

INVESTIGATING THE ISSUES AND CHALLENGES IN GLOBAL DISTRIBUTION OF CHEMICALS

SANTANU MANDAL*

*Doctoral Research Scholar,
Faculty of Operations,
IBS, Hyderabad.

ABSTRACT

Due to the increased globalization and innovative technologies helping in more and more efficient and timely distribution of intermediate products, there has been a tremendous boost in the existing competition between firms to apply newer and innovative solutions to their tactical as well as strategic problems involved in the distribution of their products. Logistics i.e., the movement of goods across the various points of their supply chain or the distribution network have always been the focal point of experimentation of application of innovative strategies by the firms so as to gain sustainable competitive advantage. The advent of IT has opened newer ways and routes of distribution by enhanced information sharing thereby promoting trust and mutual cooperation for maintaining an efficient distribution network. Now chemical handling has always been a critical activity at various junctions of the distribution network. Proper knowledge of handling coupled with emergency safety procedures are of utmost importance in any chemical distribution network. Two issues are crucial nowadays (a) managing different forms of risk arising out of absence of trust, lack of communication and other similar factors and (b) designing and implementing sustainable practices across the distribution network. So in this purview, this paper makes an attempt to review the various issues and challenges involved in the global distribution of chemicals.

KEYWORDS: Chemical handling, Risk Management, Sustainable Practices, Global Distribution.

I. INTRODUCTION

During the last decade with the evolution of technology and other allied developments, firms have got a boost in developing their products and making the same ready for their customers both local and global. Now days firms are competing on a global platform where the operations of any chemical firm are now spread over a wide geographic area and spanning continents. Previously firms used to compete with each other based on prices and market segmentation and other similar dimensions but now they have shifted their competition focus into a different paradigm. The chemical firms are now concentrating like other product firms on efficiently and effectively managing their supply chain starting from manufacturer, wholesaler and retailer to the final customer. Since nowadays optimizing supply chain operations has become the new competitive priority, hence firms are finding newer and newer ways of operating their supply chain. In doing so, they have to pay attention to a host of factors like safety of their personnel, minimum environmental damage etc. As nowadays environmental safety has also become the

prima facie factor for each and every industry; for the chemical sector it's the most important discussed area of concern. Several rules and regulations are being developed frequently so as to provide minimum damage to our environment. For this several regulatory bodies also have been set up particularly in the area concerning chemical handling and associated safety. A brief summary of the existing such bodies can be enunciated as below:

STRATEGIC APPROACH TO INTERNATIONAL CHEMICALS MANAGEMENT

(SAICM): This initiative was adopted at the International Conference on Chemicals Management (ICCM), which took place from 4–6 February 2006 in Dubai gathering Governments and intergovernmental and non-governmental organizations. It defines a policy framework to foster the sound worldwide management of chemicals. This initiative covers risk assessments of chemicals and harmonized labeling up to tackling obsolete and stockpiled products. Are included provisions for national centres aimed at helping in the developing world, train staff in chemical safety as well as dealing with spills and accidents. SAICM is a voluntary agreement. A second International Conference on Chemicals Management -ICCM2- held in May 2009 in Geneva took place in order to enhance synergies and cost effectiveness and to promote SAICM's multi-sectorial nature.

GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS):

The "Globally Harmonized System of Classification and Labelling of Chemicals" (GHS) proposes harmonized hazard communication elements, including labels and safety data sheets. It was adopted by the United Nations Economic Commission for Europe (UNECE) in 2002. This system aims to ensure a better protection of human health and the environment during the handling of chemicals, including their transport and use. The classification of chemicals is done based on their hazard. This harmonization will facilitate trade when implemented entirely.

STOCKHOLM CONVENTION: The Stockholm Convention is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). It entered into force, on 17 May 2004, and over 150 countries signed the Convention. In May 2009, nine new chemicals are proposed for listing which then contained 12 substances.

ROTTERDAM CONVENTION: The objectives of the Rotterdam Convention are: (a) to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; (b) to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties. The text of the Convention was adopted on 10 September 1998 by a Conference in Rotterdam, the Netherlands. The Convention entered into force on 24 February 2004. The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure.

BASEL CONVENTION: The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is a global environmental agreement on hazardous and other wastes. It came into force in 1992. The Convention has 172 Parties and aims to protect

human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other wastes.

