INTEGRATED SUPPLY CHAIN MANAGEMENT: A MODEL FOR ASIAN KNITWEAR EXPORT SECTOR

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ABSTRACT

In the Post-MFA phase-out trade regime, the Asian textile and garment industry has carved a ‘niche’ in the European and US markets. According to the WTO’s latest international trade statistics, the phase-out of the WTO agreement on textiles and clothing has boosted the roles of Asian players, especially, China, India, Bangladesh and Pakistan, in global exports of textiles and clothing, in 2005. Knitwear, one of the constituents of garment exports is a major clothing item exported from the Asian countries, especially, China, India, Pakistan, Bangladesh, Taiwan, Thailand and Sri Lanka.

Globally, there is a spurt in demand for knitwear, and, Asia has become the hub of knitwear manufacture and export. The Asian knitting industry, with the predominance of small and medium enterprises, engaged in direct and indirect exports, has emerged as a premier supplier of value added items, earning high foreign exchange for the countries in the region. There has been a phenomenal change in technology and modernization initiatives, and knitwear exports from Asia have been increasing ever since, the phasing out of the quota system. However, the industry is confronted with fast changing consumer tastes and preferences in the developing and developed country markets, hectic competition from countries within and outside the continent and frequent changes in government policies, especially, in the erstwhile quota countries.

Knitwear manufacturing and exporting firms in Europe and North America compete in the competitive global market place, using their supply chain as the weapon. Whereas, many Asian firms are experiencing severe problems in managing their supply chains, especially, due to lack of best practices. The primal reason behind the scenario is lack of conceptual framework and the basic knowledge of SCM, amongst the business professionals, missing of global context and the focus being on only one or two parts of SCM, rather than the complete concept. The challenges of Asian knitwear industry can be overcome by proper supply chain management, that facilitates integrated and interdependent decision-making between all the partners in international business operations.

This paper is part of a research work, the author undertook, on the state of affairs of knitwear export industry, in India. It presents a conceptual model of supply chain management, for the Asian knitwear manufacturers and exporters, integrating the functions of export business, especially, product and logistics functions, at the front and back ends, leading to value addition/value creation.

KEY WORDS
Global Markets, Integrated Supply Chain, Production, Distribution and Relationship

1. Introduction

The textile industry is one of the most firmly established major industries in Asia, and the backbone of national economies, in the region. Garments constitute an important part of the textile exports. Global trade in apparels is undergoing important changes, subsequent to the full de-restriction of quotas that took place on January 1, 2005 following the completion of Multi-Fiber Arrangements (MFA) phase-out, under the WTO Agreement on Textiles and Clothing (WTO-ATC). The phase-out of MFA is having major ramifications for trade in apparels worldwide and for Asia, in particular [1]. The readymade garment sector in Asia, has evolved as the most important export earning sector of countries in the region. The two constituents of garment industry are knitted and woven garments. The knitwear sector accounts for a significant part of private sector investment, national employment and gross domestic output. For the past few years, there has been a phenomenal change in technology and the Asian knitting industry is emerging as a premier supplier of value added
items, earning high foreign exchange for the countries in the region, especially, China, India, Pakistan, Bangladesh, Sri Lanka, Thailand, Taiwan and South Korea. Asian knitted garments today are sold almost in every part of the world. The market for knitwear is expected to continue and grow in the future years. However, increasing competition, changing government policies and the new world order created by the WTO have become matters of concern to garment exporters in the region, especially knitted. Knitwear manufacturing and exporting firms in Europe and North America compete in the competitive global market place, using their integrated and effectively managed supply chain. It is high time for the Asian knitwear sector, to adopt an abridged methodological manual for successful international operation and grabbing the global opportunities in the quota free trade regime. A development strategy based on supply relationships should include, methodologies to assure a good working relationship between all the members in the supply chain i.e. suppliers, customers, middlemen and the supporting firms.

