well as SME-related institutions. The studies further emphasize that individual firms seeking to establish partnerships in global value chains should understand the governance of specific value chain processes and structures. As international trade is largely undertaken by global firms and since the leading firms, often TNCs are the key decision makers managing the global production systems and trade, they should be the ones influencing the participation of smaller firms in global value chains. It is most desirable that the structure of a specific value chain and characteristics of lead firms are fully understood.

It is an established fact that a product's quality and value depends not only on innovations in production process but also on other improvements, such as creating new products, developing marketing skills to serve different customers and various markets, and increasing capacity to introduce new products into international and domestic markets. To reach these goals, SMEs should be provided with support from public agencies and industry associations. In the absence of such support, SMEs in South Asia would not be able to establish effective value chain connections at local, regional and global levels. Therefore, the studies focused on the Governments' leading

role in facilitating SMEs' growth by providing the necessary support for export-oriented SMEs in forming strong partnerships in global value chains.

Similarly, to help a subregional action programme succesful, some background studies should be undertaken and the required technical assistance should be provided. It is expected that national Governments would initiate actions as soon as possible.[10] The regional actions could be undertaken by various multilateral and regional donors interested in promoting trade and helping South Asian nations in economic development and poverty reduction efforts. Well-articulated and thorough action plans would still go a long way in the developing and promoting the products considered in this publication. The challenges to action plan implementation include managing the required resources, creating synergies among stakeholders, government agencies, civil society and private sector and coordinating and harmonizing development partners' support.

As a conclusion, the authors would like to suggest two main points. First, based on the studies and action plans the participating Governments should take the lead in engaging independent market development facilitators who understand targeted foreign markets and international marketing, which are not fully covered by this publication, to formulate sector-specific policies, outline an intervention scheme and implement both. Second, the global value chain approach should also be used for other products/sectors with export potential in South Asia and in other developing subregions in Asia and the Pacific (e.g., Central Asia and the Greater Mekong Subregion[11]), where SMEs could play a greater role in economic development than they presently do.

[10] In this connection, the Government of Bangladesh recognized a potential of the plastics industry, which provides opportunities for backward- and forward-linkages as well as for exports and foreign currency earnings. As suggested in the national study, the industry was included in the national industrial policy as one of the 18 thrust sectors (DCCI 2009).

[11] The Greater Mekong Subregion comprises Cambodia, Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam and two provinces of China (Yunnan and Guangxi).

Annex I

Country Study on Bangladesh using Global Value Chain Analysis:

THE PLASTICS INDUSTRY

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1. Introduction

Plastic-based products currently represent a sizeable subsector in the chemical industry in Bangladesh. Starting as a backward linkage industry, manufacturing of plastic and plastic-based products is making significant contributions to the economy and has become an important segment of the manufacturing industry of the country. The plastics sector has approximately 3,000 manufacturing units providing an employment to more than one million people (Islam 2008; Sakib et al. 2004; Yousuf 2003). In the fiscal year 2006-2007, the industry manufactured various types of plastic products: approximately $714 million worth of varied quality products for the domestic market and $234 million worth of high-quality products for the global market (BPGMEA 2009). Despite this fact, per capita consumption of plastics and plastic-based products is still low in Bangladesh, estimated at two kg per person per year. The estimate is rather low compared to the global average consumption of 20.4 kg per capita per annum and the developed country consumption of 80.0 kg per capita per annum. This indicates that the consumption of plastic products in Bangladesh is expected to rise as the economy develops (Shaheen and Maksudur 2001).

Plastic recycling has also developed into a sizeable component of the plastics industry with major recycling centres in and around Dhaka. Availability of river water (used in cleaning) and low transportation costs have made recycling units located around Dhaka economically attractive. Current recycling of plastic wastes saves import costs for the industry and helps improve overall waste management situation. The small units were estimated to recycle nearly 60 per cent of plastic waste, which saved approximately $44 million worth of imports in raw materials in 2005 (BPGMEA 2009). Many other support and ancillary industrial service providers, such as small machine/equipment makers, distributors, printing and packaging firms and additives importers, have also grown significantly.

Although the plastics industry in Bangladesh has made remarkable progress over the years, it still lacks a well-designed approach and a strategic direction for achieving long-term, sustainable growth. Without having such strategic approach and distinctive competitive strengths, Bangladeshi plastic products find it difficult to compete in the global market. The void, if sustained over time, may also lead to difficulties in the domestic market as internationally competitive suppliers will likely bid for the fast growing Bangladesh market demand. Thus, to achieve global competitiveness, the plastics sector needs to have a national strategic action plan for ensuring growth and sustainability through distinctive competencies. But unlike the apparel and textile sector, the plastic sector in Bangladesh is yet to see any long-term policy guideline specifically designed for the development of this burgeoning industry. The sector is presently governed by the general industrial and trade policies applicable to all industries. A decade ago, the Government agreed to develop a special industrial park for the plastics sector and successive governments 'continue to work on that'.

1.1. OBJECTIVES OF THE STUDY

The broad objective of the study on plastics industry in Bangladesh is to analyze the competitive context in which enterprises (especially SMEs) operate and explore the growth potential of the sector within global value chains. Based on the findings, a national strategic action plan is prepared for enhancing value added in the plastics industry in Bangladesh.

The objectives of the study are presented below.

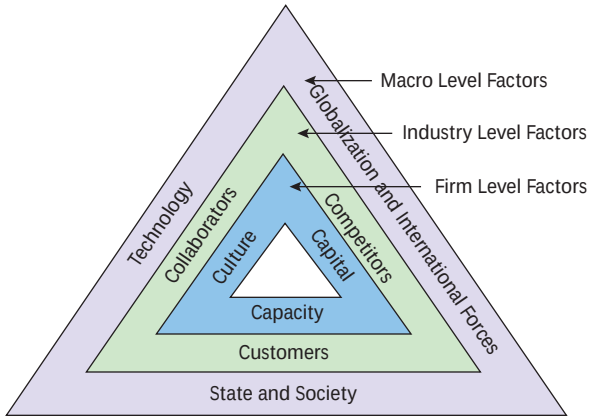
- Analysing the plastics industry in Bangladesh, taking into consideration:
  - business prospects and economic impact, including export potential;
  - current supply chain networks;
  - supply-side capacity, including human resources, product development, standards and certificates and producers' associations;
  - policy and regulatory framework;
  - infrastructure and logistics systems (e.g., transportation); and
  - marketing, including brand development, distribution channels and quality requirements.
- Developing a national action plan.

1.2. METHODOLOGY

In order to analyse the competitiveness potential of the plastics industry in Bangladesh, the authors have chosen the global value chain approach. After the value chain analysis and the assessment of growth potentials and competitiveness, SWOT and triple triangle framework (TTF) techniques were used to synthesize the findings and to devise a strategic plan of action. While SWOT analysis is a widely used tool, TTF is a new tool developed and used in the analysis of market development interventions and policies.

TTF uses three triangles, each summarizing the factors that affect business competitiveness at different levels. The inner triangle – with each of the three sides symbolizing either capacity, or capital or culture – explains the internal, largely controllable dynamics of firms. The middle triangle – with each of its three sides symbolizing either a customer, or a competitor or a collaborator – describes the immediate, industry-level context in which firms work. The outer triangle – with each of the three sides symbolizing either technology, or state or society and global forces – presents the macro environment, a largely non-controllable setting in which firms have to operate. Figure 1 below illustrates the TTF.

Figure 1: Triple triangle framework



Source: Jahan (2008a).

1.3. DATA COLLECTION AND DATA SOURCES

Data were drawn both from primary and secondary sources. Primary data were collected through extensive field visits, interviews with key informants and focused group dialogue. The research team visited SME plastic manufacturing cluster in Dhaka. Interviews and discussions were held with major industry players, including RFL Plastics, Partex Plastics and Luna Plastics, involved in different stages of the plastics industry value chain. Representatives of plastics sector associations, such as Bangladesh Plastic Goods Manufacturers and Exporters Association (BPGMEA) and Bangladesh Plastic Importers Association (BPIA) were consulted and interviewed.

The Government of Bangladesh, Dhaka Chamber of Commerce and Industries (DCCI) and the Ministry of Industries have organized a national workshop deliberating on the draft study report and obtaining additional information from the stakeholders. There were over 60 participants from the government agencies, businesses, universities, mass media and the plastics industry sector. The draft study was further enriched with additional perspectives provided by plastic goods manufacturers, wholesalers, retailers, importers of raw materials and machineries and plastic recycling businesses.

An extensive review of available studies provided the details on the history and evolution of the industry, global trade, industry practices, government policies and regulations governing the sector. Extensive literature survey was undertaken using the Internet and the archives of BPGMEA, Dhaka Chamber of Commerce and Industries (DCCI) and newspapers. Reports and publications were provided by Bangladesh Bureau of Statistics (BBS) for trade and related data and some additional information by Export Promotion Bureau (EPB). Trade database of the United Nations, UNIDO and UNCTAD were also explored.

1.4. LIMITATIONS

Although the draft study provided an extensive research using qualitative research instruments, no enterprise-specific survey could be done due to time and resource constraints. Access to certain trade databases, such as the World Trade Analyzer (WTA),[12] was not possible. However, despite severe time and resource constraints, the use of multiple primary research instruments (e.g., field visits, depth interviews with key informants and focused group discussions) helped gain very effective and meaningful industry assessments.

2. An Overview of the Plastics Industry

The plastics industry can be viewed from the three perspectives, including: (a) end-user/market; (b) production technology; and (c) support industry. The end-users and markets of the plastics industry can be classified into five categories: automotive; construction; packaging; medical supplies; and (v) consumer products. Based on the technology platform being used in plastics production, plastic products can be classified as: thermoformers; injection moulders; pipe, profile and tubing extruders; rotational moulders; film and sheet manufacturers; and blow moulders. Notable support industry players are: raw material suppliers; machinery importers; mould makers; additive/chemical suppliers; and plastic products recyclers.

2.1. GLOBAL PLASTICS INDUSTRY

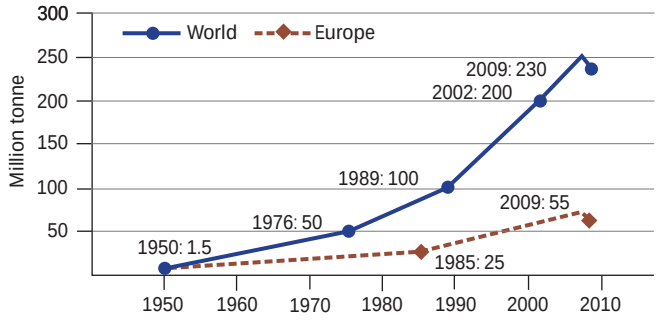
In the modern world life without plastic products would be difficult, if not impossible. Ranging between kitchenware and medical supplies, construction materials and automotive supplies, safety and security devices and packaging materials and, finally, home decorations – plastic products are widely used in almost every facet of modern life.

Consumers choose plastic products for their versatility, durability, lightness and excellent insulating properties. Manufacturers like to produce plastic goods because of low production costs and energy-efficient production processes. Driven by these forces, the global production and consumption of plastic goods have significantly increased from a mere 1.5 million tonnes in 1950 to 230 million tonnes in 2009 (Plastic Europe 2009). Figure 2 depicts this exponential growth trend in global plastic production over the last 60 years.

Global production of plastic products is dominated by developed nations, with the European Union producing about 24 per cent and North America producing about 23 per cent of total global plastic production in 2009. The plastics industry is ranked as the third largest manufacturing industry in the United States of America. In comparison, China as the largest manufacturer of plastic goods among developing

[12] The World Trade Analyzer (WTA) is a trade database that contains trade data on United Nations member countries. Statistics Canada created it from the data reported by member countries to the United Nations Statistical Office. See some more details at http://www.statcan.gc.ca/dli-ild/data-donnees/ftp/worldtrade-commerce_mondial-eng.htm.

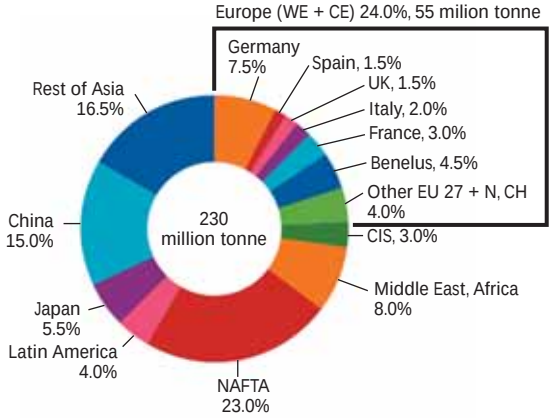
Figure 2: Global production of plastic products



Source: Plastic Europe (2010).

countries, contributed about 15 per cent to the world's total plastic production in 2009. Other large plastic manufacturing countries in Asia are India and Thailand. Recently, developed nations have opened their markets for plastic products from developing nations, such as Bangladesh. One of the reasons for this shift is the low cost of production in developing countries due to cheap labour and low transportation costs. As developing countries are increasingly moving towards accelerated industrialization, the plastics sector becomes an important backward linkage industry in manufacturing. For example, over the past two decades, the apparel sector in Bangladesh has increasingly relied on the local sources not only for cost advantages but also for 'flexibility' and 'lead time' factors. As a result, the country's reliance on imported packaging materials and other plastic-based accessories have decreased. Figure 3 shows the global market share (2009) of plastic production for different countries.

Figure 3: Market share of global plastic production in 2009



Source: Plastic Europe (2010).

Table 1 presents the past, current and estimated future plastic consumption in some major economic regions of the world. As one can notice, developed countries far outweigh the developing and the least developed countries in plastic per capita consumption and use.

Table 1: Per capita consumption (kg/year) of plastic products in different regions of the world

Regions/Countries	1980	2005	2015 (estimated)
North America	46	105	139
Western Europe	40	99	136
Central Europe + CIS	9	24	48
Latin America	7	21	32
Middle East/Africa	3	10	16
Japan	50	89	108
Asia (excl. Japan)	2	20	36
World	11	30	45

Source: Plastic Europe (2009).

2.2. THE PLASTICS INDUSTRY IN BANGLADESH

Plastic products were introduced in Bangladesh in the later half of the 1940s. However, significant commercial growth in plastic production took place much later, in the early 1980s. The industry experienced gradual growth as large numbers of injection grade and film grade plastic companies were set up during the 1980s (Hasan 2008). Initially, processing technologies and equipments came from India and later from Thailand, the Republic of Korea, Japan, China, Singapore and some of the European countries.

Table 2: Overview of the plastics industry in Bangladesh (2006/2007)

Domestic plastic use	Approximately $714 million worth of plastic goods.
Per capita plastic consumption	Two kg per year
Export earnings	$234 million, of which 41.6 per cent came from direct exports and 58.4 per cent came from deemed exports.
Number of manufacturing units	Approximately 3,000 small, medium and large plastic manufacturing units operate across the country.
Growth	The industry expanded its output by over 20 per cent per annum during the 1990s.
Employment	About half a million workers are directly employed in the sector.
Plastic waste recycling sector	There are 300 small units in and around Dhaka city, which recycle about 138 tonnes/day of plastic waste.

Sources: BPGMEA (2009); Hasan (2008).

Currently, the industry adopted relatively modern manufacturing processes, such as using several types of extrusion materials, injection and blow moulding, rotational moulding and thermosetting conversions. The country also produces a wide range of products, such as PVC pipes, shopping bags, woven bags, PET/PE bottles, laminated packages, rigid sheets, garment accessories, household products and medicine packs (BPGMEA 2009). Table 2 gives an overview of the plastics industry in Bangladesh in 2006-2007.

2.3. IMPORT TRENDS

Value creation in plastic products starts with the import of polymers. Since the country does not have polyolefin production, nearly 100 per cent of its required polymers are imported (BPGMEA 2009). According to BPGMEA, in the fiscal year 2001-2002 approximately $138 million worth of plastic raw materials were imported, which increased at a compound average growth rate of 27.1 per cent and reached $458 million in the fiscal year 2006-2007. Over the same period, the volume compound average growth rate was around 8.0 per cent, with imports rising from 196,000 metric tonnes in the fiscal year 2001-2002 to 288,000 metric tonnes in the fiscal year 2006-2007. Table 3 illustrates the growth trend in raw materials import in both volume and value terms.

Table 3: Raw materials imported for plastic production in Bangladesh

Volume (in million tonnes)	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	CAGR* (in per cent)
Bonded Category	74 637	60 606	57 477	85 365	80 628	103 853	6.8
Non-Bonded Category	121 532	126 571	157 053	295 168	193 246	184 611	8.7
Grand Total	196 169	187 177	214 530	380 532	273 874	288 464	8.0
Value (in million US$)	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**	**2005-2006**	**2006-2007**	**CAGR (in per cent)**
Bonded Category	43	40	43	92	96	153	28.6
Non-Bonded Category	95	143	143	175	287	305	26.4
Grand Total	138	182	187	267	382	458	27.1

Source: BPGMEA (2009).

Notes: 1) Bonded import implies the type of import where a bank provides a guarantee for the payment of raw materials in case the importer fails to make the payment for the shipment. In the case of non-bonded import no such guarantee is required; 2) CAGR is a compound average growth rate.

According to the United Nations Commodity Trade Database, the total value of raw materials imported for plastic production[13] in Bangladesh amounted to $574.6 million in 2007. It has grown at a steady growth rate of 26.0 per cent from 2003 to 2007. Commodity-wise, polymers of polyethylene, propylene and polyacetal are the three

[13] Fifteen broad categories of materials in primary form (HS Code -3901 to 3915) were considered as raw materials for plastic production.

largest imported resins. The polyacetal resin had the highest import growth rate of 37.4 per cent from 2003 to 2007. Overall, all imported items demonstrate a steady positive growth rate. Table 4 summarizes the top 10 raw materials for plastic production (in terms of import value) imported in Bangladesh.

Table 4: Top 10 raw materials imported for plastic production in Bangladesh (in millions of dollars)

HS Code	Commodity	2003	2004	2005	2006	2007	Per-centage Share (2007)
3901	Polymers of ethylene	59.6	67.8	79.9	105.1	147.8	25.7
3902	Polymers of propylene or of other olefins	56.2	53.7	64.8	122.0	144.7	25.2
3907	Polyacetal, and other polyether and epoxide resins	30.1	46.2	67.5	78.9	107.2	18.7
3904	Polymers of vinyl chloride or of other halogenated olefins	31.1	42.0	55.4	55.0	62.9	11.0
3903	Polymers of styrene	14.2	10.8	14.1	25.4	31.5	5.5
3909	Amino-resins, phenolic resins and polyurethanes	9.0	11.1	14.4	21.8	28.7	5.0
3906	Acrylic polymers	7.8	9.9	12.8	17.2	18.2	3.2
3905	Polymers of vinyl acetate or of other vinyl esters	5.9	6.2	7.6	7.8	9.6	1.7
3912	Cellulose and its chemical derivatives	3.7	5.1	5.8	6.9	7.5	1.3
3908	Polyamides	4.6	7.8	8.7	5.6	6.3	1.1
3901-3915	**Total Raw Materials Imported**	**227.6**	**267.1**	**337.9**	**455.3**	**574.6**	**100.0**

Source: BPGMEA (2009); BBS (2007).

2.4. EXPORT TRENDS

The plastic sector is gradually emerging as an important source of export earnings in Bangladesh. During the fiscal year 2006-2007, total export earnings from the industry stood at $234 million, of which 41.6 per cent came from direct exports and 58.4 per cent came from deemed exports.[14] Major export items constitute poly bags, polyethylene sheets, plastic hangers, toys, toothbrushes and ballpoint pens. Direct export earnings from the plastic sector demonstrate a remarkable increase of over 300 per cent in its total GDP share – rising from 0.25 per cent of GDP in the fiscal year 2002-2003 to 1.07 per cent in the fiscal year 2006-2007 (BPGMEA 2009).

Currently, Bangladesh exports plastic products to 23 countries in North America, Europe, Asia and the Pacific and the Middle East. Major export countries are China, India, Germany and Poland (Table 5). In South Asia, Bangladesh is exporting plastic products to India, Sri Lanka and Nepal (BPGMEA 2009). Seven eastern states in India represent

Table 5: Major export markets for plastic products of Bangladesh in 2007 (in millions of dollars)

Country	2006-2007	2005-2006	Per cent Growth	Per cent Share
China	8 550	8 101	5.5	29.5
India	4 116	4 391	-6.3	14.2
Germany	2 615	2 142	22.1	9.0
Poland	2 280	2 165	5.3	7.9
Belgium	1 426	1 792	-20.4	4.9
United Kingdom	1 340	1 653	-18.9	4.6
Ukraine	1 196	1 401	-14.6	4.1
United Arab Emirates	908	19	4 690.4	3.1
Greece	898	543	65.3	3.1
Netherlands	887	332	167.4	3.1
France	800	957	-16.5	2.8
Tunisia	633	138	357.7	2.2
Others	427	33	1 177.1	1.8
Viet Nam	421	40	959.8	1.5
Spain	345	340	1.5	1.2
United States of America	306	205	49.6	1.1

Source: BPGMEA (2009).

[14] Direct exports mean exports of finished plastic products. Examples are – plastic kitchenware and utensils including crockery, plastic furniture, toys, garbage bags, oven sacs, industrial films, PVC pipes, polyethylene sheets, belts, tableware, toothbrushes, ball pens, artificial flowers, electric switches, computer accessories and so on. Deemed exports mean plastic products as embedded parts of other exports. Examples are – buttons, hangers Used in ready-made garment industry, packaging materials and plastic accessories used virtually in all industries (BPGMEA 2009).

a major market for Bangladeshi plastic goods. Bangladesh has a cost advantage in exporting plastic products to these areas as Indian manufacturers from central and western parts of India have higher transportation costs delivering their products in these areas.

Table 6 below summarizes top 10 plastic items exported from Bangladesh over the period of 2003-2007. The largest export earner, plastic articles for packaging goods, constitutes about 48.8 per cent of the total export volume in 2007. This deemed export is mainly driven by the strong ready-made garment industry (RMG) demand in international markets.

Table 6: Top 10 plastic export items of Bangladesh in 2003-2007 (in thousands of dollars)

HS Code	Article Description	2007	2006	2005	2004	2003
3923	Articles for the conveyance or packaging of goods, of plastics	23 993	20 665	19 052	13 615	6 448
3915	Waste, parings and scrap, of plastics	10 391	6 585	8 249	6 418	600
3926	Other articles of plastics and articles of other materials	8 467	11 099	9 717	4 564	1 508
3917	Tubes, pipes and hoses and fittings	1 977	170	210	176	56
3920	Other plates, sheets, film, foil and strip, of plastics	1 713	458	478	88	39
3906	Acrylic polymers in primary forms	900	1 121	1 059	626	12
3904	Polymers of vinyl chloride	614	71	8	40	0
3924	Tableware, kitchenware, other household articles and toilet articles	195	159	473	491	564
3916	Monofilament of which any cross-sectional dimension exceeds 1 mm	162	116	521	452	402
3902	Polymers of propylene or of other olefins, in primary forms	139	562	182	94	41
	Total exports	49 145	41 719	49 382	28 141	10 127

Source: UNCOMTRADE (2009).

3. Value Chain Dynamics in the Plastics Industry

This section provides value chain analysis of the plastics industry in Bangladesh. The analysis helps identify major opportunities and obstacles for the development of the plastics industry. Various measures for improving competitiveness in the international markets are suggested on the basis of value chain analysis and an action plan is formulated.

3.1. AN OUTLINE OF THE PLASTICS INDUSTRY VALUE CHAIN

Raw Materials: The value chain for plastic industry begins with raw materials selection. Two major types of raw materials used for plastic products are granules (commonly known as resin and locally as '*dana*') and additives. There are two sources of granules: virgin and recycled. Virgin granules are mainly imported from the Middle East, while the recycled raw materials are both imported and locally produced.

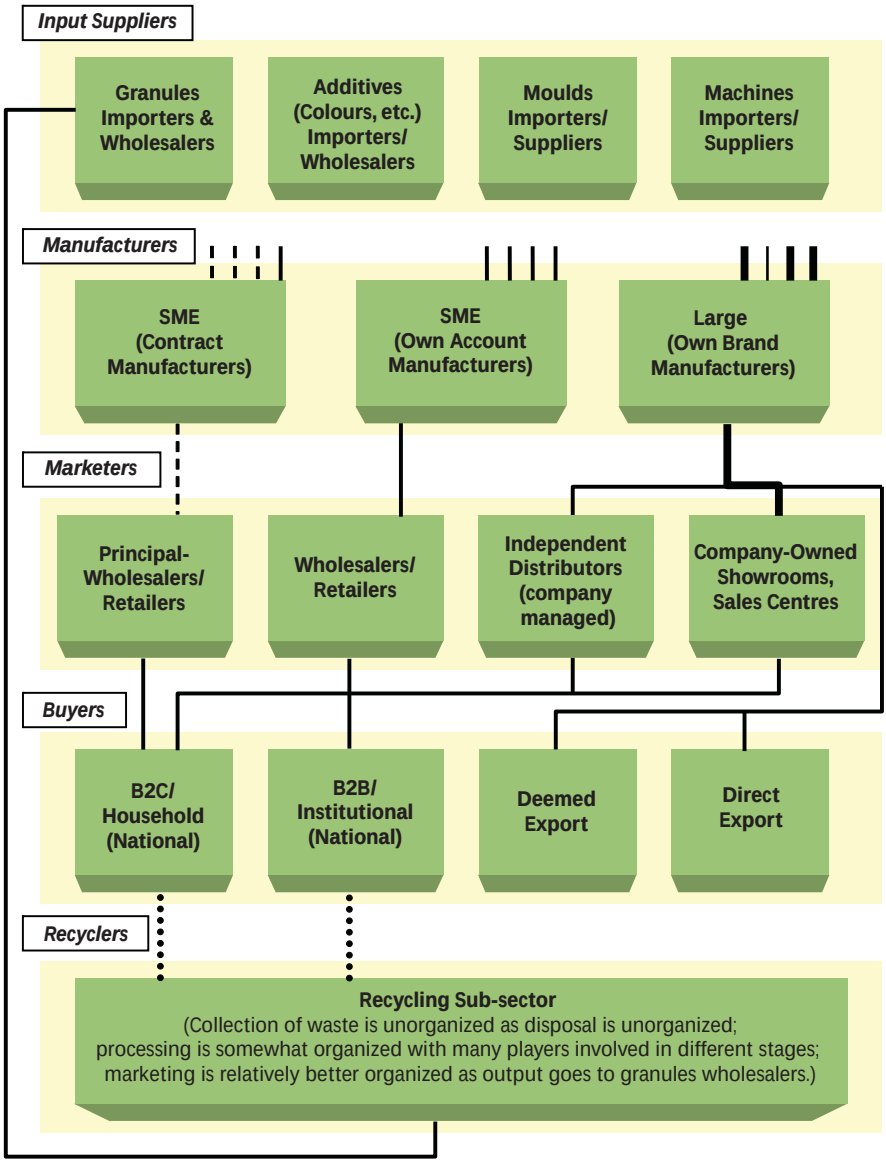
Production: Factories vary according to the types of machines they use, i.e., injection, extrusion or blow machines. Injection moulding machines produce solid plastic goods, such as buttons and furniture. Blow machines produce such goods as bottles and polythene. Moulds used in these machines are usually imported, though there are some exceptions. It takes approximately seven days to produce a new mould locally and more than two weeks to import it. A mould with plastic granules is placed inside the injection (or blow) moulding machine to produce a finished product, which takes a maximum of three minutes per item. However, a machine takes half an hour to warm up to its full production capacity. One machine would engage two to four workers, depending on their skills and the type of the machine. After the production is complete, some finishing work (e.g., polishing the surface of the product) is required before the product is ready for the market.

Marketing: The Mitford Market (in Old Dhaka) and the New Market (close to Old Dhaka) are considered the two largest wholesale markets for plastic products in the country. These markets are used by 'sub-wholesalers'/retailers, who then resell these products locally to final consumers. Although most of retail sales occur through retail outlets, a certain portion is sold or exchanged for used utensils by door-to-door vendors, especially in rural areas. Business-to-business (B2B) sales and distribution rely on corresponding contracts. Major B2B transaction parties include: RMG; pharmaceutical companies; real estate companies; and construction firms. Most of RMG transactions are treated as deemed export. While large manufacturers and intermediaries are involved in direct exports only, SMEs are usually not.

Recycling: In case of recycled materials value chains work in a different way. After customers dispose of used plastic products, street garbage collectors gather those wastes and sell them to larger collectors. These waste collectors also get plastic wastes from another group of waste collectors called hawkers, who collect the disposables from houses. The larger collecting groups wash and prepare used plastic products to be used as raw materials for recycling. After recycling, recycled granules are produced and sent to the wholesale market to be sold to SMEs as raw materials for plastic products. Such raw materials are used mostly to produce cheap plastic products (e.g., toys, waste bags and household items).

Figure.4 below shows a comprehensive value chain for the plastics industry in Bangladesh.

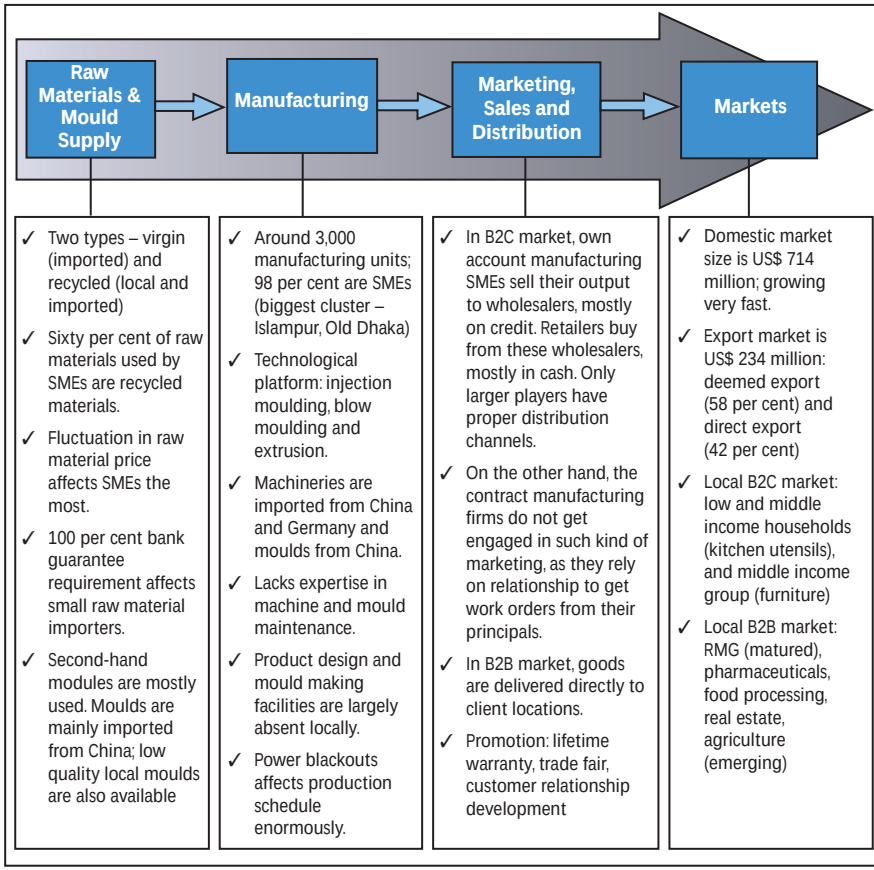
Figure 4: Value chain of the plastics industry in Bangladesh



3.2. CURRENT STATE OF THE PLASTICS INDUSTRY VALUE CHAIN

The current state of the plastics industry value chain in Bangladesh is briefly summarized in figure 5.

Figure 5: Value chain dynamics of the plastics industry in Bangladesh



3.3. RAW MATERIALS AND MOULDS

Oil-based resins are mainly manufactured in oil-producing countries, particularly in the Middle East. Resins are produced in two forms: (i) virgin resins (come directly from petroleum processing), and (ii) recycled resins (come from recycling of used plastic products). Though specific types of resins should be used for different quality and functional requirements, SME manufacturers in Bangladesh use only resins such as

polyvinyl chloride (PVC), polypropylene (PP) and polystyrene (PS) for all the products they manufacture.[15] Few large manufacturers are exceptions to this practice.

Virgin resins: Virgin resins are imported mostly from the Middle East. These resins are of better quality and food grade plastic products are made only from such virgin resins. Since virgin raw materials are expensive, recycled raw materials are often used for products serving the low-end market. However, SME manufacturers in Bangladesh sometimes mix virgin resins with recycled ones to make quality and cost adjustments. Large manufacturers use recycled raw materials too; but those recycled resins are produced from the residual plastic waste generated by their own manufacturing process. Such recycled resins are as good as virgin resins since they do not get contaminated or mixed with any other materials.

The price of resins in the local market was around $1,200 per tonne in 2007. But during the past few years prices started to fluctuate between $700 and $3,000 per tonne. This happened because the price of resin is directly correlated with the price of crude oil and as the price of crude oil varies depending on the stage of business cycle, so does the price of resins. For example, at the end of 2008, the global recession made the oil price drop from $150 to $50 per barrel, causing a simultaneous drop in the price of virgin resins to about $700 per tonne.

Recycled resins: Recycled raw materials are imported as well as produced locally. The import chain of recycled resins does not vary much from that of virgin resins. In the case of locally recycled resins, most of producers and suppliers are located in and around Dhaka. The demand for recycled resin is increasing because of the attractive price[16] and availability, and so is the number of recyclers. Currently, recycled raw materials account for almost 60 per cent of the total raw materials used by SMEs in Bangladesh, and this trend is upward.

Value added potential: In the case of virgin raw materials, there is hardly any value added potential since the plastics industry in Bangladesh has always been using

[15] Major types of resins are: i) polyethylene (PE) with a wide range of uses and a low cost advantage; ii) polypropylene (PP) used for food containers and kitchen appliances; iii) polystyrene (PS) used for packaging foam, food containers, disposable cups, plates and cutlery; iv) polyethylene terephthalate (PETE) used in producing beverage containers; v) polyamide (PA) (nylon) widely used in producing fibers, toothbrush bristles and fishing line; vi) polyester, popular in producing garment accessories like fibers and textiles; vii) polyvinyl chloride (PVC) widely used in plumbing pipes, flooring and clothing; viii) polycarbonate (PC) used for compact discs, eyeglasses, etc.; ix) acrylonitrile butadiene styrene (ABS) used widely in producing electronic equipment cases (e.g. housing for computer monitors, printers and keyboards); and x) polyvinylidene chloride (PVDC) (saran) for food packaging. Some special purpose plastics are: i) polytetrafluoroethylene (PTFE) (teflon) for heat resistant and low-friction coatings, used in frying pans and water slides; ii) bakelite used in insulating parts in electrical fixtures, a thermosetting plastic, a.k.a. phenol formaldehyde or phenolic resin that can be moulded by heat and pressure when mixed with a filler-like wood flour or can be cast in its unfilled liquid form; and iii) polylactic acid: biodegradable, thermoplastic, aliphatic polyester derived from lactic acid which in turn can be made by fermentation of various agricultural products such as corn starch.

[16] The price of recycled raw materials, including the imported materials, is only half the price of virgin raw materials.

the best possible virgin raw materials. However, recycled raw materials remain a major possible value upgrading area as nearly 60 per cent of raw materials used by SMEs in the plastics industry come from low-quality recycled material. It is worth mentioning that the substitution of virgin resins by recycled ones could reach 100 per cent in certain cases, provided that the recycled resins are of very good quality.

Raw material suppliers: Usually SMEs producing for independent contractors get raw materials directly from them. In Bangladesh, SMEs marketing their own products buy the raw materials directly from the local market, i.e., from importers and wholesalers. Most large firms import directly from abroad. Some of the major problems related to the import of raw materials are as follows:

- *Delays at ports.* The most common problem is unnecessary delays and hassles at the ports. Because of operational inefficiency and political unrest, containers tend to be stuck at the port warehouses, causing rental costs and delayed delivery. Consequently, the price of virgin plastic granules increases. However, recently the Government has initiated various measures to solve these problems.
- *Pre-shipment inspection (PSI) procedure.* The PSI procedure, involves a government appointed agent inspecting imported raw materials. Importers made several complaints against the agency regarding it being inadequately staffed and not being client-oriented, resulting in long lead time in import and distribution procedures.

To address this and related issues virgin plastic granule importers have organized Bangladesh Plastic Importers Association, which is mandated to negotiate with the Government on policy matters.

3.4. ADDITIVES

Additives are used with plastic granules to alter and improve mechanical, physical or chemical properties of the final product and protect it from the degrading effects of light, heat or bacteria as well as improve product value through enhanced durability, smoother surface and overall better look. However, the smart use of such additives is still restricted only to large manufacturers.

For colouring of plastic products, powdered colours were used until the 1980s. However, master batches (colour granules) made their way into the market ever since. Different types of master batches and chemicals are imported from abroad, mainly from Germany and China. Of course, China is the leading exporter in the Bangladesh market due to its low price offer.

3.5. MOULD MAKING

Since the introduction of handmade local moulds, technological change of any significance has yet to come to mould manufacturing in Bangladesh. Large manufacturers mainly import moulds directly from China and Thailand, whereas SMEs rely on local sources. However, the locally manufactured moulds are quite substandard

and produce products of poor quality. The nascent light engineering sector of the country has come up with some solutions but the initiatives are very far from what the burgeoning plastics sector requires in terms of quality. Neither the light engineering sector SMEs nor the plastics sector firms are capable, both financially and technically, of making any significant progress in this venture. However, knowing the fact that each of the large manufacturers requires almost 50 moulds a year, made a couple of large players contemplate on it.[17] But again, confidence is running low due to uncertainties regarding government policy directions, inadequate infrastructural development (particularly gas and electricity supply), and perceived market risks in the absence of proper market intelligence. However, the availability of Chinese and Thai moulds makes the plastics sector players somewhat complacent and prevents the sector from achieving long-term competitiveness. The absence of such a vital manufacturing linkage could preclude research and development in product design and other innovative solutions.

In the absence of sound mould making facilities, the capital constrained SMEs are forced to use locally made, low-quality moulds and end up producing low quality plastic products with poor finishing, serving the low-end segment of the market. Such products, lacking the desirable precision and fine finishing result in poor profits for SMEs. Low quality product excludes local SMEs from joining the export market. Thus, the vicious circle of industrial backwardness continues.

However, the situation might offer an opportunity for technology upgrading by developing local mould making facilities. Seizing this opportunity could help the plastics sector not only serve the domestic market better (particularly by fighting off imports), but also enter the export markets, which is crucial for long term industry competitiveness.

3.6. MANUFACTURING

The plastics industry sector in Bangladesh displays a significant diversity of enterprises ranging from large 'integrated' players to very small 'specialized' manufacturing units. According to BPGMEA, of the 3,000 plastic manufacturing firms 66 per cent fall into 'small' enterprise category, 1.7 per cent into 'large' enterprise category and the rest belong to medium enterprises as defined by the Bangladesh Bureau of Statistics. Large firms are mostly located in major cities of the country. Some of the large players are RFL Plastics, Bengal Plastics, Navana Plastics, Gazi Tanks, Boss Plastic Industries, Leos Plastic, Bismillah Plastics and N. Mohd. Plastics. Small and medium manufacturing firms consist of highly fragmented clusters scattered around the country with the largest cluster being the Lalbagh-Islambagh cluster in Dhaka. Table 7 provides information on plastic manufacturing firms.

[17] One such plant is expected to be in place by 2011.

Table 7: Plastic manufacturing firms by category and location

Category	Small	Medium	Large
Definition[18]	Less than 10 workers.	More than 10 workers and less than 50 workers.	More than 50 workers
Numbers	1,965 (65.6 per cent)	980 (32.7 per cent)	52 (1.7 per cent)
Location	Dhaka City (Old Dhaka), Keranigonj, Narayangonj, Khulna, Chittagong	Dhaka City, Tongi, Gazipur, Savar, Munshiganj, Narayangonj, Chittagong, Khulna	Dhaka City, Tongi, Gazipur, Savar, Chittagong

Sources: BPGMEA (2009); BBS (2007).

The common characteristics in each category of the plastics producers are summarized in Table 8.

