The Era of Clusters for Economic Growth and Industrial Change, Egypt Case.

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Abstract:

The Arab Republic of Egypt witnessed an industrial development in the nineteenth century while at the beginning of the twenty-first century, Egypt began another phase characterized by the development of the Egyptian industry, raising the competitiveness of Egyptian manufacturing within the framework of an integrated program that contributes to raising exports to effectively join the global economy.

The industrial sector in the Egyptian state represents an advanced rank in the national economy. It comes at the forefront of the economic sectors in terms of its contribution to the GDP, with a rate of 18% in the GDP. In addition, the industrial sector has many relationships with many services and commercial sectors, it also has a role in developing foreign trade and revitalizing the balance of payments.

The paper suggests that in order to maximize the economic return of the industrial sector, the planning of industrial zones should be designed for cluster building.

Many authors have agreed that clusters and agglomerations are the best way to achieve industrial growth. This paper seeks to demonstrate the importance of clusters for many countries and helps to clarify different policies and strategies that could help the Egyptian government build a view that enables the decision-makers to choose the best way that could help economic development. The paper's main finding is that 93 targeted clusters for the Egyptian industry are classified by technological intensity: Medium-high and high technology, Medium technology, and Low technology.

Keywords: Cluster, Industry, Economic

1. Introduction:

There is clear evidence that the quality of the industrial sector and diversification is a key to improving productivity, and accordingly economic growth. The precedent of manufacturing in the 18th and 19th centuries shifted the structure of production in Europe and the USA. Manufacturing was the power for more economic achievement, similarly to what happened in East Asia. Manufacturing makes strong ties with different sectors in the economy which increases demand for more skills, inputs, transportation, and storage. It means that the improvement of the industrial sector enhances growth through different activities. Therefore, most literature found that the source of innovation and technological development was the industrial sector which makes different sectors more productive. Many countries have an enormous share in the total world manufacturing. These economies have adopted different policies and strategies to improve their position on the industrial map. The improvement of this sector reflects the growth of the total economy. Table 1 demonstrates the contributions of these economies in 2019 to the total world industry.

Table (1): Share of the Higher Industrial Countries in the Total World Industry in 2019.

Country	*Percentage of Total World Manufacturing*
China	28.7%
USA	16.8%
Japan	7.5%
Germany	5.3%
India	3.1%
South Korea	3.0%
Italy	2.1%
France	1.9%
UK	1.9%

Source: (IDSC, June 2022)

In fact, a strategy of concentration is more likely to produce fast growth for the largest number of people.

Lin & Monga, 2017 and Booth, et al., 2018 found that the common mistake causing so many failures of industrial zones around the world is to allow such zones to be occupied randomly or to achieve secondary policy objectives so that the learning benefits of agglomeration are missing.

In 2020, the world investment report pointed out that, investors' goals shift to promote strong diversified industrial clusters and enhance cooperatives between SMEs.

Cluster structures are different from old local production systems because they bring and support collaboration between firms and R&D centers such as universities and laboratories. This brought the scientific and industrial units and enabled them to work together as a single unit. Linking local units to the network of formal and informal interactions facilitates joint research and development, exchange of knowledge and information, exchange of modern technology, and spreading of intensive innovation (Kowalski, 2014).

Large companies are leading clusters in the US, Japan, Vietnam, and China, whereas both the EU and South Korea where the SMEs have the focus in clusters (Hollanders, et al., 2020).

