

“Clusterpreneurship” in the MENA Region; Mapping the Phosphate Cluster of Gabes

Hatem Mhenni*, Haythem Abidi**

*(Laboratory THEMA, ESC Tunis, University of Manouba (UMA),)

** (Eng. Haythem ABIDI, National Engineering School of Tunis. University of ElManar (UTM).)

Abstract:

This paper aims to measure the Ghannouche industrial zone growth, social and economic impact on the region. Using a cluster approach, it identifies the main determinants of the regional cluster, clarifies the nature of its network relations and interdependencies and gives an overall hierarchy. This analysis should be based on a database inventory of empirical attributes (Knowledge promotion, strategic management, R&D promotion, knowledge transfer, partnerships and cooperation, government orientations and policies, PME's, etc ...). The challenge ahead lies in the location and extraction of the data. Therefore, serious attention was given to the practical methodology choice. The purpose of this study is to give a general anatomy of the region's main revenue and employment generator in order to determine its major strengths and weaknesses in term of innovative performance. The study can be used as a support for future work in elaborating development policies for regional competitiveness enhancement.

Keywords —Cluster; Phosphate; Gabes; Development; Policy; Innovation;

I. INTRODUCTION

The fluctuating economy of Gabes's region provides both opportunities and challenges. The region's manufacturing capabilities has enormously felt the impact of post revolution socio-political tornado. Yet, a newer economy has helped the region –on a relative scale- to recover (health, construction, agriculture).

Still, it is essential to identify the region's main revenue generator. The idea proposed is to provide an overview of the region's economy, propose a basic profile of the economy of Gabes and examine the major industry sectors and clusters that make up its economy. The cluster analysis method is proposed in accordance with the geographical and economical context of Gabes's industries.

The region is well known for its heavy chemical industries whom are interdependent and sharing

geographical proximity. The anchorage of the first heavy industry units in Ghannouche created opportunities for employment in the region. Furthermore, it can be noticed today that newer industries, small and medium enterprises were created and evolved around the same geographical perimeter and thus generating more revenue, creating more employment opportunities and bringing wealth to the region. Therefore, policy makers should give serious attention to regional “clustering” in order to formalize and create an adequate ecosystem for innovation to take place within the cluster. Hence, both local and national leaders need to understand the nature of the cluster, determine its major components and interdependencies in such a way that helps understand and identify weaknesses and strengths to be dealt with in future policy development plans. Therefore, this work tries to answer the following questions: Did the installation of the first Tunisian Chemical Group create a dynamic industrial cluster

in the region? To what extent did the clustering process take place in Gabes?

II. ABOUT CLUSTERS

A. Definition

Clusters are groups of inter-related industries that drive wealth creation in a region, primarily through export of goods and services. The use of clusters as a descriptive tool for regional economic relationships provides a richer, more meaningful representation of local industry drivers and regional dynamics than do traditional methods. An industry cluster is different from the classic definition of industry sectors because it represents the entire value chain of a broadly defined industry from suppliers to products, including supporting services and specialized infrastructure. [1]

Cluster industries are geographically concentrated and inter-connected by the flow of goods and services, which is stronger than the flow linking them to the rest of the economy. Within regional clusters, firms may operate more efficiently and innovate faster due to sharing common technologies, infrastructure, pools of knowledge and skills, inputs and responding to demanding local customers.

B. Determinants of an industrial cluster

In a wider sense, a cluster is a group of companies operating in the same chain or in the value chain and associated institutions / organizations that face the same challenges and opportunities. This group of stakeholders are usually:

- Enterprises of the same productive sector.
- Anchored on the same territory.
- Maintaining cooperative relations (networks, consortium).
- Animated by a coordination structure.
- Supported by partnerships with local public actors.
- Implementing collaborative projects.
- Dealing with common problems and issues.

