



DO MANUFACTURING SMALL AND MEDIUM ENTERPRISES CLUSTER GEOGRAPHICALLY IN KHULNA CITY? – A SPATIAL ANALYSIS

S M Towhidur Rahman*

Business Administration Discipline
Khulna University
Bangladesh

Ahsanul Kabir

Urban and Rural Planning Discipline
Khulna University
Bangladesh

*Corrospoding author's Email: towhid_ku_97@yahoo.com

*Peer-review under responsibility of 3rd Asia International Multidisciplanry Conference 2019 editorial board
(<http://www.utm.my/asia/our-team/>)*

*© 2019 Published by Readers Insight Publisher,
lat 306 Savoy Residencia, Block 3 F11/1,44000 Islamabad. Pakistan,
info@readersinsight.net*

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



Research Highlights

The study found a clustered spatial pattern of manufacturing small and medium enterprises (SMEs) in the study area, Khulna city of Bangladesh. This pattern helps determine the potential cluster regions (PCR) for manufacturing industry which is the important first step in cluster based regional economic development strategy. The manufacturing SMEs were found to cluster along the major transportatin routes of city. The SMEs are also not evenly distributed across the city area and couple of wards (Ward 21 & Ward 30) have more geographic potentials to be developed as potential cluster regions since SMEs tend to agglomerate in these wards more in numbers.

Graphical Abstract

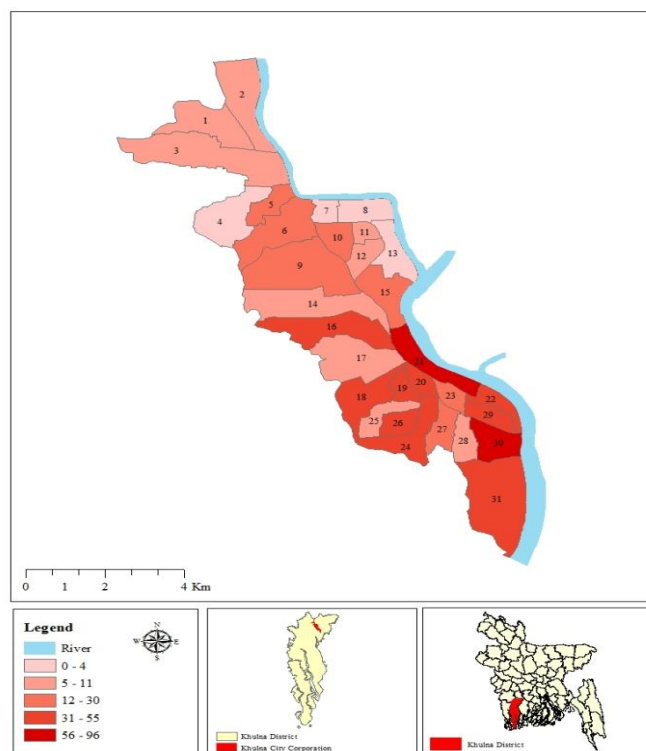


Figure 1: Ward Wise Distribution of Manufacturing SMEs Across Khulna City

Research Objectives

Industrialization and economic growth are often correlated as evident from literatures (Sahu, 2013). Manufacturing SMEs play a pivotal role in industrialization process and regional growth since they constitute the major portion of the industry sector in both developed and developing countries of the world (Li & Chen, 2005; Tambunan, 2008). Development of SME cluster had been recognized as an effective strategy for regional development since such clusters enhance the competitiveness of the industries and the region as a whole (Karaev, Lenny Koh, & Szamosi, 2007; Navickas & Malakauskaite, 2009). Bangladesh is undergoing a transformation in economic structure from agriculture to industry and service based economy. Government of Bangladesh also prioritized the cluster based development of industries (General Economics Division, 2015). Porter (2000) noted that some locational



advantages are a prerequisite for successful formation of cluster and effective implementation of cluster based economic development (CBED) strategy. Identifying potential cluster region is an important first step in CBED. But very few research had been found in the context of Bangladesh focusing on industry cluster identification. Researches applying of geospatial tools for cluster identification are even fewer in numbers. So this study aimed to contribute to the existing literature through identifying potential cluster regions of manufacturing SMEs in Khulna applying geo-statistical tools.