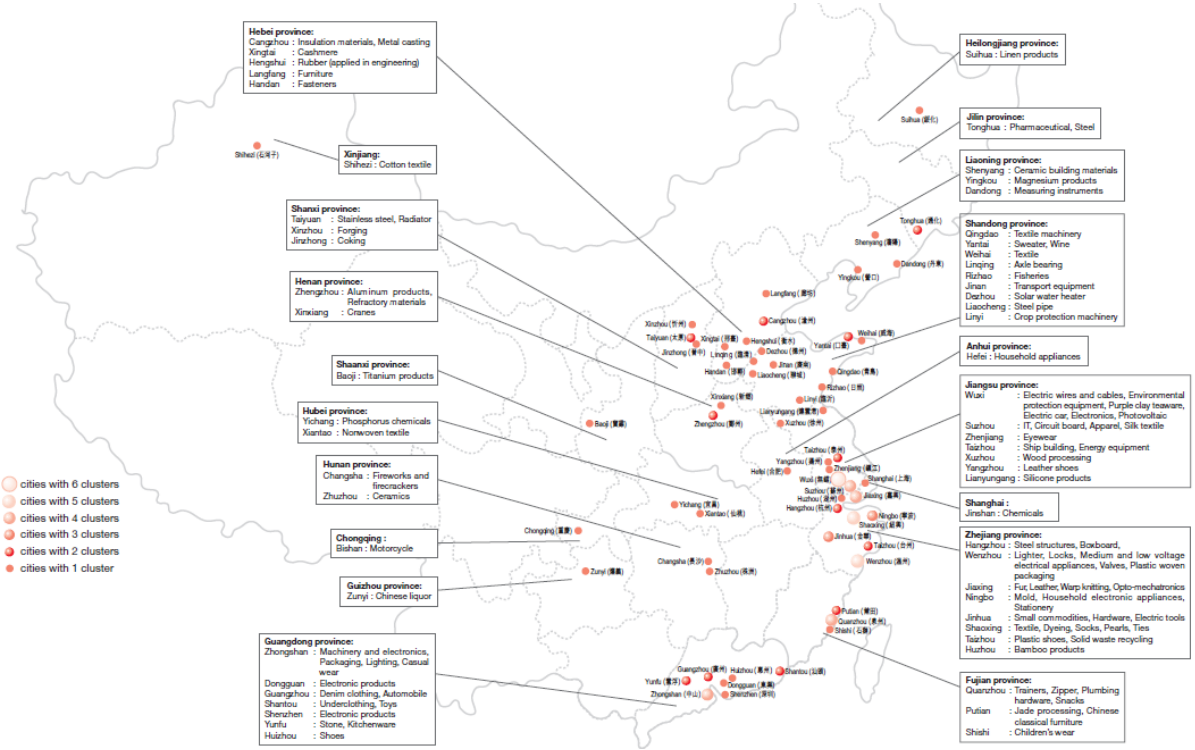
The most recent research by Ketels and Protsiv (2020), using comprehensive data from the European Cluster Observatory demonstrated that the presence of strong clusters is a main driver of wealth in Europe.

2. Literature review

3.1 ***Most Developed and Emerging Countries have Given more Attention to Promoting Clusters*****:** In France, the UK, and the USA 75–95 % of the industry is clustered or concentrated relative to overall economic activity (World Bank, 2009). In **Europe,** there are currently 2950 clusters, accounting for 61.8 million jobs. Moreover, the productivity of companies that are part of clusters is 25% higher than average productivity (ECCP report, 2020). Examples include the National Clusters Platform (Austria), Support Programme Cooperation (Czech Republic), Innovation Clusters Saxony (Germany), Aviation Cluster (Hamburg), Competitiveness Clusters (Portugal), Support Industrial Clusters (Slovakia), Catalisti Spearhead Cluster (Flanders) (ECCP, 2021),

Technology Cluster Initiatives (Canada), The Innovative Cluster Cities Program (South Korea), The Regional Cluster Program (Sweden), Cluster Development Program (Kazakhstan), Chemical Industry Clusters (Chemelot, Netherlands), Operational Programme (Greece), Interaction on Innovation (Denmark), Supported Clustering (Romanian) (Florio, M., et al, 2016). In China, by the year 2001, more than 800 industrial clusters were focusing on 175 industrial sectors (XU, S., 2011).
Figure 1 illustrates the top 100 industrial clusters in China.

Figure (1): Top 100 Industrial Cluster in China.



Compiled by Li & Fung Research Centre

3.2 Intentionally or Organically Formed Clusters?

While building a dynamic cluster from scratch is a more difficult task than strengthening an existing one, intentional clusters could be built by using different strategies and policies. For example, in South Africa, the networking of firms in 15 sectors has been promoted by the Department of Trade and Industry (including motor vehicles, mining equipment, textiles and clothing, the chemical industry, farming and food, and tourism).

In 2007, the government of Kazakhstan launched the cluster development program to support and enhance the total production output of clusters. After 7 years, this program produced more than 400 new products not previously produced in Kazakhstan (ADB, 2018).

In the beginning, the telecommunications industry in China was dominated by foreign companies because the technical levels of Chinese companies were less than those of overseas ones. Also, there was no standard in China at the beginning. So, Chinese companies paid to get the know-how (Fan, 2011). The companies in Huaqiangbei Zone recognized that there was an increased demand for mobile phones in the local economy. Therefore, many Chinese companies in the Zone tried to manufacture their mobile phone products. Between 1998 and 2008, to operate the telecommunications business, the government approved and licensed China's first and largest state-owned company, China Mobile. China Mobile finances Coolpad (Shenzhen), ZTE (Shenzhen), and OPPO (Ai & Wu, 2016).

When the government of Singapore announced its intention to become a biomedical sciences hub, the country did not have any competitive advantages to be attractive in this sector. In the past, Singapore often relied on attracting FDI and supporting them to get the technologies and know-how (Wong, 2001). For example, the advantage of Singapore being the leading IT and electronics manufacturer in the world came from these global MNCs which supported the country before (Wong, 2002). The same strategy was adopted in the biomedical sciences sector. In 2006, the BMS cluster as a whole had an output of $23 billion, with an average annual growth rate of 17.9% since 1980 (Wong, et al, 2010).

