ABSTRACT

ULUSKAN, MERYEM. Improving the Competitiveness of the Haitian Apparel Supply Chain. (Under the direction of Dr. A. Blanton Godfrey).

The purpose of this research was to investigate the competitiveness of the Haitian apparel supply chain for the U.S. market vs. the Chinese supply chain. The guiding conceptual framework for the research was the House of TQM by Noriaki Kano (2006). This model was used to develop necessary criteria for the competitiveness in the supply chains. The study addressed governmental, infrastructural, and educational issues and the role of quality, productivity and innovation in supply chains. The study also discussed the current situation of Haitian apparel assembly using a case study of a single Haitian apparel assembly factory to discuss Haitian apparel production quality. The study was intended to identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

The methodology used in this study consisted of two phases. In Phase I, the researcher conducted a case study to determine the current situation of Haitian apparel assembly. The case study was conducted in one of the largest Haitian apparel assembly sites and the study focused on Haitian apparel assembly quality. In Phase II, the researcher used a qualitative approach in order to gain secondary data resources and primary data from in-depth interviews with industry executives. Phase II was a compilation of both secondary and primary data. The researcher compiled the secondary data from industry wide studies and articles from academic and business journals. Primary data was compiled via industry interviews. A questionnaire was used to interview company representatives by face-to-face interviews and phone conferences. The company representatives were selected from
purchasing representatives of leading U.S. apparel brands and manufacturers, and representatives of a technology development and research center for apparel industry. The questionnaire was developed by the researcher based on information collected from the literature review. The interview questions were separated into two groups including open ended questions regarding the sourcing location selection criteria which are based on the Kano model and general issues addressing the competitiveness of Haitian apparel supply chain vs. Chinese apparel supply chain.

Results discussed the current situation of the Haitian apparel supply chain vs. the Chinese apparel supply chain through comparison of governmental, educational, infrastructural, quality, productivity and innovation issues in supply chains. The results also discussed the current situation of the Haitian apparel assembly and quality. The results also identified the strengths and weaknesses of Haiti as an apparel sourcing site. The conclusions include necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti. The suggestions include infrastructural improvements particularly in the areas of logistics and energy; stability of government; job training at operator, middle management and technical staff levels; understanding of industrial engineering; and quality improvements through implementation of lean manufacturing.
Improving the Competitiveness of the Haitian Apparel Supply Chain

by
Meryem Uluskan

A thesis submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the Degree of
Master of Science

Textiles

Raleigh, North Carolina

03/29/2010

APPROVED BY:

__________________________________________________
Dr. A. Blanton Godfrey                Dr. Timothy G. Clapp
Committee Chair

__________________________________________________
Dr. Marguerite Murray Moore           Dr. Michelle R. Jones
BIOGRAPHY

Meryem Uluskan was born in Eskisehir, Turkey on April 3, 1984. In 1999, she attended Eskisehir Science High School and in 2002, she attended Textile Engineering Department of Istanbul Technical University. In 2004, she started to pursue Management Engineering Degree in Istanbul Technical University as a double major program. During her undergraduate years, after learning fluent Italian, she went to Politecnico di Torino University in 2006 as an exchange student. In 2008, she earned Bachelor of Science degrees from both department and started to pursue Master of Science Degree in Textile and Apparel, Technology and Management Department at North Carolina State University. She is continuing her Master of Science Degree with Minor in Statistics.

She is a research assistant in North Carolina State University, and her major research areas are six sigma applications, quality improvements and supply chain management. She is interested in international business with a focus in the supply-chain and quality areas. In 2009, she had an internship with CHF and USAID in Haiti working on a project funded by U.S. government to develop Haiti’s textile industry. She is currently completing the requirements for her Master’s Degree and planning to pursue a PhD in Textile Technology Management at North Carolina State University.
ACKNOWLEDGMENTS

I would like to extend my sincere gratitude and appreciation to Dr. A. Blanton Godfrey for serving as my advisor and for his continuous guidance and support throughout my study. He went above and beyond, encouraging me when I needed it and always making time to meet and discuss my progress.

I would like to thank Dr. Marguerite Moore for the extra assistance I received from her. Her patience and willingness to assist my research at any time and her enthusiasm for my study went far beyond her advisory role.

I would also like to extend my gratitude to the other members of my thesis committee Dr. Tim Clapp and Dr. Michelle Jones for their support. Their doors were always open and their guidance was greatly appreciated. I also would like to express my appreciation to Mr. Michael Fralix, Dr. John McCreery and Dr. Nancy Cassill for their endless help and support. I also particularly would like to thank Mrs. Margaret Bishop for providing me the opportunity to conduct research in Haiti.

I would like to thank the companies that took the time to participate in my case study and interviews made this study possible.

I also would like to thank my friends for their love and support. Finally, I would like to extend my deepest gratitude to my family for their unconditional love, support and encouragement.
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CHAPTER I
INTRODUCTION

Globalization has been the primary driver of change in supply chain structures of the global textile and apparel industries. Competition in the market is no longer between companies but instead is between supply chains (Christopher, 1998). The value chain in the textile and apparel industry extends from raw material production through yarn spinning, fabric production, dyeing and finishing, apparel manufacturing, labeling, packaging and delivery. The various elements in this supply chain are geographically spread out, and contain a variety of partners. The textile and apparel industry is generally separated into two parts: 1) production and finishing of primary textiles and 2) transformation into finished goods, e.g. apparel production. Textile and apparel manufacturers stay in different economic environments. Production and finishing of primary textiles (fiber, yarn, and fabric production, dyeing, and finishing) is capital intensive and dependent on specialized equipment. On the other hand, apparel manufacturing is heavily labor-intensive and usually relies on a low-cost workforce.

The search for low-wage labor and the desire for flexibility are the two primary reasons that explain the shift of geographical locations of apparel firms. Because the retail sector is more fashion-oriented, retailers are currently more involved in global sourcing (Gereffi, 1994). According to the World Trade Organization Statistics (2008), European Union (E.U.) is the biggest exporter of primary textiles followed by China, United States and Korea. As it can be seen in the Table 1, the E.U. and the United States are the biggest importers of textiles, followed by China, which needs fabric for its large apparel industry.
Table 1: Leading Exporters and Importers of Textiles, 2008, Billion dollars

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<td>Thailand</td>
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The E.U. is the biggest exporter of clothing followed by China. The leading exporter and importer countries are shown in Table 2. Over the course of the 1990s, economic reform
and development in China had created an export-driven clothing industry that rapidly gained global market share. E.U. and U.S. are the biggest importers of clothing.

Table 2: Leading Exporters and Importers of Clothing, 2008, Billion dollars

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The expiration of the quota restraints of the Multi-Fiber Arrangement (MFA) on January 1st, 2005, brought to an end four decades of quota restrictions on the trade in textiles and garments among WTO members. Trade in these products is now governed by normal WTO rules. Under the MFA quota system, annual per-country limits were placed on garment exports from a number of low-cost countries into the United States and Europe. The quotas placed significant restrictions on high-volume producing countries such as India and China. When quota restriction was removed, China increased its exports.

Because of the large number of small enterprises and home workers, measuring employment in the textile and garment sectors is difficult. More than 40 million workers are estimated to be employed directly in the global textile and garment manufacturing industry. Of those around 19 million, roughly half, are employed in China.

Haiti is a low-end garment supplier for the U.S. It has a long-established garment assembly industry that, in the 1980s, employed over 100,000 people: today it employs less than 26,000. This is slightly up from a recent low of 20,000. Currently, Haiti supplies mostly commodity t-shirts and sweatshirts and other simple apparel for the U.S. market. The challenge is improving the quality of the production processes and the quality of the finished product, building a viable and efficient supply chain, and maintaining the cost advantages.
**Purpose of Research**

The purpose of this research is to investigate the competitiveness of the Haitian apparel supply chain for the U.S. market vs. the Chinese apparel supply chain. The guiding conceptual framework for the research is the House of TQM by Noriaki Kano (2006). The Kano model suggests that general education, political stability, a strong infrastructure and total quality management are all important to create a competitive advantage. This model is used to develop necessary criteria for the competitiveness in the supply chains. The study addresses governmental, infrastructural, and educational issues and the role of quality, productivity and innovation in the supply chains. In order to discuss the Haitian apparel production quality level, the study also discusses the current situation of Haitian apparel assembly using on a case study of a single Haitian apparel assembly plant. The study is intended to identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

**Research Objectives**

The following are the main research objectives are used in this study:

**Research Objective One:** To investigate the basic criteria for selecting an apparel sourcing location from the U.S. apparel buyers’ perspective.

**Research Objective Two:** To investigate the importance/role of the following criteria in the Haitian vs. Chinese source market from the U.S. apparel buyers’ perspective.

1) Governmental

2) Infrastructural

3) Educational
4) Quality
5) Productivity
6) Innovation

**Research Objective 3:** To investigate strengths and weaknesses of Haiti and China as apparel sourcing partners for the U.S. market from U.S. apparel buyers’ perspective.

**Research Objective 4:** To discuss the current situation of Haitian apparel assembly based on a case study in a single Haitian apparel production plant.

**Research Objective 5:** To discuss the current Haitian apparel production quality level based on the case study.

**Research Objective 6:** To identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

**Significance of Research**

This study provides an in-depth understanding of the strengths and weaknesses of Haiti as an apparel manufacturing site. It provides a comparison of Haitian apparel supply chain vs. Chinese apparel supply chain as source for U.S. market. This study is important to provide insight into the current and future competitiveness of Haiti as a source market for the U.S. apparel industry. The findings can also be generalized for other industries in Haiti and also for other sourcing countries especially in the Western Hemisphere.
Limitations of the Research

In this study, for in-depth interviews, there was a potential for respondent bias depending on the willingness of respondents to disclose information in regards to actual and accurate business strategies. In addition, the researcher acknowledges the limited sample size. However, the sample was chosen as representative of the apparel industry and consisted of the industry leaders in U.S. apparel market that would potentially chose Haiti as a source market.
CHAPTER II
LITERATURE REVIEW
Defining the Supply Chain

The development of the concept of supply chain was initially along the lines of the physical distribution and transport (Croom, Romano, & Giannakis, 2000). However, “supply chain management is a means of managing a business while logistics is a category that needs to be optimized for efficient supply chain management” (Pang, 2004). Supply chain is defined as a network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product. According to La Londe and Masters (1994), “a supply chain is a set of firms that pass materials forward”. Raw material and component producers, product assemblers, wholesalers, retailer merchants and transportation companies are all members of a supply chain (La Londe and Masters 1994). Lambert, Stock, & Ellram (1998) state that a supply chain is a set of firms that brings products or services to market.

According to Krajewski and Ritzman (2001) a supply chain is a set of linkages between suppliers of materials and services that includes the transformation of raw materials into products and services. Christopher (2005) defined a supply chain as a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer (as cited in Statdler, 2008, p.9 ). Statdler and Kilger (2008) state that a supply chain is comprised of two or more legally separated organizations which are linked by material, information and financial flows. These organizations can be companies
producing components and end products, logistic service providers and even the ultimate customer himself (Stadtler & Kilger, 2008). According to Mentzer et al. (2001), a supply chain is a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flow of products, services, finances, and/or information from a source to a customer. Considering these definitions it is important to note that supply chain also includes the target group – the ultimate consumer. In other words, a supply chain consists of multiple firms, both upstream (i.e., supply) and downstream (i.e., distribution), and the ultimate consumer.

Mentzer et al. (2001) defined three degrees of complexity for a supply chain: direct supply chain, extended supply chain, and ultimate supply chain. According to Mentzer et al. (2001) a direct supply chain is compromised of a company, a supplier, and a customer involved in the upstream and/or downstream flows of products, services, finances, and/or information (Figure 1), whereas an extended supply chain consists of suppliers of the immediate supplier and customers of the immediate customer, all involved in the upstream and/or downstream flows of products, services, finances, and/or information (Figure 2).

![Figure 1: Direct Supply Chain](source: Mentzer, T. J., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D. & Zacharia, Z. G. (2001). Defining the supply chain management. Journal of Business Logistics, 22 (2), 4-6.)
On the other hand, “an ultimate supply chain includes all the organizations involved in all the upstream and downstream flows of products, services, finances, and information from the ultimate supplier to the ultimate customer” (Figure 3) (Mentzer et al., 2001).

An important factor to consider is that supply chain exists even without the existence of supply chain management. Mentzer et al. (2001) called this a “phenomenon” that exists in business environment. In other words, a supply chain may exist, but may not necessarily be managed.
Supply Chain Management

Competition in the market today is no longer between companies but instead is between supply chains (Christopher, 1998). Therefore, it is important to manage the supply chains successfully to be competitive in the global marketplace. Over the past decades the term supply chain management (SCM) has gained importance. SCM was initially related to the management of inventory within a supply chain. The concept gained popularity due to globalization, increased cross border sourcing and emphasis on time and quality based competition. As a result of outsourcing and globalization, companies started to seek for more effective ways to manage the flow of information and materials into and out of the company. Supply chain management concept was later broadened to include the management of all functions within a supply chain. SCM provided the ability to make supply chains bigger, shorter, faster and reliable. According to Cooper & Ellram (1993), supply chain management simply is “... an integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user” (as cited in Mentzer et al., 2001, p.6).

The integration and control of the flow of materials, across multiple members of the system, involving multiple linkages among suppliers and customers is the main goal of the supply chain management (Monczka et al., 1998). Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes. Previous researches determined three different approaches in SCM: a management philosophy, implementation of management philosophy, or a set of management processes (Mentzer et al., 2001). More recently, the management philosophy approach has gained popularity among senior managers. This approach helps to promote a set of beliefs that can
influence directly and indirectly the performance of the other supply chain members as well as overall supply chain performance (Cooper & Ellram, 1993).

According to Jones and Riley (1985), in SCM, the philosophy of supply chains extends the concept of partnerships into a multi-platform effort to manage the total flow of goods from the supplier to the ultimate customers (as cited in Teng & Jaramillo, 2006, p.45). It seeks synchronization and convergence among all members throughout the supply chain (Ross, 1998). Therefore, it is not simple to establish a management philosophy for SCM. In order to obtain consistent organizational efforts, commitments at all levels are required. Greene (1991) states that implementation of a set of activities in a coordinated effort between the supply chain partners to respond dynamically to the needs of the end customer is the best way to adopt SCM philosophy in an organization (as cited in Teng & Jaramillo, 2006, p.45).

According to Chopra and Meindl (2001), “supply chain management involves the management of flows between and among stages in a supply chain to maximize total profitability.” (as cited in Sila, Ebrahimpour & Birkholz, 2006, p.492 ). This definition suggests that SCM involves management of the flows of products, information, and funds upstream and downstream in the supply chain. SCM also involves making decisions about the locations of production facilities, which products to produce, how to produce them, and finally, how to distribute these products. Competitiveness, systematization of operations, reduction of costs, improved customer satisfaction, increased revenues and ultimately increased profits are some of the potential benefits that can be obtained from SCM. (Sila, Ebrahimpour & Birkholz, 2006). Therefore, the key in SCM is to create or enhance the
competitive advantages for members in the chain to increase customer satisfaction that can reflect higher profitability for all supply chain members (Mentzer et al., 2001).

**Global Supply Chain Structures for Textile and Apparel Industry**

The textile and apparel industry has a highly diverse and heterogeneous structure, and is known as being a key sector for both industrialized and developing countries (Bruce & Daly, 2004). Raw material production, yarn spinning, fabric production, dyeing and finishing, apparel manufacturing, labeling, packaging and delivery comprise the value chain in the textile and apparel industry. Figures 4 and 5 depict the textile and apparel value chain and the basic supply chain model in the textile-apparel industry. According to Gereffi (2005), the value chain describes the full range of activities that firms and workers do to bring a product from its conception to its end use and beyond. Value chain activities can produce goods or services, and can be contained within a single geographical location or spread over wider areas (as cited in Berdine, Parrish, Cassill & Oxenham, 2008, p.2).
Figure 4: Textile and Apparel Value Chain

Figure 5: Basic Supply Chain Model in the Textile-Apparel Industry
The different components in textile and apparel supply chain are geographically scattered, and are consisted of a variety of partners. The textile and apparel industry is mainly divided into two groups: 1) manufacturing and finishing of primary textiles and 2) transformation of primary textile products into finished textile goods, e.g. apparel. These two groups have relatively different economic environments. Textile manufacturers are generally larger than apparel producers; they are typically capital intensive firms. On the other hand, the apparel industry is more scattered, it mostly consists of small, labor intensive firms.

Like in other industries, globalization has been the primary cause of the change in supply chain structures in the textile and apparel industries. The apparel sector was one of the first industries to become global, through outsourcing strategies and offshore assembly and apparel manufacturing continued to be one of the most geographically dispersed manufacturing activities.

Short-Term Arrangements, Long-Term Arrangements, and Multi-Fiber Arrangement placed quota restrictions on global textile and apparel exports for over four decades. A ten-year quota elimination period started with the foundation of the World Trade Organization in 1995. In January 1, 2005, quota phase-outs were completed. As a result of the elimination of the quota restrictions, there has been a shift in terms of textile and apparel export amounts between developing and developed countries. In other words, developing countries started to become global leaders in textile and apparel exports because of the quota elimination (Daniels, 2008). The cost advantage of developing country manufacturers is the primary reason for the increase in foreign apparel imports of U.S.
As stated previously, the global textile and apparel industries have encountered a number of migrations of production over the past decades. Repositioning of production has occurred in areas of developing economies that have become leading exporters of apparel goods, mainly countries in Latin America, Eastern Europe, and China. The apparel industry is a labor-intensive industry, and therefore, labor costs comprise the main piece of the overall manufacturing costs (Barbee, 1998). Developing countries have lower labor rates. Lower labor rates, together with the labor-intensiveness of apparel manufacturing, led to a comparative advantage for developing countries in terms of apparel manufacturing. Therefore, textiles and apparel manufacturing has shifted towards developing countries. According to trade data, the textile and apparel exports for developing countries in 2001 were almost seven times their 1980 level (Gelb, 2007).

As Singhal (2003) states textile and apparel supply chains are mostly buyer-driven value chains in that they are highly unpredictable and are characterized by short lifecycles, many trading partners, and cross-border trade difficulties (as cited in Nowell, 2005, p.1) The textile and apparel markets are also characterized by their high volatility, and high level of impulse purchases. Therefore, issues such as quick response are of considerable importance (Bruce & Daly, 2004).

**Global Supply Chain Competitiveness**

Cesca, Jones, & Nowell defined competitiveness as “the ability to sustain and grow a business within an industrial environment, through optimization of products, processes, and strategies to gain a competitive advantage.” (as cited in Cesca, 2005, p.62). Supply-chain competitiveness is a holistic matter that requires each partner within the supply chain to align
their structural elements (Cooper et al. 1997). According to Porter (1998), the competitive advantage of a country is created, not inherited. A country’s competitiveness depended on “creating a business environment, along with supporting institutions, which enable the nation to productively use and upgrade its inputs.” (Porter, 1998). Previous research indicated the major reasons for global sourcing as cost reduction, quality, and availability. Carter and Narasimhan (1990) state that in order to be competitive in today’s global environment, it is necessary offer quality products at competitive prices (as cited in Nowell, 2005, p.11). The availability of products is also among the main drivers of offshore sourcing, because many desired products are not currently available in the United States (Cho and Kang, 2001). The trend of offshore sourcing has caused a decrease in domestic suppliers, which has led to a decrease in domestic supply in return. Therefore, improvements in quality, cost reduction and availability areas lead to a competitive advantage in the global market.

