A STUDY OF MORATUMULLA TIMBER CLUSTER: AGGLOMERATION THEORY

Chamodhi Anuradha, Prathibhani Bandusena *
Department of Town & Country Planning, Faculty of Architecture, University of Moratuwa, Sri Lanka

Abstract

"Cluster" means purely a grouping. Industries and firms are geographically concentrated as clusters. Location behaviour of firms of a particular industry tends *to be clustered together in space as clustering enables them to reach higher economic performance. Alfred Marshall defined the economic benefits gained through the clustered industry as agglomeration effects. Agglomeration economies are the benefits that generate when industries, firms and people locate together in close vicinity to one another in cities. The researchers have discussed agglomeration economies in different contexts. However there was a knowledge deficiency about this in Sri Lanka.*

This research was based on the theory of agglomeration economies (AE) that aims to study way of functioning sources of agglomeration economies such as sharing, matching and learning in Moratumulla timber industrial cluster. The literature review was studied the theory and identified the indicators to study the sources of agglomeration economies. Moreover the identified indicators were finalized through the professional discussions. Further Questionnaire survey, interviews and observation were used for data collection in order to study the sources of agglomeration economies of Moratumulla. The research was based on the qualitative analysis. Therefore content analysis, network analysis and mapping techniques were used as data analysis of this study.

The empirical result of analysis in Moratumulla timber industrial cluster has identified sharing the intermediate input supplies, workers and consumers and a large pool of labor also facilitated the matching. However due to the trend of reduction skilled carpenters' labor pool in Moratumulla is leading to mismatching. Further Moratumulla can be identified as a center for learning carpentry and act as a workers training school due to the generation of knowledge and diffusion among others through accumulation of knowledge. However Moratumulla timber industry cluster have characteristics of urbanization economies as it goes beyond the localization boundary.

Keywords: *Agglomeration economies, Timber cluster, Sharing, Matching, Learning, Moratumulla,*

* Corresponding Author: prathibhanipb@gmail.com

Introduction

Most industries tend to cluster around the same location to reach higher economic performance. Michael Porter (1990) defined clusters as "groups of companies and institutions co-located in a specific geographic region and linked by interdependencies in providing a related group of products or services" (Michael Porter, 1990 cited in Ketels,C.H.M. & Memedovic,M. 2008).

Alfred Marshall used this theory to describe the concentration of specialized industries in particular localities. He also gave three possible reasons for the successful clustering in the same location. The first reason is the knowledge spill overs that take place when the employees of any firms can have relatively easy access to employees from other firms. The second reason is the local non-traded inputs indicating the share of specialized inputs benefiting the whole cluster. Finally, the third reason is the Local skilled labor pool concentrated in the same location, which invariably contribute to the expansion of skilled labor pool benefiting all firms engaged in the industry.

Agglomeration Economies (AEs) is not a new phenomenon. It has been used since 19th century. Latter , many authors have carried out studies based on Alfred Marshall's theory. Krugman, (1991) highlighted that the "Clusters are not seen as fixed flows of goods and services, but rather as dynamic arrangements based on knowledge creation, increasing returns and innovation in a broad sense". According to Porters' definition "Clusters are geographic concentrations of interconnected companies and institutions in a particular field." (Porter 1998: 78 cited in Lambooy,J.G 1998).

Many researchers have taken different approaches in discussing AEs. The world famous example is the center of innovation in electronics in Silicon Valley in North California in USA. With the application of this theory it has been found that in the USA AEs enhance jobs due to localization of services. In the Republic of Korea it is the highly specialized cities that take the advantage of local scale externalities. Moreover application of AEs in India provides support for the urban employment program to achieve the well-being of the poor. Even in the in Sri Lankan context, agglomeration economies are not a new phenomenon. In many cities we find the formation of AEs in sectors such as tourism, specialization of services in Panchikawathta, Maliban Street and Main Street in Pettah. With this background Moratumulla is identified as an AEs with timber industry. However there is a lack of research on how AEs works on spatially in Sri Lankan context. In order to fill this knowledge gap this research is aimed to identify how Moratumulla is functioning in accordance with AEs theory and how this theory really works in a ground situation such as Moratumulla. Further this study is focuses only agglomeration sources namely sharing, Matching and learning.

Literature review

Firms and Industries are found to be spatially concentrated as clusters. Why do firms geographically cluster in close proximity? The economic forces that influence the industries and firms to concentrate in close proximity to each other are known as agglomeration economies. To answer the above question, we need to turn towards the classical economist Alfred Marshall. He was the first scholar who argued over hundred years ago, that firms experience external economies and increasing returns when they geographically agglomerate together in close

proximity. Further he applied this theory to describe the concentration of specialized industries in particular localities.

"When an industry has thus chosen a location for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade getting from near neighbourhood to one another. The mysteries of the trade become no mysteries; but are as it were in the air…." (Marshall, 1890, cited in Antony Potter a & H. Doug Watts, 2012)

In detail observations of his theory Alfred Marshall identified three sources of agglomeration that generated increasing returns ,or the so-called trinity of agglomeration economies. These are a local pool of skilled labor, local supplier linkages and local knowledge spillovers. Moreover "Agglomeration of economic activities may benefit firms and increase productivity due to labor market pooling, input sharing and knowledge spillovers" (Marshall, 1920 cited in Hans R.A. Koster, 2010). Agglomeration economies of Alfred Marshall's are regarded as localization economies that occur when similar plants from the same industry cluster in close proximity at the same location.

The ideas of Alfred Marshall are playing a central role in present theories of clustering and agglomeration. As explained earlier firms that are located in high agglomeration areas are more productive than firm in areas with less economic activity around and agglomeration economies is a powerful force that can attract large number of people to a location.