3.3 Building Potential Clusters:

a) The first step to identifying potential clusters is to understand the capabilities of current manufacturers in the economy and the relationship between them vertically and horizontally and how these capabilities could be utilized in the larger production systems. After that, identify proximity points between these firms. Economic and industry experts could start to attract those firms which are connected to each other based on their previous knowledge. Then gaps in the system are determined and used to upgrade or attract current or new firms (Doeringer, et al., 1995).
b) Attract knowledge centers, such as universities, and R&D centers from the local economy, either by building new institutions or re-building the present, to emphasize and support the cluster's growth (Wong, et al, 2010).
c) If a large percentage of investment comes from the local economy, this will reduce the knowledge and technology transfers. Therefore, the gaps in the first and second points should be identified, and then foreign players be attracted to the cluster; either knowledge and manufacturing firms or supporting services which will form the knowledge and technology base of the cluster. This could be through incentives and plans which will attract firms into the cluster and encourage those already existing to upgrade their knowledge intensity (Wong, et al, 2010).

3.4 Structure of a cluster:

a) The Steering Committee or cluster board:

The Steering Committee comprises the main stakeholders (e.g. ministries, industrial organizations, promotion agencies, universities, financing institutions, and R&D centers) which have a direct impact on the cluster development and could offer valuable support to them. The Committee/board in most cases is responsible for promoting and launching the project, setting regulations, brokering agreements between agencies and ministries, encouraging supporting initiatives, designing strategic

goals, and providing incentives. Make sure that the cluster has developed a long-term strategy to support the economic growth of the country.

b) Cluster Coordinator: This tends to be an expert who has good knowledge of the industry on which the cluster concentrates. Of the most important responsibilities, they could build relationships between cluster members through appropriate communications and arranging discussions between them. In some cases, they may also provide services (e.g., consulting, training, certifications issue, and setting conferences) (Weisert, et al., 2013), enhance connections that support knowledge transfer between research centers and industry and provide strategic direction for cluster members to spread their activities e.g., digitalization, and collaborative activities (Alexandre et al, 2012).

c) The Executive Team: is responsible for daily decision-making related to cluster processes and all management activities (Weisert, et al., 2013), ensuring all procedures are aligned with the policy and regulations enacted (Alexandre et al, 2012).

d) Cluster Development Agents: CDAs perform the role of impartial brokers who provide guidance and support to the cluster (Weisert, et al., 2013). They gather information from a wide range of internal stakeholders and foreign markets and map out these potential markets. They also gather information about new supply chains and provide advice on improving the processes. They provide support for mapping out local assets and identifying new trends, which will contribute to building cluster members' capabilities, and showcase events for cluster members to present their capabilities to MNCs or government entities (Alexandre, et al, 2012).

3.5 *The Importance of Collaboration and Presence of Different Entities inside each Cluster*:

The presence of different entities in the same cluster is very important but what is most important is the collaboration between them to get the most benefits.

a) Bangalore is considered one of the most successful clusters in India and the world in the IT sector. Most of its success comes from the relationship between multinational and local firms and research, educational, and training centers. The cluster is very famous for intensive connection between their members (Session, 1999). The Central Machine Tools Institute provides technical support, testing facilities, designs and modifies machine tools on request, and researches and develops CNC technologies (K. Nadvi, 1995).

b) In Spain, the advanced materials cluster "MAV" acted as a facilitator between individual protection equipment manufacturers from Spain and the suppliers of raw materials from France, which allowed the Spanish manufacturers to increase their production and diversification (Kamp, et al, 2020).

c) In Japan, there are three main organizations supporting the development of each cluster (i.e., Cluster Promotion Organizations (CPOs), Cluster Project Promotion Organization (CPO), and The Japan External Trade Organization (JETRO)), which complement each other and are responsible for: managing every cluster, providing information, calling for seminars, connecting businesses, advertising, counseling, educational centers collaboration and promotion for each cluster (Fujita & Hill, 2007).

d) In China, Wenzhou University played a pivotal role in enhancing technological development, especially in the footwear cluster, the university has made great efforts in the field of R&D and leather manufacturing innovations and cooperated with many companies to

set up the Leather Production Technology Research Center of Wenzhou in 2004 (Lai, Chiu, and Leu 2005).

3.6 Policies and Strategy to Improve the Development of a Cluster:

The government can play a significant role in simplifying the development of clusters through its initiatives, policies, and investment programs.