As Cho and Kang (2001) stated in their research, on-time delivery and delivery reliability are among the important key issues to be considered in the global sourcing market. Therefore, reliable logistics infrastructure is critical in managing a successful supply chain. According to Birou and Fawcett (1992), logistic problems are the number-one challenge faced in global sourcing (as cited in Nowell, 2005, p.11). In order to achieve maximum cost-effectiveness and maintain service requirements, international logistics support is necessary. With the trend of global sourcing, companies must be able to manage international logistics covering longer distances than domestic logistics.

In addition to the inbound and outbound logistics issues, previous research suggests that lead times, quality, costs, and the supporting technical service are important to manage
to achieve a competitive advantage in a global supply chain (Sounderpandian and Prasad, 2003). Furthermore, Chin, Tummala, Leung, & Tang (2004) suggested that “supplier-customer relationships, advanced information and communication technology, re-engineering material flows, creation of a global corporate culture, and identifying performance measures are among the strategic success factors”. In global supply chains companies can normally compete with low cost or product differentiation. However, the costs and complexity of coordination in global supply chains can sometimes overcome the competitive advantage. Therefore, it is critical to invest in information systems to organize the whole supply chain. Reliable communications and information systems are important to have flexible and responsive networks (Sounderpandian and Prasad, 2003).

According to Yusuf et al. (2004) the integration of upstream and downstream operations, continuous flow of assets, sophisticated information technology, and supplier-customer relationships are the drivers of supply chain integration that results in competitiveness (as cited in Nowell, 2005, p.13). The research was intended to reveal if supply chain structures have an impact on a firm’s ability to compete in global market. He studied three structures of supply chains which are traditional, lean, and agile supply chain structures. It is stated that most companies are implementing the lean structures to create long-term collaborations with suppliers and customers. A lean supply chain structure allows a company to achieve flexibility and time-based technology leadership goals. On the other hand, agile supply chain helps companies to compete more on the basis of cost. Therefore, Yusuf suggested that companies should adopt the lean supply chain approach to compete in the areas of timely deliveries and supply chain flexibility (Yusuf et al., 2004, as cited in
Nowell, 2005). Briefly, in order to gain a competitive advantage, the factors to be considered include, customer-supplier relationships, quality, cost, product availability, service / delivery, logistics, innovativeness, value-added services and flexibility in supply chains.

**Apparel Industry Trends**

Several key trends for the apparel industry have emerged during the past decade to reshape where and how the industry is organized. Trends affecting supply chain structures include “change from pull to push strategies, global sourcing to multiple low-wage countries, sourcing agents, and full package sourcing cities” (Kahn, 2004). In addition to geographic shifts and full package sourcing, emergence of international corporations and fast delivery are among the important trends affecting the apparel industry. These trends have forced companies and countries to offer low cost production coupled with a variety of related value chain services, on very short turnaround. Buyers confirm they readily shift sourcing from one country to another for mere pennies in cost difference. In order to compete in the global apparel market it is necessary to assess the impact of some the key trends.

**Geographic Shifts**

As stated previously there are many developing countries that are competing for apparel production. Because apparel manufacturing needs few fixed assets at a factory other than sewing machines, it is relatively easy to quickly move apparel manufacturing factories from one country to another based on small changes in cost factors such as wage rates or exchange rates. If one apparel manufacturing country gets too expensive for production, brands move their production and sourcing to lower cost countries, considering the other factors in these countries are roughly equal. Countries such as Mexico and Dominican
Republic have become high cost manufacturers (McNamara, 2008). Therefore, it is important for these high cost countries to offer superior products and customer service through improvements, innovation, technology, “full package” production and increased relationships with the customers. For example, the low cost Asian competition has forced some countries such as Turkey to upgrade labor skills, industrial technology, and information processing in order to be able to compete for the higher end, more profitable but more demanding quick-turn fashion segment, to maintain its market share (McNamara, 2008).

**International Corporations**

The emergence of large retailers that dominate the global textile and apparel industry has also had an effect on sourcing decisions. These giant customers influence and often determine the geographical location of various parts of the value chain and put pressure on prices due to their bargaining power. These corporations, based mostly in U.S., E.U., and Japan, need to source large volumes. As McNamara (2008) stated, while they continue to source from diverse geographic locations to spread risk, they have shifted towards sourcing in larger volumes from fewer countries in the post-quota era. These factors have driven the trend in “lean retailing” and full package production.

**Full Package (Lean Retailing)**

Retailers and brands are gradually eliminating apparel sourcing agents and doing business directly with manufacturers. These manufacturers are expected to provide a much wider and more complicated range of services. Currently, the retailers and brands focus on branding activities and selling apparels while passing on other supply chain activities and associated capital requirements and risks to their suppliers. This is the concept of the "full
package retailer”. A full package supplier should be able to offer a "full package" service. Generally, a full package supplier takes operational and financial responsibility for the overall supply chain, from sourcing fabric, zippers, buttons, and accessories etc., organizing the logistics and transportation of these, manufacturing the finished product by providing cutting, assembly, trim, finish, and packaging, and delivering these finished goods to the retailers’ / brands’ warehouse or stores in a "ready-for-sale" packaged state (McNamara, 2008).

Since buyers move to full package sourcing, most aspects of planning, materials sourcing, pattern-making, assembly, finishing, and packaging are being transferred to the supplier/manufacturer. This provides new opportunities for job creation and better margins for the apparel manufacturers. However being a full package supplier requires greater managerial, technical, administrative, financial and technological capacity because the company needs to manage more complicated package of services. These services include purchasing, planning, inventory stocking and control, management, communications with suppliers and customers, information management, pattern and sample making, labor / workforce training, quality assurance, quality control, and more.

In addition, a supplier may even be asked to monitor the customer's stocks and place replenishment orders. The shift towards full package can be a real challenge for some developing countries, especially in which they do not have the supporting industries. In order to have a full package service a supplier needs to be able to coordinate and manage various stages within a supply chain rather than being responsible for only one part of that value chain. Managing and coordinating various stages necessitates a high level of integration,
necessary capital, business relationships, management, systems, and information technologies to make it possible. However, once it is achieved, it also offers an opportunity to move into higher margin activities, improve profits, and create more administrative and managerial level employment (McNamara, 2008).

Although retailers and mostly brands prefer to have more control in the fabric selection because it affects the finished product quality and because of the significant role that quality plays in brand positioning, full package sourcing has become a competitive advantage being offered to retailers and brands by Asian, specifically Chinese, suppliers. On the other hand, full package production is more difficult for South/Central American suppliers, because of a lack of fabric supply. Their lack of raw material, especially fabric, supply makes them more dependent on U.S. suppliers. Therefore, the sourcing chain for full package Asian suppliers is less complicated than for South/Central American suppliers and this leads to lower prices offered to their customers (Cesca, 2005).

**Speed-to-Market**

Cycle time reduction is one of the most important elements of successful apparel manufacturing today. Previously a season's products were ordered up to ten months in advance and delivered in bulk to large warehouses. At the end of each season, large stocks of unsold items were tried to be sold in the end-of-season sales. Increased consumer demand for fast changing fashion and financial pressure to reduce mark-downs have forced brands to reduce inventories and significantly shorten the time between product design, sourcing decisions, and retail sale (McNamara, 2008). While U.S. retailers used to have five fashion seasons per year (spring, summer, back to school, winter and cruise), global fast fashion
retailers such as Zara currently have as many as thirty seven (Carana, 2009). Electronic point-of-sale barcode technology helps retailers to collect and process large quantities of up-to-the-minute data about what styles, colors, and sizes are in demand. Since apparel products have ever-shorter life spans, fast fashion retailers such as Zara, and Hennes & Moritz (H&M) have set new standards for fast turnover in styles. Therefore, apparel manufacturers who are able to respond in a very short time to last minute style decisions and variations in the orders are required by the brands and retailers (Diaz, 2005). Logistics and supply chains must be able to support a turnaround from a retailer's order to the delivery of finished product to the individual stores in just a few days.

One of the key advantages of apparel suppliers located in the Western Hemisphere is their natural proximity to the U.S. market. Short shipping times help retailers and brands to reduce inventories and associated costs. It also allows retailers and brand to reduce financial risk of ordering wrong combination of style, size, and color. In order to be able to respond in a very short time frame, apparel manufacturers need to have highly well-organized supply partnerships with textile, fabric, accessories, and trim producers. Therefore, when speed-to-market is crucial, it is necessary to have a highly integrated supply chain with regard to information and data exchange and efficiency, even while suppliers are dispersed geographically.

**Supplier Selection and Sourcing Strategy**

In order to more easily identify most appropriate suppliers, buyer companies often create a list of preferred supplier features and the importance of each (Webster & Wind, 1972). Supplier value is a significant factor in the organizational buying process. Most often,
delivery reliability, price, and supplier reputation are the most important attributes considered by brands and retailers (Webster & Wind, 1972).

Neuman (2004) states that labor costs are most important issue to be considered in sourcing decisions. Innovation, product development, delivery time, fashion focus and speed are among the most important factors in sourcing. Brands and retailers seek for higher quality products at competitive prices and want to receive these items as fast as possible. Therefore, flexibility and speed are critical in supply chains (Neuman, 2004).

Previous research also shows that cost, reliability of delivery, product quality, full-package sourcing, lead-time, flexibility are among important sourcing decision criteria (Berdine et al., 2008). According to Berdine et al. (2008)’s study, product quality is ranked as most important in terms of sourcing criteria, whereas cost is ranked second, and reliability of delivery is ranked third. Cost and quality are the main drivers in terms of sourcing decisions. Besides, they state that those three criteria (product quality, cost, and reliability) are equally essential. Capacity, type of fabric, and lead time are among important sourcing decision factors. However, Berdine et al. stated that lead time is less important for some buyer companies, because it can be built into the time and action calendars. One important finding of their study is the decreasing importance of full package sourcing. Buyers prefer to have more control on their supply chains, and therefore on the fabric quality and selection, because quality plays a significant role in their brand positioning.

On the other hand, according to Nowell (2005), quality, on-time delivery, and cost are the top three criteria to be used when selecting a supplier. U.S. retailers believe that on-time delivery is more important than costs because if the product is not on the shelf when it is available, customers will not wait for it.
supposed to be, no money will be made and costs will no longer matter. Besides, the full package sourcing is desired from a supplier, because most of the buyers want to communicate with as few people as possible and want to take on less responsibility. They want to go to an apparel manufacturer with product specifications and have the manufacturer produce or source any components and manufacturing needed (Nowell, 2005).

Berdine et.al.’s study shows that most of the buyers source “high-make” or fashionable, low replenishment goods in East Asia, and “low-make” or basic, replenishable goods in the Western Hemisphere. Most of the buyers use a blended sourcing strategy which means that they source in different locations to minimize risk, labor costs and leverage the manufacturing competencies of different regions. Besides, it is indicated that buyer companies source from Mexico, Central America and the Caribbean Region because of cost and speed-to-market advantages, despite the supply chain advantages offered by East Asia. In addition, customer service is ranked as the most important in terms of competitive advantage variables, whereas production efficiency and relationship with suppliers are ranked second and the third respectively (Berdine et al., 2008).

**House of Total Quality Management and Elements of a Successful Supply Chain**

In his book, *The World Is Flat*, Thomas Friedman looks at how globalization and technology advances effect people, enterprises and economies. In all industries, enterprises are all coping with forces of change. As competition continues to increase enterprises must secure markets and continue to grow. In order to achieve competitive advantage, enterprises see supply chain management and total quality management as two of the strategic factors. Quality, efficiency and innovation are some of the capabilities that can be achieved through
the implementation of both supply chain management and total quality management (Daghfous, 2004).

Ross states that Total Quality Management (TQM) is an integrated management philosophy and set of practices that emphasizes, among other things, continuous improvement, meeting customers' requirements, reducing rework, long-range thinking, increased employee involvement and teamwork, process redesign, competitive benchmarking, team-based problem-solving, constant measurement of results, and closer relationships with suppliers (as cited in Powell, 1995, p.16). TQM is a concept that has evolved over time. Starting with the formal application of statistical quality control methods in the Western Electric Company in the 1920s, quality management methods evolved rapidly in the United States and the U.K. during World War II with massive training efforts and implementation throughout the war equipment manufacturing sites. In 1951 the Union of Japanese Scientists and Engineers created a national prize to promote quality and formalized a solid structure first called company-wide quality control and then total quality control (TQC). In 1997 they announced a formal name change from TQC to TQM. In the U.S. the term TQM became widely used under the Malcolm Baldrige National Quality Award in 1988 and the perception that quality had become central to company competitiveness and national competitiveness. With the creation of the European Quality Management Foundation and the European Quality Award the now twenty-seven European Union members had a common understanding of TQM as well as countries with similar awards ranging from Argentina, Brazil, Malaysia, Mexico and Singapore.
Total Quality Management is based on three fundamental concepts: focus on the customer, continuous improvement, and valuing the work and ideas of every member of the organization. TQM emphasizes a number of concepts, values and scientific methods – the so-called quality tools. It relies on strong top-management leadership with clear short-term, mid-term and long-term vision, strategies and goals. It requires an appropriate management system with an effective quality assurance system and cross-functional systems managing costs, delivery, environment and safety. Companies employing TQM have alignment of the vision, strategies and goals throughout the organization. They have created linkages across all key processes. This is critical in managing complex international supply chains. They have means to quickly replicate improvements throughout the organization including with key suppliers and customers (Juran & Godfrey, 1999).

TQM has continued to evolve with many organizations now using the terms Six Sigma Quality or Lean Six Sigma to label their approach. One of the most successful implementations of the Japanese version of TQM has been by the Toyota Corporation that calls its approach the Toyota Production System. This has often been called Lean Production in the U.S. and other countries. Six Sigma was pioneered by Motorola and then dramatically improved by General Electric, DuPont and Allied Signal (now Honeywell) and widely implemented by other organizations throughout the U.S. and the world. But many still use the term TQM to encompass a total company approach to quality management and achieving world-class, competitive quality.

Currently, the core ideas of TQM proposed by W. Edwards Deming, Joseph Juran, and Kaoru Ishikawa gained significant acceptance and has become something of a social
movement. TQM can be implemented in any organization-manufacturing, service, healthcare, nonprofit, government or educational institutions -and the implementation of TQM results in “improved products and services, reduced costs, more satisfied customers and employees, and improved bottom line financial performance” (Walton, 1986) (as cited in Powell, 1995, p.16).

Customer focus, leadership, involvement of people, process management, system management, continual improvement, factual approach to decision making, and mutually beneficial supplier relationship are stated as the eight principles of TQM. (Deming, 1986) These eight principles generalize the success experience of the advanced enterprises in the developed countries and these principles are embedded in House of TQM developed by Noriaki Kano (Kano, 2006). Figure 6 shows the House of TQM.
The House of TQM by Noriaki Kano (2006) suggests some base criteria should be fulfilled in order to be competitive in the global business environment. At macro level, in order to achieve customer satisfaction, it is necessary to have a satisfactory level of general education and political stability in the supplier countries. House of TQM also suggests that intrinsic and information technologies are important to achieve better overall quality leading to customer satisfaction. Besides, the model suggests that motivation of executives and people are important for success. The implementation of methods and techniques for quality development, vehicles and principles - quality and management principles - of quality management system are all important for the successful management in the businesses.
Ultimately House of TQM indicates that improved implementation of quality management system leads to competitive advantage and increased customer satisfaction.

As previously stated, in the current global competition, enterprises cannot respond rapidly to the customers’ demand through traditional operation mechanism. Therefore a kind of new operation mechanism is required to be competitive. In global supply chains, the majority of buyers rely heavily on their suppliers. The product quality and manufacturing processes of suppliers have great effect on the quality of final product of buyers. Therefore, the emphasis of research and practice of TQM has shifted from enterprise focus to supply chain focus. Not only the high quality of product and service but also the high level of quality control of the entire supply chain system ensures competitive advantage. In other words, the essence of competition advantages are not satisfying product quality and process quality simply, but satisfying the performance of the entire supply chain system (Chang, 2009). Therefore, the establishment of bases/elements of a successful supply chain and a supply chain management system based on the management ideas of TQM and House of TQM will promote the involvement of all the members, facilitate the quality control of the entire supply chain system and improve the competitiveness of both suppliers and buyers.

Depending upon these ideas, in the current study, the researcher built a new model depending upon both the House of TQM and previous research findings about the apparel supply chain / sourcing competitiveness criteria, to determine the key factors driving the competitiveness of apparel supply chain management. As in all management systems, in supply chain management, ultimate goal is the satisfaction of the customers which help companies to have higher profit margins. Therefore, the researcher adopted the structure of
the House of TQM to have general picture of supply chain management / sourcing criteria /
elements. It is obvious that education and political stability of a country affects the country’s
relationships with other countries and with business partners. Previous research showed that
sourcing location decisions are effected by political stability of a country as well as education
and training level of its workforce. Therefore, the researcher generalized these bases of
House of TQM regarding political stability and education into two parts as “government” and
“education” for the new model of a successful supply chain management. In addition to
governmental and educational issues, “infrastructure” is also found as essential for the
foundation of a viable supply chain network for all industries. Therefore, the researcher
included an “infrastructure” element to the macro level of the new model for supply chain
management. Previous research also showed that cost, reliability of delivery, product quality,
full-package sourcing, lead-time, and flexibility (Berdine et al., 2008) are found as
determiners for the sourcing location decisions / selections. Furthermore, previous research
suggested that marketing, location, customer service, relationship with suppliers, research &
development, and production efficiency are competitive advantage variables for apparel
suppliers (Berdine et al., 2008). Considering previous research findings and House of TQM
suggestions on competitive advantage, the researcher determined the elements of a successful
supply chain as governmental, educational, infrastructural elements as well as quality,
productivity and innovation. This new model that suggests the elements of a successful
supply chain is shown in Figure 7. It is a basic framework on metrics for the successful
supply chain implementation.
Because each unit in a supply chain is both a supplier and a customer, it is important to have a customer focused corporate vision while trying to implement the TQM and SCM practices effectively both upstream and downstream. As Tan et al. (1999) state that, the customer driven vision can generate competitive advantages for the supply chain by helping improve productivity, reducing inventory, and increasing customer satisfaction, market share and profits (as cited in Sila et al, 2006, p.491). Therefore, in the new model, the researcher positioned the customer satisfaction and profits as the main objectives of a successful supply chain.
chain implementation. Governmental, educational, infrastructural elements together with quality, productivity and innovation are important to consider when creating competitive advantages in supply chains.

**Government**

Government’s role in shaping successful apparel supply chain is huge. Political and economical stability, general image of a country, and the security of businesses are all shaped through governmental actions. “Government policies must be consistently shifting to create the foundation of a more advanced economy” (Porter, 1998). Government plays an important role in satisfactory education throughout the country that leads to creation of a better workforce. In addition, government policies on infrastructural improvements for logistics, energy and communications are critical to maintain and develop global businesses. Governmental policies can attract foreign investment and encourage private enterprises. Besides, trade policies can create strong relationships with buyers. Government bodies establish local product standards or regulations that mandate or influence buyer needs. Government also plays a role in shaping the energy and labor costs. Government can also shape the circumstances of related and supporting industries in countless other ways. “Government policies influence firm strategy, structure and rivalry through capital market regulations, tax policy and antitrust laws.” (Kobayashi and Hillary, 2004).