Moreover he identified types of AEs as localization economy and urbanization economy. Localization economy is a system where production cost of a firm in a particular industry decrease as the total output of the industry increases. "Localization economies are external to the firm, but internal to the industry" (Agarwalla A., 2011). Secondly most defuse type of agglomeration economy are the urbanization economies. Urbanization economies occur when going beyond the localization boundary. Urbanization economies are external to the firms as well as to the industry (Agarwalla A., 2011). Further expansion of an urban area brings benefits to firms from the proximity to a diversity of industries, leading to regional growth. This happens when production cost of firms decrease as the total output of the urban area increases.

Finally, internal returns to scale which take place at one particular location generates large level of investment, rather than at different places. AEs are reducing cost due to economic activity carried out in the same location. However AEs have problems with externalities. Further negative externalities will leads to the diseconomies of scale.

Alternative Description on Agglomeration Economies

Agglomeration theory was introduced by Alfred Marshall who is known as a classical economist. Later many studies have been carried out on his application. Krugman, (1991) highlighted that "Clusters are not seen as fixed flows of goods and services, but rather as dynamic arrangements based on knowledge creation, increasing returns and innovation in a broad sense"(Boja, 2011). He described the reason for industry agglomeration as demand linkages among firms.

Moreover though the Porter's concept of the 'cluster' he has also contributed to the blooming of the economic approach to agglomeration economies. Porter defined (1990) cluster as "Geographic concentrations of interconnected companies and Institutions in the particular field" Major alternative classification was introduced by Duranton and Puga in 2004 who classified the sources of agglomeration as sharing, matching and learning.

Sharing

Sharing implies the sharing of indivisible facilities, intermediate suppliers, workers and consumers by firms. This will lead to the reduction of fixed cost. According to the needs of buyers, sharing of inputs also permits suppliers to provide highly specialized goods and services. The outcome of this is higher profit for all due to appurtenant by easy access to broader range of inputs. The concept of input (sharing depends on the existence of scale economies in purchasing production inputs (Marshall, 1920 cited in COAG Reform Council, 2012). Further Input sharing may be represented by purchased input intensity relative to sales), which has been found to be positively related to concentration (Holmes, 1999 cited in Jeffrey P. Cohen 2011).

Matching

Matching facilitate employers to better matching of workers to their distinctive needs when employees with a range of skills are available. As explained when many workers are available in close proximity, employers can easily find different types of workers. As explained by Puga "Workers also have differentiated skills uniformly spread over the same circumference, and must incur more costly retraining the greater the difference between their skill and the skill required by their employer"(Puga, 2009).

Learning

'Learning' denotes the transfer of information, knowledge and skills. Moreover in world of fast communication technologies, close connections between large groups of people and firms provide more opportunities for learning and more opportunities for face-to-face contact, which tends to facilitate knowledge exchange and transfer of skills. "Cities, by bringing together a large number of people, may thus facilitate learning" (Duranton and Puga, 2003). Also, a larger market can facilitate learning, for instance by promoting the development and widespread adoption of new technologies and business practices (Puga, 2009)

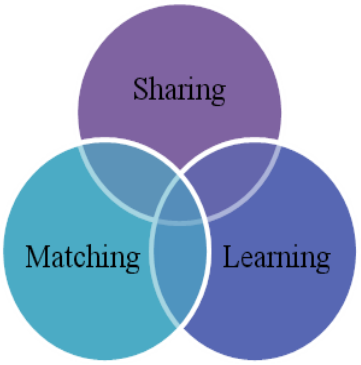


Fig1.1 :Inter linkage of Sharing, Leaning and Matching
Source: Compiled by author

Methodology

The intention of this study is to examine the functioning of agglomeration economies theory within Moratumulla timber industry agglomeration area based on the sources of agglomeration was collected from respective agencies. In addition content analysis, network analysis, narrative analysis, mapping and simple analysis techniques were used to analyze data of this study. economies. Therefore literature review had been used to identify the indicators to examine the sources of agglomeration economies such as sharing, Matching and learning. Preliminary survey was carried out through professionals to re-arrange indicators gathered from detailed literature review study to suit the Moratumulla area. Further according to the professional views

few indicators take as it is and others were edited (refer table 1.1). Detail survey consisted of primary data collection and secondary data collection. Primary data were collected through questionnaire survey, observations and interviews. The questionnaire was based on the above mentioned mandates and indicators. Further random sampling method was used to carry out questionnaire survey and interviews. Secondary data

Table.1.1Sources of Agglomeration Economies and indicators for study Moratumulla

Mandates	Finalized Indicators
Sharing	Input Sharing industries
	Intermediate input suppliers
	Intermediate input producer
	Proximity to market
	Intermediate labor supply
	Availability of public infrastructure
Matching	Proximity to related firms
	Wage of a labor
	No. Of Shops
	A pool of workers with similar skills
	Technical skilled of labor
Learning	Personal ties
	Co-location with other firms
	Information exchange among firms
	Amenities (Education)

According to the theory consumers' use inputs from intermediate suppliers. Further based on professional discussions indicators of the input sharing and amount of intermediate input used were re-arranged as intermediate input suppliers and input sharing industries. Intermediate input producer and proximity to market which are noted from literature review keep as it is. To study how labor share within firms, arranged the indicator as intermediate labor supply by tallying two indicators namely, total labor supply intermediate sector and manufacturing employment sharing. The Public infrastructure indicator was edited as availability of Public infrastructure.