Examples of the strategic policies and initiatives implemented by policymakers include:

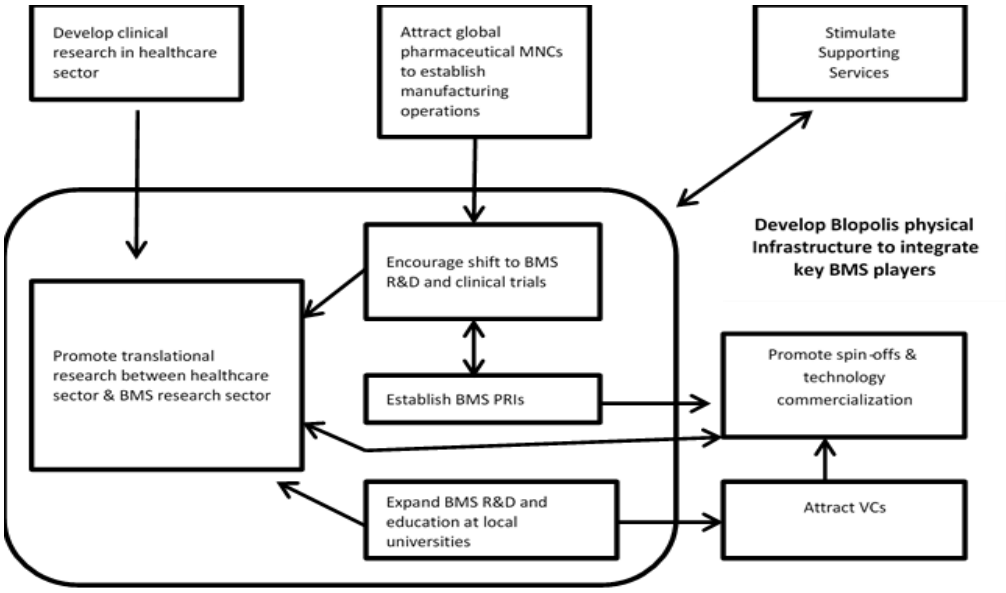
a) The Biomedical sciences (BMS) cluster in Singapore

First, the government has allocated a US$1 billion fund to build new life science research institutes and a complex named Biopolis, in addition, to funding new R&D projects by multinational pharmaceutical companies (Wong 2007).

The Agency for Science, Technology, and Research, and the Economic Development Board (EDB) were the two main governmental entities responsible for establishing Singapore as a biomedical science center. In addition, the Biomedical Research Council was responsible for putting appropriate policies and educational plans that will enhance biomedical science competencies e.g., funding and research initiatives. The EDB core responsibilities are attracting investments to develop long-term economic growth in the BMS sector (Finegold et al 2004).

Figure 2 presents a flowchart demonstrating different strategies developed by T&R and EDB to develop the BMS cluster in Singapore.

Figure (2): Flow-Chart of Singapore's BMS Cluster Development Strategy



Source: Wong et al., 2010

Singapore has attracted global talents in BMS development. The Biomedical Sciences Executive Committee which drives Singapore's BMS Initiative is managed by the International Advisory Council (IAC), which encompasses superior scientists from all over the world.

BMS hub development: key elements of development strategy

a) Attracting FDI into industrial, engineering, and R&D centers; b) Developing varied and connected infrastructure to attract potential investors into the cluster; c) Attracting top (local or foreign/young or senior) talents into the cluster, for example (Sidney Brenner, a Nobel laureate (Chairman of BMRC and Co-chairman of the IAC)); d) The government has played an important role in providing and encouraging different funding initiatives, which were managed by one organization called Bio*One Capital; e) Encouraging linkages among all cluster members, i.e., R&D centers, universities, Biopolis complex, and foreign institutes by a consortium set to promote such linkage. These consortia engage in a variety of activities such as financing, and training (Wong, et al, 2010).

b) The success of Chinese industrial clusters came from governmental support and promotion. This support often takes many policies:

i) local governments have designed, developed, and built well-specialized markets and industrial zones to enhance all activities; ii) local governments are gradually highlighting technological innovation and upgrading. Because of the high cost of investment in innovation and technology upgrading, most firms cannot invest in such activities. So, the government does so. In Guangdong, the government has invested RMB 300,000 in each specialized zone to set up a technology center. In Wenzhou, the government encouraged and invited shoe manufacturers in Italy to set up a footwear design center to help the cluster gain innovation (Zeng, 2012).

