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Evaluation of Cluster Paradigm as a Tool for Agricultural Development in Nigeria

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Abstract
Cluster development is a conspicuous and common feature in today's economy. However, this concept is not exactly new and has been the object of attention from a wide variety of management and social scientists for much of this century. In recent years, this phenomenon has attracted renewed interest from academics, practitioners, and the African continent - which have become aware of its central importance in competitive strategy. An understanding of clusters adds an important dimension to the more commonly debated role of personal contact networks in the success of Agricultural. The study adopts a Meta analysis and the use of secondary data. It was concluded that Agriculture in the 21st century requires an urgent turn around. It was recommended that the government should formulate policies, provide legal framework and create enabling environment to support cluster development.
Keywords: Cluster Development, Agricultural Development, Innovation, Government

INTRODUCTION

Cluster initiatives are starting to be seen as a key approach to help advance all sectors of many countries. Although there is a wealth of research and initiatives relating to clusters in general, remarkably little attention has been paid to clusters in the agricultural sector (Food and Agriculture Organization (FAO),(2010). This might be because the notion of cluster is closely related to competitiveness and innovation, and thus it has been traditionally applied to sectors that focus on innovation as a core value, such as information technology, electronics, car manufacturing, biotechnology, and oil and gas industries. Cluster approaches recognize that all the actors in the agricultural value chain are often more innovative and successful when they interact with supporting institutions and other actors (International Bank for Reconstruction and Development, 2012). Porter (1990) opined that cluster concept has become a subject of intense research studies and economic analysis regarding the competitive advantage of nations. Clusters are new developed tools to push local economies and to coordinate efforts. Governments and firms are applying cluster theory with the goal of improved competitiveness and growth of local economies.

These clusters provide an environment that enables specialized local firms to develop the competitive ability to service large, global markets and extend to serve many sectors of industry. Porter further agreed that clustering and concentration of industries in specific geographic areas is a key driver of regional and national prosperity. Clustering is not new in the developed world, there are many incidents of successful clustering initiatives from a range of developed economies around the world. The Silicon Valley, a region just south of San Francisco that has become home to over 7,000 high-tech companies, Hollywood, the corner of Los Angeles that is the movie making capital of the world. Similarly, the financial cluster located in the "square mile" called "The City" of London.

Cluster work in Africa is in an infant stage of development, The World Bank Institute (WBI) started some work on African clusters with its initiative "Knowledge, Technology and Growth in Africa" in 2005–06 (Zeng, 2008). The initiative delivered 11 case studies, 3 of which are in the agricultural sector: fish clusters in Uganda, a Kenyan cutflower cluster and a South African wine cluster where More than 4 340 farmers cultivate some 108 000 ha of land under vines. Although, in Nigerian situation, mini clusters exists within in the form of industrial layouts, most of this had been converted to residential houses.

In Nigeria, the greatest potential for sustainable growth also lies in the agricultural sector. Nevertheless, it is this sector where poverty is most widespread and found in its worst forms. Small-scale farmers, and the rural communities in which they live, are imprisoned within a "cycle of equilibrium" of low margins, resulting in low risk-taking ability and low investment, which leads to low productivity, low market orientation and low value addition which, in turn, nets low margins.

Following the ban on importation of rice in Nigeria, States like Kebbi, Jigawa, Niger had focused on production of certain Agricultural products through the adoption of Agro base cluster development. Hence, the study seeks to evaluate cluster models as a tool for agricultural Business Development in Nigeria.

REVIEW OF LITERATURE

Concept of Cluster

The term 'cluster' was first coined by Michael Porter when he used it in his seminal work "*The Competitive*

Advantage of Nations" to explain the concept of 'economic competitiveness' and what it stands for. A consequence of the system of [diamond] determinants is that a nation's competitive industries are not spread evenly through the economy but are connected in what Porter(1990) termed a *cluster* consisting of industries related by links of various kinds. It was then that various scientists and academics began to put forward their own definitions of clusters and clustering, but it was Porter who identified the commercial phenomena and first coined the term. In this handbook the following definitions are used as the basis for understanding.