Further proximity related firms, wage of a labor, no of shops indicators take as it is. Moreover A pool of workers with similar and labor pooling market indicators were changed as a pool of workers with similar skills. Highly skilled labor and technical skilled labor implies the same. Therefore the indicators rearranged as technical skilled of labor

Learning indicates the exchange of information. It include the personal contacts and nearby location with other firms. The indicator found from literature with guidance from professionals, spillover effects (knowledge) add to the information exchange and re arranged as information exchange among firms. Further support from national government and local government set up to fit in to Moratumulla area edited as support from local government. Moreover the amenities

available within area, personal ties and co-location with other firms were taken as it is explained in the literature.

Moratumulla Timber Cluster

Moratumulla area is traditionally known for skilled carpentry work and furniture industry which provides employment opportunities in this reputed sector. Agglomeration theory was developed based on industries which co-locate within the same area. . Further as explained in the above theory firms that cluster together in space are engaged in same type of economic activity. In the Moratumulla area prominent economic activity is timber related industries such as furniture industries, timber mill industries, carpentry industries, and timber seasoning industries etc. According to statistical data (2011) more than 60% of the population is engaged in timber industry in this area. Further according to the records of Moratuwa Municipal Council 75% of economic activities are based on timber industry.

Fig 1.2: Carpentry Shop in Moratumulla

Fig 1.3: Timber yard in Moratumulla

Fig.1.4: Carving shop in Moratumulla

Fig 1.5: Furniture showrooms in Moratumulla

Source: Author's observation

Sharing in Moratumulla

Sharing implies the sharing of facilities such as local infrastructure, intermediate supplies, consumers and works among the firms. According to the collected data the mechanism of sharing is analyzed as below.

- **Intermediate input supplier& input sharing industries**

The main production of the timber cluster in Moratumulla is furniture. Puwakaramba mawatha, Moratumulla north, Temple road, Galapitahabada road, Thapasarama mawatha, Alokapitiya, Puwakgaha Thotupola, St. Anthony's road, Sri Premarathna mawatha and Kovil road are the areas engaged in large scale production of furniture in Moratumulla. (Refer figure 1.6). There are 527 carpentry workshops, and 7 furniture polishing shops in this area contributing to the production. They consume items such as timber, wooden care, various types of glues, machines, machinery tools, spurs and cushion for production process of furniture. Those inputs can be identified as intermediate inputs the whole cluster use for their production process. All intermediate inputs suppliers are located within the Soyza road (Sappu Mawatha)making them easily accessible to the producers. There are 32 Hardware and wooden care shops, 2 glass shops, 18 saw mills, 8 cushion and cushion workshops and 5 electronic shops. Carpentry workshops, furniture polishing shops and carving shops in Moratumulla area are sharing those intermediate suppliers for production of furniture. The diagram below clearly illustrates how the firms are sharing the intermediate input suppliers in Moratumulla.

