PERFORMANCE OF LOGISTICS SECTOR IN AIZAWL CITY

(A DISSERTATION SUBMITTED FOR THE AWARD OF THE DEGREE OF MASTER OF PHILOSOPHY IN ECONOMICS)

BY

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CERTIFICATE

This is to certify that the dissertation entitled, "**Performance of Logistics Sector in Aizawl City**" by Lalhlimpuia has been written under my guidance. This dissertation is the result of his investigation into the subject and was never submitted to any other University for any research degree.

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DECLARATION

MIZORAM UNIVERSITY

2018

I, Lalhlimpuia, do hereby declare that the subject matter of this dissertation is the record of work done by me, that the contents of this dissertation did not form the base of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the dissertation has not been submitted by me for any research degree in any other University/ Institute.

This is being submitted to the Mizoram University for the degree of Master of Philosophy in Economics.

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(LALHLIMPUIA)

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LIST OF ABBREVIATIONS

CLM	:	Council of Logistics Management
1 PL, ..., 5 PL	:	First Party Logistics, ..., Fifth Party Logistics
BI	:	Business Intelligence
CAGR	:	Compound Annual Growth Rate
EoDBI	:	Ease of Doing Business Index
FIATA	:	International Association of Freight Forwarders
GDP	:	Gross Domestic Product
GFP		Global Facilitation Partnership for Transportation and Trade
GST	:	Goods and Service Tax
IATA	:	International Air Transport Association
ICT	:	Information and Communication Technology
IT	:	Information Technology
LEADS	:	Logistics Ease Across Different States
LIS	:	Logistics Innovation System
LPI	:	Logistics Performance Index
MoCI	:	Ministry of Commerce and Industry
NAFTA	:	North American Free Trade Agreement
NH	:	National Highway
OECD	:	Organisation for Economic Co-operation and Development
PCA	:	Principal Component Analysis

1.1: INTRODUCTION

Due to the differences in resource endowments and production capabilities of different regions, goods that people want to consume cannot always be produced where people want to consume them. Or these goods may not be accessible when people want to consume them. Food and other commodities are only available in abundance at certain times of the year. Lack of transportation and storage facilities had always hamper early people to consume what they want where and when they want.

Even today, in some areas of the world consumption and production take place only within a very limited geographic region. Striking examples can still be observed in the developing nations of Asia, South America, Australia, and Africa, where some of the population live in small, self-sufficient villages, and most of the goods needed by the residents are produced or acquired in the immediate vicinity. Few goods are imported from other areas. Therefore, production efficiency and the economic standard of living are generally low. In this type of economy, a well-developed and inexpensive logistics system would encourage an exchange of goods with other producing areas of the country, or even the world (Ballou, 2006).

1.2: LOGISTICS DEFINITION

The word logistics was first used in military organisations. Military forces have always been very effective in maintaining inventories, supply and

delivery of goods. The term later finds usage beyond military organisations and now logistics management is often used synonymous to supply chain management in business world as well as literature,

1.2.1: Some Definitions of Logistics

- According to the Council of Logistics Management (CLM), the leading edge professional organisation in the field; Logistics is a part of the supply chain process for planning, implementing, and control of effective and productive two way movement and storage of materials, services and information flow within the supply chain from the production of the products up to the consumption point of end use in order to meet the requirements of customers.
- The American Council of Logistics Management defines logistics as "the process of planning, implementing and controllinnng the efficient, cost effective flow and storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customers' requirements".
- Philip Kotler defines logistics as "planning, implementing, and controlling the physical flows of materials and finished goods from point of origin to point of use to meet the customer's need at a profit".

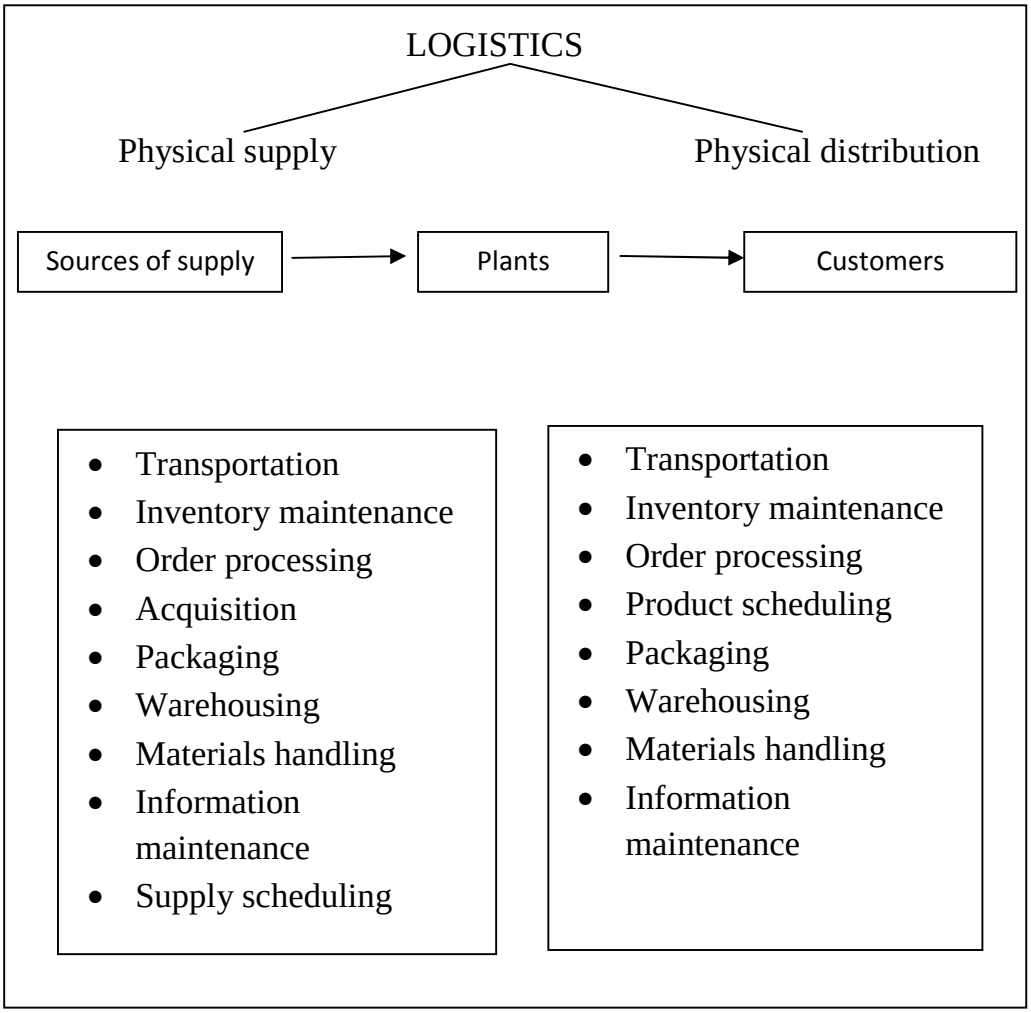
Logistics is all pervasive. Some excellent examples of value adding logistics services are:

1. Dabbawalas of Mumbai: Reliable, foolproof logistics system of delivering lunch boxes to over 5,00,000 office goers every day without letting the wrong lunch box reaching the wrong office and also ensuring the boxes reach on time.
2. The Indian Postal Services: One of the largest logistics network in the world today, which delivers letters in the most cost effective manner across six lakhs villages, one hundred and twenty cities and several thousand towns covering the length and breadth of the country within twenty-four to forty-eight hours and serving more than hundred and seventy countries with Indian source stations/ customers and/or destinations.

Logistics is a collection of functional activities (transportation, inventory control, etc.), which are repeated many times throughout the channel through which raw materials are converted into finished products and consumer value is added. Because raw material sources, plants, and selling points are not typically located at the same places and the channel represents a sequence of manufacturing steps, logistics activities recur many times before a product arrives in the marketplace. Even then, logistics activities are repeated once again as used products are recycled upstream in the logistics channel (Ballou 2006).

The components of a typical logistics system are: customer service, demand forecasting, distribution communications, inventory control, material handling, order processing, parts and service support, transportation, warehouse and storage, packaging and salvaging. Logistics activities of a single market supply chain can be shown with the following figure:

Figure 1.1: Logistics Activities of a Single Supply Chain



1.2.2: Objectives of Logistics

Logistics performs with the following objectives.

- **Reduction of inventory**: Enterprises have to maintain a large inventory of goods, if they were to satisfy the needs and requirements of all the customers. But maintaining such large inventory is difficult and costly. One has to be concerned about the loss in product value with time and the capital requirement of maintaining such large inventory of items. Logistics helps in maintaining inventory at the lowest level but still achieving the customer goal. This is done through small, but frequent supplies.
- **Economy of freight:** Selection of proper mode of transport, consolidation of freight, route planning, long distance shipments etc. can reduce freight and transport cost significantly.
- **Reliability and consistency in delivery performance:** Reliability in terms of deliveries as per orders placed in terms of quantity, quality and timing is the core item of logistics service.
- **Minimum damage to products:** damages caused during transit due to bas packaging, false handling, lack of specialised equipments, etc adds to logistics cost. These

damages can be reduced with specialised skills and equipments.

- **Quicker and faster response:** By utilizing the latest technologies in processing information and communication, logistics sector can help fulfil customer requirements, in the shortest possible time frame.

1.2.3: Activities of Logistics Sector

Lambert et al. (1998) identified the following major logistics activities.

- Customer service
- Traffic and transportation
- Warehousing and storage
- Plant and warehouse site selection
- Inventory management
- Order processing
- Logistics communications
- Procurement
- Materials handling
- Packaging
- Demand forecasting
- Parts and service support
- Salvage and scrap disposal
- Return goods handling

} Reverse Logistics

In addition to these listed, are the freight forwarding and customs clearance activities that are key to logistics operations. Depending on the products and services that a company supplies, it may consider some, or all, of these logistics activities core to its business, or of a less strategic nature. Yet, all of these activities are important to most supply chains and the manufacturing sector. Stock and Lambert (2001) provided the following definitions for some of these activities in greater detail.

- **Traffic and transportation:** *The traffic and transportation activity refers to managing the movement of products and includes activities such as selecting the method of shipment (air, rail, water, pipeline, or road, or a combination thereof), choosing the specific route also known as routing, complying with various local, provincial and national transportation regulations and being aware of both domestic and international shipping requirements. (Stock & Lambert, 2001).* Transportation may be the most important factor in logistics activities. It accounts for a major portion of total logistics cost.
- **Warehousing and storage:** *Warehousing can be defined as that part of a company's logistics system that stores products (raw materials, parts, goods-in-process, finished goods) at and between point-of-origin and point-of-consumption, and provides information to management on the status, condition, and disposition of items being stored. Warehousing therefore*

supports the time and place utility of goods by allowing an item to be produced and held for later consumption. (Stock & Lambert, 2001). Warehousing has developed into one of the most important component of logistics service due to the pattern of demand and consumers' expectations. It also helps in reduction of logistics cost.

- **Inventory management:** *Inventory management involves trading off the level of inventory held to achieve high customer service levels, with the cost of holding inventory which includes capital tied up in inventory, variable storage costs, and obsolescence. (Stock & Lambert, 2001).* Inventory management is particularly important when the enterprises cannot manage inventory because of shortage of fund as well as management skills.
- **Order processing:** *Order processing includes the systems used by an organisation to receive orders from customers; check on the status of orders and communicate with customers regarding orders; as well as actually filling the order and making it available to the customer. Part of the order processing system therefore is the checking of inventory status, customer credit, invoicing, and accounts receivable. (Stock & Lambert, 2001).* Order processing time and accuracy have a significant impact on

customer perception of service, and consequently, customer satisfaction.

- **Procurement:** *Procurement, or purchasing and supply management, is the purchase of materials and services from outside organisations to support the company's operations from production to marketing, sales and logistics. Procurement includes activities such as supplier/provider selection, negotiation of price, terms and quantities, and quality assessment. As organisations form longer-term relationships with fewer key suppliers/providers, procurement continues to grow in its importance and contribution to the organisation. (Stock & Lambert, 2001).* Procurement connects the end users with the sources of products and completes the supply chain.
- **Packaging:** *Packaging provides advertising, marketing, protection and storage for goods. (Stock & Lambert, 2001).* Apart from safeguarding the products while being transported and stored, packaging helps in ease of storing and handling of items. Moreover, packaging can be used to advertise and promote the products in the markets.
- **Parts and service support:** *Parts and service support, or after-sale service support, provides repairs, spares and parts to dealers, and ensures the collection of defective or malfunctioning products from customers, and responding quickly to demands for*

repairs. (Stock & Lambert, 2001). The parts and service support activity is very important to customers, for whom the time spend in waiting, as a result of production stoppages or delays caused by awaiting repairs, can be extremely costly.

- **Salvage, scrap disposal and return goods handling:** *Salvage and scrap disposal together with return goods handling is often referred to as reverse logistics. It is an element increasingly receiving management attention, particularly as the concern for recycling and reusable packaging grows, and considering the complexity and high cost of return goods handling. (Stock & Lambert, 2001).*
- **Forwarding and clearing:** *Freight forwarders typically purchase transportation capacity from carriers in bulk and sell it to their network of shipping clients, earning a fee based on the spread between the purchased transportation cost and the price sold to a shipping client. A freight forwarder is a classic example of a non-asset based third-party logistics provider which thus by definition does not own the logistics assets and instead contracts out to execute client's logistics needs. (Sopher, et al. 2002)***.** Freight forwarders are an example of Third Party Logistics Providers who purchase transport service from carriers and sell it to their network of clients, earning a fee for their service. They do not necessarily have transport vehicles, but they

specialise in providing the cheapest, appropriate and accurate mode of transport as per the needs

In summary, these are the major logistics activities which are very crucial in the supply chain management. These activities may be outsourced or maintained by the manufacturing companies. But due to the very nature and importance of these logistics sector activities, firms may choose to see through these activities or may outsource these activities by letting the logistics sector to take care of it.

1.2.4: Logistics Strategies or Types of Logistics Providers

Logistics service requirements for different customers are different. As mentioned above, most companies, firms and producers often choose to outsource their logistics requirements to professional logistics providers (PLs). Thus there is a need to identify what strategies are used by these logistics firms in order to choose among the different types of logistics providers according to their requirements. Although third party logistic (3PL) is a common term known to umbrella other types of outsourced logistic providers (PLs), it can be confusing to understand what each term means and how the various types of logistics provider differ. Here are the most prominent logistic strategies used in the market today.

1. **1PL (First Party Logistics):** First Party Logistics are the manufacturer or supplier shipping the goods that directly benefit from the consignment of goods. Specifically, a First Party Logistics

provider is the consigner of their products or marketer of the products who themselves send the goods.

2. **2PL (Second Party Logistics):** Second Party Logistics are the carriers of goods in transact. Mode of transport may be rail, road, sea and/or air. Second Party Logistics providers specialise in the transportation role in the supply chain management. They are usually the owners of the transport machines like trucks, ships, aircraft, etc. Second Party Logistics providers can vary in size from small local freight carriers to global freight carrying companies.
3. **3PL (Third Party Logistics):** Third Party Logistics providers, apart from concerning with transportation of goods from a consigner to a consignee, involves in other additional services. The services can include warehousing, terminal operations, customs brokerage, supply chain management, Logistics IT software products and analysis services and track and trace.
4. **4PL (Fourth Party Logistics):** Fourth Party Logistics providers usually oversee the supply chain of their business partners (companies and industries). A 4PL can also manage 3PLs. Sometimes they are called the Lead Logistics Provider. In an essence 4PLs measures the efficiencies and effectiveness of the 3PLs, whose services are utilised by their consulting firms and manage the whole contracts.

5. **5PL (Fifth Party Logistics):** 5PL is a new term circulating within the supply chain industry. Its functions are closely similar to that of 4PLs except that 5PLs manage supply chain networks with an extensive e-business focus across all logistic operations, other than 3PLs and the parent company.

The present scenario of demand and supply schedule, which is largely dominated by consumer's preferences, has made it difficult for manufacturers to meet all the requirements of their consumers. Thus the role and importance of Third Party Logistics Providers and above has increased immensely in the supply chain.

1.3: IMPORTACE OF LOGICTICS PERFORMANCE MEASUREMENT

The Logistics sector has become a leading industry which plays an important role in social and economic development. Nowadays, the globalization of the economy and the deepening of social division labour have led logistics sector an important component in the planning of economic strategies and gradually cause for concern. Thus the interaction between logistics and economic growth has also become a research spot. Logistics is important in supply chain because it creates value – value for customers and suppliers of the firm by defining value in terms of time and place. Products or services have little or no value unless they are in the

possession of customers when and where they want to consume them. (Ballou, 2006). It also provides a large employment opportunity to people with different skills and a stable employment to unskilled labour as well. Ballou highlighted the importance of logistics management in today's economy into the following points. These points also reflect why a good logistics performance measurement is needed for decision makers.

1. **Costs are significant**

According to the International Monetary Fund, logistics costs average about 12 percent of the world's gross domestic product. Examples of logistics costs within individual economies show variation. Depending on the particular industry, logistics costs may range from 4 percent of sales (pharmaceuticals) to over 30 percent of sales (food and food products). It has been noted that for many firms, after the cost of goods sold, logistics represents the highest cost of doing business. (Ballou, 2006). The cost of logistics can greatly influence profit level of the firms. With the increasing trade across boundaries, countries that have cost-efficient logistics sector will simply have competitive advantage over its competitors.

2. **Globalization of industries**

The trend is towards an integrated world economy. Firms are seeking, or have developed, global strategies where either their products are designed for a world market; produced wherever the low-cost raw materials, components, and labour can be found, or they simply produce locally and

sell internationally. In both cases, supply and distribution lines are stretched, as compared with the producer who wishes to manufacture and sell locally. (Ballou, 2006). Logistics sectors are the lifeline of industries that provides the necessary raw materials and distributes the finished products. A country or a region devoid of smooth functioning logistics sector cannot exploit its full potential in industrial development. It is important to find out the weaknesses and strength of each functions of the supply chain to devise appropriate industrial development policies.