The cluster is an economic phenomenon that is placed in a competitive context in which many businesses simultaneously compete and collaborate to gain different economic advantages. Porter defined cluster as the geographical concentration of interlinked companies and institutions in related branches of industry that complement each other by joint relations of exchange and activities along one (several) value creation chains. Porter (1998) further redefined the word cluster as geographic concentrations of interconnected companies and Institutions in the particular field. However, the phenomenon was viewed narrowly in these definitions, propelling the concept of value chain and vertical integration in clusters. Their emphasis was then on sustaining the nation's competitive position where Porter particularly acknowledged that cluster activities increase productivity and the innovation of products. It also highlights two essential features of clusters:- critical mass of enterprises located in geographical proximity to each other and enterprises within them share many common features. Cluster as a critical mass of enterprises located in geographical proximity to each other. Porter (2000) however, stressed that there is no universally accepted way of establishing the exact boundaries of a cluster. What is perceived as close in one location may represent an insurmountable distance in others; distance can be influenced by the availability of transport facilities, as well as by cultural identity and social values. Moreover, the number of enterprises necessary to be considered as constituting a cluster can vary depending on the size of a country. Krugman, (1991) further emphasized 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. Innova (2007) differed in opinion when he described cluster as co-location of partners, service providers, educational and research institutions related through linkages of different types.

Furthermore, UNIDO (2003) described clustering as the interaction of businesses of a similar type, healthy competition, networking and collaboration between them. Cluster theory emphasizes the role of networks and relationships between the various parts of a cluster but not of individual firms, and also fits with models of innovation and competitiveness. Leleur, (2009), provided a simpler definition of a cluster when they described it as the geographical concentration of industries which gain advantages through co-location.

To this end, the definition of UNIDO shall be adopted. It is intended to encourage similar businesses, promote healthy competition and collaboration among the agric based industries.

Concepts of Clusters, Innovation and Competitive Advantage

According to Ferreira, (2000) Innovation is managed effort of an organizations that operate in unstable or dynamic environments tend to have a greater need to produce innovations as a way of keeping up with or getting ahead of competitors. Innovation can also be used by organizations that are trying to catch an industry leader". Innovation is the key to the economic development of any company, region of a country or country itself. As technologies change, old products decrease in sales and old industries dwindle. Inventions and innovations are the building blocks of the future of any economic unit, (Hisrich, Peters and Shepherd, 2013).

Innovation refers to any new or significantly improved change resulting from research and development, whether improving existing insights or knowledge or improving the functionality, performance or other value to the user, and or exploitation of entrepreneurial opportunities (Ulhoi, 2004). Baumol (2011);Drucker, (1998) & Schermerhorn (2011) all agreed that Innovation is the process of creating something new, which is central to the entrepreneurial process. Innovation is the process of creating new ideas and putting them into practice. Drucker (2000) further defined innovation as an effort to create purposeful, focused change in an enterprise's economic or social potentials". It is said in a bit different way by Schermerhorn (2011) that it is the act of converting new ideas into usable applications with positive economic or social consequences. It is clear that that the central point of innovation is creating new ideas, change that results in exploitation of entrepreneurial opportunities.

Garelli (1997) Stated that one of the forces that would dominate the competitiveness environment of any country was the 'economy of globality and proximity'. Globality assumes that production does not necessarily need to be close to the end-user. It benefits from the comparative markets worldwide, especially in operational costs. It is generally competitive and price efficient. On the other hand, the economy of proximity inherent in a cluster provides value-added services close to the end user. With improvements in telecommunications and transportation infrastructures, the world is becoming more of a global village - where physical separation is no longer a barrier to international business relations, and multi-national corporations (MNCs) thrive on tapping international resources (such as cheaper labour, raw material and location) for added competitive advantage. However, Porter (1998) observed that the continuing competitive advantage in a global economy lies increasingly in local things – knowledge, relationships, motivation- that distant rivals cannot match.