**Infrastructure**

The infrastructural issues are among the most important factors in the supply chains. A reliable logistics infrastructure is critical for the delivery reliability, shorter lead times and overall supplier delivery performance. Logistics capabilities are among the first criteria to
look at when making sourcing decisions. Improved logistics in terms of ports, railroads, airports, and highways is likely to attract foreign investment easily. Besides, in apparel supply chains, it important to develop and maintain overnight delivery services which are essential for back and forth shipment of product samples between the supplier and buyer companies. The improved overnight delivery services can be achieved through reliable physical infrastructure. In addition to logistics infrastructure, reliable energy infrastructures and grids are crucial to support the industry with consistent energy supplies and transparent costs. Furthermore, communication infrastructure is required to provide efficient supplier-customer relationships. More and more a high speed broadband internet capability is considered critical especially for transmitting detailed specifications, color information, and graphics.

**Education**

General education in a country is necessary to create a satisfactory level of desired capabilities in businesses. In textile and apparel industries a high school degree is sufficient for most entry-level production positions. Besides, basic computer knowledge and some job training are necessary for more technical jobs and to operate complicated machinery. As the production of textiles and apparel products becomes more technologically advanced, education and training are playing a larger role in the workplace. Administrative and technical workers often require more formal training. Most production workers in textile and apparel manufacturing are trained on the job. Extensive on-the-job training has become an integral part of working in today's textile mills. Therefore, job training is of paramount importance in the field of apparel assembly (U.S. Department of Labor, 2010). This training
facilitates workers’ understanding of automated machinery and recognition of problems, and thus training efforts result in improved quality, productivity and increased profit margins. Therefore, proper and structured training on the job and primary education are essential success factors in apparel supply chains.

**Quality**

Quality is an important factor both at manufacturing and service levels throughout the supply chains. The high quality of both products and services at each level of the supply network has been determined as an essential part of successful supply chain management (Romano and Vinelli, 2001). It is critical to manufacture defect-free components for the quality level delivered to the end customer. The quality level of the final products is the overall outcome of the quality management activities of each player in the supply chain. Therefore each player is responsible for the end result (Romano and Vinelli, 2001). This situation is especially important in the apparel industry. In apparel industry, quality is one of the main competitive factors, and successful results are not the responsibility of one individual company but, rather, the responsibility of the entire supply chain. According to Romano and Vinelli (2001), the quality of the final product that is delivered to the customer is the result of a chain of successive, inter-linked phases. Sustaining quality efforts along the supply chain has also significant effects on cost reduction. Besides cost reduction, Beamon and Ware (1998) state that “improving the quality of all supply chain processes results in improved resource utilization and improved efficiency” (as cited in Rahman, 2006). Companies can avoid being simply reactive to the requirements of their customers along the supply chain and can meet their demands more proactively by achieving high quality at all
levels (Sila et al., 2006). Although quality management practices of each link are important for the success of the entire supply chain, considering the objectives of this study, the researcher mostly referred “quality” as the product and service quality of individual companies.

**Productivity and efficiency**

The large volume of goods moved in the supply chains necessitates efficient and productive practices, because small changes in operational cost generate significant amounts, impacting overall profit margins. Efficient supply chain management is critical for goods with short life cycles such as textile products. Fast handling has become a requirement to achieve cost efficiency in the supply chains. As large volumes of goods are managed through the entire supply chains, all savings in time in handling become an important competitive advantage (Karkkainen, 2003). Productivity is a measure of quality/output from a production process, per unit of input. Labor productivity is the ratio of output to the input of labor. Most often, hours worked, rather than the numbers of employees, is used as the measure of labor input. Productivity may be conceived of as a metric of the technical or engineering efficiency of production. In this study, productivity is referred as the overall output of the manufacturing factories at a given time frame.

**Innovation**

A business can gain sustainable competitive advantage by innovations in technology or concepts as well as in products. According to Porter (1998) “Firms create competitive advantages by perceiving or discovering new and better ways to compete in an industry and bringing them to market which is ultimately an act of innovation.” Innovation includes
improvement in technology and better methods of doing things. Innovation can be manifested in product changes, process changes, new approaches to marketing, new forms of distribution, and new conceptions of scope. Innovation is the result of organizational learning as well as from research and development. Innovations lead to shifts in competitive advantage in supply chains. The most typical causes of innovations that shift competitive advantage are: new technologies, new or shifting buyer needs, shifting input costs or availability and changes in government regulation (Porter, 1998).

Country Analyses

China

Geography of China. China is world's fourth largest country in area after Russia, Canada, and U.S. and is located in Eastern Asia, bordering the East China Sea, Korea Bay, Yellow Sea, and South China Sea, between North Korea and Vietnam. The climate of the country is extremely diverse; tropical in south to subarctic in north. Its natural sources include coal, iron ore, petroleum, natural gas, and hydropower potential which is the world's largest hydropower. China suffers mainly frequent typhoons which are about five per year along southern and eastern coasts, damaging floods, tsunamis, and earthquakes. The country has a huge air pollution problem created by the reliance on coal producing acid rain, and also has water shortages, particularly in the north and water pollution caused by untreated wastes. The time zone of China is UTC+8 which is 13 hours ahead of Washington, DC.

Size and population of China. The capital of China is Beijing. There are twenty three provinces that make up the country. There are also five autonomous regions, four municipalities and two special administrative regions. These twenty two provinces, five
autonomous regions and four municipalities can be collectively referred to as “Mainland China”, a term which usually excludes Hong-Kong and Macau. The population of China is estimated 1,338,612,968 in 2010 (CIA World Factbook, 2010). It is the largest country in the world in population. The majority of the population falls between the age of 15 and 64. The median age is 34 years. The population growth rate was estimated 0.65 % in 2009. The literacy rate is 90.9% of the total population.

**Politics of China.** China is a communist state and the Chinese government is described as communist and socialist but also as authoritarian, with many restrictions remaining in many areas most notably on the internet and the press. President and vice president are elected for a five-year term.

**National economic performance of China.** China's economy has changed from a centrally planned system that was largely closed to international trade to a more market-oriented economy during the past 30 years. The country has a rapidly growing private sector and is a major player in the global economy. Annual inflows of foreign direct investment rose to nearly $108 billion in 2008 (CIA World Factbook, 2010). The renminbi, which means “people’s currency”, is the currency of China, denominated as the Yuan. For most of its history the Yuan was pegged to the U.S. dollar at 2.46 Yuan per USD. When China’s economy gradually opened in the 1980s the Yuan was devaluated to improve the competitiveness of Chinese exports. Therefore, the official Yuan/USD exchange rate declined to 8.62 Yuan by1994. Chinese government maintained a peg of 8.27 Yuan per USD from 1997 to 2005. On 21 July 2005, the peg was finally lifted and currently the exchange rate is 6.83 Yuan per USD.
The Chinese government faces several economic development challenges, including: (a) sustaining adequate job growth for a large number of migrants and new entrants to the work force, (b) reducing corruption, and (c) containing environmental damage and social conflict related to the economy's rapid transformation. “Economic development has been more rapid in coastal provinces than in the interior, and approximately 200 million rural laborers and their dependents have relocated to urban areas to find work. One demographic consequence of the "one child" policy is that China is now one of the most rapidly aging countries in the world. The Chinese government seeks to add energy production capacity from sources other than coal and oil, and is focusing on nuclear and other alternative energy development. In 2009, the global economic downturn reduced foreign demand for Chinese exports for the first time in many years” (CIA World Factbook, 2010).

**GDP and growth of China.** China has a strong growing GDP with estimated $7.42 trillion in 2007, $8.088 trillion in 2008, and $8.791 trillion in 2009. After the European Union and United States, China has the world’s third highest GDP level with a growth rate of ~9% annually. In 2009 China was the second-largest economy in the world after the U.S. on purchasing power basis, although in per capita terms the country is still lower middle-income. In terms of labor force China stands as the first in the world with 813 million people.

**Economic profile and textile and apparel industry in China.** China had an unemployment rate of 4.3% in 2009 est. and 4.2% in 2008 est. It should be also noted that these data include only urban areas and including migrants may increase total unemployment to 9% (CIA World Factbook, 2010). Apparel and textiles have been important Chinese exports since the introduction of economic reforms in the 1970s (Abernathy, Dunlop,
Hammond, & Weil, 1999). China’s textile and apparel industry has substantially expanded in recent decades. The textile and apparel sector plays a vital role in the Chinese economy. Overall, the industry employs around 20 million people directly—plus a large number in support activities. Chinese export sales increased 40 times in the last thirty years and in 2008 the number reached U.S.$185 billion which is more than ten times the value of Chinese textile and apparel imports (China National Textile & Apparel Council, 2010). China has become the world’s largest supplier of primary textiles and apparel, and is the largest source of textile and apparel imports into the U.S., the E.U. and Japan. In addition, China stands among the world’s largest producers of natural and synthetic fibers, and fabric. Chinese manufacturers also account for around half of the world’s purchases of textile and apparel manufacturing machinery. China’s fast growth is based on the “open door” policy declared thirty years ago. After that a series of reforms has been implemented and international trade and investments have been promoted. In addition, Chinese government pursued policies which are designed to encourage private enterprise and attract foreign investment. China’s textile and clothing industries have gone through a major transition, from being centrally controlled by the government to a more free and independent system and environment (Shen, 2008). As a result, the textile and apparel industry currently has many private enterprises, which are eager to expand their presence in international markets. This overall macro picture of China’s textile and apparel industries has provided more and more opportunities not only to China’s own textile and apparel industries, but also to the global market and many individual countries, such as the United States (Industry Report, 2009). According to CNTAC (China National Textile & Apparel Council) (2010), from January to November
2009, China’s total textile and apparel export value to the United States, E.U. and Japan was $78.818 billion, which accounted for 51.14% of China’s total textile and apparel export value and accounted for 40.22% of the United States’ total textile and apparel imports. The Figure 8 gives a visual depiction of the Chinese apparel export numbers vs. other top apparel exporter countries’ numbers for U.S. market. As it is seen from Figure 8, the difference between Chinese export numbers and those of remaining nine is huge.


China's gross output value of textiles rose by 10.3 percent in 2009. The growth can be attributed to equipment upgrading and relocation of the companies from coastal areas to central China where costs are lower (China National Textile & Apparel Council, 2010). Besides these increased export numbers, there are several challenges that Chinese textile and clothing manufacturers have recently faced: “the instability of trading environment mainly
caused by the changes of policy and regulations, the changes of currency exchange rate (Yuan vs. U.S. dollar), and the increasing price of energy”. (Shen, 2008) In addition, the Chinese apparel industry faces several challenges including growing competition from Asian countries with lower labor costs, particularly from Bangladesh and Vietnam.

**Labor costs in China.** By one estimate, even after doubling between 2002 and 2005, the average manufacturing wage in China was only 60 U.S. cents an hour, compared with $2.46 an hour in Mexico. The highest minimum wage in China was $106 a month in the southern business center of Shenzhen and the lowest is $35 a month in the eastern province of Jiangxi in 2007. Average minimum wages in China have risen 15% in 2007, and 21% in 2008 based on available data. Currently the minimum wage ranges from 580 Yuan ($84.97) to 1,000 Yuan ($146.50) per month around the county.

These trends, coupled with the ongoing worker shortage in China, are causing some foreign buyers to look to other countries as part of a strategy to diversify sourcing risk. According to China’s Ministry of Commerce, foreign direct investment (FDI) from the European Union fell 29.4 per cent in 2007 and FDI from the U.S. fell 12.8 per cent. However, it is true that as wages in China continue to rise rapidly, wages in other countries have also been increasing. The minimum monthly wage in China has risen by nearly 50 per cent in the past six years. Mirroring that, Bangladesh saw a 33 per cent increase in legal minimum wage rates in 2007, while Vietnam’s wages rose 64 per cent between 2001 and 2008.

**Energy costs in China.** China is the world's second-biggest energy user and its energy consumption has been consistently increasing in the last decade. Figure 9 shows the
comparison of the growth rate of the power consumption and installed capacity in China over the last 30 years. The difference between the installed capacity and the consumption rates caused energy shortages and an increase in the energy prices in China. At the end of 2010, installed capacity is projected to reach 560 GW and 950 GW by the end of 2020. At the end of 2010, power demand is projected to reach 3,000 TWh, and 4,600 TWh by the end of 2020. Power generation will continually be based on coal-fired thermal power (Ni, 2006).

Figure 9: Growth Rate of Power Consumption and Installed Capacity

In addition to the gap between the installed capacity and the consumption growth rate, coal prices have fluctuations in the recent years. 62% - 69% of the electrical power is supplied by the coal-fired thermal plants in the country. The fluctuations in the coal prices have a quite direct impact on profits for coal power plants - their operating costs fluctuate. The increase in the coal prices vs. industrial and residential electricity costs is shown in Figure 10.
Therefore, suppliers of electricity are withholding product to pressure the government to offer higher prices (Meagher, 2008). As a result, China increased the price of coal-fired electricity tariffs twice in 2008 after domestic coal prices reached a record (Datang, 2009). Currently, the Chinese government tries to control power prices to reduce their impact on inflation. According to Beijing Electric Power Corporation, electricity price for industry use was 0.76 Yuan (0.11 USD) per kilowatt hour in 2009. In addition to coal-fired electricity, the wind power electricity price in China is approximately 0.080 USD since August 2009 (Article, 2009).
Haiti

**Geography of Haiti.** Haiti is located in the Caribbean and in the western one-third of the island of Hispaniola. The country is situated at the west of the Dominican Republic and is positioned between the Caribbean Sea and the North Atlantic Ocean. The climate of the country is tropical and semiarid where mountains in the east cut off trade winds. Its natural resources include copper, gold, and hydropower. Haiti lies in the middle of the hurricane belt, and faces severe storms from June to October. The country is subject to occasional flooding as well as periodic droughts (CIA World Factbook, 2010). On January 2010, a 7 magnitude earthquake struck Haiti and devastated the capital city, Port-au-Prince. The country suffers from extensive deforestation - much of the remaining forested land is being cleared for agriculture and used as fuel. Haiti also has inadequate supplies of clean/drinkable water. The time zone of China is UTC-5 which is the same with that of Washington, DC.

**Size and population of Haiti.** The capital and the largest city of Haiti is Port-au-Prince. Haiti has ten departments - Artibonite, Centre, Grand ’Anse, Nippes, Nord, Nord-Est, Nord-Ouest, Ouest, Sud, Sud-Est. The population of Haiti was 9,035,536 in 2009. The majority of the population falls between the age of 15 and 64. The median age is 20 years. The population growth rate was estimated 1.83 % in 2009. The literacy rate is 52.9 % of the total population.

**Politics of Haiti.** The government of Haiti is a semi-presidential republic, a multiparty system where the president of Haiti is the head of state elected directly by popular elections. The President is elected by popular vote for a five-year term.
National economic performance of Haiti. Haiti is the poorest country in the Western Hemisphere with 80% of the population living under the poverty line and 54% in abject poverty. Two-thirds of all Haitians depend on the agricultural sector, which is mainly small-scale subsistence farming, and it is vulnerable to damage from frequent natural disasters. Although the country’s economy has shown positive growth since 2005, four tropical storms in 2008 and a 7 magnitude earthquake in 2010 severely damaged the transportation infrastructure and agricultural sector. ‘Gourde’ is the currency of Haiti, and currently one USD is equal to 40 Gourde.

Haitian Hemispheric Opportunity through Partnership Encouragement (HOPE) Act, passed in 2006, has slightly increased apparel exports and investment by providing duty free access to the U.S. A second version of the legislation, passed in 2008 and named as HOPE II, has further improved the export environment for the apparel sector by extending preferences to 2018. Currently, the apparel sector accounts for two-thirds of Haitian exports and nearly one-tenth of GDP. Haiti suffers from a lack of investment because of insecurity and limited infrastructure, and a severe trade deficit (CIA World Factbook, 2010).

GDP and growth of Haiti. Haiti has a very low GDP with estimated $11.51 billion in 2007, $11.66 billion in 2008 and $11.61 billion in 2009. In terms of purchasing power parity Haiti is ranked as 144th in the world with estimated 1.3 % in 2008 and negative 0.5 % GDP growth rate in 2009 (CIA World Factbook, 2010).

Economic profile and textile and apparel industry in Haiti. Haiti is one of the poorest countries in the world and suffers from one of the world’s worst unemployment rates. Due to poor census data Haiti is left off comprehensive lists of unemployment figures for
countries around the world, but experts estimate that their unemployment rate falls somewhere between 60%-70%. More than two-thirds of the labor force does not have formal jobs in Haiti. Figure 11 shows the unemployment rate of Haiti vs. some selected countries including China.

![2008 Unemployment Rate by Country](chart.png)

**Figure 11: Unemployment Rate by Country**  
(Source: CIA World Factbook. (2010).)

The apparel industry in Haiti has experienced a number of ups and downs. In the late 1980s, the industry comprised of more than 100 firms employing over 100,000 people. Political instability, insecurity, and economic sanctions imposed affected the apparel industry in the early 1990s. Today Haiti has less than 26,000 apparel workers. The apparel assembly sector has been the nation's most important industry over the decades.
Currently, Haiti’s apparel industry supplies mostly mass-produced commodity knit products, such as t-shirts and sweatshirts which require only simple stitching, to the U.S. market. Besides, more complex woven products such as pants, shirts, and suits account for about 20% of the country’s apparel production. In order to maintain profitability, apparel assembly factories need to produce large volumes.