3. Logistics is important to strategy

Firms spend a great deal of time finding ways to differentiate their product offerings from those of their competitors. When management recognizes that logistics impacts on a significant portion of a firm's costs and that the result of decisions made about the supply chain yields different levels of customer service, it is in a position to use this information effectively to penetrate new markets, increase market share, and increase profits. (Ballou, 2006). Thus for any enterprises, it is important to know the impact of logistics processes on one's decision to make proper planning on further development actions.

4. Logistics is key to customer service

Research over the years has shown that logistics variables are dominant in the minds of customers when they evaluate the service offerings for a product. Frequently, one-half of the customer service variables are logistics

related and delivery time typically ranks the highest among all service variables. (Ballou, 2006). The level of customer satisfaction and consumer surplus is influenced significantly by the performance of logistics sector because goods are only valuable when they are in possession. This is most important for firms and companies who wish to gain loyalty of their customers, other than maintaining quality of their products, to frequently measure and analyse their performance in terms of logistics management that the expectations of the customers are met.

5. **Customers increasingly want quick customized response**

Customers have been increasingly expecting quick response to their demands. In addition, improved information technology and flexible manufacturing systems have led the marketplace towards mass customization. Rather than consumers having to accept the “one size fits all” philosophy in their purchases, suppliers are increasingly offering products that meet individual customer needs. This has placed growing demands on production and logistics systems to achieve ever higher performance levels. (Ballou, 2006).

To summarise, smooth logistics sector performance enhances critical decision making in business strategy of any commercial entity and promotes manufacturing sectors. It also contributes to business objectives of meeting customers’ expectations and enlargement of market. Enhancement such business performance in total have a strong positive

impact on the growth of an economy on both internal performance and with the external. Performance, unmeasured cannot be improved without ascertaining the weakness and the thrust areas. This is done through logistics performance measurement systems. There are a number of ways to measure performance of the logistics sector of a region. Whatever method is used, it should be kept in mind that the aim of such measurements should include to determine these attributes of the logistics sector.

1.4: AREA OF STUDY

Mizoram is the fifth smallest state in India and it is one of the seven states in the North-East India. It shares its borders with other north-eastern states of Manipur, Tripura and Assam and neighbouring countries of Bangladesh and Myanmar. Geographically Mizoram lies between East Longitudes 92°15' to 93°29' and North Latitude 21°58' to 24°35' covering a total area of 21,087 square kilometres. The topography of Mizoram is not very different from its other north eastern neighbours with the presence of hills and mountain ranges. Mizoram is the second least populous state in the country. Its population was recorded as 10,97,206 according to 2011 Census which accounts for only 0.09 percent of the national population. As per Population census 2011 the density of population of Mizoram is 52 persons per sq.km while it is 382 persons per sq.km in India. At the district level, Aizawl district has the highest density in population (112 persons per sq.km), and Mamit district has the lowest density in population (29 persons per sq.km). As per the census 2011 results, the literacy rate of the state is

91.33 percent which is the 3rd highest in the country. Among the districts, Serchhip district recorded the highest literacy rate of 97.91 percent while Lawngtlai district recorded the lowest at 65.88 percent.

The road network is the major and cheapest mode of transportation and communication in Mizoram. Besides connecting cities towns and villages within the state, everyday good numbers of people commute via the road network to Silchar, Guwahati, Dimapur, etc for trading purposes. Majority of the goods consumed in Mizoram are transported from or through these neighbouring trade hubs through road transport. According to Mizoram Economic Survey 2016-2017, Mizoram has a road network of around 8,000 kilometres including unsurfaced village roads to surface national highways; and as on 2016 there were 1,65,694 motor vehicles on the road. The village roads are primarily single lane roads and there are typically light traffic on these roads. Landslides and weather damage to these roads is significant in parts. The State is connected to the Indian network through Silchar in Assam through the National Highway 54. Another highway, NH-150 connects the state to Imphal, Manipur and NH-40A links the State with Tripura. A road between Champhai and Tiddim in Burma has been proposed and is waiting for cooperation from the Burmese authorities. Mizoram has an airport, Lengpui Airport (IATA: AJL), near Aizawl. This airport is connected with New Delhi, Kolkata, Imphal, Guwahati and Silchar. There is a rail link at Bairabi rail station which is being under construction to be extended upto Sairang. Recently, the Northern frontier

railway completed the Broad Guage rail line construction in Bairabi. Passenger transportation has been in operation. There has also been a $103 million project work in progress known as Kaladan Multi- modal Transit to develop water ways with the port of Akyab Sittwe in Burma along Chhimtuipui. The Indian government, with the view of acting towards the east, considers it a priority to set up this waterway to trade with South East Asian countries.

The existing road networks and other transport infrastructure are still backward in comparison to other areas. But progress has been made by the Indian government in the process of developing Mizoram into a gateway for foreign trade with the east. Therefore, the future looks good for development of export and import logistics hub in Mizoram.

Aizawl is the state capital of Mizoram. It is home to 293,416 persons according to 2011 census. The city is connected with the national transport network by the National Highway 54, and it is connected to all parts of the state by road linkage. It is the centre of administration, trade and business hub for the rest of the state. Financial sectors and business activities that have their branches spread across the state have their main offices situated at Aizawl. Moreover, majority of all trades in goods and equipments as well as services within the state are carried out through Aizawl either physically or on papers. It can thus be said that a study on the performance of sectors of business activities in Aizawl city to a large extent will be representative of the performance in the state.

1.5: OBJECTIVES OF THE STUDY

1. To examine the overall performance of the logistics sector using efficiency and effectiveness measures in Aizawl city.
2. To examine the cost efficiency and the condition of infrastructure of logistic sector within the study area.
3. To study whether there is any significant relationship between the use of IT and innovations and performance of the logistic sector.
4. To analyse the problems faced by this sector and to make relevant suggestions.

1.6: RESEARCH QUESTIONS

1. Is it difficult to obtain official clearances for transport of consignments?
2. Do the logistics providers face any security problems? Is there any unnecessary checking and stoppages?

1.7: RESEARCH METHODOLOGY

The research was done by circulating questionnaire, asking respondents to provide qualitative information based on their experience is deemed suitable. It comprises of the following core components of key indicators of logistics performance.

- Cost efficiency
- Communication and tracking possibility

- Ease of obtaining official clearances and permissions
- Ease of payment
- Ease of reimbursement
- Infrastructure
- Security and safety
- Timeliness
- Quantity fulfilment
- Quality fulfilment
- Use of information technology and innovations

The respondents then rank their logistics providers on the above indicators from 1 to 5; 1 being very low and 5 being very high.

In order to attain reliable response, the respondents have to be fairly knowledgeable about the market supply chain of goods in Aizawl city. This requirement is met by including wholesale owners, distributors, dealers of different goods, importers and retail outlets that have close connection with suppliers from outside the state and their logistics providers.

To measure the overall performance of logistics sector, the following product heads (industry-wise) are selected in order to include wide and varied logistics providers.

The item heads are as given below:

Clothing items

Consumption goods and confectionaries

Consumer durables

Electronics

Hardware items

Medicine

Raw materials for industries including semi finished products

Vegetables, fish and meat

Vehicles, spare parts and machineries

Sample size of 45 respondents has been selected for this survey, 5 respondents for each item head or industry. And the results are then analyzed simple mathematical tools like mean, average, percentage, etc. which is finally used for preparing overall performance of logistics sector in Aizawl city.

1.8: LIMITATION OF THE STUDY

This research work has certain limitations. Firstly, the study is done from the perspective of the consignees only. The ratings of the logistics providers like the suppliers and the carriers and forwarders are not taken,

which make it one-sided in aspect and render the results useless for inter-regional comparisons.

Secondly, time and cost data of incoming and outgoing cargo records, way bill records, custom clearances, etc are not obtained because of lack of accessible accurate data set to calculate the actual performance in terms of quantity and cost efficiency.

Studies on logistics dates back to Alfred Weber's Theory of Industrial Location (1909) in which the optimum location point of an industry is analysed with respect to locations of raw material source and consumption point in order to minimise logistics costs. The relationship between development in logistics sector and economic growth has been a frequent research topic, in the context of both regional and national economy.

Caplice et al. (1995) [1] drew four common principles concerning performance measurement systems. Firstly, a measurement system should be comprehensive and capture performance for more than one perspective. Secondly, the measurement system should be oriented in a way that it captures the performance rather than just the results. Thirdly, a performance measurement system should be vertically integrated. And lastly, performance measurement system should be horizontally integrated such that it measures processes rather than each function of department.

Fawcett et al. (1995)[2] in their study of the Logistics Measurement and Performance for United States – Mexican Operations Under NAFTA, asked respondents to rate the five priorities of logistics effectiveness viz. innovation, low cost, flexibility, delivery and quality of service on their relative importance. While innovation and low cost are one-dimensional,

[1] Caplice, C., Sheffi, Y. (1995), 'A Review and Evaluation of Logistics Performance Measurement Systems', *The International Journal Of Logistics Management*, Vol. 6, N0. 1.
[2] Fawcett, S.E., Smith, S.R. (1995), 'Logistics Measurement and Performance for United States – Mexican Operations under NAFTA', *Transportation Journal*, Vol. 34, No. 3.

the latter strategic objectives including flexibility, delivery and quality (collectively customer service) are multidimensional. From the respondents' ratings, customer service quality emerges as the primary strategic priority. A remarkable revelation made from the study was that even though respondents belonging to manufacturing sectors are continually obsessed with reducing cost of production, logistics performance in terms of cost reduction comes fourth in priority ranking. Availability of quality and reliable information regarding different aspects of logistics performance was also deemed valuable and necessary for strategic planning and achievement of competitive advantage. From the study of the performance, delivery criteria received the highest performance rating followed by logistics service quality and flexibility. Relative little measure of logistics innovation occurs and lowest rate of performance was given to improvement in logistics costs. Both these ratings (of relative importance of the five performance measures given by manufacturers and the ratings given to the logistics sector against each measurement) showed close relationship, meaning that logistics providers are working aggressively to fulfil the wishes of their business partners.

Gentry et al. (1996)[3] were of the opinion that logistics sectors can be utilised as a means of gaining competitive advantage by forming alliance or

[3] Gentry, J.J., Vellinga, D.B. (1996), 'Using Logistics Alliances to Gain a Strategic Advantage in the Marketplace', *Journal of Marketing Theory and Practice, Vol. 4, No. 2.*

by integration. The literature review done showed that there had been an increasing trend of opinion regarding the advantage of tying up a formal business contract with logistics service providers. There had however been lack of empirical research and evidence in the field. But theoretically, the process of integration had been regarded as a step towards better management skills, superior resources and the resulting innovation and cost efficiency and the ability to distinguish oneself by improving interactions with customers.

Lambert et al. (1996)[4] in their well known partnership model described the importance of integration in logistics and supply chain management. The study focuses on the need for an organisation to tie up with other payers in the supply chain like suppliers and logistics providers in the present economic scenario of high competition to gain competitive advantage. According to their study, an existence of good partnership with intense level of communication will definitely be profitable for all party involved in the supply chain. An effective connection with the buyers will also result in better outcome for both the buyers and the firms. Communication and trust building is considered the key to a successful partnership.

[4] Lambert, H.D., Emmalhainz, A.M., Gardner, T.J (1996), 'Developing and Implementing Supply Chain Partnership', *The International Journal of Logistics Management, Vol.* 7, No. 2.

Fawcett et al. (1997) [5] studied the role of logistics sectors on the competitive advantage of manufacturers in the three super export nations of the world viz. United States, Japan and Germany. The study revealed that manufacturers rely on logistics providers in the management of their facility networks and market networks. Apart from this function, logistics providers also coordinate a major share of firms' management strategies. Although the approaches of the firms towards utilisation of logistics services differed strategically, one common aspect was the increasing reliance on logistics sector to meet customer needs. Japanese firms emphasized on integrative approach by utilising logistics services to integrate their firm's network relationship. U.S. and German firms mainly utilised logistics service for management, marketing and customer service with comparatively lesser emphasis on integration. Measurement of logistics performance became increasingly important in the three nations. Logistics performance measurements were relied upon to meet customer demands, to control logistics costs, to support manufacturing excellence and to facilitate export – based strategies. Excellent logistics processes had had been the objective of manufacturers then, emphasis was later laid on performance measurement and information development.

[5] Fawcett, S.E., Clinton, S.R. (1997), 'Enhancing Logistics to Improve the Competitiveness of Manufacturing Organisations: A Triad Perspective', *Transportation Journal*, Vol. 37, No. 1.

Bititcti et al. (2000)[6] discussed, in an effort to devise a comprehensive and dynamic performance measurement system, that performance measurement needs to have characteristics like; sensitiveness to external and internal change, reviewing and reprioritising objectives when significant environmental changes occur, deployment of changes and maintaining gains achieved through the changes.

Larson et al. (2001)[7] discussed the impact of partnerships and integration by studying triad relationship. A triad relationship consists of shipper (a.k.a. consignor), carrier and receiver (a.k.a. consignee). This triad is considered to be the minimum unit of analysis for logistics researches. The case study found that the formation of the triads was advantageous for all the parties involved in the form of greater flexibility and timeliness. Communication was considered to be one of the most important factors for the success of triad relationships. On this note, use of modern communication methods and improvement in IT services is considered the underlying necessary logistics infrastructure.

[6] Bititci, U.S., Turner, U.T., Begemann, C. (2000), 'Dynamics of Performance Measurement System', *International Journal of Operations and Production Management*, Vol. 20, No. 6.
[7] Larson, P.D., Gammelgard, B. (2001), 'The Logistics Traid: Survey and Case Study Results', *Transportation Journal*, Vol. 4, No. 2.

Baldry (2002)[8] was holding the view that performance measurements need to be transcribed into practical improvements. The measurements results should be laid out and the implications should be put in such a way that it is feasible for practical arrangements. Implementation may be done in such a way that it is attractive by giving incentives on the development of good practices, thereby moving from performance measurements toward performance management.

Berman (2002)[9] suggested two possible corrections in the way performance measurements are carried out. First, it is clear that performance measurements require a strong capacity in information technology. Reviewing performance by evaluating hard copies of evidences and data are time consuming, such that it is difficult to acquire timely performance measure data. Those with jurisdiction should review their information technology capacity for performance measurement. Secondly, performance measurement efforts have had more success in measuring activities and outputs than outcomes. Measuring outcomes require stakeholders or customers perceptions of timeliness, quality and usefulness of services. At the same time, it is equally difficult to scientifically measure performances based on activities and outputs because those who would answer the questionnaires, like managers and owners of enterprises are usually not

[8] Baldry, D.A., (2002), 'Moving from Performance Measurements to Performance Management', *Facilities*, Vol. 20, Iss. 5/6.
[9] Berman, E., (2002), 'How useful is Performance Measurement', *Public Performance and Management Review*, Vol. 25, No. 4. June.

familiar with research processes. Ambiguity in findings often occurs because they often tend to give inaccurate inputs for no particular reason when it concerns with their business. If we can have trained personnel on the inside that can provide the required data, performance measurements can be more accurate and useful.

Christopher et al. (2002)[10] accentuates the need of logistics specialisation in the present market supply chain where the market is volatile and customer's tastes and preferences change rapidly. For different items, there exists specific supply chain and demand schedule. They used three key dimensions namely, product characteristics, demand characteristics and replenishment lead-time to study the solutions for supply chain management. What they found out was that "one size fits all" does not apply to the supply chain of all type of items. So, specialisation thus means choosing the best way to support the supply chain of a particular item, considering the nature of the item; its procurement process and nature of demand to best respond to customer's demand at the lowest possible cost.

[10] Christopher, M., Towill, R.D. (2002), 'Developing Market Specific Supply Chain Strategies', *The International Journal Of Logistics Management,* Vol. 13, No. 1.

Gimenel et al. (2003)[11] study supply chain of Spanish grocery sector and emphasize on the gain in competitive advantage as a result of integration with external participants in the supply chain of the products. Stages or level of integration from one to three were identified. Where stage one only considers logistics function merely as a distribution function, stage two regards the integration of all logistics function within a firm's boundaries and stage three extends the integration to the customers and suppliers. The finding from the study was that firms' performance improved without competitive advantage as they moves from stage one to stage two. Without external integration firms usually function super effectively but without competitive advantage. When firms move to stage three into integration with the suppliers and customers, they achieve competitive advantages in variables like response to customer's needs, response to special requirements, accomplishment of quantities and delivery dates, and collaboration in new product launches. This study stresses on the need for entering into external integration with logistics providers.

Gunasekaren (2004)[12] devised a framework for supply chain performance measurement by constructing metrics from the relative importance of supply chain performance components as perceived by respondents revealed from their ranking of the various components. In case of delivery

[11] Gimenel, C., Ventura, E., (2003), 'Supply Chain Management as a Competitive Advantage in the Spanish Grocery Sector', *The International Journal of Logistics Management,* Vol. 4, No. 2.
[12] Gunasekharan, A. (2004), 'A Framework for Supply Chain Performance Measurement', *International Journal of Production Economics*, Vol. 87.

performance metrics, highly important components were quality of delivered goods, on time delivery, flexibility of service systems to meet customer demands. Within supplier metrics, supplier delivery performance was ranked much more important than supplier pricing of the items. This study put the general guideline for performance measurements in supply chain as: for effective performance measurement and improvement, measurement goals must represent organisational goals and metrics selected should reflect a balance between financial and non-financial measures that can be related to strategic, tactical and operational levels of decision making and control.