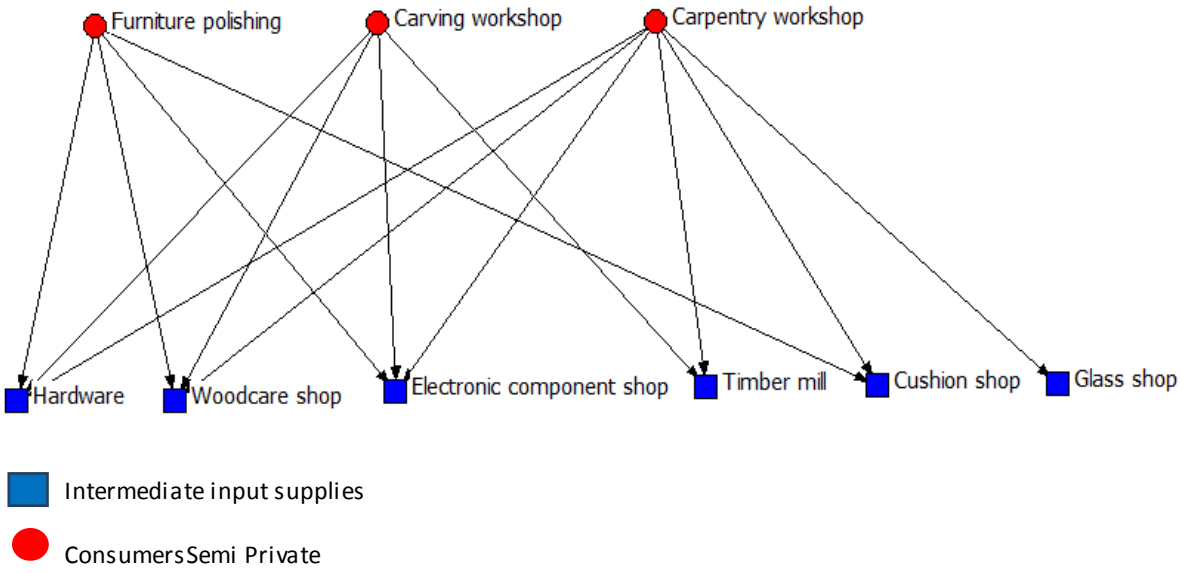


Fig 1.6: linkages between intermediate inputs

Source: Compiled by author using UCINET (Version 6.592) software

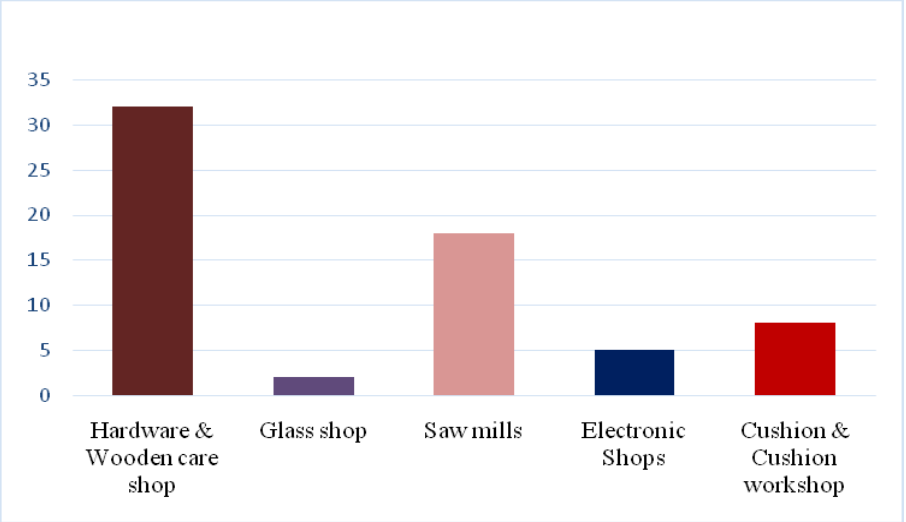


Fig1.7 Number of Intermediate input suppliers in Moratumulla
Source: Compiled by author using secondary data

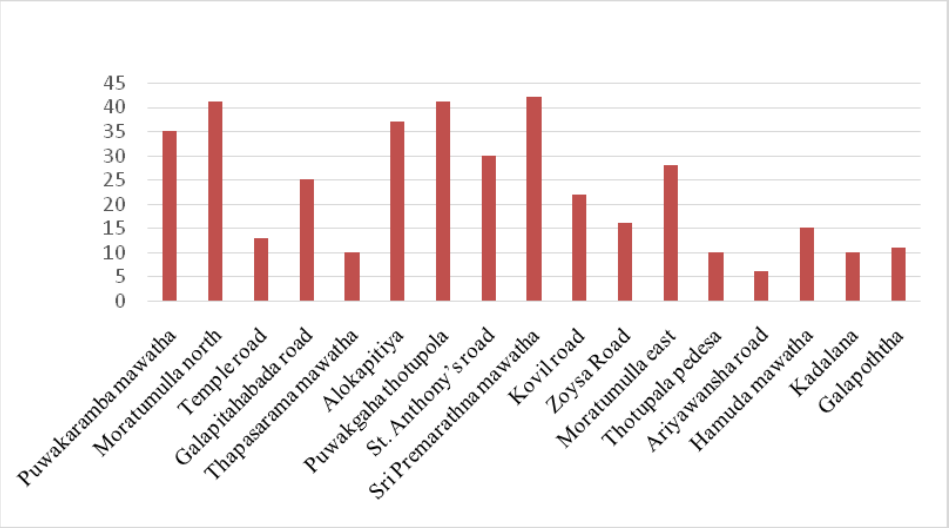


Fig 1.8 : Number of carpentry workshops in Moratumulla
Source: Compiled by author using secondary data

- **Proximity to market**

The intermediate input suppliers in Moratumulla are located in the Zoysa road. Therefore carpenters can buy inputs at low cost due to close proximity to market and it leads to the production of furniture at low cost. This low cost production of furniture leads to further development of furniture manufacturing in Moratumulla. In addition, final productions of furniture are easily tradable within Moratumulla. The furniture manufactured in carpentry workshops at the above mentioned area is sold to the furniture showrooms in the Soyza road (so called Sappu lane). There are 140 furniture showrooms and furniture selling shops in Moratumulla. Also the furniture manufactured within the Sri Premarathne mawatha are delivered to furniture shops in other districts in the country as raw furniture. Large number of customers' is attracted to the Moratumulla from all parts of the country.

"This is the traditional industry of this area. All my family members are engaged in carpentry. Timber comes to Moratuwa and Moratumulla from all over the country. And other things also we can get easily from Moratumulla. So we can do our job without any hindrance"

A carpenter

"People come to Moratumulla from all over the country to buy furniture. There is no other place where you can buy furniture and other items at low cost. There are many shops with variety of designs, making it convenient for people to choose furniture according to their preference"