Competitive advantage grows out of the value a firm is able to create for its buyers and this can be

identified through the value chain (Porter,1985). Innovation is seen to be vital in creating a competitive advantage by recognizing and discovering novel and better ways to compete in an industry and conveying them to market (Porter, 2000). Competitive advantage grows primarily out of improvement, innovation and change. Firms in a cluster will get advantage over international rivals if they could find new and better means to compete with better linkages, knowledge spillovers and innovation.

Benefits of cluster Development to Agricultural Business

Clusters promote both competition and cooperation (Porter 1998). Rivals compete intensely to win and retain customers. Porter (1998) further stated that without vigorous competition, a cluster will fail. Yet there is also cooperation, much of it vertical, involving companies in related industries and local institutions. Competition can coexist with cooperation because they occur on different dimensions and among different players.

The benefits of clustering for the development of individual companies and for improving the competitiveness of Agricultural sector cannot be underestimated. Zumbach (2010) and corroborated by Maxwell Stamp (2013) highlighted the following benefits

1. At the level of the firm, clusters help companies to take advantage of market opportunities that they could not achieve alone.
2. Clusters can reduce the 'pain barriers' of cost and risk and adapt international rules and standards to the local context. Companies no longer can rely solely on their internal processes and strengths.
3. To maintain pace with innovation, technological development and evolving consumer expectations, companies have to adjust quickly and develop appropriate responses at a higher speed. This is when combining efforts, making use of synergies, pooling resources increases competitive advantage while at the same time, reducing the risks involved in launching new products or entering new markets.
4. Clusters enable improvement of firms' capacity building by offering inter-company learning, experience sharing and mutual use of know-how. Finally, there are benefits in terms of business management. For instance, the use of joint sales channels augments the sales networks of each individual cluster member; personnel sharing (especially specialized functions such as R&D) reduce costs and time to market.

Challenges of Cluster Development In Agriculture

Maxwell Stamp (2013) Identified certain challenges that cluster initiators and leaders are confronted with when trying to build a cluster. The most obvious one is in developing a cooperative spirit amongst cluster members and participants. Building trust is a big challenge, hence command and control mechanisms, the rules of engagement and the 'way we will work together" should be carefully thought through at the very beginning and agreed with each cluster member. A coordinated decision-making mechanism should be introduced and observed. Other typical challenges as identified by Maxwell Stamp (2013) are:

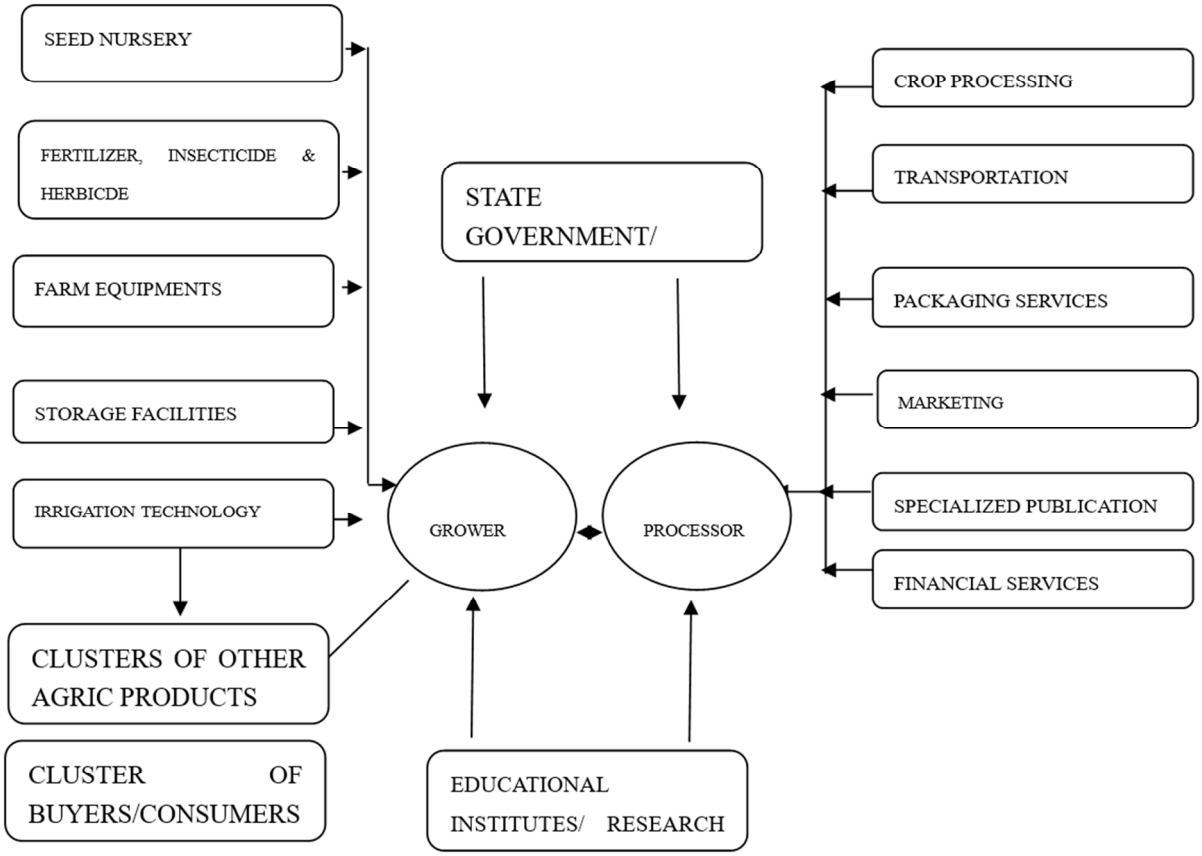
- Agreement on the use of patents of newly developed product and process innovations
- Agreement on the ownership of land
- Partly longer process time as a result of comprehensive coordination efforts by the players involved
- Lack of time to deal with additional responsibilities required by a cluster (cluster tasks that could interfere with day-to-day work)

Cluster Development Approach

Cluster development is basically supporting and strengthening the clusters by creating networking among the stakeholders to reduce the cost of doing business, bringing them on a single platform for more voice among policy makers, create new business opportunities, reducing risk of doing business and capacity building of the enterprises (World Bank, 2012). Agricultural Clusters have huge potential and critical to sectoral growth. UNIDO, (2013) explained that advanced Countries have always been fully cognizant of the significance of Cluster Development and has taken several initiatives for sustainable development of these clusters in the agricultural sector. These initiatives mainly include:

1. Technological Up-gradation
2. Establishment of Common Facility Center
3. Technology Transfer
4. Access to Formal Finance for Agric clusters
5. Establishing/strengthening cluster associations
6. Marketing support
7. Improving human resource skills through support to strengthening/establishing sector specific institutions, conducting training workshops/seminars and provision of consultants.
8. Awareness on International Certification (Social, Environmental and Health & safety), Testing and other regulations.
9. Removal barriers in regulatory procedures
10. Support in establishing Business Incubation Centers

Fig 1 Cluster Model



Source: Cluster for Competitiveness- A Practical Guide & Policy Implications for Developing Cluster Initiatives, World Bank, February 2009 modified by Researcher.

Common Facility Centers (CFC)

Worldwide, one of the most widely used practices to support Cluster Development is through the provision of Common Facility Centers (CFC). The CFCs provide a common pool of machinery/equipment, testing and inspection services and process technology related services for the collective up-gradation of Agric Clusters. The Agricultural firms use these facilities for improving quality and adding value addition to their products or processes. The specialized high-cost services and technology offered through such an arrangement are those which do not justify investments by a single enterprise. The establishment of CFCs is an integral part of Cluster Development activities.