Kovacks et al. (2005)[13] studied previous researches and publications in the aim to find the most suitable research approach to study the logistics sector. From the study, they pointed out the presence of positivist focus and the scarcity of qualitative and interpretative research. The lack of theoretical researches on the topic was also pointed out. This was regarded due to the reason that, since the study of logistics involves a wide array of variables in the market and transportation sector. As such is the case with regards to logistics sector, abductive and inductive research approach were considered more appropriate against the dominant deductive research approaches. The abductive approach differs from deduction and induction in its research

[13] Kovacks, G., Spens, M.K. (2005), 'Abductive Reasoning in Logistics Research', *International Journal of Physical Distribution and Logistics Management,* Vol. 35, No. 2

strategy and process. Deduction research scans theory and derives conclusions from the theories to form hypothesis and propositions, followed by empirical tests. Thus the logical sequence of the research is from rule to case to result. Inductive approach follows this sequence in opposite path and no literature review or general case is absolutely necessary. In abductive approach, the case may present plausible rules or general suggestions without logically necessary conclusions.

Shao et al. (2006)[14] studied the Chinese pharmaceuticals industry. The study stressed the success rate of the industry's attempt on logistics sector reconfiguration. Reconfiguration was done by the stakeholders in their attempt to achieve higher efficiency and effectiveness in logistics operation. It was found that while manufacturers were more inclined towards outsourcing the logistics operation, retailers took steps towards improving logistics competency. Manufacturers outsource logistics activities to reduce cost. Retailers took actions to improve customer service. The process of reconfiguration cannot, of course, be done without facing problems at certain level. Employees' morale towards reconfiguration – hesitation to adapt to changes – was the main reason that forces manufacturers to outsource logistics activities. Another barrier was hesitation towards cultural and organisational change. All in all, an

[14] Shao, X., Ji, j. (2006), 'Reconfiguration of Pharmaceutical Logistics Operation in China: An Empirical study', *Transportation Journal*, Vol. 45, No. 4.

institutional change and support from top managers, planners, availability of reliable third party logistics providers and suppliers support were necessary to achieve successful reconfiguration.

Liu (2009)[15] analysed the relationship between development of logistics industry and economic growth of China. The study was done by selecting Gross Domestic Product, logistics sector value added, total employment of logistics sector, new fixed asset investment, freight volume and freight turnover. By using Grey relational degree analysis, it was found out that logistics sector value added and freight turnover have the greatest impact on national economic growth. Logistics sector value added is part of logistics scale and freight turnover is part of logistics efficiency. It was thus concluded that enlargement of logistics scale and the increase of logistics efficiency can bring tremendous influence on the development of national economy.

Wang (2010)[16], however, by analyzing the effect of logistics activities on regional economic growth for Anhui Province in China using cargo turnover and GDP as proxy of logistic activities and regional economic growth respectively found that the causal effect is uncertain. This test was

[15] Liu, S (2009), 'A Research on the Relationship of Logistics Industry Development and Economic Growth in China', *International Business Research,* Vol. 2, No. 3

[16] Wang, A. (2010), 'Research of Logistics and Regional Economic Growth', *iBusiness,* Vol. 2, pp 395-400.

done using Granger causality test, which is considered as a more effective approach to study the relationship between regional logistics and economic growth when compared with regression analysis using the available research data. The uncertain result of the Granger causality test was due to the fact that the test result did not give a two way feedback. That is, while the changes in GDP did not cause any change to the cargo turnover at 80% significant level, the cargo turnover can lead to GDP change at the same significant level. However an analysis of the entire research data revealed the importance of developing logistics sector of the region for economic growth.

Tokar (2010)[17] highlighted the need to identify behaviours of individual members involved in the supply chain with regard to judgement and decision making to make a comprehensive study of market supply chain and logistics sector. This is because people often do their job in specific and systematic norms ignoring normative or optimal policies. Logistics researches have been improving in using hypothesis testing and using empirical data to make certain conclusions. But lack of behavioural analysis in these researches amounts to ambiguity because of uncertainties of human behaviours in decision makings. It was considered significantly

[17] Tokar, T. (2010), 'Behavioural Research in Logistics and Supply Chain Management', *The International Journal of Logistics Management.* Vol. 13, No. 6, pp 30-41.

important to analyse behaviours of the personnel involved in logistics sector especially because that human interaction happens and plays a vital role in each and every step of supply chain management. Thus interplay of empirical researches backed up by behavioural analyses of those involved in logistics in their judgement and decision making was deemed necessary to have a comprehensive study of different aspects of logistics sector performance and status.

Mohan (2013)[18] showed how logistics management has effect on global competitiveness. In his study, he examined the Indian logistics industry scenario. He strongly proposed that Indian companies should opt for fourth party logistics services (4PL) to bring in savings through usage of high technology tools, systems and collaborations. This will in turn bring down the logistics cost, which will bring customer satisfaction and improved service standard.

Choy et al. (2014)[19] analysed the impact of IT on logistics industries in Hong Kong and Pearl Delta region. They studied three dimensions of IT use viz. Information and Communication Technology (ICT), Logistics Innovation System (LIS) and Business Intelligence (BI). The importance of

[18] Mohan, J.B., (2013), 'The Impact of Logistics Management on Global Competitiveness', *International Journal of Business and Management Inventions*, Vol. 2, No. 3.

[19] Choy, K.L., Tse, Y.K., Lu, X.A., Chow, .H., Chi, Y. (2014), 'Impact of Information Technology on the Performance of Logistics Industry: the Case of Hong Kong and Pearl Delta Region', *The Journal of the Operational Research Society*, Vol. 65, No. 6.

IT in logistics sector and its contributions to current logistics scenario was discussed in detail. Generally the utilisation of ICT has no relationship with either service quality or competitive advantage. It is the use of LIS and BI that has effect on improving service quality and competitive advantage. The utilisation of BI would, in general improve competitive advantage of any commercial entity; so, it is the use of LIS that is specially advocated for logistics industries to cater to customers' requirements and improved overall management operations.

Kuzu et al. (2014)[20] studied the long term relationship between economic growth and developments in the logistics sector in Turkey. Using Granger's causality test he analyzed the relationship between GDP as an indicator of economic growth and Turnover Index of Transportation and Storage as an indicator logistics development. The test showed one sided causal relationship from economic development to logistics development which explained that increasing economic growth has been leading to the development of logistics sectors. In other tests the relationship between logistics sector and economic growth in the long run was found.

[20] Kuzu, S., Onder, E (2014), 'Research into the Long-Run Relationship Between Logistics Development and Economic Growth in Turkey', *Journal of Logistics Development,* Vol. 3, No. 1.

Hayalogu (2015)[21] segmented the Logistics sector into its components and studied the relationship between economic growth and each of the variables for OECD countries. The analysis produced different results depending on the variables used. Road transport, air transport, internet connections, phone connections and freight turnover show positive relationship to economic growth. In case of railway transport, no significant relationship was found. He remarked that logistics sector development is one of the most important factors of economic growth.

This review of literature includes scholarly articles on a wide area of the subject matter ranging from the role of logistics sectors in the economy to current trends and development in the field of logistics study and research. Unsurprisingly, recent development in logistics researches are dominated by study on Chinese logistics sectors, which is one of the countries that have seen staggering development in logistics industry.

A few literature reviews done on the method and techniques of measuring logistics performance acts as a guide to develop a research methodology which is best suited for the present study. Contemporary studies on the performance of logistics industry stress more on innovations and utilisation of Information Technology in the aim to keep the logistics sectors compatible with the current trend of doing business.

[21] Hayaloglu, P (2015), 'The Impact of Development in the Logistics Sector on Economic Growth: The Case of OECD Countries', *International Journal of Economics and Financial Issues,* Vol. 5, No. 2.

3.1: GLOBAL LOGISTICS SCENARIO

In a report by Transparency Market Research (TMR)published on May 2018, the global logistics market is projected to stay exceptionally fragmented with top four companies (FedEx, UPS, Inc., CEVA Logistics, and Deutsche Post DHL) undertaking a major share of the global logistics. These companies accounted for a small aggregate share in the past, but they recently emerge out to be major players in the industry. TMR envisions the global logistics market to reach a value ofUS$15.5 trillion by the completion of 2023 by rising at 7.5% compound annual growth rate (CAGR). In terms of the type of transport infrastructure, road transport is securing and will continue to secure the largest share of the market due to its broad usage across the world. In terms of geography, Asia Pacific will continue to be real revenue supporter for the market because of large acceptance of outsourced logistics administrations.

The world logistics market is influence by the fast developing internet business industry. Comfort and product availability provide by web-based shopping has cause to its popularity and it has become an option all types of purchasers. This has raised the need for logistics administrations that are more productive, efficient, and faster than others.

3.2: WORLD BANK'S LOGISTICS PERFORMANCE INDEX

The importance of efficient logistics sector is now accepted worldwide by policy makers. Trade and commerce are done across borders and supply chain has come to exhibit a global feature for almost all kinds of items. the efficiency of these supply chains is measure by the Logistics Performance Index (LPI) to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. LPI survey is carried out through The World's Bank partnership with the International Association of Freight Forwarders (FIATA), The Global Facilitation Partnership for Transportation and Trade (GFP). The LPI 2016 was the last report which allowed for comparisons across 160 countries.

The LPI consists of both qualitative and quantitative measures and it provides profiles of logistics friendliness for the countries. It measures performance along the logistics supply chain within a country and offers two different perspectives: international and domestic:

- International LPI provides qualitative evaluations of a country in six areas by its trading partners—logistics professionals working outside the country.
- Domestic LPI provides both qualitative and quantitative assessments of a country by logistics professionals working inside it. It includes detailed information on the logistics

environment, core logistics processes, institutions, and performance time and cost data.

The international LPI is a summary indicator of logistics sector performance, combining data on six core performance components into a single aggregate measure. The six core components are:

- The efficiency of customs and border clearance, rated from “very low” (1) to “very high” (5) in survey question 10.
- The quality of trade and transport infrastructure, rated from “very low” (1) to “very high” (5) in survey question 11.
- The ease of arranging competitively priced shipments, rated from “very difficult” (1) to “very easy” (5) in survey question 12.
- The competence and quality of logistics services, rated from “very low” (1) to “very high” (5) in survey question 13.
- The ability to track and trace consignments, rated from “very low” (1) to “very high” (5) in survey question 14.
- The frequency with which shipments reach consignees within scheduled or expected delivery times, rated from “hardly ever” (1) to “nearly always” (5) in survey question 15. The LPI is constructed from these six indicators using principal component analysis (PCA).

The LPI rankings of the countries according to LPI report 2006 is as given under. The full list as given by the report is given here in order to help assess logistics performance of the countries and for easy comparisons.

Table 3.1: LPI Rankings of Countries

Country	LPI Rank	LPI Score	Customs	Infrastructure	International shipment	Logistics competence	Tracking & tracing	Timeliness
Germany	1	4.23	4.12	4.44	3.86	4.28	4.27	4.45
Luxembourg	2	4.22	3.9	4.24	4.24	4.01	4.12	4.8
Sweden	3	4.2	3.92	4.27	4	4.25	4.38	4.45
Netherlands	4	4.19	4.12	4.29	3.94	4.22	4.17	4.41
Singapore	5	4.14	4.18	4.2	3.96	4.09	4.05	4.4
Belgium	6	4.11	3.83	4.05	4.05	4.07	4.22	4.43
Austria	7	4.1	3.79	4.08	3.85	4.18	4.36	4.37
United Kingdom	8	4.07	3.98	4.21	3.77	4.05	4.13	4.33
Hong Kong, China	9	4.07	3.94	4.1	4.05	4	4.03	4.29
United States	10	3.99	3.75	4.15	3.65	4.01	4.2	4.25
Switzerland	11	3.99	3.88	4.19	3.69	3.95	4.04	4.24
Japan	12	3.97	3.85	4.1	3.69	3.99	4.03	4.21
United Arab Emirates	13	3.94	3.84	4.07	3.89	3.82	3.91	4.13
Canada	14	3.93	3.95	4.14	3.56	3.9	4.1	4.01
Finland	15	3.92	4.01	4.01	3.51	3.88	4.04	4.14
France	16	3.9	3.71	4.01	3.64	3.82	4.02	4.25
Denmark	17	3.82	3.82	3.75	3.66	4.01	3.74	3.92
Ireland	18	3.79	3.47	3.77	3.83	3.79	3.98	3.94
Australia	19	3.79	3.54	3.82	3.63	3.87	3.87	4.04
South Africa	20	3.78	3.6	3.78	3.62	3.75	3.92	4.02
Italy	21	3.76	3.45	3.79	3.65	3.77	3.86	4.03
Norway	22	3.73	3.57	3.95	3.62	3.7	3.82	3.77
Spain	23	3.73	3.48	3.72	3.63	3.73	3.82	4
Korea, Rep.	24	3.72	3.45	3.79	3.58	3.69	3.78	4.03
Taiwan	25	3.7	3.23	3.57	3.57	3.95	3.59	4.25
Czech Republic	26	3.67	3.58	3.36	3.65	3.65	3.84	3.94
China	27	3.66	3.32	3.75	3.7	3.62	3.68	3.9
Israel	28	3.66	3.5	3.49	3.38	3.6	3.72	4.27
Lithuania	29	3.63	3.42	3.57	3.49	3.49	3.68	4.14
Qatar	30	3.6	3.55	3.57	3.58	3.54	3.5	3.83
Hungary	31	3.43	3.02	3.48	3.44	3.35	3.4	3.88
Malaysia	32	3.43	3.17	3.45	3.48	3.34	3.46	3.65
Poland	33	3.43	3.27	3.17	3.44	3.39	3.46	3.8
Turkey	34	3.42	3.18	3.49	3.41	3.31	3.39	3.75

India	35	3.42	3.17	3.34	3.36	3.39	3.52	3.74
Portugal	36	3.41	3.37	3.09	3.24	3.15	3.65	3.95
New Zealand	37	3.39	3.18	3.55	2.77	3.22	3.58	4.12
Estonia	38	3.36	3.41	3.18	3.07	3.18	3.25	4.08
Iceland	39	3.35	3.13	3.02	3.32	3.26	3.42	3.88
Panama	40	3.34	3.13	3.28	3.65	3.18	2.95	3.74
Slovak Republic	41	3.34	3.28	3.24	3.41	3.12	3.12	3.81
Kenya	42	3.33	3.17	3.21	3.24	3.24	3.42	3.7
Latvia	43	3.33	3.11	3.24	3.28	3.29	3.42	3.62
Bahrain	44	3.31	3.14	3.1	3.33	3.38	3.32	3.58
Thailand	45	3.26	3.11	3.12	3.37	3.14	3.2	3.56
Chile	46	3.25	3.19	2.77	3.3	2.97	3.5	3.71
Greece	47	3.24	2.85	3.32	2.97	2.91	3.59	3.85
Oman	48	3.23	2.76	3.44	3.35	3.26	3.09	3.5
Egypt, Arab Rep.	49	3.18	2.75	3.07	3.27	3.2	3.15	3.63
Slovenia	50	3.18	2.88	3.19	3.1	3.2	3.27	3.47
Croatia	51	3.16	3.07	2.99	3.12	3.21	3.16	3.39
Saudi Arabia	52	3.16	2.69	3.24	3.23	3	3.25	3.53
Kuwait	53	3.15	2.83	2.92	3.62	2.79	3.16	3.51
Mexico	54	3.11	2.88	2.89	3	3.14	3.4	3.38
Brazil	55	3.09	2.76	3.11	2.9	3.12	3.28	3.39
Malta	56	3.07	2.78	2.94	3.09	2.85	3.12	3.61
Botswana	57	3.05	3.05	2.96	2.91	2.74	2.89	3.72
Uganda	58	3.04	2.97	2.74	2.88	2.93	3.01	3.7
Cyprus	59	3	3.11	3	2.8	2.72	2.54	3.79
Romania	60	2.99	3	2.88	3.06	2.82	2.95	3.22
Tanzania	61	2.99	2.78	2.81	2.98	2.92	2.98	3.44
Rwanda	62	2.99	2.93	2.62	3.05	2.87	3.04	3.35
Indonesia	63	2.98	2.69	2.65	2.9	3	3.19	3.46
Vietnam	64	2.98	2.75	2.7	3.12	2.88	2.84	3.5
Uruguay	65	2.97	2.78	2.79	2.91	3.01	2.84	3.47
Argentina	66	2.96	2.63	2.86	2.76	2.83	3.26	3.47
Jordan	67	2.96	2.55	2.77	3.17	2.89	2.96	3.34
Pakistan	68	2.92	2.66	2.7	2.93	2.82	2.91	3.48
Peru	69	2.89	2.76	2.62	2.91	2.87	2.94	3.23
Brunei	70	2.87	2.78	2.75	3	2.57	2.91	3.19
Philippines	71	2.86	2.61	2.55	3.01	2.7	2.86	3.35
Bulgaria	72	2.81	2.4	2.35	2.93	3.06	2.72	3.31
Cambodia	73	2.8	2.62	2.36	3.11	2.6	2.7	3.3
Ecuador	74	2.78	2.64	2.47	2.95	2.66	2.65	3.23
Algeria	75	2.77	2.37	2.58	2.8	2.91	2.86	3.08
Serbia	76	2.76	2.5	2.49	2.63	2.79	2.92	3.23
Kazakhstan	77	2.75	2.52	2.76	2.75	2.57	2.86	3.06
Bahamas	78	2.75	2.65	2.72	2.8	2.74	2.64	2.93
Namibia	79	2.74	2.65	2.76	2.69	2.63	2.52	3.19