A broker

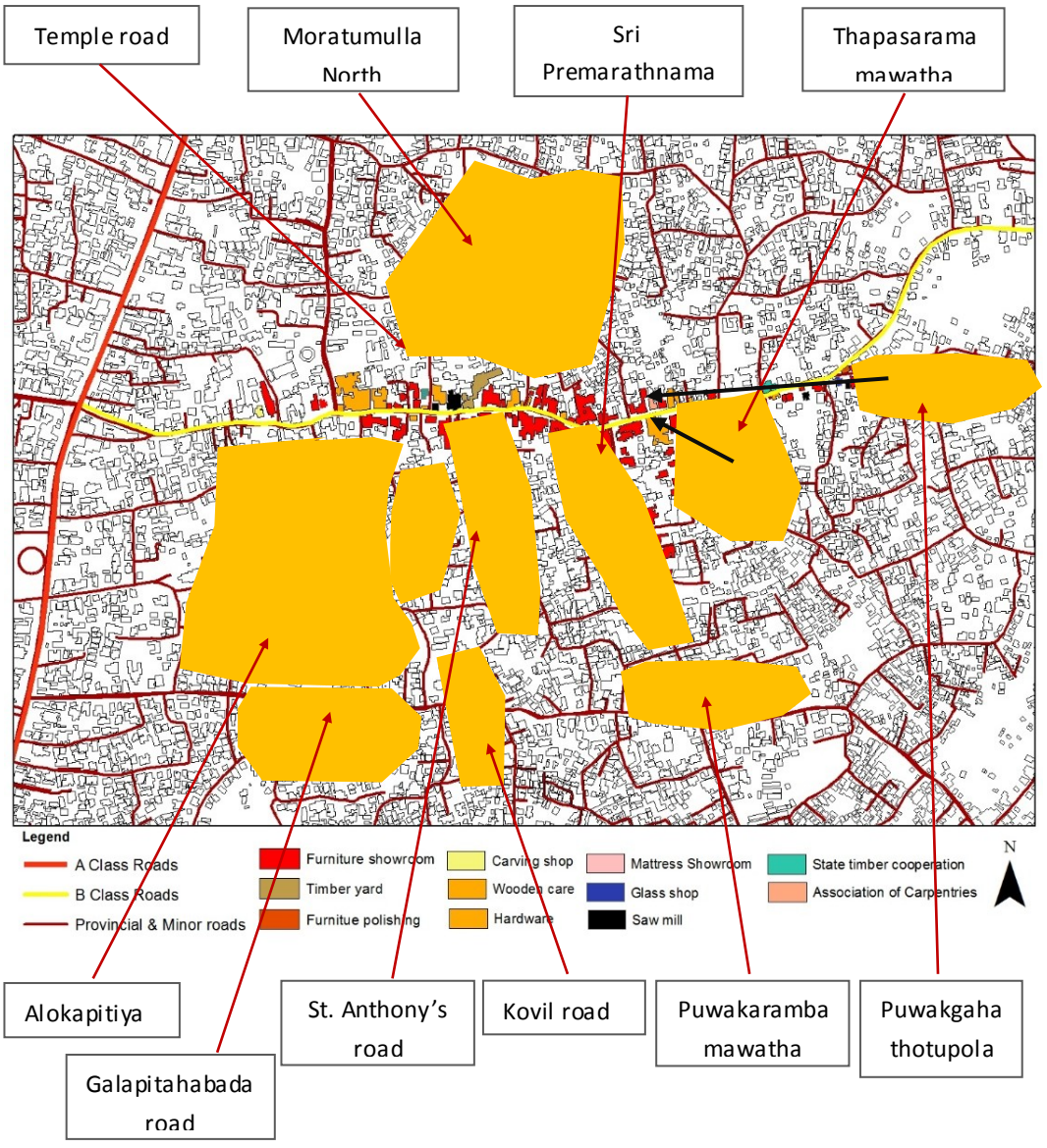


Figure1.9 Market proximity and linkages between intermediate inputs

Source: Compiled by author

- **Intermediate input produces**

The intermediate input suppliers within the Moratumulla. Timber mills are getting timber from the firms that supply intermediate inputs within Moratumulla area are getting their raw

materials from the input producers. However intermediate input producers are also sharing with timber yard, timber yards are getting timber from Ampara, Anuradhapura, Badulla, Moneragala, Batticaloa, Jaffna, Trincomalee, Puttlam, Polonnaruwa, and Killinochchi districts. Glass shops and electronic machines are imported from Philippine, China, Indonesia, Thailand and Japan.

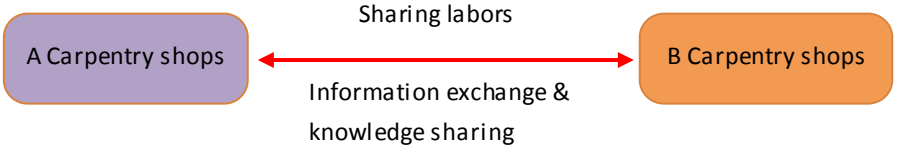
- **Intermediate labor supply**

Further sharing facilitates sharing of workers by firms. The findings clearly demonstrate that in Moratumulla area workers are shared within firms.

"We are getting large orders from universities and companies. Last year we got an order from Sabaragamuwa University. Within those situations we are hiring labours from a friends shop or another shop to complete the order within the agreed time frame"

A carpenter

Further in Moratumulla area, sharing of orders is done within firms more than sharing of labor. This is due to the location of many carpentry workshops in close proximity. Therefore more than sharing of labor, order sharing is taking place very successfully within the firms.



Sharing of labor will facilitate information exchange and knowledge sharing. Thus in Moratumulla area when a firm hires a worker from another firm it facilitates sharing of knowledge. Also the Moratumulla area gets benefited from sharing transportation, electricity and water supply etc. There is considerable sharing; it is taking place in Moratumulla with regard to workers, facilities and suppliers in the production of furniture. The intermediate input suppliers identified in Moratumulla cluster such as hardware and wooden care shops, glass shops, timber mills, cushion and cushion workshop and electronic components shops are located in Soyza road. Those supplies are sharing through carpentry workshops, furniture polishing shops and carving shops. Close proximity of carpentry shops and market sharing at Moratumulla is taking place in a successful manner.

According to the theory, Sharing means the sharing of invisible facilities, intermediate suppliers, workers and consumers by firms. As the theory explains, in Moratumulla timber cluster locating the firms in close proximity to each other has facilitated widening of the market for input suppliers. (Hardware and wooden care shops, glass shops, timber mills, cushion and cushion workshop and electronic components) These are shared among intermediate input sharing firms. Further more workers too are shared in carpentry workshops as explained by the theory. Further the orders received by carpentry workshops are shared by the carpentry shops. According to the theory, consumer that come to Moratumulla are shared within the furniture showrooms. The outcome of this is that every firm area gets higher profit by easy access to broader range of inputs as explained by the theory.

Matching in Moratumulla

Matching implies that perfect matching of workers and firms.

- **A pool of labor with similar skills and proximity to related firms**

The main occupation of people living in Moratumulla is carpentry or an occupation related to furniture manufacturing. Carpenters are the main category of skilled labor available in Moratumulla.

