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SPATIAL CONCENTRATION AND LOCALIZATION: A CORE-PERIPHERY LINKAGE MODEL OF DOMJUR-GHATAL GEMS AND JEWELLERY INDUSTRY

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Abstract

The present study focuses on how the Domjur (Howrah) and Ghatal (West Midnapore) linkage in West Bengal is promoting growth for Domjur Gems and Jewellery industry. In this regard, the study considers: why this particular growing informal localized industry has agglomerated successfully in specific geographical cluster of Domjur and is flourishing day by day but not concentrated, hence localized, in Ghatal. Despite the fact, Ghatal has been incorporated in our study due to its importance in the migration map of labour mobility in West Bengal for long years back. In this sense, the present study objects to detect the factors and their influences that determine successful formation of localized informal industries and businesses in specific spaces. To do this, labour mobility is considered as an important contributory factor behind localization of informal industry formation and its spread. The logical argumentation of the study is based on literature support specifically of the classical and new economic geography school, case studies conducted, and the primary survey results. The micro-level field surveys, sampling design and data analysis of the study conducted is based on the standard model approach in order to avoid spatial heterogeneity.

Keywords: Informal Sector, Cluster Economy, Economies of Scale, Location, Mobility.

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INTRODUCTION

This paper attempts to focus on the linkage between Domjur (Howrah) and Ghatal (West Midnapore) Gems and Jewellery industry in West Bengal. In this regard, the study attempts to focus on: why this particular growing informal localized industry has agglomerated¹ successfully in specific geographical cluster² of Domjur of Howrah district and is flourishing day by day but not concentrated³ in Ghatal of West Midnapore district. It is common to observe that production units in several informal industries are in specific geographical spaces. The additional consideration of the present study, therefore, concentrates on: what are the factors that determine successful formation of localized informal industries in particular spaces and how they influence localized informal industry formation, as in the case of Domjur, and why they can not influence localized industry informal formation in some others, as in the case of Ghatal. The consideration is strongly based upon the support of literature derived from classical and new economic geography school, verified on the basis of field surveys. To reveal this, the present study is solely confined to the Domjur and Ghatal clusters of the Gems and Jewellery industry in West Bengal.

The reference of Domjur is attributed to the 'Growth Pole'⁴ programme of the Central Government and in the Arjun Sengupta Report (2006).