Ukraine	80	2.74	2.3	2.49	2.59	2.55	2.96	3.51
Burkina Faso	81	2.73	2.55	2.67	2.73	2.78	2.49	3.13
Lebanon	82	2.72	2.73	2.64	2.84	2.45	2.75	2.86
El Salvador	83	2.71	2.37	2.25	2.82	2.66	2.78	3.29
Mozambique	84	2.68	2.49	2.24	3.06	2.44	2.75	3.04
Guyana	85	2.67	2.4	2.24	2.66	2.66	2.9	3.12
Morocco	86	2.67	2.22	2.46	3.09	2.59	2.34	3.2
Bangladesh	87	2.66	2.57	2.48	2.73	2.67	2.59	2.9
Ghana	88	2.66	2.46	2.48	2.71	2.54	2.52	3.21
Costa Rica	89	2.65	2.33	2.32	2.89	2.55	2.77	2.98
Nigeria	90	2.63	2.46	2.4	2.43	2.74	2.7	3.04
Dominican Republic	91	2.63	2.39	2.29	2.67	2.68	2.63	3.06
Togo	92	2.62	2.49	2.24	2.62	2.46	2.6	3.24
Moldova	93	2.61	2.39	2.35	2.6	2.48	2.67	3.16
Colombia	94	2.61	2.21	2.43	2.55	2.67	2.55	3.23
Cote d'Ivoire	95	2.6	2.67	2.46	2.54	2.62	2.62	2.71
Iran, Islamic Rep.	96	2.6	2.33	2.67	2.67	2.67	2.44	2.81
Bosnia and Herzegovina	97	2.6	2.69	2.61	2.28	2.52	2.56	2.94
Comoros	98	2.58	2.63	2.36	2.58	2.6	2.44	2.82
Russian Federation	99	2.57	2.01	2.43	2.45	2.76	2.62	3.15
Niger	100	2.56	2.59	2.22	2.63	2.5	2.35	3.02
Paraguay	101	2.56	2.38	2.45	2.58	2.69	2.3	2.93
Nicaragua	102	2.53	2.48	2.5	2.5	2.55	2.47	2.68
Sudan	103	2.53	2.23	2.2	2.57	2.36	2.49	3.28
Maldives	104	2.51	2.39	2.57	2.34	2.44	2.49	2.88
Papua New Guinea	105	2.51	2.55	2.32	2.46	2.35	2.58	2.78
Macedonia, FYR	106	2.51	2.21	2.58	2.45	2.36	2.32	3.13
Burundi	107	2.51	2.02	1.98	2.42	2.46	2.68	3.45
Mongolia	108	2.51	2.39	2.05	2.37	2.31	2.47	3.4
Mali	109	2.5	2.45	2.3	2.48	2.46	2.36	2.93
Tunisia	110	2.5	1.96	2.44	2.33	2.59	2.67	3
Guatemala	111	2.48	2.47	2.2	2.41	2.3	2.46	2.98
Honduras	112	2.46	2.21	2.04	2.58	2.44	2.53	2.91
Myanmar	113	2.46	2.43	2.33	2.23	2.36	2.57	2.85
Zambia	114	2.43	2.25	2.26	2.51	2.42	2.36	2.74
Benin	115	2.43	2.2	2.39	2.55	2.47	2.23	2.69
Solomon Islands	116	2.42	2.6	2.21	2.28	2.43	2.18	2.76
Albania	117	2.41	2.23	1.98	2.48	2.48	2.15	3.05
Uzbekistan	118	2.4	2.32	2.45	2.36	2.39	2.05	2.83
Jamaica	119	2.4	2.37	2.23	2.44	2.31	2.38	2.64
Belarus	120	2.4	2.06	2.1	2.62	2.32	2.16	3.04
Trinidad and Tobago	121	2.4	2.38	2.34	2.31	2.28	2.28	2.79
Venezuela, RB	122	2.39	1.99	2.35	2.47	2.34	2.48	2.71
Montenegro	123	2.38	2.22	2.07	2.56	2.31	2.37	2.69

Nepal	124	2.38	1.93	2.27	2.5	2.13	2.47	2.93
Ethiopia	126	2.38	2.6	2.12	2.56	2.37	2.18	2.37
Congo, Rep.	125	2.38	2	2.6	2.37	2.26	2.48	2.57
Congo, Dem. Rep.	127	2.38	2.22	2.01	2.33	2.33	2.37	2.94
Guinea-Bissau	128	2.37	2.44	1.91	2.57	2.07	2.41	2.74
Guinea	129	2.36	2.28	2.01	2.38	2.54	2.54	2.38
Georgia	130	2.35	2.26	2.17	2.35	2.08	2.44	2.8
Cuba	131	2.35	2.38	2.31	2.31	2.25	2.31	2.51
Senegal	132	2.33	2.31	2.23	2.25	2.39	2.15	2.61
São Tomé and Príncipe	133	2.33	2.24	2.12	2.26	2.42	2.14	2.75
Djibouti	134	2.32	2.37	2.3	2.48	1.96	2.09	2.69
Bhutan	135	2.32	2.21	1.96	2.5	2.3	2.2	2.7
Fiji	136	2.32	2.33	2.25	2.21	2.25	2.25	2.6
Libya	137	2.26	1.88	2.04	2.4	2.5	1.85	2.83
Bolivia	138	2.25	1.97	2.11	2.4	1.9	2.31	2.79
Angola	139	2.24	1.8	2.13	2.37	2.31	2.21	2.59
Turkmenistan	140	2.21	2	2.34	2.37	2.09	1.84	2.59
Armenia	141	2.21	1.95	2.22	2.22	2.21	2.02	2.6
Liberia	142	2.2	2.07	2.01	2.22	2.07	2.07	2.73
Gabon	143	2.19	2.07	2.05	2.28	2.12	2.07	2.52
Eritrea	144	2.17	2.01	2.06	2.16	2.25	2.03	2.5
Chad	145	2.16	2.08	2.07	2.41	2.06	2.07	2.25
Kyrgyz Republic	146	2.16	1.8	1.96	2.1	1.96	2.39	2.72
Madagascar	147	2.15	2.33	2.12	2.17	1.93	2.01	2.35
Cameroon	148	2.15	2.09	2.21	1.98	2.32	2.04	2.29
Iraq	149	2.15	2.01	1.87	2.33	1.97	1.98	2.66
Afghanistan	150	2.14	2.01	1.84	2.38	2.15	1.77	2.61
Zimbabwe	151	2.08	2	2.21	2.08	2.13	1.95	2.13
Lao PDR	152	2.07	1.85	1.76	2.18	2.1	1.76	2.68
Tajikistan	153	2.06	1.93	2.13	2.12	2.12	2.04	2.04
Lesotho	154	2.03	1.91	1.96	1.84	2.16	1.92	2.35
Sierra Leone	155	2.03	1.91	2.07	2.31	1.85	1.74	2.23
Equatorial Guinea	156	1.88	1.88	1.5	1.89	1.75	1.89	2.32
Mauritania	157	1.87	2.14	1.54	2	1.74	1.54	2.14
Somalia	158	1.75	1.29	1.57	1.86	1.85	1.51	2.35
Haiti	159	1.72	1.7	1.47	1.81	1.68	1.56	2.02
Syrian Arab Republic	160	1.6	1.11	1.24	1.36	1.39	2.1	2.4

Source: World Bank's Global Logistics Report 2016

3.3: INDIAN LOGISTICS SECTOR OVERVIEW

Logistics industry in India is evolving rapidly. It is the result of development in infrastructure, technology and new types of service providers that seek to provide to the customers reduced costs and effective services. The logistics industry is witnessing growth due to the progress in retail, e-commerce and manufacturing sectors. Rise of e-commerce logistics and increased domestic consumption will pave the way for the industry to grow further in future.

As per the Economic Survey 2017-18, the Indian logistics sector is providing livelihood to more than 22 million people. More improvement in the sector would facilitate a 10% decrease in indirect logistics cost, leading to a growth of 5-8% in exports. The Survey estimates that, with the implementation of Goods and Service Tax (GST), the worth of Indian logistics market would be around US$ 215 billion in next two years compared to about US$ 160 billion currently. The Indian logistics sector is a growing industry and is going through transformation. Due to the initial efforts of Government of India, such as Make in India programme and improvements in infrastructure along with the emergence of skilled professionals, the country's position bettered from 54 in 2014 to 35 in 2016 in the World Bank (WB)'s Logistics Performance Index (LPI), in terms of overall logistics performance. India improved its tally in all the six components of LPI. India also experienced an overall 30 points rise in 2017 WB's Ease of Doing Business Index (EoDBI) and stood at 100th position

compared to 2016, The Indian logistics infrastructure has lately gained boosts from business sectors and policy makers.

The biggest challenge faced by the industry today is poor integration of transport networks, information technology and warehouse & distribution facilities. Regulations exist at different levels which are imposed by national, regional and local authorities. These regulations differ from city to city which restricts the formation of national networks. Lack of IT and trained manpower in logistics services is a big issue. The sector is in a disorganized state in India. The problem arises mainly because of the absence of specialist equipment, like proper refrigerators. Practitioners and academicians are slowly becoming aware of the importance of logistics and supply chain. However, the field is still unexplored in terms of research and academic studies to identify the weakness and improvement areas of this sector.

A new Logistics Division in the Department of Commerce has been established to coordinate integrated development of the sector by way of policy changes, improvement in existing procedures, identification of bottlenecks and gaps, and introduction of technology-based interventions. The Ministry of Commerce and Industry (MoCI) is developing an integrated logistics portal which would serve as a transactional e-marketplace by connecting buyers, logistics service providers and the relevant government agencies such as customs, port community systems, port terminals, shipping lines, railways, etc. Once functional, it would

reduce delays and facilitate a transparent, informative and convenient trading system. Recently the Ministry also launched a new Logistics Ease Across Different States Index (LEADS) to rank states for the support they provide to improve logistics infrastructure within their respective jurisdictions. This report was prepared by a team of Transportation & Logistics professionals at Deloitte and academics under the guidance of the State Cell, Department of Commerce, the Ministry of Commerce and Industry, Government of India. The logistics sector now finds a place in the Harmonized Master List of Infrastructure Subsector. The commitment of the Government of India towards an integrated development of logistics sector through policy amendments, infrastructural development, tax reforms and technology adoption will certainly deliver desirable results. It will enhance our trade competitiveness, create jobs, shoot up country's performance in global rankings and pave the way for India to become a logistics hub.

4.1: INTRODUCTION

Most of the goods consumed in Aizawl city are imported from outside the state and since there is very little outgoing consignments from the states, the major logistics player in the supply chain mechanism consists primarily of outstate logistics firms, suppliers and transporter. In order to study their performance - shopkeepers, dealers, wholesalers, importers within the city and those who are closely in touch with these logistics providers and those who are aware of the current supply trend are asked to rank their respective logistics providers on a scale of 1 to 5, where 1 stands for very bad and 5 stands for very good. These rankings given are made carefully keeping in mind the performance trend of logistics sector prevailing in the neighbouring regions as and from their past experiences.

Keeping in mind the integration of companies, marketing, firms, transporters, supplier and distributors, the rankings are done to represent the whole sector as a unit to better represent the performance of logistics sector as a whole while widely welcoming any kind of remarks, professional criticisms or suggestions for particular players in the chain during the conduction of field survey. Various logistics providers exist for different type of products and some products even require special vehicles and special handling. Respondents are hence selected from across different groups of people involved in different item groups or product groups to incorporate performance on a wide array as mentioned in the methodology.

4.2: EFFICIENCY MEASURES

Efficiency measures the level to which logistics sectors utilise available resources. Simply put, efficiency means doing things right. Efficiency is important in any kind of economic activity because it reduces time and cost of operation and increases utility of available resources at the same time. It can be said that efficiency is particularly important for logistics sector as the main purpose of their effort is to reduce time and cost of moving products from manufacturers to consumers using available infrastructures.

4.2 (a): Cost Efficiency

Cost efficiency simply refers to whether using the current logistics provider is perceived to be efficient in terms of cost or not; or if other providers were to be hired, or when calculating the estimated cost of completing that operation. The respondents were asked in the questionnaire to rank the cost of logistics of their items in overall from 1 to 5 where 1 stands for very costly, 2 stands for costly, 3 for average, 4 for cost efficient and 5 for very cost efficient. There were instances when the respondents were not fully confident how to give the ranking because they cannot just estimate the cost of logistics for their items. This often happened where the respondents procure their goods from middlemen and active suppliers, in such situation they have little knowledge of the supply chain mechanism in terms of costs. On such occasions, the ranking criteria gets redefined as whether they are satisfied with the costs they pay for procuring the goods or could

have any other suppliers could have done cheaper with reference to the level of competition among those. The ranking thus measures their satisfaction level. The ranking given by all the respondents across all the product groups is as given below.

Table 4.1: Cost Efficiency

Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	3	3
2	13	26
3	16	48
4	9	36
5	4	20
Total	**45**	**133**
Average rating	**2.95 out of 5**	

Source: Field Survey 2018

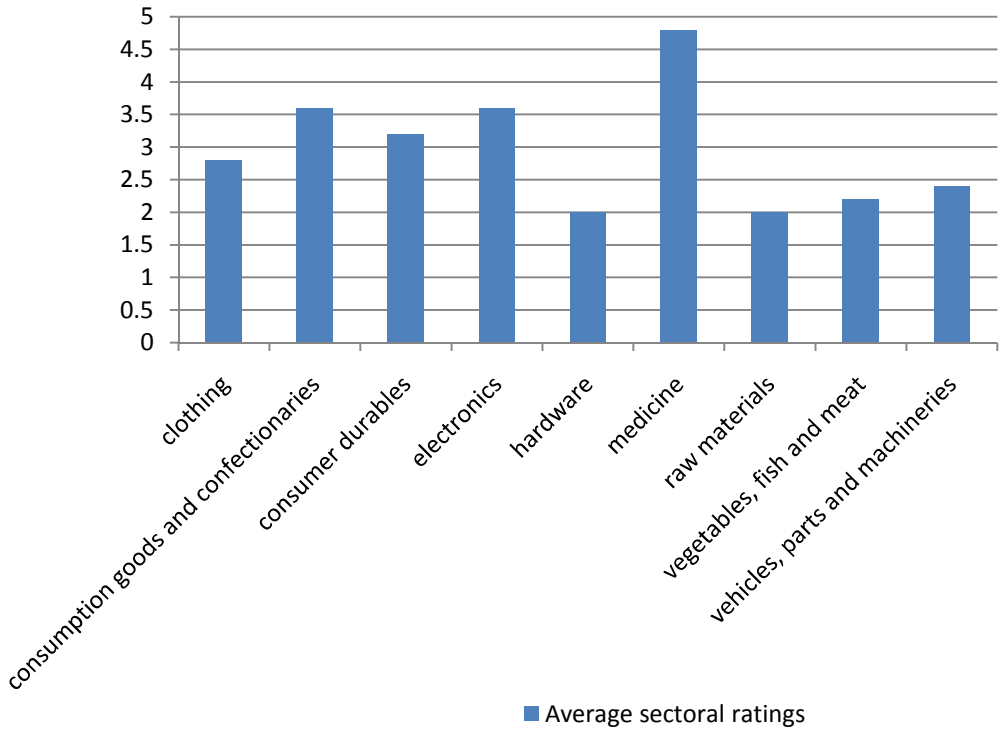
The survey data reveals the variation in the perceived cost of logistics in the surveyed area. On average, in ranking done on this matter to business men; who are often reluctant to give the extremities of the spectrum to their partners we get 3 respondents who gave the lowest ranking of 1 and 4 respondents who gave the ranking of 5 to their logistics providers. Out of 45 respondents 16 respondents rank the cost average which is also revealed in the overall average rating calculated score of 2.95 out of 5. But when we see that 16 (3+13) respondents ranked their logistics providers' cost efficiency below average as compared to 13 (9+4) respondents who ranked their logistics providers above the average, we can partially conclude that majority of the respondents feels their logistics providers' cost efficiency is

below average assuming the respondents who responded with average ranking are not even slightly bend towards one or the other.

In overall, Despite the prevailing high cost of transportation owing to extreme terrain and bad road conditions the cost efficiency of logistics sector in Aizawl city is ranked above average at 2.95 out of 5, because, for some sectors logistics cost is quite low as compared to others such that the overall cost balances out.

Sectoral or item-wise ranking of the performance of their particular logistics providers is depicted in the bar graph below.

Graph 4.1: Cost Efficiency



As shown in the bar graph medicine are procured at quite an efficient cost as shown by the sectoral overall rating of 4.8 out 5 in terms of cost

efficiency. This may be due to the long and stable existed efficient supply mechanism prevailing in medicine logistics, as well as the nature of the item - which implies that a truck load of medicine is very high in value as compared to the bulky items in the comparison like hardware items, raw materials, vegetables etc. Respondents from which item groups rank their logistics providers in terms of costs at 2,2 and 2.4 out of 5 respectively. This variation in rankings explained in terms of bulkiness of the items is however not the main reason for the difference in cost efficiency. Products like electronics (ranked at 3.6), consumer durables (ranked at 3.2) and consumption goods and confectionaries (ranked at 3.6) enjoy fair logistics cost because the suppliers and the producing companies are in good terms of agreement with transporters and other necessary players. The fact that clothing retailers and distributors often have to travel themselves and the supply mechanisms of hardware, vegetables etc where there is often an intervention of middlemen cause these sectors rate their logistics performance relatively lower in terms of cost efficiency.

As it turns out, there is a huge variation in the perceived cost of logistics among the respondents depending on the type of item, mode of business dealings and partnership and the people involved in the logistics sector of each item groups.

4.2 (b): Ease of Obtaining Official Clearances

Official papers and clearances like way bill, form c, customs clearances etc can be a hindrance to logistics efficiency. Stringent regulations and protocol on movement of goods may affect business activities. At the same time, too much leniency may promote black markets which can affect the economy adversely. Respondents were asked to rate the ease of clearing these regulatory processes from 1 to 5 where 1 represents very difficult and 5 represents very easy.