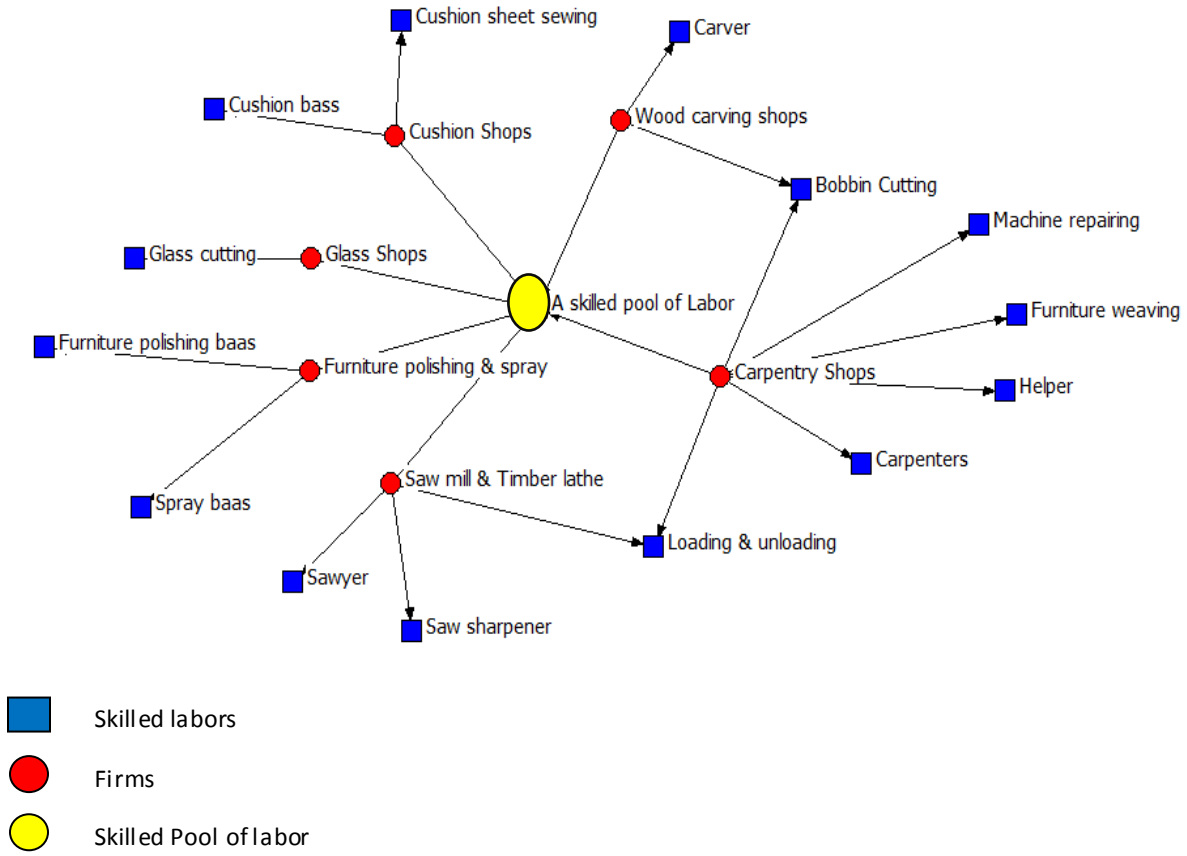


Fig 1.10: Labor pool of Moratumulla

Source: Compiled by author using UCINET (Version 6.592) software

There are many related firms that engage in with carpentry work. In Moratumulla there is a skilled labor pool of carpenters and other skilled workers as presented in figure 1.11 in above. All workers have unique skills according to their position. This skilled labor pool is created within the area because of many carpentry shops clustered in the same location.

- **Technically skilled labor**

According to the data gathered through questionnaire survey, there are 64 of skilled workers in the area within 50 carpentry shops. Interviews indicate that 50% of the workers within the whole cluster are skilled. As explained above, when there is a pool of skilled labor with technical skills, firms can match labor according to their needs. Labor matching is happening in Moratumulla according to the technical skill and wage of a labor

"When we want a skilled spray bass we display a notice. Within few days we can find a bass because lots of spray basses are available within the area. However as there is a huge demand for skilled labor, we have to pay high wages for them"

A furniture showroom owner

In the present situation of Moratumulla timber cluster workers and firms are not always perfectly matched. This mismatching is due to the reduction of the technically skilled labor pool.

" In Moratumulla there were skilled carpenters who were like engineers. . But due to high earnings of this trade , people came from outside to learn carpentry and become a bass within 2 or 3 months. But they don't have the real skills of a traditionally trained carpenter. . They can't even fix an Almira after "

A Carpenter

Carpentry skills are no longer acquired in the traditional way. Young generation don't like the carpentry. The few who are engaged in this industry are also doing it for money. They don't want to be skilled in carpentry. Now manufacturing is done with machines. Nobody consider the quality of furniture.

A Furniture showroom owner

"During the colonial period this area was famous for timber industry. My father is a carpenter. In earlier times there was very clever carpenters. But now there only few skilled carpenters"

A resident

Considering the above indicators there is a large pool of labor in Moratumulla. So that leads to matching of employees to employers according their needs. Mostly labours matching takes place in furniture polishing shops and cushion shops according to their skills. But carpentry workshops in Moratumulla are not involved in matching of labor.

According to the theory of matching, the employers match workers to their needs. As the theory explains when many workers are available in close proximity, employers can easily find workers to their firms. In Moratumulla a pool of skilled labor is available in different firms that are in close proximity to each other. According to the theory, firms hire workers who have precisely the skills those firms require. The theory explain that "When a firm hires a worker that is less than a perfect match for its skill requirement, there is a cost of mismatch borne by the worker (one may think of this as a training cost)" (Duranton &Puga, 2003).Similarly the firms in Moratumulla hire the workers who match with their needs. However presently at Moratumulla timber cluster workers and firms are not always perfectly matched. This mismatching is happening due to the trend of reduction the technically skilled labor pool.

Fig 1.11: labor matching in Moratumulla

Source: Captured by author

Learning in Moratumulla

Learning implies to Sharing knowledge, information and skills between firms in an industry.