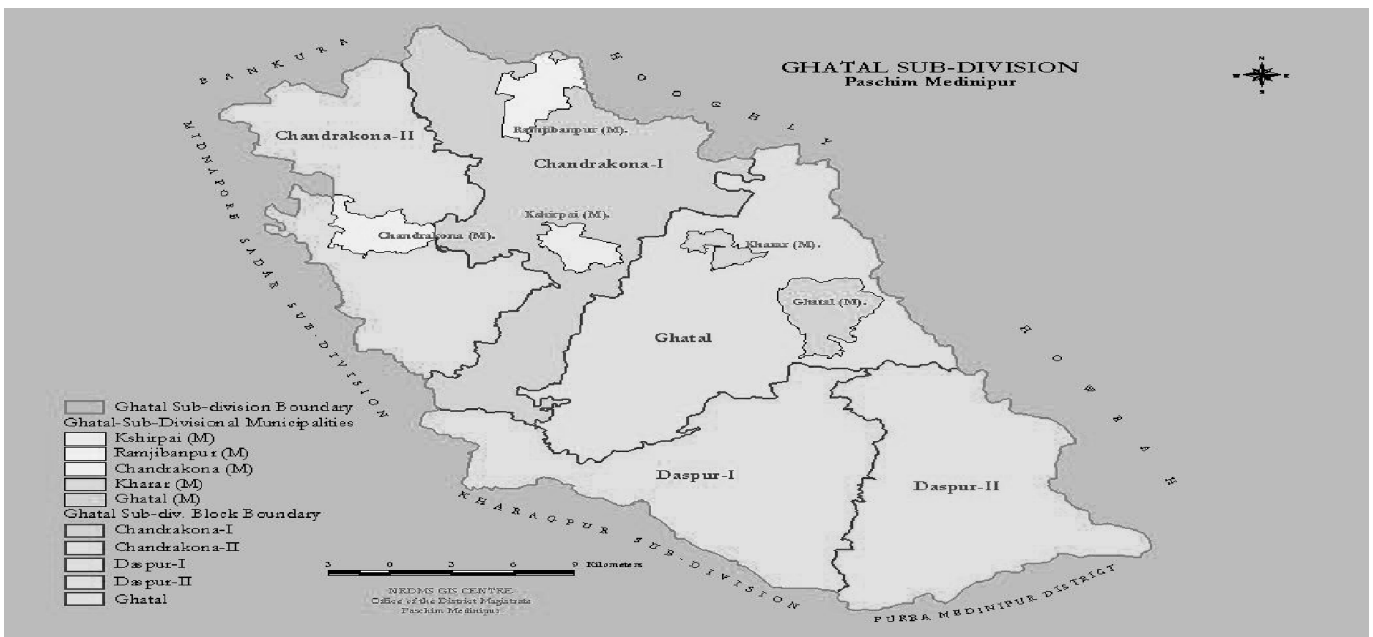
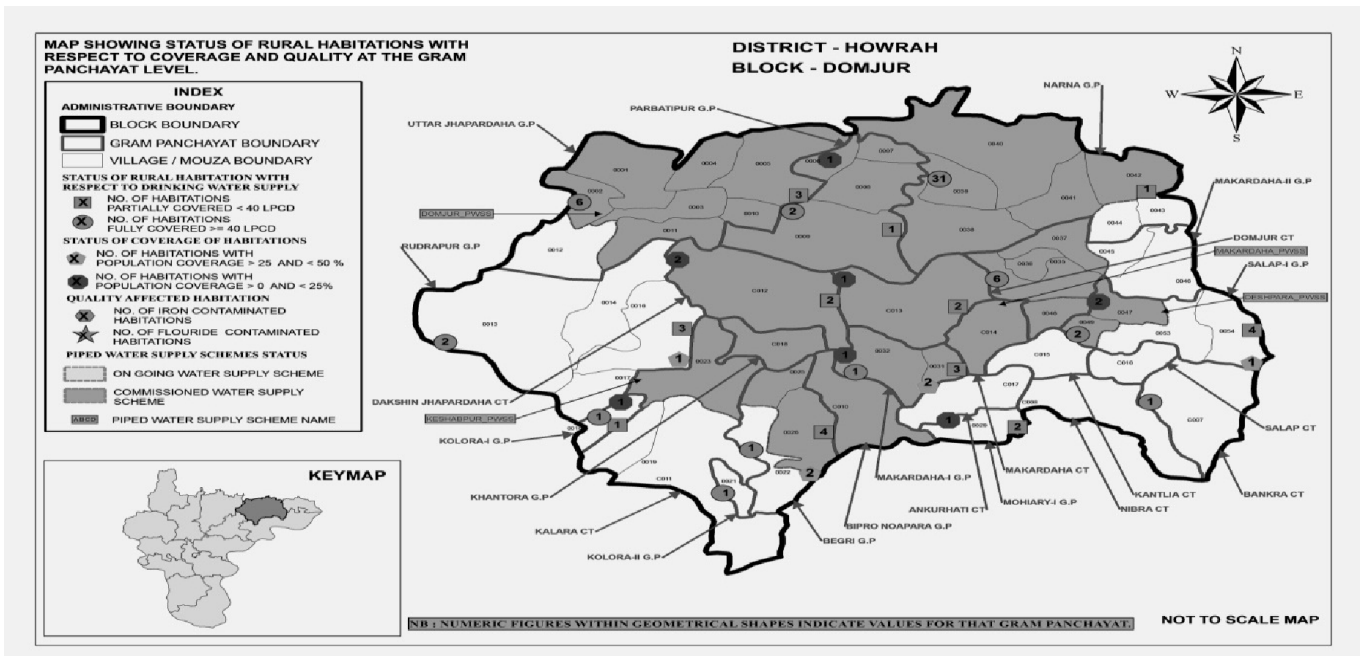
MATERIALS AND METHODS

The logical argumentation of the study is based on literature support, case studies and primary survey results. The survey process is exhaustive. The survey is based on qualitative purposive sampling with semi-structured questionnaire and indirect interview method. The micro-level field studies, sampling design and data analysis are based on the standard model approach. The implication is that the selection of any sampling region does not depend on data availability (or non-availability) and avoids spatial homogeneity. The study also assumes that the producing firms within a cluster of the industry are non-homogeneous by nature. However, the spatial distribution of production units of a single industry is cross-sectional, given and known. Sometimes an ethnographic study has been approached due to data non-availability and data non-responses in the sample survey area under the purview of the study.