Table 4.2: Ease of Obtaining Official Clearances

Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	0	0
2	4	8
3	10	30
4	18	72
5	13	65
Total	**45**	**175**
Average rating	**3.89 out of 5**	

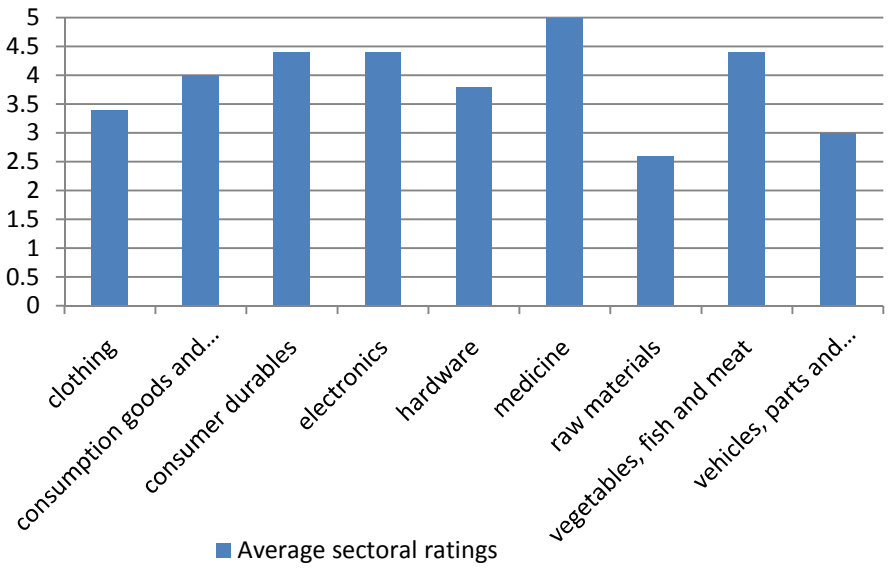
Source: Field Survey 2018

According to the survey data, none of the respondents felt it very difficult to access official clearances and regulatory processes. Only 4 out of 45 gave a score of 2 and 10 respondents gave a ranking of 3. A whooping number of 13 respondents felt that it is very easy to get official regulatory clearances and 18 respondents gave the ranking of 4.

On overall, official clearances for transportation of consignments are easy to get and applied for, as it is shown by the calculated average rating scored

at 3.89 out of 5. The efficiency brought by the attempts of the authorities to make transparent and efficient regulations may be the cause of the high rating. For instance, the introduction of online application facilities to apply for these necessary compliances makes it quite easy for all who involve. Besides, companies, distributors, suppliers and transporters are quite efficient in terms of getting the necessary papers and official clearances for movement of goods into Mizoram such that the consignees rarely have to bother much.

Graph 4.2: Ease of Obtaining Official Clearences



Analysis of the sectoral ratings given on ease of obtaining official clearances using the graph above shows that, medicine dealers in Aizawl city are unanimous on giving 5 out of 5. Respondents from all other item groups viz, clothing (3.4), consumption goods and confectionaries (4), consumer durables (4.4), electronics (4.4), hardware (3.8), raw materials (2.6), vegetables, fish and meat (4.4) and vehicles, parts and machineries

(3) gave ranks above average. Dealers of vehicles, parts and machineries rank the current system of obtaining clearances at 3 out of 5. This in part accounts for the problems faced in importing second hand goods. There is also a load of paper works to be verified to import raw materials and clothing from other countries; which is reflected in their rating.

It can be conclude that, there is not many of a problem in obtaining official clearances for movement of goods for the logistics sector in Aizawl city apart from when special procedures needs to be applied for. For example, inter-state transactions of second-hand goods and in the case of imported items.

4.2 (c): Ease of Payment Process

In today's world payment is usually done safely and very easy through online banking and through banks. For certain goods, suppliers and agents themselves collect payment from the consignees at prefixed dates. This is reflected in the rating given as under.

Table 4.3: Ease of Payment Process

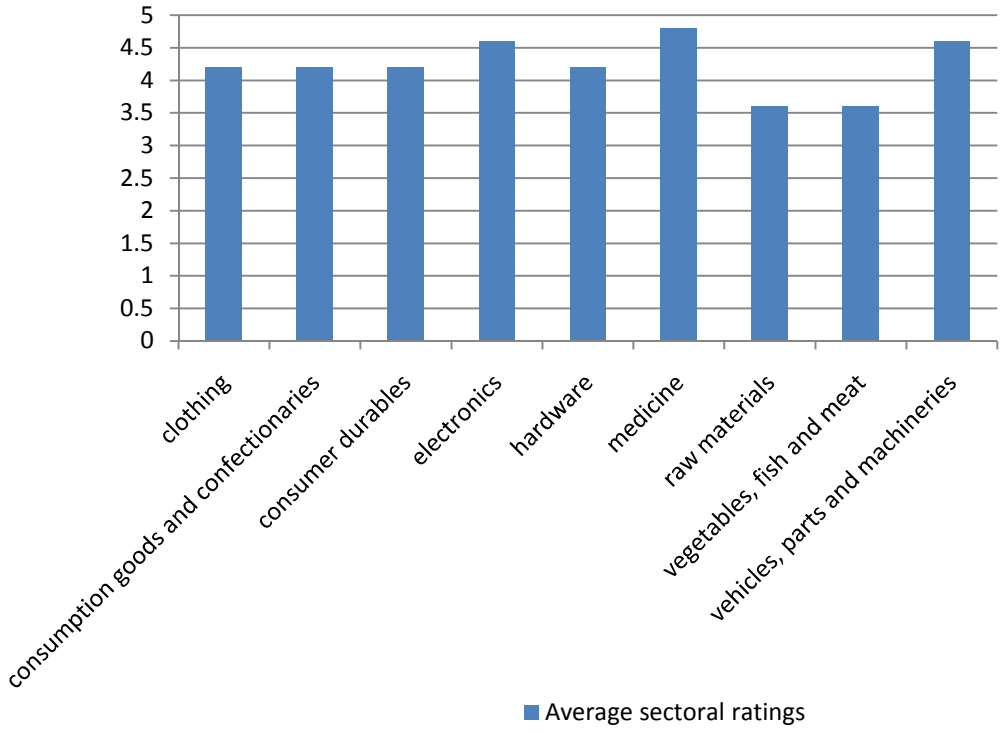
Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	0	0
2	0	0
3	8	24
4	19	76
5	18	90
Total	**45**	**190**
Average rating	**4.23 out of 5**	

Source: Field Survey 2018

In terms of ease of payment process, none of the respondents rank the current situation of logistics sector in Aizawl city below 3. 8 respondents gave a score of 3, 19 respondents gave a score of 4 and 18 respondents rate it 5 out of 5. The average rating of the logistics sector in Aizawl city with respect to ease of payment process stood at a very high score of 4.23 out of 5.

From the analysis we can conclude that it is felt that there is not much difficulty in the method of payment for consignments along with safety of payment processes and time taken for the same.

Graph 4.3: Ease of Payment Process



As for item wise respondents' rankings, logistics providers for medicine sector records the highest score for ease of payment process (4.8 out of 5),

followed by logistics providers for electronics sector and vehicles, parts and machineries sector (both scoring 4.6 out of 5). Clothing sector, consumption and confectionaries sector, consumer durables sector and hardware sector rank their respective providers at 4.2 out of 5 followed by scores given to logistics providers for the supply of raw materials and vegetables, fish and meat into Aizawl city (3.6 out of 5).

Sectoral ranking also shows the efficient process of payment methods applicable to all those involved in the supply chain of goods in Aizawl city.

4.2 (d): Ease of Reimbursements and Returns

In case of deficiency and defective items supplied on paid transactions, the consignor has to take responsibility or hand over responsibility to the transporters. It largely depends upon the type of items and business relationships. The respondents were asked to rank their logistics providers on the ease of reimbursements in case of deficiency and returns in case of defective or inferior items and wrong consignments on a scale of 1 to 5, where 1 stands for very difficult and 5 stands for very easy.

The survey result is formed into a table below which shows overall average ranking of respondents at 2.67 out of 5. 6 respondents rank their logistics providers 1 out of 5 in terms of ease of reimbursements and returns and 13 respondents gave a score of 2. 16 respondents gave a score of 3 and 10 respondents gave 4. None of the respondents from the surveyed area felt

that it is very easy to get reimbursements and returns in case of deficiencies and defect of items from their logistics providers.

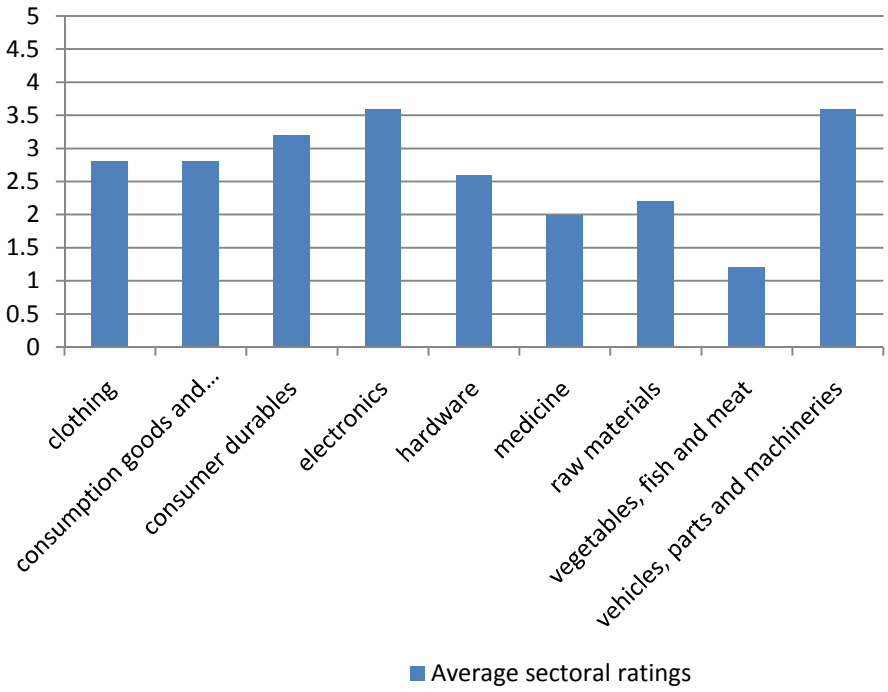
Table 4.4: Ease of Reimbursements and Returns

Ratings (1)	Number of respondents (2)	Value (1×2)
1	6	6
2	13	26
3	16	48
4	10	40
5	0	0
Total	**45**	**120**
Average rating	**2.67 out of 5**	

Source: Field Survey 2018

For established dealers and carrying forward agents, reimbursements and returns facilities are provided. But the whole process can be very irksome and time taking. Verification process and return shipping cost are unaccounted cost of operation. For perishable and fragile items, returns in case of defective items are not provided. It is also uneconomical to return those items that are of low value. All in all care is usually taken to avert this problem on both sides while it is non absent. The data analyse the 'what if', however rare such conditions might happen. This provision is ranked average at 2.67 out of 5. It may be more useful to analyse the following graph.

Graph 4.4: Ease of Reimbursements and Returns



Within the studied area, electronic items show the highest ratings with a score of 3.6 out of 5 since most of the products come with warranty in case of defects. Sectors where suppliers usually carry the goods themselves or where the retailers have formal contracts with logistics providers like vehicles and parts dealers also rate their logistics providers high in terms of ease of reimbursements and returns (whose logistics sector also scored on average 3.6 out of 5). Consumption goods and confectionaries (2.8), consumer durables (3.2), hardware (2.6) rate their logistics providers above average line. Perishable items like foods and those items that can be damaged with time like medicine and raw materials are ranked below average. When specialised vehicles are not provided, this ranking can be seen as causing big problem for the end user and is therefore rated only 1.2

for vegetables, fish and meat. In case of medicine, the absence of carrying and forwarding agent within the state is the main reason for the low rating of 2 out of 5 just below raw materials which is ranked 2.2.

What can be concluded from this graphical representation is that logistics sectors are not up to the mark when in terms of ease of reimbursements and returns of items in case of defects and deficiencies. This finding is important because this is the core item of customer care norms.

4.2 (e): Infrastructure

Logistics infrastructure includes roads, railways, waterways, air ways, vehicles, warehouse, on and off loading equipments, packaging system and equipments, communication facilities, etc. Infrastructure is the single most important factor that can influence cost of logistics and overall efficiency. Here, ratings are from 1 (very bad) to 5 (very good).

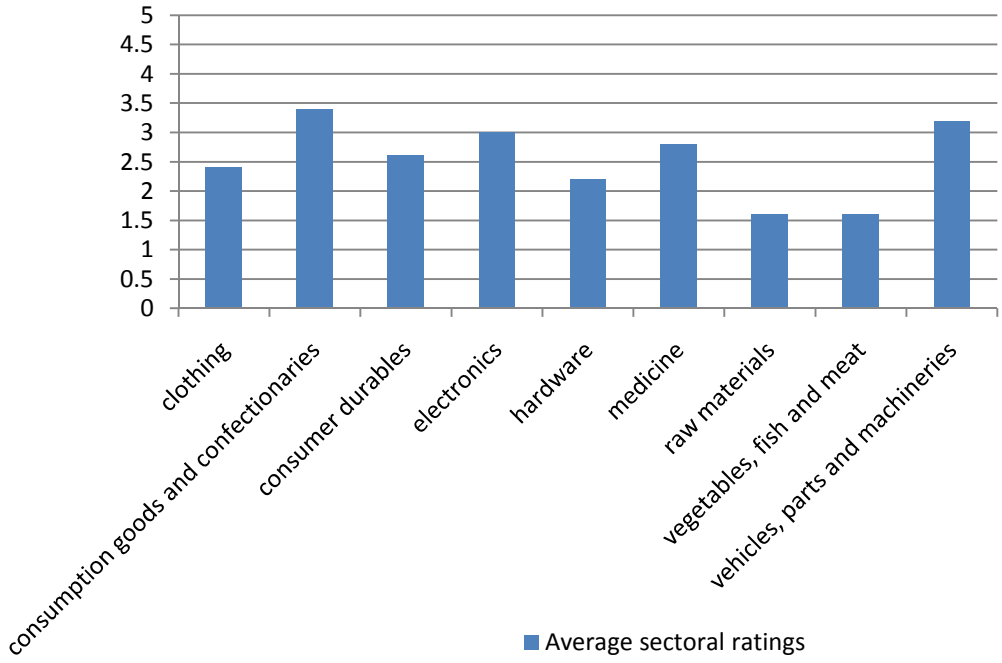
Table 4.5: Infrastructure

Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	6	6
2	17	34
3	14	42
4	8	34
5	0	0
Total	**45**	**114**
Average rating	**2.53 out of 5**	

Source: Field Survey 2018

Overall ratings given by the respondents from different item pools stood at 2.53 out of 5. No respondents feel that logistics infrastructure in Aizawl city is very good, while 8 respondents out of 45 thinks that infrastructure condition in the surveyed area is satisfactory by giving a score of 4 out of 5. The bad road condition influenced the respondents' answers as shown by the table. More than half of the total respondents, 23 to be exact, feel that logistics infrastructure in Aizawl city is indeed bad. While 14 respondents feel that it is average.

Graph 4.5: Infrastructure



Ratings of infrastructure of the logistics sector are usually low for items that are bulky and those that require road transport. The overall rating is also quite low at 2.53 reflecting the bad road conditions. For perishable food items, road conditions affecting the time taken for transit, lack of cold storage and warehouses are the main reasons for the lowest rating of 1.6.

Items that are transported through airways and courier services and other items that are non perishable and plenty in supply are not affected as much and hence ratings given are a bit higher. Viewing the current situation of roads, bridges, railways, warehouses, storages and communication facilities, it can be said that the ratings given are fairly lenient.

In overall, it can be concluded that the level of logistics infrastructure remains the weak point of logistics sector in Aizawl city. Above all, road condition is often phrased by the respondents who feel that logistics infrastructure is below satisfactory.

4.2 (f): Use of Information Technology and Innovations

Another important factor in measuring efficiency of any business entity is the utilisation of information technology and innovations. In today's world, information technology can be used to replace the traditional methods of paper works and manual labour, for advertising products and customer care and support. Innovations can also be used to raise the overall quality of work and work environment. The use of IT and innovation will certainly raise the delivery quality of the goods at the end user and thus increase customer satisfaction. For example the use of refrigerated cargo truck to transport fruits keeps the quality of the fruits high for the consumers. Likewise, packaging technique and preservation methods are also important components. The last few decades have experienced the rapid growth in information technology which ultimately finds its way into

supply chain management. Now, software and mobile applications are made to suit the needs in the management of logistics.

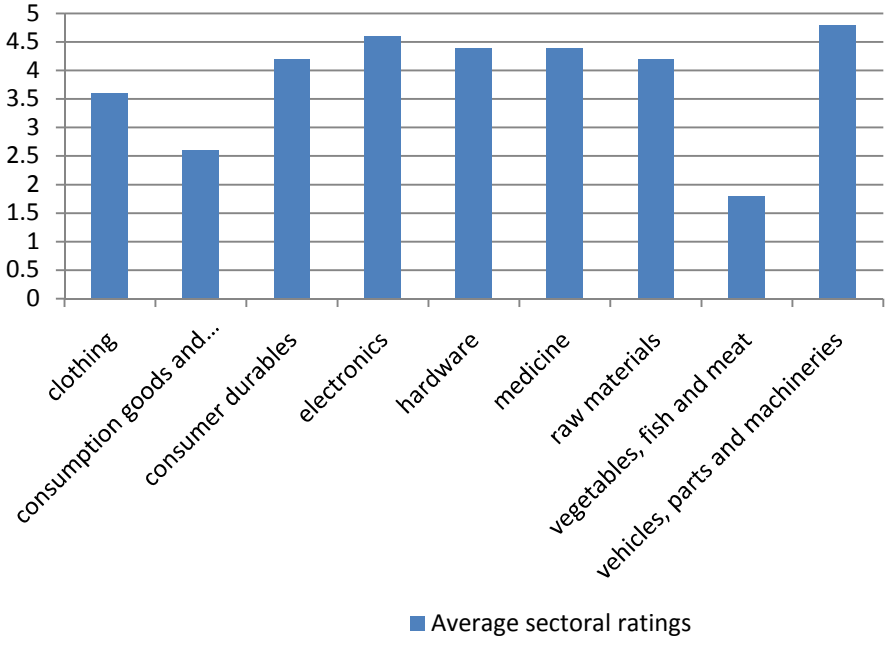
Table 4.6: Use of IT and Innovations

Ratings (1)	Number of respondents (2)	Value (1×2)
1	1	1
2	6	12
3	6	18
4	18	72
5	14	70
Total	**45**	**173**
Average rating	**3.84 out of 5**	

Source: Field Survey 2018

32 respondents out of 45 rank the present utilization of IT and innovations by their respective logistics providers more than 3. At the extremes, only 1 respondent gave a ranking of 1and 14 respondents gave a ranking of 5 out of 5. Overall average rating stood at a high 3.84 out of 5.