The Hemispheric Opportunity through Partnership Encouragement Act of 2006 (HOPE) gave Haiti significant U.S. trade benefits. U.S. Congress provided the country with trade preferences in addition to those already available under the Caribbean Basin Initiative (CBI). The HOPE Act intended to achieve a market based economy in the country, eliminating barriers to U.S. trade, fighting against corruption in Haiti. The major benefits of the HOPE initiative are tariff preferences for Haitian produced textile and apparel goods, including more flexible rules of origin than those applied to apparel imports from other countries to the U.S. The major difference is that Haitian firms can use components from third countries. The HOPE Act allowed apparel imports from Haiti to enter the United States duty free provided that at least 50% of material and processing cost, rising from 50% in year one to 60% in year five, needs to originate in Haiti, the United States, or a country that has a preference program or FTA (Free Trade Agreement) with the United States (Hornbeck, 2007). However, HOPE I did not result in remarkable growth in Haitian apparel exports to the United States, inhibited by the limited time frame and complicated rules of origin. The Haitian apparel exports in terms of numbers and value in U.S. Dollars in the last ten years can be seen in Figures 12 and 13.
Figure 12: Haitian Apparel Exports to the U.S., in Million Units

Figure 13: Haitian Apparel Exports to the U.S., in Million U.S. Dollars
In addition to HOPE I which was set to expire in 2012, the U.S. government decided to provide Haiti with HOPE II, the Hemispheric Opportunity through Partnership Encouragement Act of 2008, opportunities. According to Seelke & Hornback (2008) the HOPE II Act enhances the tariff preferences by extending them for 10 years through September 30, 2018, making the rules simpler and more flexible, and expanding duty-free treatment for U.S. apparel imports wholly assembled in Haiti (Hornbeck & Seelke, 2008). HOPE Acts permit duty-free treatment for apparel imports in limited quantities assembled in Haiti with inputs from third party countries. Because 90% of Haiti’s exports to the United States are woven and knit apparel, the HOPE Act potentially provides an important competitive advantage to Haitian garment producers over others in the region. Table 3 shows the top 29 apparel exporter countries of U.S. in terms of U.S. Dollar value, whereas, Table 4 shows the top 19 apparel exporter countries in terms of numbers. Haiti is ranked 28th in terms of dollar value of the exports, however the country is ranked as much higher – 18th - in terms of export numbers.
Table 3: Leading Exporters of Apparel to the U.S., in terms of U.S. Dollars, in Millions

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>22.74</td>
<td>22.92</td>
<td>23.50</td>
<td>Hong Kong</td>
<td>2.03</td>
<td>1.55</td>
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<tr>
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<td>5.22</td>
<td>5.06</td>
<td>Italy</td>
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<td>1.33</td>
<td>0.88</td>
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<tr>
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<td>4.52</td>
<td>4.01</td>
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<td>3.98</td>
<td>4.02</td>
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<td>3.44</td>
<td>3.41</td>
<td>Dominican Republic</td>
<td>1.05</td>
<td>0.84</td>
<td>0.61</td>
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<td>India</td>
<td>5.17</td>
<td>3.07</td>
<td>2.84</td>
<td>Peru</td>
<td>0.81</td>
<td>0.79</td>
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<td>Honduras</td>
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<td>2.60</td>
<td>2.03</td>
<td>Egypt</td>
<td>0.69</td>
<td>0.74</td>
<td>0.74</td>
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<td>Cambodia</td>
<td>2.42</td>
<td>2.37</td>
<td>1.87</td>
<td>Canada</td>
<td>0.96</td>
<td>0.69</td>
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<td>Thailand</td>
<td>1.76</td>
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<td>Taiwan</td>
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<td>1.38</td>
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<td>Turkey</td>
<td>0.55</td>
<td>0.40</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Table 4: Leading Exporters of Apparel to the U.S., in Million Units (SME (Square Meter Equivalent))

<table>
<thead>
<tr>
<th>Country</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<td>China</td>
<td>8,034</td>
<td>7,789</td>
<td>8,623</td>
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<tr>
<td>Vietnam</td>
<td>1,274</td>
<td>1,523</td>
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<td>Bangladesh</td>
<td>1,352</td>
<td>1,435</td>
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<td>Honduras</td>
<td>1,223</td>
<td>1,331</td>
<td>1,006</td>
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<td>Indonesia</td>
<td>1,064</td>
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<td>Mexico</td>
<td>1,210</td>
<td>1,035</td>
<td>883</td>
</tr>
<tr>
<td>India</td>
<td>868</td>
<td>883</td>
<td>907</td>
</tr>
<tr>
<td>Cambodia</td>
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<td>888</td>
<td>751</td>
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<td>315</td>
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<tr>
<td>Guatemala</td>
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<td>291</td>
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<tr>
<td>Dominican Republic</td>
<td>382</td>
<td>360</td>
<td>240</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>285</td>
<td>330</td>
<td>307</td>
</tr>
<tr>
<td>Taiwan</td>
<td>303</td>
<td>344</td>
<td>166</td>
</tr>
<tr>
<td>Haiti</td>
<td>247</td>
<td>222</td>
<td>238</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>358</td>
<td>258</td>
<td>049</td>
</tr>
</tbody>
</table>


**Labor costs in Haiti.** A comparison of the monthly minimum wage rates in countries that compete in garment sector shows that among its Latin America neighbors, Haiti had by far the lowest wage rate in 2009. Haitian Parliament voted to raise the minimum wage in the assembly sector from 1.29 dollars (70 gourde) to only 3.20 dollars (125 gourde) per day in August 2009. Figure 14 shows the comparison of the minimum wage of Haiti vs. some selected competitors.
It can be seen that where a cheap cost of labor may be competitive advantage for Haiti versus its Latin America competitors, the Asian labor market is equally competitive on wages. Since 2000, countries in Latin America, such as Dominican Republic, Honduras, and El Salvador, have increased their minimum wages. This has been one factor in buyers’ increased sourcing in Asian products.

**Energy costs in Haiti.** Haiti’s cost of electricity puts the apparel industry at a competitive disadvantage versus Asian and Latin American countries. The comparison of the hourly electricity rates by country is shown in Figure 15. Not only is electricity expensive in Haiti, the unreliability of the grid causes many lost production hours, while competitors in other countries can continue producing for a higher daily output.
Figure 15: Hourly Rates of Electricity, in USD  
Garment manufacturing in Haiti: An economic analysis of the cost structure.)
CHAPTER III

METHODOLOGY

Purpose of Research

The purpose of this research is to investigate the competitiveness of the Haitian apparel supply chain for the U.S. market vs. the Chinese apparel supply chain. The guiding conceptual framework for the research is the House of TQM by Noriaki Kano (2006). The Kano model suggests that general education, political stability, and total quality management are all important to create a competitive advantage. This model is used to develop necessary criteria for the competitiveness in the supply chains. The study addresses governmental, infrastructural, and educational issues and the role of quality, productivity and innovation in the supply chains. In order to discuss the Haitian apparel production quality level, the study also discusses the current situation of Haitian apparel assembly using on a case study of a single Haitian apparel assembly plant. The study is intended to identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

In order to provide insight into the current and future competitiveness of Haiti as a source market for U.S. apparel industry, we pose research objectives to guide the inquiry. Because the purpose of the study is broad and draws upon both primary and secondary data sources it addresses many questions in an inductive manner. Therefore, these objectives best serve the research design from administrative and logical standpoints.
Research Objectives

The following are the main research objectives used in this study:

**Research Objective One:** To investigate the basic criteria for selecting an apparel sourcing location from the U.S. apparel buyers’ perspective.

**Research Objective Two:** To investigate the importance/role of the following criteria in the Haitian vs. Chinese source market from the U.S. apparel buyers’ perspective.

1) Governmental
2) Infrastructural
3) Educational
4) Quality
5) Productivity
6) Innovation

**Research Objective Three:** To investigate strengths and weaknesses of Haiti and China as apparel sourcing partners for the U.S. market from U.S. buyers’ perspective.

**Research Objective Four:** To discuss the current situation of Haitian apparel assembly based on a case study in a single Haitian apparel production plant.

**Research Objective Five:** To discuss the current Haitian apparel production quality level based on the case study.

**Research Objective Six:** To identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.
Research Design

Qualitative Research Methods

In this study qualitative methods are used to answer the research questions. Qualitative research is the collection of data in the form of text or images using open-ended questions, observation, or found data (Hair, Wolfinbarger, Ortinau, & Bush, 2008). Because the objective of this study is to gain preliminary insight into the stated questions, qualitative research was used. The study consisted of two phases. Figure 16 shows these phases and their relevant research objectives.

![Research Objectives Addressed in Phase I and Phase II](Source: Uluskan, 2010)

Phase I was designed to gain insight into the Haitian apparel production and the production quality levels. This phase used a case study to examine one of the largest Haitian apparel assembly plants. Phase I was intended to address the research objective three, four, five, and six. Phase II was designed to understand how the governmental, educational, infrastructural issues and the quality, productivity and innovation effect the U.S. apparel
buyers’ decision when sourcing from a specific country. Phase II was also aimed to gain better understanding of current situation of Haiti’s and China’s apparel sourcing regarding these stated criteria of selection. In Phase II, in-depth interviews were conducted to collect data. Phase II was intended to address the research objective one, two, three and six.

Phase I

Case study research helps to investigate a contemporary phenomenon within its real-life context (Yin, 2003). Due to the exploratory nature of this research, a case study approach was chosen for Phase I of the study. The case study was conducted in a single assembly plant in Haiti. In order to understand the overall picture of the current Haitian apparel sourcing, it was essential to observe and understand the real apparel manufacturing environment in Haiti. A specific t-shirt manufacturing plant was studied with the research aim to discuss the current situation of Haitian apparel assembly.

In choosing a single representative company to research, as compared to a larger survey research method, the primary benefit is that a greater amount of information was gathered on the company than would have been possible through a survey with a much larger sample size. Another benefit of doing case study research is the ability to gather unstructured and detailed data that can be qualitatively analyzed. Unstructured data allows for additional insight (Diluna, 2003).

Secondary and primary data was collected in Phase I. Because primary and secondary data complementary in nature and secondary data helps to identify and define the problem, answer certain research questions, and to interpret primary data (Malhotra, 2006), both data sources were used concurrently. The information gathered from the secondary and primary
data was used to clarify the research objectives – four, five and six and to discuss the current situation of the Haitian apparel production.

**Instrument development.** According to Tellis (1997) “a case study can be seen to satisfy the three tenets of the qualitative method: describing, understanding, and explaining.” In order to create a case study, six types of information can be used in combination. These six types of information are documentation, archival records, interviews, direct observation, participant observation, and physical artifacts (Yin, 2003). The current study used company documentation, interviews and discussions with company managers and staff, direct observations of practices, and participation in the manufacturing environment.

**Data collection.** The secondary and primary data for Phase I was collected in June and July of 2009. Internal secondary data collected by the plant staff were used to provide depth into the subject. The data collection was via company data sources, observations of the researcher, interviews and discussions occupied an essential part in the case study.

**Case study steps.** The case study was conducted in six steps: understanding the general workflow and working environment of the plant; understanding the processes, mainly production processes, step-by-step; understanding the general plant procedures and quality inspections and audits; data collection via primary and secondary sources; production observation; and analysis. The first three steps were used to gain insight into the manufacturing environment within the plant. The data collection and the observation steps were aimed to gather data which would help to discuss the current situation in the plant and define some of the problems that the plant had. All the steps were supported with the
observations of the researcher. Ultimately, the analysis was conducted to draw conclusions from the data collected. Table 5 shows the case study steps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Sources Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>To understand the general work environment and workflow of the plant</td>
<td>Interviews and discussions with the plant manager</td>
</tr>
<tr>
<td>Step 2</td>
<td>To understand the manufacturing processes/manufacturing floor</td>
<td>Interviews and discussions with the department managers, direct observation</td>
</tr>
<tr>
<td>Step 3</td>
<td>To understand the procedures and quality inspection and audit processes</td>
<td>Company procedures, interviews with engineer, internal and external auditors, quality assurance department manager</td>
</tr>
<tr>
<td>Step 4</td>
<td>Data collection</td>
<td>Secondary sources – plant data, primary sources</td>
</tr>
<tr>
<td>Step 5</td>
<td>Observation of manufacturing processes, work environment, worker training, machinery, quality audits, module efficiency</td>
<td>Discussions with the plant manager, engineer, department managers, floor leaders, auditors, operators</td>
</tr>
<tr>
<td>Step 6</td>
<td>Analysis</td>
<td>JMP tables, Excel tables, Discussions</td>
</tr>
</tbody>
</table>

(Source: Uluskan, 2010)

**Step I: Industry and company background.** Step I was aimed to gather basic information about the company and its working environment. For the purpose of the Step I, interviews and discussions were conducted with the plant manager.

**Step II: Production floor.** In order to attain information about working conditions and production, the researcher conducted several interviews and made discussions with the
plant manager, production engineer and other division managers. Besides, some of the information depends on the observations of the researcher.

**Step III: Procedures.** In order to be able to discuss the comparisons of the theoretical and actual processes, the researcher examined the company procedures and spent time in the various departments - mainly in the manufacturing floor, to observe the practical operations.

**Step IV: Production and quality audits’ data collection.** After the researcher established an understanding of the general working environment and the processes within the plant, secondary and primary data were gathered to be able to discuss the quality level and the general situation of the company. In this step, researcher collected production and quality audit data from the secondary and primary sources. Secondary data information was compiled from the company data. These data included monthly production data, internal audit and external audit data. The researcher also attained hourly production data of each module for several days. The internal and external audit data, and hourly production data was entered into the computer and converted into graphs to help to attain visual depiction of the available data.

After determining the best and the worst modules from the secondary data, researcher also conducted time studies for different modules to be able to compare the productivity of the modules. The data collected were converted into table and graph forms for visual depiction.

Production data was already as in the form of excel table and this data was converted into the graph form as well to be able to understand the fluctuations in the production. In order to understand the production rate and the stability, production data is observed.
Step V: Observation. In order to be able understand the real working environment and the production, the researcher made observations by spending time on the manufacturing floor.

Step VI: Analysis and conclusions. Some of the seven tools of quality which are the cause-and-effect diagrams, check sheets, control charts, histograms, Pareto charts, scatter diagrams, and flow charts are used for analysis of the attained data and findings. Besides, JMP and excel tables and discussions are used for analysis and conclusions.

Data analysis. Primary and secondary data and information collected from discussions, interviews and observations was converted into tables, graphs and paragraph forms and the researcher made conclusions from them.

Phase II

After the researcher established an understanding of the current Haitian apparel assembly sites in Phase I, she conducted in-depth interviews in order to concentrate on following research objectives: one, two, three and six. In addition, prior to the in-depth interviews, the researcher compiled secondary data about China and Haiti.

Secondary sources were used to collect information and data, which gave the researcher a more in depth understanding of the countries of interest. Data compiled from secondary sources were in the form of published materials and databases. More specifically, qualitative data were obtained from journal articles, industry analyses and opinions, and trade associations. Quantitative data were compiled from manufacturing, and industry production data.
The researcher conducted face-to-face and telephone interviews with U.S. apparel buyers, and one research company which is planning to build an apparel industry training center in Haiti. The methodology used was focused on getting a qualitative overview of the main opportunities and concerns buyers and investors see in the Haitian apparel industry in comparison with China. The researcher conducted open-ended interviews with senior management personnel who deal directly with global sourcing and/or investing decisions. All of the companies interviewed have been in the industry for many years. The researcher queried respondents about their sourcing decisions, how they decide where to buy/produce, then focused on Haiti and China and how these countries fit into their global portfolio of sourcing countries. These companies consider their costs and sourcing percentages to be proprietary and confidential; however, they provided qualitative comparison points.

For Phase II, a judgment sampling was used to determine the frame. “In judgment sampling respondents are selected because the researcher believes they meet the requirements of the study” (Hair et al., 2008). In order to conduct interviews, a sample of companies was determined from sourcing agents, U.S. retail chains and U.S. manufacturers. The sample of retailer and manufacturing companies was selected from those that are sourcing both from Haiti and China, and from the companies sourcing from China and other countries. In order to obtain in depth information about Haiti’s apparel industry, representatives of a technology development and supply chain improvement research center are also interviewed. This research company is planning to build a training center for apparel manufacturers in Haiti.
In order to narrow the sampling population and choose the sample of buyer companies, some key factors were identified such as sourcing location. Figure 17 presents a visual depiction of how the sample was determined for the U.S. buyers. The sample of companies is presented in Table 6.

![Diagram of company selection criteria](image)

**Figure 17:** Company Selection Criteria for U.S. Retailers  
(Source: Uluskan, 2010)

**Table 6:** The sample used for the study.

<table>
<thead>
<tr>
<th>Companies</th>
<th>Sourcing from Haiti</th>
<th>Sourcing from China</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Brand</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>U.S. Brand</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>U.S. Brand</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>U.S. Manufacturer</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sourcing Agent</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Research Center*</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

(Source: Uluskan, 2010)

*Not sourcing, planning to build a training center for apparel industry in Haiti.*
In order to address the research objectives and the six criteria based on the new model created by the researcher in the previous chapters, general and specific questions are prepared for the interview questionnaire. These open-ended questions were aimed to attain general information regarding sourcing decisions of the buyer companies. Questions were also used to determine the buyers’ perspectives on Haiti as a sourcing partner and its comparison with China in terms of governmental, educational, infrastructural criteria in the supplier countries, and quality, productivity and innovation of the supply chain partners in these target countries.

Interview questionnaire questions were divided into eight categories based on the objectives of the study. The categories were determined in accordance with the research objectives one, two, three and six. These categories were 1) General 2) Government 3) Infrastructure 4) Education 5) Quality 6) Productivity 7) Innovation and 8) Final questions categories. The in-depth-interview questions are given in Appendices A and B. Figure 18 gives a visual depiction of flow of the interview questions.
A general questions section was aimed to obtain general information from the companies regarding sourcing activities. These questions included the criteria for selecting a sourcing location. This section also included questions related China and Haiti as sourcing partners. The strengths and weaknesses of both countries are questioned to be able to make comparisons. This section also included questions about buyer companies’ thoughts on both countries as sourcing partners in the short and the long term. At the end of this section, the recommendations of the interviewees were asked to draw conclusions about improvement suggestions for the countries.

The “Government” section was aimed to obtain opinions of the interviewees about the governmental criteria such as political stability, general image - security, governmental initiatives for the apparel industry, trade agreements, cost of energy, apparel workers’ wages,
and duty expenses of the country of concern as an apparel sourcing partner. The questions were used to gain insight into the governmental issues in apparel supply chains and to understand how these criteria effect the decisions of buyer companies when selecting a sourcing partner. In order to be able to compare Haiti and China, the opinions of the interviewees for both countries were also asked along with each question in this section.

The “Infrastructure” section was designed with the aim of obtaining opinions about the infrastructural criteria of the country of concern. These criteria included logistics and communications infrastructures, delivery time, delivery reliability, and proximity of the country of concern. The questions were asked to understand the role of infrastructural issues in making the sourcing decisions. The section also included comparisons between Haiti and China.

The “Education” section questions were prepared to have opinions on primary education for workers and job training. Interviewees were also asked to compare China and Haiti in terms of apparel workers’ education.

The “Quality” section questions were aimed to obtain information about the interviewees’ thoughts on product quality, packaging quality, full package supply quality and sewing capability. Differences between Haiti and China were also asked.

The “Productivity” and the “Innovation” section were used to gather opinions about how the supplier productivity and the innovativeness of the suppliers effect the sourcing decisions of buyers. The questions regarding comparison of Haiti and China were raised as well.
The “Final” part of the questionnaire included a question about additional opinions of the interviewees. It should be noted that respondents without being prompted voiced their opinions on recent earthquake in Haiti and its results on the sourcing infrastructure. And they also voiced their opinions emphasizing that as a result if this there is a tremendous amount of help coming to Haiti from U.S. and other nations.
CHAPTER IV

RESULTS

Respondent Background in Sourcing - Brands vs. Manufacturers

The apparel buyers interviewed stated that their final sourcing preferences are shaped by their strategies, needs, product mix, product demands, and forecasts. They stated that buyers pick a country based upon their sourcing mix. All of the respondents stated that they develop their own designs and send these designs/sketches to their manufacturers. The majority of respondents use a blended sourcing strategy; meaning they sourced in a variety of locations. Reasons given were that to minimize risk, minimize labor costs, and to leverage the manufacturing competencies of different regions. In addition, despite the supply chain advantages offered by East Asia, respondents stated that they utilize Mexico, Central America and the Caribbean region for cost and speed-to-market advantages.

Depending on the company, preferences about full package suppliers vary. Brands interviewed stated that they are working directly with their suppliers for all garment components, they are nominating their suppliers’ suppliers, and they manage the entire supply chain. On the other hand, some of the manufacturing companies, that manufacture a certain percentage of their products in the U.S., stated that they mostly prefer to work with full package suppliers to transfer the supply chain activities to their suppliers, whereas, some of the manufacturer companies claimed that “Lean Retailing – Full Package” is in theory and added that in the real world – in practice - they need to control and manage their entire supply chain.
Research Objective One

Research objective one is designed to investigate the basic criteria for selecting an apparel sourcing location from the U.S. apparel buyers’ perspective. In order to address research objective one, the data compiled from in-depth interviews in Phase II was used.

Sourcing Location Criteria

The apparel buyers interviewed reported that in selecting a sourcing location, they look for the following factors: Competitive / desired price points, political and social atmosphere in the country, quality of the products, infrastructures, socially and environmentally compliant suppliers, WRAP (Worldwide Responsible Apparel Production) certification, delivery time, availability of the right product and mix, quick turns and flexibility of last minute order changes, manufacturer capabilities, financially sound suppliers, and overall service. These criteria are the most important ones for the respondents. Figure 19 shows the basic criteria desired from the apparel sourcing location.
According to the respondents, “service” refers to: response rates and communication levels in case of a problem, suggestions for the solution to that problem, the sample preparation and delivery time, being proactive in helping buyer companies to run their business, watching the marketplace for the type of products that they produce and bringing new ideas to buyer companies, and offering full package. One of the respondents stated that if the prices of suppliers are the same or close, the differentiator is this word “service” which

Figure 19: Sourcing Location Selection Criteria  
(Source: Uluskan, 2010)
is quality, delivery time and being proactive – to have the knowledge and experience to prevent problems and unwanted situations from reoccurring.