Table 8: Profiles of small, medium and large manufacturers

	Small Manufacturers	Medium Manufacturers	Large Manufacturers
Business model	Subcontracting and low quality own account manufacturing	Both subcontracting and own account manufacturing	Own account manufacturing
Control over raw material	In subcontract manufacturing raw materials are supplied by the principal.	Raw materials are bought from importers.	Manufacturers themselves import raw material.
Types of raw materials used	Sometimes low quality recycled raw materials are used.	Imported raw materials are preferred.	Recycled raw materials are never used.
Types of machines used	Semi-automated injection and blow machines	Semi-automated injection and blow machines	Automated injection and blow machines
Types of labour	Unskilled and semi-skilled	Unskilled and semi- killed	Trained (in-house training)
Types of moulds used	Local moulds of low quality	Local moulds used in most cases. Some imported moulds	Imported moulds
Channels and distribution	Sold to a wholesaler.	Have own wholesale shops.	Use own channels and distribution.
Export	Do not export	Hardly ever export	Majority of exports are from this segment of manufacturing units

[18] The definitions of SMEs and large enterprises in the plastics sector in Bangladesh are different from those in existing literature (cf. section A, chapter 1). However, the co-existence of different SME definitions in a developing county is not unusual in Asia and the Pacific (AMMO 2007; ESCAP 2009b).

Table 8: *(continued)*

	Small Manufacturers	Medium Manufacturers	Large Manufacturers
Location	Mainly located in Old Dhaka (Lalbagh-Islambagh cluster)	Mainly located in Old Dhaka (Lalbagh-Islambagh cluster) and Mirpur area.	Different, depending on corporate considerations

Source: Primary (interviews, discussions, etc.).

Most firms in the micro- and small manufacturer categories are run by a sole proprietor, which is an indication of the dominance of such single owner-managed units in SME category. According to industry sources, the amount of start-up equity capital varies, on average, from $14,000 for micro firms to $578,000 for large firms. SMEs entrepreneurs have to rely on equity financing and other forms of non-institutional loans. However, there is little information on term structure of non-institutional loan arrangements that SMEs entrepreneurs may use. The larger tier firms use bank loans to meet their financing needs.

In general, manufacturing units in the plastics sector follow either *Own Account Manufacturing* (OAM) or *Contract Manufacturing* (CM) business models. Own account manufacturers produce their own products, market them and have the full authority over the process. In the local plastics industry most manufacturers operate their own accounts. Own account manufacturers are actively involved in every stage of a product life-cycle, i.e., conceiving business idea, making business plan, setting up production unit, buying raw materials, accessing finance, planning batch production, determining costs and marketing the final product. Larger manufacturers predominantly rely on the OAM business model and market goods under their own brand names.

Contract manufacturing is another business model in which small manufacturers essentially work as third party subcontractors without taking the risk of finding buyers and facing much of uncertainties arising from sales and distribution processes. Under this business model, a CM firm requires a machine and a small place to house that machine, while the principal (i.e., a contractor, who markets the final product) provides moulds and granules. Recently, the industry has experienced a significant rise in this type of business practice as more and more SMEs are accepting this business model as it requires small start-up capital and represents low risk exposure. However, businesses using CM model usually do not enjoy the economies of scale and have little control over the industry value chain. Until CM model firms become big enough to switch to OAM model firms or form alliances establishing common platforms of shared business goals, it is very unlikely that they would enjoy any greater control over the plastics industry value chain.

Although most CM firms produce low-end products using recycled granules supplied by the principals, some CM firms are switching to higher-end product categories. However, as most CM units use relatively low-quality machines, it is difficult to get into the high-end product segment unless they upgrade the equipment.

Bangladesh is experiencing substantial infrastructure and logistics challenges, particularly in Dhaka, where there is the biggest concentration of CM firms. Power outage is rampant and, because of narrow streets, transportation is a major problem. The Government is currently contemplating on setting up an industrial park for the plastics sector SMEs that will include the required infrastructure, utility services and logistic support as well as some other fiscal and financial incentives. It is expected that SMEs of Old Dhaka area will eventually move their facilities to the park. If that happens, positive externalities, including business and technical knowledge spillover, will be enormous. Also, it will be easier for the Government to support SMEs with, among other things, preferential utility supply, the lack of which is a major obstacle for improving productivity and competitiveness of SMEs.

Box 1: RFL plastics – a success story

RFL Plastics Limited is one of the leading manufacturers of moulded household and furniture products in Bangladesh. The company started the operation in 2003, focusing on manufacturing and marketing plastic household products and furniture at an affordable price. It produces more than 300 items of reasonably high quality and superior design. In the manufacturing process the company uses fully automated injection moulding machines, operated by skilled and experienced local and foreign technicians. Due to superior quality, innovative design and product variety, RFL has been established as one of the most preferred brands in the plastics sector in Bangladesh. Recently, RFL has also started exporting its plastic products.

The manufacturing plant is located at Ghorashal, Narshingdhi, in the outskirts of Dhaka, and is equipped with more than 70 injection mould machines operated by 3,000 workers under the supervision of more than 100 technical experts. The company has its own R and D facilities, creating new product design and making simpler moulds. Driven by its success, RFL is currently planning an expansion but is unsure of additional utilities (gas and electricity) supply – 'the most significant obstacle' faced by the industry in general.

3.7. TECHNOLOGY AND EFFICIENCY

At an earlier stage of the plastics industry development in Bangladesh, hand moulding was the standard practice. However, recently machine moulding has largely replaced hand moulding, as it is cheaper and makes superior product. In most cases, mould machines are imported from China, Germany and Taiwan Province of China. Reconditioned machines are also in demand because of a low cost and a quick payback period.

In terms of design, small players usually copy the patterns from larger manufactures' plastic products. SMEs order local mould manufacturers to make moulds replicating the products of large manufacturers. Even large manufacturers often copy design patterns from other manufacturers or imported products. Manufacturers give sample products to mould makers located outside the country (usually in China) and order the necessary number of moulds required.

Presently, capacity utilization of the plastics industry, particularly of SMEs, is suboptimal. A number of factors are contributing to the inefficient operation. The most prominent of the factors are: frequent power failures (locally known as "load shedding"); semi- or unskilled labour; frequent breakdowns of machines; and a severe shortage of technical personnel for maintenance.

The situation is particularly bad in the Dhaka area, where the largest clusters of the plastics sector SMEs are located. Frequently, particularly in summer, the firms experience five to six hours of 'load shedding.' Productivity is badly affected by sharp fluctuations in power supply and frequent energy shortages. However, large firms rely on generators (primarily gas-based) to ensure uninterrupted power supply and hence enjoy higher productivity. Since early 2009, even large firms have experienced difficulties with their planned expansion projects as the Government stopped providing new gas supply connections.

In most SMEs, workers are hired untrained and placed under the supervision of an experienced worker for about a year before they can start working independently. The productivity of such labourers is rather low as they are not adequately trained and frequently rely on trial and error in their work. Unfortunately, unskilled workers constitute a significant portion of the total workforce of SMEs. As soon as the workmen acquire the skills, they leave for higher salaries in larger enterprises. As a result, SMEs continue to suffer due to a lack of skilled workers. The situation contributes to constant low productivity and low capacity utilization in most of the smaller production units.

Since SMEs in the local plastics sector usually use reconditioned machines (typically five to 10 years old), the technological production level is pretty low. As a result, frequent breakdown of machines is a common phenomenon. But unfortunately, the sector suffers from a severe shortage of technical personnel for repair and maintenance. Sometimes it takes days and even weeks to get a broken machine repaired, which keeps the machine idle and leads to low capacity utilization.

3.8. POTENTIAL FOR UPGRADING AND CHALLENGES

The plastics sector in Bangladesh has an enormous potential for upgrading machinery and making quality improvements in mould manufacturing. Only a handful of manufacturers use new machines mostly imported from China. Machines from Germany are considered expensive and require long payback periods. All long-term investment decisions are considered risky and full of uncertainties. Entrepreneurs are reluctant to invest in costly technology because of the low confidence in the Government policies and regulations. For example, in the early 2000s the Government abruptly banned thin plastic shopping bags. While the rationale for the Government decision could be explained, its hasty implementation was highly detrimental for the sector as many SMEs suddenly went bankrupt, losing their source of revenue. Such rushed Government decisions make entrepreneurs feel uneasy when they contemplate substantial investment by purchasing brand new machines required for producing high-end products to compete in premium market segment. Other major negative impacts are the shortages in electricity and gas supply, the unavailability of skilled labour and a lack of access to capital.

3.9. QUALITY PARAMETERS

Maintaining quality of plastic products requires a presence of certain factors that are elaborated upon below.

- *Raw materials:* Low quality raw materials make products fragile. Products made from low quality recycled raw materials become inferior quality products and break down easily. Another problem with recycled raw materials is the loss of elasticity during recycling. As a result, products made of recycled raw materials often fail the load test, a major quality parameter for such products as plastic furniture.[19] For this reason, producers of high-end goods do not use recycled raw materials.
- *Additives:* Poor quality chemicals and additives reduce the smoothness attribute of a product. Chemicals imported from Germany are of superior quality though rather expensive. Chinese additives are cheaper but they do not provide as much smoothness as the German additives do.
- *Design:* Customers look for products with superior design, wide variety and high quality finishing. However, local SMEs fail not only to produce innovative designs but also to come up with nice finishing. Nevertheless, though plastic products of larger firms are a better quality, large firms' production capacity at present is insufficient to cover the market demand.
- *Machinery:* Use of reconditioned machines affects product quality. To protect the premium segment of domestic market from foreign competition and to capture the export market, manufacturers need to use new, state-of-the-art machines.
- *Workforce:* Machine-operating skills are important for producing smooth and well-finished products. Workers with such skills are not readily available in Bangladesh and, therefore, SMEs are particularly affected by the situation because, unlike large manufacturers, they cannot provide in-house training or employ formally trained technicians.[20] Consequently, SMEs have to rely on whatever labour force is available in the job market and train them through informal apprenticeship. An untrained workforce costs SMEs dearly in terms of consistency in product quality.

3.10. MARKETS AND MARKETING

The plastics market in Bangladesh can broadly be divided into two segments: domestic market and export market. Both the domestic and the export market can further be subdivided into two segments: business to households/customers (B2C) market and business-to-business (B2B) market. B2C market carries no specifics: household customers irrespective of their age and sex use plastic products. However, the desired product quality varies according to customer income and social status. All

[19] Usually extra amounts of raw materials are added to offset the lack of elasticity.

[20] Large manufacturers occasionally hire technical experts from abroad, mainly from India to train local staff.

B2C transactions are made at the retail level. In contrast, B2B customers buy directly from producers: they buy wholesale and receive a discount that reduces the cost. Many of them call for competitive bids, known as 'tenders', asking the interested parties to quote prices against a given specification. The manufacturers submit price quotes. The B2B buyers then select the party that meets both the technical and the financial criteria. Such competitive bidding is popular among B2B clients from sectors such as edible oil, RMG and fast moving consumer goods. However, once a trustworthy relationship is established with a B2B client, the client relies on the same producer and place repeat orders. Popular B2B products include office furniture, pharmaceutical accessories, RMG accessories, containers, PET bottles, packaging materials, construction pipes and wristwatch bodies. However, the RMG sector has been the largest B2B market segment that essentially drives up the deemed export of plastic.

The domestic market for plastic products in Bangladesh is likely to grow for several reasons. First, given a large number of population and, therefore, a big domestic market[21] for mass consumer goods, the plastics sector in Bangladesh could enjoy high growth potential. Second, Bangladesh so far has very low per capita consumption of plastic products. Third, further economic growth and development in Bangladesh as well as in the region are expected to continue in the coming years, which would result in an increased demand for plastic products. Fourth, new types of plastic products should be introduced in the market and consumers are most likely to purchase these new products for their usefullness, cost, durability, functionality and design Many domestic entrepreneurs are considering expansion to take advantage of the unfolding opportunities in the plastics industry development.

Domestic business consumers/markets for plastic products can be classified into subsectors such as packaging, construction, pharmaceutical, consumer products, agriculture, transportation and other industries. The packaging industry has been under strict regulation after the ban on the use of thin polythene shopping bags in 2001. Both the local and export markets for packaging materials are growing steadily. The RMG sector continues to be the largest consumer of packaging materials while the growth in packaged food market has led to a surge in the demand for food grade packaging. In the pharmaceutical industry, there is also a huge demand for high quality food grade packaging materials. So far, only a few manufacturers have managed to enter the pharmaceuticals market and than only in packaging products for insecticides and pesticides. The agricultural sector is also becoming a major consumer of plastic products as plastic pipes are used extensively for irrigation purposes. Also, farmers are now using plastic film for shedding crops. Plastic containers, boxes and cartons are gaining popularity for bulk packaging and transportation of agricultural products. In the construction sector PVC pipes, plastic fittings, plastic doors and other products are the major items consumed. In the consumer goods category major items constitute domestic utensils, kitchen and tableware, toys and plastic furniture.

The current scenario of the plastics sector in Bangladesh could be seen as both a mine of opportunities and threats. On one hand, impressive growth is highly likely

[21] Export market was discussed in detail in section B of this chapter.

even if the sector is driven only by the domestic market. Of course, the emerging export trend indicates numerous market opportunities abroad as well thanks to the Bangladeshi advantage of low-cost labour. On the other hand, the plastics sector could face fierce competition from other Asia-Pacific countries both at home and abroad, as international trade barriers are eroding fast. Domestic market for the plastics industry in Bangladesh is quite large and, according to industry players, demand far outweighs supply.[22] As a consequence of persistent supply shortages, a great volume of plastic products (particularly for B2C market) is imported, mainly from China. Although the market for plastic products have grown quite rapidly, Bangladeshi entrepreneurs are yet to avail themselves of these opportunities as customers find the imported items to be of better quality and lower priced.

3.11. MARKET ACCESS

SME manufacturers are facing significant difficulties in accessing the market while large manufacturers are in a better position in overcoming such difficulties and getting an access into the plastic markets. The difference between large companies and SMEs lies in the former financial strengths, entrepreneurial capabilities and vision, marketing wisdom and fair business model. SME manufacturers, typically non-brand manufacturers, often have to sell their products at a 100 per cent credit to wholesalers because they have no other distribution channel for their non-brand products. Large companies sell their products for a 100 per cent advance cash payment. They have created brand names for their products over the years through promotional campaigns, dedicated sales force and consistently good quality product. Unfortunately, this is not the case for most SMEs, which constitute more than 98 per cent of all manufacturing units in Bangladesh. As these manufacturing SMEs fail to control a value chain, they are unable to create value for themselves and all the benefits go to other players along the industry value chain. Thus, sadly for SME manufacturers, the vicious circle continues.

As for the export market, SMEs are not present there because of the obvious constraints already discussed. Large manufacturers are also facing problems in accessing export markets. Their problem is rooted in market intelligence, trade negotiation capability and quality perception associated with the label 'made in Bangladesh.' Large firms in Bangladesh have neither sound international business network nor an access to a well-researched market information bank. There are no professionally trained negotiators to conduct business talks. Bangladesh missions abroad and the related ministries cannot support export promotion and bilateral trade negotiations. Bangladesh Standard and Testing Institution (BSTI), the only quality certifying authority in the country, is not adequately equipped with either laboratory facilities or skilled personnel. As a result, their quality testing process tends to be lengthy and lacks the required credibility.

[22] Although no verified data on import of final plastic goods is found, industry insiders unanimously confirmed the fact of a huge demand-supply gap.

3.12. DISTRIBUTION CHANNELS

There are several types of independent market intermediaries, such as importer, wholesaler, retailer and hawker.[23] These intermediaries usually deal with imported products and the products of SMEs (having either OAM or CM arrangements). Large manufacturers have their own distribution channels – of varying nature and depth – to cover the whole national market. The usual channel is a distributor-dealer-retailer network, which is nurtured by a manufacturer in-house sales and distribution teams. These intermediaries are independent business entities working closely with manufacturing companies acting as real partners in the business. Some of the large companies run their own showrooms in important locations all over the country. Also, in case of B2B, products are delivered directly to the client firms.

Small manufacturers search for the wholesalers to sell their products. Medium manufacturers typically use the same marketing channel as small manufacturers (i.e., wholesalers); however, some of them sell goods in their own names and have their own shops in major wholesale markets. Large players employ distributors for marketing their products. For example, RFL Plastics, the biggest consumer plastic products maker in Bangladesh, has (approximately) 1,500 dealers around the country. These dealers deliver the products to retailers.

3.13. PROMOTIONAL ACTIVITIES

Trade fairs have so far been a major collective promotional tool for Bangladeshi plastic manufacturers. This initiative is helpful in gaining an access to the export market. Although deemed export constitutes a major portion in the export of plastic products from Bangladesh, some large manufacturers have embarked upon identifying the ways of accessing the global market through direct export of plastic products. Recently, a number of plastic manufacturers from Bangladesh participated in international trade fairs abroad, particularly in developed countries, and received orders from new customers. Participation in foreign trade fairs and exhibitions is an effective tool in exploring the new markets and strengthening trade relationships in the old markets. Similar and related activities, serving the same purposes include trade missions, buyer-seller meetings and new product launching events.

Trade fairs have also been arranged in Bangladesh. Some of these fairs are general trade fairs, open to all industries, and some are industry-specific fairs. One of the largest trade fairs is Dhaka International Trade Fair (DITF), which is held every winter and it lasts a full month (usually January). The plastics sector industry in Bangladesh organizes industry fairs regularly and plans to have them more frequently. Such trade fairs provide the local plastics industry with an opportunity of presenting their products to both the local and global markets.

Mass media, such as television and print media have helped large manufacturers to promote their plastic products to domestic market audience. But advertising is something SMEs cannot afford.

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[23] A small, door-to-door, retailer.

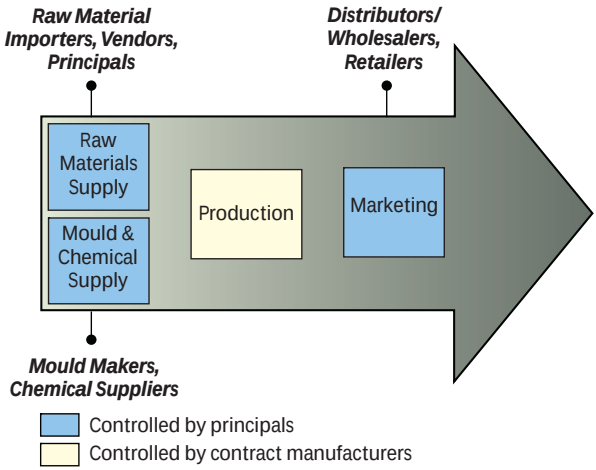
Some companies offer warranties for their products. For instance, Tanin and RFL Plastics (two very popular names in the plastic furniture market) offer 'life time warranty' for their products. This mechanism allows customers to pay only half of the original price of the damaged product and obtain a replacement. Such promotional offers are increasing as the industry matures.

Relationship marketing has been another vital element particularly used for B2B markets. Entrepreneurs hire skilled marketing professionals to find potential corporate buyers and develop long-term relationships with these corporate clients. Sometimes entrepreneurs develop personal contacts with corporate buyers to procure large or strategically significant orders. Good and long-term business relationships with corporate buyers help manufacturers secure an uninterrupted order flow for many years.

3.14. VALUE CHAIN GOVERNANCE

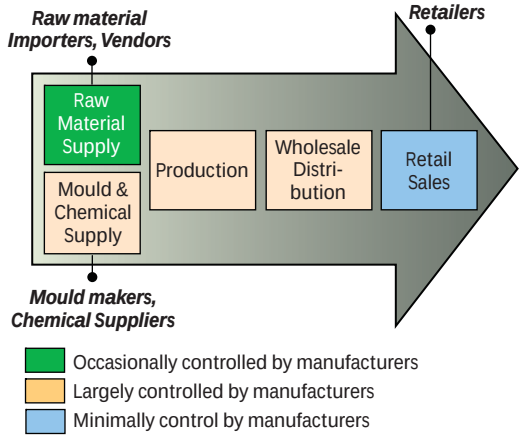
Governance of a value chain (i.e., a degree of control by an agency over an entire value chain, supply chain or production network) in the plastics sector in Bangladesh varies, depending on the size of a manufacturer and the business model (CM and/or OAM) used. With small contractual (CM) production, the contract principal (a wholesaler or a corporate buyer) supplies raw materials and necessary mould/s to SME manufacturer. The manufacturer's role is limited to final product manufacturing as required by the principal. In most cases the principal would even make transport arrangements for delivering raw materials and moulds and picking up the finished goods as it guarantees full adherence to the schedule. In this case, the value chain is fully governed by the principal who only pays the CM unit for labour and production facilities and utilities costs plus the margin. Such principals control the entire value chain. However, there are uncertainties still faced by value chain players, such as the international market price fluctuation, lead-times and so on. The value chain governance is further illustrated in figure 6.

Figure 6: Value chain governance for small contractual manufacturers



Large manufacturers usually import raw materials themselves. They also import moulds and produce plastic goods on their own account. They mainly use their own brand name and market their products in Bangladesh through either their own distribution channels or through designated agents or some kind of hybrid arrangement. Large manufacturers are mostly vertically integrated companies and therefore govern the majority of their value chains. However, manufacturers who do not import raw materials directly are dependent, to some extent, on raw materials importers. The balance of governance in the latter case depends, among other things, on the fluctuation of raw materials prices in the international market, purchase volume and timing. The value chain governance for large firms is illustrated in Figure 7.

Figure 7: Large manufacturers' control of value chains



4. Competitiveness of the Plastics Industry in Bangladesh

The competitiveness of any industry depends on several key factors, including the availability of support industries/services, access to finance, human resources, quality standards and certifications, policy and regulatory framework and infrastructures. If any of these factors are missing, the industry may loose its competitiveness. Several key factors, determining the competitiveness of the plastics industry in Bangladesh, are presented below.

4.1. SUPPORT INDUSTRIES/SERVICES

Support industries play an important role in the plastics sector in Bangladesh. That is particularly true of equipment suppliers and recyclers, two important support players, as the quality and, in turn, the competitiveness of plastic products largely depends on them.

Mould making industry

Besides the presence of the skilled workforce and plastic granules and additives fine attributes, the quality of final plastic products depends on the quality of moulds. However, the mould making industry in Bangladesh is still at its nascent stage and high quality moulds are largely imported from foreign countries. Many local mould makers in Bangladesh work using traditional methods. Only a few of them have modern mould making equipment such as EDM, pantographs and CNC milling machines.

There are mainly two types of customers using moulds in the plastic goods manufacturing industry in Bangladesh; (i) small and medium plastic goods manufacturers; and (ii) large plastic goods manufacturers.

Small and medium plastic goods manufacturers depend on moulds supplied by local mould makers – directly in the OAM model and indirectly (i.e., through principals) in the CM model. Made of low quality steel,[24] using traditional trial and error production method, these moulds cannot provide precision and quality required for certain types of plastic products.

However, as large manufacturers aim to produce export-quality product made with high precision, they depend mainly on imported moulds, which are more reliable and longer lasting than the local ones. Before a large plastic goods manufacturer introduces a newly designed product in the market, the firm sends a sample product design to a foreign mould maker, who produces the mould in accordance with the sample. Most new moulds are imported from China and India. It is a known fact that Chinese moulds have advantages over the Indian ones both in quality and cost.

The sizes and shapes of imported moulds vary from small (used for production of household items) to large (used for production of furniture). Prices for moulds also vary from $2,890 (small size mould) to $72,254 (large size mould). However, imported moulds include problems such as longer lead times, higher costs and the absence of after sales services. Local manufacturers cannot change product designs rapidly using imported moulds.

SME manufacturers repair moulds (and machines) hiring technicians who are not readily available locally. Large manufacturers normally have in-house engineers and technicians for repair and maintenance work. Large manufacturers' expert technicians usually receive their technical training (in most cases facilitated and funded by their employers) in China. Some of technicians come from other machine exporting countries to Bangladesh.

Machine importers generally offer three years of replacement warranty for both electronic and hydraulic brand new mould machineries imported from China. They also offer one-year free service that is provided by Chinese producers and can be extended to up to five years at their expense, creating goodwill in the market.

[24] Scrap metal from old vessels.

Recycling

Recycling is a crucial support industry for the plastics industry all over the world and it is one of the most important factors for the long-term growth and survival of the plastics industry. As large numbers of manufacturers, especially in the SME segment, are using recycled raw materials, recycling carries a lot of economic (besides environmental) importance. By using recycled granules manufacturers can cut the cost of raw materials by almost half. Although there are ample examples of good practices in plastic recycling around the world, Bangladesh is yet to learn from such cases. Recycling in Bangladesh is hindered by poor waste disposal and management culture and the use of primitive processing technologies.

There are three technical/operational aspects involving recycling that determine the quality of recycled granules. These aspects are the following:

- Proper washing of contaminated plastics;
- Manual or mechanized sorting; and
- Quality of processing equipment.

In addition, there are some significant compliance issues, including:

- Health and safety of plastic collectors, sorters and recycling factory workers;
- Environmental consequences of recycling process; and
- Rules and regulations involving use of recycled granules.

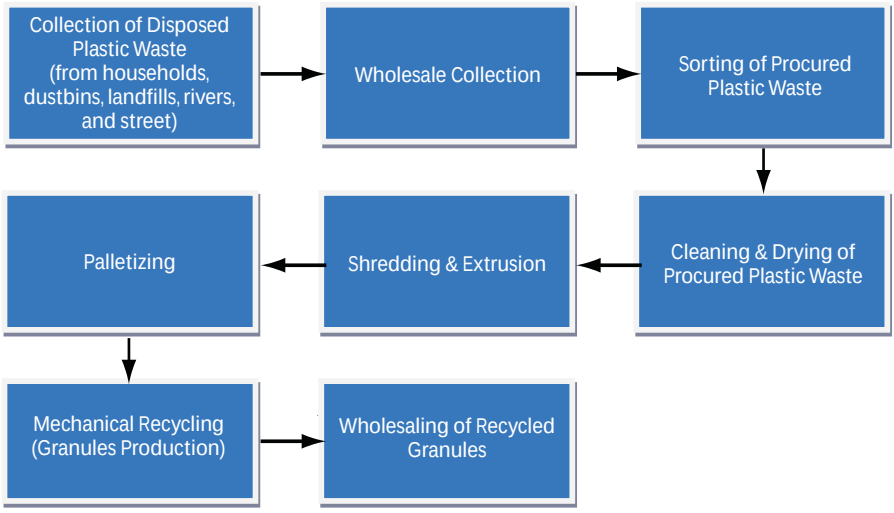
Unfortunately, the recycling subsector in Bangladesh demonstrates poor compliance on most of these issues. Although, on the environmental issue the recycling subsector, to some extent, is keeping the plastics industry afloat by reducing the likely environmental damage and this is in spite of the fact that plastic waste disposal and recycling system are yet to be standardized and modernized, which pose a tremendous threat to the economy. The recycling subsector deserves an immediate attention from all parties concerned, particularly from the Government of Bangladesh.

The recycling practice in Bangladesh is still highly dependent on manual processing. The process can be broken down to a number of steps. Figure 8 presents the flow diagram of a typical recycling process of plastic waste in Bangladesh.

In developed countries wastes are disposed of and collected in accordance with different categories. This means different types of waste are disposed of separately. In Bangladesh, all types of waste – starting from kitchen waste to paper waste to plastic waste to metal waste – are disposed of and collected together. Plastic wastes are generally collected from households by hawkers and from waste disposal bins by street collectors.

After plastic waste is collected, it is sorted out manually according to categories, which is very time consuming and inefficient. Plastic wastes are sorted out by the degree of cleanliness (dirty or clean), by plastics type (thermoplastic or thermoses), by category (PP, PE, PS, PVC), by colour and by product type (bottles, bags, films and sheets).

Figure 8: Plastic recycling process in Bangladesh



In Bangladesh, labourers who sort the plastic wastes do not often have adequate knowledge on the plastic type and category. They sort out wastes by product type (e.g., plastic bottles and plastic packs). They can not differentiate among materials of which similar types of products are made. For example, different plastic bottles are made of different types of plastics. As a result of this type of sorting, different types of plastic materials stay together, which affects the quality of recycled granules.

After sorting according to types, plastic waste is sent to a mechanical recycler for cleaning and drying. Plastic waste is washed with the water coming from the nearby water sources, such as rivers, canals and ponds. Drying is done naturally by exposing the washed plastic waste to the sunlight. However, substances like dust, germs and other contaminated materials remain on plastic waste after poor and inadequate washing.

After the drying, plastic waste goes through shredding and extrusion and is prepared for palletizing. Shredding can be done by scissors, shears, saws and so on. Shredding is done for the following reasons:

- To reduce larger plastic waste to smaller fraction sizes that could be managed by smaller machines;
- To make storage and transportation easier; and
- To prepare plastic waste for further processing.

After shredding the plastic waste goes through palletizing, the final step in recycle process. Here the shredded materials are melted in a palletizing machine and transferred into recycled plastic granules.

However, the recycling process, as discussed above, does not produce high-quality recycled granules. The reason for that is the absence of automated sorting and cleaning. The existing practice of plastic waste processing yields granules of inferior quality (compared to imported recycled granules). Inferior quality recycled granules also mean inferior quality finished products. That is why locally recycled granules are used mainly by SMEs producing non-branded, low quality products.

Nearly all the equipment used by recycling sector SMEs in Bangladesh is made locally. Since the recycling equipment is not technologically complex and the recycling subindustry is at its nascent stage, locally made machineries have so far proved to be good enough to support the recycling SMEs. However, as the plastics industry matures and waste management culture improves the demand for better recycling machineries is expected to grow. And, this is another area of potential technology upgrading.

4.2. ACCESS TO FINANCING

Like any other SMEs, the plastics sector SMEs are facing severe constraints when it comes to access to financing. Bank loans that could have been the main source of financing are extremely hard to obtain. There are a number of reasons for this, including:

(i) Banks' reluctancy to provide loans to SMEs;

a. Loan sizes are too small to deal with. Given the fixed interest rates, the profit received from such a small loan is not attractive enough. On the other hand, banks cannot charge a higher interest rate both for market and non-market reasons. The market reason — a higher price would result in low demand — and the non-market reason – numerous requirements and formalities would have to be complied with.

b. The perceived risk is quite high. SMEs hardly possess the collaterals required by the banks as security.

c. Accounting practice is poor. Proper financial documentation and accounting are not part of the SMEs business culture. Most of SMEs follow the traditional way of bookkeeping, writing down all the entries in a notebook and performing some simple computations at the end of a certain period.

(ii) SMEs' reluctancy to ask banks for loans.

a. Banking environment is too complex for SME entrepreneurs. SMEs perceive banks as inaccessible and banking officials as unapproachable.

b. The low educational level of SME entrepreneurs is a major obstacle. Lack of education prevents them from becoming accustomed to official requirements and formalities of the bank.

Although there are state-owned commercial banks mandated to finance SMEs, their performance is rather poor. However, there are some positive developments. For example, BRAC Bank, a local commercial bank, is aggressively marketing SME loan schemes. For the past four decades the bank has successfully managed one of the

world's largest micro-finance institutions. Seeing BRAC Bank's apparent success with SME loan schemes, more commercial banks are moving in this direction. This shift is also triggered by policy interventions and incentive schemes recently declared by the Government. For example, the central bank of the country provides commercial banks with low rate funds to be offered to SMEs as loans at an interest rate of 10 per cent (as opposed to the regular rate between 14 per cent and 16 per cent). However, there is a ceiling on SME loan amount – it cannot exceed $15,000, which is considered insufficient to make a serious investment. Furthermore, small enterprises are finding even such loan programmes difficult to access for the reasons mentioned earlier. Consequently, the government policy interventions and incentives have remained ineffective.

4.3. HUMAN RESOURCES

Like the SMEs in any other sectors, the plastics sector SMEs are constrained by the shortage of skilled workforce in many important areas, including technical, entrepreneurial and business management. Although the country has an old-fashioned vocational/technical education system, the number of graduates is small and the quality of education is poor compared to the real market demand for skilled manpower both at home and abroad.[25] Of course, some SME sectors enjoy good specialized training institutions. These sectors are: glass and ceramic industry; leather industry; textile industry; and garment industry.

The plastics sector does not have any formal training institution and has to deal with unskilled (and, in the case of SMEs, uneducated) workforce. Only a few large enterprises can afford to invite expatriate trainers (primarily from India) to offer in-house technical training. SMEs have to place their unskilled employee under a supervision of an experienced worker for on-the-job training hoping that the new employee, once trained, will continue to work for them. Sometimes SMEs are lucky, but most of the time they are not. Many SME workers, after acquiring the necessary skills, tend to leave the firm and join larger companies at higher salaries that SMEs cannot afford to pay. As a result, SMEs have hardly any return on their investment in human development struggle with the low productivity of unskilled workers.

[25] Two major factors contributing to this dismal scenario are capacity constraints and systemic failures. With regards to capacity, the country has a significantly smaller amount of technical/ vocational institutes than it requires. Moreover, most of the technical/ vocational institutes are constrained by either its physical infrastructure or human resources or both. With regards to systemic failure, there are at least two issues that need immediate attention. First, the system has largely failed to attract potential students to the vocational/technical training stream. Second, the macro level failure in the reduction of the widespread poverty has resulted in low educational attainment becoming a bottleneck to demand-driven education and training. The search of means for survival forces most of the students of these vocational/technical institutes look for any kind of job – be it a low paid job or an easy, less costly certificate or degree. Ironically, the good news for SMEs is that these young people can be hired for a low wage but the bad news that comes together is that these new recruits are not skilled/educated or, at best, 'inappropriately educated' (in areas that has no relevance to the work where s/he is put in).

There is no specialized institution for entrepreneurship development training in the country. Although there has been a burgeoning growth in the number of business schools since the 1990s, their contribution to entrepreneurship development is insignificant, if existing at all, particularly regarding entrepreneurship training for the plastics sector. Though there are graduates in business administration coming from over 50 business schools but the plastics sector SMEs cannot hire them as SME salaries are too low.

Under such circumstances, the plastics sector SMEs is severely constrained in building up its competitive strength. All the constraints hinder market access for SMEs both domestically and internationally.

4.4. STANDARDS AND CERTIFICATION

Standardization and industrial certification are mandatory requirements for SMEs willing to become globally competitive. SMEs in Bangladesh, mainly serving the local markets, however, have yet to become seriously involved in the standardization and certification processes. The Bangladeshi plastics industry needs to adopt adequate standardization system and obtain international industrial certification in line with quality improvement. Currently, no international standard certification (such as ISO) is adopted in the local plastics sector, except for some large enterprises. Also, consumers are unaware of quality certification issues.

National

Appropriate standardization techniques for plastic products are yet to be developed in Bangladesh. Bangladesh Standards and Testing Institution (BSTI) is responsible for certifying product standards in Bangladesh. BSTI is incorporated under the law entitled "The Bangladesh Standards and Testing Institution Ordinance, No. XXXVII of 1985." Tasks of BSTI include preparation of standards for all articles, products, methods and services. To protect consumer rights, BSTI often comes up with a mandatory certification scheme under which certain products need approval from BSTI before they are marketed. Food items, chemicals and jute-related products are mostly certified under this scheme. Unfortunately no standardization benchmark has been set to measure the quality of plastic products in Bangladesh. Only one product, namely "table wear made of melamine plastic" is brought under mandatory certification under BDS (Business Development Services) code 1425:1993.

International

Some trade organizations have come up with standards for plastic products. In 1988, Society of the Plastics Industry (SPI) developed resin identification code (RIC) system, identifying six thermoplastic resins most commonly used in manufacturing bottles and containers, in order to facilitate sorting during recycling process.[26] The resin types, identified in the SPI system, are as follows (PackagingLaw.com):

[26] *Society of the Plastics Industries (SPI):* SPI is a body for monitoring and developing codes and standards for the plastics industry at a global level. SPI is a United States-based trade association,

- Polyethylene terephthalate (PETE)
- High density polyethylene (HDPE)
- Polyvinyl chloride (PVC or vinyl)
- Low density polyethylene (LDPE)
- Polypropylene (PP)
- Polystyrene (PS), etc.

SPI is working with the American Society for Testing and Standards (ASTS) International to adapt the RIC system to international standards for the universal application. ASTS has been developing standards for marking plastic products based upon the RIC system developed by SPI in the 1980s. The proposed new standard WK20632 "Practice for Marking Plastic Products for Identification in Reuse and Recycling" is intended to facilitate the recycling of plastic articles through increasing the number of recyclable materials while expanding the types of covered products to other resin types.

It is clear that developed countries, such as the United States of America and the European Union countries are adopting standards mainly for sorting and recycling purposes. If sorting is not done according to the resin type and the recycling process continues regardless of the type of plastics, the quality of the recycled resins will degrade. Unfortunately, Bangladesh has not yet developed such standards to sort various types of plastic wastes properly. Therefore, locally recycled plastic granules are not on par with international standards and, as a result, most of small and medium manufacturers are losing export competitiveness.

Compliance

Bangladesh lacks resin identification code (RIC) system for efficient recycling and, so far, no steps have been taken to develop this standard. Global standards of recycling practices should be adopted to ensure the long-term sustainability of the sector. Many manufacturers are unaware of the requirements of such standards that would ensure environmental protection.

It should be noted that full compliance with environmental and health regulations is a serious concern for the plastics sector because of the very nature of the plastic products. Poor waste disposal and management system and the harmful impact caused by the inefficient and improper treatment of plastic wastes are two other serious issues. The health effect on both consumers and workers, particularly in the recycling segment, is a major source of concern. Many research studies and advocacy campaigns have been conducted to ensure occupational safety and good working conditions for

with headquarters located in Washington DC. SPI's member companies include the entire plastics industry supply chain: processors, machinery and equipment manufacturers and raw materials suppliers (www.plasticsindustry.org). SPI's activities include alerting its members about code and standard based issues that may impact plastic industries, ensuring that the members express their opinions in code and standard making processes. It also cooperates with the WTO in implementing regulations, codes and policies for plastic industries. Bangladeshi manufacturers are still not very aware of all those provisions of SPI.

the garment industry workers, but little attention has been paid to those working in the plastics sector. Although the country's labour laws are applicable to the plastics sector as well, awareness is depressingly low, and enforcement of the laws is severely weak.

4.5. POLICY AND REGULATORY FRAMEWORK

The plastics industry in Bangladesh, operating under regulatory and institutional framework encouraged by the Government, is promoted through various incentives. Achieving global value chain competitiveness largely depends on how the framework facilitates and promotes the future development of the plastics industry.

Bangladesh Investment Regime

To promote investment, the Government of Bangladesh has liberalized its industrial and investment policies over the past couple of decades by introducing pro-business policies, reducing administrative control and opening up many areas for private sector investment. Major incentives for all kinds of industrial enterprises are as follows:

- Tax exemptions: Generally five to seven years. However, for power generation, exemption is allowed for 15 years.
- Export/Import Duties: No import duty on raw materials (and in some cases machinery) for export-oriented industries. For other industries it is at five per cent ad valorem.
- Tax law: Double taxation can be avoided when foreign investors operate on the basis of bilateral agreements.
- Exemption of income tax: Up to three years for the expatriate employees in industries specified in the relevant schedule of income tax ordinance.
- Remittance: Facilities for the full repatriation of invested capital, profit and dividend.
- Exit: An investor can wind up an investment either through a decision of an annual general meeting (AGM) or an extraordinary general meeting (EGM). Once the foreign investor completes the formalities to exit the country, he can repatriate the sales proceeds after securing a proper authorization from the central bank.
- Ownership: A foreign investor can set up a venture either as a wholly owned operation or as a joint collaboration with local partners.

SME Policy Strategies

Bangladesh aims to create a market-based economy with a level playing field for all enterprises, where SMEs can aspire to grow and create wealth using their own endowments, diligence, innovation and management. Some of the key objectives of the current SME policy include:

- Accept SMEs as indispensable players in growth acceleration and poverty reduction;

- Encourage and induce SME development and promote the growth of FDI, develop code of ethics and establish good governance, ICT-based knowledge management and customer supremacy in the market;
- Identify and establish an appropriate physical and ICT network of infrastructure and institutional delivery mechanism that facilitate the promotion of SMEs;
- Reorient the existing fiscal and regulatory framework and government support institutions towards facilitating the achievement of SMEs policy goals;
- Nurture and partner civil society institution(s) with credible management teams providing the required services, leadership, initiation, counseling, mentoring and tutoring;
- Create innovative and meritocratic arrangements so that small enterprises with the proven entrepreneurial track record and/or promise could be offered financial incentives;
- Help implement dispute settlement procedures that proactively shield small enterprises, especially from the high legal costs and insidious harassment;
- Take measures to create possibility of providing credit without collaterals; and
- Systematically accord precedence to small enterprises over medium enterprises, especially with regards to limited government resources.

While SMEs development policies and strategies in Bangladesh are sound and progressive, the implementation mechanism and institutions, responsible for enacting these policies, require further strengthening in terms of resources, including human resources and financing.