The Industry Profile

Domjur in Howrah has appeared as a separate location for long years back with its high product and labour market linkage with Bowbazar 100 years back. The market is well-known for producing gold jewellerys with diamond setting and brass metal jewellerys. The production orders come from the contractors of Bowbazar or from the local customers which get a finishing touch by skilled workers of Bowbazar and are ready for sale. The diamonds required for production are being imported, the raw gold is supplied by the contractor and other raw materials are purchased by the producer mainly from the local market. In the labour market, majority of the labourers in Domjur come from the districts of Howrah, Hooghly and West Midnapore. The labourers get training in Howrah and acquire skills and experiences necessary to enter in Kolkata skilled labour market to earn higher wages. They also move to other cities of the country and even to middle-east Asian countries for higher income earnings.

The Ghatal location in West Midnapore is situated near Panskura (about 50 minutes by train). It has appeared as a small cluster due to its high product and labour market linkage, particularly with Domjur (Howrah) and of Bowbazar (Central Kolkata). This is why the location attributes significant position in the map of Bengal Gems and Jewellery industry. Though production units do not appear in large numbers in Ghatal, however, it has become a popular location for supplying skilled labourers to the Bowbazar (Central Kolkata) and Sinthi (North Kolkata) and particularly Domjur (Howrah) location, and even to the other states in India such as Maharastra, Gujarat, and Delhi. The workers receive their required training in the production units of Ghatal. When they become semi-skilled and skilled worker, they move spatially in order to make higher wage earnings. The skilled workers of Ghatal are highly demanded almost in all locations for their skill and innovativeness - hence are easily absorbed at higher remuneration.



The theories on location economics refers that industries do not develop arbitrarily. There are significant economic factors that influence formation of a cluster of industries and businesses in particular spaces. In other sense, the theories explore the logic and science behind: why certain industries emerge and grow in specific geographical locations and why not in others. It may be referred that the enterprises in one location within a cluster with repeated transactions among themselves promote better coordination, trust, informal organizational linkage between enterprises, efficiency, effectiveness, flexibility, formal management linkages in partnerships and alliances, and many others. All these promote sustained spatial bonding among the production units and businesses within a specific geographical location.⁵ However, it is not a very good explanation for successful localized industry formation⁶, as is the case of Domjur.

To examine the issue on the basis of literature support, we may start with Alfred Marshall (1890, 1892), one of the early contributors in the literature of location economics – though the analysis of location started much before than Marshall with ‘monocentric city model’ of Von Thunen (1826) [Von Thunen’s “Der Isolierte Staat in Beziehung auf Landschaft und Nationalökonomie”]. Later, in his ‘Principles of Economics’, Alfred Marshall (1891) has referred the idea of “industrial district” to describe location of industries – which may appear as a good explanation for localized industry formation in Domjur. To Marshall, an “industrial district” means an area (a district) where concentration of firms has settled down in a particular industry or in a group of industries (the ‘growth pole’ of Domjur Gems and Jewellery industry including PanchlaZari and Embroidery industry in Howrah). However, the idea of “industrial district” does not simply refer to a “localized industry” but the idea refers more than it. Usually a “localized industry” is an industry concentrated in certain geographical spaces. But an “industrial district” refers concentration of firms in an industry (or a group of industries) has settled down.⁷

To refer Marshallian explanation, one of the chief causes behind formation of this localized industry in Domjur is rather the “patronage of a court” factor. The richer people assembled there to make a demand for ornaments of especially high quality, which attracted skilled workers from distance areas (East and West Midnapore, Hooghly, and the hinterland of Howrah district) to this cluster industry. In such localized industries, workers seek employment where they expect to find a good market for their skill – which happened in Domjur. For these, firms attempted to settle down there. In Ghatal, this “patronage of a court” factor is not sufficient to create an incentive for the firms to settle down there and is also not sufficient to absorb skilled artisans of the region and attract skilled labourers of the adjacent regions.