- **Amenities available within the area (Education)**

There are no institutions to teach carpentry in Moratumulla and people in the area also do not get any assistance from government to learn carpentry. In the past carpentry was learnt as a family tradition. In the present learning is taking place within the area through the carpentry workshops and carving shops.

"For generations Moratumulla was a specialized area for carpentry. There were very clever carpenters in the past. They learnt the carpentry from the elder generation. As high income could be earned from carpentry it become a tradition here"

President of association of carpentry

"This is a paradise for earning money. Therefore more people came here to learn about carpentry. They come to work as helpers in small carpentry workshops. After they learn to work with machines manufacturing furniture, they start a new firm or go to a large scale workshop"

A carpenter

- **Personal ties**

The learning is taking place within Moratumulla through the personal contacts of workers. Most of the people living in Moratumulla are engaged in furniture manufacturing. Therefore they know each other not as carpenters or showroom owners but as people living in the same area. Due to this they have good personal contacts as friends and relations. Through these contacts the knowledge and skills exchange among firms. This leads to leaning of new methods in carpentry.

- **Co-location with other firms and information exchange among firms**

The carpentry shops in Moratumulla are clustered in the same location. This clustering of carpentry workshop in the same location allows workers and firms to learn from each other. This co-location of carpentry shops help to bring new innovations to the firms. However in the present context there are two furniture shops attracting more customers because they are using new technologies to manufacturing and produce new innovative quality products in keeping

with the present demand. Further co-location of firms leads to information exchange among firms. There is no educational institution in Moratumulla to teach carpentry. However the role of education institute is played by the carpentry workshops. When new workers join the industry he will learn the carpentry from existing carpentry workshops.