MONTREAL PROTOCOL: The Montreal Protocol was a globally coordinated regulatory action that sought to regulate ozone depleting chemicals. 191 countries have ratified the treaty.

USA: The Environmental Protection Agency (EPA) of the US has announced that the chemicals management laws will be strengthened. It will initiate a comprehensive approach to enhance the current chemicals management program including: New Regulatory Risk Management Actions Development of Chemical Action Plans, which will target the risk management efforts on chemicals of concern Requiring Information Needed to Understand Chemical Risks Increasing Public Access to Information About Chemicals Engaging Stakeholders in Prioritizing Chemicals for Future Risk Management Action.

Chemicals are regulated under various laws including the Toxic Substances Control Act. In 2010, Congress was considering a new law entitled the Safe Chemicals Act.

EU: Chemicals in Europe are managed by the REACH (Registration, Evaluation and Authorization and Restriction of Chemicals) and the CLP (Classification, Labelling and Packaging) regulations. Specific regulations exist for specific families of products such as Fertilisers, Detergents, Explosives, Pyrotechnic Articles, Drug Precursors.

II. LITERATURE REVIEW

Supply chain management thereby embraces a new way of organizing and running business and relationships with the different members and partners of the supply chain. (Lambert, Cooper, & Pagh, 1998; Lambert & Cooper, 2000). But the existing literature finds rare consensus regarding the scope and depth in matters of definition and understanding of the supply chain and allied topics (Mentzer et al., 2001; Burgess et al., 2006; Stock & Boyer 2009; Stock, Boyer, & Harmon, 2010). According to the works of Li, Ragu-Nathan, and Ragu-Nathan (2005) and Li, Ragu-Nathan, Ragu-Nathan, and Rao (2006) SCM practices can be enunciated as a set of activities being executed so as to publish the efficient and effective management of its supply chain. The studies in SCM practices can be categorized into the following general themes: (a) identification of activities or actions related to SCM at manufacturing companies in different countries (Basnet, Corner, Wisner, & Tan, 2003; Halley & Beaulieu, 2010); (b) categorization and validation of constructs for SCM practices (Tan, Lyman, & Wisner, 2002; Li et al., 2005); (c) verification that the adoption of SCM practices affect company performance (Tan et al., 2002; Li et al., 2006; Zhou & Benton, 2007; Chow et al., 2008; Robb, Xie, & Arthanari, 2008) and (d) verification that the characteristics of the industrial sector can affect the adoption of SCM practices (Jharkharia & Shankar, 2006). The existing literature depicts some of the major findings related to factors influencing the adoption of SCM practices: the role of contextual factors such as the company's position in the chain, its field of operation (economic sector) and size (Li et al., 2005, 2006; Halley & Beaulieu, 2010); the industrial sector (Jharkharia & Shankar, 2006); and the relationship between SCM practices and elements of the operational capacity portfolio (Hsu et al., 2009), such as competitive priorities (Zhao & Lee, 2009). According to Zhao and Lee (2009), competitive priorities (CP) are an important factor influencing the adoption of SCM.

They define CP of production (cost, quality, flexibility and delivery) as operational capabilities, which are the competence of the production function to achieve company strategy. Studies related to CP in the manufacturing and automotive sector find a significant relationship between suppliers and manufacturers competitive priorities and practices (Salles, Vieira, Vaz, & Vanalle, 2010). Competitive priorities (CP) choices (Maia, Cerra, & Alves Filho, 2005) and the company's focal strategy (Demeter, Gelei, & Jenei, 2006) are related to its SC configuration and practices. In identifying the factors that affect SCM practices, the literature emphasizes contextual factors such as size of the company, position in the supply chain, field of operation; the industrial sector; and operational capacities or competitive priorities (CP) particularly related to production. Several studies (Li et al., 2005, 2006; Halley & Beaulieu, 2010) have drawn attention to the effect of contextual factors such as size, position and field of operation on the adoption of SCM practices. Some research has already studied the relationship between the company size and SCM. The lack of comfortable fit between small and medium size enterprises (SME) and SCM practices has been affirmed by several studies (Quayle, 2003; Arend & Wisner, 2005), unless they are adopted in conjunction with large customers (Quayle, 2003) or key partners (Arend & Wisner, 2005). Thakkar, Kanda, & Deshmukh (2008) also verified differences between large and small and medium enterprises in terms of key SCM practices. With regard to the position in the SC, Harland (1997) and Li et al. (2005, 2006) affirm that the company's position in its main chain differentiates it in terms of performance. Having a short literature survey, therefore we are in a position to discuss the major issues and challenges affecting the global distribution of chemicals. Having a short literature survey, therefore we are in a position to discuss the major issues and challenges affecting the global distribution of chemicals.