Box 2: Institutional framework for promotion of the plastics industry in Bangladesh

(i) Bangladesh Plastic Goods Manufacturers and Exporters Association (BPGMEA):

BPGMEA is a leading private sector association for all plastic goods manufacturers in Bangladesh responsible for safeguarding the interests of the plastics sector in Bangladesh and developing trade opportunities both nationally and internationally. It deals with matters relating to government regulations, patent rights and import and export regulations. The association also serves as a contact point for overseas companies who want to buy or sell Bangladeshi plastic products.

(ii) Dhaka Chamber of Commerce and Industry (DCCI):

DCCI is the largest and most active Chamber of Commerce and Industry in the country for SMEs. It was established in 1958 and serves as a nonprofit, service-oriented organization. DCCI basic functions include promotion and development of trade, commerce and industry. DCCI provides market-oriented inputs to the Government in the formulation and implementation of policies regarding import, export, industry, investment, banking, insurance, fiscal measures and annual budget. DCCI also liaises with other

international trade related organizations and frameworks, such as WTO, UNCTAD, SAPTA, SAFTA and BIMST-EC. DCCI is an important stakeholder in the plastics industry and other major industries in Bangladesh.

(iii) Small and Medium-sized Enterprises Foundation (SMEF):

SMEF is created as an independent centre for the betterment of SMEs in Bangladesh, under the auspices of the Ministry of Industries (MOI), the Government of Bangladesh. The main objective of the foundation is to promote, support, strengthen and encourage the growth and development of SMEs in all productive sectors of the economy and to plan, programme and finance private sector organizations, including chambers, associations, trade bodies and research and development institutions. It is mandated to facilitate SMEs access to finance by creating and supporting appropriate strategies and institutions. The foundation assists the plastics sector development along with 11 other industrial sectors outlined in SME Policy Strategies 2005 as thrust areas.

(iv) Bangladesh Small and Cottage Industries Corporation (BSCIC):

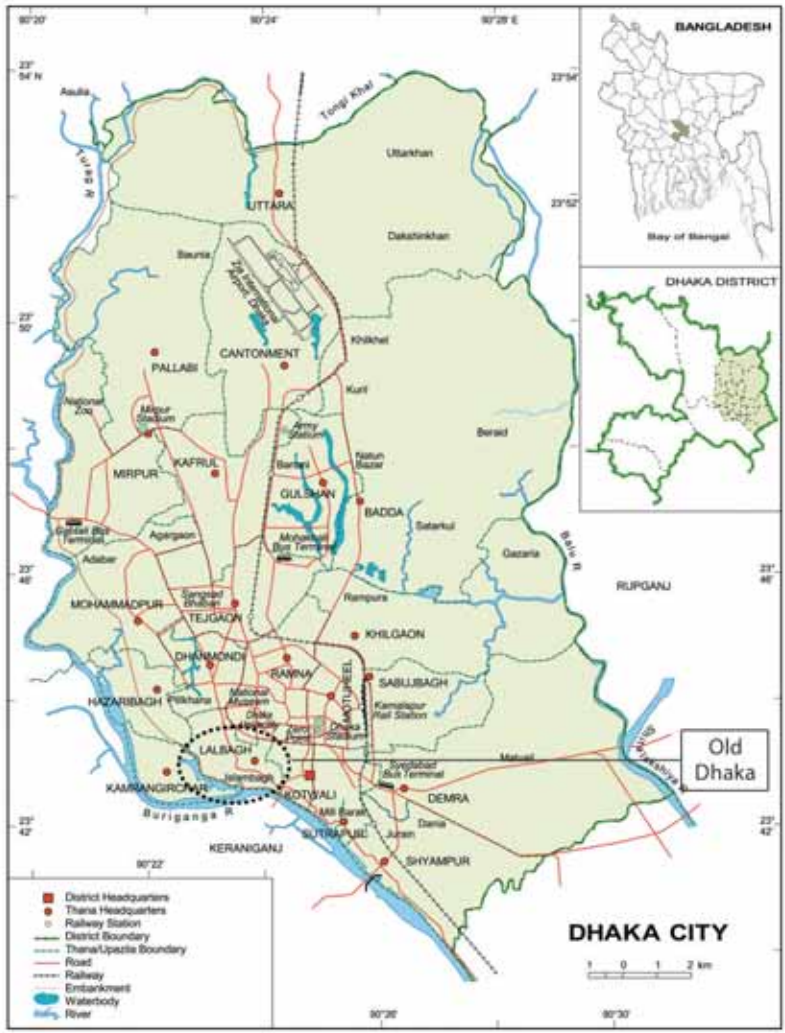
BSCIC is the prime mover organization entrusted with development of small and cottage industries (SCI) in Bangladesh. It is an autonomous corporation that was established in 1957 by an Act of the Parliament, and it operates under the auspices of the Ministry of Industries. It is the successor organization of East Pakistan Small and Cottage Industries Corporation (EPSCIC). BSCIC is mandated to provide: pre-investment counselling, post-investment extension services, technical information, design and prototype of handicrafts, industrial profiles and fact sheets, marketing information, infrastructural facilities, skill development training, entrepreneurship development training, in-plant advisory services and credit facilities to various industrial enterprises, including the SMEs in the plastics sector.

4.6. INFRASTRUCTURES AND UTILITIES

Adequate provision of infrastructural facilities and the supply of basic utilities for the industries are considered a primary requirement for the industrial promotion and growth. As the plastics industry is maturing, becoming one of the key export sectors in Bangladesh, it is most desirable that it be adequately supplied with the required infrastructure for future development. Such key infrastructure, including the transportation and public utilities systems are essential for facilitating effective business activities.

Bangladeshi plastics sector, however, is constrained with constant electric power crisis, as well as insufficient gas and water supply. Currently, electricity is the major hurdle for the accelerated industrial growth in Bangladesh. The plastics industry is highly automated compared to many other industries in Bangladesh, including SMEs sector, and requires stable and constant electricity supply without which the production is impossible. The situation becomes worse in the hot season when electricity demand reaches its peak. Due to the lack of adequate supply of electricity, larger plastic goods manufacturers often run their factories on gas generators. However, due to a heavy load shedding of electricity and an interrupted supply of gas (both of which cause frequent generator shutdowns), plastic producing units have low capacity utilization.

Figure 9: Dhaka City Map



Source: www.banglapedia.org.

Besides electricity problem, SMEs have to deal with irregular water supply and severe congestion of transport infrastructure. As most of the plastic procuring and production units are located in Dhaka area (figure 9) and Dhaka area has dense population, narrow roads, poor traffic management system, outdated and overused water supply system and old building structures, the plastics industry enterprises are experiencing difficulties in developing efficient production and distribution systems. Incidentally, except for the plastics recycling subindustry, water is not a direct element of production process of plastic goods, and therefore the water supply shortage is not such a serious a problem as the crisis of power supply. But if the plastics sector is to thrive at the backdrop of recycling industry, for both economic and environmental

reasons, and at the backdrop of other industries, such as light engineering, it must have access to all necessary infrastructural support required for its core operations as well as for its support industries. This very fact makes a strong the case for a development of an independent special industrial park for the plastics sector (along with its core linkage industries).

5. Strategic Analyses

This section of the study presents SWOT and triple triangle framework (TTF) analyses and identifies major impediments to the growth of the plastics sector in Bangladesh. Both types of analyses create a basis for business competitiveness action plan proposed in the next section.

5.1. SWOT ANALYSIS

Strengths

The major strengths of the plastics industry in Bangladesh include, among other things, a large pool of entrepreneurs, simple technology and trusted collaboration among value chain partners.

- One of the main reasons the plastics industry in Bangladesh is developing at both the small and medium levels is the availability of cheap labour. In general, SME entrepreneurs in Bangladesh work with relatively low profit margins and low wages compared to not only developed countries but also to many developing countries in Asia and the Pacific, particularly India and China.
- The number of SME plastic manufacturers in Bangladesh is as high as three thousand. In addition, many other industries SMEs are engaged at various levels of the plastics industry value chain. Altogether, this presents an indication of enormous entrepreneurial interests within the plastics industry in Bangladesh.
- Increasing trust and collaboration among value chain partners and competitors has resulted in smooth operation within the sector. Also, there is a growing dependence on value chain partners, particularly among SMEs.
- Increasing exposure to external markets has allowed large industry players to benefit from international exposure contributing to deeper understanding of global market dynamics and helping to establish a long-term strategy for export marketing.
- Large fast growing domestic market and domestic demand for low-end plastic products has facilitated the development of local plastic industry, particularly the SME sector. It should be noted that low priced items are in huge demand compared to the existing supply capacity. Also the demand for higher end domestic plastic utensils is increasing and most of large players are expanding their existing projects.
- The plastics industry adopts simpler technologies compared to other heavy industries. Adoption of less sophisticated technologies has led to a growth

of plastic products used by other sectors, such as light engineering sector in Bangladesh.

- A large amount of export earnings (deemed export) from the plastic goods sector comes from RMG export. As the RMG industry in Bangladesh is a mature sector and is expected to grow further, the plastics industry should benefit strongly from the trend.

Weaknesses

Major weaknesses of the plastics industry include weak backward linkages (particularly mould-making facilities), lack of skilled manpower and rudimentary recycling practices. These and other difficulties are elaborated on below.

- Absence of equipment and machinery manufacturing facilities, particularly mould-making units, puts Bangladesh at a disadvantage, as reliance on exports from China and India is pretty costly. This weakness remains a serious one as entrepreneurs are reluctant to invest in equipment/ machinery in an uncertain environment of long-term prospects for gas/electricity supply and the Government policy direction.
- There is a serious shortage of skilled labour in the plastics industry. The situation worsens when it comes to equipment repair and maintenance. The problem is particularly serious for small and medium-sized enterprises because (i) they cannot afford in-house professional training for their workers and (ii) trained labourers leave SMEs to join larger firms to get higher salaries and compensation packages.
- Relying on outdated and traditional technologies makes plastic recycling process unclean and inefficient. The problem gets exacerbated with the existing waste disposal and management system that is not environmentally friendly. As a result, the quality of recycled raw materials remains low.
- The industry lacks uniform quality standards and modern quality control practices, particularly as it relates to the use of raw materials and labelling of material codes. As a result, the absence of level playing field affects fair competition.
- Thare is a lack of long-term vision among entrepreneurs. Most of entrepreneurs in the SME segment of the plastics industry are satisfied with the current level of earnings. They do not actively seek new markets or product diversification. They do not think of exporting their products since the domestic market is large enough for survival. When the local market gets competitive, only then they might look for new markets for survival. This attitude is prevalent in small and medium sized units.

Opportunities

The plastics industry in Bangladesh has good potential for development in both domestic market and export markets. If these opportunities could be capitalized on through policy reforms and other support services, the plastics industry in Bangladesh

could achieve significant growth in the future. The opportunities in domestic market and international markets are described below:

- There are still good prospects in the domestic markets where plastic manufacturers can enter profitably. In the household segment, more expensive wood-based products can be replaced by less costly plastic products. For instance, in the recent years the local market has seen an exponential growth in the demand for plastic furniture. There are other areas where manufacturers can explore the needs and expand the market.
- Presently, Bangladesh produces mainly basic plastic products and possesses a nominal share in the global production. Therefore, there is a huge potential to compete in the international market through product diversification and quality improvements. It should be noted that plastic products global demand has been growing steadily at around 20 per cent a year (in the period between 2003 and 2007). Moreover, deemed export (along with RMG, pharmaceuticals and other products) is also growing at a steady rate. In fact, the growth is seen mostly at the deemed export category. The fact that the developed world is moving away from such export category (particularly in the low-value segment) is creating opportunities for countries such as Bangladesh. The cost advantage in transportation to the eastern India is also a big opportunity to expand the export market in that region.
- Deemed export of plastic goods, influenced by the growth of the RMG sector,is becoming very important over time. The fact that the plastics industry is now working as a backward linkage industry for many local industries, especially the RMG and pharmaceuticals, has created a lot of opportunities for value added within the country. If more forward linkage industries such as food processing, agriculture, electrical and electronics develop and mature, the plastics sector will experience a robust growth. Conversely, if the plastics sector becomes competitive, these forward linkage industries will enjoy cost advantage.
- During the period of July 2007 – January 2008, Bangladesh exported plastic wastes amounted to $6 million. Despite huge demand for recycled raw materials inside the country, these products were exported because of a lack of proper technology for waste recycling in Bangladesh. This also forces the industry to raise the quality of recycled raw materials. Introduction of better technology would not only save the environment but also create huge opportunities for recycling these products domestically and would significantly reduce the reliance on plastic raw materials imported from abroad at high prices.

Threats

The plastics sector in Bangladesh faces threats that constrain its growth. The most immediate threats that should to be addressed are presented below.

- The principal constraint for the growth of the plastics sector in Bangladesh is the recurring energy crisis and frequent electricity blackouts. Despite huge market potential and unsatisfied demand, the industry is unable to produce and expand due to its inability to utilize the existing capacity as the supply of energy has been limited and uncertain. Many SME units are actually finding it difficult to survive because of constant power failures that they experience four to six times a day. Though large manufacturers deal with daily power disruptions by installing power generators, SMEs are not in a position to do so.
- Many of the government policies and practices do not provide enough support to domestic plastic producers. For example, while some government institutions (such as Ministry of Defense) offer purchase tenders, importers of finished products usually get an advantage over the local producers due to a requirement to pay 15 per cent VAT in addition to import tariffs on imported raw materials. Enterprises producing packaging materials for the pharmaceutical industry are facing similar problems. Such policies have a negative impact on the growth of domestic enterprises.
- Bangladesh does not have a proper waste disposal for the used plastics products similar to that of developed countries. As a result, plastic wastes get mixed with other wastes making it difficult to use for recycling. Plastic waste, if not collected and recycled properly, could pose a serious threat to environment and health.
- Since plastic granules price is directly correlated with crude oil prices, a hike in crude oil prices affects SMEs greatly and puts them at a disadvantage in import competition compared to large enterprises.
- The industry might face embargo at any time on the grounds of social and environmental incompliance. The threat is significant for SMEs involved in direct or deemed exports.

5.2. TRIPLE TRIANGLE FRAMEWORK ANALYSIS

The SWOT analysis could be further structured using the elements of the triple triangle framework (TTF), which was mentioned earlier in the introduction (Figure 3.1). The framework focuses on the factors affecting business environment at three different levels. The first level deals with firm's internal factors, i.e., micro-level factors that affect some of the firms more than the others. The second tier deals with industry-level factors, which affect all the firms across the industry. The third tier deals with macro-level factors which include, among other things, the required policy and infrastructural framework.

Firm's internal or micro-level factors

The factors that constrain growth and expansion of firms, include: i) lack of trained and experienced human resources, particularly mould makers, machine operators, and skilled technicians for the repair and maintenance of machines; ii) limited access to formal institutional loans and a requirement of bank guarantee for bonded import of raw materials; and iii) limited current operational activities aimed at survival, lack of plans for future expansion and growth.

Industry-level factors

Competition and non-branded products: Currently, except for some large manufacturers, many plastic sector SMEs in Bangladesh are producing non-branded items. As the local demand is very high, most producers are not concerned with creating a brand name and improving the product quality. Although presently plastics sector SMEs do not experience any problems in the domestic market, they cannot compete at the global level due to a lack of brand names as well as low product quality. The growth could have been much faster and robust, including in the global market, had SMEs put more efforts in product quality improvements and creating brand names.

Collaboration and quality certification: Due to a lack of proper standardization and quality certification facilities, plastic products in Bangladesh are unable to attain recognition in international markets. Though there are institutions willing to assist in quality improvements and certification, but due to the absence of formal collaborative long-term arrangements, the possibilities are yet to be explored.

Improved recycling practices: Poor collection of waste materials and improper recycling practices has been responsible for the poor quality of recycled materials and hence poor quality products. This in turn forces the plastics industry SMEs to rely on expensive virgin raw materials raising the cost of production.

Innovation in production and marketing: There is a huge opportunity to create new demand in the domestic market by introducing new plastic products. Also, large B2B customer segments could be captured if plastic items that are currently imported could be produced locally. Likewise, the role of the country's foreign missions, to promote Bangladeshi products through economic diplomacy, need to be strengthened. Of course, some of government agencies (e.g., Export Promotion Bureau) do occasionally arrange trade fairs and exhibitions abroad to attract foreign buyers; yet these efforts are limited compared to what needs to be done to enter foreign markets and capture the untapped export opportunities.

Technological upgrading: Technology transfer and technology upgrading are necessary to maintain and promote competitiveness. There are enormous technological lags in mould making and recycling in Bangladesh.

Macro-level factors

Macro-level factors affecting the company emerge from a complex interrelationship among the factors that are beyond the control of any specific industry or its constituent firms. The outcome of this interplay influences all the firms in the industry. These factors – mainly linked to governance and state support, globalization dynamics and the interaction of international forces – are the major determinants of the macroeconomic environment in which the industry and its constituent firms operate.

State support: Although Bangladesh offers a predictable policy direction involving the role of market vis-à-vis state (Jahan 2008b), the plastics industry needs a comprehensive and consistent policy guideline from the government to keep up and

accelerate the existing rate of growth. The plastics industry needs a proper government arrangement of an uninterrupted power supply,, the single most important obstacle affecting industry growth. Furthermore, the government should introduce favourable tax policy, establish of specialized industrial zones and increase government purchase. These initiatives would certainly give a huge boost to growth in this sector.

Although the plastics sector is in the list of thrust sectors, it is not included in the first list of Highest Prioritized Export Development Sectors declared by Export Promotion Bureau. As a result, the industry fails to receive such benefits as tax concessions, better access to institutional credit and other preferential facilities awarded to the industries included in the first list of Highest Prioritized Export Development Sectors.[27]

To compete globally, local manufacturers must be proficient in understanding foreign market dynamics and the issue of compliance to international mandates and requirements. Lack of skill and knowledge in these areas makes the plastics industry less competitive globally. Most of entrepreneurs are completely unaware of the relevant provisions in international trade treaties of which Bangladesh is a party. They hardly see any relevance of regional agreements and facilities such as SAPTA, BIMSTEC, EU-GSP, etc. Many of entrepreneurs are unaware of many specific requirements and benefits under the provision of multilateral trade system, particularly the World Trade Organization.

6. Business Competitiveness Action Plan

To accelerate the growth of the plastics industry in Bangladesh, the obstacles discussed above should be removed or minimized and the strengths should be further augmented. To reach this aim, the following actions should be initiated.

6.1. ADDRESSING THE FIRM LEVEL FACTORS

Capacity building

- Skills development programme: To meet the immediate need for the skilled workforce, plastics industry specific training and skills development programme should be initiated, particularly focusing on:
  a. Plastics industry machines operation and maintenance;
  b. Plastics engineering;
  c. Heat treatment;
  d. Quality control;
  e. Mould design and making;
  f. Product design;
  g. Work safety issues;
  h. Waste management; and
  i. Standardization and quality control.

[27] The benefits are granted to the sectors that are included in the official list of Highest Prioritized Export Development Sectors as decided by the Government of Bangladesh from time to time.

Although firm-level actions are required in most of these cases, capacity-building efforts should be launched primarily on a basis of public-private partnerships. BPGMEA, BSCIC, DCCI, SMEF and Ministry of Industries could act as collaborating partners. Special SMEs requirements should be assessed and priority programmes should be organized with the Government support in a cost-effective manner.

If experts are needed from the developing economies having advanced plastics sectors such as China, India, Taiwan Province of China and Thailand, such experts should be hired to organize workshops to provide hands-on training to the local employees. In addition, business visits to those economies can help entrepreneurs get an idea of modern plastics industry practices and assess their applicability in Bangladesh thus improving the local industry practices. In the long-term, a separate department/ institute, like the ones already existing in textile engineering, leather engineering or fashion design should be established to facilitate product development, standardization of production, innovation and market research. The project should be undertaken as either a public sector project or as a public private partnership (PPP).

Capital: access to finance

- Access to credit and availability of financing should improve significantly for the plastics industry SMEs. It could prove beneficial to reduce collateral requirements, educational qualifications and technical conditions so that enterprise growth potential could be the only basis for financing SMEs. In this case the Government could guarantee such loans to SMEs perhaps through public loan guarantee scheme.
- Dialogue could be organized to ensure credit at a lower rate for the plastics industry SMEs. Implementation partners for this project could be Ministry of Finance, Ministry of Industries, Ministry of Commerce, Bangladesh Bank, Commercial Banks, EPB, SMEF, BPC, FBCCI and DCCI, as well as trade bodies, professional associations and Chambers.
- In case of raw materials import, bank guarantee requirement for bonded import should be reduced to facilitate working capital to SMEs manufacturers.

6.2. ADDRESSING THE INDUSTRY LEVEL FACTORS

Industry-wide customer oriented fair competition and strategic collaboration with value chain partners and other stakeholders are critical success factors shaping the sector's competitiveness. These factors are discussed below.

Customer and market access

- Capacity of plastics sector SMEs in Bangladesh should include a wide range of products for domestic and international markets. Creation of new product categories has proven to be a key to success. Some of examples include wood furniture substituted with plastic furniture and metal pipes substituted with PVC pipes. These examples demonstrate the willingness of the local market to accept new products that makes good economic sense.

- Encouraging local industries and institutions (i.e., B2B clients) to use locally made intermediate and finished plastic goods is a smart way of enlarging the market size.[28] Although this is a pure business proposal, the Government has a big role to play in this plan. For example, the Government could facilitate this plan by ensuring, among other things, a level-playing non-discriminatory tax regime.
- Campaigns to identify new and enter the existing export markets should be undertaken under a strategic framework. Campaigns should be supported by extensive market research and should be conducted with the help of private sector firm(s). BPGMEA, DCCI, EPB and the Chambers should take the lead in this regard.
- Trade-fairs and exhibitions at national and international levels should be arranged reach new markets and expand the existing ones. Industry-specific fairs for plastic products should be arranged more frequently domestically and internationally. DCCI, SMEF, BPGMEA, Ministry of Commerce and Ministry of Industries ought to collaborate in arranging such events.

Competition and branding

- Efforts should be taken to create a level-playing field for fair competition for the plastics industry in Bangladesh, particularly addressing the issues of quality, standards and competitive international prices. Such drive should be led by BPGMEA, the main industry association of the plastics sector.
- Establishment of national brands – individually at a firm level and collectively at a national level ("Made in Bangladesh") – is crucial to promote competition domestically and internationally.

6.3. ADDRESSING MACRO-LEVEL FACTORS

Macro level factors, such as technological level, government policies and access to information have an impact on all industries operating within an economy. This is particularly important for the plastics industry, as the sector is emerging as one of the most promising manufacturing sectors in Bangladesh.

Technological support

- *Mould making technology:* Proper mould preparation and maintenance should be achieved in the mould-making industry. Feasibility study of local high-quality mould making industry should done to minimize costs. Institutions such as Bangladesh University of Engineering and Technology should be asked to participate in the study together with plastics industry representatives.

[28] It should be mentioned that, besides the RMG industry, the pharmaceutical industry has recently started procuring locally made plastic packaging materials. Although scores of challenges still exist, the general picture is quite encouraging.

- *Recycling technology:* Introduction of better technology in the recycling industry has become essential for the long-term sustainability of the plastic industry. Proper workshops and training should be arranged to disseminate the technological know- how of quality recycling procedures.
- *Product design technology:* Training services on the use of CAD/CAM and designing software should be arranged to improve product design and innovation. A central research and development cell in BPGMEA should be established to provide support to SME manufacturers.
- *Quality and standardization:* BSTI should be equipped with modern amenities and trained professionals in order to facilitate standardization and quality improvement measures. In the Export Policy 2009-2012, the Government promised to establish proper laboratory facilities and means for standardization (EPB 2009). This factor has a high priority.

State support: policy, infrastructure and institution

- *Uninterrupted energy supply:* The Government should undertake every effort to ensure uninterrupted power and energy supply for at least eight to twelve hours a day. This is a must in order to minimize labour and raw material waste. The industry should have the facility of getting priority power connection and gas supply. Uninterrupted power supply could be achieved by establishing separate power plants – Common Commercial Power Plants – for industrial clusters.
- *Industrial parks:* Establishment of industrial parks for the plastics industry has become a must for several reasons, including: i) ensuring proper infrastructure; ii) nurturing SME producers; iii) providing special uninterrupted utility services; iv) avoiding environmental hazards; and v) ensuring compliance. The decision regarding the establishment of such cluster park should be implemented without delays.
- T*ax regime:* The government should introduce consistent, coherent and pro-business tax regime. It should follow a procurement system (for its own agencies) that ensures level-playing field for all types of industry players. To make the local plastics industry more competitive, the Government could consider offering certain incentives for the firms that are the plastics sector's B2B clients from other industries and that use locally made plastic intermediate goods. Such incentives could be provided in the form of reduced corporate income tax, and/or in any other way that do not conflict with international trade treaties and obligations.
- *Plastic waste disposal:* The Government, in collaboration with other stakeholders, should support public awareness campaigns in order to change the negative attitude that people have about plastic and to educate people about the proper use and disposal of plastic products. The campaigns should be backed by an introduction of an innovative plastic waste disposal-collection-recycling mechanism.
- *Research-based database:* A nationwide sample survey should be conducted in order to create a database for taking informed policy

decisions and providing priority assistance.

- *Sector-specific policy:* There is hardly any coordinated sector-wide policy available for the plastics industry in Bangladesh. Given the sector's potential, the Government should formulate sector-specific industry policy to ensure all-out support for the growth of this burgeoning sector.
- *Certification process:* Registration and other related requirements and processes should be simplified. Currently SMEs are required to have 30 different registration documents, such as registration certificate, trade license, BSTI certification, VAT registration, fire license, boiler license, environmental clearance certificate, etc. from different governmental bodies. SMEs documentation process should be brought under one umbrella in order to reduce the cost of doing business.

International dimension: compliance and beyond

- *Compliance:* Institutional arrangements for foreign markets compliance and requirements should be provided to make local manufacturers aware of the global market mandates and multilateral trade systems. Such counseling should focus on: i) compliance issues; ii) certification requirements; and iii) global business practices.
- *Trade and commercial diplomacy:* Trade and economic sections of Bangladesh's foreign missions should be staffed with business professionals who could represent and protect the country's business interests in bilateral and multilateral trade negotiations and treaties. The trade missions should be backed by proper research-driven market intelligence and sound strategic framework.

National action plan

Table 3.9 presents a comprehensive business competitiveness action plan for the plastics sector in Bangladesh. It outlines strategic goals, objectives, current scenario, actions recommended and parties involved. The Government in collaboration with development partners (e.g., UNESCAP, UNIDO, ADB, etc.) and industry associations (e.g., BPGMEA) should take actions strengthening the value chain competitiveness in the plastics industry and making it a prominent export-earning source.

To reach this goal, a few critical areas that require immediate attention are identified and presented below.

(a) Help SMEs attain cost competitiveness, particularly by ensuring proper infrastructural support through creating industrial parks and providing uninterrupted electricity supply, as well as by undertaking a business feasibility study on mould making in line with public-private partnership.

(b) Ensure sustainable competitive advantage by designing and launching a sound, strategic campaign promoting 'green plastic' in collaboration with other stakeholders.

(c) Develop human resources engaged in manufacturing activities by providing technical skill development programmes. Special training programmes for SMEs entrepreneurship development, mastering managerial and marketing as well as accounting techniques should also be organized.

Table 9: Business competitiveness action plan for the plastics sector in Bangladesh

To become a global market player in the plastics industry reaching a market size of USD two billion by 2015 and USD four billion by 2020 from the current level of USD one billion through sustainable competitive advantage.

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
Goal #1 *Achieving the plastics industry sustainability*	Developing backward linkage capability in mould making	• Some small SME mould making factories are currently producing low quality moulds. These moulds are primarily being used to produce low-end plastic products from recycled granules. All big players are importing moulds from abroad. This, in turn, causes the price of end products to go up as imported moulds are costly.	• Initiate a feasibility study for developing a mould making facility to cater to the mid- and high-end market (Explore public private partnership or FDI joint venture options for establishing a central mould making facility). • Arrange training programmes to develop capable mould manufacturing workforce	Initiation: GoB, JICA ESCAP, BPGMEA Action: IBA, BSCIC, business associations
Goal #2 *Creating favourable business environment for low-cost competitive advantage*	Guaranteeing smooth supply of electricity/gas	• Power blackout is rampant: it happens four to six times a day lasting one hour or so and hampers SMEs production schedules. • Big players are not getting gas supply for extension projects.	• Take immediate actions to increase power generation and industrial gas supply.	GoB and/or GoB-patronized private sector (through PPP arrangement with the support from organized non-resident Bangladeshis (NRBs) and capital markets
	Ensuring policy consistency and providing a long-term policy direction	• Businesses have no knowledge of the Government's future policy direction and, therefore, prefer short-term investment projects to long-term ones, depriving themselves of the benefits of economies of scale.	• Devise and stick to the long-term policy direction, particularly in the fiscal (tax regime) and industrial policy issues.	Initiation: GoB, BPGMEA Action: Market development experts/policy analysts

Table 9: *(continued)*

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
	Removing anti-production (and pro-import) tariff bias	• Although the official tariff on finished products is higher than on intermediate goods and raw materials, government purchase clause often favours imports over local production, as the latter is subjected to a 15 per cent VAT.	• Government purchase decisions and support to other industries (e.g., pharmaceuticals) should not adversely impact local plastic production. • Rationalization of tariff structure creating a non-discriminatory level playing field for domestic producers and importers.	MoF, Government Agencies, BPGMEA
	Promoting pro-business government machineries	• Government officials have negative attitude to business and demonstrate rent-seeking behaviour.	• Sensitization campaign should be designed and run to improve the situation.	Initiation: BPGMEA & MoI/GoB Action: Professionals/private firms
	Formulating dedicated plastics industry policy	• Although the Government is impacting this sector through numerous policy interventions, there is no comprehensive plastics industry policy.	• Given the sector's enormous potential the Government should declare it as a strategic sector and make it a part of the bigger export-oriented industrialization (EOI) strategy.	Initiation: GoB/EPB/MoI Action: Professionals/private firms
Goal #3 *Promoting 'Green Plastic' for sustainability*	Promoting a sound recycling culture	• People are not aware of proper waste disposal and no sound waste management mechanism exists.	• Specialized plastic waste management system MUST be developed. • Sensitization campaigns should be designed and run.	Initiation: Local government/city corporations/BPGMEA/ MoI/ development partners and other stakeholders (media) Action: Professionals/private firms

Table 9: *(continued)*

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
		• If such practice continues, extraordinary pressure will come from environmental and social groups and the industry's sustainability will be at jeopardy.		
	Developing positive mindset among stakeholders	• People are largely ignorant/ unaware of plastic's contribution to saving natural resources in replacing things like wood and iron.	• Highlight eco-friendly aspects of plastic products. • Partner with anti-deforestation and resource conservation campaigns.	Initiation: BPGMEA and MoI Action: professionals/private firms
	Supporting health and environmentally-friendly production and recycling	• Currently, raw material identification code is not used in many cases. As a result, recycling gets inappropriate. • Also, due to improper disposal system and non-availability of sound recycling technology, recycled raw materials are not of high quality and thereby create health and environmental problems.	• Make "Raw Materials Identification Code" legally binding. • Subsidize business operations that promote sound disposal of plastic goods and health and environmentally-friendly recycling.	Initiation: GoB ministries (MoI, NBR/MoF), city corporations, BPGMEA and other industry associations Action: Professionals/private firms

Table 9: *(continued)*

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
Goal #4 *Supporting SMEs*	Providing easy access to finance	• SMEs do not have access to institutional loans due to collateral requirements and a lack of capacity to prepare a business plan. • A good number of SMEs had to face bankruptcy even for a small loan.	• Provide low-cost SME loan. • Offer government guarantees (in lieu of collateral) for deserving SMEs.'	Initiation: GoB (MoI), SMEF, Bangladesh Bank Action: Commercial banks
	Supplying skilled technical workforce	• The sector has severe shortage of skilled workforce (machine operators). Currently SMEs hire unskilled workers who learn on the job. However, good workers leave for big players paying higher salary. So, SMEs continue to suffer. The big players in general train their workforce inviting international trainers from India/China.	• Provide technical training for machine operators on operation, trouble shooting and maintenance of machineries. • Provide advanced training in mould-making in technical universities (e.g., BUET, CUET, KUET, DUET, etc.). • Industry-University collaboration. • Seek technical assistance (e.g., from ESCAP) in this regard. • Explore a possibility of bringing in experts from developed countries to provide training services.	Initiation: BPGMEA – MoE/Univ. Grants Commission (UGC) Technical & Vocational and Education Board Action: Tech Univ. Departments, polytechnic institutes/training institutes, BSCIC, private firms etc.

Table 9: *(continued)*

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
	Supporting entrepreneurship development	• Most of the entrepreneurs are first-generation businessmen and are entrepreneurs by chance. Nearly all SME entrepreneurs lack proper business background. • Many entrepreneurs are happy with whatever they have and do not plan their businesses' long-term growth.	• Capacity building through business development workshops/training. • Sensitization campaign for developing positive entrepreneurial mindset.	Initiation: MoI, ESCAP, BPGMEA Action: Institute of Business Administration (IBA), University of Dhaka
	Providing essential physical and soft-infrastructure	• Most of SMEs are located in old Dhaka that is not an industrial area and lacks basic infrastructure. • There is no central quality management mechanism.	• Implement proposed SME industrial park (SEZ) for the plastics sector (and light engineering and electronic goods as well). • Establish quality management institute.	Initiation: GoB, in collaboration with ADB, BPGMEA Action: IBA and BUET
	Facilitating international market access and national marketing endeavors	• Currently only PET bottle manufacturers get 10 per cent cash incentive. • SMEs are not aware of international market opportunities; SMEs and large firms face sever information insufficiency.	• Make cash incentives for plastic goods exports. • Identify profitable market segments (through market research/intelligence), particularly international out-sourcing opportunities.	Initiation: GoB (MoF, EPB, Foreign Ministry), BPGMEA Action: Local business development service providers (consulting firms), as applicable

Table 9: *(continued)*

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
		• SMEs lack capacity in meeting international quality standards. • Bangladeshi businesses suffer from inappropriate country brand image.	• Help SMEs build capacity in terms of human resource skill development, technological upgrading, product design market intelligence and marketing. • Assist brand building initiatives (capitalize on RMG's "made in Bangladesh" success). • Arrange national and international trade fairs (ITFs) and assist SME participation in such fairs.	
Goal #5 *Achieving higher share of global production*	Introduce existing products to new markets, at both regional and global levels.	• Although large firms are ready to access international markets using existing quality standards, SMEs are far away from that. • Trade relationships with neighbouring countries are not very smooth, particularly since the advent of NTBs. • There is a lack of awareness among local manufacturers regarding demand and quality requirements in the export market.	• Improve trade diplomacy. • Help SMEs achieve international quality standards. • Promote environmental and social compliant enterprises. • Initiate a study to explore export potential of plastic products from Bangladesh in developed markets.	GoB, BPGMEA, ESCAP (to provide with technical assistance to initiate research)

Table 9: *(continued)*

Strategic Goals	Strategic Objectives	Current Scenario	Strategic Actions	Agencies Involved
	Access new markets with new products by targeting potential B2B segments and unexplored B2C opportunities.	• Currently RMG sector is the prime B2B segment served by Bangladeshi plastics industry. Others are construction and pharmaceuticals. • A premium segment of the B2C segment is also largely untapped.	• Target B2B segments such as pharmaceuticals, food-processing and agriculture. • Target high-end B2C segment and diversify the offering basket by incorporating the products that offer cost-advantage. • Offer fair competition to local firms over imports through policy support and actions.	Initiation: Industry players, GoB, development partners Action: Private firms

Annex Notes

ANNEX NOTE 1.1

List of Plastic Products

HS 2002 Code	Name	Description
39	Name: Plastics and articles thereof	Plastics and articles thereof
3901	Polymers of ethylene, in primary forms.	Polymers of ethylene, in primary forms.
3902	Polymers of propylene or of other olefins, in primary forms.	Polymers of propylene or of other olefins, in primary forms.
3903	Polymers of styrene, in primary forms.	Polymers of styrene, in primary forms.
3904	Polymers of vinyl chloride or of other halogenated olefins, in primary form...	Polymers of vinyl chloride or of other halogenated olefins, in primary forms.
3905	Polymers of vinyl acetate or of other vinyl esters, in primary forms	Polymers of vinyl acetate or of other vinyl esters, in primary forms; other vinyl polymers in primary forms.
3906	Acrylic polymers in primary forms.	Acrylic polymers in primary forms.
3907	Polyacetals, other polyethers and epoxide resins, in primary forms	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms.
3908	Polyamides in primary forms.	Polyamides in primary forms.
3909	Amino-resins, phenolic resins and polyurethanes, in primary forms.	Amino-resins, phenolic resins and polyurethanes, in primary forms.
3910	Silicones in primary forms.	Silicones in primary forms.
3911	Petroleum resins, coumarone-indene resins, polyterpenes	Petroleum resins, coumarone-indene resins, polyterpenes, polysulphides, polysulphones
3912	Cellulose and its chemical derivatives	Cellulose and its chemical derivatives, not elsewhere specified or included, in primary forms.
3913	Natural polymers and modified natural polymers	Natural polymers (for example, alginic acid) and modified natural polymers (for example, hardened proteins, chemical derivatives of natural rubber), not elsewhere specified or included, in primary forms.
3914	Ion-exchangers based on polymers of headings 39.01 to 39.13, in primary for...	Ion-exchangers based on polymers of headings 39.01 to 39.13, in primary forms.

HS 2002 Code	Name	Description
3915	Waste, parings and scrap, of plastics.	Waste, parings and scrap, of plastics.
3916	Monofilament of which any cross-sectional dimension exceeds 1 mm	Monofilament of which any cross-sectional dimension exceeds 1 mm, rods, sticks and profile shapes, whether or not surface-worked but not otherwise worked, of plastics.
3917	Tubes, pipes and hoses, and fittings therefore	Tubes, pipes and hoses, and fittings therefore (for example, joints, elbows, flanges), of plastics.
3918	Floor coverings of plastics in rolls	Floor coverings of plastics, whether or not self-adhesive, in rolls or in the form of tiles; wall or ceiling coverings of plastics, as defined in Note 9 to this Chapter.
3919	Self-adhesive plates, sheets, film, foil, tape, strip and other flat shapes...	Self-adhesive plates, sheets, film, foil, tape, strip and other flat shapes, of plastics, whether or not in rolls.
3920	Other plates, sheets, film, foil and strip, of plastics	Other plates, sheets, film, foil and strip, of plastics, non-cellular and not reinforced, laminated, supported or similarly combined with other materials.
3921	Other plates, sheets, film, foil and strip, of plastics	Other plates, sheets, film, foil and strip, of plastics.
3922	Baths, shower-baths, sinks, wash-basins, bidets, lavatory pans	Baths, shower-baths, sinks, wash-basins, bidets, lavatory pans, seats and covers, flushing cisterns and similar sanitary ware, of plastics.
3923	Articles for the conveyance or packing of goods, of plastics	Articles for the conveyance or packing of goods, of plastics; stoppers, lids, caps and other closures, of plastics.
3924	Tableware, kitchenware, other household articles and toilet articles, of pl...	Tableware, kitchenware, other household articles and toilet articles, of plastics.
3925	Builders' ware of plastics, not elsewhere specified or included.	Builders' ware of plastics not elsewhere specified or included.
3926	Other articles of plastics and articles of other materials of headings 39.0...	Other articles of plastics and articles of other materials of headings 39.01 to 39.14.

Source: UNCOMTRADE (2009).

ANNEX NOTE 1.2

Types of Manufacturers in the Global Plastics Industry

Types	Operational Process	Products Type
1. Thermo Formers	Plastic sheet is heated to a pliable forming temperature, formed to a specific shape in a mould, and trimmed to create a usable product	*Thin-gauge thermoforming:* disposable cups, containers, lids, trays, blisters, clamshells, and other products used as food carriers or medical appliances *Thick-gauge thermoforming:* vehicle doors and dash panels, refrigerator liners, utility vehicle beds and plastic pallets
2. Injection Moulders	Material is fed into a heated barrel, mixed and forced into a mould cavity where it cools and hardens to the configuration of the mould cavity	Milk cartons, packaging, bottle caps, automotive dashboards, pocket combs, consumer products, toys, plumbing, packaging and construction materials *etc.*
3. Pipe, Profile and Tubing Extruders	High volume manufacturing process in which raw plastic material is melted and formed into a continuous profile	Tubes, pipes, rods, rails etc.
4. Rotational Moulders	A high-temperature, low-pressure plastic-forming process that uses heat and biaxial rotation (i.e., rotation on two axes) to produce hollow, one-piece parts	Storage tanks, bins and refuse containers, doll parts, road cones, footballs, helmets, kayak hulls *etc.*
5. Film and Sheet Manufacturers	Manufacture of film and sheets through a controlled extrusion process	Trash bags, stretch films, packaging materials *etc.*
6. Blow Moulders	Manufacturing process by which hollow plastic parts are formed. Three main types of blow moulding are extrusion blow moulding (EBM), injection blow moulding (IBM), and stretch blow moulding (SBM)	EBM: dairy containers, hoses/pipes IBM: medicine containers SBM: pet bottles

Source: Compiled from PlasticsNews.com 2009.