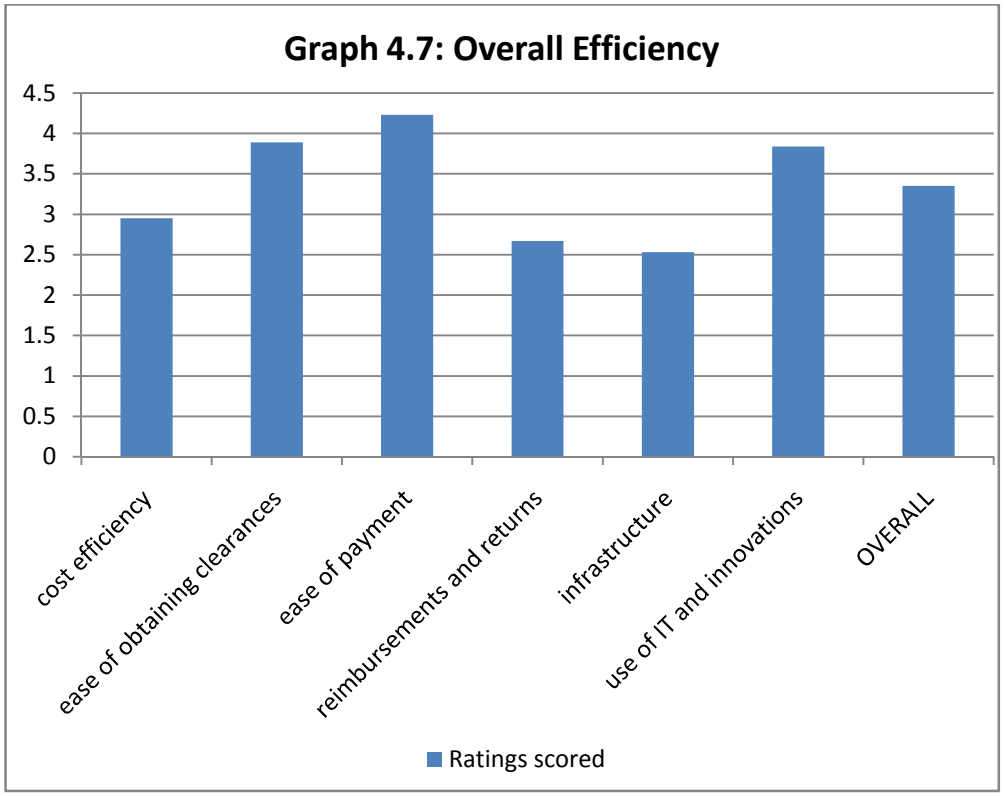
Graph 4.6: Use of IT and Innovations



According to the survey data, there has been tremendous development in the use of IT and innovations by the logistics sector except in the supply chain of vegetables, fish and meat; where modern techniques are not utilized up to mark - be it transporting, storing, processing, packaging etc. Rated 1.8 out of 5, there is a wide room for improvement. The logistics providers of consumption goods and confectionaries have also not yet use IT and innovations as compared to that of other items and are rated 2.6 out of 5. Other average sectoral ratings are usually high; clothing – 3.6, consumer durables – 4.2, electronics – 4.6, hardware – 4.4, medicine – 4.4, vehicles, parts and machineries – 4.8.

We can conclude from this data that, in terms of utilisation of IT and innovations, logistics providers are doing good by adopting the latest technology in communication, order processing, management, tracking capabilities, etc. The low rankings for this field were given where utilization of IT and innovation requires infrastructural improvements and improvement in material handling.

Overall efficiency of the logistics sector can be represented in the form of graph as under to make it easy to judge what the areas are that need improvement to attain efficient logistics performance.



Overall efficiency of logistics sector in Aizawl city is rated 3.35 out of 5. Infrastructure is ranked lowest among the efficiency indicators with a score of 2.53, followed by ease of reimbursements and returns (2.67). The overall average ranking of the rest in ascending order is; cost efficiency (2.95), use of IT and innovations (3.84), ease of obtaining official clearances (3.89) and ease of payment process (4.23).

Thus from the survey data, we can say that efficient performance of logistics service in Aizawl city is hindered most by the poor level of infrastructure and high cost of logistics services. Lack of reimbursements and returns provision in case of deficiencies and defects affects the satisfaction of end user of the items and customers ratings of the logistics sector.

4.3: EFFECTIVENESS MEASURES

Effectiveness measures rate the performance of logistics sector on completing tasks to satisfy customers' requirements. While efficiency means 'doing things right', effectiveness means 'doing the right things'. It basically measures the performance of the logistics sector on their material service of the customer demands. The following basic fields were selected and studied based on the respondents' reactions for effectiveness measures.

4.3 (a): Timeliness

One of the most important aspects of specializing in logistics service is being able to provide goods and services to the customers as and when they are needed. Goods required today may not be useful tomorrow or they may decrease in value and utility. Thus timeliness is first and foremost to measure the effectiveness of logistics sectors. Again, the following tables and graphs show ratings of the logistics sector in Aizawl city given by the respondents on different fields and sectoral ratings respectively.

Here, respondents were asked to rate their logistics providers from 1 to 5 where 1 represents never on time and 5 represents that the consignments always reach on time. With respect to timeliness of consignments in the surveyed area, responds varied across respondents.

As we can see from the table below, 7 out of 45 respondents confided that their consignments never reach on time. And 3 respondents receive their goods always on time. The rest of the respondents' replies swayed towards

the lower spectrum. This is shown by the average low rating of 2.6 out of 5 on timeliness of receipt of consignments in Aizawl city.

Table 4.7: Timeliness

Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	7	7
2	16	32
3	13	39
4	6	24
5	3	15
Total	**45**	**117**
Average rating	**2.6 out of 5**	

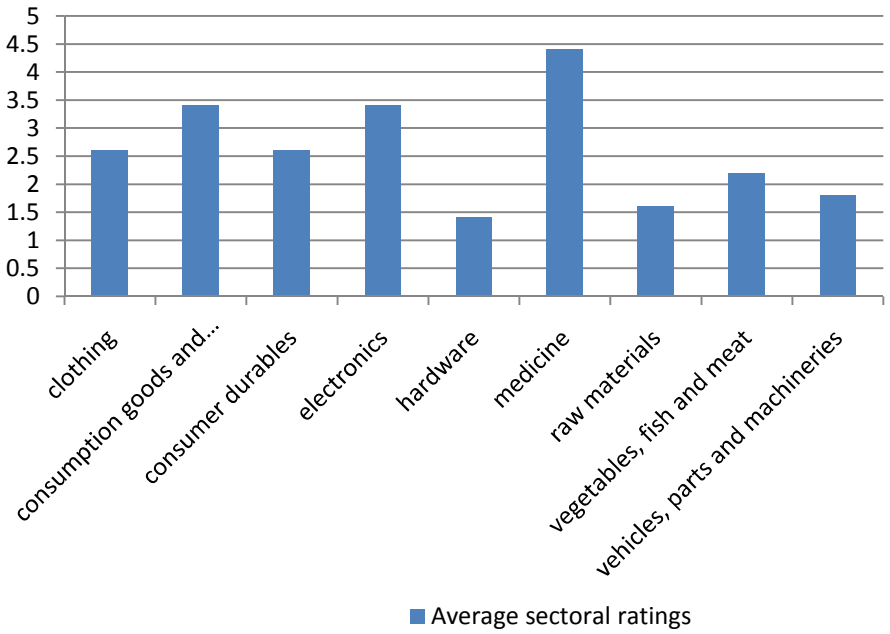
Source: Field Survey 2018

From the survey conducted, it has been found out that delay in transport due to bad road conditions in Mizoram state has been one of the major problems faced by all as shown by the low rating of only 2.6 on average. Time taken in the processing of orders for goods is another problem faced by raw materials importers and vehicle parts dealers. Sometimes orders for goods are waited and accumulated until a there is truck load of orders to be despatched. The remoteness of the city and the distance of factories and industries play a vital role in timeliness of delivery and also lead to higher chances of delays. Transporters, sometimes, as a way of creating bargaining power, intentionally delay shipping.

Medicine supplies show relatively higher ratings (ranked 4.4 out of 5) on timelines of delivery. Items which are high in demand and quickly consumed like hardware (ranked 1.4 out of 5) and raw materials (ranked 1.6 out of 5) are often short in supply and therefore not delivered on time.

Vehicles, spare parts and machineries (ranked 1.8 out of 5), clothing (ranked 2.6 out of 5) are procured from distant parts of the country and foreign countries; hence, their ratings are relatively low. For perishables items – for vegetables, fish and meat products, a slight delay could cause a great disaster; thus their ratings of their logistics providers are lower in general (2.2 out of 5).

Graph 4.8: Timeliness



Sectoral analysis of the timeliness of consignments provided by respective logistics providers reveals that medicine dealers are quite happy with their logistics providers in term of timeliness. Other than that, overall responds showed that logistics providers in Aizawl city need improvements in terms of timeliness in order to rightly respond to customer needs.

4.3 (b): Fulfilment of Required Quality

Quality of items delivered depends upon the competitiveness of firms, genuinity of products, transportation process, packaging process, storing techniques, etc. Detailed survey data analyses are as under.

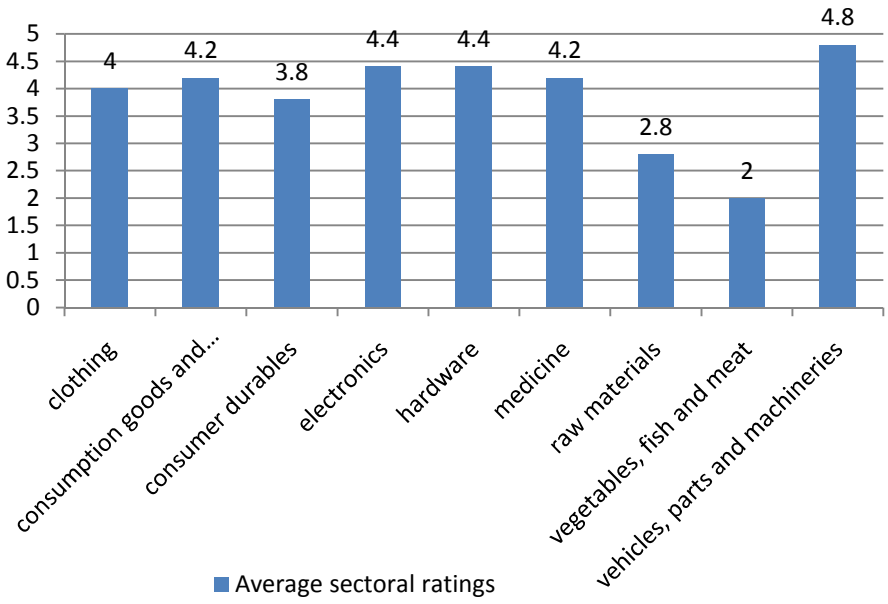
Table 4.8: Fulfilment of Required Quality

Ratings (1)	Number of respondents (2)	Value (1×2)
1	1	1
2	5	10
3	7	21
4	19	76
5	13	65
Total	**45**	**173**
Average rating	**3.84 out of 5**	

Source: Field Survey 2018

In today's highly competitive market, manufacturers and distributors as well as transporters are always competing to provide goods and services of the best quality especially when there are competitors in the market. The ratings given to logistics providers in Aizawl city are generally high in terms of fulfilment of required quality. Out of 5, the average rating score is 3.84. Only 1 respondent gave the rating of 1 and 5 respondent gave the rating of 2. Out of 45 respondents, 32 respondents are satisfied with the quality of products received and they rate their logistics providers above 3.

Graph 4.9: Fulfilment of Required Quality



When there are large numbers of manufacturers and demand for item is high and the manufacturing process of which can be carried out fairly easy, quality of products tend to be mixed up between good and bad products. Quality of perishable items greatly depends upon technology and time taken in transits, which is shown here with low rating of 2 out of 5. There is also a difficulty in getting the required quality of raw materials and the ranking given is 2.8. apart from consumer durables (rated 3.8), the rankings scored for logistics providers of all the other product groups is above 4 with vehicles and parts dealers ranking their logistics providers the highest at a score of 4.8 out of 5.

It can be concluded that, in terms of quality management, the logistics providers within Aizawl city are doing fairly well especially when there is

fierce competition in the market. Thus the ratings are generally high except for perishable items.

4.3 (c): Fulfilment of Required Quantity

Another important aspect of good performance of logistics sector in supply chain mechanism is fulfilment of required quantity. This attribute shows the capacity of the logistics sector to fulfil what is demanded of them. Time factor also plays an important role here. The scores here actually rank the logistics sector on the basis of fulfilment of required quantity on time. Even when there is adequate amount on the suppliers' side, logistics sectors may not be effective and efficient enough to store, transport and deliver the required amount to the consumers.

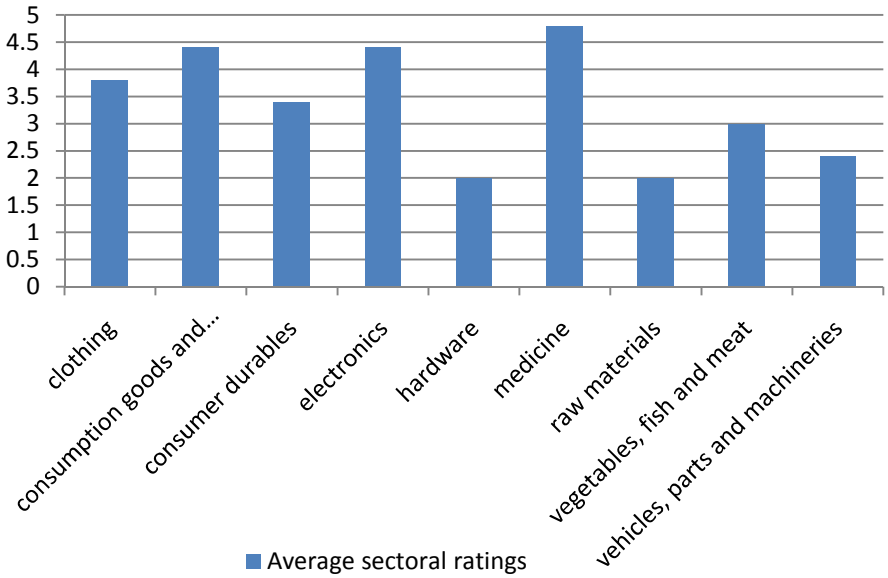
With respect to fulfilment of quantity required, logistics sector are doing fairly well with average rating of 3.35 out of 5. The ranking distributes around the mid-point, with only 2 respondents giving the score of 1 and 9 respondents giving the score of 5 as shown in the table below.

Table 4.9: Fulfilment of Required Quantity

Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	2	2
2	11	22
3	10	30
4	13	52
5	9	45
Total	**45**	**151**
Average rating	**3.35 out of 5**	

Source: Field Survey 2018

Graph 4.10: Fulfilment of Required Quantity



The graph above representing sector wise rating reveals that the customers are less satisfied in terms of quantity fulfilment where there are greater demands for the items in, and where items are bulky and a truckload of which met only a few proportion of the demands in case of vegetables, fish, meat, hardware, raw materials and vehicles. This rating is also greatly influenced by business experience, terms of relationships built between the concerned players and how influential the customer is to the logistics providers.

4.3 (d): Security and Tracking

Logistics sector effectiveness is also influenced by security conditions of the region. Highway robbery, hostility, prevalence of bribery, etc can largely influence the cost of operation and time taken in transits. Other aspects of security include security of payment method, level of

responsibilities taken by the transporters, incidences of unscheduled stoppages, etc. In congruent to this, tracking possibility of order processed, the whereabouts of consignments, customer care, communication maintenance, etc. enhance security and overall effectiveness.

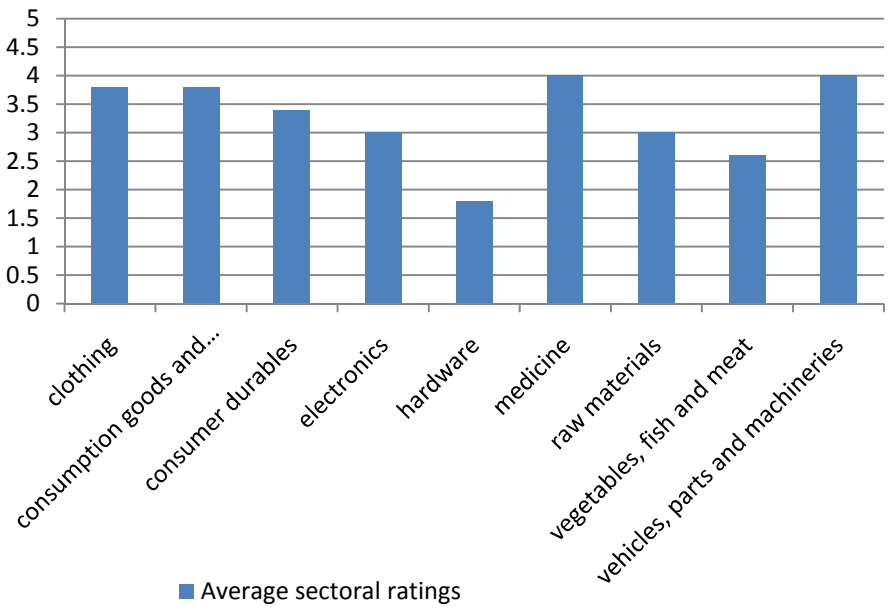
Table 4.10: Security

Ratings (1)	**Number of respondents (2)**	**Value (1×2)**
1	2	2
2	8	16
3	14	42
4	18	72
5	3	15
Total	**45**	**147**
Average rating	**3.27 out of 5**	

Source: Field Survey 2018

The overall average rating on security of consignments is 3.27 out of 5. 2 respondents out of the total feel that the environment and supply procedures are very unsafe and gave a score of 1 out of 5. At the same time, 3 respondents rate the overall security 5 out of 5. On average, the environment and transit process is safe and secure.