Formal Finance for Agricultural clusters

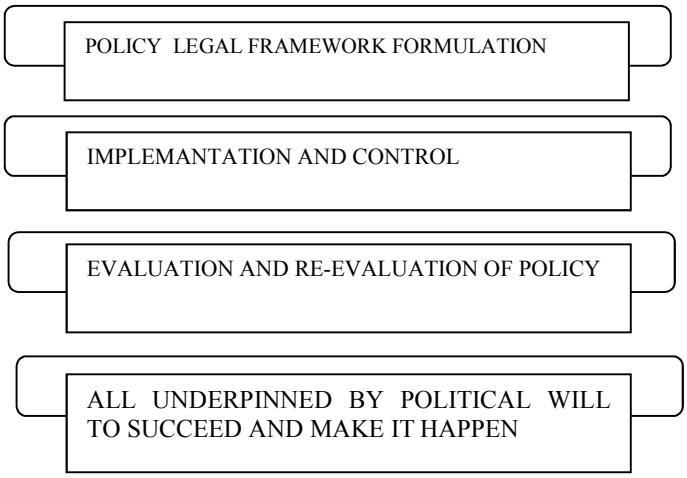
Credit is life line for any running business including Farming. However, flow of credit from the formal sources to this sector in Nigeria is at its evolutionary stage. The criteria and general understanding (technical guidance) required by most of the Small and Medium Entrepreneurs (SMEs) approaching financial institutions for credit are becoming more accessible Central Bank of Nigeria CBN(2016). These understandings are considered as highly relevant and verifiable.

Financial institutions in Nigeria now realize that Agricultural Financing is different from financing conventional businesses, and present its own risks and opportunities. Realizing the potential in SME sector, banks are bringing in structural changes by setting up SME divisions and SME desks. The time is right to assist financial institutions in identifying financing requirements of different sectors. One of the most efficient ways of doing that is identification of common need of a sector and design financing program accordingly. It helps in establishing standardized loan approval and disbursement procedures and eventually reduces application handling costs.

Role of Government in Cluster Development

Clusters were already long in existence before the concept was defined by Michael Porter and the label of ‘cluster‘ applied. Since then, however, policy makers have begun to formulate approaches to encourage the further development of existing and potential clusters. Here, the role of government is one of facilitation by provision of an enabling environment by which the following is meant :

Fig 2. **Role of State Government In Cluster Development**



Sources: Authors Conceptualization on the role of the government in cluster building

Chete, Adeoti, adeyinka, ogundele, (2014) Observed that in Nigeria economic activity is clustered in in a way to make a controlled environment for industrialization to prosper especially in the presence of chronic infrastructural deficits. This has conventionally taken the form of industrial estates or parks. The key benefit of the clustering of firms in this way is that it allows for infrastructural provisions to be prioritized and to give firms a spirited edge while offering access to raw materials, skilled labour, technology and materials. Chete et al (2014) futher states that Nigeria has a number of large industrial hubs and estates and has also witnessed an impulsive development of small clusters across the country. These includes the garment cluster in Aba, computer village in Ikeja, Lagos, the auto and industrial spare parts fabricators in Nnewi, the leather tannery in Kano and the footwear, and host of others. However, in crop production, the clustering pattern is determined on regional bases. Kebbi State Government and Kwara State Government are developing framework for clustering in rice and soybean production respectively.

THEORETICAL REVIEW

Cluster theory can be explained by four basic concepts: The competitive advantage of clusters, cluster initiative, cluster location, and geography and trade. This study identifies with Geography and trade cluster theory as theorized by Krugman (1991). Moreover, it is germane to the objectives of this study. Other theorist are Porter (1998), Sölvell, Lindquist, and Ketels (2003), Weber (1929),

Geography and trade cluster theory by Krugman (1991)

Krugman (1991), Termed economic geography as the location of production in space or the part of economic thinking that is concerned with where things happen in relationship to one another. The geographic concentration of production is obvious evidence of increasing returns. Consequently, to explain economic location decisions leading to industrial agglomerations, it is important to disregard constant returns and perfect competition. Krugman highlighted several reasons for geographic concentration such as multiple equilibriums, increasing returns, history, accident, and self-fulfilling prophecy.