Annex II

Country Study on Nepal using Global Value Chain Analysis:

THE AGRO INDUSTRY (COFFEE AND GINGER PRODUCTS)[29]

[29] The author would like to thank Ms. Neelu Thapa, Programme Coordinator and Mr. Paras Kharel, Senior Programme Officer both of South Asia Watch on Trade, Economics and Environment, Kathmandu, Nepal for research and logistics support.

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1. Introduction

In developing countries, small and medium-sized enterprises (SMEs) are generally considered the engine of economic growth, as well as a means for poverty reduction by virtue of their numbers and their significant economic and social contributions. In Nepal, they account for 90 per cent of total enterprises, employ 95 per cent of the non-agricultural workforce and contribute 50 per cent of industrial value addition (Khatiwada 2001).

Economic liberalization and globalization have significant bearings on the performance and prospects of SMEs. At the macro-level, trade liberalization could benefit the country broadly through improved resource allocation, access to better technology, inputs and intermediate goods, economies of scale and scope, greater domestic competition and availability of favourable growth externalities such as transfer of know-how. Similarly, globalization can provide better access to markets and information, and may also facilitate a new physical or virtual proximity between global buyers and local firms (UNCTAD 2004). SMEs could benefit enormously from these processes, provided they improve their competitive strengths.

At the disaggregated and firm levels, at least in the short run, however, globalization may affect domestic firms both positively and negatively through increased foreign competition due to lower import tariffs, quotas and other non-tariff measures, lower production costs through cheaper imported inputs, increased export opportunities and reduced availability of local inputs (Tambunan 2008). In addition, the global system of market governance advocates macro policies that largely tend to be indifferent towards the microeconomic conditions of SMEs.

Thus, it is difficult to have an *a priori* judgment of the impact of liberalization and globalization on SMEs. Increased foreign competition in the domestic market may hurt some inefficient or uncompetitive SMEs while benefiting efficient or competitive ones. Empirical evidences show that in the short run SMEs may lose due to liberalization as it may work against scale efficiency (Tewari 2001; Tybout 2000). Therefore, it is necessary that SMEs are supported to upgrade their production capabilities, their access to human resources and new technology and their ability to improve the quality of their products so as to enable them to expand their base and sustain higher rates of export growth through participation in global and regional value chains (Kaplinsky, Morris and Readman 2002; Roberts 2000; Roberts and Tybout 1996). It means that it is imperative to improve the competitiveness of SMEs through addressing supply-side constraints and building up national productive capacity, as well as an efficient trading and transport infrastructure.

The present study, using value chain analysis, proposes national action plans for the improvement of the business environment for the facilitation of the Nepalese SMEs' access to regional and global markets. In particular, it presents a supply chain network of selected products, their supply capacity, policy and regulatory framework as well as an infrastructure and logistics system for the selected agro products in Nepal.

1.1. OBJECTIVES OF THE STUDY

The broad objective of the study is to analyze business environment within which Nepalese agro product SMEs, particularly those dealing in coffee and ginger products, are operating, and develop national action plan to enhance their competitiveness. The study also evaluates production capacity, export potential, supply chain networks, policy and regulatory frameworks and strengths, weaknesses, opportunities, and threats (SWOT analysis) for the coffee and ginger products sectors.

Other objectives of the study included assessing export potentials, identifying constraints/bottlenecks to export promotion and the value added and suggesting measures for implementing national action plans. To achieve the objectives, value chain and SWOT analyses were carried out.

1.2. METHODOLOGY

The export basket of Nepal contains more than 1100 products at HS 6 digit level, including agricultural and manufacturing products, both primary and processed. The regular macro-level export promotion strategies and programmes might be unable to address the firm- or product-level constraints and conditions for export promotion. It is neither practical nor feasible to develop export promotion strategies for all exportable products. Therefore, the study focuses on two targeted products with a high export potential that could contribute significantly to poverty reduction and social development of the country.

The following key criteria have been used to identify two out six short-listed products, namely: cardamom; ginger; medical plants (herbs) and essential oils; processed leather; tea; and coffee.[30]

a. Export potential
b. Value added
c. Job creation
d. Linkages with other sectors
e. Supply capacity
f. Impact on gender empowerment
g. Accessibility
h. Government priority

Out of these products, ginger and coffee were selected by the Steering Committee of Nepal, chaired by the Secretary, Ministry of Commerce and Supplies and comprised of representatives from the ministries of commerce, industry, finance and agriculture, the private sector and the civil society organizations, including the study team (Box 1).

[30] ESCAP Mission had initially identified five potential products for consideration, namely: cardamom; ginger;medical plants (herbs) and essential oils; processed leather; and tea based on government priority, domestic value addition and potential for employment creation. The Steering Committee of Nepal added coffee to the list.

Box 1: Composition of the Steering Committee of Nepal

The Steering Committee, chaired by the Secretary, Ministry of Commerce and Supplies was formed to provide policy and operational guidance to the implementation of the project. The composition of the committee included:

Secretary, Ministry of Commerce and Supplies	Chairman
Joint-Secretary (Export Promotion, Trade and Transit Division), Ministry of Commerce and Supplies	Member
Joint-Secretary (Planning and International Trade Cooperation Division), Ministry of Commerce and Supplies	Member
Representative, Ministry of Industry	Member
Chief Executive Officer, Trade and Export Promotion Centre	Member
Chairman, South Asian Watch on Trade Economics & Environment	Member
Representative, Federation of Nepalese Chamber of Commerce and Industry	Member
Representative, Federation of Nepalese Cottage and Small Industry	Member
Representative, ESCAP	Member
Under-Secretary (Planning and International Trade Cooperation Division), Ministry of Commerce and Supplies	Member Secretary

The analysis was conducted through a combination of literature review and focus group discussions. The required data and information were collected through different sources, including the government, private sector and international organizations publications. The consultants on the project met and interacted with all possible value chain agents – farmers, traders, processors, exporters, service providers, international non-governmental organizations and government officials in focus group discussions. The focus group discussions were organized in Kathmandu for the coffee products sector and in Byas Municipality, Tanahu district for the ginger products sector. The events not only helped verify additional information, but also provided critical insights into the issues. Subsequently, the study was submitted at a national workshop and a subregional workshop in Kathmandu and Colombo, respectively, where key stakeholders conducted further review. Discussions and comments made at the workshops were all reflected in the final study.

1.3. LIMITATIONS

The study was conducted within a limited time frame and with little resources, which made it impossible to collect primary information through a structured questionnaire from all the actors. Similarly, it was impossible to observe all the processes included in the value chain, for example land preparation, farming, harvesting,

processing and so on. While interactions with stakeholders helped gain insights into the issues, such insights could not be considered as representing all nation-wide stakeholders.

2. Business Prospects for the Ginger and Coffee Products Sectors in Nepal

Sandwiched between two neighbours with giant populations—China to the north and India to the south, west, and east—Nepal has a population of about 27 million. The country is divided into three geographical regions: (i) the Himalayan range, covered with snow throughout the year; (ii) the valleys and hills; and (iii) the Terai belt, low and fertile land that borders India. While about 70 per cent of land area in Nepal is covered by hills and high mountains, only the remaining 30 per cent of land, found in the Terai belt is suitable for commercial agriculture. Over 56 per cent of the country's population lives in the hills and mountains and relies on subsistence farming in the absence of other economic activities. Since the Terai belt has highly fertile land compared to other regions, most economic activities are located there. Because of a difficult terrain, there is a lack of an efficient transport network in the hilly and mountainous regions.

Agriculture is the backbone of the Nepalese economy, making an important contribution to the national income and employment generation. In the 1950s, it contributed as high as 80 per cent to gross domestic product (GDP) and employed 90 per cent of the workforce. However, with a shift in government policy since the mid-1950s, its importance as a major contributor to GDP gradually declined and fell to 32.8 per cent by 2008/09 (MOF 2009a). Despite the fact, agriculture still provides employment for 67.1 per cent of the workforce—64.0 per cent in subsistence farming and 3.1 percent in market agriculture (CBS 2009). The share of manufacturing in GDP remains very small, at 6.8 per cent, while the services sector, largely based in urban areas, contributes about 60 per cent of GDP.

Total cultivated land in Nepal is a little more than three million hectares, but irrigation facilities are available only on one third of the cultivated land. Nepalese farmers have traditionally produced cereal crops, such as paddy, maize, millet, wheat and barley. However, they have been shifting to the exclusive production of or intercropping with cash crops, such as oilseeds, potato, tobacco, sugarcane, tea, coffee, ginger and horticultural products. The following section introduces coffee and ginger production in Nepal.

2.1. OVERVIEW OF MAJOR COFFEE PRODUCING COUNTRIES

Although there are between 25-100 different species of Coffea (coffee trees), the two most important species that are grown and traded internationally—Coffea arabica (Arabica coffee), which accounts for over 60 per cent of the world production and Coffea canephora (Robusta coffee). Two other species that are grown on a much smaller scale are Coffee liberica (Liberica coffee) and Coffee dewevrei (Excelsa coffee). These major species of coffee have different varieties and cultivars. For example, the

best known varieties of Coffea arabica are 'Typica' and 'Bourbon' but from these two varieties many different strains and cultivars have been developed, such as Caturra (Brazil, Colombia), Mundo Novo (Brazil), Tico (Central America), the dwarf San Ramon and the Jamaican Blue Mountain. Arabica coffee plants are often susceptible to attacks by pests and diseases.

Coffee is a tropical plant which grows between the latitudes of less than 25 degree north and less than 25 degree south of the Ecuator and requires very specific environmental conditions for commercial cultivation. Temperature, rainfall, sunlight, wind, and soils are all important but requirements vary according to varieties grown. Ideal average temperatures are 15-24 degrees Celsius for Arabica and 24-30 Celsius for Robusta, which can take hotter and drier conditions. Coffee plants are easily damaged by frost. In general, coffee plants need an annual rainfall of 1,500 to 3,000 mm; Arabica plants require less moisture than other species. The patterns of rainy and dry periods are important for growth, budding and flowering. Rainfall requirements depend on the retention properties of the soil, atmospheric humidity and cloud cover as well as cultivation practices.

Arabica coffee plants are best grown at higher altitudes (over 1,000 metres), often in hilly areas and, thus, produce superior quality beans of good flavour and aromatic characteristics. Robusta coffee, on the other hand, can be grown at lower altitudes (between sea level and about 800 metres), have higher yields and are more resistant to disease. But they produce beans of inferior taste in comparison with Arabica, usually with a woody, astringent flavour and with double amount of caffeine. As a result, Robusta beans command a lower price and are generally used for producing cheap instant coffee or to increase a caffeine 'kick' in products such as espresso. In terms of production markets, Arabica coffee is grown throughout Latin America, in Central and East Africa, in India and Nepal, and to some extent in Indonesia; while Robusta coffee is grown in West and Central Africa, throughout South-East Asia and in certain parts of Brazil, where it is known as Conillon.

The first coffee plantations were originally established in Ethiopia and the Arabian Peninsula. Today it is widely grown throughout topical regions (ITC 2009). Coffee is produced in more than 70 developing countries while 45 countries are responsible for over 97 per cent of world coffee output. The world production of coffee is quite volatile and is extremely vulnerable to weather conditions. Global production during the period 2000/01 to 2010/08 was recorded in the range of 6.4 million MT to 8.0 million MT; however, the production sharply declined by 13.7 per cent in 2003/04, whereas it increased by 8.4 per cent in the crop year 2010/11 (table 1). Most of the world's coffee beans are produced in Latin America, which accounts for 61.9 per cent of global production; the shares of Asia and Africa are 25.5 per cent and 12.6 per cent, respectively (Roldan-Perez et al 2009). Brazil is the largest producer of coffee followed by Viet Nam, Colombia and Indonesia. In 2008/09 more than half of global coffee production was concentrated in these three countries (table 2).

Table 1: World coffee production, 2000/2001-2010/2011

Coffee year	Production Million Bags (60 kg)
2000/2001	113.0
2001/2002	107.7
2002/2003	123.2
2003/2004	106.3
2004/2005	116.2
2005/2006	111.3
2006/2007	128.9
2007/2008	120.0
2008/2009	128.4
2009/2010	123.0
2010/2011	133.3

Source: ICO (2011).

Table 2: Major coffee producing countries, 2010/2011

Country	Production Million Bags (60 kg)
Brazil	48.1
Viet Nam	18.5
Colombia	9.2
Indonesia	8.8
Ethiopia	7.5
India	5.0
Mexico	4.0
World	133.3

Source: ICO (2011).

Arabica is the dominant variety in coffee production. More than 60 per cent of coffee produced worldwide is Arabica, with Brazilian natural being the principal Arabica variety, though its share has declined in recent years compared to the 1980s and the 1990s. The remaining share is Robusta variety (table 3). Arabica is produced in Colombia, Kenya, United Republic of Tanzania, the Plurinational State of Bolivia, Burundi, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, India, Jamaica, Malawi, Mexico, Nicaragua, Panama, Papua New Guinea, Peru, Rwanda, Venezuela, Zambia, Zimbabwe, Brazil, Ethiopia, and Paraguay; whereas Robusta is produced in Angola, Benin, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Ghana, Guinea, Indonesia, Liberia, Madagascar, Nigeria, Philippines, Sierra Leone, Sri Lanka, Thailand, Togo, Trinidad and Tobago, Uganda and Viet Nam (ICO 2009).

Table 3: Coffee production by coffee bean type (in per cent)

Types of Coffee Beans	2005	2006	2007	2008
Arabicas	61.72	62.27	61.20	61.62
Colombian Milds	12.43	10.82	11.56	8.62
Other Milds	22.88	21.19	22.90	20.95
Brazilian Naturals	26.41	30.26	26.73	32.05
Robustas	38.28	37.73	38.80	38.83

Source: ICO (2009).

2.2. COFFEE PRODUCTION IN NEPAL

Coffee production does not have a long history in Nepal. A saint, Hira Giri of Gulmi district in western Nepal, is considered to be the pioneer of coffee cultivation in Nepal. He bought some coffee seeds from Myanmar and introduced them in Aanpchaur of Gulmi district back in 1938. Gradually, plantations of coffee started spreading to adjoining districts, such as Palpa, Syangja, Kaski and Baglung, and other districts.

As the climate and soil conditions in the mid- and high hills of Nepal are suitable for Arabica coffee, Nepal grows only the Arabica variety of coffee. Areas under coffee plantations have increased more than ten-fold between 1994/1995 and 2008/2009. In 2008/2009, a total of 557 MT of coffee was produced on 1,531 ha of farmland in Nepal (table 4). The average yield of green beans is about 300 kg per ha. Although the productivity has increased significantly over the period, it is lower than in major coffee producing countries such as Viet Nam and Indonesia. However, through proper management, adequate shading and manuring practices, the productivity level could go as high as up to 1,550 kg per ha (AEC 2006). Gulmi district produces the highest amount of coffee followed by Laltipur, Kavrepalanckok, Syangja and Palpa. Lamjung, Gorkha, and Nuwakot districts are other emerging coffee producing districts (table 5).

Table 4: Coffee production in Nepal, 1994/1995-2008/2009

Year	Area (ha)	Production Dry Cherry (in MT)	Productivity (dry cherry kg per ha)
1994/1995	135.7	13.0	95
1995/1996	220.3	29.2	132
1996/1997	259.0	37.4	144
1997/1998	272.1	55.9	205
1998/1999	277.1	44.5	160
1999/2000	314.3	72.40	230
2000/2001	424.0	88.7	209
2001/2002	596.0	139.2	233
2002/2003	764.0	187.5	245
2003/2004	925.0	217.6	235
2004/2005	1 078.0	250.0	231
2005/2006	1 285.0	391.0	304
2006/2007	1 295.5	270.0*	347
2007/2008	1 145.0	265.0*	386
2008/2009	1 531.0	334.0*	364

* Parchment, average ratio parchment to dry cherry is about 0.6.
Source: NTCDB (2011).

Table 5: District-wise production of coffee in Nepal, 2007/2008

Districts	Area (ha)	Production (MT)
Palpa	185.0	25.0
Gulmi	110.0	35.0
Arghakhangi	74.0	10.0
Syangja	205.0	29.5
Kaski	70.0	13.5
Parbat	40.0	5.0
Lamjung	148.0	8.0
Gorkha	97.0	5.0
Baglung	35.0	5.0
Tanahu	45.0	2.0
Myagdi	5.0	3.0
Sankhuwashava	18.0	3.0
Ilam	30.0	15.0
Khotang	7.0	2.0
Jhapa	2.0	1.0
Panchthar	8.0	2.0
Udayapur	2.5	2.0
Lalitpur	70.0	30.0
Sindhupalchok	77.0	17.0
Kavrepalanchok	116.5	30.0
Nuwakot	58.0	13.0
Dhading	16.0	7.0
Makawanpur	11.0	3.0
Others	20.0	10.0
Total	1 450.0	276.0

Source: MAC 2008.

2.3. OVERVIEW OF MAJOR GINGER PRODUCING COUNTRIES

Ginger, the underground stem, or rhizome, of the plant *Zingiber officinale Roscoe*, is a medicinal plant that has been widely used in Chinese, Ayurvedic and Tibb-Unani herbal medicines since antiquity to remedy a wide array of ailments that included arthritis, rheumatism, sprains, muscular aches, pains, common cold, flu-like symptoms, sore throat, headaches, painful menstrual periods, cramps, constipation, indigestion, vomiting, hypertension, dementia, fever, infectious diseases and helminthiasis. In addition to medicinal use, ginger is valued as an important cooking spice.[31] Currently, there is a renewed interest in ginger, and several scientific studies have been conducted aimed at identifying ginger's active constituents and verifying their pharmacological properties in treating ailments and diseases. The main pharmacological characteristics

[31] New World Encyclopedia. Available at www.newworldencyclopedia.org.

of ginger and compounds include immuno-modulatory, anti-tumorigenic, anti-inflammatory, anti-apoptotic, anti-hyperglycemic, anti-lipidemic and anti-emetic actions. Ginger is also a strong anti-oxidant and may either mitigate or prevent generation of free radicals. It is considered a safe herbal medicine with only a few and insignificant adverse/side effects (Ali et al. 2008).

Ginger has a long history of medicinal use in the preparation of many Ayurvedic formulations, the traditional medical discipline in India and Nepal. In the United States of America and Europe, remedies containing ginger are sold as nutraceuticals or over-the-counter medications for the treatment of nausea, motion sickness and migraine. Ginger is also listed in the *German Commission E Monographs* as an approved phytomedicine against dyspepsia and as a preventive remedy against motion sickness (Plotto 2004).

Ginger is cultivated in Nepal, Bhutan, India, China, Japan, Indonesia, Australia, Nigeria and the Pacific islands. India is the largest producer and consumer of ginger in the world. Out of the total production, about 30 per cent is used dry, while 50 per cent is consumed as a fresh product and the rest as seed material. Table 6 presents total areas under cultivation and production volumes of ginger in the world. It shows that in 2009 the area under ginger cultivation in the world was 273,736 ha. India has the largest area of ginger cultivation, constituting about 39.7 per cent of the total world area under ginger cultivation. World production of ginger was 1,615,974 MT in 2009. India had a predominant position in ginger production, contributing 23.5 per cent of the total world production in 2009 but productivity was very poor compared to that of the United States of America (FAO 2011).

Table 6: Area and production of ginger in the world, 2009

Year	Area (ha)	Production (MT)
1998	312 689	862 863
1999	308 409	948 720
2000	307 277	948 235
2001	318 776	986 267
2002	314 064	996 005
2003	338 106	1 150 820
2004	340 713	1 195 546
2005	365 002	1 321 790
2006	417 349	1 491 069
2007	270 007	1 581 392
2008	279 648	1 641 629
2009	273 736	1 615 974

Source: FAO 2011.

2.4. GINGER PRODUCTION IN NEPAL

Ginger is an important spice cash crop traditionally grown in the mid-hill areas of Nepal at altitudes of up to 1,500 meters, across the whole east-west length along the Siwalik. It can also be grown in the uplands of Terai. The intercropping of ginger with maize is a traditional method and the two form a suitable crop combination. Some farmers of Palpa are intercropping ginger with pigeon pea and okra. Ginger is being grown in coffee plantations and orange orchards as well (AEC 2006).

The production of ginger almost doubled in a decade to reach 174,268 MT in 2009; however, the growth is attributed more to the area harvested than to the growth yield. The growth yield is 3.0 per cent per year compared to 4.7 per cent of the growth of harvested area during 1998 to 2009. Ginger is produced all over the country except on high altitudes (table 7). The geographical distribution of ginger production shows its concentration in western mid-hills. Among the development regions, production is the highest in the eastern development region followed by the western, central mid-western and far-western regions. However, the productivity seems highest in the far-western development region followed by the central and mid-western regions. Among the districts, the most important ginger producing districts are Palpa, Nawalparasi, Arghakhanchi, Syangja, Kaski and Tanahu in the western development region, Salyan in the mid-western region, and Ilam in the eastern region (table 8).

Table 7: Production of ginger in Nepal, 1998-2009

Year	Area Harvested (ha)	Yield (kg/ha)	Production (MT)
1998	8 821	92 508	81 601
1999	8 821	92 732	81 799
2000	8 314	90 202	74 994
2001	8 956	94 201	84 366
2002	9 189	95 668	87 909
2003	11 830	127 298	150 593
2004	11 930	128 000	152 704
2005	12 000	128 500	154 200
2006	12 994	118 668	154 197
2007	13 025	122 000	158 905
2008	13 332	132 465	176 602
2009	13 808	126 208	174 268

Sources: FAO 2011.

Table 8: Geographical distribution of ginger production in Nepal, 2008

Development Regions	Area Harvested (ha)	Production (MT)
Eastern	4 119	51 956
Central	1 928	24 791
Western	5 136	46 848
Mid-Western	1 830	23 452
Far-Western	994	14 124

Source: MAC 2008.

Ginger is grown in tropical, subtropical and humid climate at an altitude of up to 1,500 metres. A well-distributed (eight to ten months) rainfall (1,500-3,000 mm) during the growing season and dry spells during land preparation and harvesting are required for good growth and yield of the crop. Dry weather, with temperatures in the range of 28-30 degree Celsius for about a month before harvesting, is ideal for ginger farming. High humidity throughout the crop growing period is necessary. Ginger gives high yield when planted at a depth of 30 cm in good, light, well-drained, loosely friable, rich in humus garden soil with a slightly acidic character.

Depending on the altitude and rainfall, planting is done from February to April. Farmers believe that early planted ginger escapes hailstorms and results in high yields. Rhizomes are planted in two-three rows in each bed and covered with soil. The spacing between rhizomes should be about 15 cm. In most areas, the whole unbroken rhizome is planted , which increases the recovery of the mother rhizome yield called *mau* extraction, an ancient practice in Nepal. However, there has been a widespread practice among small farmers of intercropping ginger with maize, beans and millets. When ginger is intercropped with other crops, inter-row distance is generally 60-90 cm. Immediately after planting, beds are covered with mulches consisting of forest leaves, straw, grass and other plant residue up to eight- ten cm. thick. Mulching protects seedlings from rain, prevents weed growth, keeps soil soft and moist and accelerates growth.

For fresh ginger, the crop should be harvested before full maturity, i.e., when rhizomes are still tender, with low pungency and fibre content, usually from the fifth month after planting. Such fresh and green ginger is used in pickles, candy preparation or cooking. In order to make preserved ginger, harvesting should be done between five and seven months after planting, while for dried spice and oil harvesting is best at full maturity, i.e., between eight to nine months after planting, when leaves become yellow. Rhizomes used as planting material should be harvested when the leaves become completely dry. The root and rhizome diseases, particularly bacterial wilt, soft rot and yellow are major troubles besides insect pests, such as white grub and shoot borer.

After harvesting, the ginger should be stored properly. There are three traditional methods of seed rhizome storage in Nepal. They are storage in soil pits, storage in a dry and shaded place and *in situ* storage. Instead of bearing storage costs, many farmers prefer *in situ* storage (delayed harvest) so that they can supply the product according to market demand and allow the rest of rhizomes to remain in the field. However, this method leads to rhizome rotting and rhizome sprouting in the course of time and also to harbouring insect pests.

After the harvest, the fibrous roots attached to rhizomes should be trimmed off and the soil removed by washing. Rhizomes should be soaked in water overnight and then cleaned. The skin can be removed by scraping with sharp bamboo splits or wooden splice. Use of metallic knives should be avoided since they will discolour the rhizomes. Peeling or scraping reduces drying time, thus minimizing mould growth and fermentation. However, the scraping process tends to remove some of the oil that is concentrated in the peel. By removing the outside corky skin, the fibre content also

decreases. After scraping, the rhizomes should be sun dried for a week with frequent turning and hand rubbed to remove outer skin. This process is called unbleached ginger. Mechanical drying is rapid and gives more homogenous and cleaner product over the sun drying method where peeled ginger takes eight to nine days to reach moisture content of eight to nine per cent. To reduce losses in quality, cleaning and drying should be done as fast as possible after harvesting. To avoid discolouration, the temperature should not exceed 60 degree Celsius during mechanical drying. Proper care should be taken during the grading and packaging to supply quality ginger (Yadav et al. 2004).

Farmers in Nepal traditionally cultivate two landraces of ginger, namely, *Nase* rhizome containing more fibers, and *Bose rhizome*, which is fibreless or with negligible fibres. Ginger Research Programme, Kapurkot offered another ginger variety named Kapurkot Aduwa-1 in 2001; however, the demand for seeds of this variety of rhizome among farmers cannot be satisfied even now (AEC 2006).

2.5. EMPLOYMENT IN THE COFFEE AND GINGER PRODUCTS SECTORS

Coffee and ginger products are highly labour intensive and a large number of small farmers are involved in their production. Generally, small farmers employ household labour for production and post-production management; however, medium and large farmers use hired labour in their post-production and value added activities. Small farmers' family members do almost all the work – from land preparation to harvesting of the crops. Men generally purchase seeds and do the ploughing while both men and women do the hoeing and digging. Sowing, planting, manure application and harvesting are done by both men and women. Women do the weeding. While women generally dig out ginger from the field and do cherry picking, its sale is looked after by men.

International Trade Centre (ITC) estimates that ginger production requires around 66,600 people for two months per year, which is around 11,000 people as full-time employees at the current level of production (ITC 2007). Similarly, it is estimated that about 20,000 families are engaged in the production of coffee (Ghimire 2009) and that is the equivalent of more than 7,700 full-time employees (ITC 2007). In addition to direct employment, a large number of people are employed in different stages of value addition such as cleaning, packaging, transportation, loading and unloading. The Agro Enterprise Centre (AEC) of the Federation of Nepalese Chambers of Commerce and Industry estimates that promotion and diversification of coffee products into specialty and organic coffee products may engage 75,000 farm families, resulting in 460,000 people as beneficiaries – with 420,000 employment positions going to farmers' family members and 40,000 employment positions to processing and marketing (AEC 2006).

3. Export Potential and the Government Policy

While the total exports of Nepal declined by 0.2 per cent in 2007/08, the export of coffee and ginger increased by 168 per cent and one per cent, respectively, implying the significance of these sectors. The study evaluates the potential for export promotion

of coffee and ginger products based on export supply growth, global market situation and market access conditions. Government policies in agriculture and trade promotion are also reviewed.

3.1. EXPORT POTENTIAL FOR COFFEE PRODUCTS

Nepal Coffee Producers Association estimates that about 65 per cent of the production of coffee is exported to foreign countries. In 2007/08, a total of 112 thousand kg of coffee was exported with total proceeds reaching 107 million NRs. The trend in the growth of export both in volume and value is quite encouraging. During the last seven years export volume increased at an average annual growth rate of 71 per cent, whereas export value increased at a growth rate of 264 per cent indicating that Nepalese coffee exporters are getting better prices for their products (table 9).

Table 9: Coffee export of Nepal (green beans)

Year	Exports	
	Volume (kg)	NRs. Millions
2000/01	3 677	0.67
2001/02	9 075	2.45
2002/03	16 861	5.20
2003/04	25 295	5.94
2004/05	65 000	1.96
2005/06	91 500	27.67
2006/07	100 180	40.11
2007/08	112 000	107.80

Source: NTCDB (2009).

Nepal exports only Arabica green beans of two varieties: de-caffeinated (65 per cent) and regular. Destination-wise, export of coffee is presented in table 10. The major market for the Nepalese coffee is Japan for both decaffeinated (85 per cent) and regular varieties (50 per cent), followed by Germany for the former, Canada for the both, and the Republic of Korea for the latter varieties. Smaller volumes of coffee have also been exported to the United Kingdom and the United States of America.

Table 10: Export markets for the Nepalese coffee, 2007/2008 (in thousands of Nepalese Rupees)

Countries	Regular unroasted	De-caffeinated unroasted
Canada	1 044	927
Germany	140	7 857
Japan	8 899	9 242
Republic of Korea	185	989
United Kingdom	98	–
United States of America	6	–
Total	10 372	19 015

Source: TEPC (2008).

Coffee is the second most traded commodity in the world after oil. It reached $13 billion in international trade and about 80 per cent of the coffee's global production trades internationally (ICO 2011). World exports increased at an annual average growth rate of 26.4 per cent in value and 0.7 per cent in volume from 2000/2001 to 2009/2010, implying that the prices of coffee in international market increased over the period (table 11). As far as the global export market is concerned, the share of Brazil (32.1 per cent in 2009/2010) is the highest, followed by Viet Nam

(15.5 per cent), Indonesia (8.5 per cent) and Colombia (7.6 per cent) (table 12). Similarly, the United States of America is the largest importer of coffee followed by Germany, France, Italy, Japan, Belgium and Canada. The growth of imports in all major importing countries during 2004-2008 is quite high for both green bean and roasted coffee. Belgium recorded the highest growth of 34 per cent in the import of green beans whereas Japan topped the list with an average annual growth rate of 78 per cent for roasted coffee during 2004-2008 (table 13).

Table 11: World coffee export from 2000/2001 to 2009/2010

Year	Exports (US$ billion)	Exports Million Bags	Average Price Cents/lb FOB
2000/2001	6.7	88.0	58
2001/2002	6.6	85.8	58
2002/2003	7.6	90.2	64
2003/2004	9.2	88.0	79
2004/2005	12.4	89.0	106
2005/2006	14.8	88.0	127
2006/2007	17.8	98.5	137
2007/2008	22.0	94.1	177
2008/2009	20.0	95.4	159
2009/2010	24.4	94.2	196

Sources: ICO (2011); ITC (2011).
Note: One bag contains 60 kg.

Table 12: World's top 10 coffee exporters, 2009

Country	Exports in thousands of bags
Brazil	30 207
Viet Nam	14 591
Indonesia	7 990
Colombia	7 196
India	3 901
Guatemala	3 446
Honduras	3 161
Peru	2 999
Ethiopia	2 904
Uganda	2 669

Source: ICO (2011).
Note: One bag contains 60 kg

Table 13: World's top 10 coffee importers, 2008

Country	Value in billions of dollars	Import Growth 2004-2008 (in per cent)	
		Green Bean	Roasted
United States of America	4.256	18.0	4.0
Germany	3.329	23.0	30.0
France	1.381	29.0	16.0
Italy	1.379	26.0	30.0
Japan	1.267	24.0	78.0
Belgium	1.206	34.0	20.0
Spain	0.669	21.0	25.0
United Kingdom	0.628	18.0	3.0
Austria	0.445	25.0	45.0

Source: ITC (2011).

All major importing countries levy zero duty in the imports of green coffee beans; therefore, any kind of tariff preference is irrelevant for Nepal. Nonetheless, Nepal, being a least developed country (LDC), enjoys duty-free access for roasted coffee under trade preference for LDCs in all major coffee importing countries. However, the preference margin is higher in Japanese markets compared to other markets (table 14).

Table 14: Market access conditions for the Nepalese coffee in major importing countries (tariffs in per cent)

Country	Green Beans			Roasted		
	Most Favored Nation Tariff	Pre-ferential Tariffs for GSP	Pre-ferential Tariffs for LDCs	Most Favored Nation Tariff	Pre-ferential Tariffs for GSP	Pre-ferential Tariffs for LDCs
United States of America	0	–	–	0.0	–	-
Germany	0	–	–	7.5	–	0
France	0	–	–	7.5	–	0
Italy	0	–	–	7.5	–	0
Japan	0	–	–	20.0	10	0
Belgium	0	–	–	7.5	–	0
Spain	0	–	–	7.5	–	0
United Kingdom	0	–	–	7.5	–	0
Austria	0	–	–	7.5	–	0

Source: ITC (2011).

The above tables demonstrate that the export of coffee from Nepal has been growing significantly and the markets are diversified. The world export market is encouraging and demand in major importing countries recorded double-digit growth. There are no tariff barriers for market access for the Nepalese coffee and the country enjoys significant tariff preferences in European and Japanese markets. Thus, a major challenge for promoting export is export quality for both specialty and organic coffee and meeting sanitary, phyto-sanitary and other standards.

The quality of coffee is determined by a combination of factors, including botanical variety, topographical conditions, weather conditions and care taken during growing, harvesting, storage, export preparation and transport. Botanical variety and topographical conditions are constants while weather conditions are variable and difficult to predict. Therefore, growing, harvesting, storage, export preparation and transport are variables that can affect the quality. Although Nepalese coffee producers and processors are not highly skilled and equipped with adequate expertise, Nepalese coffee is considered high quality because of suitable and diverse climatic conditions. Nevertheless, Nepalese producers are not that quality conscious and the presence of Ochratoxin A (OTA)[32] has been found in Nepalese coffee in recent years (AEC 2006). Moreover, it is disheartening to note that there is no coffee quality standard introduced by any agency, private or public, in Nepal.

The International Coffee Organization (ICO) has adopted resolution 420, which recommends voluntary targets for the minimum quality export standards for both varieties of coffee, Arabica and Robusta. It calls on producing members to restrict the export of Arabica coffee with more than 86 defects per 300 g sample or the export of Robusta coffee with more than 150 defects per 300 g sample. The resolution also calls on members to prohibit Arabica or Robusta of any grade to be exported if the moisture level of beans is below eight per cent or above 12.5 per cent; it also includes a proviso that this should not affect the established, good and accepted commercial practices. Although specialty coffees that traditionally have high moisture content are exempted, resolution 420 requires all producers to clearly identify on the Certificate of Origin any coffee that does not reach the recommended standards.

Since consumer awareness on sanitary and phyto-sanitary standards of food items has increased, stringent food legislation is being introduced with a potential impact on the export of coffee. For example, Hazard Analysis Critical Control Points or HACCP system developed by Codex Alimentarius Commission has become a mandatory requirement in the markets of various countries since the 1990s and, particularly, for non-farm food businesses in the European Union since January 2006.

Despite the fact that coffee is mostly grown organically in Nepal, Nepal has not been able to export all the coffee as organic because of the problems with certification Organic certification requirements cover not only on the product itself but also the intrinsic part of the production process and procedure. International Federation of

[32] Ochratoxin A is one of the most abundant food-contaminating mycotoxins in the world. Studies have shown that OTA is potentially carcinogenic. Human exposure occurs mainly through consumption of improperly stored food products, including coffee.

Organic Agriculture Movements (IFOAM) has formulated basic standards for organic products. These standards are at the base of the legislation that has been introduced in the European Union (1992), the United States of America (2000), Japan (2001), and a number of other countries, including Argentina, Bolivia, India and Mexico that have created national legislation to regulate the market for organic products (ITC 2009).

Besides certifying coffee cultivation, all subsequent steps in production chain also have to be certified to get an organic product certificate. On-farm processing, storage, transport, drying and hulling, roasting, packaging, distribution and retailing all have to be certified organic. Contact with conventionally produced coffee should be excluded. Spraying or fumigation with toxic agents should not be permitted and special measures should be taken to prevent contact with areas where fumigation has taken place. Adequate records should be kept of incoming and outgoing coffee products so that the entire product flow could be documented and accounted for, such process referred to as traceability. All steps in the chain should, therefore, be documented and accounted for making it possible to trace back the origin of the product from one step to the next (track and trace), ensuring that no contamination with conventional coffee has occurred. This traceability minimizes the risk of fraud at all stages and is a very important part of the inspection process by certifying organizations (ITC 2009).

Organic products imported into the European Union must have been produced in accordance with the European Union regulation on organic food (EC 834/2007). This regulation provides that a non-European Union country can get an approval if its production system complies with principles and inspection measures equivalent to those laid down in the European Union regulations. According to such regulations, the following standards must be followed:

- Cultivation of vegetables, green manures or deep-rooting plants in an appropriate multi-annual rotation programme;
- Incorporation in the soil of organic material, organic livestock manure and vermicompost;
- Pests, diseases and weeds to be controlled by using appropriate varieties, rotation programmes, biological pest control, mechanical practices and flame weeding;
- Seeds and propagation materials organically produced;.
- Use of non-organic fertilizers, pesticides and biological pest control methods is limited.

In the United States of America, National Organic Program (NOP) has been established under Organic Food Production Act. Organizations that are fully NOP-compliant (certified) may label their products or ingredients as organic, and may use the 'USDA Organic Seal' on organic products in the country, irrespective of whether they are produced domestically or are imported.

Japanese Agricultural Standard (JAS) for Organic Agricultural Products entered into force in April 2002. Enacted by the Ministry of Agriculture, Forestry and Fisheries, JAS regulates the production and labelling of organic food items produced in Japan.

Although coffee is not grown in Japan, JAS nevertheless also covers organic coffee (and tea) under 'organic agricultural products.' Only Ministry-accredited certifying bodies may issue JAS organic certification for coffee to be imported into Japan.

3.2. EXPORT POTENTIAL FOR GINGER PRODUCTS

World trade in ginger was estimated at $578 million in 2008 and the quantity traded was 2.223 million tonnes (table 15 and FAO 2011). The growth of world ginger exports was one per cent in value terms and nine per cent in volume terms during the period 2004-2008 (ITC 2011). China is the major supplier in world ginger markets followed by Thailand, Nepal and the Netherlands (table 16). Despite the fact that ginger accounts for just more than one per cent of national exports, Nepal ranks as the third largest exporter of ginger in terms of volume and the sixth largest exporter in terms of value in the world market. The fact implies that the price Nepal is getting for its exports is substantially lower than that of the world average.

Table 15: World export of ginger, 2001-2008

Year	Value in millions of dollars
2001	123.1
2002	121.1
2003	132.4
2004	286.5
2005	321.7
2006	248.0
2007	264.6
2008	578.4

Source: ITC (2011).

Table 16: Top 10 ginger exporting countries, 2009

Country	Quantity (tonnes)	Value (in thousands of dollars)	Unit value (dollars/tonnes)
China	341 388	284 454	833
Thailand	49 808	24 932	501
Nepal	26 724	5 209	195
Netherlands	18 364	25 835	1 407
India	12 175	14 279	1 173
Ethiopia	10 752	6 531	607
Indonesia	7 326	3 391	463
Nigeria	4 256	4 431	1 041
Brazil	3 952	3 892	985
Fiji	1 037	3 270	3 153

Source: FAO (2011).

Nepal's export market for ginger is primarily India although it has also been exporting to Japan and the United States of America in smaller quantities (exports of less than half a million NRs. in 2007/2008). Raw and dry ginger export constitutes about a half of Nepal's total export of spices to India. Export of raw ginger constitutes about 85 per cent and the remaining percentages of ginger export are divided between semi-

processed and dry product, i.e., *Suntho*. It is reported that more than 60 per cent of the total production of ginger is exported to India as fresh or dry product. Ginger export trend in terms of value is very erratic. From 2011 to 2008 it has showed an annual growth of as high as 75 per cent in 2006/2007 and a decline of 33 per cent in 2004/2005 (table 17). Such volatility in exports could not be explained just by the volatility in production; it could be explained partly by the internal security measures, the political situation and by an imposition of sanitary standards by the Indian Government.

Table 17: Ginger export to India (in millions of NRs.)