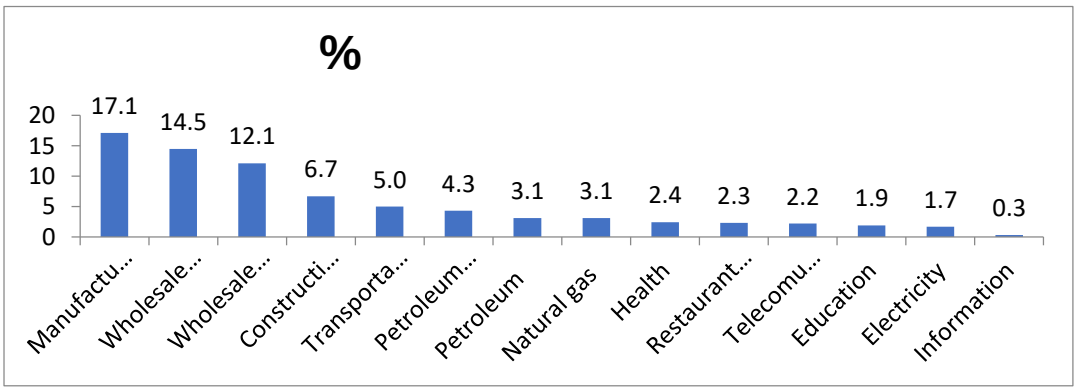
4. Targeted Clusters for the Egyptian Economy

4.1 *The Competitiveness Drivers of the Egyptian Economy*

Deep insight into the Egyptian economy has demonstrated that the most prominent problem of the economy is manufacturing and how to develop this sector (IDSC, June 2022).

The manufacturing share in the Egyptian economy for 2019/2020 was 17%, agriculture 12%, and the service industry 50%.

Figure (3): The relative share of economic sectors in the GDP in Egypt in 2019/2020



Source: (INP, 2020).

The percentage of the added value for the industrial sector has increased very slowly compared to the total GDP for the last 30 years from 27.4%: to 30.8%.

Table (2): **%** Manufacturing value Add of Total GDP of the Egyptian economy in different years.

	1990	*1995*	*2000*	*2005*	*2010*	*2015*	*2019*	*2020*	*2021*
% Manufacturing value Add of Total GDP	**27.4**	**30.2**	**30.8**	**34.1**	**35.8**	**36.6**	**35.6**	**31.8**	**30.8**

Source: (Mohamed, 2022)

Considering the degree of depth of the Egyptian manufacturing industry and its slow entry into the modern or more advanced industries, such as electronics, machinery, equipment, and vehicles, shows that it is inferior to foreign ones. The data in table No. (3) show the decline in the basic indicators of the depth of the manufacturing industry in the value-added position of medium and high-tech industries, particularly machinery and transport equipment. This means that the depth of the Egyptian manufacturing industry has not witnessed a significant change in the last three decades. This is evident in the small value of Egyptian exports of high-tech products, and the growth in the export capabilities of the manufacturing industry, as the percentage of commodity exports did not bridge the existing gap in the Egyptian trade balance deficit, and the Egyptian economy's import of manufacturing products continued to outweigh its exports.

Table (3): Some Manufacturing indicators of the Egyptian economy in different years**.**

	1990	*1995*	*2000*	*2005*	*2010*	*2015*	*2019*	*2020*	*2021*
The Added Value in Medium and High Technology Industry as a Percentage of Added Value of the Manufacturing Industry	**23.4**	**25.1**	**36.2**	**29**	**23.8**	**18.5**	**20.9**	——	——
Total Export of High Technology Industry of Total Manufacturing Export	——	——	——	——	**1**	**0.8**	**2.3**	**2.7**	——
Total Export of Manufacturing as a % of Total Egypt Export	——	**40.3**	**38.4**	**23.6**	**41.7**	**51.6**	**45.2**	**47.8**	**45.6**
Total Import of Manufacturing as a % of Total Egypt Import	——	**60.6**	**55.4**	**45.2**	**59.9**	**58.8**	**57.7**	**57.9**	**55.9**

Source: (Mohamed, 2022)

Even though the Egyptian economy has many hidden capabilities that could deepen the activities and turn the economy from assembly to manufacturing, this needs implementing strategies to utilize these capabilities. This turning will be a focal point in the growing economy especially if the expansion in the manufacturing is in the high technology.