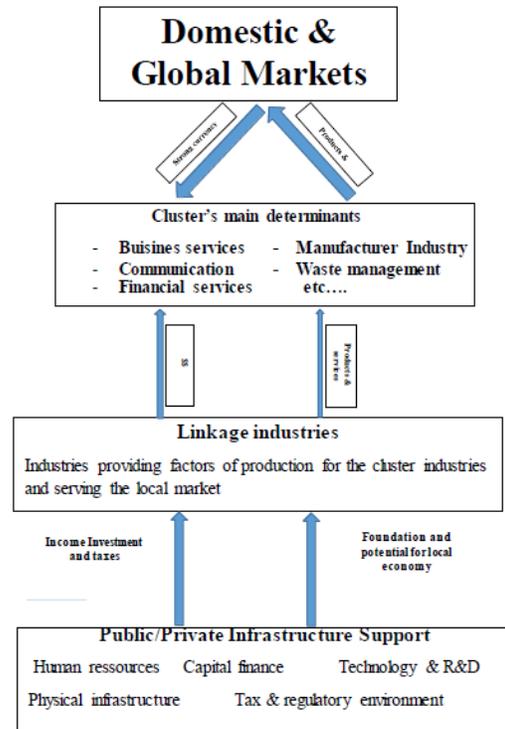


Figure 1 Hierarchy of an industrial cluster

C. Performance

Clusters affect competition in three broad ways:

- First, by increasing the productivity of companies based in the area.
- Second, by driving the direction and pace of innovation, which underpins future productivity growth.
- Third, by stimulating the formation of new businesses, which expands and strengthens the cluster itself. A cluster allows each member to benefit as if it had greater scale or as if it had joined with others formally—without requiring it to sacrifice its flexibility. [2]

Moreover, being part of a cluster allows companies to operate more productively in sourcing inputs; accessing information, technology, and needed institutions; coordinating with related companies and measuring and motivating improvement.

III. CLUSTERS IN THE WORLD

D. Developed countries: Italian leather

Consider also the Italian leather fashion cluster, which contains well-known shoe companies such as Ferragamo and Gucci as well as a host of specialized suppliers of footwear components, machinery, molds, design services, and tanned leather. (See the exhibit “Mapping the Italian Leather Fashion Cluster.”) It also consists of several chains of related industries, including those producing different types of leather goods (linked by common inputs and technologies) and different types of footwear (linked by overlapping channels and technologies). These industries employ common marketing media and compete with similar images in similar customer segments. A related Italian cluster in textile fashion, including clothing, scarves, and accessories, produces complementary products that often employ common channels. The extraordinary strength of the Italian leather fashion cluster can be attributed, at least in part, to the multiple linkages and synergies that participating Italian businesses enjoy. [3]



Figure 2 Anatomy of Italian leather cluster

E. Developing countries: Morocco’s automotive cluster

The automotive industry in Morocco has grown into a substantial cluster, which by 2013 had a vehicle production of 167,000, €2.8 billion in exports, 85,000 employees and over 200 companies. The cluster is mostly based in the Casablanca Industrial Zone and the Tangier/Kenitra free zones. These zones offer fiscal incentives and have strong infrastructure (a modern road network and state-of-the-art ports). The cluster benefits from geographical proximity to large European 12 consumer markets and the potential to function as a gateway to emerging markets in North Africa and the Middle East. The main player of the cluster is Renault, which owns 80% of the Casablanca plant and is the only manufacturer in Tangier. The cluster is significantly integrated into the local economy. 43% of car parts are sourced from local suppliers, including electronic components, plastics and metals. Exhibit 7 shows all the major suppliers. Renault uses these parts supplied to builds Logan, Tandero, Kangoo, Lodgy and Dokker cars, as well as its cheaper brand Dacia. Some of the car parts made in Morocco are exported to other car manufacturers in Europe. Figure 5 provides the cluster map, showing all major actors in the automotive cluster. Educational institutes play an important role to train the workforce with the appropriate skills for the automotive industry, which is necessary to overcome the current skill gaps. Government agencies and public investment funds have been important for the initial growth of the cluster (as addressed in more detail in the next paragraph). Institutes for collaboration facilitate the creation and implementation of a common strategy among different actors, and diffuse knowledge and best practices in the industry. [3]