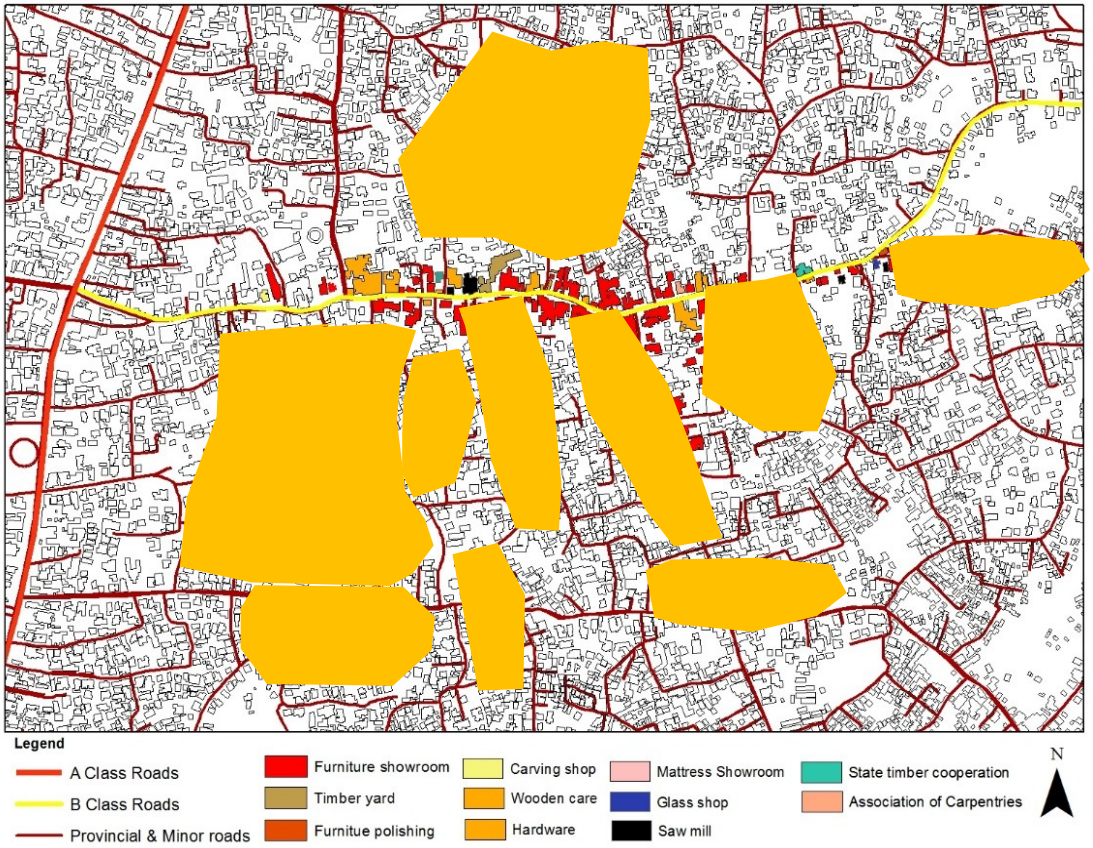


Fig1.12: Co-location of Moratumulla timber cluster
Source: Compiled by author

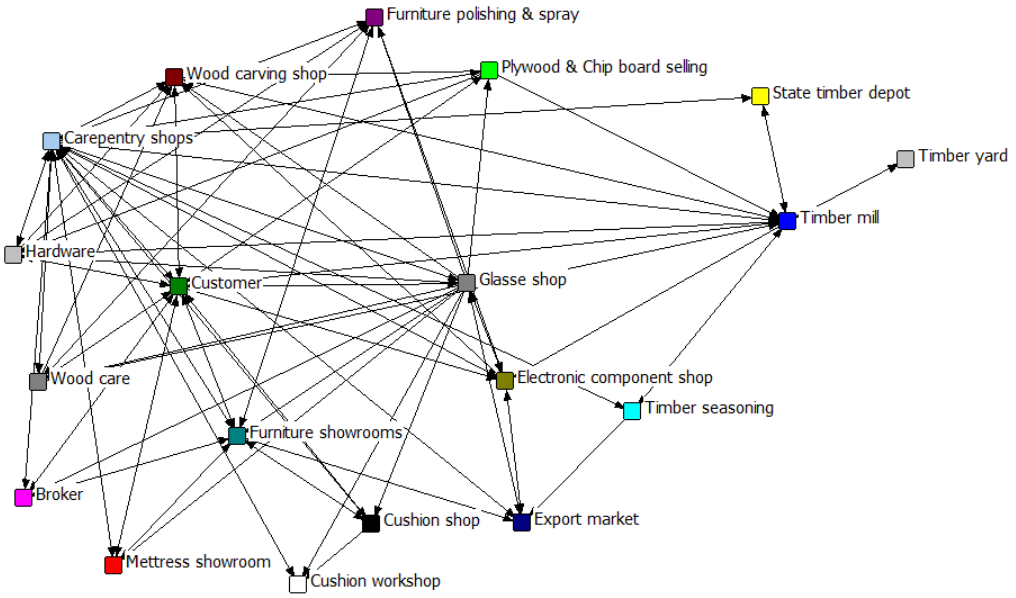
After he becomes a skilled carpenter he will start a new firm in area. Accordingly people came from Galle, Mathara, Panadura, and Wadduwa areas to get the knowledge from Moratumulla timber cluster and later they establish new carpentry workshops.

The theory of learning is transfer of information, knowledge and skills. As explained Learning is taking place in Moratumulla timber cluster. In Moratumulla people learnt carpentry from generation to generation. As explained in the theory learning leads to economic development. Similarly in Moratumulla when a person learns carpentry from a firm, after he becomes a skilled carpenter he also contributes to timber cluster by establishing a new firm. Further it leads to economic development in Moratumulla area. Mechanism of learning also facilitate to emergence of innovative knowledge and the creation of new knowledge. Further theory interprets that young workers migrate to the city to get knowledge and knowledgeable workers helps them to acquire valuable skills. Similarly people get attracted to the Moratumulla area and they are learning carpentry from existing workshops.

Types of Agglomeration economies

As the theory explains Agglomeration economies of Alfred Marshall are regarded as localization economies that occur when similar plants from the same industry cluster in close proximity at the same location. In Moratumulla area the clustered timber industry related firms at the same location, have wider buyer-supplier linkages, availability of larger pool of labor and information spillover. Further production cost of a carpentry workshop decrease as the total output of the firm increases. The timber cluster of Moratumulla can identify as a type of localized economies. However Moratumulla timber industry cluster have characteristic of urbanization economies as it goes beyond the localization boundary. As the theory explains urbanization economies occur when going beyond the localization boundary. The raw material used to manufacture furniture came from Ampara, Anuradhapura, Badulla, Moneragala, Batticaloa, Jaffna, Trincomalee, Puttlam, Polonnaruwa, and Killinochchi districts. The Furniture manufacturing process happened within Moratumulla. The final products from here are sending to the furniture showrooms in other districts in the country. Since the final activities such as polishing and cushioning are done in the districts it leads to the expansion of industry and regional growth. Saw dust which is a by-product of the timber industry is taken to Ingiriya area to produce M.D.F boards and finer saw dust is taken to Horana for the manufactured joss-sticks. Carpentry shops and other related firms clustered in the Moratumulla area help to accumulate flow of new ideas among the firms. In Moratumulla newly emerging carpentry shops use new technology for production and do their business via the internet. They go beyond the inherent traditional furniture manufacturing process as explained by "In turn, the effects of such agglomeration drivers involve various aspects of economic performance from clustering such as enhanced innovation, higher input (labor/capital) demand or price (wage/asset value), greater productivity, reduced costs, and location decisions" (Jeffrey P. Cohen, 2008).

Fig 1.13: Buyers and supplier linkages of Moratumulla



Source: Compiled by author using UCINET (Version 6.592) software

Conclusion

Moratumulla timber cluster has many advantages such as close proximity to large scale of furniture production and specialization of workers in the area. It also has inputs for effective production and has attracted a lager customer base from all over the county. Further it has created the many job opportunities related to the cluster.

According to the results derived from the analysis regarding sharing, matching and learning it could be concluded that as explained by the theory, these three sources of agglomeration economies is functioning within the Moratumulla timber industrial cluster. Sharing invisible facilities, intermediate suppliers, workers and consumers are also taking place within the Moratumulla area as stated in the theory. Further Moratumulla is going beyond the theory as there is sharing of the orders received by the firms. Firms with greater purchased input intensity will thus benefit more from locating close to input suppliers" (Holmes, 1999 cited in Jeffrey P. Cohen 2008)

Regarding the functioning of matching at Moratumulla, the large pool of labor facilitates the employers. However there is a trend of reduction technically skill labours. With regard to learning, Moratumulla can be identified as a center for learning carpentry. Moratumulla act as workers training school due to generation of knowledge it is diffusing in the national level. Further Moratumulla is a unique industrial cluster, which emerged with knowledge specialization through generation and consisting of smaller firms.

Moratumulla industrial cluster gained the advantage of the economies of scale and reflect characteristics of the urbanization economies. Further this cluster now opens to the international market as a result of the innovations and specializations. However negative externalities such as congestion of area, traffic congestion, noise pollution and air pollution are remaining. Therefore government agencies can be enforced more formalized systems to gain high return from this cluster.

The findings will help to identify the existing reality of the Moratumulla timber cluster and it will guide to enhance the economies of scale in the area minimizing the negative externalities. Further research could improve those criteria by applying them in different clusters. Moreover agglomeration effects can be assessed based on quantitative approaches.

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