Generally, respondents divided the criteria into two categories: the nation/country infrastructure and the individual companies that they will be sourcing. They talked about the nations regarding their political and social atmosphere, capabilities and infrastructures. Quality, delivery reliability, social and environmental compliances, WRAP certification, service levels are all related to the individual suppliers.

Stable government, limited bureaucracy, and ease of dealing with business paperwork are found as desirable governmental criteria. Ease of access to the facility via roads, railways and/or air, physical infrastructure of the manufacturing sites, economics of scale at the production site, modern and flexible machinery, location of the manufacturing sites with respect to the port of departure of the product are stated as the important infrastructural criteria. Quality of the actual products, strong technical service - especially after sales services involving the technicality of the products, and ability for the product to be serviced in small and large lot sizes are found as the important quality criteria in making sourcing decisions.

The respondents also stated that they look at the infrastructure in terms of the actual factory infrastructure and the capabilities and techniques that suppliers are able to handle. The respondents stated that they consider the factory’s physical capability and physical structure regarding its safety and security. They also added that the control systems that are in place to ensure the execution are also important for them when they are making sourcing decisions. Because buyer companies invest tremendous amount of time and energy, they
want to make sure that everything is properly managed and balanced in their sourcing activities.

Some of the specific criteria for the brands are found as: the other companies that their potential suppliers work with i.e. the other companies that their potential suppliers manufacture goods for, and trade agreements that benefit the U.S. in terms of the cost. Implementation of good human rights practices for workers is also crucial in their sourcing decisions. The leading brands interviewed are very conscious of the negative image associated with child labor, bad working conditions, and low wages. Innovation is also important for many of the brands.

**Research Objective Two**

Research objective two is designed to investigate the importance / role of the following criteria in the Haitian vs. Chinese source market from the U.S. apparel buyers’ perspective.

1) Governmental
2) Infrastructural
3) Educational
4) Quality
5) Productivity
6) Innovation

**Role of Governmental Issues**

**Political stability of the sourcing location / country.** Respondents stated that the political stability of a country plays an important role in their sourcing decision but also
added that it is not the number one factor. According to the respondents, the stability, transparency and predictability of the government in the sourcing country are important. Furthermore, good legal structure in terms of respect for contracts, working agreements, investor rights, and copyrights are also important factors to take into consideration before starting a business in that country.

It is also found that political stability has an impact especially in the long run, for long-range strategic planning and viability of a sourcing partner. Respondents stated that they make changes gradually regarding their sourcing decisions. They claimed that they would not make a significant change in their sourcing decisions regarding locations, unless something radically goes wrong within the sourcing country.

According to the respondents, Haiti’s government is unstable, and is not predictable. Some of the respondents claimed that today Haiti is in better shape due to foreign help than it had been and is improving. On the other hand, respondents said that China’s government is very stable. It is claimed that Chinese population is pretty much under government control and added that China is relatively stable with the type of government that they have. This has a positive effect on buyers’ sourcing decisions. Besides, China is found as very transparent in terms of predictability. It is also said that China will be politically stable and should not pose any threat to businesses in the short-term to medium-term, however, if the U.S. trade war and currency issues with China escalate, then relations would depend on the decisions of the government of China.

General image of the sourcing location / country. Respondents stated that general image of a country plays a part in the sourcing decision equation/mixture. It is stated that
especially the first impression of infrastructure and business methods are important to the buyer companies. According to the respondents, general image mostly refers to the social environment and security within that country. Respondents claimed that it is important to know the general situation in the sourcing country to maintain their production. They also added that they need to monitor the change in the country as well.

Respondents stated that it is necessary to think about what their consumers’ image is of the sourcing area. They added that a brand has to be aware of what their customers are thinking of that sourcing location. It is indicated that if the area is considered as not socially responsible among their customers, brands decide not to source from that location and try to minimize their relationships with these partners.

According to the respondents, China and Haiti are very different nations. China is a very large nation with direction, infrastructure, stability, and purposefulness. China is found as very predictable, much more developed nation compared to Haiti. In terms of security, respondents claimed that China is a secure place to do business. There is a lot less corruption than it used to be. It is more secure than some of the other nations that they are working with. In terms of doing business, respondents feel that China is world-class.

On the other hand, respondents stated that it is difficult to do business in Haiti, especially due to poor infrastructure and logistics. Moreover, in spite of the political and security improvements achieved, Haiti suffers from having an image as an unsafe country. In terms of social compliance, it is stated that there are very few companies that are WRAP certified in Haiti.
Governmental initiatives for the apparel industry in sourcing location/country. It is found as an important aspect of doing business in a country, but stated as not being the final determiner. Respondents stated that governmental decisions, policies, and execution of these, affect buyers’ desire and ability to source from a country. Initiatives like free-trade zone, trade legislations, financial incentives for the industry, are stated as important determinants in this area, because these determinants make it easier to do business, and make the products flow better. It is also important to take into consideration laws of the land as far as labor rates are affected through government.

It is claimed that China has many governmental initiatives to its apparel industry, which also makes its industry very competitive. China has recently completed a large textile initiative to assist to textile apparel business because it has large export numbers for apparel. It has a mature apparel business.

The apparel industry is the largest industry in Haiti. Therefore, the government is engaged in supportive activities for their apparel industry such as building donations for the “training center” that will be build by U.S. government’s support. However, these supportive activities of Haitian government are not found sufficient to improve the apparel industry. The country is also trying benefit from HOPE I and II Acts.

Cost of energy. Cost of energy is another important factor affecting the overall cost of the buyer companies. Factories focusing on low end garments such as t-shirts generally consume less energy per garment than those producing higher end products, such as suits. Higher end production generally requires more sewing operations but also depends more on
high-energy consuming broilers for steaming; such equipment also requires additional capital outlays and maintenance costs.

According to respondents, abundance of energy in China is an advantage vs. Haiti. Although respondents claimed that the cost of energy is rising in China and has affected buyers’ overall costs, it is seen as much higher in Haiti. Because China has a great deal of coal reserves and hydropower, it is claimed that China is self sufficient in terms of energy. However, it is true that as cost of energy in China continue to rise; energy costs in other countries have also been increasing. Some of the respondents claimed that the cheaper labor in these countries off-sets high energy costs.

On the other hand, Haiti is seen as not as self sufficient regarding energy sources. Respondents interviewed typically listed power as the next largest cost after labor in Haiti. Manufacturers in Haiti rely on diesel powered generators for backup power. The undependable electric supply in the country means that manufacturers are more reliant on generator fuel, the cost of which is set by the price of diesel. In Haiti, lack of energy, lack of predictable energy and the cost of it are seen as major handicapping issues.

**Labor costs / operator wages.** Depending on the garment, the labor is about 30-50% of the total cost. Labor costs are found as a portion of the total equation. Respondents stated that it is necessary to look at total cost, total value benefit, and the cost of raw materials – not only the labor costs.

Labor rates are: 40 cents per hour for Haiti, and $1-1.25 per hour for China. When queried if Haiti could compete with its low labor rates, it is found that buyers would not consider low wages as a key advantage because of the absence of infrastructure in Haiti.
Respondents believe that Haiti is not going to be able to take the advantage of its low wage rates without a good infrastructure.

Chinese labor rates are found as low compared to many key Asian and Central American apparel suppliers to the U.S., but they are high compared to Vietnam, Cambodia, and some of the AGOA (African Growth Opportunity Act) nations. But in short, Chinese labor rates are stated as very competitive for apparel sourcing. Buyers believe that they will no longer be able to afford manufacturing in Southern China, because labor rates are getting very expensive. However, in Northern China, the manufacturers are still very competitive in terms of operator wages. Therefore, it is claimed that there is potential for development in Northern China.

**Duty expenses.** Duty expenses change depending on the product categories. For China and Haiti, it is said that they are both really predictable. Haiti is seen to have a slight advantage over China, because there are some options with zero duty programs – HOPE II. China is stated as self-sufficient in all major fibers and textile products, therefore, import duties within China do not matter, and also they are low.

**Role of Infrastructural Issues**

**Logistics infrastructure.** Because if there is no logistics infrastructure, buyers will not be able to transport their goods, and therefore, logistics infrastructure – roads, ports, railroads, airports- is found as one of the most important criteria. Logistics infrastructure must evolve to support the global sourcing businesses. It is said to be essential for on-time shipping and for safe travel to the supplier country.
According to the respondents, China is excellent in infrastructure and Haiti has a long way to go and is currently in the bottom 10 of the world rankings. Over the last 15 years, China strategically has made major decisions to invest in infrastructure. As a result, they have efficiency in their sourcing practices. Buyers believe that Chinese logistics infrastructure is more similar to a Western country’s compared to other countries in Asia. Chinese logistics infrastructure is much more advanced compared to the other countries that they work with. On the other hand, Haiti is found as the extreme opposite. It has not been able to make investment in its infrastructure for logistics. As a result, it has most of its manufacturing crowded around the capital and around the port which creates some problems of congestions and inefficiency.

**Delivery / lead time.** Delivery time can vary from brand to brand/company to company, depending on their business model. If it is basic items, delivery time is not as important; however, if it is fashion goods, speed to market is very critical. The only way brands capture the market is being the first to introduce the product into the market. The importance of delivery time and where it really ranks as far as the importance depend upon who the buyer companies are, and what their business model is. On the other hand, delivery time has become someway important for all buyers no matter who they are, because, now that the buyers do not want to hold too much inventory and would prefer short delivery notices. Proximity to the U.S. is one of the key advantages of apparel suppliers in the Western Hemisphere. It is stated that proximity also allows buyers to reduce inventories as more stock is at the factories and on the shelves and not in transit on ships. Although proximity is an advantage for quicker delivery times, it can be overcome with other things.
Respondents commented that countries can be geographically close to the U.S., but if they cannot deliver a quality good and if they are inefficient in getting products from the plant to the port, and to the ship, then they lose their proximity advantage. In addition, it should be noted that speed was not directly associated with proximity. Due to new and innovative logistics systems being utilized, proximity is starting to become less of a benefit offered by South/Central American suppliers.

Haiti has a lead time advantage being geographically near to the U.S., however, China also is commented as being not far off in terms of lead times, especially to the West Coast, where products arrive within 15 days from China. Products arriving on the West Coast will take even longer to bring to the East Coast. It is also claimed that there is so much more efficiency in manufacturing and in delivery in China. The fabric is manufactured in China as well, so its transit times from the mills to the actual factories are quicker rather than shipping the fabric from other countries. On the other hand, Haiti has to source raw material – fabric, zippers, and buttons- from other countries. Respondents believe that logistics from China/Asia continue to improve while logistic improvements from Latin America and the Caribbean are stagnant. Besides, while shipment takes a day or two days by boat for Haiti, respondents claimed that infrastructural deficiencies of the country make it unfavorable as a sourcing location. Respondents believe that proximity makes a difference only if there is suitable infrastructure to bring the products from a country to the U.S.

**Delivery reliability.** Delivery reliability is found very important. It is rarely the nation/country determines the delivery reliability and therefore it depends on the company. It is found as more of the individual level, supplier level - depending upon the ocean carriers.
Respondents stated that both China and Haiti have the ability to ship. China is noted as very reliable. There are not too many problems. Because China is trying to become a world super power in the world, the changes caused by these efforts benefitted the buyers. Frequency of the shipments is also commented to have a major role in delivery. The biggest challenge is stated as cargo security. China is found very secure, whereas respondents raised some concerns for Haiti’s ability to secure cargo.

**Other logistics infrastructure.** Overnight delivery companies such as DHL, UPS, FedEx, also play an important role in global sourcing. Having those networks within a country is stated as essential. It is important to have the ability to move samples back and forth. This relates to the service level that the suppliers are providing.

It is also important to have alternative infrastructures. The number of different shipping ports that the country has is stated as a competitive advantage. Haiti is very constrained in alternative strategies, whereas China has many alternative strategies. Port-au-Prince is Haiti’s primary port. China has a significant advantage in possessing alternative strategies. Moreover, a transportation network for waste disposal is also stated as being necessary for the supplier plants.

**Communications infrastructure.** Communications is critical in business today. If suppliers want to be in the business, they have to have strong communications. Therefore, communications infrastructure is commented as being basic/given requirements. It is necessary to have different ways to communicate through internet, phones, satellite, and teleconference. Communications infrastructure is stated as being important for Electronic
Data Exchange that is used to transfer electronic documents from one computer system to another, i.e. from one trading partner to another trading partner.

Respondents also commented on time delays regarding communications. Because of being in different time zones, there is 12 hour time delay for sourcing from Far East. This is stated as one of the complications to manage when sourcing from China. On the other hand, sourcing within the same time zone or closer time zones, such as sourcing in Western Hemisphere, facilitates business communications in that regard.

Although there used to be some phone service problems in Haiti, both China and Haiti are found efficient for communications. Both countries are stated as being able to provide sufficient communication infrastructures and being quite capable of delivering basic communications.

Energy infrastructure. Energy infrastructure is generally comprised of many components, such as the physical network of pipes for oil and natural gas, electricity transmission lines and other means for transporting energy to consumers. This infrastructure also includes facilities that turn raw natural resources into useful energy products. Energy infrastructure plays a primary role in industrial activities and their development in a country. As for any other the industry manufacturers, consistent energy supplies are critical for apparel manufacturing factories to be able to stay in the business. Therefore, energy infrastructure is stated as an important criterion.

According to the respondents, Haiti’s energy infrastructure has failed to keep pace with the changing requirements of industries. The electricity transmission system is constrained by insufficient capacity. One of the greatest energy challenges facing Haiti is the
need for improvement of its energy infrastructure to provide sufficient energy to households as well to the industries. In order to demonstrate the variability of electricity in Haiti, the blackout hours compiled during Phase I of the research is shown in Table 7.

**Table 7: Blackout Hours in Port-au-Prince**

<table>
<thead>
<tr>
<th>Month - 2009</th>
<th>Blackout Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>540</td>
</tr>
<tr>
<td>February</td>
<td>600</td>
</tr>
<tr>
<td>March</td>
<td>940</td>
</tr>
<tr>
<td>April</td>
<td>475</td>
</tr>
</tbody>
</table>

(Source: Case Study Company Data)

On the other hand, energy infrastructure in China is found sufficient by the respondents. Even though China has recently faced some problems with its electricity supply, the efforts of Chinese government to create more and viable energy infrastructures are found as promising for future sourcing relationships.

**Role of Educational Issues**

**Primary education.** Although general education in a country is found very important, respondents think that it is not necessary to have formal education to be a good apparel sewing operator. Primary education is found as being important at technical and management levels, not at the operator level. Therefore, primary education for apparel operators is ranked as the least important of the factors to consider when sourcing decisions are done. It is stated that as far as a sewing operator has experience in apparel manufacturing and is of legal age to work, that satisfies the needs. However, respondents believe that if the operators have been exposed to some type of more formal education previously, this leads to better results in training efforts. Operators’ ability to read and write, ability to have some
basic math skills are considered as a plus but as not being required. Haiti is commented as struggling for its education level. In addition, due to lack of primary education in Haiti, there is a limited availability of technical personnel and middle managers including front line supervisors, and industrial engineers. On the other hand, respondents stated that China has made huge investments in education and skill development. However, still, it is stated for both countries that primary education is not an option for sewing operators that are working in supplier factories.

**Job training.** Training is found as imperative, even more depending on whether a worker has primary education or not. Job training is stated as being crucial, because most apparel sewing operators are trained on the job and training has become an essential part in current apparel manufacturing. Administrative and technical workers often require more formal training. In terms of training support provided by buyer companies to their suppliers, it is found that particularly the buyers that have been manufacturers and had their own manufacturing facilities in the past; provide more support for their suppliers than others. These companies have more engineering capabilities to help their suppliers to set capabilities up. They provide work sequence, standardized minutes, and equipment. On the other hand, it is only possible to get only very limited support from brand companies those do not have manufacturing background. These companies tend to send a sketch and want their suppliers to handle manufacturing operations for those products.

In Haiti some of the manufacturers have had a lot of support from their customers. It is noted that Haiti has insufficient operator, middle management, and mechanics trainings. It
is commented that operators and mechanics require structured in-house training programs, whereas middle management needs more industrial engineering training.

Furthermore, cross training, which refers to train one operator for various operations to improve overall performance, is found as a key success factor in apparel manufacturing. In a cross trained apparel manufacturing team, sewing operators are interchangeable among tasks within the team. This ability plays an important role in increasing the flexibility and responsiveness of the manufacturers. In China operators are noted as being cross trained, whereas, in Haiti they are not.

In terms of Chinese operator training, even though Chinese government is stated as being supportive for job training and operator development through financial incentives, there were some contradictory comments by the respondents in terms of training level of Chinese operators. Several respondents feel that worker training is not an in-depth training in China and found Chinese training as insufficient, whereas, several respondents stated that China far exceeds other manufacturer countries in worker training and skill development.

**Role of Quality Issues**

Quality has a huge effect on the apparel buyer companies and it is a very important criterion for selecting a sourcing partner. It is not considered as competitive advantage for the supplier companies anymore and it is seen as a basic requirement.

Quality goes underneath the educational component and depends upon the extent to which the operators are developed and trained. Respondents stated that if people have the opportunities for education, training, and development, the quality of the products will be improved. Therefore quality and operator training are found as being positively correlated.
It is stated that Chinese operators has been given the opportunity for better education, better skill development, better training than Haitian operators. Both of the countries are believed to possess the same ability to achieve the required quality levels, however, just one of them has access to more training and development. Therefore, Chinese quality is noted as being improved a lot during the last decade, and stated as the best or better depending on the product categories, whereas, Haiti is also found satisfactory in terms of its product quality due to its basic apparel offerings. However, it is also noted that as Haiti moves into different products, that will be more challenging for them to provide the required quality.

In terms of sewing capabilities, China is said to be very advanced, and more capable. Because China has been in the apparel industry for a long time, it is believed to have enough experience to handle more complicated products, and Chinese handworks are stated as being more delicate. Respondents indicated that they produce more specialty items in China and in Vietnam as well, and added that other countries such as Cambodia and Philippines are able to handle more basic, less detailed items/products. In addition, because Chinese capabilities are greater than that of the other countries, it is stated to have more expensive product range.

In terms of packaging quality, respondents stated that they provide packaging guidelines and set packaging rules for their suppliers. Therefore, buyers specify how their suppliers ship the goods. It is noted that the suppliers need to meet these requirements; otherwise buyers will no longer be working with them as sourcing partners.

**Role of Productivity**

Productivity is stated as important while selecting a sourcing partner, but not as important as infrastructure, product cost, and political/financial stability. The more suppliers
can produce, the lower buyers’ cost will be. The more productive suppliers are stated as being better sourcing partners.

Productivity is the result of investment and utilization. It is stated previously that China has made infrastructure, energy, education, and skill development investments. Therefore, respondents believe that Chinese workers tend to have better investment capital in them, whereas Haitian workers do not have such an investment. The Haitian workers are capable of being productive; however, because the country has not invested in stated areas, buyers noted that, because they are the investors, they need to make some investment in their manufacturers in Haiti. On the contrary, in China, buyers do not have to invest in these. Investment and support are noted as being part of government strategy in China, and as a result of this strategy, most of the Chinese factories are bigger and their productivity is higher compared to other nations.