Year	Total	Dried Ginger	Fresh Ginger
2001/2002	288.4	80.5	207.9
2002/2003	423.8	108.4	315.4
2003/2004	365.1	78.0	287.1
2004/2005	241.1	80.1	161.0
2005/2006	337.4	62.2	275.2
2006/2007	590.9	49.6	541.3
2007/2008	597.2	54.0	543.2
2008/2009	403.1	68.0	335.1

Source: MOF (2009b).

Northern Indian markets of Gorakhapur, Varanasi, Lucknow, Kanpur, Patna, Jaipur and Delhi are major destinations for Nepalese ginger. India is a large and dynamic market for Nepalese ginger. A number of long established markets for Nepalese ginger in India are currently under threat from the increased domestic production, especially from the towns of Cochin in southern India and Bangalore in south-eastern India (ITC 2007). The major competitors in the Indian markets are China, Nigeria, Myanmar and Ethiopia.

Japan, followed by the United States of America, the United Kingdom and Bangladesh, are the major importers of ginger in the world. In these countries, ginger is imported processed rather than fresh. However, in South Asia, in countries such as India, Pakistan and Bangladesh, fresh ginger constitutes a major chunk of ginger imports. The growth rates of ginger imports are high in Bangladesh, the United Arab Emirates, Germany, the Netherlands, the United Kingdom, and Malaysia; moderate in Pakistan, the United States of America and India; and negative in Japan (table 18).

Table 18: Top 10 importers of ginger, 2009

Country	Import value (in millions of dollars)	Import growth (2004-2008) (per cent)
Japan	90.7	-12.0
United States of America	43.2	14.7
Bangladesh	35.6	732.4
Pakistan	28.9	23.6
Netherlands	24.7	46.2
United Kingdom	24.2	41.2
United Arab Emirates	22.8	177.0
Malaysia	21.0	37.1
Germany	15.9	59.9
India	12.3	8.5

Source: ITC (2011).

The market access conditions for the Nepalese ginger in major importing countries show that Nepal enjoys duty-free access in

developed economies, such as Japan, the United States of America, the Netherlands and Germany under the Generalized System of Preferences (GSP) for least developed countries. Nepal also enjoys a zero duty in the Indian market under a bilateral trade agreement and the margin of preference for Nepal is higher in India compared to other South Asian least developed countries. Pakistan also provides preferential access for least developed countries under the Agreement on South Asian Free Trade Area (SAFTA). However, there is no such tariff preference in the Bangladeshi and Saudi Arabian markets (ITC 2011).

The above analysis shows that tariff barrier is not a major constraint for Nepal in promoting exports of ginger. The challenge is in the diversification of the value added products and the markets. Ginger in Nepal is traded in fresh, dry and processed forms. About 85 per cent of ginger is traded fresh and the remaining volume is distributed between the dry and a negligible quantity of processed forms. Similarly, more than 99 per cent of ginger is exported to India. However, product diversification and value added is the precondition for market diversification.

In Asia and the Pacific, most of the consumption of ginger is in the fresh form but in other countries consumption of processed ginger, such as paste, oil, oleoresin, candy, etc., is on the increase. For example, ginger can be preserved in syrup as in China. Australia has also developed the ginger industry and it exports mostly candied rhizomes, reputed to have 'superior and consistent quality.' Ginger oil can be received by steam distillation of grind paste or dried powdered ginger, which is used as a flavouring agent for soft drinks and ginger beer and in food preparation. Similarly, ginger oleoresin can be obtained by extraction from dried ginger pulverized to coarse powder and added organic solvents like ethanol or acetone. However, one needs to note that oil obtained from dried rhizomes yields 1.5 per cent to 3.5 per cent on the dry weight basis and 0.4 per cent on the green weight basis while oleoresin content ranges from 3.5 to 9.5 per cent. With the increasing ginger production, India and Hawaii (the United States of America) have started to produce ginger paste as a value added product. However, it is difficult to maintain stability in flavour and quality and preserve ginger paste for a long time.

To enter new markets Nepal needs to diversify processed ginger products. It is imperative for Nepal to explore export potentials in the Asia-Pacific markets for fresh ginger and in other markets for processed ginger, including organic ginger products. However, exporters need to comply with sanitary and phyto-sanitary standards.

3.3. THE GOVERNMENT POLICY

Agricultural Perspective Plan (APP) launched in 1995, is the Government's key policy document on agricultural and rural development, but it has only been partially implemented. The strategies outlined in the APP were expected to lead to a technology-based green revolution in agriculture, which would raise outputs and incomes through increased use of yield increasing inputs (fertilizer, improved seed, reliable irrigation) and promotion of off-farm activities. The strategy was regionally differentiated between the Terai (focusing on high yielding input-based food grain production) and hilly and mountainous areas (focusing on horticulture and other cash crops, including ginger and

coffee, as well as on livestock production in prioritized pocket programmes). The APP envisaged significant increases in public and private investments and an integrated package approach to exploit complementarities between public and private investments and with other sectors such as transport and energy. The APP included explicit investment targets focused on four priority inputs: fertilizer, irrigation, technology and infrastructure (HMG/ADB 1995).

National Planning Commission of Nepal adopted a three year interim plan (2007/2008-2009/2010) in which it spelled out one of its strategies for commercial agriculture as establishing and strengthening competitive agriculture value chains on products with comparative advantages. The plan also included creating partnerships among the Government, cooperatives and the private sector for sustainable development of commercial agriculture by establishing, developing and strengthening larger pocket areas based on geographic, technical and economic feasibilities. The plan has also identified priority agricultural crops and commodities for mission programmes by choosing ginger and coffee products and proposed to accomplish the mission by addressing various stages of the products' value chains, among others. To achieve this, the plan has adopted the policy of providing high quality seeds, better irrigation facilities, agricultural credit, technological development and dissemination, extension services, better marketing management system and regulations and human resource development (NPC 2007).

Trade Policy 2009 has also identified ginger and coffee as products for export promotion. Regarding ginger products, the policies included production expansion based on providing financial support, technology and quality seeds, establishment of market system, improvement in the quality of production and processing of ginger, introducing quality certification, training farmers during all stages from production to marketing, value addition and product and market diversification. Regarding coffee products, the document emphasized providing high quality seeds and seedlings, identification of new areas for highland and organic coffee production, adoption of new technologies for coffee production, processing and grading and assistance to farmers in the formation of farmers' cooperatives (MCS 2009). The Government has also enacted Coffee Policy 2003 aiming at increasing the participation of private and cooperative sectors in coffee production, processing and trade, developing coffee sector in a sustainable manner, creating income and employment opportunities, reducing poverty and promoting coffee exports. The policy has also identified strategies and policies in production and processing, market and market promotion and institutional development (MAC 2003). However, it is yet to be implemented because of the absence of implementing policy regulation.

Direct support to farmers and processors included Government provided interest subsidies for the loans taken by coffee producers. The budget speech of 2009/2010 has initiated a programme of providing 25 per cent subsidies on the cost of machinery and equipment to coffee and ginger processing industries. It has also introduced 100 per cent subsidies for the registration of a trademark 'Nepalese Coffee' in international markets. However, there is no similar support programme designed for the ginger sector.

The Government policies on the development of coffee and ginger sectors are positive and progressive, but in comparison with policies of other Asian coffee and ginger producing countries are still inadequate and policies' implementation is sluggish. There is no government support for planting seeds and seedling, technology adoption and adaptation, quality upgrading and market development, while government initiatives on product research and development, processing technology and human resource development are disappointing.

4. Value Chain Analysis

Value chain has been defined by Michael Porter as a tool for analysis that 'disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and existing and potential sources of differentiation' (Porter 1985). He claims that value chain allows us to diagnose the competitive advantage of a firm or industry and to enhance the advantage by tailoring the value chain. However, there have been significant developments since Porter introduced the concept and a broad approach to value chain looks at the complex ranges of activities implemented by various actors (suppliers, primary producers, processors, traders, service providers, etc.) to deliver raw material to retail market of the final product. The broad value chain starts from the production system of raw materials and moves along the linkages between enterprises engaged in trading, assembling, processing, etc. This broad approach not only looks at the activities implemented by a single enterprise but also includes all its backward and forward linkages, up until the level at which the raw material produced is linked to the final consumers (Roldan-Prez et al. 2009).

Value chain analysis or commodity chain analysis disaggregates the global structure of fabrication, trade and consumption of commodities and allows for the identification of factors and geographical divisions (Tuvhag 2008). Value chain analysis has been widely adopted by researchers, industry and development practitioners to understand the political economy of contemporary global production systems and has been also used as a tool to analyze different aspects of chain coordination and governance. Value chain analysis has three key elements: (a) barriers to entry and rent; (b) governance; and (c) systemic efficiency (as opposed to point efficiency, meaning that the links of the complex value chain need to be integrated to make them efficient) (Kaplinsky 2000). At the most basic level, it systematically maps the actors participating in the production, distribution, marketing and sale of a particular product. This mapping assesses the characteristics of actors, profit and cost structures and flows of goods throughout the chain, as well as employment characteristics and the destination and volumes of domestic and foreign sales (Kaplinsky and Morris 2001). Secondly, it can play a key role in identifying the distribution of benefits to different actors in the chain. It means that, through a value chain, one can determine who benefits from participation in the chain and also assess which actors benefit from the government interventions or support. Thirdly, it can be used to examine the role of upgrading within the chain, i.e., improvement in quality and product design and identification of product regulations, entry barriers, trade restrictions and standards. Fourthly, it can highlight the role of governance in the value chain. Governance in a value chain refers to the structure of relationships and coordination mechanisms that exist between its various actors. The following analysis focuses on the first two aspects.

4.1. ANALYSIS OF THE COFFEE PRODUCT VALUE CHAIN

Coffee product value chain is the sequence of stages involved in delivering coffee products to the final consumer. It includes production (cultivation, harvest and initial processing), roasting, distribution and consumption.

Coffee production takes place in coffee estates and small farms. This stage involves planting, growing and harvesting of the coffee cherry and initial processing of separating coffee beans from the skin and pulp of the cherry. The stage is finished with the production of green beans.

Since coffee is largely consumed in non-producing countries, it is exported to consumer mostly in the form of green beans. Several firms may be involved in the international trade of coffee including exporters, importers and roasters. The trade can also occur directly between a grower and a roaster. Moreover, growing and roasting can be vertically integrated under single ownership and management.

Green beans should be processed to display its aromatic and flavour characteristics. This processing is called coffee roasting and consists of heating coffee beans that transforms the physical and chemical properties of the green beans and turns them into roasted coffee beans.

Finally, coffee is ground and brewed for consumption as a hot or cold beverage. Brewing includes the use of a dip brewer, an espresso machine, a French press or a vacuum pot, among other methods. Coffee may be further processed to make instant coffee, which only requires adding water to consume.

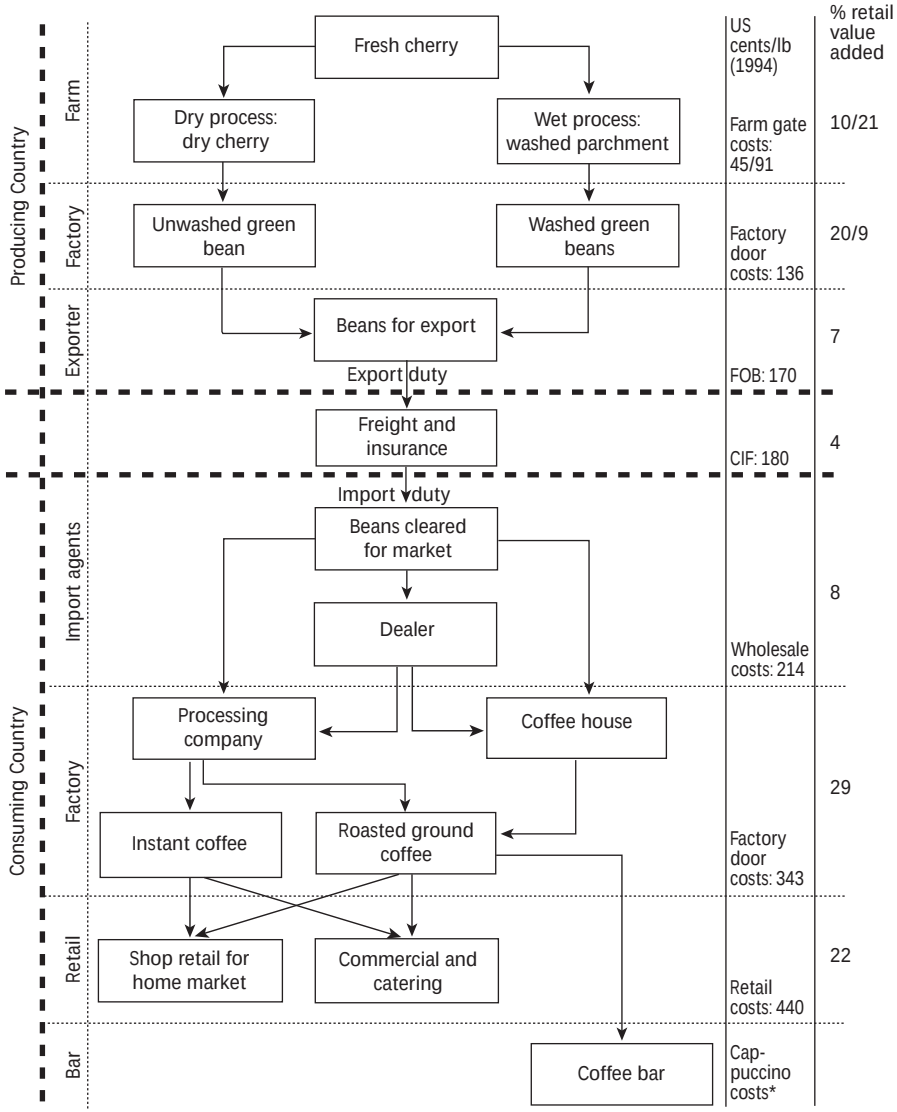
Fitter and Kaplinsky (2001) have mapped the major inter-country input-output relations in the coffee value chain presented in figure 1. Various stages of a value chain include the following:

- Farmers either pick and dry process or pick and wet process coffee cherries, receiving a *farm-gate price.*
- The cherries are then dry or wet processed to receive coffee beans at *factory gate price.*
- Coffee beans then go to an intermediary for export, reflected in *fob prices.*
- Coffee beans are shipped to importing countries at *cif prices.*
- Importers sell coffee beans at *wholesale prices.*
- Roasters process coffee beans and sell them at *factory gate prices.*

Retailers sell coffee beans to the public for domestic consumption and restaurants, caterers and coffee bars for out-of-home consumption at retail prices.

Fitter and Kalinsky (2001) found that not only have coffee producers experienced declining share of returns, but also a rising share of the total value chain returns has gone to roasters and retailers in the high income consuming countries, who were able to protect themselves from competition by introducing product-related

Figure 1: The coffee value chain[33]



* Costs variable but very high. Include: overheads, advertising other products (i.e., milk), and the 'experience' of the coffee bar. (see breakdown of the price of a cup of coffee)

[33] *Source:* Fitter and Kaplinsky (2001).

branding barriers entry. It is estimated that farmers only get 10 per cent of final product prices and total returns in producing countries are less than 40 per cent of the final product prices.

4.2. VALUE CHAIN ANALYSIS OF THE COFFEE SECTOR IN NEPAL

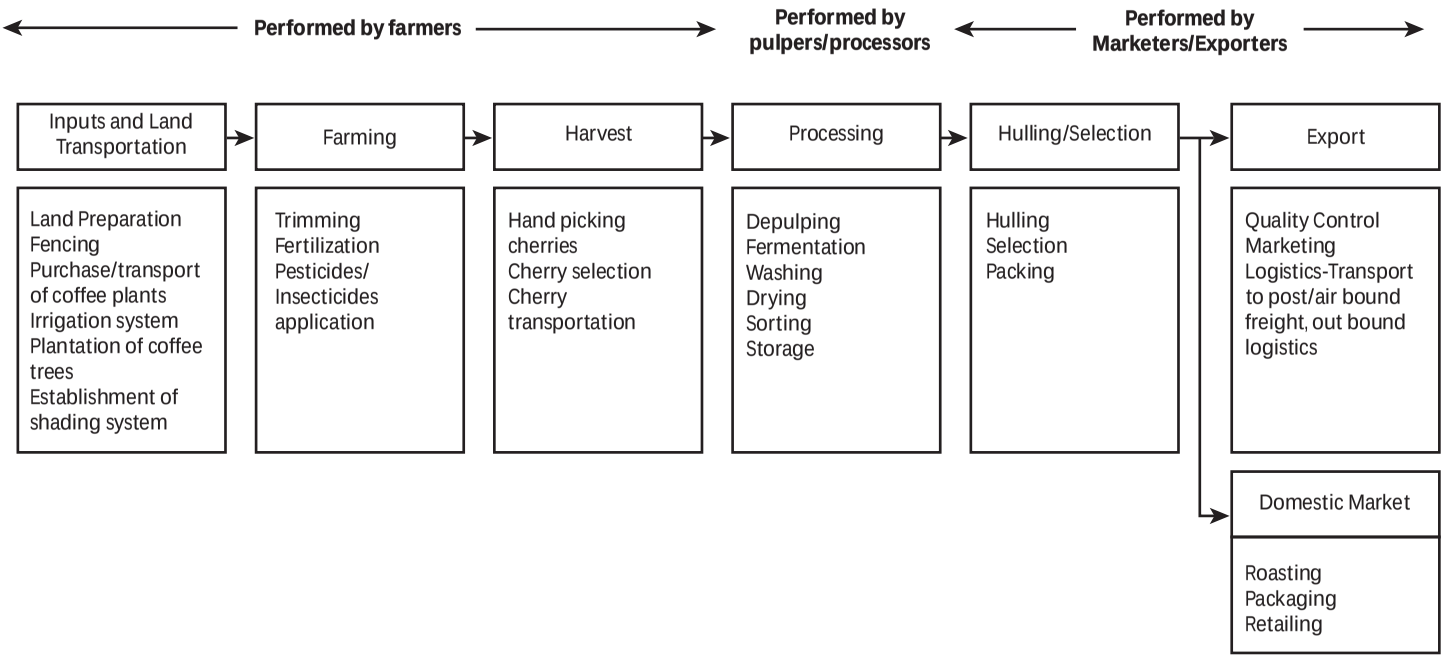
In a simplified model of Nepal's participation in the global coffee value chain, the first stages include artisanal process of planting and growing coffee plants, then hand picking and seizing and afterwards drying, washing and cleaning coffee beans. The process requires a farmer's constant attention, assuring good quality coffee. Local farmers, sometimes through cooperatives, sell the cherry to pulpers or operators, who in turn sell them to processors/marketers. After hulling and quality control, it is exported as roasted or green beans or sold on domestic market after roasting, grinding and packaging. An exporter channels the coffee either to roasters or to other brokers or intermediaries. About 65 per cent of the total coffee production is exported while 35 per cent is consumed domestically. Coffee value chain map is presented in figure 2.

Farmers play an important role in the coffee value chain because they take part in production phase, the first phase in the chain. There are more than 21,000 farmers producing coffee in 40 districts of mid hills. Lalitpur, Gulmi, Palpa, Syangja, Kaski, Kavrepalanchok, Sindhupalchok, and Arghakhanchi are well-known districts for coffee production and farmers of Baglung, Parbat, Dhading, Gorkha, Lamjung, Tanahu, Rasuwa, Nuwakot, Okhaldhunga, Ramechap and Ilam have also started growing coffee recently. An average coffee farmer belongs to lower middle class and owns 1.4 ha of land consisting of bari grassland (non-arable land with steep and moderate slopes, prone to soil erosion, which is used for cultivation of maize, millet, beans and mustards) and arable land divided in almost equal parts/segments (AEC 2006). Since coffee farming gives returns only after three to four years of plantation, poor farmers are rarely engaged in coffee farming, as they need immediate returns from their land and labour. Some of exporting enterprises, e.g., Highland Coffee Promotion Company Limited and Plantec Coffee Estate have also started coffee farming on a large scale by leasing land from farmers/government agencies.

All cherries are handpicked by farmers/hired workforce. Farmers often pluck all berries on each branch and do not distinguish between ripe and green cherries. Such practice has resulted in quality variation of coffee beans.

The focus group was informed that the expansion of coffee farming is being carried out by farmers despite any scientific proof of the suitability of the land and climate conditions to such type of farming. Pioneers of coffee farming had adopted the farming and processing system imported from El Salvador and they have been modifying the system on hit-and-trial basis ever since. Some farmers are emulating such farming system. There has not been any scientific research on the farming methods in Nepal and the appropriate method for coffee farming in terms of attaining optimum yields and better quality and minimizing plant diseases is yet to be found.

Figure 2: The coffee sector value chain



Initially there were five players/stakeholders in the coffee sector value chain, namely farmers, collectors, pulpers, processors and traders. However, in the past few years some collectors have also started pulping ripe cherries and delivering them to processors. The process is common in wet processing systems, which covers nearly 80 per cent of the market. However, in some places farmers bring ripe cherries/dry cherries to collectors, who in turn (after drying ripe cherries if needed) take them to processors directly. Such procedure prevails in the dry processing system that accounts for nearly 20 per cent of the market share. In both dry and wet processing systems, the processors act as traders and sell the final product either on domestic and/or international markets.

Coffee farmers sell ripe cherry to pulper operators at pulpers' gate. The pulping stage is the crucial stage for determining the quality of coffee. It involves sorting, water soaking, pulping, fermentation, washing and drying. Pulpers sell parchment to processors/marketers. After processing and packaging, processors/marketers sell coffee in domestic or international markets.

Processors or exporting companies often buy parchment from collectors or get cherries from their own farms. Processors are also involved in processing and packaging of coffee in different size packages and putting brand labels.

It was reported in the focus group discussion that there has not been any research on the use of technology in pulping, hulling and drying. Participants in the discussion complained that the Government does not provide any support for farming and processing. On the contrary, they view government policies as a bias against the coffee sector. For example, the import of machinery for pulping, drying, grinding and roasting has normal custom duties up to 30 per cent, while other machinery importing industries have much lower custom duties.

In order to prepare coffee beans for marketing in the domestic market or for export, marketers/exporters reprocess the coffee collected from processors to meet export standards and classify the coffee into different quality categories. But even after reprocessing, the coffee still has many imperfections, due to inadequate technology. The coffee export is often affected by three problems: humidity, black and broken beans, and impurities. Additionally, contamination with Ochratoxin A is also seen as a problem (AEC 2006).

Coffee is exported mostly on *fob* Kolkata basis. However, some exporters also export by air. Transporting coffee is costly. The extra cost involved in export includes the movement of fumigated container (for conventional coffee) from Kolkata to Kathmandu and back, the cost of ventilated container and a detention charge. Exporters also have to pay taxes/fees at customs points. Since there is no national agency in Nepal that certifies both the quality of coffee and the country origin of producer, it has been reported that imported coffee, mostly coming from India, has been marketed and exported overseas as the Nepalese coffee.

An indicative value added/profit in different supply chains of the coffee sector is presented in table 19. The table shows that coffee growing is more profitable for farmers compared to growing alternative crops. Farmers get 150 per cent return on

Table 19: Value added in the coffee sector supply chains (inclusive of profits)

Stages	Index	Percentage of value added and profits
Cost of production	100.0	–
Sale proceeds of growers/farmers	250.0	150.0
Sale proceeds of pulpers/operators	322.2	28.8
Sale proceeds of processors/marketers	355.5	10.3
Sale proceeds of domestic retailers	611.1	71.8
Sale proceeds of exporters	648.8	82.5

Source: The author's calculation based on AEC (2006).

their investment. The return in exporting coffee in international market is higher than the return in marketing it in domestic market. However, the quality of exported coffee is also high compared to the quality of coffee sold in domestic market.

In 1990 the farmers of Palpa district established Coffee Entrepreneurs Association, Palpa for promoting coffee production and distribution. In 2001 the initiatives of the farmers of Palpa and farmers of other districts resulted in the establishment of a Federation of Nepalese Coffee Producers Association, an umbrella organization of coffee producers, traders and exporters. At present, 14 district-level coffee entrepreneurs' associations, 750 coffee producers' groups and cooperatives and about 20,000 farmers are affiliated with the Federation. The objectives of the Federation include: improving quality and standards of Nepalese coffee, institutionalizing commercialization of coffee in a sustainable manner, developing infrastructure for coffee production and distribution and protecting the interests of coffee farmers.

National Tea and Coffee Development Board (NTCB) was established in 1993 under Tea and Coffee Development Board Act 1993. Its functions include: formulating and implementing tea and coffee development policies; identifying problems and providing recommendations for the development of tea and coffee sectors; providing support to enterprises in using tools and equipment for tea and coffee production and processing; bringing in technical know-how and skills to farmers, entrepreneurs and relevant organizations; and networking and cooperating with all stakeholders in tea and coffee sectors.

4.3. MAJOR CONSTRAINTS TO THE COFFEE SECTOR DEVELOPMENT IN NEPAL

The favourable natural conditions, enjoyed by the coffee industry in Nepal, create an advantage over other coffee exporting countries. These conditions are a product of the right altitude, latitude, climate, soil type, the surrounding environment and default organic farming practices. In spite of being blessed with favourable natural environment, the Nepalese coffee industry has been facing problems in all parts of its value chain, including production, processing and marketing. In addition, there are some institutional problems too.

As there has not been any research on the suitability of soils for coffee production, coffee tree planting has been done sporadically, all over the mid-hills, without any pocket areas selected for coffee development. As the production is thinly distributed among small growers, the farmers are not aware of the quality of the coffee produced as there is no agency to certify the quality of coffee. Similarly, there has not been any research on improving the quality of seeds and seedlings and there is no institutional mechanism to provide/distribute quality seeds/seedlings or the required nutrients/organic fertilizers and pesticides. There is no financial incentive to upscale production such as an easy access to and lower cost of finances. Participants in the focus group discussion also mentioned that coffee plants were infected by White Stem Borer.[34] But there were no experts who could advise farmers on how to control the pest.

In processing coffee beans, there is a lack of adequate machines, equipment and accessories for pulping, washing and drying. There has not been any significant research on the suitability of the machines used in coffee processing. There is a lack of skilled workforce to do the processing and the accredited laboratory to control the quality. After the processing is finished, storage at appropriate temperatures becomes another problem, which, if not solved, exposes coffee beans to fungus and moulds and thus causes Ochratoxin A.

Exporters and traders are facing a number of problems both in domestic and export markets. There is no quality and market regulation in the domestic market resulting in substandard imported products entering the market. Similarly, there is no testing laboratory for certification, including cup testing, to ensure coffee beans quality. In addition, exporters are facing high costs for certification, transportation (including fulfilling requirements for ventilator containers) and packing materials as well as experiencing problems with warehousing system. Exporters are also required to pay local taxes, both formal taxes levied by the state and informal taxes imposed by multiple private actors. There is also no institutionalized system providing export market information.

Though the Government has enacted the Coffee Policy 2003, but due to a lack of implementation guidelines the policy is in limbo. During focus group discussion the participants complained that National Tea and Coffee Board (NTCB) was preoccupied by the activities of tea promotion and coffee-related issues were put on the back burner.

4.4. VALUE CHAIN ANALYSIS OF THE GINGER SECTOR IN NEPAL

The ginger produced in Nepal has been traditionally traded domestically as well as exported to India. Therefore, both Nepalese and Indian functionaries are engaged in creating a value chain map – the Nepalese functionaries are engaged in production and collection stages and the Indian functionaries in wholesale and retail stages. Though the linkages between the actors are traditionally deeply rooted but the chain

[34] A disease caused by an insect *Xylotrechus quadripes*, that affects the stem and sometimes the root of Arabica coffee plant. It is one of the most destructive pests affecting Arabica coffee plants in India, resulting in not only the loss of the current crop but also in uprooting of infested plants and replacing them with new trees.

provides more value to the Indian traders and wholesalers than to the Nepalese producers (Full Bright Consultancy 2008). The Agri-Business and Trade Promotion Multipurpose Cooperative reports that scientific method of cultivation, improved varieties, grading and modern packaging methods are not practiced by farmers as well as by traders (ABTRACO 2005). Traders reported that because of these problems up to 20 per cent of the product was wasted every year and the Nepalese ginger fetched a comparatively lower price than the ginger produced in the hills of India.

There are three types of farmers engaged in ginger production: (a) small farmers with subsistence ginger production; (b) small commercial farmers with small production volume but still targeting the market; and (c) large-scale commercial production farmers. The produce from the first category of farmers generally does not enter the market or enters in a very limited quantity, targeting local *hat-bajar* market. Small and large-scale commercial farmers sell most of their produce to various market intermediaries.

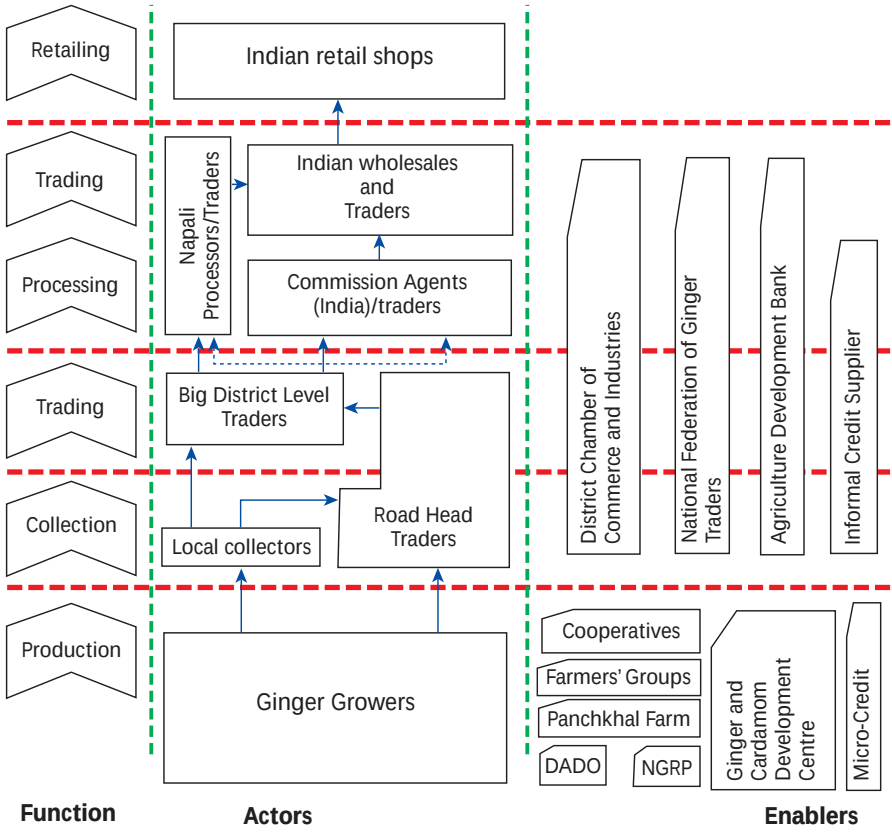
Many farmers clean ginger by removing dirt and soil immediately after harvesting. About half of the farmers sell ginger immediately after harvesting and the rest store their produce either inside or under houses in jute bags or in pits. Only commercial farmers do sorting and grading of ginger according to product size (AEC 2006).

Market information is generally inaccessible to small farmers and they have to depend on the information provided by collectors, while large farmers do use information technology such as phones, radios and TVs to get the latest market information.

Small traders and big producers residing in same village would occasionally be involved in ginger trading. Local traders generally collect ginger from producers and transport it to the district-level traders and wholesalers. In addition to the village-level collectors, some shopkeepers on highways/roads are also engaged in ginger trading. These traders have a permanent base of regular customers/farmers. Road head traders are important market functionaries in ginger marketing and a large part of the produced ginger flows through them. Farmers deliver ungraded ginger to the road head traders and it is there, where the preliminary grading is performed. Cut, rotten and spoiled rhizomes are graded out. The grading may be carried out on their premises or when the product reaches the district market but in both cases road head traders pay for grading (labour cost plus weight loss). These traders have limited storage facilities and keep ginger until they have filled a full truck or tractor load. In many cases the road head traders make purchases using the capital provided by big traders as short-term loans. The interest rate is quite high, around two per cent per month (Full Bright Consultancy 2008).

Local traders collect ginger from local collectors and sell them to wholesalers/exporters stationed in bordering cities. These traders deal in big quantities and possess some sort of storage facilities. However, the storage facilities are not adequate for storing fresh ginger for a long time and losses are reported to be quite high for delayed shipments.

Figure 3: The ginger sector value chain



Source: Full Bright Consultancy (2008).

Commission agents play a vital role in marketing channels. Basically all exportable ginger go to various terminal markets in India through commission agents stationed in border cities in India. The commission agents generally do not own the product but arrange sales on behalf of owners/traders, working on commission and bearing no risk. For this service, they charge 10 per cent commission on the total sales value. Nepalese exporters do washing, grading and repacking before handing over the shipment to Indian wholesalers.

Unlike coffee farmers, ginger growers are not well organized. Nepal Ginger Producers and Traders Association was established in 2005 to promote ginger product in Nepal but its activities cover only the eastern part of Nepal. NGOs/INGOs and other support groups have assisted farmers organizing informal groups but these groups are mostly inactive. However, recently ginger farmers started forming cooperatives, although the effectiveness of such cooperatives is negligible compared to cooperatives of vegetable growers.

There are only a few ginger producers' associations at district levels, such as in Palpa and Ilam districts. Some of district chambers of commerce and industries are active in promoting the ginger business. However, these organizations do not have meaningful coordination and linkages with the public sector and other support agencies to enhance the value chain (Full Bright Consultancy 2008).

Department of Agriculture (DOA), Ministry of Agriculture and Cooperatives is entrusted with the task of providing pre-cultivation, cultivation, harvesting and post-harvesting services to farmers. However, due to limited financial and human resources the services are inadequate. Instead, farmers get 'embedded' services from input suppliers. For example, information and protection measures against pests and plant diseases are provided by pesticide retailers. Unfortunately such information is biased and the quality of services is poor.

District Agriculture Development Office (DADO) is also implementing various activities on ginger product promotion, such as farmers' group formation, providing advice to farmers, training and technology demonstrations. Ginger and Cardamom Development Section (Directorate of Vegetable Development within the Department of Agriculture) is engaged, among other things, in collection and selection of ginger varieties, technology generation, production and distribution of quality planting materials and providing training and technical know-how to farmers. Spices Development Centre, Panchkhal and National Ginger Research Programme are public sector agencies engaged in promotion and development of ginger product.

An indicative value added at different stages of ginger sector value chain, based on a study in Phidim, Panchthar district in east Nepal, is presented in table 20. The Table shows that farmers incur major expenditures in the cost of seeds (around 38 per cent), labour (26 per cent), fertilizer (19 per cent) and land rent (13 per cent). A margin received by the farmers is about 25 per cent of the wholesale market price in India. Local traders are generally involved in collecting and transporting ginger to local market centres and their margin is about four per cent of the wholesale market price in India. The local traders and wholesalers are two key players in ginger product marketing and bear the costs of short-term storages, transportation, washing, grading, packaging, etc. They also have to pay taxes, both formal and informal, also, the cost of customs clearance. The margin at this level of the value chain is reported to be around nine per cent of the Indian wholesale market price. An Indian commission agent stationed in Naxal, a nearby Indian wholesale market, receives a 10 per cent margin on this nearest Indian market wholesale price. An important finding, emerging from the analysis, shows that the costs incurred in customs clearance, transportation and tax collection by different groups make the marketing cost quite high. Similarly, the losses at the marketing level are also high due to inadequate post-harvest management at the production level. Also, the commission charged by wholesalers and commission agents is relatively high due to a lack of market information among upstream value chain actors.

Table 20: The ginger sector value chain (Phidim, Panchthar), (in NRs. /kg)

Farmers/ Growers		Local Traders/ Collectors		Wholesaler/ Exporters		Indian Commission agent	
Items	**Cost**	**Items**	**Cost**	**Items**	**Cost**	**Items**	**Cost**
Production Cost		Assembling Costs		Load/unload	0.19	Commission	4.32
Land rent	1.92	Bag	–	Short term storage	0.05		
Seed	5.39	Grading/ Packaging	–	Transport	1.25		
Labour	3.69	Collection/ Transportation	1.50	DDC tax	0.25		
Fertilizer	2.73	Acquisition costs	25.0	Other local informal taxes	0.34		
Total production cost	13.73	–	–	Customs clearance	1.15		
Post production cost	–	–	–	Cleaning, grading, packaging cost (India)	0.89		
Post harvest transportation	0.47	–	–	Acquisition cost	28.25		
Total Farm level costs	14.20	Total local trade level cost	26.50	Total Wholesaler/ Exporter cost	32.37		
Losses	–	Losses	–	Losses (8%)	2.58		
Margin	25.00	Margin	1.75	Margin	3.93		
Farm gate price		Assembler level price	28.25	Wholesale level price	38.88	Price at Indian wholesale market	

Source: Full Bright Consultancy (2008).

4.5. MAJOR CONSTRAINTS TO THE GINGER SECTOR DEVELOPMENT IN NEPAL

In spite of the fact that ginger is an important cash crop for the Nepalese farmers, no major breakthrough has been made so far in boosting its production and export. Since it is a vegetatively propagated crop, a lack of knowledge in selecting high-yield varieties and other mistakes, committed in the past, must have contributed to poor results. The major constraints to ginger production and export increase are as follows:

Small land holdings. Because of the terrain, the size of land holdings is very small and farmers are producing many crop varieties on the same piece of land. Therefore, commercialization of crop/variety on a large scale is very difficult unless the Government supports the system of contract/ lease farming;

Unavailabilty of quality planting material and other inputs. Although National Ginger Research Programme is mandated to conduct research on ginger, it has recommended so far only one variety of ginger, Kapurkot-1. Good quality, high-yielding and disease resistant rhizomes are not available to farmers. In addition, inputs like manure, pesticides and herbicides are rarely used;

Pest infestation. High rainfall and inappropriate storage facilities cause heavy infestation with weeds, pests and diseases and lead to nutrient leaching;

Lack of funding. Although ginger is one of the major cash crops for rural farmers, farmers are not getting any financial support from the Government to purchase quality seeds and other inputs. A scheme should be created to provide soft loans to farmers;

Problems in processing and marketing. Succesful ginger growing depends on adequate processing units, marketing and transport facilities. Presently, there are hardly any cold storage facilities available and a few existing processing units are not functioning up to the desired capacity. All ginger producing pockets are not well connected to a transport network and the majority of farmers do not get access to collection centres;

Lack of laboratory testing facilities. The major export market for the Nepalese ginger is India. Indian Quarantine Act requires ginger to be tested in the laboratory and the quality ensured before importation. There is no such facility in Nepal or at least none that fulfills Indian requirements. In order to export ginger to India, exporters are required to send a sample to an Indian laboratory and get the laboratory report, which takes about three weeks. Moreover, a higher quality standard would be required to export to developed countries.

5. SWOT Analysis

SWOT analysis is a simple framework for generating strategic alternatives from a situation analysis. It is a strategic planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in a business venture. It involves identifying favourable and unfavourable internal and external factors helping to achieve the objectives of a business venture. The strengths and weakness related to the business venture are internal factors whereas the opportunities and threats from the outside environment are external factors. The results are often presented in the form of a matrix. This section presents the SWOT analysis for the coffee and ginger product sectors.

5.1. SWOT ANALYSIS OF THE COFFEE SECTOR

The favourable climate, the rate of growth in coffee production and export the interest and passion on the part of the Nepalese coffee farmers and the identification of coffee as a priority product for development — all point to its potential, emerging as an important enterprise. Therefore, it is necessary to identify and analyse the strengths, weaknesses, challenges and opportunities of the coffee sector, so that the necessary steps required for its development are taken out on time. The study has identified the following major strengths, weaknesses, opportunities and threats.

Strengths

- Availability of favourable climatic and other natural conditions for the production of high quality coffee, including specialty coffee, in most districts of the mid-hills.
- Existence of a well-established institutional base, e.g., Federation of Nepalese Coffee Producers Association and Nepal Tea and Coffee Development Board and the willingness and the ability of all stakeholders, including the Government, the farmers, the private sector, the non-governmental organizations and the donor community to participate in coffee product promotion.
- Availability of numerous cheap workforce for coffee farming and production with the farming system being 'organic' by default.
- Availability of farmers and processors having basic understanding of coffee production and the gradual emergence of professional pulpers, processors and roasters.
- Emergence of the Nepalese coffee as a highland organic coffee brand in export markets and the increased demand for such specialty coffee.
- Possibility of intercropping with other food crops.
- Coffee production as a potent instrument to alleviate poverty in rural areas by creating employment and generating income in marginalized groups.