Once the localized industries are developed due to functioning of these factors, trading functions of the city are developed (which is not present in Ghatal). Then it becomes stochastic that rent becomes higher in the central sites of a large town or city.

This makes the factories ‘congregate’ in the outskirts of large towns and in their neighbourhood rather than in the towns

themselves with physical availability of raw materials. For the same reason, the industry of Domjur has expanded in the peripheral areas of Baruipara, Rudrapur, Kolra, Makardaha, and many others. Due to lack of this, firms have not congregated in the outskirts of Ghatal. To Marshall, this ‘primitive localization’ is transformed into an ‘industrial district’ in the long run in case of Domjur – hence horizontal expansion and growth of the localized industry appears by finding new physical locations even.

In an ‘industrial district’, “the mysteries of the trade become no mysteries”; and “children learn many of them unconsciously”, as Marshall points out. The factor is strong in case of Domjur in Howrah (and Ghatal in West Midnapore) than any other spatial cluster of the industry in West Bengal from long years back. This is why specialized abilities has been transmitted from one generation to another from their teen age and has become an important characteristic of the area. In this way, skills are embodied within one from his/her childhood or teen-age in Domjur and Ghatal - he/she may become unconscious regarding incorporation of this skill within him/her from the childhood, however, may possess some specialized skill after a particular age (usually teen age). Since it appears for majority of the people of the area, the area has become renowned for specialized skill and knowledge in jewellery production and has acted upon as an important determinant for concentration of firms requiring this hereditary skill in production in Domjur. Lack of firms has compelled skilled workers of Ghatal to out-migrate to nearby Domjur and other locations of the industry like Bowbazar and Sinthi.⁸

With specialized skills, high division of labour appears within the firms due to differentiated skill possession by individuals with differentiated abilities. This has led to product specialization (particularly of diamond setting in Domjur) and innovation with labour-intensive techniques of production - the ‘karigars’ of Domjur and Ghatal are much renowned throughout the country for their innovativeness. The reason may be found on the fact: in an “industrial district”, good ideas are promptly adopted into the production process because good ideas are in the “air” of the district, which works well into the well-established social networks with well-developed bonding and tie-ups at the local level which is strong in Domjur (and the workers of Ghatal working in Dpmjur). In this way, the localized industry has offered “a constant market for skill” in several locations including Domjur itself, particularly when the production of the “industrial district” is skill-based. The employers are assured with supply of skilled workers since there is always a supply of skill in the local market.

When a number of firms are concentrated in a particular area within a localized industry, it is likely that several other subsidiary firms are built in the neighbourhood areas who supply necessary inputs and services. An industrial atmosphere is built in. This has happened in Domjur (and not in Ghatal). The producing firms have accepted this business stimulus and made faster expansion and growth of the localized industry. The industrial leadership has been captured by those firms who are able to initiate or follow these changes appearing in the market.

To Scitovsky (1954), the Marshallian “information spillover” affects firm’s production function. To this, an increase in

industry output increases stock of knowledge through positive information spillovers for each firm - which leads to an increase in output at the firm level.⁹ The “pure” external economies appear due to Marshallian “local market for specialized inputs” and “labour market pooling”, which is consistent with imperfect competition with some market power of influential local producers, required for internal economies. The effect is strong in Domjur - but weak in Ghatal due to lack of capacity of skilled labour absorption in the locality.