2. Methodology

This paper forms part of a research study, by the author, recently concluded, on the state of affairs of Indian knitted garments manufacturing and exporting units, in the post MFA-phase out period. The number of direct knitted garment exporters, who were registered with the Apparel Export Promotion Council (AEPC), Government of India and those who registered with District Industries Centers in select districts, constituted the population. From the population, a sample size of 218 exporters was selected statistically, using simple random sampling method. The primary data were gathered from the sample, using a structured questionnaire, and, the secondary data were collected from national and international sources. The gathered data were quantitatively and qualitatively analyzed and inferences were made there from.

3. Global Garment Exports- The Current Scenario

In the context of quota de-restriction, there exists looming uncertainty in apparel exports. China's accession to the WTO in November 2001, which allowed it to export apparels to the U.S., EU and other markets on MFN basis, is being felt as having a major impact on global trade in apparels [2]. This is particularly important for the Asian countries, since China exports many apparel items, in which, these countries have traditionally enjoyed strong market presence in the USA and the EU. The new entrants to global apparels markets such as Vietnam, Cambodia and Lesotho are also expected to pose a formidable challenge to the Asian countries in some of their traditional markets.

The global trade statistics reveal that, since January 2004, the USA is the major ready made garment market for the Middle East, South and South East Asian countries i.e. China, Indonesia, India, Vietnam, Hong Kong, Bangladesh, Cambodia, Philippines, Thailand, Sri Lanka, Pakistan, Jordan, Taiwan, South Korea, Malaysia, UAE, Singapore, Brunei Darussalam, Nepal, Oman, Qatar and Syria. Of the total world readymade garment exports in 2006 (US $ 875229.56 million), China’s share was US $ 80188.37 million, of which, knitwear was US $ 40291.04 million US $ and woven was US $ 39897.33 million (Source: China customs).

In 2005-06, China, Hong Kong, Nepal, Thailand, Malaysia, Indonesia, Vietnam, Singapore, South Korea, Sri Lanka, Pakistan, Bangladesh, Taiwan, Nepal and UAE were among the top 25 supplier countries of India for knit apparels (Source: UN Database & DGCI&S Data at World Trade Atlas).

A recent study by the American Textile Manufacturing Institute (ATMI) shows that, China's shipments of apparels categories that were removed from quota control has increased by an average of 79% per cent (in volume terms), since 2001 [3]. China's share in U.S. import of quota-derestricted items has gone up from 9 per cent to 65 per cent (as of March, 2005). In the international market, USA is the major buyer, followed by UK, Germany, Canada, France and Belgium, for the Asian countries. The share of Asian suppliers in the US import market increased from 52.3% in 2002 to 58.3% in 2005. As regard to the textile machinery import, Asia's textile industries account for 37% of the world market for textile machinery, today. Asia has a share of 80% in the total shipments of textile machinery, mainly because of the rising share of China. The growth in shipment of knitting machines continues.

4. The Asian Knitwear Industry-An Overview

Knitwear, made from knitted fabrics has special characteristics such as elasticity and openness of structure. With modern developments in the knitting industry, by high-speed machines and the simultaneous development of synthetic filament yarns, the knitted fabrics are now competing with woven fabrics. The Knitwear industry in Asia is divided into three segments viz., cotton, woolen and synthetic. Cotton
5. Knitwear Exports – The Latest Trends

The quota phase out has created tremendous opportunities for the developing countries, in the erstwhile quota markets. Globally, there is a spurt in demand for knitwear, and Asia has become the hub of knitwear manufacture and export. The Asian knitting industry, with the predominance of small and medium enterprises, engaged in direct and indirect exports has emerged as a premier supplier of value added items, earning high foreign exchange.

It has been found that in the quota free garment trade regime, the European and African countries and the USA are losing out their markets to their competitors. Moreover, increased competition from Asia is snatching the market share of most Latin American textile and clothing makers.

The Asian knitwear industry, on the eve of the dismantling of the multi-fibre agreement (MFA), wears a different look now. The bigger units supply their wares to some of the leading retail chains in the developed world, such as, Wal Mart, Marks and Spencer, C&A and many others. Many of the products wear labels of some of the top brands. The top destination countries for Asian knit apparels are U.S.A, Germany, U.K, France, Italy, Canada, U.A.E, Netherlands, Spain, Denmark, Saudi Arabia, Finland, Belgium, Ireland, Switzerland, Sweden, Mexico, Russia, Japan, Poland, Singapore, Kyrgyzstan, South Africa, Ukraine and Australia.