In demonstrating the effect of these factors of economic activity in space, Krugman chose the case of the US Manufacturing Belt, a small part of the Northeast and Eastern part of the Mid-west. This belt took shape in the second half of the nineteenth century. By 1900 Zumbach (2010) reported that it contained 74 percent of the country's industrial employment which only slightly decreased by 1957 to 64 percent). The small change in industrial employment shows that there must be a reason for the remaining high manufacturer concentration which is not linked to natural resources. The established existence of the Manufacturing Belt was reason enough. Moreover, because of the great industrial employment number it also established the region as the country's main agricultural center. Once the belt had been created, it was not in the interest of any individual producer to move out of it. During the second half of the 19th century, after new land and new resources in the West were discovered and the initial advantage had altered the internal demand of the established manufacturing areas were strong enough to keep the manufacturing core intact. Part of the initial advantage of the manufacturing belt arose from the first railroad lines between the Great Lakes and the East Coast. These railroad lines supplied low transportation costs and basic infrastructure to the region.

Increasing returns affect economic geography at many scales and is responsible for the uneven economic development of whole regions. Increasing returns have been responsible for uneven economic development in the belt because of the lower transportation costs by the railroad and the Manufacturing Belt's increasing demand. In Krugman's model each manufacturer wants to serve the national market from a single location. The

firm chooses a location with large regional demand to minimize transportation costs; this again is largely where the majority of the manufactures are located. Hence, once created, after the initial advantage had shifted, the belt remained the manufacturing and agricultural center.

Multiple equilibriums can occur, if two separate markets develop a certain independent demand. Krugman shows a multiple equilibrium example of East and West. If the concentration of production is in the East each firm would want to be located in the East, serving the market in the West from the East and vice versa. However, if both markets develop a strong enough independent demand, the firm would serve the two markets from two locations. As a result, multiple equilibriums could occur.

The role of history and accident in the location of production is apparent for all economic agglomerations. Since the immigration of labor took place through the East and the British colonies, the historical movement of labor is the crucial reason for manufacturing location. Today one third of the US population still lives in the original colonies. Other agglomeration processes follow a similar process so that the appearance of clusters can be explained by the first-come first-serve advantage. These clusters exist because of their history and sometimes sheer luck.

Self-fulfilling prophecies also play an important role in explaining geographic concentration. Suppose the East initially offers better economic conditions. As a result, geographic concentration should occur in the East. However, if people are convinced the West is the future market because they expect other people to settle there, then people would move to the West. For example the discovery of gold in California convinced people to move to the West even if they did not have the incentive to search for gold. The fact that other people are expected to move there was reason enough. Therefore, the economic development of the West was not limited to gold. After the region achieved a certain population, the economy became self-supporting according to the high demand and growth rates. In this case the expectations of people became self-fulfilling leading to geographic concentration on the West Coast. Several conditions are required for self-fulfilling prophecies: the movement to the region must be easy and fast, there are increasing returns within the region, and the region should not be completely underdeveloped compared to other regions. Krugman theory was actually a build on Marshall (1920)

Hence, firms of the same industry create a superior market by pooling qualified workers. On the other hand, single firms have to deal with less qualified market, but also have less competition in the market. To this end, workers and firms benefit from the clustering process by:

- ✓ higher salaries and highly qualified labor force.
- ✓ the sharing of specific inputs allows firms to get access to more variety and lower costs.
- ✓ know-how and information flows more easily locally than over great distances. The co-location generates spillover effects and increasing returns.

Therefore, Krugman provides plausible explanations of geographic concentration. The concept of increasing returns is crucial in this respect. However, he does not describe how these factors interact with each other such as Porter (1998). Furthermore, he does not supply any solutions, techniques, or tools to direct geographic concentration, in order to increase economic growth.