Simultaneously, some important contributions in the literature were the “Central Place Theory” by Walter Christaller (1933) and August Losch (1944a, 1954b). The major contribution of Christaller is to show that a hierarchical urban system may exist with a variety of different-sized spatial market areas.¹⁰ However, the Central Place Theory has been revised latter by **Losch**. To Losch, any spatial economy would tend to be dominated by a central primal city, the hinterland of which would be characterized by smaller settlements and alternating areas of industrial concentration and dispersion. This has acted as a strong factor to spread the localized industry of the central site of Domjur to its hinterland by making the region almost an “industrial district” through smaller settlements and alterations. Such settlements and alteration is not present in case of Ghatal due to lack of presence of large number of firms in the region. Much later, Becattini (1989, 1990) has raised the issue that government and/or government-sponsored institutions are not able to create an industrial organization with collective efficiency - rather a minimum concentration of privately initiated industrial activity may involve.¹¹ However, the argument may be true for the initial days of expansion of Domjur but not for the present scenario. In 2006, the Central Government in its “Growth Pole” programme has included Domjur and Panchla of Howrah among the six selected growth poles throughout the country. In 2011-12, the State Government has initiated an infrastructural development programme to promote growth of the existing cluster of Domjur.

The New Economic Geography

The factors behind localized industry formation may be searched for to the arguments given by Krugman. Paul Krugman (1991), one important contributor among the new growth theorists, refers that the geographical structure of any (industrial) economy depends on some key parameters. These are: (1) Transportation costs, (2) Economies of scale¹², and (3) Factor mobility. To Krugman, a combination of these factors results in increasing returns at the production unit. Reduced transport costs provide incentives to locate plants close to large markets. Labour mobility becomes then easier and a regular phenomenon due to the presence of well-developed transport and communication in the large markets - labour mobility appears from the “traditional” sector considering labour-intensive traditional methods of production to the “modern” sector which employs modern and improved technologies.

A circular causation of all these appears there.¹³ It provides maximum individual interaction in the informal industrial periphery from the industrial ‘core’. The functioning of the

“spread effects” accrued from the ‘core’ growth poles eventually impedes development of the periphery areas through multiplier effect on employment and output and a “relay” function appears through urban hierarchy at the peripheries. This creates an incentive among the producers to form localized industries which may change the spatial production pattern dramatically. In this case, Domjur has appeared as such a ‘core’ by maintaining multiplier effect particularly on employment and a “relay” function with its peripheral unit Ghatal.

In case of informal agglomerations of Domjur, the transport cost factor of Krugman does not appear crucial (similar for Ghatal). Moreover, labour mobility from the “traditional” sector to the “modern” sector does not become compatible in absence of modern mechanized firms in both of the locations. What is crucial is the maximum individual interaction in the informal industrial periphery from the industrial ‘core’ at the main site of Domjur has attributed knowledge externality in the presence of effective social capital network with Ghatal. This knowledge spillover and knowledge externality has appeared due to four factors: (1) Marshallian labour market pooling; (2) Pecuniary externalities; (3) Variety of non-traded inputs supplied at the local level; and (4) Information spillovers both in product and labour market processes. Here, the Marshall-Arrow-Romer (MAR) externality suggests that an increased concentration of a particular industry (or service) within a specific geographical region facilitates knowledge spillovers across firms, thereby promotes incentives to innovative activity and inter-firm spillovers. However, Jacobs externality and Porter externality suggest that local competition is suitable to extract knowledge externality.

The argument of circular causation by Krugman appears to be strong for Domjur. The functioning of the “spread effects” accrued from the ‘core’ growth poles at the main sites of the area has eventually impeded development of the periphery areas of Domjur through multiplier effect on employment and output, thereby a “relay” function has appeared at the peripheries - though the effect is not so strong to impede expansion of production units in Ghatal with strong production orders and strong product market linkages.

To analyze factor mobility, it is to refer here that the informal worker of Domjur and Ghatal enters into the job market not with any physical or financial capital but with a social capital¹⁴ that is nothing but a reference (even often oral) by any of his senior experienced community member(s) who is/are already established in the market. Such references come from any familiar sources of the trainer like relatives, neighbours, friends and community members. This investment of social capital by a newly introduced worker of the industry gives him necessary knowledge endowment of work tricks and ethics that he/she receives from his/her senior community members who are experienced and expert enough in the sector. Moreover, social capital acts as an informal insurance in such an informal labour market to make him/her trustworthy to the recruiter.¹⁵ However, a mere social capital coverage and informal form of bonding become insufficient to tie up (skill) labourer at a particular place since a skilled informal labourer has always a tendency to flow across spaces in absence of much paper