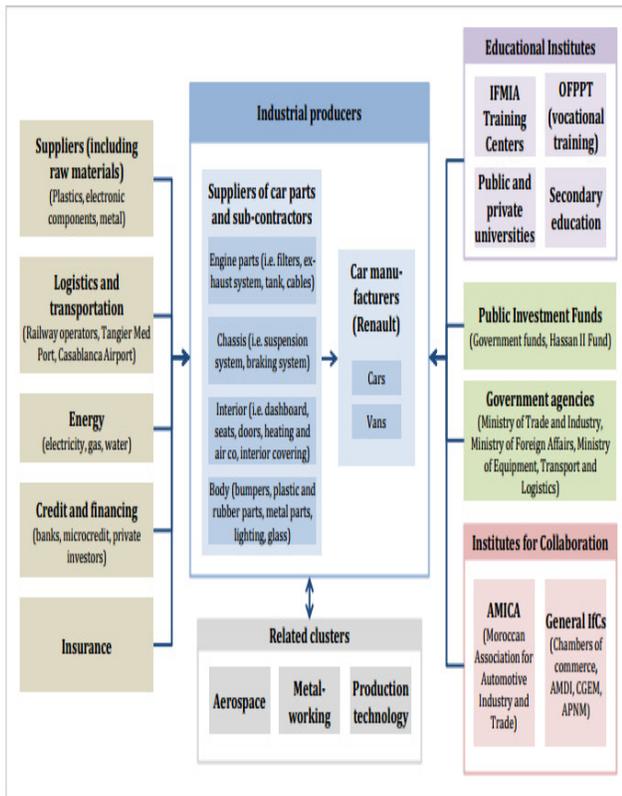


Figure 3 Anatomy of Morocco's automotive cluster

IV. MAPPING THE PHOSPHATE CLUSTER OF GABES

F. Gabes's regional profile:

The region of Gabes is located in the southeast of the country and in the middle of the Mediterranean, constituting an important linkage between the Southeast and the rest of the country, which helped develop a flow of exchange with its national and international environment. It is bounded on the east by the Mediterranean (a coast of 80 km), on the west by the governorate of Kebili, on the northeast by the governorate of Sfax, on the north-west by the governorate of Gafsa and at the south by the governorate of Medenine. Gabes extends over 7166 km² (4.6% of Tunisia's total surface) and benefits from 80 km of coast.



Figure 4. Map of Gabes

370 803 people live in Gabes. 97 832 are considered as occupied working age population (24.7%) and 62.2% of the whole population live in urban areas. The region has the 4th lowest unemployment rate following Tunis, Sousse and Sfax.

Gabes benefits from a relatively strong and diverse infrastructure that consists of:

- Commercial port approximately 12m deep (the deepest in the nation).
- Gabes-Matmata international airport with a capacity of 200,000 passengers.
- A rail network with a length of 135 km (linking Gabes to Gafsa, Sfax, Sousse and Tunis).
- Highway linking Sfax to Gabes over a length of 152 km.

Gabes is privileged with its high-qualified human resource asset consisting of:

- 19129: Students (Gabes: 17181, Medenine: 1799, Tataouine: 149).

- 1620: Teachers Researchers (Gabes: 1422, Medenine: 184, Tataouine: 37).
- 4584: Graduates of higher education.
- 7 public vocational training centers.
- 59 private vocational training centers.

Gabes is also well equipped in terms of R&D institutions, they include:

- One Multi-sectoral industrial and technological center.
- One Technical center for geothermal and greenhouse crops.
- One Station of the National Institute of Rural Engineering, Water and Forests.
- One Station of the National Institute of Sciences and Technologies of the Sea.
- One Regional Directorate of the Institute of Arid Regions (IRA).
- 14 Research Units.
- 2 Research Laboratories.
- One Doctoral School.