**Role of Innovation**

Innovation is stated as necessary to move into the next level in terms of business and it is noted as being associated with the capabilities of suppliers. U.S. companies are always trying to get newer things. Innovativeness is more important to some buyers than it is to others. It is less important for some buyer companies that are developing their own products and looking for manufacturers those will manufacture what they are told. On the other hand, some companies that are looking for advanced service level and want their suppliers to take more responsibilities, study the market place, bring new product ideas to them, and therefore, for those kind of companies the importance of innovation is huge.
In order to be able to meet the requirements, suppliers need to be instrumental and help their buyers to figure out solutions, special techniques, new ideas in terms of better fabrics, and strategic ideas that increase the production efficiency. Respondents feel that the more innovative suppliers are better sourcing partners. Innovativeness is stated as being one of the competitive advantages that suppliers can possess. Respondents claimed that innovation is an area that companies can differentiate themselves among others and can deliver superior service to their customers. If a supplier is innovative, have some design capabilities itself, studies its product, and follows the trends, it can position itself to be a better business partner. Bringing in new ideas in design/fashion/color also helps suppliers to align with their customers’ corporate goals. In addition, the suppliers that seek different approaches to be more efficient in manufacturing and in energy usage will create competitive advantages for themselves over other suppliers.

According to the respondents, China has improved a lot over the last few years in apparel innovation, but has still a long way to go compared to Taiwan and Korea. As a result of their culture, Chinese suppliers are always trying to be better and therefore, they accomplished to help their buyers to come up with new ideas that are supportive for their buyers in the competitive market place.

Respondents think that innovation with regard to design is not in Haiti. They also noted that Haiti is not able to apply detail for the product. However, respondents believe that manufacturers in Haiti are willing to achieve improvements in these areas and they need some professional help.
Research Objective Three

Research objective three is designed to investigate strengths and weaknesses of Haiti and China as apparel sourcing partners for the U.S. market from U.S. buyers’ perspective. According to the findings, Central America and the Caribbean offer a degree of attractiveness for apparel that need faster lead time for quick replenishment. Some respondents indicated that the industry’s outlook is questionable, not only in Haiti, but also for the region as a whole. The Western Hemisphere is losing its competitiveness to Asia. Asia is indicated as more competitive in all aspects. China became a strong exporter because it is still able to sustain higher productivity and lower costs, whereas Mexico could not compete with China, in spite of being neighbors with the U.S. market.

It is indicated that input costs (materials) in Central America are too expensive compared to those in Asia. Many products do not even exist in Americas. Besides, it is stated that logistics from East to West have significantly improved while from South to North have not. Transit time from East to West is good in spite of the distance. (For example: 15 days for shipment from China)

Strengths of China as an Apparel Sourcing Partner

China is the leading textiles and apparel exporter in the world. It has the largest production capacity in cotton, manmade fiber and wool fabrics. For the apparel industry, China is the number one supplier and it is very difficult to compete with. China is perceived as to have the ability to sustain higher productivity and lower costs and therefore, they still can deliver products at competitive costs and quality. According to the respondents, Chinese manufacturers are experts in the full package concept which is initiated in China.
approximately 15 years ago. It is the leading investor in new and modern textile machinery. China is world’s largest importer of high-tech textile machinery. It is easy to get a variety of fabric in China unless it is a very specialized one. (For high-tech fabrics buyers prefer Korea and Taiwan.) China has a very good network of suppliers where buyers are provided with all types of yarn, knitting, weaving, dying, sewing, screen printing, embroideries, and packaging materials. It is also found to be very strong in accessories. It is cost competitive - their labor is relatively cheap -, the factories are fairly flexible, and a lot of factories are socially compliant. The country has excellent infrastructures. Respondents stated that China’s capabilities are among the best due to their experience in the apparel industry.

China has made great decisions on how to invest in infrastructure and how to invest in a national strategy. China strategically has invested in infrastructure probably more so than any nation in the world over the last 15 years. As a result, they have efficiency that most countries do not have. China’s efficiency makes it a very competitive country that has the ability to ship, distribute, manufacture, obtain products, and quickly get them in. Buyers believe that Chinese logistics infrastructure is more similar to those in Western countries, and advanced compared to other countries in Asia.

China has provided strong governmental and financial support for its textiles and apparel industries which means more state of the art equipment is available to support innovation and product improvements. China is stated as being very large nation with direction, infrastructure, stability, and purposefulness. China is very predictable, and much more developed nation. In China, the government is also found as very transparent.
The availability of raw materials for the apparel industry is also a strength for China, allowing Chinese manufacturers to reduce transit times from mills to the apparel assembly factories through fast shipment from local suppliers rather than fabric shipment from other countries.

In addition, China has made huge investments in education, operator training and skill development. With the improved (higher) labor wages and medical schemes for the workforce as of 2008, the factories have been forced to ‘work smarter’ and improve efficiencies through technology and equipment as opposed to the old concept of ‘throwing more bodies at the demand’. China has a large trainable and mostly educated workforce. In terms of sewing capabilities China is very advanced and more capable. Their handworks are stated as being more delicate compared to those supplied from other countries.

**Weaknesses of China as an Apparel Sourcing Partner**

The major weakness of China is stated as its geographical distance to the U.S. marketplace. It takes longer to ship due to its location to the U.S. Besides, logistics costs are found as being higher compared to those in other Asian countries. Language and traditional mindset are also stated as weak points of the country. Respondents noted that there may be some difficulties in doing business and they also feel that it takes some time to come to an agreement with Chinese suppliers because of their traditional way of thinking. Therefore, it is indicated that customer-supplier communications can be a problem in doing business with China.

In addition, lack of design / fashion capability of Chinese suppliers, and lack of smaller order sourcing from the country make China less competitive. Their limited design
capabilities are generally supported by foreign customers. In terms of product quality, respondents believe that there are also some problems in finishing and dyeing.

Previously, it is stated that China has a large trainable and mostly educated workforce. However, respondents said that there seems to be a trend of workers staying closer to their home places rather than travelling to South Eastern China to work in the factories. Therefore, areas like Shanghai and Beijing are experiencing high turnover and are struggling to retain good workers. Textiles manufacturing is starting to spread to West and North provinces / counties where the local governments are providing domestic companies incentives to start up factories as well as working to attract international investment to bring the textiles / apparel industry to their regions. In doing this, they are also seeking assistance with training and implementation of best practices / processes from their potential customers / partners. This means that there is a risk in being the first customer in any new factory, because they are inexperienced and this likely means many ‘hiccups’ during the start up process. Furthermore, rising wages and living costs in the future are seen to make China a less competitive apparel producer compared to other emerging Asian suppliers. Respondents stated that they would consider moving some of their production out of China as a result of rising labor and energy costs. China is seen to get too expensive for many apparel buyers to afford. Besides, respondents said that they are looking for more vertical options referring to suppliers that are able to manufacture both fabric and garment, rather than importing the fabric from another mill or another supplier. Moreover, it is stated that there are many other options outside of China with that regard. Respondents also noted that China can end up with a similar situation of U.S. apparel production in the long run.
Strengths of Haiti as an Apparel Sourcing Partner

Haiti’s natural proximity to U.S. marketplace is stated as being its main strength, especially when compared to Asian manufacturers. Because geographic proximity facilitates speed of delivery, its location to the U.S. market is seen as the main advantage of the country, particularly for quick replenishment. Ironically, despite having proximity as one of its prime comparative advantages against Asia, Haiti’s apparel manufacturers have focused on those products for which speed of delivery is least important.

Price, one of Haiti’s main advantages, relates directly to low wage rates. Wages are very competitive with most countries around the world. Among the respondents, Haiti is perceived as a good location for production of basic low end commodity products such as t-shirts, denim, hospital scrubs and uniforms, based on its low wages. Such products require few and simple assembly operations and change little in style from one season to the next. Slightly longer lead times are generally acceptable for these products, and demand is generally more predictable than for higher fashion products where speed of delivery is a critical factor.

Policy decisions regarding apparel trade play a role in determining where to source apparel products. Regional and bilateral free trade agreements have opened new markets and have influenced buyers’ sourcing decisions. U.S. legislations like HOPE I and HOPE II Acts are specific U.S. policy interventions designed to open markets to the U.S. for Haiti. These legislations give Haiti some opportunities for free apparel exports to the U.S.

In addition, Haiti is perceived to have good basic sewing skills. According to the respondents, the Haitian sewing operators have very good dexterity and having so, their skills
for sewing are very good. Respondents believe that if direction and leadership is provided to Haitian sewing operators, they can demonstrate great skills. It is believed that with proper training, the Haitian operators can be one of the best in the region.

Furthermore, although buyers are sourcing from Haiti because of low wage cost advantages, it is claimed that they source from Haiti for social responsibility reasons than to achieve an economic advantage. In other words, some of the respondents indicated that they are not extracting tremendous benefits or profits from their activities in Haiti, but they want to contribute to the improvement of one of the poorest countries in the world.

**Weaknesses of Haiti as an Apparel Sourcing Partner**

The primary weaknesses mentioned by interviewees are related to lack of logistics, and energy infrastructures, lack of local raw materials production, and lack of training at all levels. Specific weaknesses of the country listed include:

- **Lack of logistics infrastructure.** Respondents claimed that roads, ports, railroads, and airports are not sufficient in terms of numbers and quality to provide sourcing services. It is stated that shipment of items via truck freight from the Dominican Republic is totally a nightmare. There are quite a few ports in Haiti where ships can dock. The two main international ports, or ports that are officially opened to external trade, are the ports of Port-au-Prince and that of Cap-Haitien. This situation creates limitation for the country.

- **Lack of energy infrastructure.** According to the respondents, electricity is a huge problem in the country. It is indicated that electricity is very scarce and very expensive in the country. The national power grids are not reliable. Due to the unreliability of the grids, the
manufacturer companies rely on diesel-powered generators for backup power. Therefore, cost of energy comes out as a significant cost - next largest cost after labor- for Haitian manufacturers.

- Lack of communications infrastructure. Respondents indicated that although it is not a major weakness, there are some issues with the phone service. It is stated that calls are dropped when buyers attempt to call Haiti from the U.S. It is indicated that this situation creates an aggravation for the international business.

- Political instability. Companies are generally concerned about instability in Haiti. The Haitian government is found as being not transparent and predictable. It is indicated that there are not sufficient governmental investments to provide better infrastructure and education to support the industry in the country.

- Limited availability and training of middle management (including engineers and supervisors) and technical personnel (machine mechanics). Respondents indicated that there is a lack of understanding in efficiency, workplace design, and a lot of core industrial engineering issues, particularly at the middle management level.

- Poor operator training. It is indicated that lack of structured, in-house training programs for sewing operators in Haiti creates a weakness.

- Lack of primary textile production. The fact that Haiti does not have textiles – raw materials and textile facilities – is seen as a weakness for the country. At the end of the day,
Haiti is only a center for assembly as there are no mills, no weaving, and no spinning facilities.

- Negative image of the country regarding security. Respondents voiced their opinions about general security issues as well as cargo security. There are significant concerns about being able to travel safely and safety in the country. There are some perceptions of Haiti in the marketplace that it is unsafe.

- Lack of social compliance. Respondents indicated that very few manufacturer companies have compliance certifications such as WRAP and lack of social compliance is found to have a negative effect on the buyers – especially on the brands.

- High cost of accommodations for expatriate personnel living in Haiti over the long term.

According to most respondents, although Haiti's wages are perceived to be low (for example Haiti versus China), it is not helpful, and is in fact risky, to compare wages alone as productivity elsewhere is generally higher than in Haiti, materials are cheaper elsewhere (e.g., in China). Operating costs vary significantly from place to place but Haiti's are not low. Quality is a work in progress in Haiti and many factories do not have adequate standards or operating procedures in place.
Research Objective Four

Research objective four is designed to discuss the current situation of Haitian apparel assembly based on a case study in a single Haitian apparel production plant. In order to address this objective a case study was used to examine one of the largest Haitian apparel assembly plants. Phase I was designed to gain insight into the Haitian apparel production and the production quality levels.

Industry and Company Background

The apparel manufacturing industry transforms fabrics produced by textile manufacturers into clothing and accessories. The apparel industry traditionally has employed production operators who perform the cutting and sewing functions in an assembly line. Despite advances in technology and workplace practices, this industry remains highly labor-intensive. The industry increasingly contracts out its production to foreign suppliers to take advantage of lower labor costs in low-wage countries. Haiti is one of these sourcing countries that U.S. and other western nations import some of their apparel from. Currently, Haiti supplies mostly commodity t-shirts and sweatshirts and other simple apparel for the U.S. market. The challenge is improving the quality of the production processes and the quality of the finished product, building a viable and efficient supply chain, and maintaining the cost advantages.

Company X is one of the largest t-shirt assembly plants in Haiti. The company employs over 1700 workers - 1200 of which are sewing operators. The company receives cut-t-shirt parts from Dominican Republic and transforms these parts into apparel and
performs packaging operations. Ultimately, the company ships these assembled t-shirts to the retailer. Figure 20 shows the general workflow in the plant.

**Figure 20:** General Workflow  
(Source: Uluskan, 2010)

**Working Conditions**

The plant runs 10 hours a day and cannot run 24 hours due to energy problems and blackouts in the country. The productivity is negatively affected by the electrical power problems. The energy costs are found as very high due to dependency on the diesel-powered generators. Table 8 shows an example for the blackout hours in Port-au-Prince.

**Table 8:** Blackout Hours in Port-au-Prince  
(Source: Case Study Company Data)

<table>
<thead>
<tr>
<th>Month - 2009</th>
<th>Blackout Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>540</td>
</tr>
<tr>
<td>February</td>
<td>600</td>
</tr>
<tr>
<td>March</td>
<td>940</td>
</tr>
<tr>
<td>April</td>
<td>475</td>
</tr>
</tbody>
</table>

98
Sewing operators work 6-day, 60-hour weeks, and sit for long periods and lean over machines. Managerial and administrative support personnel typically work 5 to 6-day, 40-50 hour weeks in office settings, although some of these employees also may work longer hours. The production floors are noisy, have airborne fibers, hot and humid. The plant is slightly congested and poorly lit and ventilated. Production workers, including floor leaders and mechanics, spend most of their shifts on or near the production floor.

Production Floor

In order to gain a sustainable business in apparel manufacturing, it is important to improve merchandise quality, increase worker productivity, and increase the overall productivity.

Basic t-shirts require only simple stitching. Because of low margins, large volumes must be produced to maintain profitability or even meet the breakeven point. Producing apparel in large volumes causes a set of operating problems. Therefore, the plant is facing some quality and productivity problems. The causes for efficiency and quality problems can be many. Figures 21 and 22 show the possible causes for efficiency and quality with a main diagram and sub-diagrams. The challenge is to understand root causes and create efficient and sustainable production processes, improve the quality of the production processes and the quality of the finished product.

![Figure 21: Cause and Effect Main Diagram](Source: Uluskan, 2009)
Figure 22: Cause and Effect Sub-Diagrams for People, Method, Machine, Environment, Material and Other Causes
(Source: Uluskan, 2009)
Production and Modules

Logistics department receives containers in the yard and verifies them; then the containers are opened and checked in the plant. Cut bundles and supplies are sent to the production floor. The production is based on Modular Production System (MPS) which is a teamwork sewing system (Lin, Moore, Kincade, & Avery, 2002). In the production floor, the sewing operators work in teams and they are organized into 70 production "modules". The unit of work is a t-shirt.

Each operator in a module is trained to perform their specific operations required to assemble a t-shirt. Therefore, operators are not interchangeable among tasks within the team. This causes a production slowdown or stop in the absence of team members. In order to compensate these absent operators, there is a small number of staff who can perform all the sewing operations and can substitute the missing operators. However their number is not sufficient.

Components for t-shirts are fed into the workflow. Different machines are clustered into a team area, for an independent workflow. Components are passed by hand for the next operation. The t-shirt sewing operations performed by the operators are listed in Table 9.
Table 9: T-shirt Sewing Operations

<table>
<thead>
<tr>
<th>Operation sequence</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bundling</td>
</tr>
<tr>
<td>2</td>
<td>Hem Bottom</td>
</tr>
<tr>
<td>3</td>
<td>Close Shoulder</td>
</tr>
<tr>
<td>4</td>
<td>Set Collar</td>
</tr>
<tr>
<td>5</td>
<td>Top Stitch</td>
</tr>
<tr>
<td>6</td>
<td>Set Tape</td>
</tr>
<tr>
<td>7</td>
<td>Set Sleeve</td>
</tr>
<tr>
<td>8</td>
<td>Close Sleeve</td>
</tr>
<tr>
<td>9</td>
<td>Hem Sleeve</td>
</tr>
</tbody>
</table>

(Source: Case Study Company Data)

Figures 23 and 24 show the flow of operations and general module layout. Each module has 12-13 sewing machines.

Figure 23: Work Flow
(Source: Uluskan, 2009)

Figure 24: General Module Layout
(Source: Uluskan, 2009)

Each module is responsible for its own performance, and individuals usually receive compensation based on the team's performance. The performance of the modules varies due...
to different sewing skills of operators. The performance of the individual modules and the overall plant depends upon the production numbers. The efficiencies of the individual modules and the overall plant are calculated with the “target production numbers” and the actual production numbers of the plant. The plant is supposed to meet these “target production numbers” which are given to the plant manager monthly by the customer – i.e. the buyer company. These target numbers are determined by the customer in its other apparel suppliers’ plants in Honduras. This way of determination of the target numbers in a different manufacturing environment and a country is important to take into consideration. Although sewing operations do not vary from country to country and plant to plant, the capabilities, machinery, infrastructure, etc. can differ. Therefore, regardless of different manufacturing environments, it is not appropriate to determine and assign target numbers for production. This can cause a deception in the supplier’s real performance. The researcher used these calculated efficiency data in order to determine the production variations between the modules and to discuss the overall efficiency for the plant.

According to the module efficiency data calculated for six months, the average efficiency of the modules differs from 117% to 62%. Best 10 modules operate with at least 100% efficiency, whereas, the worst 10 modules operate at maximum 79% efficiency. Figure 25 shows the efficiencies of best 10 modules vs. worst 10 modules. It can be easily seen that the efficiency highly differs between the individual modules.
Figure 25: Efficiency of Best 10 Modules vs. Worst 10 Modules
(Source: Case Study Company Data)

Figure 26 shows the comparisons between the current average efficiency calculated according to the target numbers, the average efficiency of top 10 modules, the average efficiency of worst 10 modules and the efficiency of the best module. This fluctuation of the efficiency numbers between the modules may be caused by mainly insufficient operator training and lack of operator motivations.
One of the main causes of efficiency fluctuations between the modules is cycle time - necessary time to sew a finished product – differences. After the researcher determined the best and worst modules, and the overall module ranking, she conducted a time study among different modules selected. Table 10 shows the time study results. The time study conducted for the selected modules shows that there is a time variation between and within the modules. The time needed to sew a t-shirt varies among the modules - cycle times differ from module to module. In addition to cycle time fluctuations between the modules there is also time inconsistency within the modules. The skills, experience and motivation of the operators are found as the primary causes of this situation. The time differences within the modules cause bottlenecks among the sewing operations and affect the overall productivity of the individual modules.
Table 10: Time Study Results

<table>
<thead>
<tr>
<th>Module</th>
<th>Production 1</th>
<th>Production 2</th>
<th>Production 3</th>
<th>Production 4</th>
<th>Production 5</th>
<th>Production 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Time (min)</td>
<td>Time (min)</td>
<td>Time (min)</td>
<td>Time (min)</td>
<td>Time (min)</td>
<td>Time (min)</td>
</tr>
<tr>
<td>W20</td>
<td>01:22:00</td>
<td>00:49:59</td>
<td>00:48:59</td>
<td>01:25:00</td>
<td>00:49:21</td>
<td>01:15:00</td>
</tr>
<tr>
<td>W21</td>
<td>01:40:00</td>
<td>01:22:00</td>
<td>00:48:59</td>
<td>01:25:00</td>
<td>00:49:21</td>
<td>01:15:00</td>
</tr>
<tr>
<td>W22</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
</tr>
<tr>
<td>W23</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
</tr>
</tbody>
</table>

(Source: Uluskan, 2009)

As stated previously, the production cycle time and output quality differences between the modules caused productivity fluctuations, whereas, the time differences within the modules caused bottlenecks. The major reasons for different output levels of the operators can be summarized as experience, training, motivation, and the overall performance level of the individual modules.