III. DISCUSSION OF ISSUES & CHALLENGES

1. INFLUENCE OF INFORMATION TECHNOLOGY

With the advent of Information technology ,many things in the sphere of day to day operations of the manufacturing firms have been revolutionized. Nowadays as the chemical firms are expanding operations to low cost destinations; it has become imperative for the firms to realize the fact that IT can help in realizing many benefits across the supply chain and hence firms should consider the option of making its supply chain members and partners ready so that they are able to take the full advantage of the information technology thereby leading to successful information sharing thereby fostering trust, mutual cooperation and transparency across the supply chain members.

2. PROPER MATERIAL HANDLING

Since all the nodal points in a chemical supply chain enunciates proper and careful handling of the intermediate products, every chemical firm should ensure that all its supply chain members and partners along with their working counterparts at the grass root level are well aware of the material handling procedures and safety precautions. Else serious catastrophe can take place at any moment and the same can be too costly for the firm as well as for the surrounding environments. Occasionally it has been found that there exists wide disparity in awareness level across the various supply chain partners because of the diversity in climatic as well as other allied geographic conditions because the chemical supply chain of today's major firms are

dispersed across wide geographic areas. So firms must take proper care for the training of its supply chain members so as to make them aware of the emergency procedures as well as the ambient working conditions for the intermediate as well as the final products.

3. COPING WITH THE LANGUAGE BARRIER

With the emergence of the low cost destinations for outsourcing; many firms are now looking towards these destinations for outsourcing many of their in house activities. But their arises several problems like misunderstandings, miscommunication, wrong interpretation due to the wide disparity in languages used across supply chain members and partners which ultimately leads to or results in losing efficiency in supply chain operations. In order to alleviate the above problem, firms should try to maintain a common language for maximum communication across its members and work forces and in doing so it should take proper steps so as to impart training to the concerned workforce and members.

4. OVERCOMING THE CULTURAL BARRIER

Due to the fact that the various parts of a chemical company's supply chain lies across several geographic regions having people with varying tastes ,preferences and lifestyles; it's evident that the cultural beliefs and value system also differs considerably. So in order to maintain uniformity and efficiency in operations across the various nodes of the supply chain ,every firm has to take necessary steps so that the above mentioned language barrier can be minimized to the extent possible and this will itself help to lessen the cultural barrier therefore facilitating timely information exchange which can lead to significant cost savings by spreading the information and interpreting in the manner in which it would expected to be thereby increasing efficiency and effectiveness of supply chain.

5. BRIDGING THE TECHNOLOGY GAP

Due to the difference education system and allied beliefs and value system prevailing across different geographic regions; the readiness for technology acceptance are also different for different supply chain members and partners as they are dispersed across several geographic regions. Thus the difference in the skill set and training level has a great bearing in making the relevant people of any particular region tech savvy. So for any chemical firm having a lengthy supply chain and that too spread across wide geographic regions has to take this situation into priority and should organize frequent training sessions so as to bring all its supply chain members and partners on a common platform because then only whenever any new technology arrives; the same can be implemented quickly and its benefits can be realized to its full potential across the entire supply chain.

6. ENVIRONMENTAL RULES AND POLICIES

With the emergence of technologies, danger to the environment has also increased which has led to the growth and formulation of new policies, legislations and regulations at frequent intervals and all this made every firm to think of how to maintain its quality standards in its products while providing minimum damage to the ad-joint environment at the same time. This is quite a tough situation for all chemical firms because environmental protection is the highly growing

area of concern especially with the chemical industries because both the usage and disposal of chemical is a critical issue.

IV. CONCLUSION

Through the above study a modest attempt has been made to review a little bit existing literature on supply chain management followed by a brief discussion of the major issues and challenges involved in the global distribution of chemicals. This provides the future motivation to study in depth the issues specific to the different types of the chemical. industries existing throughout the world having their operations and distribution globally.

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