Weaknesses

- Low export volume.
- Minimum research and development on the suitability of land, seeds and seedlings varieties, farming techniques and processing and roasting technologies.
- Lack of skilled manpower.
- Lack of awareness among farmers of the importance of quality resulting in quality variation.
- Lack of supply of quality inputs, such as seeds and seedlings, nutrients, organic fertilizers, insecticides and pesticides.
- Lack of coffee product standardization, quality laboratories, certification agencies and market regulation.
- Inadequate government support in land acquisition, farming, processing, and marketing.
- Insufficient information on production, processing, marketing, and domestic market.
- Discontinuity of the initiatives on coffee development by international non-governmental organizations and development partners.
- Insufficient coordination among government agencies and private sector players.

Opportunities

- High-income elasticity and the growing demand in domestic and international markets, although at a slow rate.
- Ample opportunities for entering into new niche markets in the United States of America, the European Union and the Gulf countries with specialty and highland organic coffee.
- Favourable climatic conditions and a high potential for growing specialty and highland organic coffee for the international market.
- Increasing demand and price for specialty and organic coffee.
- Growing interest and activity of producers' associations both at the district and national levels and farmers/private sector in coffee production.

Threats

- Increasing migration of the workforce overseas and to urban areas may result in a decrease of labour force for coffee farming and an increase in the wage rate.
- Income elasticity of the coffee sector is positive and greater than one and, thus, any volatility in global economic situation impacts the demand for coffee.
- Unilateral trade liberalization and tariff reduction under the World Trade Organization may erode the margin of preference that the Nepalese coffee has been enjoying in export markets.
- Most coffee exporting countries are promoting coffee with the help of strong government intervention and support; hence, lack of resources to provide support to the coffee sector may adversely affect the competitiveness of the Nepalese coffee.
- Nepal specializes in the production of Arabica variety so the increased production and aggressive marketing of Robusta at the global level may affect the demand for Arabica coffee.
- Increasing quality consciousness of the consumer in the export markets may pressure governments concerned into adopting unilaterally higher level of sanitary and phyto-sanitary standards.
- High variations and unpredictability in quality may be detrimental to acquiring brand status in the international market.

5.2. SWOT ANALYSIS OF THE GINGER SECTOR

Ginger is one of the main cash crops supporting the livelihood and improving the economic level of many rural households in Nepal. Its development would contribute in creating employment and raising income and standard of living of rural dwellers. The following section deals with the strength, weaknesses, opportunities and threats of the ginger sector in Nepal.

Strengths

- The climatic and soil conditions for the production of ginger exist in many districts in Nepal and the supply capacity could be enhanced with the appropriate interventions.
- Traditional spices in South Asia include ginger as a major component and, therefore, demand in the domestic and export market is stable. In addition, the medicinal value of ginger has also helped increase the demand.
- It could be traded in raw or semi-raw form without any sophisticated processing.
- Farmers are aware of the production system, and are organized through cooperatives and district-level associations.
- Most of the ginger producing pockets, e.g., Palpa in the west and Ilam in the east of Nepal are well connected to the transportation system and market network, including domestic retail and wholesale markets as well as northern Indian markets.

Weaknesses

- Most of ginger produced in Nepal have high fibre content and is considered inferior in quality compared to ginger produced in South India, but farmers are not aware of the importance of quality.
- The prices farmers receive from collectors are highly volatile and this is a disincentive for ginger farming.
- Farmers are not well organized and transport their produce to the collection centres on their own, paying high transportation costs.
- Shortage of the minimum essential services required for the farmers, including the inputs such as: seeds and fertilizer, irrigation facilities, marketing services, credit, and market/price information.
- Farmers use traditional farming methods and do not possess the adequate knowledge of and techniques in production, grading, packaging, and post-harvest handling.
- Prevalence of rhizome rot disease causes significant losses during both growing and storing stages.
- Farmers use traditional method of drying (*Suntho* making) ginger, which makes it unacceptable for industrial use.
- Farmers and other entrepreneurs are unaware of ginger processing technology and value added secondary ginger products.

Opportunities

- High and increasing demand in northern cities of India for the Nepalese ginger.
- Government has identified ginger as one of priority products for development and committed to provide facilities/services to farmers/ traders.

- A rate of return in ginger production is higher compared to the rate of return in the production of cereal products.
- Market access condition in export market is favourable for Nepal as it enjoys high tariff preferences in the Indian market.
- Private sector institutions, e.g., Agro Enterprise Centre, provide market/price information to farmers/traders; there is also a well established coordination mechanism with government agencies, e.g., Agro-business and Marketing Development Directorate.

Threats

- China has been aggressively entering into the ginger market and there is a risk of displacement of Nepalese ginger from the Indian market by an over-supply of better quality cool season products from Tibet of China.
- In order to diversify the product by moving upwards in the value chain, the product has to meet sanitary and phyto-sanitary standards as well as other quality standards.
- Insufficient and interrupted supply of electric power used for ginger processing.

6. Future Thrust and Business Plans

6.1. THE COFFEE SECTOR: FUTURE THRUST

Interventions in the followings areas of production, processing and marketing would go a long way in the promotion and development of coffee product in Nepal, which might eventually reduce costs and improve quality and efficiency.

Survey, analysis and farming model: There is a need for a survey and analysis of lands suitable for coffee growing and the development of area-specific farming system model under a cluster approach.

Introduction, evaluation and improvement: There is a need for research on the varieties of coffee, their productivity, susceptibility to diseases, cup quality suitable for Nepalese climatic situation and soil conditions. Similarly, commercialized nurseries with proper monitoring of the quality of seedlings need to be widely established.

Awareness and skill development: Only producers in the organized sector are aware of the importance of the quality of coffee while small farmers give least importance to the quality matters. Therefore, there is a need for creating awareness in the quality of coffee and training all actors involved in the value chain – farmers, pulpers, and processors – on how to improve, maintain, and preserve the quality of coffee. Also, there is a need for imparting knowledge to the farmers on the farming of coffee. Introduction of a course on coffee in Agricultural Colleges would help to create the trained workforce for the coffee sector.

Certification of coffee products: The Nepalese coffee is by default organic but due to the absence of a certifying agency, the bulk of coffee is exported as conventional

coffee. The future action should be focused on establishing legal and institutional frameworks for certification and labelling of coffee. There should be a regular monitoring of coffee quality marketed in domestic and/or export markets. Similarly, supply of organic fertilizers, pesticides and insecticides should also be ensured and cup testing laboratories should be widely established. In this regard, support to the farmers in establishing internal control system (ICS) is crucial.

Processing and storage system: Participants in the focus group discussion argued that coffee processing system adopted in Nepal was brought in from El Salvador more than a decade ago and there has been no improvement in the system since then. Research is needed for improving coffee processing system, in particular introducing new pulping and solar drying methods. Intervention is also required for better storage of coffee so that fungal infection and mould could be reduced.

Reducing transport and transaction costs: The distance between a farm and a processing unit is high in most of the rural areas and, due to a lack of road connections, coffee is transported through portage. In this context, harmonization of the rural road transport programme with coffee production sites would go a long way to lower transportation costs. Traders are required to pay District Development Committee taxes even for bringing cherry for processing. In addition, they have to pay taxes to non-state actors as well. An empty ventilated container has to be brought to Kathmandu from Kolkata by exporters and sent back to Kolkata with coffee beans. A proper warehousing facility is also needed in the airport for air transport.

Institutional development: There is a need for coordination between and among government agencies such as Ministry of Agriculture and Cooperatives, National Planning Commission, National Tea and Coffee Development Board, District Agriculture Development Office, Federation of Nepalese Chambers of Commerce and Industry, Federation of Nepalese Cottage and Small Industries, Federation of Nepalese Coffee Producers Association and district-level chambers. There is also a need for the establishment of a resource centre and institutional support for coffee producers. The technical support for this may be sought from development partners including ESCAP and FAO.

6.2. THE COFFEE SECTOR: BUSINESS PLAN

Table 21: The coffee sector: business plan

Objectives	Actions Recommended	Responsible Institutions
Increasing production of high quality coffee to 3,000 MT in 10 years' period	Establishing high level Coffee Development Committee under the Chairmanship of Member, National Planning Commission to coordinate and monitoring the activities listed below.	National Planning Commission
	Establishing and strengthening of Coffee Resource Centre for identification of suitable land,	Ministry of Agriculture and Cooperatives

Table 21: *(continued)*

Objectives	Actions Recommended	Responsible Institutions
	varieties, farming system, collecting and disseminating of coffee-related information	
	Establishing commercial nurseries in major coffee producing pockets and providing high yielding and disease resistant varieties	Ministry of Agriculture, National Agriculture Research Centre, National Tea and Coffee Board, National Coffee Producer's Association, Coffee Resource Centre
	Developing technical expertise in coffee farming and up scaling extension services	Ministry of Agriculture and Cooperatives, National Coffee Producers' Association, Universities, Centre for Technical Education and Vocational Training (CTEVT)
	Providing training to farmers, pulpers, and processors, including organizing study visits in coffee producing countries	Department of Agriculture, District Agriculture Development Office, National Tea and Coffee Development Board, National Coffee Producers' Association, Federation of Nepalese Chamber of Commerce and Supplies
	Improving existing and introducing new and appropriate pulping, drying storage, and roasting technology	Ministry of Agriculture and Cooperatives, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries, National Coffee Producers' Association
	Provisioning of cheap and easy access to finance	Ministry of Agriculture and Cooperatives, Ministry of Finance, Nepal Rastra Bank
	Creating awareness in specialty coffee and organic farming and provisioning of organic fertilizers, pesticides and insecticides	Ministry of Agriculture, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries, National Coffee Producers' Association
	Strengthening of organic certification system	Ministry of Agriculture and Cooperatives, National Coffee Producers' Association
	Supporting farmer groups in the establishment of Internal Control System	Ministry of Agriculture and Cooperatives, District Agriculture Development Offices, District Coffee Producers' Association

Table 21: *(continued)*

Objectives	Actions Recommended	Responsible Institutions
	Encouraging contract and lease farming, including leasing of government land and community forest	Ministry of Agriculture and Cooperatives and other Ministries/ Agencies
	Supporting coffee producers in the establishment of cup testing laboratories	Ministry of Agriculture and Cooperatives, District Agriculture Development Offices, National Tea and Coffee Development Board, District Coffee Producer's Associations
	Linking coffee producing pockets with rural transport system and promoting gravity rope way	National Planning Commission, Ministry of Physical Planning, Ministry of Agriculture and Cooperatives
	Establishing Coffee Development Board as an exclusive body for coffee development and market regulation	Ministry of Agriculture and Cooperatives, National Tea and Coffee Board
	Enforcing Implementing Regulation for Coffee Policy 2003 and implementation of coffee development strategy	Council of Ministers, Ministry of Agriculture and Cooperatives
Increasing export to four per cent of total export in 10 years period and diversifying export markets	Exploring new export markets and developing inventory of sanitary and phyto-sanitary and other standards required in export market	Ministry of Commerce and Supplies, Trade and Export promotion Centre, Federation of Nepalese Chamber of Commerce and Industries
	Rationalizing tariffs on the import of machinery and packaging material	Ministry of Finance, Ministry of Agriculture and Cooperatives
	Reducing transaction costs including abolishing local taxes	Ministry of Finance and Ministry of local Development
	Supporting private sector in acquiring appropriate containers	Ministry of Finance, Ministry of Agriculture and Cooperatives
	Support in acquiring logo and brand name for Nepalese coffee	Department of Industry, Ministry of Agriculture and Cooperatives, National Coffee Producers' Association
	Improving warehouses at major customs points	Ministry of Finance, Department of Customs
	Promoting FDI	Department of Industry, Federation of Nepalese Chamber of Commerce and Industries

6.3. THE GINGER SECTOR: FUTURE THRUST

Identified below are the areas where intensive intervention could increase production and productivity in the ginger sector.

Survey, analysis and farming model: There is a need for survey and analysis of lands suitable for ginger growing and the development of area-specific farming system model under a cluster approach.

Introduction, evaluation and improvement: Introduction of indigenous and exotic high-yielding strains of ginger suitable for Nepalese climatic and soil conditions. Selective breeding should be done for high-yield, better quality varieties with resistance to biotic and abiotic stresses.

System management research: There is a need to develop micro propagation and other propagation methods for rapid mass multiplication. Use of integrated pest management (IPM) and integrated nutrient management system is required.

Post-harvest management: There is a need to develop quality control measures, adequate packing and storage techniques. Similarly, there is a need for modern technology for processing and preservation of value added products.

Establishment of a laboratory for product certification: In the global trading system, non-tariff barriers, such as sanitary and phyto-sanitary, have become the major market access constraints after tariff reduction. Therefore, there is an urgent need for the establishment of a well-equipped laboratory for certification of products. The Government should also initiate the process for concluding Mutual Recognition Agreements (MRAs) with major importing countries.

Skill development and technology transfer: There is a huge need for strengthening the extension system for transfer of technologies and providing training to farmers.

Emphasis on organic farming: Ginger production in Nepal is organic by default as ginger farmers in the country use neither chemical fertilizers nor chemical pesticides. They only use locally available farmyard manures (cow dung, pig manure, poultry manures, etc.). Considering the increased demand for organic produce in the world, farmers could hope to get better returns for their produce. But first and foremost, they need to have proper organic certification for their products.

Diversification of products: Nepal exports ginger mostly in raw or semi-raw form without any significant value added. In order to increase export proceeds from ginger products, Nepal should focus on both the value added and diversification of products in its production structure.

6.4. THE GINGER SECTOR: BUSINESS PLAN

Table 22: The ginger sector: business plan

Objectives	Actions Recommended	Responsible Institutions
Creating 200,000 full time employment opportunities in rural areas in 10 years	Establishing high level Ginger Development Committee under the Chairmanship of Member, National Planning Commission to coordinate and monitoring the activities listed below.	National Planning Commission.
	Establishing and strengthening of Ginger Resource Centre for the identification of suitable land, varieties and farming system.	Ministry of Agriculture and Cooperatives.
	Introducing new exotic high yielding varieties of ginger.	Ministry of Agriculture, National Agriculture Research Centre, Ginger Resource Centre.
	Developing technical manpower and upscaling extension services.	Ministry of Agriculture and Cooperatives, Centre for Technical Education and Vocational Training (CTEVT).
	Training farmers in the new ginger. farming system, including the system management.	Department of Agriculture, District Agriculture Development Office, District Ginger Producers' Association and District Chambers.
	Introducing new processing technology and supporting farmers/cooperatives in the application of such technologies.	Ministry of Agriculture and Cooperatives, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries, District Ginger Producers' Association, Cooperatives.
	Providing cheap and easy access to finance.	Ministry of Agriculture and Cooperatives, Ministry of Finance, Nepal Rastra Bank.
	Creating awareness in organic farming and providing organic fertilizers, pesticides and insecticides.	Ministry of Agriculture, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries, District Ginger Producers' Association.
	Strengthening organic certification system.	Ministry of Agriculture and Cooperatives.

Table 22: *(continued)*

Objectives	Actions Recommended	Responsible Institutions
	Supporting farmer's cooperatives and agriculture product trading centre(s).	Department of Agriculture, District Agriculture Development Office, District Ginger Producers' Association.
	Strengthening ginger market information system and establishing ginger trading centre(s).	Agro Enterprise Centre, Department of Agriculture.
	Encouraging contract and lease farming.	Ministry of Agriculture and Cooperatives and relevant government Ministries/ Departments.
Increasing export of ginger to five per cent of total export through increased exports of processed products in 10 years.	Creating awareness in export potential of processed ginger products.	Ministry of Agriculture and Cooperatives, Ministry of Commerce and Supplies, Trade and Export promotion Centre, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries.
	Expanding and strengthening quarantine laboratory services at customs points and initiating process for mutual recognition agreement with major importing countries	Ministry of Agriculture and Cooperatives, Ministry of Finance and Ministry of Commerce and Supplies
	Organizing study tour for potential investors to ginger processing centres.	Ministry of Agriculture and Cooperatives, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries.
	Providing support/ incentive in production of secondary products.	Ministry of Agriculture and Cooperatives, Ministry of Industry, Ministry of Finance.
	Establishing strategic alliance with ginger traders of the South Asia region and promoting FDI in ginger processing.	Trade and Export Promotion Centre, Department of Industry, Federation of Nepalese Chamber of Commerce and Industries, Federation of Nepalese Cottage and Small Industries.

Annex III

Country Study on Sri Lanka using Global Value Chain Analysis:

THE INDUSTRIAL RUBBER AND ELECTRONIC PRODUCTS SECTORS[35]

[35] The authors acknowledge cooperation extended by the steering committee of Sri Lanka consisting of officials from Ministry of Enterprise Development and Investment Promotion, Ministry of Industrial Development, Ministry of Plantation Industries, Federation of Chambers of Commerce and Industry of Sri Lanka, Small and Medium Enterprise Developers and Export Development Board. This study would not have been possible without the support of all sector level institutions including Rubber Research Institute of Sri Lanka, Sri Lanka Association of Manufacturers and Exporters of Rubber Products, Sri Lanka Electronic Manufacturers and Exporters Association, which provided the core data essential for this study.

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Preface

Rubber and electronic products are two important export-oriented products of Sri Lanka. Rubber, mainly natural rubber industry in Sri Lanka, is based on the geographical advantage of the country, with its extensive experience in growing rubber trees, and on foreign investment in advanced technologies in processing and manufacturing of rubber products. Sri Lanka is now exporting different types of manufactured finished rubber products. In view of the increasing global demand for natural rubber and rubber products and the emerging competitiveness in the rubber industry, Sri Lanka is enacting various measures to increase and improve rubber cultivation and collection and to enhance the quality of manufactured products.

Electronic products manufacturing relies on the availability of a skilled labour force and the country's central transit location particularly for maritime logistics, which could facilitate efficient transportation of electronic components for different end products, manufactured in other countries. Furthermore, with considerable experience in producing and exporting electronic components for the local joint ventures and fully foreign-owned branded electronic products companies, Sri Lanka is now exploring the prospects of developing its own branded products.

The study was conducted with the purpose of enhancing the value added in both the rubber and electronic products sectors' SMEs so that the benefits from such value added could be widely distributed. Action plans, detailing national strategies, as well as some critical regional programmes have been prepared to facilitate cooperation among countries and enterprises for the products under consideration. The findings of the initial studies were presented at a national workshop, held in Colombo, and the proposed strategies and recommendations for strengthening the value added in the rubber and electronic products sectors were deliberated. Action plans were presented and further discussed at the subregional workshop also held in Colombo with representatives from participating countries, bilateral and multilateral agencies, involved in promoting subregional cooperation, and other stakeholders.

The Industrial Rubber Products Sector in Sri Lanka

1. AN OVERVIEW OF THE NATURAL RUBBER SECTOR IN SRI LANKA

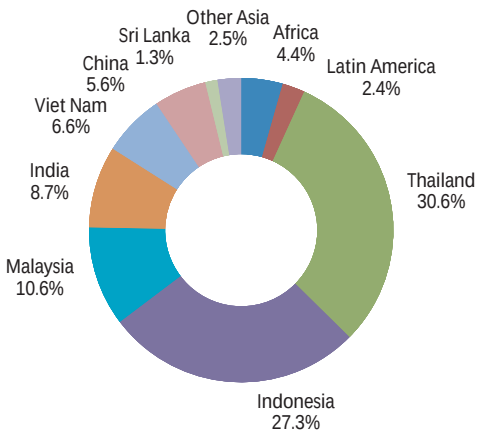
The rubber industry in Sri Lanka dates back to 1876 with the first planting of rubber trees in Henerathgoda Gardens in Gampaha. Rubber cultivation focuses on growing rubber trees and producing raw rubber from field latex, while rubber manufacturing converts the raw rubber into value added products. In 2008 the natural rubber sector contributed $664 million to the economy (EDB 2009) and created employment for approximately 200,000 people, mainly in the rural areas (ASI 2009). Rubber plantations in 2008 extended over 122,000 hectares, accounting for seven per cent of the total cultivated land area of Sri Lanka (Central Bank 2008).

The manufacturing of rubber products began in the 1950s primarily with rubber re-treading and expanded rapidly after the introduction of open trade policies and development of industry zones in the late 1970s. A tremendous growth of the rubber sector has allowed Sri Lankan rubber manufacturers to compete in regional and global markets at both industrial and consumer levels, offering value added natural rubber products such as solid tires, surgical gloves, automotive parts, mats and hoses. Currently, the Government of Sri Lanka and private entrepreneurs are considering the possibilities of product diversification and the improvement of domestic and international competition.

2. THE GLOBAL RUBBER MARKET AND SRI LANKA'S SHARE

The global demand for rubber is satisfied by the supply of both natural and synthetic rubber each catering to different consumer needs. Global natural rubber production in 2008 amounted to 9.88 million MT, of which 93.2 per cent came from Asia and the Pacific (figure 1). The remaining 4.4 per cent and 2.4 per cent were produced by Africa and Latin America, respectively. The global supply of synthetic rubber mainly comes from Asia and the Pacific, the United States of America and the European Union. A contribution of Asia and the Pacific in the global synthetic rubber production in 2008 was 48.8 per cent, of which 17.3 per cent and 12.3 per cent were from China and Japan, respectively. On a macrolevel, the global natural rubber production has gradually increased from 2004 to 2008 while synthetic rubber production experienced a dip in 2008 (table 1) due to economic recession in North America and Europe. Increased petroleum prices also led to the decrease in production of synthetic rubber during this time. While there was a further overall decline in production and consumption in 2009, estimates for 2010 indicated an upward trend.

Figure 1: Global natural rubber production in 2008



Source: IRSG (2009).

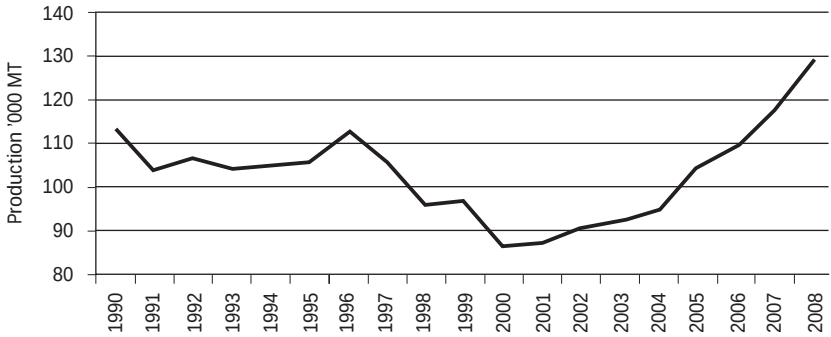
Table 1: Global rubber production and consumption, 2004-2010* (in thousands of MT)

	2004	2005	2006	2007	2008	2009	2010*
Natural rubber production	8 758	8 906	9 698	9 687	9 877	9 662	10 291
Natural rubber consumption	8 701	9 184	9 709	10 230	10 088	9 390	10 671
Synthetic rubber production	11 999	12 136	12 690	13 434	12 813	12 087	14 002
Synthetic rubber consumption	11 880	11 921	12 692	13 284	12 586	11 754	13 858
Per cent of natural rubber in total rubber consumption	42.3	43.5	43.3	43.5	44.5	44.4	43.9

Source: IRSG (2009 and 2011).

Sri Lanka ranks as the eighth largest natural rubber producing country in the world with a production of 129,243 MT in 2008, which represents just a tiny share of around 1.3 per cent of the global natural rubber production and 0.6 per cent of the global total rubber production (see figure 1). The natural rubber production in Sri Lanka declined significantly and rapidly during the Asian financial crisis in 1997-1998 due to low prices for natural rubber in the world market, but rebounded strongly during the next decade, as shown in figure 2.

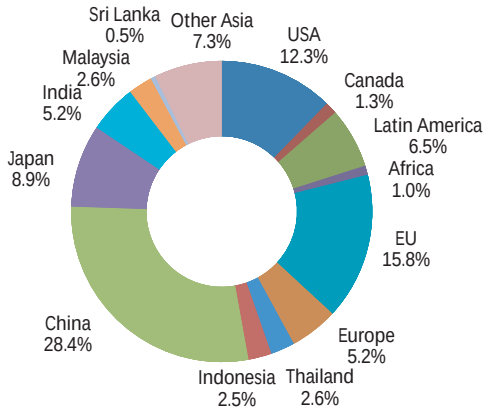
Figure 2: Rubber production in Sri Lanka from 1990 to 2008



The production of natural rubber in Sri Lanka increased by 36 per cent between 2004 and 2008 (figure 2) and is expected to increase even further as rubber plantation projects have been implemented both by the private or small holding and the larger state estate (20 acres or more of agricultural land) sectors. Of the total natural rubber production in Sri Lanka in 2008, 62 per cent was used for domestic product manufacturing and the remaining was exported as raw rubber.

Of the global rubber consumption in 2008, China consumed 28.4 per cent while the United States of America, the European Union, Japan and India consumed 12.3, 15.8, 8.9 and 5.2 per cent, respectively (figure 3). Sri Lanka consumed 0.5 per cent of global rubber products, of which 0.8 per cent was natural rubber consumption and 0.2 per cent synthetic rubber consumption (IRSG 2009).

Figure 3: Global rubber consumption in 2008



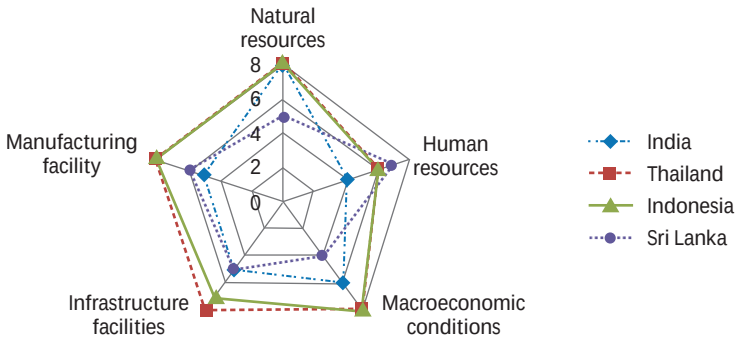
Source: IRSG (2009).

With respect to natural rubber production, Sri Lanka has to compete with its regional neighbours India, Thailand and Indonesia. Except for the human resources factor, these other countries have better competitive advantages as seen in the competitive factor analysis presented in table 2 and figure 4 and based on the industry expert opinion.

Table 2: Competitive factor matrix (based on industry expert opinion)

	India	Thailand	Indonesia	Sri Lanka
Natural resources	Strong	Strong	Strong	Average
Human resources	Average	Strong	Strong	Strong
Macroeconomic conditions	Strong	Strong	Strong	Average
Infrastructure facilities	Average	Strong	Strong	Average
Manufacturing facility	Average	Strong	Strong	Average

Figure 4: Competitive factor grid (based on industry expert opinion)

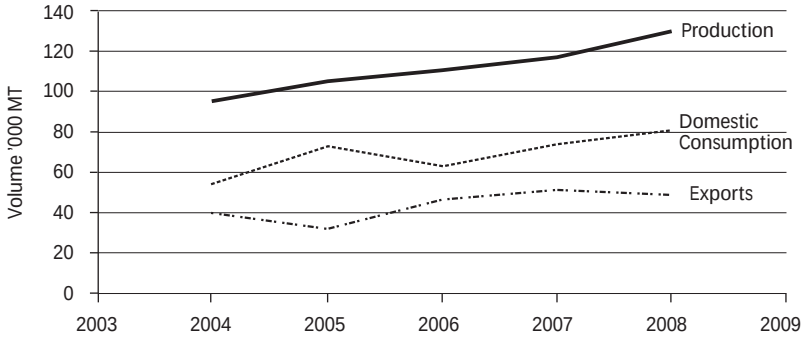


Market analysis

Sri Lanka produces different natural rubber products such as ribbed smoked sheet (RSS), latex crepe, sole crepe, scrap crepe, technically specified rubber and concentrated latex. Sheet rubber, which is mainly produced by small enterprises, accounted for 43 per cent, while concentrated latex accounted for 28 per cent of the total production in 2008, becoming the second largest type of natural rubber products in the country (RDD 2009). The production of latex crepe, which is mainly produced for the export market by the estate sector, accounted for 16 per cent.

Sri Lankan raw natural rubbers and latex are exported mainly to Pakistan; the European Union; India; Japan; the United States of America; Hong Kong, China; and some other industrially developed countries (EDB 2009). Of those raw rubber exports in 2008, 35 per cent was high-quality sheet rubber and 32 per cent latex crepe. Currently, 83 per cent of the sole crepe and 73 per cent of the latex crepe are mainly exported to manufacturers to produce footwear, food and pharmaceutical products. Sri Lanka rubber clones produce pure white latex containing no significant dirt content and suitable for clear transparent products. Therefore, there is a high demand for Sri Lankan natural rubber that has resulted in a gradual increase in the export of raw rubber over time with a slight decline in 2008. Over the years, domestic consumption of natural rubber has kept on rising, indicating that the fall in the 2008 export was compensated by the increase in domestic consumption (see figure 5).

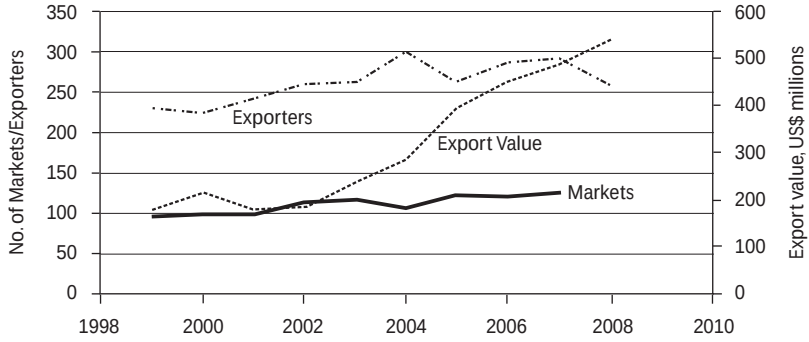
Figure 5: Natural rubber production, consumption and exports in Sri Lanka



Sources: RDD (2009); MPI (2008).

Rubber products have been a solid part of country's economy since the 1980s. All leading solid tire manufacturers — major consumers of natural rubber — have operations in Sri Lanka. In the past two decades, Sri Lankan rubber product manufacturers have entered into regional and global markets for the value added products in both industrial and consumer segments. Although export of rubber products from Sri Lanka dropped during the Asian financial crisis of 1997-1998, it has recovered significantly during 2002-2003 due to the introduction of a new investment incentive, growing steadily from $286 million in 2004 to $543 million in 2008 (figure 6). According to statistics, rubber product exports accounted for seven per cent of the total

Figure 6: Rubber products export from Sri Lanka, 1999-2008

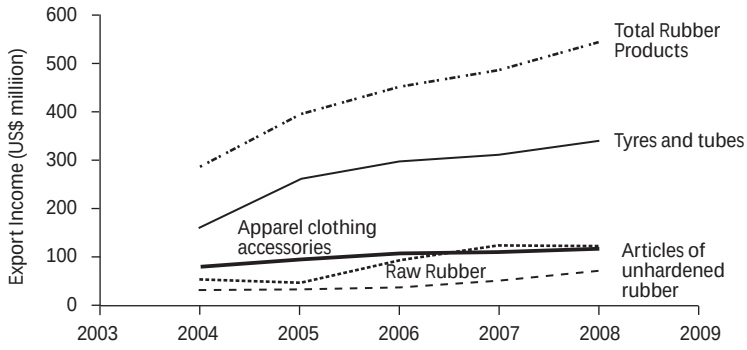


Source: EDB (2009).

export earnings of Sri Lanka, representing 1.4 per cent of its gross domestic production in 2007 (Central Bank 2008). A total number of 259 players are engaged in the export of rubber products (EDB 2009).

The number of countries, where Sri Lankan rubber products are exported, has grown up to 130 in 2008 and include the major markets such as the United States of America, the European Union, India, Canada and Australia. The rubber products, exported to those countries, include tires, tubes, articles of unhardened rubber like gloves, apparel clothing accessories, industrial components, biomedical devices and food packaging materials. It is clear that the export earnings of Sri Lanka from value added rubber products are rapidly growing compared to that of raw natural rubber (figure 7). Of the total earnings from the value added rubber products, more than 50 per cent is from tires and tubes. The rest is largely distributed among apparel clothing accessories and unhardened rubber products.

Figure 7: Export income from value added rubber products



Sources: EDB 2009; RDD 2009.

3. STRUCTURE OF THE RUBBER SECTOR VALUE CHAINS

A global value chain for rubber products (both natural and synthetic) is illustrated in figure 8. The main input to the industry is the different types of raw materials: natural rubber, synthetic rubbers, natural and synthetic lattices, chemicals and other additives. Different natural rubber products are available locally while synthetic rubbers, lattices and additives are all imported. Natural rubber originates from rubber trees and field latex and coagulum are collected by planters. Field latex and coagulum are converted into raw rubbers and concentrated latex by raw rubber manufacturers and then used by compound manufacturers and/or by rubber product manufacturers buying product from rubber traders. Some rubber product manufacturers collect raw rubber from their own plantations and from other smaller subsidiaries. Rubber product manufacturers sell their products to local customers through agents/dealers. Most domestically manufactured high value added rubber products are exported to international markets through wholesalers and retailers. Several ministries, trade associations, research institutions and business associations provide their assistance and services to planters, traders and manufacturers in the rubber industry to improve quality and quantity of the final rubber products.

3.1. Raw materials and suppliers

Different natural rubber products are produced in Sri Lanka of which 60 per cent is produced by smallholders. Natural rubber is also imported to meet occasional shortage on the domestic market. For example, 3,636 MT of natural rubber was imported in 2008 (DOC 2009); however, this amount is insignificant compared to the domestic natural rubber consumption of 80,600 MT.

Synthetic rubber is a distinct but integral part of rubber products sector, though it is not a complete substitute of natural rubber. Different types of synthetic rubbers, such as SBR, BR, NBR, EPDM, IR, IIR, HIIR and CR (see table 3), and synthetic lattices are imported for specific use in certain industries. 23,500 MT of synthetic rubbers and lattices (IRSG 2009) were imported in 2008, mainly from the United States of America, the Republic of Korea, Malaysia, the European Union, South Africa and some other countries. Rubber chemicals, such as carbon black, silica, activators, accelerators and processing oil, are mostly imported from India. Small volumes of rubber chemicals are also imported from Thailand, Malaysia and China. A total of 10,660 MT of chemicals (DOC 2009) was imported in 2008. On top of that, steel and nylon fabrics are also imported and used especially in the tire manufacturing industry.

Figure 8: Global value chain of rubber products

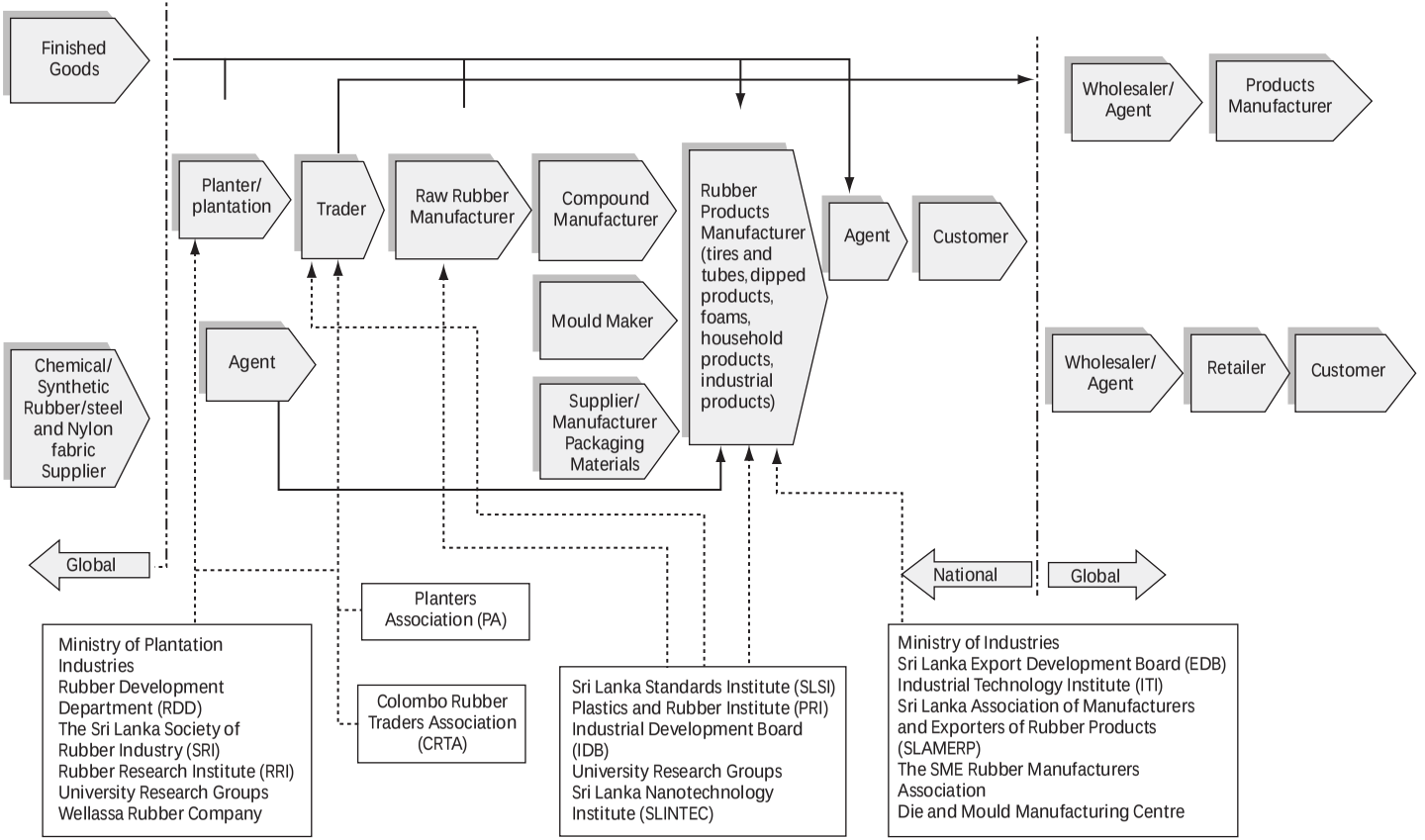


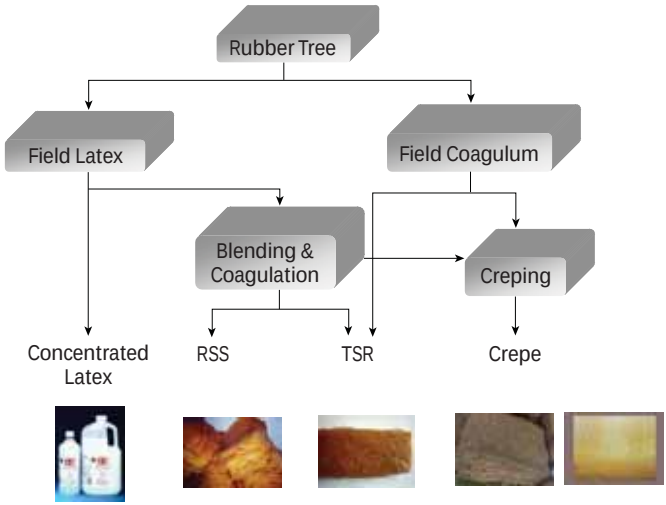
Table 3: Types of rubbers

Rubber	Abbreviation	Used mainly to manufacture
Stirene Butadiene	SBR	Tire
Butadiene rubber	BR	Tire
Nitrile Rubber	NBR	Gaskets
Ethylene propylene	EPDM	
Isoprene rubber	IR	Tire
Butyl rubber	IIR	Tubes
Halobutyl rubber	HIIR	
Chloroprene rubber	CR	

3.2. Natural rubber production process

Natural raw rubber production starts with the tapping of the field latex from the trunk of a rubber tree. The latex is first collected in small containers fitted on the bark of the rubber tree and then transferred into buckets and mixed with anticoagulants. The field latex and field coagulum (cup lump, tree lace and earth scrap) are delivered to raw rubber manufacturers. Anticoagulated field latex is placed into a centrifuge to produce concentrated latex that contributes to the rubber value chain at process specific level and is used in the manufacturing of foam rubber, dipped products, rubber threads and caste rubber products. In the ribbed smoked sheet (RSS) and technically specified rubber (TSR) manufacturing units, the field latex is blended and coagulated first to form the soft coagulum. The soft rubber mass is then milled in a two-roller mill with ribbed rollers and the resultant sheets are then dried in a smoke house. These dried sheets are then packed into bales for transport. The soft rubber mass is also mashed and then dry heated to produce block rubber, which is also called TSR. Some grades of TSR are produced from field coagulum. Crepe rubber is manufactured from fresh coagulum, field coagulum or cuttings of RSS. In the latex crepe manufacturing units latex is transferred into bulking tanks to separate white and yellow fractions. The two fractions are taken out from the tanks separately and coagulated separately. The white coagulum is cut and then fed through mills to become mats and then laces. The laces are dried in drying chambers and are either sold as pale crepe or folded and compressed into blankets called blanket crepe. The yellow coagulum is processed in the same way to produce laces. In this case, the laces are then made into blankets, which in turn are passed through a lamination process to form sole crepe. Field coagulum also undergoes the same processes to produce low-grade rubbers. The production cycles of main raw rubbers are given in Figure 9.