Graph 4.11: Security



From the survey data, hardware retailers are the ones that face security problems with their consignment the most and their ranking is only 1.8 followed by vegetables, fish and meat (scored 2.6 out of 5). Although Mizoram is a peaceful place, truck drivers from outside often face problems with the local thugs and highway robbery is not a rare situation. It is often carried out but only in small magnitude that it does not gets noticed to most people. Many items are procured from outside via maxi cabs and passenger transport where the drivers of the vehicles take little or no responsibility on the safety of the goods

As shown by the table below, none of the respondents ranked the logistics sector in Aizawl city more than 4 out of 5 in terms of possibility of tracking feature. The average rating of logistics sector in this field is only 2.67. by studying the table, one can conclude that tracking possibility of the

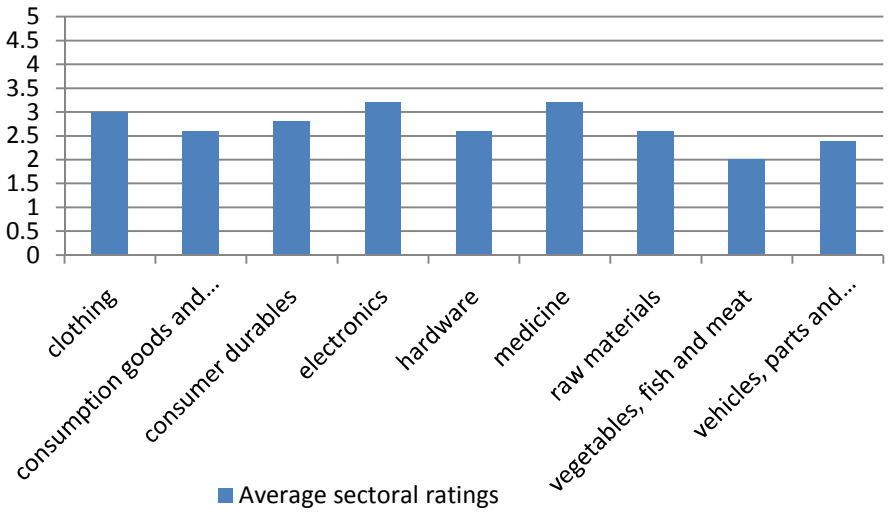
progress of order placed and the situations of the consignment can be improved upon by the logistics sector in the surveyed area.

Table 4.11: Tracking

Ratings (1)	Number of respondents (2)	Value (1×2)
1	2	2
2	17	34
3	20	60
4	6	24
5	0	0
Total	**45**	**120**
Average rating	**2.67 out of 5**	

Source: Field Survey 2018

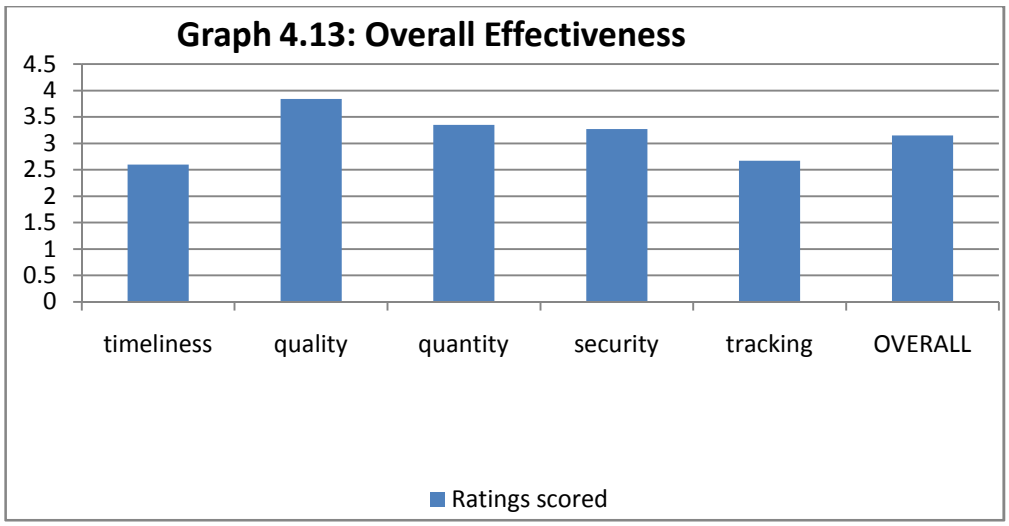
Graph 4.12: Tracking



From the survey, it was studied that time taken for order processing is one of the main reasons for delays which make it difficult to forecast delivery days. The result does also reveals that, even though tracking provisions are made available, there is a tendency for unscheduled delays and stoppages even after despatch.

Tracking of consignments, nowadays, is made possible by mobile phones and internet. But there exist language barriers and other uncertainties relating to roads and the morale of some players towards customer care that makes tracking unreliable and difficult.

Overall effectiveness of the logistics sector can be represented in the form of graph as under.



The overall effectiveness of logistics sector in Aizawl city is rated 3.15 out of 5. Lowest score of 2.6 is recorded in the case of timeliness of delivery followed by the score of 2.67 attributed to tracking possibility of the consignments. Fulfilment of quality and quantity are given rating score of 3.84 and 3.35 respectively. Meanwhile, overall security of the consignments is given a rating score of 3.27.

4.4: SUMMARY

The above data shown can be summarised into the following table and graphs

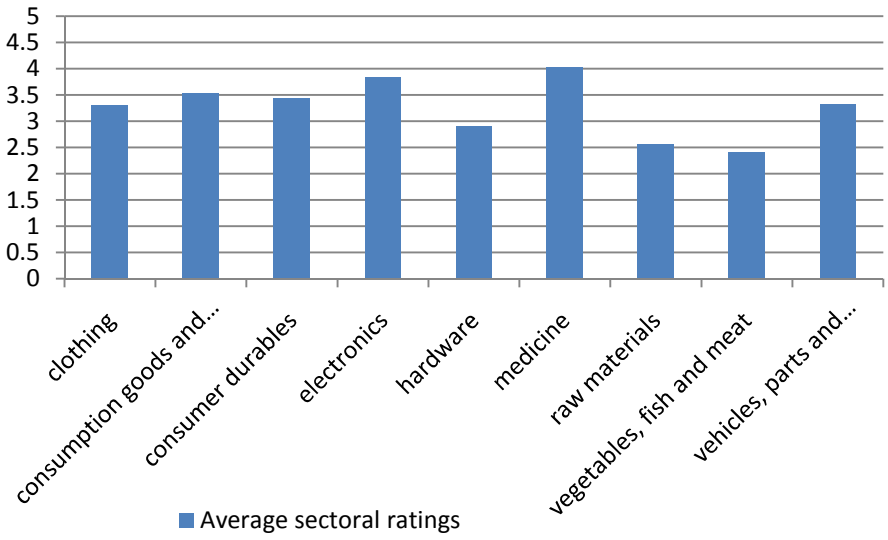
Table 4.12: Overall Sectoral Average Ratings

Sl. No.	Item groups	Ratings
1	Clothing	3.31
2	Consumption goods and confectionaries	3.54
3	Consumer durables	3.44
4	Electronics	3.84
5	Hardware	2.91
6	Medicine	4.04
7	Raw materials	2.56
8	Vegetables, fish and meat	2.42
9	Vehicles, parts and machineries	3.33

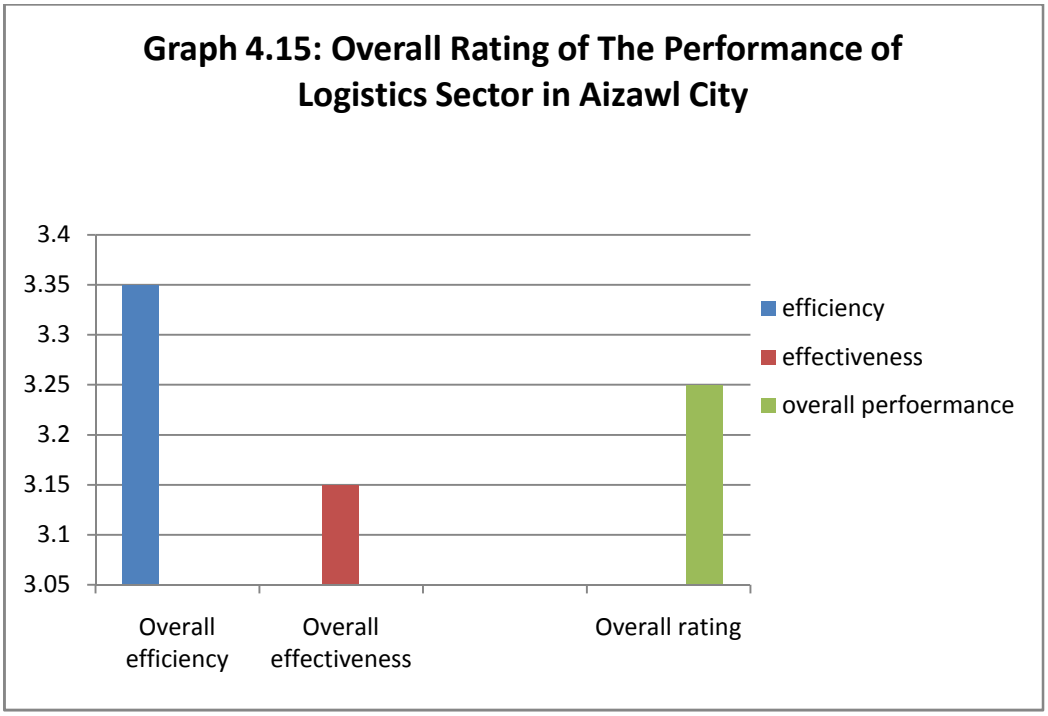
As per overall item wise ratings, medicine logistics scored highest with a high rating of 4.04 out of 5 while logistics sectors involved in the supply chain of vegetables, fish and meat scored lowest with rating 2.52 out of 5. Logistics providers of raw materials and hardware items are also rated below the overall average.

Shown below is the graphical representation of the above table.

Graph 4.14: Overall Sectoral Average Ratings



In the following graph, the overall performance of logistics sector is depicted with graphical tool.



From the data analyzed, overall performance of Logistics sectors in Aizawl city is given a rating of 3.25 out of 5, while efficiency and effectiveness are given ratings of 3.35 and 3.15 respectively.

To conclude, on the basis of respondents' views and rankings, the overall performance of logistics sectors in Aizawl city fare well than was expected though there exists a number of fields where performance can be improved upon. Efficiency of the logistics sector attains higher score than effectiveness mainly due to the logistics providers' efforts in maintaining good relations with their partners and it shows their consciousness of customer care. The lower score for the latter is caused mainly by the poor

overhead infrastructure and the remoteness of the area studied could play a vital role.

Sectoral analyses revealed the variation in the satisfaction level of the respondents on the service of logistics providers for different item groups, which is important to identify the weak sectors in the supply chain mechanism in order to be able to devise solutions for improvement in logistics sector performance in Aizawl city.

5.1: FINDINGS

- Overall performance of Logistics sectors in Aizawl city is given a rating of 3.25 out of 5. Overall efficiency and effectiveness attributes of logistics sectors are given ratings of 3.35 and 3.15 respectively. (*Objective No.1*)
- On the basis of respondents' views and rankings, the overall performance of logistics sectors in Aizawl city fare well than was expected though there exist a number of fields where performance can be improved upon. Efficiency of the logistics sector attains higher score than effectiveness mainly due to the logistics providers' efforts in maintaining good relations with their partners. It also shows their consciousness of the importance of customer care. The lower score for the latter is caused mainly by the poor overhead infrastructure and the remoteness of the area studied could play a vital role. (*Objective No.1*)
- Despite the prevailing high cost of transportation owing to extreme terrain and bad road conditions the cost efficiency of logistics sector in Aizawl city is ranked above average at 2.95 out of 5, because, for some sectors logistics cost is quite low as compared to others such that the overall cost balances out. Also the analysis reveals that there is a huge variation in the perceived cost of logistics among the respondents depending on the type of item,

mode of business dealings and partnership and the people involved in the logistics sector of each item groups. (*Objective No.2*)

- There has been tremendous development in the use of IT and innovations by the logistics sector except in the supply chain of vegetables, fish and meat; where modern techniques are not utilized up to mark - be it transporting, storing, processing, packaging etc. Rated 1.8 out of 5, there is a wide room for improvement. The logistics providers of consumption goods and confectionaries have also not yet use IT and innovations as compared to that of other items and are rated 2.6 out of 5. On average, in terms of utilisation of IT and innovations, logistics providers are doing good by adopting the latest technology in communication, order processing, management, tracking capabilities, etc. The low rankings for this field were given where utilization of IT and innovation requires infrastructural improvements and improvement in material handling. (*Objective No.3*)
- On overall, official clearances for transportation of consignments are easy to get and applied for, as it is shown by the calculated average rating scored at 3.89 out of 5. The efficiency brought by the attempts of the authorities to make transparent and efficient regulations may be the cause of the high rating. There is not much problem in obtaining official clearances for movement of goods for

the logistics sector in Aizawl city apart from when special procedures needs to be applied for. *This finding placates our first research question that whether there was any difficulties in obtaining official clearances for transport of consignments.*

- One finding is that the hardware retailers are the ones that face security problems with their consignment the most and their ranking is only 1.8 followed by vegetables, fish and meat (scored 2.6 out of 5). Although Mizoram is a peaceful place, truck drivers from outside often face problems with the local thugs and highway robbery is not a rare situation. It is often carried out but only in small magnitude and does not gets noticed to most people. Many items are procured from outside via maxi cabs and passenger transport where the drivers of the vehicles take little or no responsibility on the safety of the goods. *This finding satisfies our second research question whether the logistics providers faced any security problems and was there any unnecessary checking and stoppages.*
- In terms of ease of payment process, none of the respondents rank the current situation of logistics sector in Aizawl city below 3. The average rating of the logistics sector in Aizawl city with respect to ease of payment process stood at a very high score of 4.23 out of 5. This shows that there is not much difficulty in the method of

payment for consignments along with safety of payment processes and time taken for the same.

- Logistics sectors are not up to the mark in terms of ease of reimbursements and returns of items in case of defects and deficiencies. Scoring an average rating of 2.67 out of 5, there is lack of integration among the players along the supply chain with respect to this service. This is the core item of customer care norms.
- Ratings of infrastructure of the logistics sector are usually low for items that are bulky and those that require road transport. The overall rating is also quite low at 2.53 reflecting the bad road conditions. For perishable food items, road conditions affecting the time taken for transit, lack of cold storage and warehouses are the main reasons for the lowest rating of 1.6. Items that are transported through airways and courier services and other items that are non perishable and plenty in supply are not affected as much and hence ratings given are a bit higher. This shows that the poor level of logistics infrastructure remains the weak point of logistics sector in Aizawl city.
- In terms of timeliness of delivery, delay in transport due to bad road conditions in Mizoram state has been one of the major problems faced by all as shown by the low rating of only 2.6 on average. Time taken in the processing of orders for goods is

another problem faced by raw materials importers and vehicle parts dealers. Sometimes orders for goods are waited and accumulated until there is truck load of orders to be despatched. The remoteness of the city and the distance of factories and industries play a vital role in timeliness of delivery and also lead to higher chances of delays. Transporters, sometimes, as a way of creating bargaining power, intentionally delay shipping.

- The ratings given to logistics providers in Aizawl city are generally high in terms of fulfilment of required quality, except for perishable items. Out of 5, the average rating score is 3.84. Customers are less satisfied in terms of quantity fulfilment where there are greater demands for the items and where items are bulky and a truckload of which met only a few proportion of the demands in case of vegetables, fish, meat, hardware, raw materials and vehicles. This rating is also greatly influenced by business experience, terms of relationships built between the concerned players and how influential the customer is to the logistics providers.
- Though tracking provisions are made available; there is a tendency for unscheduled delays and stoppages after despatch. Tracking of consignments, nowadays, is made possible by the use of mobile phones and internet. But there exist language barriers and other

uncertainties relating to roads and the morale of some players towards customer care that makes tracking unreliable and difficult.

- As per overall item wise ratings, medicine logistics scored highest with a high rating of 4.04 out of 5 while logistics sectors involved in the supply chain of vegetables, fish and meat scored lowest with rating 2.52 out of 5. Logistics providers of raw materials and hardware items are also rated below the overall average. Sectoral analyses revealed the variation in the satisfaction level of the respondents on the service of logistics providers for different item groups in Aizawl city.

5.2: SUGGESTIONS

- In order to ensure easy flow of goods, it must be ensured by the authorities that unnecessary stoppages at check posts do not occur especially on items that require immediate and quick transport. Strict security procedure also has to be maintained along the highway.
- More and more use of up to date online payment gateway is suggested for efficient payment and transaction processes. In line with this, use of information technology on order processing and tracking of consignment will ensure transparency and customer satisfaction. Reimbursements and returns process in case of defects and deficiencies should be addressed more promptly by entering

into formal business contracts and agreements with freight and cargo movers.

- The quick solution to the prevailing high cost of logistics in the surveyed area is the integration of the logistics players. Transportation cost can be reduced by consolidation of orders. But, with the prevailing intervention of overlapping small and large transporters and cargo movers, this is far from happening. The existence of strong and influential fourth party logistics providers will be able to attain such goal.
- To improve the performance of logistics sector in Aizawl city, the most important step to be taken is towards integration among the key players. The present scenario, where key the players function more or less independent and pursue their own profit acts a major barrier for efficient and smooth functioning as it leads to information asymmetry and causes imperfect competition among the logistics providers. Transparency in logistics operations and strategies with each other partners among the key players of the supply mechanism will certainly improve overall performance without affecting the interest of none of the players. Informal logistics sectors like middlemen suppliers, vehicles owners, commission agents etc has to be brought under formal sectors by mandating registration for this kind of flying traders.