4.2 Snapshot of Some Capabilities of the Egyptian Economy:

- In 2014, Egyptian average salaries were about 15 times less than salaries in advanced countries such as Germany, France, and Italy (ILO, 2017). In the ICT sector, the average programmer's salary in Egypt is about 25% lower than that in China and Morocco, 40% lower than the salary of a programmer in Hungary and the Czech Republic, and 70% less than the salary in the UAE (OECD, 2017).
- Egypt was 28th among 141 countries on the index of the quality of roads in 2019 (global competitiveness report, 2019). On market size, Egypt was 23rd in the world and 3rd in Africa and the middle east (global competitiveness report, 2019), with 40% of the Egyptian people between 15:39 accounting for 40 million people, and 21.1% between 40:64 years old accounting for 21.1 million (CAPMAS, Jan. 2020).
- The information and communication technology sector is the fastest growing sector in Egypt, as it achieved a growth rate of about 16.3%, surpassing all the various sectors of the country during the fiscal year 2021/2022. The sector provides 280,000 jobs, and its exports amounted to $4.9 billion in 2021. Egypt already hosts a number of MNCs such as IBM, Amazon, Uber, Microsoft, Valeo and Bright Skies, and others in the IT sector (ITIDA, 2022).
- The state has set up nine business incubators, including distinguished incubators in the field of artificial intelligence at Alexandria university and a technology incubator at Mania University in cooperation with the Academy of Scientific Research and Technology (IDSC, Jan. 2022).
- The productivity rates of the labor force in Egypt are competitive. According to ILO estimates, Egypt witnessed high productivity rates during 2019 that amounted to about 43931 USD/annum compared to low productivity rates in other countries such as Tunisia, Jordan, Morocco, Algeria, South Africa, Nigeria, and India (GAIF, 2019).
- Corporate tax rate in Egypt is less than developing and emerging economies which stands at 22.5% in the country. That is lower than India (25:40%), South Africa (28%), Morocco (31%), and Mexico (30%) (GAIF, 2019).
- Egypt applied 14% VAT in the country which is lower when compared to different countries such as Turkey (15:35%), India (10:30%), South Africa (0:40%), Morocco (0:41.5%), and Mexico (0:30%) (GAIF, 2019).

4.3 What is the most effective strategy the country should follow:

Now we have to ask an important question, should a country follow a strategy of import substitution by substituting domestic products for what it imports? Or should a country follow an export-orientated strategy by improving its capabilities and competitiveness, and entering foreign markets?

In the past, policies of import and substitution were applied in Latin America until the 1980s by building high tariff fees for local industries so that local producers could produce and sell goods that would otherwise be imported. In contrast, Southeast Asian countries like Taiwan, South Korea, and Singapore have preferred an export-oriented strategy. It reduces involvement with capital inflow and allows supply and demand to work in the markets. It emphasizes the government's role as regulator to manage the fairly organized market economy and relies mainly on a private market system to allocate resources, instead of depending on dominance or the commands of a government in directing the production system. After a few decades southeast Asian countries focused on high-return export industries, and had overtaken every Latin American country by the late 1980s. The secret to success was that the government engaged in selective planning and intervention. Rather, the export orientation allowed these countries to gain economies of scale and the benefits of competitive advantages and international specialization, which allows the country to use domestic resources effectively, acquiring fast productivity growth.

4.4 Methods of Collecting Data

This paper has identified the targeted clusters during the period between (2004-2019). This period was selected to avoid any biased data for the period of 2020 : 2021 for the pandemic of covid 19, and to avoid biased data in 2022 for the war between Russia and Ukraine. The current privileged location of Egypt between Asia and Europe and the flow of trade between both continents is considered the most important factor to define the targeted clusters. Therefore, the most important factor is the positive combined annual growth rate for which industries have grown between Asia and Europe or vice versa, more than the world exports growth rate within the period 2004-2019. This variable shows for a specific industry the percentage share of exports of this industry in total world exports. The more an industry exports than the world export rate, the higher its potential is. Hence this index helps to identify which industry has future export potential in the global market. The variables which compose the analysis are:

1- Export-Output combined annual growth rate of the period (2004–2019): measured as the growth of the export of the sector's industrial output from 2004 to 2019 from Asia to Europe. It aims at capturing how the sector has grown during this period. However, the sectors with a higher growth rate than the global export growth rate were chosen.
2- Export-Output combined annual growth rate of the period (2004–2019): measured as the growth of the export of the sector's industrial output from 2004 to 2019 from Europe to Asia. It aims at capturing how the sector has grown during this period, however, the sectors with a higher growth rate than the global export growth rate were chosen.
3- World export-output combined annual growth rate of the period (2004–2019): measured as the growth of the export of the sector's industrial output from 2004 to 2019 from all over the world. It aims at capturing the growth rate of the global supply side of the sectors during this period.

Data for Asia exports to Europe and Europe exports to Asia and the total world exports for all products between 2004 and 2019 were collected from trade map data.

The methodology adopted in this paper was the mixed method approach involving a detailed review of the relevant literature and primary data collected from trade map which was developed in 2001 by the International Trade Centre (ITC), which mainly depends on UN COMTRADE, maintained by the United Nations Statistics Division (UNSD), and integrated with data collected by ITC. UN COMTRADE covers more than 90% of world trade or around 160 countries and regions (http://comtrade.un.org/).

Trade Map is based on the Harmonized System. The Harmonized System (HS) is an international nomenclature for the classification of products published by the World Customs Organization (www.wcoomd.org).