The top-selling brands such as Diesel, Nike, Fila, Jockey and many others are all not only made in Asia (Tirupur-India), but also labeled in units there [4]. The finished products are sent in such good conditions that, they can be unloaded at overseas retail outlets and put on display.

6. The Asian Advantages

Traditionally, Asia’s strength in the knitwear sector has been the capacity to supply mass produced apparels items such as T-shirts, basic cotton shirts, pullovers and jackets, sweaters, and basic women's wear. The low wage rate prevailing in the region, especially, in China, India, Bangladesh, Pakistan and Sri Lanka is making the products manufactured by this labor-intensive sector, price competitive, in the international markets. Although the hourly wage rate to make knitwear in Bangladesh is equal to those in Pakistan and India, and lower than in China and Sri Lanka, one or the other Asian country bags global orders, as its sellers quote the cheapest price. The availability of cotton is the major strength of Asia. The cotton produced in the region is of superior quality. The exporters in Asia are also able to keep up the shorter delivery schedules, given by the foreign buyers, as they have installed modern machinery, imported mostly from European countries and operate in shifts. India's rapidly expanding garment industry is proving to be an eyebrows arching boon for China's sewing machine makers. It is a case of how a loss in one area can generate a greater opportunity in another.

7. Knitwear Production Process

In knitted garment industry, two types of fabric are used. They are cotton and woolen knit fabrics. These fabrics are made from cotton and woolen yarn. The knitted fabric is knitted in a knitting machine. The yarn knitted through loops formed during the knitting process and the resultant fabric is in tubular form. There are a few machines that manufacture knitted fabric in flat form like the color rib knitted machine. The fabric so manufactured is then processed (bleached, dyed, Mercerized and compacted), according to the kind of end product, before it is sent for garment manufacturing. As many as 82 different machines are used to make knitted garments. There are different kinds of knitting machines, single jersey, double jersey inter lock, rib, auto stripper, fleece, mini jacquard and jacquards. Each machine manufactures different kinds of fabric. These machines are either manufactured domestically or imported. Single jersey fabric is the most widely used material in T-shirts manufacturing. The fabric is also used in the manufacture...
of vests, briefs, panties, and ladies dresses. The double jersey is a heavier fabric and is used as ‘winter wear’. The fabric would have a higher gsm compared to the single jersey. The rib machine manufactures fabrics with ribs. This machine manufactures fabrics with strips of various sizes. Dyed yarns of different colors are used in the manufacture of the fabric. Fleece fabric is normally used in the manufacture of winter garments and they give a velvet finish to the fabric. The cotton garment production process flow chart is given in exhibit -1.

8. Supply Chain Management (SCM)–A Brief Outlook

The term Supply Chain Management (SCM) was coined by consultant Keith Oliver, of strategy consulting firm, Booz Allen Hamilton, in 1982. A supply chain is a sequence of suppliers, warehouses, operations and retail outlets [5]. Different companies may have different supply chains, due to the nature of their operations and whether they are primarily a manufacturing operation or a service operation.

It is the process of planning, implementing and controlling the operations of the supply chain with the purpose to satisfy customer requirements, as efficiently as possible, and supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption [6].

SCM in Knitwear Sector

Today, manufacturing organizations in their domestic /export operations, increasingly find that, to successfully compete in the globalised domestic and international markets and the networked economy, they must rely on effective supply chains. Knitwear manufacturing and exporting units are no exception. The Asian knitting industry, with the predominance of small and medium enterprises, engaged in direct and indirect exports, is one of the major contributors of national income. While knitwear manufacturing and exporting firms in Europe and North America compete in the competitive global market place, using their supply chain as the weapon, their counterparts, in Asia, find it difficult to practice. They are increasingly becoming unable, to meet competition and utilize the market opportunities, opened up by the removal of quota system, especially in the developed countries.