- Illegal transportations of merchandise via passenger transport by traders without proper authorisations needs to be checked to promote the existing established logistics sector within the city.
- Infrastructure development is the first and foremost step the authorities can take to improve the performance of Logistics sector. Improving roads condition will certainly improve performance of logistics sectors by reducing cost of transport, time taken for transport, uncertainties and depreciations. Construction of warehouses and cold storage chains is necessary to keep the constant availability of perishable items and items of heavy demand.
- The supply chain of perishable items like vegetables, fruits, fish, meat, etc needs to be look into. There is a need for improvement in techniques and methods in terms of storing and transporting. Adequate knowledge has to be imparted to all those involved regarding quality management and inspection methods. And it even calls for authorities' actions and interventions too keep these items free from stoppages and delays in case of communal unrests and calamities when movement of other goods may be delayed.
- The state government has to be aware of the importance of improvement in logistics sector. Introducing diploma courses on logistics and supply chain management, warehouse management, cold chain management, and the like in the existing government

institutions and training institutes is necessary to develop skilled personnel in the field.

5.3: CONCLUSION

For the logistics sector in Aizawl city influence all other economic activities in the area, there is a need for all round improvement. At the same time a complete and holistic approach involving structural and institutional improvements will have to occur since logistics activities involve a wide array of activities. These improvements will be beneficial not only to those involved in the sector but to the economy of the region as a whole. The findings and suggestions is hoped to have some implications towards the conquest for performance improvement, both from those who are actually involved in the logistics sector and from policy makers and concerned authorities in Mizoram as a whole and Aizawl City in particular.

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ABSTRACT

PERFORMANCE OF LOGISTICS SECTOR IN AIZAWL CITY

BY

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TO

THE DEPARTMENT OF ECONOMICS,

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2018

INTRODUCTION

According to the Council of Logistics Management (CLM), *Logistics is a part of the supply chain process for planning, implementing, and control of effective and productive two way movement and storage of materials, services and information flow within the supply chain from the production of the products up to the consumption point of end use in order to meet the requirements of customers*. The word logistics was first used in military organisations. Military forces have always been very effective in maintaining inventories, supply and delivery of goods. The term later finds usage beyond military organisations and now logistics management is often used synonymous to supply chain management in business world as well as literature.

Logistics is a collection of functional activities (transportation, inventory control, etc.), which are repeated many times throughout the channel through which raw materials are converted into finished products and consumer value is added. Because raw material sources, plants, and selling points are not typically located at the same places and the channel represents a sequence of manufacturing steps, logistics activities recur many times before a product arrives in the marketplace. Even then, logistics activities are repeated once

again as used products are recycled upstream in the logistics channel.The components of a typical logistics system are: customer service, demand forecasting, distribution communications, inventory control, material handling, order processing, parts and service support, transportation, warehouse and storage, packaging and salvaging.

REVIEW OF LITERATURE

Liu (2009)[1] analysed the relationship between development of logistics industry and economic growth of China. The study was done by selecting Gross Domestic Product, logistics sector value added, total employment of logistics sector, new fixed asset investment, freight volume and freight turnover. By using Grey relational degree analysis, it was found out that logistics sector value added and freight turnover have the greatest impact on national economic growth. Logistics sector value added is part of logistics scale and freight turnover is part of logistics efficiency. It was thus concluded that enlargement of logistics scale and the increase of logistics efficiency can bring tremendous influence on the development of national economy.

Tokar (2010)[2] highlighted the need to identify behaviours of individual members involved in the supply chain with regard to judgement and decision

[1] Liu, S (2009), A Research on the Relationship of Logistics Industry Development and Economic Growth in China, *International Business Research,* Vol. 2, No. 3

[2] Tokar, T. (2010), 'Behavioural Research in Logistics and Supply Chain Management', *The International Journal of Logistics Management.* Vol. 13, No. 6, pp 30-41.

making to make a comprehensive study of market supply chain and logistics sector. This is because people often do their job in specific and systematic norms ignoring normative or optimal policies. Logistics researches have been improving in using hypothesis testing and using empirical data to make certain conclusions. But lack of behavioural analysis in these researches amounts to ambiguity because of uncertainties of human behaviours in decision makings. It was considered significantly important to analyse behaviours of the personnel involved in logistics sector especially because that human interaction happens and plays a vital role in each and every step of supply chain management. Thus interplay of empirical researches backed up by behavioural analyses of those involved in logistics in their judgement and decision making was deemed necessary to have a comprehensive study of different aspects of logistics sector performance and status.

Mohan (2013)[3] showed how logistics management has effect on global competitiveness. In his study, he examined the Indian logistics industry scenario. He strongly proposed that Indian companies should opt for fourth party logistics services (4PL) to bring in savings through usage of high technology tools, systems and collaborations. This will in turn bring down the logistics cost, which will bring customer satisfaction and improved service standard.

[3] Mohan, J.B., (2013), 'The Impact of Logistics Management on Global Competitiveness', *International Journal of Business and Management Inventions*, Vol. 2, No. 3.

Kuzu et.al, (2014)[4] studied the long term relationship between economic growth and developments in the logistics sector in Turkey. Using Granger's causality test he analyzed the relationship between GDP as an indicator of economic growth and Turnover Index of Transportation and Storage as an indicator logistics development. The test showed one sided causal relationship from economic development to logistics development which explained that increasing economic growth has been leading to the development of logistics sectors. In other tests the relationship between logistics sector and economic growth in the long run was found.

Hayalogu (2015)[5] segmented the Logistics sector into its components and studied the relationship between economic growth and each of the variables for OECD countries. The analysis produced different results depending on the variables used. Road transport, air transport, internet connections, phone connections and freight turnover show positive relationship to economic growth. In case of railway transport, no significant relationship was found.

AREA OF THE STUDY

Aizawl is the state capital of Mizoram. It is home to 293,416 persons according to 2011 census. The city is connected with the national transport

[4] Kuzu, S., Onder, E (2014), Research into the Long-Run Relationship Between Logistics Development and Economic Growth in Turkey, *Journal of Logistics Development,* Vol. 3, No. 1.

[5] Hayaloglu, P (2015), The Impact of Development in the Logistics Sector on Economic Growth: The Case of OECD Countries, *International Journal of Economics and Financial Issues,* Vol. 5, No. 2.

network by the National Highway 54, and it is connected to all parts of the state by road linkage. It is the centre of administration, trade and business hub for the rest of the state. Financial sectors and business activities that have their branches spread across the state have their main offices situated at Aizawl. Moreover, majority of all trades in goods and equipments as well as services within the state are carried out through Aizawl either physically or on papers. It can thus be said that a study on the performance of sectors of business activities in Aizawl city to a large extent will be representative of the performance in the state.

LIMITATION OF THE STUDY

This research work has certain limitations. Firstly, the study is done from the perspective of the consignees only. The ratings of the logistics providers like the suppliers and the carriers and forwarders are not taken, which make it one-sided in aspect and render the results useless for inter-regional comparisons.

Secondly, time and cost data of incoming and outgoing cargo records, way bill records, custom clearances, etc are not obtained because of lack of accessible accurate data set to calculate the actual performance in terms of quantity and cost efficiency.

OBJECTIVES OF THE STUDY

1. To examine the overall performance of the logistics sector using efficiency and effectiveness measures in Aizawl city.
2. To examine the cost efficiency and the condition of infrastructure of logistic sector within the study area.
3. To study whether there is any significant relationship between the use of IT and innovations and performance of the logistic sector.
4. To analyse the problems faced by this sector and to make relevant suggestions.

RESEARCH QUESTIONS

1. Is it difficult to obtain official clearances for transport of consignments?
2. Do the logistics providers face any security problems? Is there any unnecessary checking and stoppages?

METHODOLOGY

The research was done by circulating questionnaire, asking respondents to provide qualitative information based on their experience is deemed suitable. It comprises of the following core components of key indicators of logistics performance:

Cost efficiency, communication and tracking possibility, ease of obtaining official clearances and permissions, ease of payment, ease of reimbursement,

infrastructure, security and safety, timeliness, quantity fulfilment, quality fulfilment, Use of information technology and innovations.

The respondents then rank their logistics providers on the above indicators from 1 to 5; 1 being very low and 5 being very high.

In order to attain reliable response, the respondents have to be fairly knowledgeable about the market supply chain of goods in Aizawl city. This requirement is met by including wholesale owners, distributors, dealers of different goods, importers and retail outlets that have close connection with suppliers from outside the state and their logistics providers.

To measure the overall performance of logistics sector, the following product heads (industry-wise) are selected in order to include wide and varied logistics providers. The item heads are as given below:

Clothing items
Consumption goods and confectionaries
Consumer durables
Electronics
Hardware items
Medicine
Raw materials for industries including semi finished products
Vegetables, fish and meat
Vehicles, spare parts and machineries

Sample size of 45 respondents has been selected purposively for this survey, 5 respondents for each item head or industry. And the results are then analyzed with simple mathematical tools which are used for preparing the overall performance of the logistics sector in Aizawl city.

CHAPTERIZATION

Chapter I	:	Introduction
Chapter II	:	Review of Literature
Chapter III	:	Global and Indian Logistics Sector Scenario: An Overview
Chapter IV	:	Data Analysis
Chapter V	:	Findings, Suggestions and Conclusion

Bibliography

FINDINGS:

- Overall performance of Logistics sectors in Aizawl city is given a rating of 3.25 out of 5. Overall efficiency and effectiveness attributes of logistics sectors are given ratings of 3.35 and 3.15 respectively. (*Objective No.1*)
- On the basis of respondents' views and rankings, the overall performance of logistics sectors in Aizawl city fare well than was expected though there exist a number of fields where performance can be improved upon. Efficiency of the logistics sector attains higher score than effectiveness mainly due to the logistics providers' efforts in maintaining good relations with their partners.

It also shows their consciousness of the importance of customer care. The lower score for the latter is caused mainly by the poor overhead infrastructure and the remoteness of the area studied could play a vital role. (*Objective No.1*)

- Despite the prevailing high cost of transportation owing to extreme terrain and bad road conditions the cost efficiency of logistics sector in Aizawl city is ranked above average at 2.95 out of 5, because, for some sectors logistics cost is quite low as compared to others such that the overall cost balances out. Also the analysis reveals that there is a huge variation in the perceived cost of logistics among the respondents depending on the type of item, mode of business dealings and partnership and the people involved in the logistics sector of each item groups. (*Objective No.2*)
- There has been tremendous development in the use of IT and innovations by the logistics sector except in the supply chain of vegetables, fish and meat; where modern techniques are not utilized up to mark - be it transporting, storing, processing, packaging etc. Rated 1.8 out of 5, there is a wide room for improvement. The logistics providers of consumption goods and confectionaries have also not yet use IT and innovations as compared to that of other items and are rated 2.6 out of 5. On average, in terms of utilisation of IT and innovations, logistics providers are doing good by adopting the latest technology in communication, order processing, management, tracking capabilities, etc. The low rankings for this field were given where utilization

of IT and innovation requires infrastructural improvements and improvement in material handling. (*Objective No.3*)

- On overall, official clearances for transportation of consignments are easy to get and applied for, as it is shown by the calculated average rating scored at 3.89 out of 5. The efficiency brought by the attempts of the authorities to make transparent and efficient regulations may be the cause of the high rating. There is not much problem in obtaining official clearances for movement of goods for the logistics sector in Aizawl city apart from when special procedures needs to be applied for. *This finding placates our first research question that whether there was any difficulties in obtaining official clearances for transport of consignments*.
- One finding is that the hardware retailers are the ones that face security problems with their consignment the most and their ranking is only 1.8 followed by vegetables, fish and meat (scored 2.6 out of 5). Although Mizoram is a peaceful place, truck drivers from outside often face problems with the local thugs and highway robbery is not a rare situation. It is often carried out but only in small magnitude and does not gets noticed to most people. Many items are procured from outside via maxi cabs and passenger transport where the drivers of the vehicles take little or no responsibility on the safety of the goods. *This finding satisfies our second research question whether the logistics providers faced any security problems and was there any unnecessary checking and stoppages.*

- In terms of ease of payment process, none of the respondents rank the current situation of logistics sector in Aizawl city below 3. The average rating of the logistics sector in Aizawl city with respect to ease of payment process stood at a very high score of 4.23 out of 5. This shows that there is not much difficulty in the method of payment for consignments along with safety of payment processes and time taken for the same.
- Logistics sectors are not up to the mark in terms of ease of reimbursements and returns of items in case of defects and deficiencies. Scoring an average rating of 2.67 out of 5, there is lack of integration among the players along the supply chain with respect to this service. This is the core item of customer care norms.
- Ratings of infrastructure of the logistics sector are usually low for items that are bulky and those that require road transport. The overall rating is also quite low at 2.53 reflecting the bad road conditions. For perishable food items, road conditions affecting the time taken for transit, lack of cold storage and warehouses are the main reasons for the lowest rating of 1.6. Items that are transported through airways and courier services and other items that are non perishable and plenty in supply are not affected as much and hence ratings given are a bit higher. This shows that the poor level of logistics infrastructure remains the weak point of logistics sector in Aizawl city.
- In terms of timeliness of delivery, delay in transport due to bad road conditions in Mizoram state has been one of the major problems faced by all

as shown by the low rating of only 2.6 on average. Time taken in the processing of orders for goods is another problem faced by raw materials importers and vehicle parts dealers. Sometimes orders for goods are waited and accumulated until there is truck load of orders to be despatched. The remoteness of the city and the distance of factories and industries play a vital role in timeliness of delivery and also lead to higher chances of delays. Transporters, sometimes, as a way of creating bargaining power, intentionally delay shipping.

- The ratings given to logistics providers in Aizawl city are generally high in terms of fulfilment of required quality, except for perishable items. Out of 5, the average rating score is 3.84. Customers are less satisfied in terms of quantity fulfilment where there are greater demands for the items and where items are bulky and a truckload of which met only a few proportion of the demands in case of vegetables, fish, meat, hardware, raw materials and vehicles. This rating is also greatly influenced by business experience, terms of relationships built between the concerned players and how influential the customer is to the logistics providers.
- Though tracking provisions are made available; there is a tendency for unscheduled delays and stoppages after despatch. Tracking of consignments, nowadays, is made possible by the use of mobile phones and internet. But there exist language barriers and other uncertainties relating to roads and the

morale of some players towards customer care that makes tracking unreliable and difficult.

- As per overall item wise ratings, medicine logistics scored highest with a high rating of 4.04 out of 5 while logistics sectors involved in the supply chain of vegetables, fish and meat scored lowest with rating 2.52 out of 5. Logistics providers of raw materials and hardware items are also rated below the overall average. Sectoral analyses revealed the variation in the satisfaction level of the respondents on the service of logistics providers for different item groups in Aizawl city.

SUGGESTIONS:

- In order to ensure easy flow of goods, it must be ensured by the authorities that unnecessary stoppages at check posts do not occur especially on items that require immediate and quick transport. Strict security procedure also has to be maintained along the highway.
- More and more use of up to date online payment gateway is suggested for efficient payment and transaction processes. In line with this, use of information technology on order processing and tracking of consignment will ensure transparency and customer satisfaction. Reimbursements and returns process in case of defects and deficiencies should be addressed more

promptly by entering into formal business contracts and agreements with freight and cargo movers.

- The quick solution to the prevailing high cost of logistics in the surveyed area is the integration of the logistics players. Transportation cost can be reduced by consolidation of orders. But, with the prevailing intervention of overlapping small and large transporters and cargo movers, this is far from happening. The existence of strong and influential fourth party logistics providers will be able to attain such goal.
- To improve the performance of logistics sector in Aizawl city, the most important step to be taken is towards integration among the key players. The present scenario, where key the players function more or less independent and pursue their own profit acts a major barrier for efficient and smooth functioning as it leads to information asymmetry and causes imperfect competition among the logistics providers. Transparency in logistics operations and strategies with each other partners among the key players of the supply mechanism will certainly improve overall performance without affecting the interest of none of the players. Informal logistics sectors like middlemen suppliers, vehicles owners, commission agents etc has to be brought under formal sectors by mandating registration for this kind of flying traders.

- Illegal transportations of merchandise via passenger transport by traders without proper authorisations needs to be checked to promote the existing established logistics sector within the city.
- Infrastructure development is the first and foremost step the authorities can take to improve the performance of Logistics sector. Improving roads condition will certainly improve performance of logistics sectors by reducing cost of transport, time taken for transport, uncertainties and depreciations. Construction of warehouses and cold storage chains is necessary to keep the constant availability of perishable items and items of heavy demand.
- The supply chain of perishable items like vegetables, fruits, fish, meat, etc needs to be look into. There is a need for improvement in techniques and methods in terms of storing and transporting. Adequate knowledge has to be imparted to all those involved regarding quality management and inspection methods. And it even calls for authorities' actions and interventions too keep these items free from stoppages and delays in case of communal unrests and calamities when movement of other goods may be delayed.
- The state government has to be aware of the importance of improvement in logistics sector. Introducing diploma courses on logistics and supply chain management, warehouse management, cold chain management, and the like in the existing government institutions and training institutes is necessary to develop skilled personnel in the field.

CONCLUSION:

For the logistics sector in Aizawl city influence all other economic activities in the area, there is a need for all round improvement. At the same time a complete and holistic approach involving structural and institutional improvements will have to occur since logistics activities involve a wide array of activities. These improvements will be beneficial not only to those involved in the sector but to the economy of the region as a whole. The findings and suggestions is hoped to have some implications towards the conquest for performance improvement, both from those who are actually involved in the logistics sector and from policy makers and concerned authorities in Mizoram as a whole and Aizawl City in particular.

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