The International Standard Industrial Classification of All Economic Activities (ISIC REV.4) which is used in this analysis, is the international reference classification of productive activities. There is a separate classification that exists, namely, the Central Product Classification (CPC). The relationship between ISIC, on the one hand, and the product classifications HS and CPC, on the other, is based on the fact that the product classifications in principle combine in one category goods or services that are normally produced in only one industry as defined in ISIC.

Hence, we use The Companion Guide of CPC which includes a more detailed interpretation of the link between ISIC and HS.

The classification of industries by technological intensity (technology classification) was made by the United Nation Industrial Development Organization (UNIDO), the taxonomy of industry classified by technological intensity, namely:

- Low technology
- Medium technology
- Medium-high and high technology (MHT industries)

4.4 ***Results***:

Appendices (A, B, and, C) summarize the results for the 93 targeted classes (clusters) for the Egyptian economy. The results were as follows: -

- Low Technology (34 classes).
- Medium Technology (18 classes),
- Medium-high and High Technology (41 classes),

Every class in ISIC has many industries, for example, class number 2750 is called Manufacture of Domestic Appliances. This class includes the manufacture of small electric appliances and electric housewares, e.g., household-type fan.

4.5 Analysis:

Lower-skill manufacturing can be a starting point for cluster development. The literature review has revealed that developing countries should not expect to be able to directly jump into high-tech, but may rather need to go through developing labor-intensive industries initially and then upgrade technologically. Egypt has already built three clusters, two of which are classified as low technology

clusters (i.e., Damietta Furniture City, and The Robbiki Leather Cluster), and the third cluster is classified as Medium-high and high technology (i.e., Medicine City "Gypto Pharma" in Khanka).

In the **second** stage, medium industries could be considered. The **third** stage could consider the special emphasis on high-technology industries. Through a number of deliberate government policies, FDI for medium and high-technology clusters could be encouraged by incentives, physical and technological infrastructure, attracting talents, productivity enhancement services (lab facilities, specialized training, consultancies), information services, and strong laws and regulations protecting intellectual property rights (IPR).

5 Conclusion

All advanced economies actively found clusters a worthy method for enhancing economic performance. Policies, strategies, and financing clusters program would provide the initiatives that local and foreign actors at the state and local levels need to build clusters that achieve their goals to compete, provide well-paid jobs, and enhance regional and national economic performance.

A successful cluster strategy is a long-term plan that may not be easy or quick to implement, but the experience proved that it is the best way to achieve economic growth and industrial change.

Appendix **(A): Targeted Low Technology Clusters for Egypt**

ISIC	Description	world exports	Eu exports to Asia	Asia exports to the Eu
1391	Manufacture of knitted and crocheted fabrics	4%	0	7%
1080	Manufacture of prepared animal feeds	9%	14%	25%
1811	Printing	7%	10%	11%
1079	Manufacture of other food products n.e.c.	9%	12%	10%
1430	Manufacture of knitted and crocheted apparel	4%	8%	0
1393	Manufacture of carpets and rugs	3%	0	5%
1410	Manufacture of wearing apparel, except fur apparel	5%	7%	0
1073	Manufacture of cocoa, chocolate and sugar confectionery	7%	10%	0
1103	Manufacture of malt liquors and malt	5%	10%	0
1010	Processing and preserving of meat	6%	9%	0
1040	Manufacture of vegetable and animal oils and fats	7%	20%	8%
1050	Manufacture of dairy products	6%	8%	0
1101	Distilling, rectifying and blending of spirits	6%	7%	19%
1312	Weaving of textiles	1%	0	2%
1030	Processing and preserving of fruit and vegetables	7%	10%	0
1200	Manufacture of tobacco products	5%	10%	9%
1623	Manufacture of wooden containers	5%	10%	0
1061	Manufacture of grain mill products	8%	10%	0
1104	Manufacture of soft drinks; production of mineral waters and other bottled waters	3%	4%	0
3100	Manufacture of furniture	6%	7%	10%
1394	Manufacture of cordage, rope, twine and netting	7%	0	11%

1520	Manufacture of footwear	7%	0	8%
1020	Processing and preserving of fish, crustaceans and molluscs	3%	8%	4%
1399	Manufacture of other textiles n.e.c.	4%	0	11%
1420	Manufacture of articles of fur	4%	7%	7%
2599	Manufacture of other fabricated metal products n.e.c.	7%	9%	9%
2511	Manufacture of structural metal products	8%	0	15%
2593	Manufacture of cutlery, hand tools and general hardware	5%	7%	10%
2512	Manufacture of tanks, reservoirs and containers of metal	5%	0	11%
1702	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard	6%	0	13%
1910	Manufacture of coke oven products	2%	10%	0
1701	Manufacture of pulp, paper and paperboard	3%	5%	9%
1709	Manufacture of other articles of paper and paperboard	1%	2%	7%
1920	Manufacture of refined petroleum products	9%	12%	18%