The primal reason behind the scenario is that, the knitwear manufacturers and exporters in the region do not conceptualize the ground realities in production and supply of finished knitwear, to develop a framework for effective functioning. This is partly due to lack of basic knowledge of SCM, and mainly due to their attitudes and lack of global outlook. Many of those, who practice supply chain management in their international business operations, the focus is being on only one or few aspects of SCM, rather than the complete concept [7].

The need has been felt by knitwear exporters in the region, especially, India, Pakistan, Bangladesh, Indonesia and Thailand, for an effective supply chain, and a mechanism through which, different business functions and decision areas can be integrated.

The factors to be considered by knitwear exporters, while evolving a supply chain system are

- The global knitwear trade regime is changing very significantly. Fashion seasons are becoming shorter and buyers are no longer ready to wait for days, after placing export orders. The ability to shorten the lead-time is crucial, for being considered as a possible source by buyers.
9. Integrated Supply Chain (ISC) - A Model

The members in the supply chain of knitwear manufacturing units are cotton ginning units, cotton spinning mills, ancillary units making threads, buttons, elastic labels, cones, packaging bags, specialized tailors, printing units, dyeing and bleaching units, processing units, embroidery units, domestic buyers and foreign buyers (exhibit-2).

Asian knitwear industry is confronted with changing consumer tastes and preferences for designs in the overseas markets, hectic competition from within and outside Asia and frequent changes in government policies, especially, in the erstwhile quota countries. These challenges can be overcome by an appropriate supply chain system, which facilitates integration of vital functions and interdependent decision making among all the members in the chain. Establishment of strong backward linkage in spinning and weaving would augment the effectiveness of the supply chain and help the manufacturers and exporters to remain competitive in the markets.

The suggested integrated supply chain model starts with enterprise resource planning leading to production and distribution of knitwear in the overseas markets. The major decision areas in the supply chain are Production, Distribution, Supplier Relationship Management and Customer Relationship Management (exhibit-3).

Knitwear manufacturers have the option to source fabrics domestically, or internationally. Backward linkage in knit-segment is a means, by which, knit-fabrics being sourced from local knitting units. Vertically integrated manufacturing facilities can also be established, to ensure timely supply of fabrics meant for export production. For instance, the Royal classic group, which started operations in Tirupur (India) in 1991, has even established contract farms for growing cotton. Sourcing can also be done from local suppliers and by importing from cotton growing countries such as China, India, Pakistan, Hong Kong and Taiwan. Knitting machines are manufactured domestically by most of the countries in Asia. However, the quality of imported machines is superior, when compared to local machines. Skilled manpower with a passion for design excellence is required to produce knitwear as per the changing tastes and preferences of global customers. Regional sourcing of skilled manpower and their retention would lay foundation for achieving sustained export growth in the competitive markets.
Source of information is a resource. In the dynamically changing ready made garments market, knit wear manufacturers need to plan for getting up to date information about global knitwear markets.

Production

Production starts with the procurement of machinery and yarn, meant for making knit fabrics. The strategic decisions at this stage include, selection of vendors and suppliers of machinery and yarn/fabric cloth, identifying interface units for bleaching & dyeing, calendaring, cutting, stitching & ironing etc., provided, these activities are not undertaken by the manufacturers themselves. Asian knitwear exporters need to enhance manpower and machine productivity, manufacture quality garments and move up in market, with more value added products. It is learned that, only productivity gains and the ability to move up the value chain will enable firms to remain competitive in the global markets, and face cost escalation. The trade related technical assistance may be sought by the Asian countries from Europe and USA, as Pakistan receives from USA [8]. Knitted garments exported from India, Pakistan, Bangladesh, Sri Lanka and Thailand have been primarily confined to cotton garments, whereas, major proportion of international trade of these items comprises synthetic materials and other blends of cotton. Considerable attention needs to be paid to manufacture and market these products, in the developed markets.