In addition to efficiency fluctuations of individual modules, the overall production rates of the plant are also found unstable. As mentioned earlier, the plant manager is the production manager as well and he assigns the production numbers to the production floor. These production targets are determined and given by the buyer company. The plant is facing many operating problems causing production fluctuations. Figure 27 shows a visual depiction of the daily production data for six months from January to July 2009. Zero productions were caused by non-working days - holidays. Looking at the production data for six months, it can
be seen that the production rate fluctuates daily. The causes of the overall production fluctuations go back to the efficiency discussion. The main reasons of this inconsistency are found as quality problems and machinery breakdown.

![Graph of Monthly Production Data for 6 Months](source: Case Study Company Data)

**Figure 27:** Monthly Production Data for 6 Months (# of boxes per day)

In order to assure the constant flow of materials, and production rates, it is important to control and manage the processes on the floor. This requires middle management skills. In the plant, there is one production engineer who is responsible both for the whole production floor operations as well as training of the operators. This situation points a need for employing additional middle management staff, including industrial and production engineers, and trainers. The engineer is assisted with “floor leaders” whose aim are to make sure that everything regarding quality is working well on the floor and know when a module has a quality problem. There are also “mechanics” who are responsible for making machine
repairs. Mechanics are under pressure to fix equipment quickly because breakdowns usually stop or slow production. In addition to making repairs, mechanics help install new machines and change the position of the machines. Mechanics have limited knowledge of the machine parts and repairs.

The overall production numbers depend upon the individual module outputs. An example of hourly production data for 10 modules in a particular working day in June is shown in Figure 28.

![Hourly Production Rate of the Modules](source: Case Study Company Data)

Observing the hourly production rate of the modules, it can be seen that many of the individual module productions go down to zero within the day. After interviewing some of the operators, the floor leaders and the production engineer, it is found that many of these production interruptions are caused by mechanic problems. Therefore, it is important to pay more attention to the machine maintenance and to the training of machine
mechanics/technicians. When Plant In-House Maintenance Plan is examined, it is found that the cycle time for the machine maintenance of a particular module is 10-13 weeks which is very long.

**Analysis of Theoretical Efficiency**

In order to calculate the time necessary to sew a single T-shirt—cycle time—, the workflow is drawn as in Figure 29. It helped researcher to understand the critical path and the critical operations for the production line.

![Workflow Diagram](image)

**Figure 29: Workflow**
(Source: Case Study Company Data)

According to the given standard times by the customer, “cycle time” of one module is calculated and this number is used to calculate the theoretical numbers. Table 11 shows the calculated efficiency for six months.
Table 11: Calculated Theoretical Efficiency According to Standard times

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>2805</td>
<td>4235</td>
<td>0.662338</td>
</tr>
<tr>
<td>February</td>
<td>3310</td>
<td>4235</td>
<td>0.781582</td>
</tr>
<tr>
<td>March</td>
<td>3228</td>
<td>4235</td>
<td>0.76222</td>
</tr>
<tr>
<td>April</td>
<td>3091</td>
<td>4235</td>
<td>0.72987</td>
</tr>
<tr>
<td>May</td>
<td>3610</td>
<td>4235</td>
<td>0.85242</td>
</tr>
<tr>
<td>June</td>
<td>3564</td>
<td>4235</td>
<td>0.841558</td>
</tr>
<tr>
<td></td>
<td>Mean Eff.</td>
<td></td>
<td><strong>0.771665</strong></td>
</tr>
</tbody>
</table>

(Source: Case Study Company Data)

It can be seen that as well as the production rates the overall efficiency fluctuates. The real production numbers cannot meet the theoretical numbers. The average efficiency is calculated as 77% for six months. Figure 30 presents a visual depiction of the efficiency fluctuation for six months.

![Efficiency Diagram](image)

Figure 30: Monthly Calculated Efficiency
(Source: Case Study Company Data)
Research Objective Five

Research objective five is designed to discuss the current Haitian apparel production quality level based on the case study.

Current Haitian Apparel Production Quality

In order to meet the required quality specifications, the plant has different procedures regarding inspections. These quality inspections include incoming, in line inspections and three levels of inspections including internal inspection, internal audits and external audits after production. In line inspections are ignored and skipped most of the time due to efficiency and performance concerns of the individual modules. The production numbers are considered as more important than the quality levels of the goods. Figure 31 shows the inspection steps in the plant.

- In line inspection
- Internal inspection
- Internal Audit
- External Audit (By Customer)

**Figure 31: Inspection Levels**  
(Source: Case Study Company Data)
In line inspection is supposed to be conducted by sewing operators within the module, whereas the internal inspection is conducted by in line inspectors just after the production line. Internal audits are done more professionally by the internal auditors. External audits are conducted by the external auditors who are the buyer company’s employees. There is 95% RFT (Right the First Time) target and AQL (Accepted Quality Level) should be 1.5% for the external audits. When the quality audit data is observed it can be seen that the AQL numbers for internal audits are far above the target value – 1.5% - with an average value of 8%.

Figures 32 and 33 depict the fluctuations for internal quality audit data in May and June.

**Figure 32:** AQL for Internal Audits in May  
(Source: Case Study Company Data)
After three sets of internal inspections and audits after production, external audits are implemented. Figure 34 shows the AQL for external audits in June. It can be seen that the average AQL number, which is 3%, double the given target number – 1.5%.

Figure 33: AQL for Internal Audits in June  
(Source: Case Study Company Data)

Figure 34: AQL for External Audits in June  
(Source: Case Study Company Data)
Figure 35 shows the RFT levels for June which are very far below the target number - 95% - as well. The average RFT level is found as 87.97%. Given both the internal and external AQL levels, RFT levels for external audits, and their comparisons to target numbers, it can be indicated that inline inspection which is supposed to be done by operators should be conducted. The quality level is an expected result of the direction, which is to produce more, given to the sewing operators and to the inline inspectors; the machinery maintenance; and the conditions of the working environment.

![Graph showing RFT levels for June](image)

**Figure 35: RFT Levels for External Audits in June**
(Source: Case Study Company Data)

As a result of these quality deficiencies and high level of internal audit AQL numbers, 11% of total external audits are failed and returned for repair. Therefore, the whole production floor has an average of 20 Returns in a day, for each of those repair time is calculated approximately as 29 minutes. Daily total external audits conducted vs. total failed
Audits can be seen in Figure 36. When necessary calculations were done, it is found that approximately 10 hours are lost for the apparel repair in each day. This number is huge for a plant that has numerous inspections and this issue needs to be addressed. These numbers of returns are caused by quality deficiencies.

**Figure 36: Total External Audits Conducted vs. Total Failed Audits**

*June 2009 Data*  
*(Source: Case Study Company Data)*

It is important to increase the quality levels and eliminate internal and external audits to be more productive and competitive in the marketplace. In order to understand the types of defects and their percentages in the total, Pareto Charts are created with the data compiled for two months. Figures 37 and 38 show the defect types and their related numbers for May and June.
It can be easily seen that “untrimmed thread” is the most frequent defect in the production. Both in May and June “untrimmed thread” remains as the main defect with

Figure 37: Pareto Chart for Defect Types in May
(Source: Case Study Company Data)

Figure 38: Pareto Chart for Defect Types in June
(Source: Case Study Company Data)

It can be easily seen that “untrimmed thread” is the most frequent defect in the production. Both in May and June “untrimmed thread” remains as the main defect with
overall 20%. According to the interviews and discussions conducted with the engineer and floor leaders, “untrimmed thread” is found to be a mechanical problem at the very base. At the inspection level, it is also found that internal inspectors tend to forget to cut excessive treads.

“Dirt” follows “untrimmed thread” and is another important problem for the production. The causes of this defect are found as fabric, working habits of the operators and buffer areas / tools in the production line. In the production line, finished pieces are placed over stools. These finished pieces tend to fall down easily from these stools and they get dirt from the ground. It is observed that many of the “dirt” defects are caused by this situation.

Research Objective Six

Research objective six is designed to identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

As indicated in previous sections, Haiti possesses three important advantages against its competitors: low labor cost, proximity to the U.S., and free trade opportunity with HOPE Acts. U.S. buyers consider numerous factors when making their sourcing decisions. Currently, Haiti’s apparel sector relies on its competitive labor costs to drive high volume / low margin business in the low end, commodity products segment. Haiti’s apparel industry is failing to exploit their advantageous proximity to the U.S. and important duty-free advantages.

Review of the major sourcing considerations put forth by buyers interviewed and the findings about the Haitian apparel assembly attained in the case study helped the researcher
to suggest key intervention points in Haiti’s apparel industry that fall into two major categories: 1) Steps to be taken by the Haitian government and 2) Steps to be taken by the Haitian manufacturing companies.

**Steps to be Taken by the Haitian Government**

In order to be competitive in the global marketplace, political and economical stability of the sourcing countries are very important criteria considered by the buyers. Creating a good public image is one of the key factors that accelerate creation of viable business partnerships. Therefore, it is essential to build a predictable and transparent governmental structure in the sourcing countries. Haiti should build a strong transparent image of the country by sustaining economical and political stability. In order to attract foreign investment, Haiti should also undertake major public relations campaign to communicate this predictable and transparent image of the country to foreign investors and buyers.

In addition to the predictable image of a country, positive image regarding general security issues also facilitates creating strong relationships with buyers and investors. Therefore, investing in its security infrastructure could help Haiti to be able to attract foreign investment and to create more viable business relationships with other countries. Furthermore, investing in cargo security to allow safe travel to/from factories as well as ports at all hours could help Haiti to build a competitive advantage as an apparel sourcing partner.

In today’s global economic environment, it is important for countries to provide a high-quality education for its people. In order to be competitive, investment in education system is necessary. Haiti could provide a more qualified workforce by investing in high
schools, community colleges and colleges. Building community colleges for apparel workforce could lead a significant increase in the quality of the goods produced and in the overall productivity of the apparel factories in Haiti. Furthermore, supporting private education can help to improve the education. Therefore, creating partnerships with private sector in education could also generate better education opportunities for Haitian workforce at all levels. Besides, creating and improving partnerships with also donor community and research & development companies could lead to establish a better education system in Haiti.

In addition to the education system, upgrading the health system is also necessary in order to provide a better workforce. Haiti should improve its health system and invest in water sanitation in that regard. Creating and improving partnerships with also donor community to establish a good health system and build new hospitals, could help the country to built better health system and provide a better workforce.

In order to be competitive in the global supply chains, it is essential to provide a solid physical infrastructure for logistics. Therefore, considering Haiti’s insufficient infrastructure, it should invest in / built up ports, highways, railroads, and airports. Partnerships with international and private companies could also help to invest in physical infrastructure. In addition to providing sufficient infrastructure for sourcing, Haiti should provide reduced costs particularly in the ports to improve the port utilization. Besides, providing industrial discounts would be very constructive in terms of creating new global supply chain partnerships. Furthermore, a better logistics infrastructure will allow overnight delivery services to improve their services and this will result in improved relationships between the Haitian suppliers and their buyer companies. By building required infrastructure Haiti can
attract foreign investment and take advantage of its geographical proximity to the U.S. marketplace.

Viable and reliable energy infrastructures are vital for the industries. Since Haiti’s national power grid is unreliable, most of the apparel manufacturing factories rely on the diesel-powered generators for backup power. Therefore, providing sufficient electrical power for the industry could result in reduction of the energy costs for the industry. It is important for Haiti to invest in its electrical energy production and grids to achieve a viable and competitive apparel industry as a source market. Partnerships with international and private companies can be helpful in terms of energy infrastructure investments in the country. Besides, providing reduced costs for the energy and introducing industrial discount for power could also result in creation of better opportunities for the apparel industry. As a result, a reliable national power supply encourages alternative work schedules – i.e. multiple shifts – that will enable factories to be more productive with their existing assets.

In order to be able to be in touch with the suppliers, communications is a necessity in the global supply chains. Haiti should provide sufficient communications infrastructure considering its limitations in phone service and internet. Also, creating partnerships with donor community to get assistance could facilitate establishing these sufficient and sustainable infrastructures in Haiti.

In order to be competitive as an apparel sourcing partner, it is necessary for Haiti to provide incentives for investments that will lead improved production quality and efficiency including equipment upgrades. Governmental supports for investment in machinery, services, and company based-infrastructure can facilitate changes on both product and service mix. In
In order to identify optimal product/service mix based on Haiti’s competitive advantages, technical assistance can be provided to apparel factories by the government with partnering international/professional research & development and consulting companies.

In order to expand the service capability of the country in terms of sourcing, Haiti needs to move into full package supply. This can be accomplished through governmental funding for private apparel factories to build sourcing relationships with key raw materials producers in Asia and in Americas. Besides, governmental incentives for building primary textiles production – yarn, fabric, accessories, and dyeing, finishing – can facilitate to satisfy raw material needs of garment sector through low prices. Therefore, governmental incentives are critical to create a viable full package supply in the country. The governmental support for the current “apparel industry training and full package center project” is important to create base training and provide full package service that will lead a competitive advantage for Haitian apparel industry. Therefore, government of Haiti can facilitate partnerships with U.S. apparel buyers by supporting the “training center” which aims to train sewing operators in newest equipment, and train technical, supervisory staff, and middle/upper management in newest and efficient methods of production and service and also the “full package center” which aims to be a one-stop supplier/shopping center for apparel buyers.

It can be also helpful to offer incentives for investment in value-added processes and services to increase the current overall service level for sourcing. Besides, governmental incentives for development of efficient apparel clusters can be very supportive for the industry to attract new foreign investors for new industrial zones.
Steps to be Taken by the Haitian Manufacturing Companies

In this ever-expanding world of globalization, most companies are trying to identify their strengths and weaknesses relative to other players regarding production, efficiency, cost structure, resources, experience and quality, to thrive/succeed. By focusing on their strengths and outsourcing their uncompetitive processes, companies can improve performance and redirect their growth positively. However, the Haitian apparel manufacturing companies should primarily focus on improvement in their manufacturing, should create strong aspects of their work and should be more competitive in their core area – assembly, apparel production- and then outsource their uncompetitive processes such as primary textiles production to other manufacturing companies. Since cost, reliability of delivery, product quality, full-package sourcing, lead time and flexibility are among most important criteria for sourcing decisions, Haitian manufacturing companies should first focus on improvements in every aspect of their production activities.

First of all, because apparel manufacturing depends upon human labor, it is necessary to improve basic areas such as primary education and health system. In order to have a better workforce and to be more efficient in terms of manufacturing, the industrial/private sector engagement in governmental activities and incentives can be helpful to support the education and health system in Haiti.

Second, in order to be competitive, it is stated that it is critical to expand the current customer service level. Better service level refers to provide better delivery times, better product quality, better communications, solutions/ suggestions to the problems, improved relationships with the customers and provide full package service. These can be achieved
through creating a global mindset at all levels in the companies in terms of business. Therefore, Haitian manufacturing companies should develop understanding of world-class sourcing to provide better service. It is also necessary to develop an understanding of lean manufacturing and quality to be more efficient in all activities starting with the production. It is essential to have industrial engineering perspective and develop industrial engineering capabilities in that regard. Therefore, employing industrial engineers for ongoing efficiency monitoring and for improvement is critical. Besides, it is important to improve the working environment by considering ergonomics and investing in ergonomics starting with operator seats. In the eye of the buyers - especially for the brands- it is also very important to work with socially and environmentally compliant suppliers. Therefore, Haitian manufacturing companies should attain compliance certifications such as WRAP to attract more customers by providing a better working environment and work benefits to their employees as well as being environmentally sustainable. Furthermore, providing a full package service can lead to a competitive advantage. Haitian manufacturing companies can build partnerships with the primary textile producers and also can build partnerships with the “full package center” that the donor community will be building in Haiti.

It is also critical to upgrade equipment, processes, and management systems to enable change of product / service mix to better exploit Haiti’s advantages and meet higher-margin market needs. In order to prevent most of the product defects, modernization of the equipment through capital investment is crucial for the Haitian manufacturing companies. Therefore, investments that will result in improved production efficiency and quality
including equipment upgrades, and introduction of enhanced information technology play an important role to be competitive for the Haitian apparel manufacturers.

Since training is one of the considerable factors for improvement, skills enhancement training of existing and new employees and staff - operators, mechanics, floor leaders, and middle management - is critical to build production efficiency. More structured training for the sewing operators will lead better quality in the production providing higher turnover. Moreover, undertaking cross-training of existing and new employees can result in increased quality levels, decreased rework, and production flexibility. Also, cross-trained teams can lead to the elimination of internal inspections, since the team is more knowledgeable about all the operations, is able to understand the defects easily and fix them immediately, rather than have the finished goods checked by another individual at the end of the production line. The team can take the ownership for the quality and just go to an audit for their work. This will also increase the efficiency; because they find the defects and get them fixed immediately rather than continue to produce more defective parts and have many parts to repair at the end, and work-in-process is reduced. Cross training can also facilitate move to other garment styles as well.

In order to have all these trainings, it is also necessary to have deep understanding of structured training. Therefore, participating in “training center” activities to get technical assistance in terms of operator training, proper cross-training, industrial engineering, lean manufacturing, quality assurance, information management, and logistics will definitely help the manufacturing companies to have better training for their employees and the staff and ultimately, help to reduce waste and increase their productivity. Since production efficiency
is one of the competitive advantage variables, Haitian manufacturing companies can benefit hugely from these training efforts.
CHAPTER V
CONCLUSIONS AND SUMMARY

Summary

The purpose of this research is to investigate the competitiveness of the Haitian apparel supply chain for the U.S. market vs. the Chinese supply chain. The guiding conceptual framework for the research is the House of TQM by Noriaki Kano (2006). This model is used to develop necessary criteria for the competitiveness in the supply chains. The study addressed governmental, infrastructural, and educational issues and the role of quality, productivity and innovation in the supply chains. The study also discusses the current situation of Haitian apparel assembly using on a case study of a single Haitian apparel assembly plant to be able to discuss the Haitian apparel production quality level. The study is intended to identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

Summary of Results

Research objective one. To investigate the basic criteria for selecting an apparel sourcing location from the U.S. apparel buyers’ perspective.

According to the study, political and social atmosphere in the country, price, quality, infrastructure, delivery time, flexibility, overall service, social and environmental compliance, availability of the products are among the most important criteria for sourcing decisions.
Research objective two. To investigate the importance / role of the following criteria in the Haitian vs. Chinese source market from the U.S. apparel buyers’ perspective.

1) Governmental
2) Infrastructural
3) Educational
4) Quality
5) Productivity
6) Innovation

**Governmental issues.** Political stability plays an important role in the sourcing decisions. Besides the transparency and the predictability of the government, good legal structure regarding doing business is found as an important factor affecting the sourcing decisions. Moreover, general image of the sourcing country in terms of social environment and safety has an impact on buyers’ sourcing equation. Although it is indicated as not being the final determiner, governmental support for the apparel industry in sourcing country make it easier to do business and make products flow better. The governmental decisions, policies, and the execution of these affect buyers’ desire and ability to source from a country. Furthermore, cost of energy, labor costs, and duty expenses are among the important factors to be taken into consideration in sourcing decisions.