Appendix **(B): Targeted medium Technology Clusters for Egypt**

ISIC	Description	world exports	Eu exports to Asia	Asia exports to the Eu
3212	Manufacture of imitation jewelry and related articles	5%	8%	13%
2393	Manufacture of other porcelain and ceramic products	6%	0%	7%
2392	Manufacture of clay building materials	1%	0%	30%
2395	Manufacture of articles of concrete, cement and plaster	8%	0%	11%
2420	Manufacture of basic precious and other non-ferrous metals	9%	19%	8%
2220	Manufacture of plastics products	7%	8%	8%
2396	Cutting, shaping and finishing of stone	5%	0%	10%
2399	Manufacture of other nonmetallic mineral products n.e.c.	6%	7%	11%
3250	Manufacture of medical and dental instruments and supplies	8%	9%	0%
2391	Manufacture of refractory products	5%	0%	13%
2310	Manufacture of glass and glass products	4%	0%	13%
3211	Manufacture of jewelry and related articles	8%	0%	9%
2211	Manufacture of rubber tires and tubes; retreading and rebuilding of rubber tires	6%	8%	7%
2219	Manufacture of other rubber products	6%	9%	7%
3290	Other manufacturing n.e.c.	6%	0%	10%
2431	Casting of iron and steel	5%	0%	10%
2410	Manufacture of basic iron and steel	4%	0%	0%
3240	Manufacture of games and toys	2%	7%	6%

Appendix **(C): Targeted medium & medium-high Technology Clusters for Egypt**

ISIC	Description	world exports	Eu exports to Asia	Asia exports to the Eu
2023	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	8%	9%	13%
2029	Manufacture of other chemical products n.e.c.	4%	6%	5%
2011	Manufacture of basic chemicals	5%	6%	7%
2720	Manufacture of batteries and accumulators	3%	7%	4%
2710	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus	6%	7%	10%
2652	Manufacture of watches and clocks	6%	9%	-
2651	Manufacture of measuring, testing, navigating and control equipment	6%	9%	10%
2660	Manufacture of irradiation, electromedical and electrotherapeutic equipment	5%	7%	8%
2640	Manufacture of consumer electronics	-1%	5%	-
2814	Manufacture of bearings, gears, gearing and driving elements	7%	9%	10%
2813	Manufacture of other pumps, compressors, taps and valves	6%	7%	10%
2825	Manufacture of machinery for food, beverage and tobacco processing	5%	6%	14%
2822	Manufacture of metal-forming machinery and machine tools	3%	4%	7%
2910	Manufacture of motor vehicles	4%	11%	-
2930	Manufacture of parts and accessories for motor vehicles	5%	9%	9%
2920	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	6%	9%	-
2100	Manufacture of pharmaceuticals, medicinal chemical and botanical products	5%	10%	10%

3030	Manufacture of air and spacecraft and related machinery	8%	13%	17%
3020	Manufacture of railway locomotives and rolling stock	4%	10%	14%
3012	Building of pleasure and sporting boats	3%	8%	11%
3091	Manufacture of motorcycles	3%	5%	-
2012	Manufacture of fertilizers and nitrogen compounds	8%	-	10%
2013	Manufacture of plastics and synthetic rubber in primary forms	6%	-	7%
2022	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	5%	-	6%
2030	Manufacture of man-made fibres	0%	-	6%
2670	Manufacture of optical instruments and photographic equipment	4%	-	6%
2610	Manufacture of electronic components and boards	4%	-	6%
2732	Manufacture of other electronic and electric wires and cables	11%	-	25%
2731	Manufacture of fibre optic cables	11%	-	18%
2740	Manufacture of electric lighting equipment	7%	-	11%
2790	Manufacture of other electrical equipment	6%	-	9%
2750	Manufacture of domestic appliances	5%	-	8%
2823	Manufacture of machinery for metallurgy	3%	-	14%
2812	Manufacture of fluid power equipment	11%	-	13%
2824	Manufacture of machinery for mining, quarrying and construction	5%	-	11%
2815	Manufacture of ovens, furnaces and furnace burners	3%	-	11%
2816	Manufacture of lifting and handling equipment	6%	-	10%
2829	Manufacture of other special-purpose machinery	3%	-	8%
2818	Manufacture of power-driven hand tools	5%	-	7%
2826	Manufacture of machinery for textile, apparel and leather production	2%	-	6%
2817	Manufacture of office machinery and equipment (except computers and peripheral equipment)	0%	-	2%

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