Distribution

This refers to ways and means, by which, finished knitwear are distributed to customers. The inventory of finished knitwear is to be managed by regulating production as per the overseas orders and demand. Today, internet is the most powerful means of sourcing global buyers. Orders received from existing buyers/retailers and sourced buyers, need to be processed with speed, so that, the exporters can win the confidence of customers/retailers in the overseas markets and ensure repeated orders. The choice of logistics should be based on the availability of specific services, level of competition and costs of carriage. The role of forward linkage and export marketing through direct channel i.e. specialty retailers, to reach customers in the Europe, USA and other developed countries has become very important for Asia’s competitive presence, in the global markets. However, it is not immediately possible for small scale exporters and new entrants.

Supplier relationship

Establishing and maintaining cordial relationship with members in the supply chain is as important as managing the supply chain itself. The supply chain members for a knitwear manufacturing and exporting unit include the suppliers of machines, yarn and fabrics and the interface and ancillary units, that help the knitwear exporters achieve their objectives in the overseas markets. Keeping up commitments and complementing them for timely supplies and services, would strengthen the relationship.

Customer relationship

As marketing of knitwear apparels undergoes significant changes, in order to take advantage of modern business methods, a closer link is necessary, between buyers and producers, bypassing the intermediation role, traditionally performed by buying houses. Personal rapport with the retailers/customers and joint promotional efforts are needed to achieve sustained export growth, in the global markets. Such symbiotic relationship would help the Asian knitwear exporters to overcome the competition, form within and outside the host countries. Besides, this close interface between the exporters and the buyers is likely to create its own demands in terms of production flexibility, product and process modification and diversification, quality assurance and control, and compliance with various standards including social standards such as SA-8000, quality standards such as ISO-9000, and environmental standards such as ISO-14000 [9].

Making the ISC Model to Work

The following are the requisites to make the integrated supply chain system to work

- **Product Testing Facility**: As available in China, for certifying the quality of locally manufactured goods, product testing facilities need to be established by the all the knitwear exporters in the region. This will play a key role in increasing the share of knitwear exports in the developed markets.
- **Entrepreneur-friendly Labor Reforms**: The textile industry, knitted garment makers in particular, require entrepreneur-friendly labor reforms by the respective governments in the region, to enhance performance and productivity.
- **Setting up Manufacturing Units by Machinery Makers**: As textile industry is expanding, European and American textile machinery makers, for whom Asia is a major
market, may be invited to set up manufacturing units in the region.

- **Free Trade Pacts with SAARC/ASEAN:** The European Union and USA may be persuaded by the knitwear exporting countries in Asia, to establish Free Trade Agreements on knitwear products with the Asian countries, as the EU already have with India.

- **Retaining Skilled Labor:** There is a general shortage of labor in the garment industry of many Asian countries. Many workers after getting training and acquiring skills hop for greener pastures abroad, to countries in the Middle East. Efforts need to be taken by the Asian nations, to staunch the exodus.

- **Special Economic Zones:** SEZs need to be set up, to invite foreign companies invest in joint ventures, for joint production and exchange of manufacturing and marketing facilities.

- **Fashion City Projects:** It is suggested that, to make the fashion industry compete in the world markets, 'Fashion City Projects', with private funding, and, organizing Trade Fairs / World Boutique Events, covering the entire range of knitwear may be encouraged to augment exports by the governments of countries in the region.

- **Setting up Design Institutes:** Though there are fashion design institutes in countries such as India and China, the number and exposure are inadequate. More institutes in these countries and un-represented countries need to be set up, either with government support or with private partnership.

- **Intra-Regional Fabrics Pocketing Agreement:** Countries in the region may come forward to enter into agreement on pocketing fabrics, needed for knitwear production, between them, at internationally competitive terms.

**10. Conclusion**

The Asian knitwear exporters needs to realize that, to convert the potential into realistic achievement, adaptations are required. Larger production of better products with modern production methods, developing dedicated personnel and establishing closer connection with the international markets will be the most essential elements to succeed in the global market place. Nevertheless, the competitive supplier countries in the world knitwear market can be left behind, and they can take larger slice of the global markets, if the knitwear exporters in the region formulate, implement and evaluate effective supply chain management strategies. It may be difficult for small exporters in the developing countries, and it may take a long time, to implement a feasible supply chain system, however, the outcome of it, will have tremendous implications on the international business operations of Asian knitwear sector, positively.

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