works. The already 'settled' migrants work as the 'bridgeheads', form higher expectation about higher standard of living at destination, provide necessary information-remittance-feedback-training (even accommodation), and supply necessary social capital required to the newly migrants at their workplace. In this way, they reduce material-psychological costs and risks of spatial migration by formation of a 'migrant community'. Such migration 'networks'¹⁶ are renowned in Domjur (and Daspur-Ghatal) from where migration has become almost systematic by following a particular pattern or system (the 'system migration'¹⁷). This mobility tendency is much stronger in case of Ghatal in absence of large number of production units to absorb ample unit of skilled artisans – this is why Ghatal has captured a strong position in the migration map of Bengal despite not being an important spatial cluster of the industry.

Higher is the skill and access to social capital network, higher is the probability for inter-state and international migration, thereby higher income earnings. This approaches a 'stochastic' pattern of skill-deterministic labour mobility from Domjur. Such a spatially migrant labour, particularly at the international level, earns much higher income. This higher income, saving, contacts, and long years' experience they invest and become small independent entrepreneurs when they return back to their origin at Domjur after spending 10-20 years at destination. In this way, a vertical (hierarchical) labour mobility has appeared strong in Domjur (not in Ghatal in absence of appropriate business initiatives) in which previously labourers work as individual entrepreneurs. In this, the entrepreneur-cum-vertically-migrant worker now attracts a pool of investments at the local level and employs skilled labourers from the peripheral areas. This has acted as an influential factor to make spread of peripheries in the hinterland of Domjur and has maintained a strong core-periphery pattern of linkage in the labour market processes in the past two and half decades. The effect is so strong that Domjur, which was working as a periphery to the 'core' of Bowbazar by formation of strong exchange linkages in product and labour market processes, is appearing almost an independent spatial cluster in the map of Bengal Gems and Jewellery industry – now Domjur refers weak product market linkages with Bowbazar than before.¹⁸

The core-periphery model of Venables (1996) starts working herewith - which assumes that mobile workers spend their income at destination. The effect is strong in Domjur – but is absent in Ghatal in absence of business initiatives. This has caused a circular causation in locational decisions at destination and has acted as a strong influential factor to form this growing localized industry at Domjur. This immobility of income at destination has executed the Home Market Effect (HME) by which the geographically concentrated industry has generated an additional demand for the products, particularly in the peripheries of large urban locations in the Howrah district.

This has attracted a large number of imperfectly competitive firms towards this large market of the region – now large firms of the industry have started to open their branches even in Howrah. The effect has contributed much to the growth and

expansion of the Domjur location. The absence of such an influence has hindered growth and expansion of the industry in case of Ghatal. The importance of the Ghatal location, however, lies in its strong 'systematic' sending of 'network' migration to Domjur and other spatial centers of the industry at the state, national and international level. Therefore, the significance of Ghatal has to be judged in terms of its core-periphery linkages in the labour market processes of the industry.

Conclusion

The theories on location economics refer that industries do not develop arbitrarily. The present study is an effort to explore factors influencing localized informal industry formation in the Domjur and Ghatal Gems and Jewellery industry in West Bengal. To do this, the stress has been imposed upon the factors of 'patronage of a court', transport cost advantage, economies of scale, and particularly factor mobility.

The exploration is based upon the classical syntax and new economic geography synthesis of Location Economics literature. To analyze why and how industrial organization of these two particular regions is formed, the study is framed within the broader context of Regional Economics to include spatial dispersion and coherence of this particular informal industrial activity and executes a core-periphery pattern of linkage in the labour market processes. Further, uneven distribution of agglomerated production units across the two spaces has also been addressed along with the references accrued from the micro-level field studies conducted in the two regions.