Empirical Evidences

Alexandre, Mohamed & Luciano (2013), this research was carried with the aim of the present article is to investigate the role of agglomeration economies of a regional cluster on the export performance of firms. Furthermore, the study tested the mediating effect of innovation and the extent by which the technological intensity of the industry can perform a moderating effect between the constructs. Based on a sample of 100 export companies operating in the manufacturing industries, they used structural equation modeling to estimate the determinants of export performance. The results reveal that the agglomeration economies of a regional cluster have been found determinant factors of the export performance, as well as a significant source to generate innovations by firms

Steiner & Ali (2011) in their review compared key characteristics of food clusters with characteristics of clusters from other industrial sectors. The insights from these studies on clustering success and the role of government are contrasted with empirical evidence on government support for clustering in the Canadian food sector, specifically in the province of Alberta. The empirical evidence is based on two small industry surveys, one conducted in March 2005, and the second in August 2009. Considering this empirical evidence, there is little support for an emerging food (innovation) cluster in Alberta, and little evidence for effective government support toward food cluster development in Alberta.

Dejan, Josip Britvic & Bozidar (2016) in their research on tourism cluster - promoter of rural development in Croatia, affirmed that Clusters are one of the methods for structuring rural tourism, since they are built on vertical and horizontal networking and strategic partnerships. The existing knowledge on the issue was presented in the theoretical part of their paper by describing empirical evidence obtained by Croatian academic community in the field of clusters in rural tourism. The empirical part of the paper focused on the analysis of the benefits brought by clusters or common interest groups.

The Problem

In the background of the above concepts, the study seeks to answer the following general question: will cluster development really improve Agricultural Business in Nigeria? Operationally, the study seeks to answer the following questions:

- What are the benefits of cluster innovation in Agro Business in Nigeria?
- How can the benefit of cluster development be implemented to achieve competitive advantages in Nigerian Agricultural Business?
- What role will the State Government play in Agricultural cluster Development?

Agriculture in the twenty-first century is reinventing itself as a new global business reshaped by globalization, standardization, high-value production, massive growth in demand (both for the food and the biofuel industries), retail and packaging innovations, and a ramp up in efficiency(Galvez-Nogales,2010). Agriculture remains fundamental to economic growth, poverty alleviation, and environmental sustainability. Agricultural development demands and depends on innovation and innovation systems. Innovation is widely recognized as a major source of improved productivity, competitiveness, and economic growth throughout advanced and emerging economies. Innovation also plays an important role in creating jobs, generating income, alleviating poverty, and driving social development. Notwithstanding its importance, in conjunction with its methodological limitations, Nigeria had been slow in implementing cluster policies. Over the years most states are still in incubation process of adopting cluster development.

Conclusion

The potential benefits of the geographical clustering of economic activity have been well documented in the literature, yet there is little empirical evidence quantifying these effects in developing country contexts. This is surprising given the emphasis in industrial policy on productivity growth and the potential gains that could be made by facilitating cluster formation in Nigeria. Considering the stage of industrialization in Nigeria, where physical infrastructure is underdeveloped and there are a large number of informal and service sector firms that often exclusively rely on customers in local markets. Even though the study mentioned the activities of kebbi State, Jigawa and Niger State, it is crystal clear that Nigeria is far from adopting cluster development especially in Agriculture. The works of Krugman (1991), Porter(1998) and Weber (1929) provided the study with models and theories from the adoption of Clustering.

Recommendation

Given the complexity of cluster processes, piecemeal approaches addressing components one-by-one are unlikely to produce optimum results - a systematic, integrated and holistic approach is required and is recommended. The following are recommended

1. Taking a lead from the work of Dejan, Josip Britvic & Bozidar(2013), cluster formation represents a landmark innovation in Agricultural sector.
2. The government should formulate policies, provide legal framework and create enabling environment to support cluster development
3. The government should ensure minimal level of infrastructure in rural communities of the state;
4. The services of export analysts, scientists and extension workers, who are to analyze and recommend specific crops that will form the cluster.
5. The study further recommends that clustering should be done on the regional basis.

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