Figure 9: Natural rubber production cycle



Source: The authors.

Rubber product manufacturers and related entities

Manufacturers of rubber products can be classified into two categories according to the raw materials they use – rubber or latex-based manufacturers. Rubber-based manufacturers produce tires, tubes, belts, hoses, mats, floor coverings, slippers, gaskets, caster wheels, hot water bottles, jar rings, exercise components, automotive components, etc., using natural rubber (RSS, crepe and TSR), synthetic rubbers and chemicals. Latex-based manufacturers produce dipped products including different types of gloves (examination, surgical, household, cotton supported industrial and agricultural gloves), balloons, foam rubber mattresses and other articles of foams, rubber bands and threads, toys and masks, cot sheets, etc., using both natural and synthetic lattices. A total number of 529 rubber enterprises are currently engaged in manufacturing rubber products; each of these manufacturing units employ from 10 to 500 labourers (ASI 2009).

The Government of Sri Lanka has given a priority to improving global competitiveness of the country's rubber sector initiating the appropriate policy reforms and other support initiatives. In recent years, the development of this sector has been given a high priority, particularly in the areas of infrastructure development and improving access to finance. A large number of agencies, including Ministry of Enterprise Development and Investment Promotion (MEDIP), Ministry of Industrial Development (MID), Ministry of Trade and Commerce (MTC) and Ministry of Plantation Industries (MPI) have launched activities aimed at developing and improving the rubber manufacturing industry. However, they do not have product-centred strategies or specific long-term development strategies targeted to the rubber industry.

Rubber industry related government agencies and private sector organizations have also played key roles in promoting the rubber industry by short-term measures. Rubber Development Department (RDD), Rubber Research Institute (RRI), Planters Association of Ceylon (PA), Wellassa Rubber Company, Sri Lanka Society of Rubber Industry (SRI) and Colombo Rubber Traders' Association (CRTA) have provided support to the rubber plantation industry. Sri Lanka Association of Manufacturers and Exporters of Rubber Products (SLAMERP), SME Rubber Manufacturers Association, etc., are responsible for the rubber products manufacturing industry. All these organizations are engaged in certain activities individually but their lack of inter-relationship and coordination has limited the overall growth of the rubber industry. The Sri Lanka Export Development Board offers a platform for product manufacturers to market their products at international markets; however, such government sponsored export promotion activities are quite inadequate.

3.3. Marketing environment

The production and marketing of natural rubber is generally subjected to high level intrinsic barriers, which are normal for most commodity systems in developing countries (Jaffee and Gordon 1992). The geographical distribution and involvement of a large number of small-scale growers has resulted in the escalation of costs related to collection of raw materials, transportation, agglomerating, sorting, grading, etc. that occur at different locations in the processing of rubber products. Despite a relatively good system of transportation and relatively short distances, geographical dispersion of rubber plantations has adversely affected the farmers' ability to receive better prices for their products.

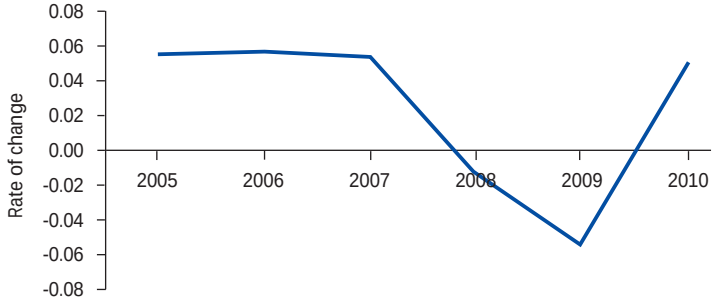
Marketing of natural rubber is left in the hands of middle-level dealers, operating in the rubber growing areas of the country, and mostly takes place at Colombo rubber auction. Traditionally, these marketing channels have been used for the low-grade rubber. Sri Lanka has yet to fully utilize Thailand's model of Group Marketing Centres, where a group of smallholders form a joint venture, which collectively assists in weighing, grading and selling their product (Ali et al. 1997). These centres collect unprocessed rubber from smallholders and decide on the best processing mechanisms that provide better pricing and quality output. Apart from creating the necessary infrastructure for such centres, it is important to educate the stakeholders about the advantages of such system for achieving long-term sustainability. Additionally, it is necessary to establish quality standards for the unprocessed rubber that will be purchased through the system. It must also be noted that Sri Lanka could receive better prices for its rubber if direct links, requiring the Government's intervention, could also be established in global niche markets.

Most of Sri Lanka's large rubber product manufacturing entities are either owned by international brands or established under joint venture partnerships between foreign and local investors. This has resulted in product marketing controlled by foreign investors. Many small players struggle, trying to find access to international markets for their products, because of the existing deficiencies in the overall marketing efforts. Sri Lanka's rubber products marketing system lacks cohesion due to a variety of reasons,

such as the inability of stakeholders (especially small players) to absorb market and production risks, asymmetric information flow, low or no integrity and coordination among stakeholders and high cost structures.

The majority of Sri Lankan rubber products reach international markets, being part of a few established international brands that operate their manufacturing entities in the country, and via other direct and indirect links of the Government and private non-governmental organizations. During the 1990s, Sri Lankan major markets for manufactured rubber products were the Islamic Republic of Iran, Pakistan and Germany. Thus, Sri Lankan export of rubber products was positively correlated with the economic growth and development of these countries. But in the past decade, Sri Lankan rubber products became diversified and reached North America and Europe, thus reducing its dependence on the markets of the Islamic Republic of Iran and Pakistan. Though the rubber sector witnessed a slump in 2008 and 2009, higher growth was predicted for 2010 and beyond (figure 10).

Figure 10: Growth of global consumption in natural rubber, 2005-2010 (in per cent)



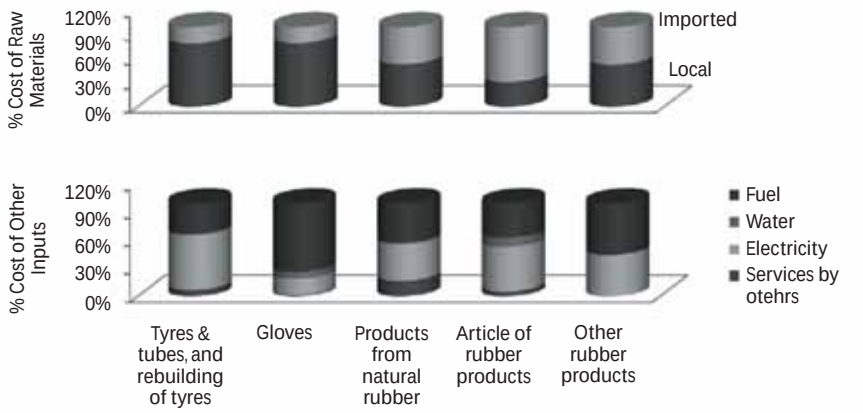
Source: IRSG (2009).
Note: Estimates for 2010.

3.4. Infrastructure and logistics system

Rubber production in Sri Lanka is blessed with year-round favourable weather conditions. Rubber product manufacturing centres are located in the districts with abundant rubber plantations within a 150 km distance from each other. Rubber-based products, raw rubber export and the raw material import are currently channelled through Bandaranayake International Airport and Colombo Freeport. The ongoing development and upgrading of Galle Port on the south coast, Trincomalee Port on the northeast coast and Oluwil Port on the east coast will help to improve maritime transportation facilities for the export market.

The rubber industry requires significant fuel and electricity consumption (figure 11) and is negatively affected by scarce energy resources in Sri Lanka. Three power generation projects (coal power plants at Norochcholai and Sampur and Upper Kotmale hydroelectric power station) were expanded to meet the country's annual growth of electricity demand by eight per cent (Mahinda Chintana 2005).

Figure 11: Value of input components in the rubber sector



Source: ASI (2009).

4. FACTORS AFFECTING COMPARATIVE ADVANTAGE IN RUBBER MANUFACTURING

As stated earlier, Sri Lanka has a significant comparative advantage in the rubber industry compared to other countries. However, to sustain its market share and improve competitiveness in international markets, Sri Lanka needs to analyze several critical factors, affecting such advantage, some of which are presented in the following sections.

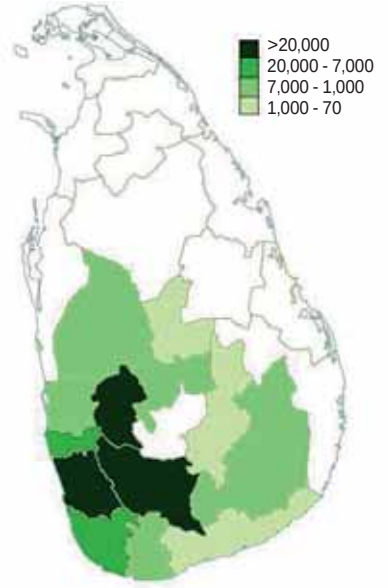
4.1. Rubber cultivation, production and costs

Rubber plantations stretch over 13 districts in Sri Lanka the largest of those, with over 20,000 hectares, are in Kegalle, Kalutara and Rathnapura districts, followed by plantations of 7,000-20,000 hectares in Colombo and Galle districts and plantations of 1,000-7,000 hectares in Gampaha, Matara, Kurunegala, Kandy and Monaragala districts (figure 12). Matale, Badulla and Hambantota districts have smaller plantation areas of 70-1,000 hectares. Of the total plantation areas, nearly 42 per cent is owned by the public/estate sector while the remaining 58 per cent is owned by the private/ smallholder sector. The major cultivating districts offer the best conditions, in terms of soil and weather, for successful rubber cultivation. Since the early 2000s, a positive trend in yield increase has emerged after the stakeholders started to put serious effort in increasing the rubber production and productivity.

Rubber replanting and new-planting has gradually increased with the implementation of the Monaragala Rubber Development Programme (MRDP) in 2005 by Sri Lanka Society of Rubber Industry (SRI). MRDP aims at replanting of around 40,000 hectares by 2016, resulting in an additional annual production of 60,000 MT of rubber (SLRC and USAID 2002).

Rubber plantation areas, yield and cost of production are shown in figure 13. Unlike in Indonesia and Thailand, where considerable areas of land were reserved for

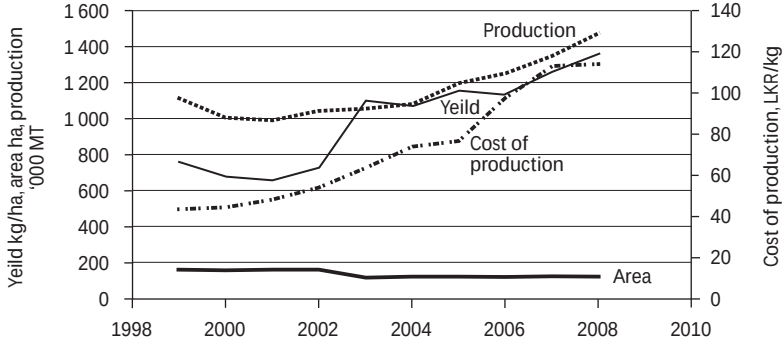
Figure 12: Rubber cultivation in 2008



Source: RDD (2009).

expansion of rubber plantations in future years, Sri Lanka, over the past decade, experienced a decrease in the areas under rubber cultivation, as these land areas were diverted to other uses, partially due to urbanization of the country. The rubber cultivation in Sri Lanka is mainly centred in the western part of the country, whereas sabaragamuwa and the southern provinces have undergone urbanization during the past two decades. The land values during the past two decades have demonstrated a growing trend, being used for residential and commercial rather than rubber cultivation purposes, and provided the owners with higher financial benefits.

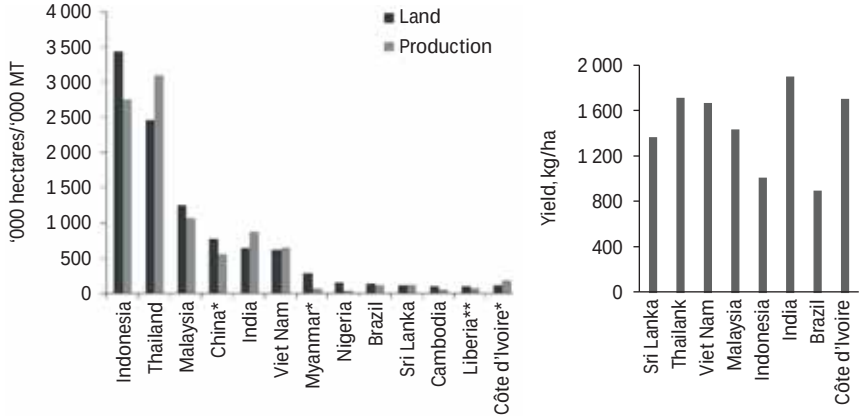
Figure 13: Rubber cultivation, yield and cost of production in Sri Lanka



Sources: MPI (2008); RDD (2009); Central Bank (2008).

Sri Lanka recorded an average yield of 1,353 kg/hectare per year in 2008, well below the yield shown by other Asia-Pacific countries, such as India, Malaysia, Thailand and Viet Nam (figure 14). The yield targets under MRDP are above 2,000 kg/hectare (USAID 2008), nearly a 50 per cent increase from the current productivity levels.

Figure 14: Global rubber cultivation, production and yield in 2008



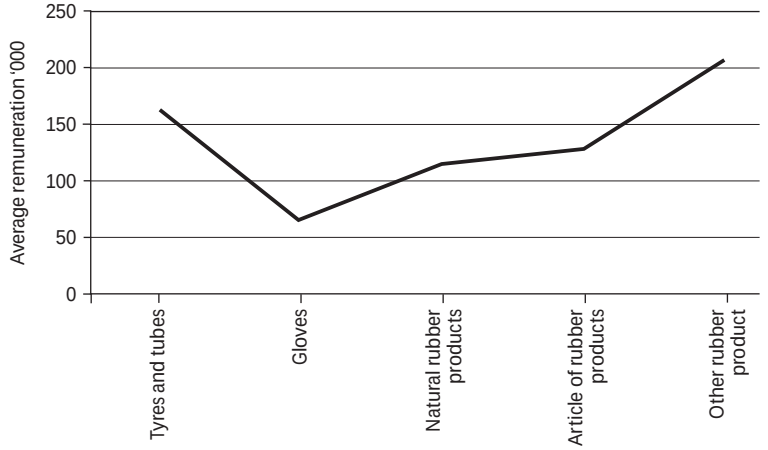
Sources: IRSG (2009), values reported in 2008, 2006*, 1999**.

A major feature in the rubber sector is the number of tapping days. A tapper in Sri Lanka can only tap an average of 260 days per year, whereas in other countries the tapping exceeds 300 days a year (Ali et al. 1997), the difference being the number of days lost to rain. A major share of rubber cultivation in Sri Lanka is located in a wet zone, which cause volatility in rubber prices compared to rubber prices in Singapore.[36] The proper use of rain guards can increase the tapping days to over 300 days.

Wages is another important component in the overall cost structure of rubber production. Figure 15 shows the average remuneration per employee during the year 2008. Though rubber glove manufacturing has recorded a high value added, the average remuneration remains low due to the labour intensive process involving low skilled workers. Large-scale manufacturers invest in advanced production facilities and employ a relatively small number of people with better remuneration packages. The labour intensive processes, such as quality inspection and packaging, are generally outsourced and the outsourced workforce tends to receive minimal remuneration.

[36] Generally, rubber prices are compared to Singapore Commodity Exchange prices. In his speech, the Senior Minister of State for Trade and Industry, Singapore at the World Rubber Summit in 2009 estimated that Singapore handled more than 50 per cent of the world's annual natural rubber trade and that Singapore has also been recognized as the global pricing centre for the physical trade of rubber, with more than 80 per cent of global rubber trade priced at the Singapore Commodity Exchange (SICOM) prices. Being neither a producer nor a major consumer of natural rubber, Singapore serves as a neutral trading hub that generates financing, procurement and risk management activities. Today the world prices for rubber are not only driven by demand but are also subject to speculations on the futures markets. Japan and Singapore are two major futures markets for rubber.

Figure 15: Annual average remuneration by rubber product segments



Source: ASI (2009).

4.2. Human resources

Sri Lanka has low cost semiskilled and disciplined labour force, engaged at different levels of the supply chain, including 23,813 skilled and 9,383 unskilled workers in rubber product manufacturing industry (ASI 2009). Employment of labour in the rubber industry is directly supervised by the Government that sets minimum daily wage rates, minimum work hours and other rules.

Over the years government and non-governmental rubber related organizations have been actively engaged in providing education and training programmes to further improve the competitiveness of the rubber sector labour force. Furthermore, government and non-governmental research bodies, employee federations and unions, farmer associations, owner associations, civil society organizations and many other statutory and non-statutory institutions have played pivotal roles in uplifting the rubber industry by providing short-term and long-term planning for labour force development. Some institutions like Plastic and Rubber Institute of Sri Lanka (PRISL) provide training facilities to workforce engaged in the rubber industry with a financial support from international development agencies (e.g., ADB and USAID). All these efforts improved the efficiency and further augmented the capabilities of Sri Lankan skilled workforce, ensuring its competitiveness in the coming decades.

4.3. Policies and regulatory framework

There are no export restrictions and no licensing requirements for rubber dealers and exporters; however, the Government imposes duty on the import of synthetic rubber and related input materials. At present synthetic rubber imports are

subjected to a CESS[37] of SL Rs 15 per kg, which has led to higher prices for final products. The Government also charges SL Rs 4 per kg as CESS on procurement of natural rubber (EDB 2007), and this has significantly impacted the cost of rubber products. The rubber products manufacturing sector could be further encouraged, if the CESS on domestically consumed natural rubber is reduced while the CESS on raw rubber exports is increased, – thus favouring domestic rubber demand without affecting the Government revenue. The changes in CESS policy should aim at natural rubber to become more competitive locally and to increase export of higher value added rubber products. Although the total CESS collection is said to be available for the development of the rubber industry and the long-term production of raw rubber, both the rubber cultivation and rubber manufacturing sectors complain that the CESS is not utilized for that purpose. However, at present the Government uses the CESS to finance replanting of rubber trees and provide certain social benefits to smallholders.

The Government also plays a pivotal role in rubber research and development, and by extension, rubber cultivation. However, the industry lacks expertise on product and compound developments, introducing only limited innovations. There is currently no centralized rubber- and/or polymer-based product testing facilities, especially the ones focused on quality improvements in Sri Lanka. Although polymer-based and compound material testing facilities exist at several research and academic institutions, cost testing procedures in these institutions do not have official accreditation and their certification is not internationally recognized to testify the quality of Sri Lankan rubber products – an important requirement in the export market. Finally, all rubber product manufacturers must obtain Environmental Protection License (EPL) from the Central Environmental Authority (CEA), affirming their continuous compliance with minimizing noise and dust levels to protect the environment.

5. SWOT ANALYSIS

The value chain dynamics in the rubber industry, as discussed above, can be strengthened by continuous improvements and innovations in production and distribution processes. To understand the factors, affecting the rubber industry in Sri Lanka with regards to global value chains, it is essential to: (a) take advantage of the opportunities; (b) mobilize the strengths; (c) manage the possible threats; and (d) assuage the weaknesses, in order to formulate a long-term strategy and strengthen Sri Lankan position in the global rubber market.

Strengths

1. The rubber industry is a relatively well-established industry in Sri Lanka having a comprehensive legal and institutional framework, good infrastructures, a strong private sector and well-organized professional bodies such as SLAMERP and PRISL. The Government has pledged to

[37] CESS is a local levy on a commodity/product for special purpose. Objectives of imposing CESS on rubber export/import are to generate funds for developing rubber cultivation in Sri Lanka and to encourage the export of value added rubber products. CESS is computed as a percentage of CIF value on imports and LKR 4 per (quantity) kg on exports as per the Gazette issued in 2004.

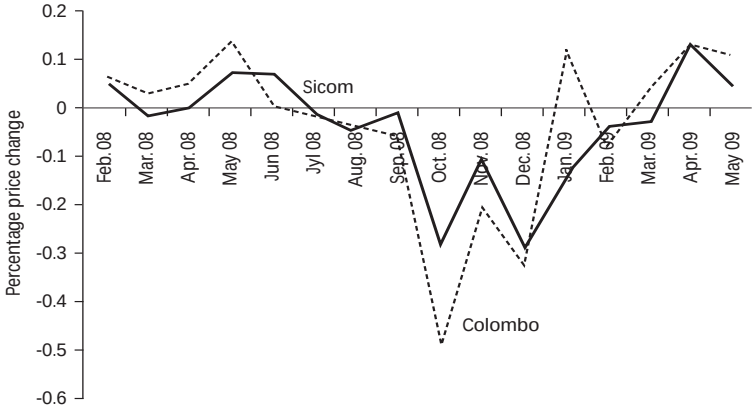
support the rubber industry private sector with pro-business policies, infrastructure development and financial help.

2. Sri Lanka's rubber industry has been successful in supplying foreign niche markets (through joint ventures with renowned multinational/world class companies) with industrial tires and surgical and household gloves by establishing high quality/low cost manufacturing facilities.
3. Competitive though limited logistics support and infrastructure facilities (seaport and airport) are available in the country.
4. Sri Lanka is a natural rubber producing country and has an adequate supply of different grades of centrifuged latex and dry rubber at competitive prices. Also, there is an easy access to rubber product manufacturers with readily available raw materials.
5. Sri Lankan crepe rubber is considered to be of the highest quality.
6. Relatively low labour cost compared to the region's other major labour supplying countries, except Indonesia.
7. Availability of skilled, trainable competitive labour force, at technical, managerial, and supervisory levels and qualified scientists, technologists and engineers.
8. Academic programmes, enhancing the knowledge and skills related to the rubber industry, are continuously provided by universities and private training institutions.

Weaknesses

1. The return on investment in rubber cultivation and production is relatively low due to the limited use of fertilizers, outdated technology, low levels of mechanization, unskilled workforce, financial constraints and inadequate investment. An increase in labour costs combined with low productivity has been a recent trend.
2. Sri Lankan rubber industry experiences high price volatility when compared to Singapore and other regional markets rubber prices (figure 16). The volatility is mainly due to the supply side constraints. For example, during the monsoon season, rubber supply drops sharply and creates significant price hikes at the rubber auctions.
3. Sri Lanka has a small domestic market compared to other competing countries such as India and China. Its rubber sector consists of only a few large producers and a relatively large number of small producers/suppliers – resulting in a weak bargaining power as a rubber-producing nation.
4. During the rainy season, the frequency of rubber tapping which is done manually, decreases and results in fluctuations in the supply of rubber.
5. Rubber production cost tends to be high due to the use of imported materials, including synthetic rubber and rubber additives.
6. There is no government or private formally established institution to provide market information on domestic and international markets. The

Figure 16: Comparative percentage price variations



Source: IRSG (2009).

marketing done by the Government through their export promotion bodies such as Export Development Board (EDB) is still at a nascent stage. This unavailability of international marketing research has hindered attempts to form linkages between local producers and international buyers to advocate product portfolio diversification or withdrawal, which resulted in failure to reach the expected export volume.

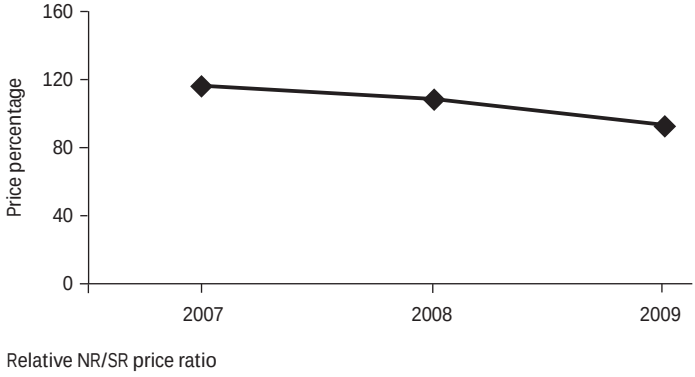
7. A lack of applied research institutions for technological development and innovations hampers the industry's ability to launch and promote new rubber products for niche markets. Also, there is no central product testing facility to cater to the rubber industry. This is a major constraint for large-scale rubber exports from Sri Lanka.
8. Low investment and poor collaboration in research and development activities, especially for product and process developments.
9. A lack of strategic integration and coordination between the existing research bodies and rubber product manufacturers.
10. Though Sri Lanka has established a formal polymer education, the industry still lacks the know-how on compound development aspects. Most research studies in Sri Lanka focuses on local optimizations and very few studies have been done on technology acquisition and/or development of advance technologies for the new product.
11. Sri Lanka lacks an internal system for quality control and product and/or process standardization; only a handful of large export-oriented manufacturers have focused on quality improvement and standardization (e.g., six-sigma and ISO).
12. Policymaking does not completely address the root causes of issues faced by the rubber industry. Restrictions applied on imported high-quality raw rubber have discouraged key stakeholders from further investment in the industry.

13. Sri Lanka records the highest energy cost compared to other rubber-producing nations as the rubber industry consumes a relatively high amount of energy compared to other industries. In particular, dry rubber production has higher energy content compared to latex production.

Opportunities

1. The global demand for natural rubber-based products has witnessed substantial growth over the years and is expected to grow further with the emerging markets in the region, such as China and India.
2. In Sri Lanka, continuous government support is provided to manufacturing by recognizing rubber industry as a "Thrust Industry."
3. Existence of many regional, unilateral and bilateral trade agreements, such as Indo-Sri Lanka Free Trade Agreement (ISFTA), South Asian Preferential Tariff Agreement (SAPTA), South Asian Free Trade Agreement (SAFTA) and Sri Lanka-Pakistan FTA, provides opportunities to export Sri Lankan rubber products at zero duty, along with many other concessions.
4. During the past few years, a declining trend in natural rubber to Stirene Butadiene Rubber (SBR) price ratio has been observed, which is favourable for natural rubber. Additionally, global demand for natural rubber shows a positive trend (figure 17).

Figure 17: Natural rubber/synthetic rubber relative price ratio



Source: IRSG (2009).

5. Existence of dedicated industrial parks, with well-designed central treatment facilities, would allow manufacturers to consolidate and control processing costs effectively.
6. Projects for new planting (in non-traditional areas) and replanting of rubber trees have been started by both the Government and private organizations with the technical and financial support from international development agencies.

7. Introduction of rubber trees with high yield clones is expected to increase natural rubber production levels.
8. Plantation companies can form joint ventures with foreign or local product manufacturers, especially to produce goods based on latex crepe.
9. A Mould and Die Design Centre was established at the University of Moratuwa to cater to the local rubber product manufacturing industry and thereby reduce high costs associated with the import of expensive dies and moulds. In addition, vocational training programmes for rubber processing machine operators are being developed by National Apprentice and Industrial Training Authority (NAITA) for the implementation at the University of Vocational Technology (UNIVOTEC).

Threats

1. In the absence of a sector-wide comprehensive marketing strategy, rubber producers in Sri Lanka are dependent on the Government external marketing efforts. Any change in the Government's focus or the withdrawal of donor support could result in the rubber industry's loss of market share.
2. The growth of Chinese rubber product manufacturing sector with its low (compared to Sri Lanka) production costs, poses a serious threat to Sri Lankan rubber industry.
3. Expansion of rubber plantation in African countries, such as Nigeria and Liberia, represent future threats.
4. Increasing wage and other labour costs, coupled with low productivity levels, are becoming serious threats to the rubber industry in Sri Lanka.

Critical issues for consideration

Based on the above strengths, weaknesses, opportunities and threats (SWOT) analysis, Sri Lankan rubber industry requires the following urgent responses:

1. Supply-side constraints have restricted the industry development and every effort should be made by both the public and private sectors to ease those constraints and help further develop the rubber industry. Particular attention should be paid to further modernization of transport and energy infrastructures in the rural areas to effectively link urban rubber industries and rural plantations.
2. The industry's focus on niche markets has resulted in greater dependence on the solid-tire export sector. Unsuccessful entries into other international market niches have hindered the development of the latex sector and attracting FDI.
3. There are no sector-wide marketing efforts for Sri Lankan rubber products and no marketing research mechanism. A well-designed marketing strategy could bring huge dividends to the rubber industry.
4. There is no evidence of strategic collaboration among research institutions, statutory bodies, producers and exporters. A well-functioning public institution with adequate resource provisions should be established.

5. There are no linkages among product development, process development and technological capability improvement entities which hinders the growth and competitiveness of the rubber industry.
6. There is an urgent need for a full-fledged standardization and quality control mechanism for Sri Lankan rubber products for both domestic and foreign markets.

6. ACTION PLAN FOR THE DEVELOPMENT OF THE RUBBER INDUSTRY IN SRI LANKA

As presented in earlier sections on the value chain and SWOT analysis, Sri Lanka could develop a competitive rubber industry and gain enormous benefits by being firmly established in both domestic and international markets. An action plan for the purpose is formulated and presented below.

Objectives of the action plan

1. *Increasing export earnings:* to increase export earnings by 50 per cent from the current export levels reaching US$ 800 million by 2014.
2. *Supply, stability of prices and volume:* to increase the supply of natural rubber by 50 per cent and stabilize the year-round supply of natural rubber by 2014 in order to avoid price volatility.
3. *Product portfolio diversification:* to diversify current product portfolio and increase its value added by 20 per cent by 2014; to improve living standards of workers engaged in the rubber industry by upgrading their skills and raising productivity

Strategic options and critical actions

While specific actions are outlined in the matrix in table 10, some of the important measures are emphasized below. Increasing plantation areas, promoting non-tire and non-traditional rubber products FDI, enhancing research and development, pursuing aggressive marketing and own-brand development are the strategic actions, requiring priority attention. For such actions, the following measures should be implemented:

1. *Establish national market research and trade promotion agency:* Sri Lankan rubber products should have an effective access to the regional and global markets through the establishment of a national marketing research and trade promotion institution.
2. *Allow import of raw rubber on a limited scale to meet occasional shortages:* permit the controlled import of raw rubber until the sufficient supply of natural rubber is fully available within the country.
3. *Increase rubber plantation in non-traditional areas along with the measures for the increased productivity to meet the domestic demand in natural rubber:* ensure a consistent supply of natural rubber to help stabilize rubber prices.

Table 4: Action plan matrix for the rubber sector in Sri Lanka

Present status/ constraints	Targets	Actions	Responsible institution
Objective 1: To increase natural rubber supply by 50 per cent by 2014 in order to achieve stable supply at low price volatility.			
Decline in land area under rubber cultivation due to rapid urbanization. Use of traditional raw rubber manufacturing processes.	Increase natural rubber supply at a competitive price.	Relax restrictions on limited import of natural rubber by introducing a licensing system.	Government, SLAMERP
	Increase the yield level of natural rubber.	Implement scientific agro-management practices.	RRI, MPI, PA
		Expand introduction of modified (high-yielding) clones, and bring down the low yielding acreage.	RRI, MPI, PA
		Introduce new tapping techniques (e.g., to replace manual tapping during rainy season with mechanical devices).	RRI, universities, PA
	Increase rubber cultivation.	Review existing rubber plantation programmes through proper survey. Develop new rubber plantations particularly in non-traditional areas (Moneragala, Hambantota and to the North East).	MPI, Ministry of Lands
		Launch new inter-cropping programmes to diversify the cultivation.	RRI, MPI, PA
	Increase natural rubber production by upgrading raw rubber manufacturing processes.	Introduce cost effective, less labour dependent, user friendly, less energy, environmental-friendly raw rubber manufacturing.	Government, business associations
	Provide better pricing to raw rubber manufacturers.	Establish raw rubber collection centres for cost reduction and higher income.	PA, MPI

Table 4: *(continued)*

Present status/ constraints	Targets	Actions	Responsible institution
Objective 2: To increase rubber products export revenue by 50 per cent by 2014			
Low value-added exports are popular among grassroots level producers who look for quick cash.	Improve research and product development facilities.	Expand present characterization and physical testing facilities at research institutions and/or universities, and provide services to SMEs.	Research institutions, universities
		Form a research and development association (a cluster of rubber industrialists, manufacturers' associations, researchers from universities and research institutions).	Universities, SLRMERP, PRI, RRI
		Launch a product and process development centre (select a suitable institution for expansion, expand capacity, purchase product testing and analytical instruments and lab scale processing equipment).	Govt.
		Improve human resources and capabilities in R&D, product development and specifications standardization (overseas/local training)	Govt.
	Enhance supply of rubber compound facilities.	Establish a custom compound facility, especially catering to SMEs	IDB, proposed technical innovation centre
	Reduce raw rubber exports by enhancing product manufacturing.	Bring necessary changes to CESS policy and other levies and duties on domestic natural rubber procurement to promote the value-added product manufacturing.	Govt., SLAMERP
		Relax restrictions on imports of synthetic and natural rubber and input material by introducing licensing mechanisms.	Govt., SLAMERP
		Establish new production facilities, especially for crepe rubber-based products (e.g., food and medical components), high end value-added products (e.g., automotive parts), and eco-friendly products (e.g., rubber with coir)	SLAMERP members, proposed product and process development centre

Table 4: *(continued)*

Present status/ constraints	Targets	Actions	Responsible institution
	Produce better quality products.	Launch quality awareness programmes at all levels of export production processes, including calibration. Develop infrastructure necessity for proper maintenance of quality. Establish a national accreditation body to assess conformity of institutions and their infrastructure for quality, with possible services extended to other regional countries. Encourage and assist more testing conducted by several institutions to be accredited to international standards.	SLSI, industries, ITI, universities and research institutions or proposed product and process development centre
	Reduce production costs.	Conduct in-house programmes on waste minimization and good housekeeping practices. Introduce cheaper alternative energy sources and energy efficient techniques.	NCPC, universities, Energy Authority
	Reduce raw material costs.	Form a central rubber-recycling unit with necessary equipment. Provide recycled rubber to industrialists at a reduced cost and encourage incorporating them in export-rubber products.	Proposed product and process development centre
	Produce import substitutes for low performance products by SMEs.	Establish promotion schemes for rubber-related SMEs manufacturing import substitutes. Develop new production lines.	SME rubber association, MID
		Provide technical know how to SMEs for manufacturing of new products.	IDB, RRI, proposed technical innovation centre
	Facilitate exporters with steady orders.	Establish long-term purchase agreements with major importers.	Statutory bodies, SLAMERP

Table 4: *(continued)*

Present status/ constraints	Targets	Actions	Responsible institution
	Minimize discrepancies between BOI and non-BOI incentives.	Maintain a level-playing field for all exporters.	BOI
	Boost marketing efforts of currently manufactured products, and identify end users' requirement by manufacturers through marketing research.	Export promotions – strengthening the trading arms of foreign missions. Creation of own brand.	EDB, SLAMERP members, BOI
		Position Sri Lanka as a high value-added rubber product manufacturer.	EDB
		To make research and development institutions market-oriented and market-driven, and to establish an international market research and trade promotion entity to boost marketing efforts for Sri Lanka rubber.	International market research entity or RRI, ITI, IDB

4. *Promote research and development, increase testing standards and improve accreditations facilities:* establish research and development facility to enable product- and process- related innovations and enhance testing standards and international accreditation related to the natural rubber industry.
5. *Attract more latex- and rubber-related FDI:* increase manufacturing of the latex-based and non-traditional rubber-based products.

Action plan matrix for Sri Lankan rubber industry

The action plan (table 4) aims(a) to achieve a 50 per cent increase in the production of natural rubber by 2014, and (b) to increase export revenues from rubber products by 50 per cent by 2014.

The Electronic Products Sector in Sri Lanka

7. OVERVIEW OF THE GLOBAL ELECTRONICS INDUSTRY

Globally, the electronics industry is a rapidly growing sector of economy that is expected to grow into a trillion dollar industry in 2011. During the past decade, the industry that encompasses consumer appliances, ICT, industrial electronics, aerospace and defense and several other industries has experienced a steady expansion that were both demand-and industrial infrastructure-driven. The exponential growth of Internet for business and personal data collection and management and communications will continue to be the driving phenomenon in this decade. Within this context, ICT equipment accounted for roughly two-thirds of global electronic production in 2007, with the increased demand for core components like semiconductors and printed circuit boards.

The growth of the electronics industry is underpinned by transnational corporations' ability to make the production process more efficient. Due to the global nature of the electronics industry, its production facilities have spread to locations with the lowest labour and production costs. The production process in most electronics sub-sectors has been organized in such a way that individual parts can be manufactured at different places and the final product assembled in yet another location thus providing low costs and high profitability (see table 5).

International electronic manufacturers are increasingly reliant on sales in established economies (i.e., the United States of America, the European Union and Japan) and emerging markets (e.g., BRICS: Brazil, the Russian Federation, India, China and South Africa) to increase their revenues. Within this framework, the criteria for choosing a suitable location for production hubs are crucial in terms of production effectiveness and optimal distance to numerous markets.

The main difference between the electronics industry and other manufacturing industries lies in the fast introduction of technological innovations and adaptations that has created rapid market expansion over the past 30 years. Presently, electronic product manufacturing is expanding at an unprecedented scale in the Asia-Pacific region. Many

Table 5: Apple iPhone 3G's major components and cost drivers

Manufacturer	Component	Cost (US Dollars)
Toshiba (Japan)	Flash Memory	$24.00
	Display Module	$19.25
	Touch Screen	$16.00
Samsung (Republic of Korea)	Application Processor	$14.46
	SDRAM-Mobile DDR	$8.50
Infineon (Germany)	Baseband	$13.00
	Camera Module	$9.55
	RF Transceiver	$2.80
	GPS Receiver	$2.25
	Power IC RF Function	$1.25
Broadcom (United States of America)	Bluetooth/FM/WLAN	$5.95
Numonyx (United States of America)	Memory MCP	$3.65
Murata (Japan)	FEM	$1.35
Dialog Semiconductor (Germany)	Power IC Application Processor Function	$1.30
Cirrus Logic (United States of America)	Audio Codec	$1.15
Rest of Cost of Materials		$48.00
Total Cost of Materials		$172.46
Manufacturing Costs in China		$6.50
Grand Total		$178.96

Source: Xing and Detert (2010).

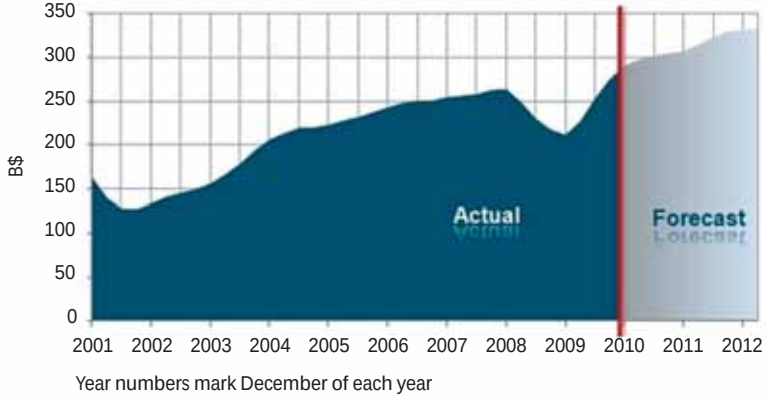
countries in the Asia-Pacific region – particularly Japan, Republic of Korea, China, Taiwan Province of China, Malaysia, Thailand, India and Singapore – have become principal manufacturing hubs for electronic goods and products. Significantly, China is becoming the global manufacturing centre of consumer electronic products. In 2002, Asia had 41 per cent of the global electronics market share and that has risen to 56 per cent in 2009 (Digivity Report 2009).