Appendix

1. The term 'agglomeration' of firms refers to decline in average costs in production as more production occurs within a specified geographic area [Anas, Arnott and Small 1998]. In other words, it relies strongly on increasing returns to scale, considering internal and external economies of scale.
2. Cluster of enterprises is a geographical concentration of micro, small, medium and large enterprises producing same or similar type of goods and services.
3. As referred by Brulhart (1998), while concentration analyzes location across space of a few well-defined sectors, agglomeration analyzes location across space for a larger part of economic activity, and specialization deals with share of a particular location in specific industry in comparison to share of other locations in that industry.
4. The concept of economic growth pole was introduced by French economist Francois Perroux (1949). The idea is based on external economies of scale, agglomeration of small scale industries, and linkage effect. The concept states that a combination of these three at a particular geographical space is sufficient to make an area a growth pole to the region (or district).
5. Ref: Saha, Sukanta (2015), Spatial Concentration: Specificity and Informality, Journal Social Vision, Vol. 1 Issue 4 Jan-March.
6. Ref: Saha, Sukanta (2014), 'An Inquiry into the Location of Industries', in Chatterjee, K. and A. Pal (ed.) 'Emerging

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7. Ref: Saha, Sukanta (2015), An Informal "Industrial District" Syntax: From Marshall to Krugman, *Splint International Journal of Professionals*, Vol. II, No. 5, May 2015.
 8. Saha, Sukanta (2015), Argument for Informal Cluster Industry Formation: The Case of Sinthi Gold and Jewellery Industry, *Journal DeshVikas*, Vol. 2, Issue 1, April-June 2015.
 9. Ref: Saha, Sukanta (2015), Sticky Knowledge Externality: An Instrument to Access Innovation, *International Journal of Innovative Research and Development*, Vol. 4, Issue 5, May 2015.
 10. The Christaller model of central place is, however, inductive rather than deductive in the sense that the model is primarily based on observations rather than exploration of any schema constructed from first principles. To Parr (2002), the Loschian approach is completely deductive and a microeconomic foundation has been approached to understand the urban system. It shows that industrial concentration and urbanization may arise independently of local peculiarity and particularity.
 11. In the Big Push theory (Rosenstein-Rodan, 1943), the solution to the insufficient size of the local market is referred to a co-ordinated (government-led) expansion of investment - hence big push enters into. This enables firms to reap the benefits of economies of scale, thereby promoting industrialization of a backward region. Without such a big push, the backward periphery cannot catch up with the core.
 12. To Scitovsky (1954), incorporation of imperfect competition initiates internal economies of scale that implies market power. Scitovsky distinguishes between "pure" (technological) and "pecuniary" external economies. The former affects firm's production function (e.g. Marshallian "information spillover").
 13. In 1957, Gunnar Myrdal introduced the concept of circular or cumulative causation. In this, once a region (or country) takes lead in the process of economic development, positive external economies of scale in the region (or country) appears there - which ensures that the location will become an attractive place to invest and more attractive location for the labourers to work. The existence of strong localized spillovers leads to the establishment of a core in the region with large market and a periphery [Dicken and Lloyd 1990].
 14. Social capital is social organizations (such as trust, norms, reciprocity, co-ordination, interactions belongingness and networks) between producers and workers that facilitate better co-ordinated actions.
 15. Ref: Saha, Sukanta & Kundu, S. (2013), Informal Schooling: Towards an Inclusive Society - Unorganised Sector Migrant Workers in Howrah and Hooghly District (Guru-Sishya Parampara and the Informal Sector), In Nabanita Sen, Allefiya Tundawala, Arjun Sengupta (eds.) 'Towards An Inclusive Society: Understanding The Role of Education and Citizenship in The Indian Context, Rachayita publishers.
 16. Ref: Djajic, 1986; Appleyard, 1992; Massey et al, 1993; Bocker, 1994; Waldorf, 1998; Levitt, 1998; Massey, 1999; Taylor, 1999; De Haas, 2003.
 17. Ref: Mabogunje, 1970; Arizpe, 1981; Borcoz, 1987; Portes & Borcoz, 1987; McKee & Tisdell, 1988; Fawcett, 1989; Massey, 1990; Kritiz et al, 1992; Martin, 1992; Gurak & Caces, 1992; Bohning, 1994; Martin & Taylor, 1996; Rotte et al, 1997; Vertovec, 1999; Olesen, 2002; van Dalen et al, 2005.
 18. Ref: Saha, Sukanta (2015), Formal-Informal Linkages and Tie up of Informal Labour: A Study Focused on Gold and Jewellery Industry, West Bengal, India, *The International Journal of Management*, Vol. 4, Issue 2, April 2015.

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