In terms of governmental stability, China is found very stable and transparent, whereas, Haiti is indicated as unstable and not predictable. General image of China is stated as positive and many of the Chinese manufacturers are indicated as socially and environmentally compliant. China is also found as a secure place to do business. On the other
hand, in spite of the political and security improvements achieved, Haiti suffers from having an image as an unsafe country. In terms of social compliance Haiti is also found as far behind China with a few WRAP certified factories. In terms of governmental initiatives for its apparel industry China is indicated as very competitive whereas Haiti only has a few free-trade legislations. Considering energy costs, even though cost of energy is rising in China and has affected buyers’ overall costs, it is seen as much higher in Haiti. Although Haiti seems to have an advantage over China regarding labor costs, buyers stated that they would not consider low wages as an advantage because of absence of other critical factors offset this advantage. Considering duty expenses Haiti is seen to have a slight advantage over China, because there are some options under zero duty programs – HOPE legislation.

**Infrastructural issues.** Logistics, energy and communication infrastructures are among important criteria in terms of sourcing decisions. Logistics is indicated as one of the most important criteria, because successful sourcing activities depend upon viable shipments. This can be achieved through superior logistics infrastructure. Considering logistics, delivery time is found as very important for fashion goods, whereas for basic items it is not that critical. Besides, overnight delivery company services are stated as important for the supplier-buyer relationships. In order to be able to improve these services, satisfactory logistics infrastructure of the country plays an important role. Energy infrastructure is also indicated as important to be able to have a sustainable manufacturing environment in the country. Moreover, because communications is critical in supply chain businesses, it is stated as the basic requirement. Different ways of communications such as internet, phones,
satellite, and teleconference, are important for data and information exchange among companies in the supply chains.

Considering logistics, energy and communications infrastructures, China is found as great and much more advanced compared to other countries in Asia. On the other hand, Haiti is indicated as having many problems in terms of especially logistics and energy infrastructures. Regarding logistics infrastructures, Haiti is currently stated as in the bottom 10 of the world rankings. Haiti is also indicated to have very unreliable national power grid. In terms communication infrastructure, some connection problems with the phone services are raised by the buyers.

**Educational issues.** Primary education is listed among the least important factors to consider when sourcing decisions are done, because buyers believe that it is not necessary to have a formal education to be good apparel sewing operator. On the other hand, job training is found as imperative, even more depending on whether a worker has primary education or not. Even though Chinese government provides necessary support and infrastructures to help its people be educated and trained, there were some contradictory comments on Chinese worker training. Several respondents stated that Chinese training is not sufficient whereas other respondents indicated that China far exceeds other manufacturer countries in worker training and skill development. Therefore, training depends upon the companies. On the other hand, Haiti is found as having poor training activities regarding workers, mechanics and middle management.

**Quality issues.** Quality has a huge effect on sourcing location decisions. Quality goes underneath the educational component and depends upon the extent to which the operators
are developed and trained. It also depends on the machinery. Chinese product quality is indicated as to be improved over the last decade and stated as one of the best depending upon the product categories, whereas, Haiti is also found satisfactory in terms of product quality due to its basic garment offerings. However, as Haiti moves into different products, that will be more challenging for them to provide the required quality. In terms of packaging quality, buyer companies stated that they determine packaging guidelines and rules for their suppliers.

**Productivity issues.** Although productivity is stated as not important as infrastructure, price, quality, and political stability while selecting a sourcing partner, production efficiency is seen as one of the competitive advantage variables for supplier companies. Because China has invested in infrastructure and skill development, Chinese manufacturers tend to have better productivity levels, whereas Haiti is not capable of being productive enough.

**Innovation issues.** Innovation is stated as necessary to be able to compete in the global marketplace and it is indicated as being related with the capabilities of the suppliers. Innovation is found as less important for some buyer companies that are developing their own product designs and are looking for manufacturers that carry out only what they are told. On the other hand, some companies that are looking for advanced service level want their suppliers to take more responsibilities and bring in new ideas, and therefore for those buyers the role of innovation is huge in their sourcing equation. China is indicated is very good in terms of innovation but still has a long way to go compared to Taiwan and Korea. On the other hand, innovation with regard to design is not in Haiti. Besides, it lacks the capability to apply detail for the product.
Research objective three. To investigate strengths and weaknesses of Haiti and China as apparel sourcing partners for the U.S. market from U.S. buyers’ perspective.

China. For the garment industry China is the number one supplier. It is the greatest importer of high-tech textile machinery. It is very easy to get a variety of fabric unless it is a very specialized one. China has a very good network of suppliers where buyers can get yarn, knitting, weaving, dying, screen printing, embroideries, and packaging materials. It is cost competitive, the factories are fairly flexible, and many of the factories are socially compliant. China has excellent infrastructure. Moreover, investments in education, worker training and skill development are among its strengths.

On the other hand, the major weakness for China is its geographical distance to the U.S. In addition, logistics costs are found as higher compared to those in other Asian countries. The language and traditional mindset are also among China’s weaknesses. Furthermore, lack of design & fashion capability and lack of small order sourcing make Chinese manufacturers less competitive. Besides, rising wages, energy and living costs are among the weaknesses of the country.

Haiti. Haiti’s geographical proximity to the U.S. market is its major strength. Despite having proximity as one of its prime competitive advantages against Asia, Haiti’s garment manufacturers have focused on those products for which speed of delivery is least important. Price, one of Haiti’s main advantages, relates directly to low wages. Haiti is a good location for production of basic low end commodity products such as t-shirts, denim, hospital scrubs and uniforms. HOPE legislations give Haiti some free trade opportunities with U.S.
On the other hand, the lack of logistics and energy infrastructures, lack of local raw materials production, and lack of training at all levels are found as primary weaknesses of Haiti. Besides, lack of communications infrastructure, political instability, limited availability and training of middle management, poor operator training, negative image of the country regarding security, lack of social compliance, and high cost of accommodations for expatriate personnel living in Haiti over the long term are among other weaknesses of the country to be addressed.

**Research objectives four and five.** To discuss the current situation of Haitian apparel assembly based on a case study in a single Haitian apparel production plant and to discuss the current Haitian apparel production quality level based on the case study.

Producing a garment in large volumes causes a set of operating problems. Therefore, the plant is facing many quality and productivity problems. The plant depends upon the given target numbers by the customer company. These numbers may not be suitable for our plant in concern, because these target number are determined in another country, under different working conditions with different level of training for operators. Although they have modular production system in the plant, the production and the quality audit numbers are found as unstable. The number of defects and daily returns are huge in spite of the number of internal inspections that the finished products pass through. It is also found that they cannot meet the given quality targets. The limited operator training and limited availability of middle management are also found as critical regarding the overall productivity. The limited understanding in efficiency, lean manufacturing, workplace design, and a lot of core industrial engineering issues starting with ergonomics are among major concerns to be
addressed in the plant. The energy costs are found as very high due to dependency on the diesel-powered generators. The productivity is also negatively affected by the electrical power problem where instead they could have used several shifts for production. The machine downtime and the number of defects that depend upon the machinery are also found as important issues. Besides, limited knowledge of mechanics about the machine repairs is addressed.

**Research objective six.** To identify necessary steps to be taken for supply chain improvement by the Haitian government and the leading apparel manufacturing companies operating in Haiti.

Basically, the improvements in logistics, energy and communications can make a huge difference in terms of being competitive in apparel sourcing. Improved logistics infrastructure will help the country to use its geographical proximity advantage to the U.S. market. In addition to the improvements in these infrastructures, political stability would help to maintain country’s current supply chain partnerships and to create new and viable ones. Besides, providing better health and education system can also facilitate to have a better and more equipped workforce leading to increased productivity and competitive advantage as well. Governmental support for the apparel industry in any sense would also help Haitian manufacturers to be able to compete in the global marketplace. Also, governmental incentives and support for the apparel industry to move into full package supply would create a great advantage for the country. Over the long run, governmental initiatives and capital investments for the primary textile production should also be considered for the availability of the raw materials.
On the other hand, it will be helpful to create a global mindset for service at the manufacturer level. A more structured training for operators would increase the productivity and increase the quality levels. The availability of well-trained technical personnel and middle management can create better workflow leading to increased productivity and quality as well. Understanding and implementation of industrial engineering issues are also important in the production floors. Participating in the training activities that are provided by professional companies can help them to have better skills, fully-trained worker pool and middle management, and technical talent. Furthermore, the Haitian manufacturers should attain social and compliance certifications such as WRAP to attract foreign apparel customers.

**Conclusions**

Haiti offers a degree of attractiveness for apparel that need a fast lead time for quick replenishment due to its natural proximity to the U.S. market. In order to create viable and competitive apparel sourcing market in Haiti, critical items that must be addressed are: political stability of the country, predictability of the government, overall infrastructure, proper training at all levels, and developing a global mindset. Haiti needs to have the potential to attract foreign direct investment. Political stability and predictability would help to maintain country’s current supply chain partnerships and to create new and viable ones in that regard. It is clear for the country to develop its physical infrastructure as well as its energy infrastructure to survive against Asian suppliers, and ultimately create a competitive advantage in the apparel sourcing market. Haitian manufacturers can benefit from decreased costs and increased productivity through reliable national energy grids and industry discounts.
for power. Regarding job training, the “training center” which will be built by TC2 with U.S. government grant, should be a part of Haitian apparel industry workforce education. By subsidizing it, Haitian government should execute this center rather than relying on foreign investment in the long run.

Considering Haiti’s strengths and abilities, the researcher suggests that Haiti should stay the course and continue to manufacture basic items such as t-shirts, denim, hospital scrubs and uniforms, about which the Haitian manufacturers have better knowledge. After skill development processes through structured trainings at all levels - i.e. operators, machine mechanics, technical personnel, and middle management-, lean manufacturing should be implemented throughout the factories to improve overall productivity. Investment in machine upgrades and proper maintenance will result in reduction of downtime, mechanical breakdown and scrap on the production lines, providing increased productivity and quality levels for the manufacturers. In addition, reduction of the defect levels, and understanding of their own capabilities and best practices can help Haitian manufacturers to achieve higher quality and productivity levels and as well as higher profit margins. As a result of these efforts, overall customer service levels will increase. Better understanding of the manufacturing environment and customer needs will definitely create strong relationships with buyers leading to creation of competitiveness. Achieving these, Haiti can gradually move into higher quality, higher priced products. The ability to supply fashion goods for which speed of delivery is critical and the ability to source in small amounts can differentiate and position Haitian apparel industry as a quick and viable sourcing partner as opposed to China. In addition, by moving towards to a full package supply, Haiti can attain a
competitive advantage as an apparel source market in the region. Starting with similar
sourcing countries to compete, Haiti should seek to become a viable alternative to China in
the long run, as Haitian manufacturers start to source for brands and retailers.

**Future Research**

Future studies could assess whether current findings can be generalized across all the
Central America and Caribbean apparel sourcing markets. Opportunities for these countries
as being sourcing markets could be addressed. The competitiveness of these countries vs.
Asian manufacturer countries could be investigated.

Further research could be conducted on how U.S. brands, U.S. retailers, and sourcing
agents manage their supply chains. The study could use a larger sample of retailers and
brands who source throughout the world – or both Western Hemisphere and Asia.

Future studies also could be conducted on a specific apparel segment in terms of
sourcing strategies, competitive advantages and costs and comparing the suppliers in the
Western Hemisphere vs. in Asia for this apparel segment.
REFERENCES


APPENDICES
APPENDIX A: Interview Questionnaire For Brands and Manufacturers

General

Do you currently import apparel from China/ Haiti?

If yes, what do you import? Can you tell me what percentage of your apparel is imported from this country?

What are the criteria for selecting a sourcing location?

  - What are the governmental criteria?
  - What are the infrastructural criteria?
  - What are the educational criteria?
  - What are the product / service quality criteria?

What are China’s strengths / weaknesses as an apparel sourcing partner?

What are Haiti’s strengths / weaknesses as an apparel sourcing partner?

Where do you see China in a few years as a sourcing partner? In 10 years?

Where do you see Haiti in a few years as a sourcing partner? In 10 years?

What would you suggest Haiti to improve its apparel sourcing sites? Any governmental and companywide improvement suggestions?

What should Haiti change in order to be competitive as a sourcing site in the global market place?

Would you consider Haiti as an apparel sourcing partner – as full package supplier or a replenishment partner because of its proximity?
Governmental

- How does political stability of a country affect your decision for selecting a sourcing partner?
  o What do you think about Haiti’s/China’s political stability?

- How does the general image of a country affect your decision for selecting a sourcing partner?
  o What do you think about the general image of Haiti/China as a place to do business?

- How do governmental initiatives for the apparel industry in the sourcing country affect your relationships with your partners in that country?
  o What do you think about China’s/Haiti’s governmental initiatives?

- What do you think about trade agreements between U.S. - China/U.S. - Haiti? Do you benefit from them?

- What do you think about cost of energy in China/Haiti?

- What do you think about wages in China/Haiti?

- What do you think about duty expenses for China/Haiti?

- Among the government related issues which are most important to you?
Infrastructural

- How does logistics infrastructure of a country affect your decision for selecting a sourcing partner?
  - What do you think about Chinese/Haitian logistics infrastructure – its ports, roads, railroads, airports -?

- How does delivery/lead time affect your decision for selecting a sourcing partner?
  - What do you think about Chinese/Haitian lead times?
  - Is proximity important for faster delivery?
  - What type of apparel do you prefer to source from China / countries in the Western Hemisphere? (fashion goods, basic goods)

- How does communications infrastructure affect your decision for selecting a sourcing partner?
  - What do you think about Chinese/Haitian communications infrastructure?

- How does delivery reliability affect your decision for selecting a sourcing partner?
  - What do you think about Chinese / Haitian delivery reliability?

- What do you think about government’s role in shaping these infrastructures?

- Are there any other key infrastructures missing in the country (China, Haiti)?
Educational
- How important do you think primary education for workers is?
  - What do you think about primary education of Chinese/ Haitian workers?
- Do you think that worker/employee training is important?
  - What do you think about Chinese/Haitian worker training?
- What do you think about government’s role in shaping education?

Quality
- How does product/apparel quality affect your decision for selecting a sourcing partner?
  - What do you think about Chinese / Haitian product quality?
- How does packaging quality affect your decision for selecting a sourcing partner?
  - What do you think about Chinese/ Haitian packaging quality?
- Is it better to have full package suppliers? Why?
- How does full package supply quality affect your decision for selecting a sourcing partner?
  - What do you think about Chinese/Haitian full package quality?
- How does price including total cost production, logistics and duty expenses affect your decision for selecting a sourcing partner? Is this the first criteria to look at or do you consider quality in the first place?
- How do product availability, product range and sewing capability affect your decisions?
What do you think about Chinese / Haitian product availability, product range and sewing capability?

**Productivity**

Do you think that productivity is important when selecting a sourcing partner from a country?
- How does productivity affect your decision/relations with your partners?
- What do you think about Chinese / Haitian apparel productivity?

**Innovation**

Do you think that the innovativeness of companies in a country is important when selecting a sourcing partner from that country? Why?
- What are the advantages of sourcing from innovative partners?
- What do you think about Chinese / Haitian innovativeness?

**Final**

Is there anything else that you would like to add that you believe is important in managing your supply chain in foreign countries (China/Haiti)?
APPENDIX B: Interview Questionnaire For Research Center

General

What type of apparel does U.S. import from China? What percentage of the total apparel import is imported from China?
What type of apparel does U.S. import from Haiti? What percentage of the total apparel import is imported from Haiti?
What is the total apparel export of Haiti per year?
- Within the last 10 years?
What are the criteria for selecting a sourcing location?
  What are the governmental criteria?
  What are the infrastructural criteria?
  What are the educational criteria?
  What are the product / service quality criteria?
What are China’s strengths / weaknesses as an apparel sourcing partner?
What are Haiti’s strengths / weaknesses as an apparel sourcing partner?
Where do you see China in a few years as a sourcing partner? In 10 years?
Where do you see Haiti in a few years as a sourcing partner? In 10 years?
What would you suggest Haiti to improve its apparel sourcing sites? Any governmental and companywide improvement suggestions?
What should Haiti change in order to be competitive as a sourcing site in the global market place?
Governmental

- How does political stability of a country affect buyers’ decision for selecting a sourcing partner?
  - What do you think about Haiti’s/China’s political stability?

- How does the general image of a country affect buyers’ decision for selecting a sourcing partner?
  - What do you think about the general image of Haiti/China as a place to do business?

- How do governmental initiatives for the apparel industry in the sourcing country affect buyers’ relationships with their partners in that country?
  - What do you think about China’s/Haiti’s governmental initiatives?

- What do you think about trade agreements between U.S. - China/U.S. - Haiti? Do buyers benefit from them?

- What do you think about cost of energy in China/Haiti?

- What do you think about wages in China/Haiti?

- What do you think about duty expenses for China/Haiti?

- Among the government related issues which are most important to you?
Infrastructural

- How does logistics infrastructure of a country affect buyers’ decision for selecting a sourcing partner?
  - What do you think about Chinese/Haitian logistics infrastructure – its ports, roads, railroads, airports -?

- How does delivery/lead time affect buyers’ decision for selecting a sourcing partner?
  - What do you think about Chinese/Haitian lead times?
  - Is proximity important for faster delivery?
  - What type of apparel do buyers prefer to source from China / countries in the Western Hemisphere? (fashion goods, basic goods)

- How does communications infrastructure affect buyers’ decision for selecting a sourcing partner?
  - What do you think about Chinese/ Haitian communications infrastructure?

- How does delivery reliability affect buyers’ decision for selecting a sourcing partner?
  - What do you think about Chinese / Haitian delivery reliability?

- What do you think about government’s role in shaping these infrastructures?

- Are there any other key infrastructures missing in the country (China, Haiti)?


**Educational**

- How important do you think primary education for workers is?
  
  - What do you think about primary education of Chinese/ Haitian workers?

- Do you think that worker/employee training is important?
  
  - What do you think about Chinese/ Haitian worker training?

- What do you think about government’s role in shaping education?

**Quality**

- How does product/apparel quality affect buyers’ decision for selecting a sourcing partner?
  
  - What do you think about Chinese / Haitian product quality?

- How does packaging quality affect buyers’ decision for selecting a sourcing partner?
  
  - What do you think about Chinese/ Haitian packaging quality?

- Is it better to have full package suppliers? Why?

- How does full package supply quality affect buyers’ decision for selecting a sourcing partner?
  
  - What do you think about Chinese/Haitian full package quality?

- How does price including total cost production, logistics and duty expenses affect buyers’ decision for selecting a sourcing partner? Is this the first criteria to look at or do you consider quality in the first place?

- How do product availability, product range and sewing capability affect buyers’ decisions?
What do you think about Chinese / Haitian product availability, product range and sewing capability?

**Productivity**

Do you think that productivity is important when selecting a sourcing partner from a country?

- How does productivity affect buyers’ decision/relations with their partners?

  - What do you think about Chinese / Haitian apparel productivity?

**Innovation**

Do you think that the innovativeness of companies in a country is important when selecting a sourcing partner from that country? Why?

- What are the advantages of sourcing from innovative partners?

- What do you think about Chinese / Haitian innovativeness?

**Final**

Is there anything else that you would like to add that you believe is important in managing supply chains in foreign countries (China/Haiti)?