According to JEITA (2009), global IT production, including electronic equipment, components and devices and information technology, totalled $1.67 trillion in 2005. Global production of electronic equipment, components and devices totalled $1.73 trillion in 2005. The annual global growth of the electronics industry was estimated at 6.6 per cent. In addition to fast growth, the electronics industry's value added is considered high when compared to the value added of other industrial sectors. For example the value added in manufacturing of electronic components ranges from 40 to 50 per cent, while the value added in equipment manufacturing ranges from 10 to 15 per cent. Since the aggregated data on the global electronics industry is difficult to attain because various sub-sectors are involved and different classifications are used

by different nations, a specific electronics sub-sector was chosen to provide a quantitative assessment of the growth in the electronics sector in the past decade.

With this in mind, the semiconductor industry[38] is widely recognized as the key driver in the growth of the entire electronics industry, with its dual role as a multiple lever and technology enabler for the electronics value chain. According to Semiconductor Industry Association, total annual sales of semiconductors for 2008 amounted to $248.6 billion compared to $255.6 billion in 2007, a decrease of 2.8 per cent (SIA Report 2009). Along with the strong growth of Internet use, smartphones, 3DTVs and tablet PCs, the global recovery from the recent financial shock will provide strong impetus for sustained growth in the electronics industry (SIA 2011). With semiconductors being a vital component in those ICT products/services, strong growth in their sales and manufacturing would indicate strong demand for electronic products (figure 18). Sri Lanka could tap this potentially lucrative market by carefully selecting certain high value-added electronic products for manufacturing within the country.

Figure 18: Performance of the semiconductor sector, 2001-2010 (actual); 2011 and 2012 (forecast)



Source: WSTS (2011).

8. ADVANCEMENT OF ASIA-PACIFIC DEVELOPING COUNTRIES IN THE ELECTRONICS SECTOR

Developing Asia-Pacific nations, such as China, India and ASEAN countries, have expanded its production capacity as suppliers of components and manufacturing systems to major electronic transnational corporations (TNCs) and significantly

[38] Semiconductors are materials that have conductivity between conductors (general metals) and nonconductors or insulators (such as ceramics) and play a pivotal role in the fabrication of electronic devices. And even though many electronic devices can be produced using vacuum tube technology, breakthrough in semiconductor technology in the past 50 years has allowed electronic devices to become smaller, faster and more reliable (SIA 2011).

increasing their production facilities throughout the first decade of this millennium. Several notable developments were observed:

a. Many Asia-Pacific producers, mainly from North-East Asia, have successfully transitioned from technology-followers to technology-leaders in handling local system design and component production. They maintain the advantage of low labour costs by spreading their operations throughout the region.

b. Global value chains for electronics equipment in the region were well-developed, especially in countries of North-East and South-East Asia. They linked various levels of production inputs, such as materials, electronic parts and components, technology, production facilities and labour to assemble competitive final products for export.

c. A consolidation of upstream suppliers of value chains in the electronics industry occurred when the leading materials and equipment supply companies became major global suppliers, developing capabilities for system design, such as integrated modules that offered short lead-time and cost reduction (e.g., electronic system manufacturing (EMS)).

d. "Green" manufacturing and environmentally-friendly electronic products emerged in response to new market demands and technological advancement.

e. Emerging markets in the region e.g., China, India and the Russian Federation have increasingly expanded their share in the global electronics market.

Thus, the trend is obvious that developing countries of Asia and the Pacific have become production hubs for electronic products. Following in the steps of other developing countries, such as China, India and ASEAN countries, Sri Lanka could have developed a potential to become a competitive electronics industry. And in order to further gauge this potential in Sri Lanka, a brief overview of the Sri Lankan electronics industry is presented below.

9. POTENTIAL FOR THE DEVELOPMENT OF THE ELECTRONICS INDUSTRY IN SRI LANKA

Despite the immense global growth of the electronics industry, Sri Lanka has yet to partake in this sector even though the issues that constrained most developing countries are not present in Sri Lanka. Sri Lanka has a great potential to procure and develop a competitive electronics industry having the low-cost and skilled labour, relatively well developed infrastructure and, most important of all, Indo-Sri Lanka Free Trade Agreement providing access to the rapidly growing neighbouring market. With this being said, the engine that has driven Sri Lanka's economic growth has been its apparel industry annually accounting for over 40 per cent of exports since 2000 (DOC 2009). Compared to its leading manufacturing sub-sector, apparel manufacturing, the electronics industry in Sri Lanka is rather small.

Box 1: Experience of Malaysia and Taiwan Province of China in the development of the electronics industry

Malaysia

Malaysian electronics industry has come a long way in the past 40 years, from its inception in the 1970s to becoming one of the world's largest exporters of semiconductor devices and ASEAN preeminent leader in electronics manufacturing. The key factor behind this impressive rise is the Government's success in attracting electronics targeted FDI. Three main waves caused the relocation of TNC production facilities to Malaysia: 1) between 1972 and 1974, when American and Japanese TNCs relocated some of their electronic assembly operations; 2) between 1987 and 1989, as a result of the Plaza Accord of 1985, Japanese TNCs moved their labour-intensive consumer electronic manufacturing to low labour cost nations; and 3) between 1990 and 1994, when American disk drive and computer manufacturers decided to move their production to locations with supplier networks of key components. TNCs were attracted to Malaysia because of its relatively modern infrastructure, efficient bureaucracy, low tariffs and tax incentives, political stability and non-unionized, low-cost skilled labour.

Source: Rasiah (1999).

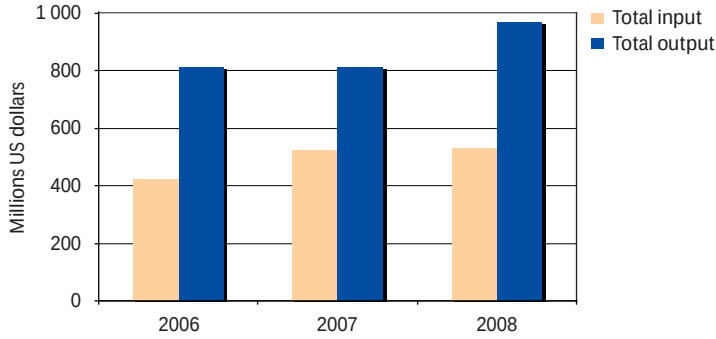
Taiwan Province of China

The rise of Taiwan Province of China as one of the global leaders in the electronics industry is closely linked to the relentless efforts of the industry stakeholders and the support of the Government. First, Taiwan Province of China overcame technology/capital barriers using task distribution among SMEs. For example, manufacturing of printed circuit boards (PCB) requires the use of expensive specialized equipment, which SMEs cannot afford. Taiwanese electronics industry solved this problem by establishing specialized drilling mills that undertake the most capital-intensive part of the PCB production process, thus allowing small PCB imprinting operators to survive and cater to other similar fields. This vertical disintegration of the PCB production process allowed for two things to happen: 1) the continual growth of SMEs in niche categories; and 2) capital-intensive producers, such as PCB imprinting, became large independent subcontractors benefiting from economies of scale. Second, Taiwanese firms evolved starting with relatively primitive electronic products and then moving to more sophisticated ones through developing advance production processes and supplier networks. A typical example is notebook PC manufacturers in the 1970s. Assembling notebook computers is a highly complex task that requires deep technological understanding. Taiwanese SMEs overcame technological constraints by relying on an earlier experience of producing calculators. The experience, working with a large number of component suppliers for calculator production, gave them a competitive advantage over their rivals in terms of cost control and work coordination. Third, the success of Taiwanese electronics industry depended on the active participation of the Government. In addition to indicating export processing zones and initiating a series of tax and financial incentives, the Taiwanese Government actively supported and fostered SMEs in the electronics industry by conducting promotional activities, such as organizing trade fairs and exhibitions that aimed to foster foreign investor and local manufacturer relationships to attract more electronics related FDI to the island.

Source: Chen and Ku (2002).

Sri Lanka's domestic electronics market is still small. In 2008, the electronics industry accounted for just 160 of the total 3,309 manufacturing enterprises in Sri Lanka and employed 27,000 people. For example, the apparel industry consists of 564 enterprises that employ a whopping 340,000 people. A look into the value of Sri Lankan imports and exports provides a perspective of the current level of the electronics industry. In 2008, the electronics industry had $967 million in outputs from the inputs of $531 million. Figure 19 shows the levels of Sri Lankan inputs and outputs between 2006 and 2008. As seen, the level of electronics industrial output has remained stable.

Figure 19: Total value of inputs and outputs in the electronics sector in Sri Lanka



Source: DCS (2011).

The electronics industry shows a great potential as a driver of future economic growth. When compared to the apparel and rubber/plastics sectors, the productivity level of the electronics industry (both at micro- and macro-levels) is considered high with the value output per worker being $16,200, which is the highest level among the three manufacturing sectors. High productivity level is seen as an important competitiveness indicator (table 6). In 2008, the apparel sector had exports valued at $2.98 billion, while the electronics sector exported only one third of this value and employed only 10 per cent of the apparel sector workforce. The electronics industry, due to its high value added, is more efficient in converting inputs into outputs than other manufacturing sectors and thus has a much higher productivity level.

Table 6: Productivity levels across the three sectors in Sri Lanka

Indicator	Apparel	Rubber and Plastics	Electronics
Output/Input Ratio	1.68	1.83	1.82
Output/Worker (in dollars)	8 767	20 599	35 972
Value Added/Worker (in dollars)	3 540	9 335	16 200
Value Added/Input Ratio	0.68	0.83	0.82

Source: Calculated by the authors with the data obtained from DCS (2011).

10. ACCESS TO MAJOR MARKETS

As previously mentioned, the electronics industry in Sri Lanka has been neglected and is underdeveloped even by the standards of lower middle income nations.[39] On average, lower middle income nations had high technology exports share of 22 per cent in their manufacturing exports from 2001 to 2008 while Sri Lanka only had a paltry 1.6 per cent (World Bank 2011b).

Sri Lanka's five main export destinations are the European Union, the United States of America, India, United Arab Emirates and the Russian Federation – with the first two having close to 60 per cent share of exports in 2010 (EC 2011a). And unsurprisingly, Sri Lanka's leading exports are apparel and clothing accessories. After a detailed look into the export data of the four major markets, including the European Union, the United States of America, India and China, one can see that there are negligible exports of electronic products to these markets with the exception of the European Union. And even though the export of electronic goods to the European Union increased more than six-fold from $22.5 million to $148.4 million in the period from 2002 to 2007, it still represents only five per cent of Sri Lankan total exports to the European Union (DOC 2007).

Sri Lanka is well situated in the middle of the main maritime transport corridor that links Europe to Asia and the Pacific and North America, which provides logistic access to key overseas markets such as the European Union, China, Japan, ASEAN and the United States of America. Sri Lanka, with its supply of relatively skilled workers and low labour costs, could market its domestic capabilities for manufacturing low-cost electronic components that could easily be exported to overseas assembly hubs (for the finished products). The following sections will briefly describe potential key export markets for Sri Lankan electronics industry, namely India, ASEAN, the European Union and the United Sates of America.

India

Sri Lanka's proximity to India allows it benefit from the Indian economic growth with its growing demand for electronic products. As more Indians can afford modern luxury and the necessary items such as televisions, refrigerators, personal computers, mobile phones, cars, etc. more opportunities emerge for the electronics industry of Sri Lanka. Sri Lanka stands to benefit from Indo-Sri Lanka Free Trade Agreement, which was signed in 2000 with the aim of promoting economic linkages between India and Sri Lanka (ISFTA 2007). This agreement allows over 4,000 Sri Lankan goods a duty-free access into India[40]; included among the list of eligible-products are various electronic

[39] The World Bank classifies countries, according to GNI per capita, into four income groups: low income, $1,005 or less; lower middle income, $1,006-$3,975; upper middle income, $3,976-$12,275, and high income, $12,276 or more. Sri Lanka is classified as a lower middle income nation with a GNI per capita of $2,290 (World Bank 2011b).

[40] Conversely, ISFTA also provides preferential tariffs for petroleum, natural gas, steel and other core infrastructural products exported from India to Sri Lanka – so that enterprises in Sri Lanka also have access to key manufacturing inputs from India.

goods: household appliances, printed circuits, semiconductors, electronic integrated circuits, electrical machinery parts, motor vehicles, televisions, personal computers and telephones (DOC 2009). The ISFTA has brought about a rapid growth of exports from Sri Lanka to India or a nine-fold increase from $55.7 million to $516.4 million in the period from 2000 to 2007 India now represents the third largest export market for Sri Lanka (table 7). More than 70 per cent of Sri Lankan exports to India presently fall under the tariff preferences offered through ISFTA.

Table 7: Trade between India and Sri Lanka, 2000-2007 (value in millions of dollars)

Year	Exports to India	Imports from India	Total Trade
2000	55.7	600.1	655.8
2001	70.1	601.5	671.6
2002	168.9	834.7	1 003.6
2003	241.1	1 076.2	1 317.3
2004	385.5	1 358.0	1 743.5
2005	559.3	1 440.4	1 999.7
2006	494.1	1 822.1	2 316.2
2007	516.4	2 785.0	3 301.4

Source: ISFTA (2007).

The current economic environment fosters the expansion of the Sri Lankan electronics industry as it has an advantage in supplying low-cost electronics parts and components to the Indian market. Since most electronic products are not manufactured in India and have to be imported, Sri Lanka could act as a production site for the electronic components (and finished products) destined for the Indian market.[41] Sri Lanka could act as secondary supplier of electronic car parts for Indian automotive manufacturers (especially small sized). With an investment from Japanese TNCs and an experience in exporting to foreign nations, Sri Lanka has been developing a capacity for producing products to international standards.[42] Despite a growth potential in bilateral trade, the level of exported electronic products to India is minimal at best.

Since the implementation of ISFTA, the growing mutual dependence of Sri Lankan and Indian economies is obvious (see table 7). Taking into consideration the supply of skilled workers and low labour costs, there is a golden opportunity for foreign investors to invest in the manufacturing of high value added electronic components/ products in Sri Lanka and export them to the Indian market.

[41] India has attracted FDI in its electronics sector mostly for research and development (R&D) operations rather than manufacturing and production (cf. Ernst 2009).

[42] Companies such as Toslanka, Kik Group, Nippon Maruchi, Soar Technologies, and FDK Lanka.

ASEAN

Association of Southeast Asian Nations (ASEAN) has undergone rapid industrialization that has transformed it from an agrarian-based economy to the one based on industry and services. The subregion's FDI-driven development strategy has integrated its industries into global and regional value chains. Next to China, ASEAN (specifically Malaysia and Thailand) has risen to become a global manufacturing centre for electronic and electrical products. However, rising labour costs are seen as a major challenge for South-East Asia, which hamper its future reliance on assembly manufacturing. A small number of skilled labour in the subregion has limited the type of manufacturing to assembly manufacturing that has drastically capped the high valued-added activities. The result is that ASEAN imports the necessary components and parts for the final assembly from abroad .

Sri Lanka is in a unique position, due to an abundance of skilled labour and low labour costs, to take advantage of the situation in ASEAN. Because of its proximity to ASEAN and its low labour, resource and transportation costs, Sri Lanka could market itself as a low-cost manufacturer of electronic and electrical components for a further integration into the ASEAN electronics value chain. Additionally, Sri Lanka could produce computer hardware components and car electronic parts (similar for those it produces for India) for the ASEAN high tech and auto industries. Since these export industries already exist in Sri Lanka (albeit minimally) through affiliation with TNC subsidiaries, their further development should be relatively straightforward.

The European Union

The European Union (EU) has incorporated the World Trade Organization (WTO) Generalized System of Preferences (GSP)[43] into its trade agreement with Sri Lanka and other 175 other developing countries and territories, which provides them with a preferential access to the European market. It achieves this by reducing tariffs[44] on over 7,000 products destined for sale in the European market. As an extension to the European GSP, there is a non-reciprocal preferential import regime for developing nations, known as the *special incentive arrangement for sustainable development and good governance* (colloquially as GSP plus). The GSP plus provides additional preferences to economically vulnerable developing countries, including Sri Lanka, that have ratified, implemented and maintained international conventions dealing with sustainable development, good governance and human and labour rights (EC 2011b).

[43] GSP is a formal exemption mechanism from the WTO provision that requires all WTO member nations to treat imports from all other WTO member nations equally, i.e., by imposing equal tariffs on them. Under the GSP, qualifying nations such as Sri Lanka have preferential access, due to lower or non-tariffs, to all WTO member nations (WTO 2011). The aim of the GSP is to contribute to the reduction of poverty and promotion of sustainable development and good governance. Within this framework, preferential tariff rates for exports to EU markets would enable developing nations to participate more fully in international trade and generate export revenue to support its developing industries, jobs and poverty reduction (EC 2011b).

[44] The tariff preferences differ according to the sensitivity of products: non-sensitive products enjoy duty-free access to the EU market while sensitive products benefit from a tariff reduction. For specific duties, however, a 30 per cent reduction is the general rule (EC 2011b).

Driven by GSP plus programme, Sri Lankan exports of electric goods, machinery, sound recorders, televisions, vehicles and parts to the EU increased from $22.5 million to $148.5 million from 2002 to 2007 (DOC 2009). In 2009, the EU was responsible for 5.6 per cent of Sri Lankan electronic exports (EC 2011b). However, in 2010 the EU suspended Sri Lanka from the GSP plus programme due to its failure to meet three United Nations human rights conventions (EC 2011c).[45] Despite this, Sri Lanka still receives regular GSP tariff preferences from the EU. This brings uncertainty about the benefits Sri Lanka may receive in the form of future electronic-related exports to the European Union.

The United States of America

Similar to the European Union GSP, the United States of America (The United States) has incorporated World Trade Organization GSP into its trade agreements with Sri Lanka and other 129 designated countries and territories, which provide preferential duty-free treatment to over 3,400 products. The purpose of GSP programme is to give exports from developing nations a competitive edge in the United States market; the United States companies, on the other hand, are interested in buying goods through GSP programme because no tariff is charged on the products' entry into the United States.[46] GSP programme covers many eligible items and among them are industrial items and inputs for manufacturing. The total United States import under GSP programme in 2006 amounted to $32.6 billion, 20 per cent of which was classified as "machinery, electronics or transportation" product types. Sri Lanka was the 14th top user of US GSP in 2006 with $143.6 million worth of exports and benefitted greatly from the programme. For example, the duties for certain electrical transformers exported were reduced by 6.6 per cent (USTR 2007). Despite this, Sri Lankan exports through GSP programme accounted for only 6.7 per cent of the total United States imports from Sri Lanka, with electronics export non-existent. As such, there is an immense potential for Sri Lanka to utilize the United States GSP programme to market itself to foreign investors for manufacturing of electronic components or finished products to be marketed in the United States.

11. VALUE CHAINS IN THE ELECTRONICS INDUSTRY IN SRI LANKA

One of the major players in the electronics industry value chain are brand owners or own brand manufacturers (OBMs). The OBMs have marketing expertise in identifying the needs of the user, doing in-house product design (i.e., own design manufacturers (ODMs)) or ordering it from outside product designers. There are a number of players in Sri Lanka that provide contract manufacturing services to the OBMs and to several other support industries such as printed circuit board (PCB) manufacturers, plastic enclosure producers, precision metal parts manufacturers and die and mould makers. The support industries provide accessories and parts/components needed for the production of electronic goods. However, the contract

[45] Those include the International Covenant on Civil and Political Rights, the Convention against Torture and the Convention on the Rights of the Child.

[46] Otherwise, the tariffs could range between two per cent and seventeen per cent of the product's cost.

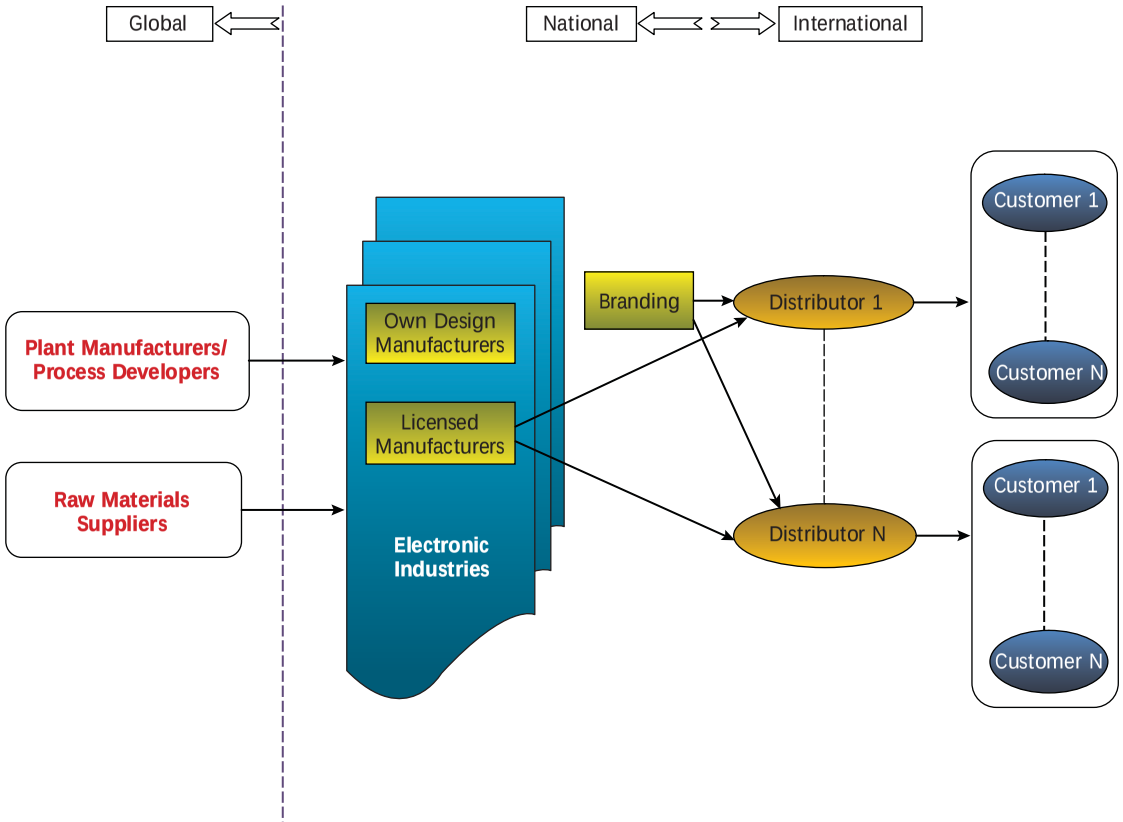
manufacturers and support industries provide their services to the OBMs with relatively low profit margins.

Figure 20 depicts a typical value chain of electronic components, which includes plant developers, process developers, raw material suppliers, electronic component manufacturers, distributors and industrial customers. In the production of semiconductors, for example, raw materials (such as silicon wafers) are converted into various discrete devices and integrated chips. The design of an integrated circuit is an expensive process and is the key factor that determines the final quality and thus the value of the product. Usually designs are protected by patents and copyrights to ensure that the expenses incurred during the design stage are recovered Thus, production under license agreements is practiced by many companies (i.e., licensed manufacturers). The cost of plants and machinery required for integrated circuit manufacturing is also considerably high. Semiconductors manufactured in large volumes, such as microprocessors and memories, are typically marketed under a brand names such as Intel, Motorola, AMD, Samsung and Hitachi.

Figure 21 depicts a value chain of electronic products for which electronic components are major inputs. Laminats are processed chemically into PCBs while electronic components are later assembled into PCBs. The assembly process is usually outsourced to contract manufacturers. Plastics and metals are major raw materials used in the industry to make enclosures and accessories. Die and mould makers provide the dies and moulds needed by the industry while plastic enclosure/component producers and metal fabricators supply the enclosures and accessories. The PCB manufacturers, die and mould makers and enclosure/component producers can be treated as related support industries for the electronic product manufacturing industry. In addition, design service providers mainly for die and mould, electronic circuit and prototyping assist ODMs and OBMs in engineering and designing electronic products.

Figures 20 and 21 also suggest that certain functions of both the electronics components and electronics products value chains could be developed in Sri Lanka. As far as the local electronics industry is concerned, the raw materials and required facilities (e.g., plant and machinery) are mainly imported at present and such trend could be continued for the foreseeable future. At present, the Sri Lankan electronics industry could be identified as a supporting industry to OBMs and ODMs that provide significant opportunities for Sri Lankan manufacturers to work for contract manufacturing services in exporting parts and components for display technologies, entertainment devices, optical storage devices, passive components and telecommunication equipment. The Sri Lankan electronics industry should attract foreign TNCs for local contract manufacturing during trade fairs organized by the EDB. Foreign direct investment could increase the sector's output and productivity due to the use of advanced manufacturing techniques and higher productivity capacities of newly constructed plants. However, technological inputs, which play a major role in value added, are expected to be provided by the leading brand owners. The quality control and marketing of the final product should be done according to TNCs standards.

Figure 20: Value chains for electronic components



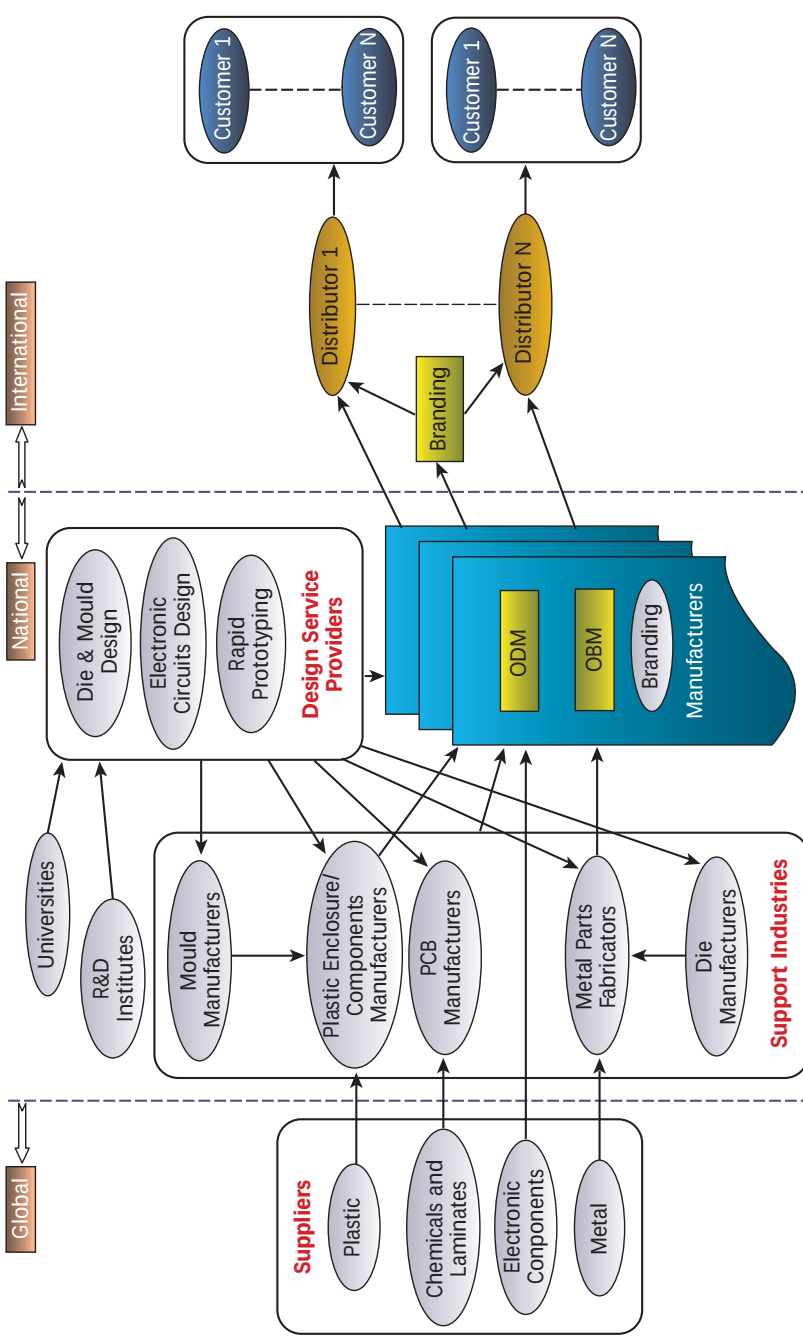


Figure 21: Value chains for electronic products

Over time, electronics contract manufacturers in Sri Lanka should attempt to come up the electronic value chain by providing the finished product to OBMs and ODMs as original equipment manufacturers (OEMs) and developing their own brands by enhancing their engineering and marketing capabilities. The local universities and R and D institutions could provide the required human resources for engineering and marketing activities. Various suppliers (e.g., raw materials, plastic enclosures/ components and metal parts) should be established near such universities and institutions to form industry clusters.

As stated earlier, the major strength of the electronics industry in Sri Lanka is the relatively skilled and adaptable local labour force, which is flexible and is used to frequent designs changes in the production of electronics components and products and to quality and delivery requirements of leading electronics manufacturers. On the flip side, the major drawback of contract manufacturing is the low value added for Sri Lankan industries. And as marketing has not been done to any discernible extent by Sri Lankan electronics industries, one could not expect that any Sri Lankan electronics brand emerge in the global market in the short term. The second major drawback is the heavy dependence on imported machinery and raw materials, such as precision metal parts required for some electronics products. The third major drawback is a lack of engineering and design activities for the electronic export products in Sri Lanka.

Within this context one key issue that the electronics industry in Sri Lanka should address is the identification of niche markets. Sri Lankan firms engaged as contract manufacturers could learn from their principal buyers, typically TNC-brand manufacturers, how to reach the regional and global markets. However, buyers may resist helping Sri Lankan contract manufacturers, who could become their competitors over time. The strategy that Sri Lankan contract manufacturers could adopt to overcome this resistance is to develop products that are not marketed by their customer TNCs.

12. SWOT ANALYSIS OF THE ELECTRONICS INDUSTRY IN SRI LANKA

Strengths

- Availability of low-cost, skilled workforce that is trainable, adaptable and capable of working in high tech environments.
- Preferential access to major overseas markets, such as the European Union, the United States of America and India, which, by way of reduced or zero tariffs, give Sri Lankan products a competitive advantage.
- Relatively low international transportation costs due to a proximity to maritime corridors.
- High productivity levels when compared to other key export sectors (i.e., apparel and rubber/plastic industries).
- Ample duty-free supply of natural resources (iron, oil, etc.) from India.
- Foundation of the Government supported microfinance institutions assisting in funding SME development.

- Presence of foreign TNCs subsidiaries, exporting quality electronic components to ASEAN and Japan, and thus displaying the feasibility and success of electronic manufacturing in Sri Lanka.
- Increase of designated industrial parks and export processing zones equipped with electric power supply, transportation access and infrastructure for manufacturing operations.

Weaknesses

- Despite relatively modernized urban centres, the rural infrastructure remains underdeveloped with neglected roads and rail lines and uneven supply of electricity, which undermines rural SMEs development.
- High corporate tax rates and convoluted tax regulations are deterrents to foreign investments in Sri Lanka.
- Arcane labour regulations restrict the free flow of labour force and hinder SMEs' ability to react to market changes.
- Lack of access to institutional credit and high costs of borrowing restrict the capital needed for SMEs startups and expansion.
- Lack of adequate local auxiliary services (precision engineering, high tech testing and calibration) for electronics goods manufacturing necessitates the import of machinery and components.
- Lack of specific training and technological capability-building facility to promote and improve electronic goods manufacturing.
- Lack of an influential electronics industry association.

Opportunities

- Proximity to India allows Sri Lanka to benefit from the growing domestic demand.
- Low levels of electronic goods exports and the electronics industry high productivity levels (relative to the apparel and rubber/plastic industries) allows for tangible gains from economies of scale.
- The growing global demand for electronic products combined with the TNCs desire to lower production costs allows Sri Lanka to market itself as a low-cost manufacturing country.
- Ability to assimilate into the existing ASEAN regional value chains (i.e., Malaysia and Thailand) as low-cost component suppliers and offer secondary components for the Indian manufacturing markets (e.g., electronics parts for automobile).
- As production costs rise in the more developed neighbouring economies such as ASEAN, Sri Lanka, with its ample supply of skilled workforce and low labour costs, represents a cost effective alternative for TNCs.
- Government sponsored electronics sector-specific investment campaign to promote Sri Lanka as an electronic manufacturing hub to foreign investors.

Threats

- Further growth of Chinese, Indian and ASEAN manufacturing electronic product markets threatens Sri Lanka prospects of electronic product market development.
- Bureaucratic processes, tax and labour regulations create confusing business environment that hinders future foreign investments.
- Weak access to credit hinders SMEs growth.

13. ACTION PLAN FOR THE DEVELOPMENT OF THE ELECTRONICS SECTOR VALUE CHAINS IN SRI LANKA

Asia and the Pacific is fast becoming the manufacturing hub of the global electronics industry and Sri Lanka should capitalize on the great opportunity. By 2020, venturing into electronic component and product manufacturing as specified in the action plan, Sri Lanka aims at capturing a 0.1 per cent share of the global electronics market, which would correspond to approximately $2 billion (as compared to $967 million in 2008).

The strategic perspectives of the action plan are based on the electronics industry maturity level and specific areas within the electronics industry where the production and sales of precision and branded electronic components and products would fit. The perspectives and action plan are presented in the following matrices (tables 8 and 9). Several priority actions and activities specified below are as follows:

1. Vigorously promote electronics component manufacturing by attracting FDI from major component manufacturers;
2. Commence electronic component manufacturing by promoting joint ventures to manufacturers under license;
3. Develop and modernize education/training and R and D for the electronics industry;
4. Establish market information and advisory system for the identification of new markets;
5. Promote design and manufacturing of electronic components for niche markets by establishing Sri Lankan brands;
6. Establish and strengthen design service providers in electronic circuit design, die and mould design and rapid prototyping;
7. Establish supporting industries capable of manufacturing precision plastic and metal components for the electronics industry;
8. Promote establishment of links with foreign brand manufacturers to consider Sri Lanka as a suitable destination for own design manufacturing in addition to contract manufacturing;
9. Promote and support technology parks that cooperate closely with educational and R and D centres;

10. Prepare the industry to comply with the environmental laws and regulations (e.g., lead-free soldering, electromagnetic compatibility, etc.);
11. Promote the establishment of links with foreign brand manufacturers to market Sri Lankan brands for niche markets where foreign brand manufacturers are not currently providing any services; and
12. Promote the establishment of foreign subsidiaries to promote Sri Lankan brands.

Box 2: An example of the electronics sector FDI in Sri Lanka

FDK Lanka was established in 1990 as one of foreign subsidiaries of FDK Corporation, a Japanese manufacturer of electronic-related materials and products that received over $1.2 billion in revenue in 2010. The FDK Lanka employs over 1,100 people and is located within the Katunayake EPZ, which provides a convenient access to transportation hubs. FDK Lanka started with producing magnetic heads for floppy drives in 1990, but recently, after five expansion stages, has overhauled its product portfolio to include optical isolators (for fibre optic communication equipments) and ferrite cores and rotary transformers (for VCR/Video cameras). FDK Lanka is equipped with computerized production machineries, precision cutting, cleanroom manufacturing environments of Class 100, 1,000, and 10,000, where optical components and rotary transformers are processed and assembled up to the final product. Its products are shipped to China; European Union; Hong Kong, China; Indonesia; Japan; Malaysia, Republic of Korea; and the United States of America. The success of FDK Lanka demonstrates a business opportunity for the electronics sector TNCs in Sri Lanka.

Source: http://www.fdklanka.com

Table 8: Action plan matrix for the electronics sector in Sri Lanka

Objective	Present Status	Target	Actions	Responsible Institution
Main objective: To capture 0.1 per cent share in the global electronics market by 2020 by venturing into electronics component and product manufacturing.				
Commence the production of electronics components.	Only one foreign investor is involved in manufacturing capacitors.	Commence production and market electronic components, such as capacitors, resistors, inductors, connectors, etc.	A1. Attract FDI by major component manufacturers.	BOI, SLEMEA
			A2. Promote joint ventures to manufacturers under license.	BOI, SLEMEA
			A3. Promote design and manufacture electronic components for niche markets by establishing Sri Lankan brands.	EDB, SLEMEA
Commence the production of electronic products.	At present, mainly contract manufacturing is carried out.	Commence production and market electronic products in consumer electronics, telecommunication, computer and office automation sector, as well as industrial electronics sectors.	A4. Development and modernization of education and R and D for the electronics industry.	Universities
			A5. Promotion and support for technology parks cooperating closely with educational and R&D centres.	MID
			A6. Preparation of industry for environmental directives (e.g., lead-free soldering), electromagnetic compatibility, etc.	Ministry of Environment
			A7. Establish market information and advisory system for identification of new markets.	EDB
			A8. Establish design service providers in electronic circuit design, die and mould design, rapid prototyping and strengthening them.	MID
			A9. Establish supporting industries capable of manufacturing precision plastic and metal components for the electronics industry.	MID

Table 8: *(continued)*

Objective	Present Status	Target	Actions	Responsible Institution
			A10. Promote establishment of links with foreign brand manufacturers to consider Sri Lanka as a suitable destination for ODM, instead of contract manufacturing.	EDB, SLEMEA
			A11. Promote establishment of links with foreign brand manufacturers to market Sri Lankan brands for niche markets where foreign brand manufacturers are not providing any service.	EDB, SLEMEA
			A12. Promote establishment of foreign subsidiaries to promote Sri Lankan Brands.	EDB, Sri Lanka Electronic and Exporters Association

Table 9: Sub-activities for the action plan

	Action (budget required)	Proposed Activities
A1	Attract FDI by major component manufacturers.	• Establish investment policies promoting FDI from component manufacturers. • Dispatch delegations comprising government and private sector stakeholders to major component manufacturers to attract FDI. • Set up a steering committee to promote FDI for component manufacturing.
A2	Promote joint ventures with manufacturers under license.	• Establish investment policies promoting joint ventures for component manufacturing. • Dispatch delegations comprising government and private sector stakeholders to major component manufacturers to promote joint ventures. • Set up a steering committee to promote joint ventures for component manufacturing.
A3	Design and manufacture electronic components for niche markets by establishing Sri Lankan brands.	• Use activities of A7 to promote marketing electronic components for niche markets. • Set up a mechanism to promote technology spillover from FDI and joint ventures to Sri Lankan brand manufacturers.
A4	Develop and modernize education and R&D for the electronics industry (SL Rs. 10 Million)	• Provide training programmes to academics/researchers in electronic product design. • Commence undergraduate course specializing in electronic product design. • Set up technology incubation facilities at Universities of Moratuwa, Peradeniya and Ruhuna to promote start-up electronics industries.
A5	Promote and support technology parks that will cooperate closely with educational and R&D centres.	• Identify suitable location to set up technology parks closed to Universities of Moratuwa, Peradeniya and Ruhuna. • Construct infrastructure for technology parks using foreign grants/loans. • Promote start-ups in incubators to commence commercial operation in technology parks.
A6	Prepare the industry for compliance with environmental directives (e.g., lead-free soldering, electromagnetic compatibility, etc.)	• Set up an expert team to identify environmental directives, standards, etc., related to major markets such as United States of America, European Union and Japan. • Identify consultants to conduct training programmes to the industry.

Table 9: *(continued)*

	Action (budget required)	Proposed Activities
A7	Establish market information and advisory system for the identification of new markets (SL Rs .10 Million).	• Establish a network of trade missions at Sri Lankan Embassies to identify new markets for electronic products and components. • Establish an information bureau to gather and disseminate market information among electronic product and component manufacturers. • Create a funding mechanism to explore market potentials identified by the above two points. • Set up a service bureau to provide marketing expertise to electronic product and component manufacturers.
A8	Establish and strengthen design service providers in electronic circuit design, die and mould design and rapid prototyping (SL Rs. 10 Million).	• Provide financial support to the private sector to establish design services for electronic circuit design. • Provide tax concessions to design service providers. • Strengthen rapid prototyping facilities at University of Moratuwa. • Strengthen die and mould facilities at University of Moratuwa.
A9	Establish supporting industries capable of manufacturing precision plastic and metal components for the electronics industry.	• Provide financial support to the private sector to commence precision plastic and metal components. • Provide tax concession to precision plastic and metal component manufacturers.
A10	Promote the establishment of links with foreign brand manufacturers to consider Sri Lanka as a suitable destination for ODM, instead of contract manufacturing.	• Use activities of A4 to promote ODM. • Use activities of A5 to promote ODM. • Use activities of A7 to promote ODM.
A11	Promote the establishment of links with foreign brand manufacturers to market Sri Lanka brands for niche markets where foreign brand manufacturers are not providing any services.	• Use activities of A7 to promote links with foreign brand manufacturers to market Sri Lankan brands.
A12	Promote the establishment of subsidiaries to promote Sri Lankan brands.	• Provide financial aids to establish subsidiaries. • Provide tax concession to companies who establish foreign subsidiaries.

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