Methodology

The study is based on primary data (regarding type, number and location of manufacturing SMEs) collected through a city wide survey in Khulna City Corporation (KCC) area. The location data of the SMEs were then plotted on the map of KCC applying GIS mapping tools that generated location coordinates (as point feature) for each SME for further analysis. The distribution of SMEs in terms of distance from two spatial variables - major roads and river were shown applying kernel density plot. The spatial pattern were explored through computing Average nearest neighbour ratio (ANN). ANN ratio is used to measure whether the features (SMEs) are geographically clustered, dispersed or distributed randomly. An ANN ratio less than 1 ($ANNR < 1$) indicates clustered pattern of distribution of the features while ANN ratio greater than 1 ($ANNR > 1$) exhibits dispersed pattern and ANN ratio 1 ($ANNR = 1$) exhibits perfectly random distribution. The distribution of the SMEs was also shown through generating a choropleth map in terms of number of SMEs across the 31 wards of the city to find potential cluster region. The spatial analysis was done using ArcGIS 10.1 and R statistical software package.

Results

The survey identified over 800 manufacturing SMEs in the city which were categorized into five categories – light engineering, agro-processing, leather shoe making, bakery and food processing and timber and furniture. The study found that all categories of SMEs tend to cluster along the major roads of the city. The Kernel Density plots based on proximity to roads show that all categories of SMEs are located within around 100 meters from the major roads of the city while in terms of proximity to river the location of SMEs vary for different categories of SMEs. Further the study found the average nearest neighbour ratios for light engineering, agro-processing, leather shoe making, bakery and food processing and timber and furniture SMEs were 0.214, 0.372, 0.194, 0.215 and 0.176 respectively. Since ANN ratios for all the categories are less than 1, the distributions exhibit a clustered pattern and the ratios were significant at 99% confidence level with P values less than 0.01 implying that the null hypothesis “Manufacturing SMEs in all categories are randomly distributed across the city area” is rejected. The SMEs were located unevenly across 31 wards (smallest administrative boundary) of the city wherein ward number 21 and ward number 30 had the highest (56-96 units) number of firms.

Findings

The major categories of manufacturing SMEs in Khulna city tend to locate close to other similar firms and exhibit a clustered spatial pattern. All categories of manufacturing SMEs were found to cluster along the major roads due to transportation convenience and improved visibility. The SMEs were found to cluster more in couple of the wards of the city indicating to the potential cluster regions. These wards are characterized as having low cost spaces, good connectivity to other parts of the country, proximity to central wholesale market,





administrative headquarter and major financial institutions and above all more circulation of people.

References

- General Economics Division. (2015). Seventh five year plan FY 2016-2020: Accelerating growth, empowering citizens.
- Karaev, Aleksandar, Lenny Koh, SC, & Szamosi, Leslie T. (2007). The cluster approach and SME competitiveness: a review. *Journal of Manufacturing Technology Management*, 18(7), 818-835.
- Li, P. , & Chen, X. (2005). The urbanization of Chinese Midland and the development of SME. *Chinese Business Review*, 4(4), 16-21.
- Navickas, Valentinas, & Malakauskaite, Asta. (2009). The impact of clusterization on the development of small and medium-sized enterprise (SME) sector. *Journal of Business Economics and Management*, 10(3), 255-259.
- Porter, Michael E. (2000). Location, competition, and economic development: Local clusters in a global economy. *Economic development quarterly*, 14(1), 15-34.
- Sahu, K. K. (2013). Urbanization and Growth Linkages in China. *IOSR Journal of Humanities And Social Science*, 8(6), 1-10.
- Tambunan, T. . (2008). Development of SME in ASEAN with Reference to Indonesia and Thailand. *Chulalongkorn Journal of Economics*, 20(1), 53-83.