G. Anatomy of the industry cluster

The zone is the largest functioning zone in the region in terms of GDP contribution. It is the home of major industrial complexes for the transformation of Tunisian phosphates and related activities: GCT, Alkimia, FCI, Salakta Fertilizers... it also incubates a decent number of small and medium enterprises providing direct services, products and related activities. This group of enterprises are coordinated by the mean of a central coordinating body "PoyltechGabes" whose activities and interest will be detailed below.

The zones main sector of productivity is phosphate transformation and related derivatives. The largest manufacturer companies anchored in the region are:

❖ Tunisian Chemical Group: The group includes the phosphoric acid production company ICM created in 1972, Di-ammonium phosphate/Ammo-nitrate production company SAEPA created in 1979 with an annual capacity production for D.A.P of 1 015 000 Tons/year and an Ammo-nitrate production capacity of 150 000 Tons/year.

❖ Alkimia: Totally exporting company created on September 26, 1972 and started its production of Tripolyphosphate Technical Sodium in 1976. Alkimia processes phosphoric acid obtained from TCG in order to produce TTS.

❖ Timab : With two plants created in 2003 and 2008, TIMAB processes and bags phosphate bought from the TCG for animal nutrition with a total annual production capacity of 270 000 Tons/year.

❖ Fluor Chemical Industries : Founded in 1971 and started production of Aluminum fluoride in 1976 for local and global markets. In 2009, FCI started the production of Anhydrite destined for the consumption of local cement factories (Cement of Gabes factory in particular). This company utilizes sulfuric acid bought from the TCG in order to produce Aluminum fluoride.

❖ Salakta fertilizers : Created in 1998, this company is specialized in the production of nitrogen fertilizers for agricultural use. Its main products are powder TSP (Triple Super Phosphate) and SSP (Single Super Phosphate) directly obtained from the TCG.

❖ Mediterranean Food Industries : MFI is a fully exporting company, which started on May 7, 2007, its export turnover has progressed gradually. MFI, employs more than 200 people including a large number of graduates, it exports to more than 20 countries in North Africa, Europe, Asia, Middle East. The company's major products are Bi calcium phosphate 18, mono di-calcium phosphate 20/20 and mono-calcium phosphate. All of which are used in the animal nutrition sector. MFI is an innovative company that holds its own patent in phosphate processing and can be considered as a one of a kind in the Mediterranean basin.

H. SME's and linkage industries

This category of industries plays an important role within the cluster. They provide vital services and products to the existing heavy industries. Their existence and prosperity rely essentially on the functioning of the surrounding industries. Although some of them do not only interact with companies

from inside the cluster, all of the enterprises cited below network with its surrounding cluster neighbors. They can be categorized by their production sector as follows:

Energy

- ❖ STEG: Central power plant and a liquefied Gas & Petrol station for hydrocarbon storage and diffusion. Since the TCG produces its own energy, STEG buys excess electricity produced by the Chemical Group and they rely on each other in case of failure.
- ❖ SAGAZ: specialized in the compression and distribution of Butane and Methane gas for domestic use. SAGAZ is a private commercial agent that interacts with STEG GPL.

Construction

- ❖ 2A2M, BMS, EMO, ETIP, G2I, GTI, LES TROIS, SGTI, SEEMIM, SIS, SOMATEC, and STSI: These companies are specialized in providing construction services for industrial installations such as: reservoir construction, steel welding, piping, mechanically welded structures, industrial steel plants...
- ❖ SOMATRASM: specialized in maritime and hydraulic works, the company provides services for the commercial port of Gabes such as sediment dredging, underwater works and canalizations.
- ❖ SudBitume: created in 1993 is a company specialized in manufacturing and marketing of bituminous products located in Gabes.

Maintenance, Transport and Industrial services

- ❖ ELENCO, Sti EZZI maintenance, GMS, SteHajjajiIssam, S2M, SOSIS, SEZAG: Installation, inspection and maintenance of industrial equipment.

- ❖ SOHATRAM, SGTM, GTSP, HFTS, STTV, and YAHYA Transport: merchandise transportation services for various industries.
- ❖ MFGT: they specialize in Industrial maintenance and assembly of factories, Electrical maintenance, Manufacture of railway equipment, manufacture of containers, metal frames.

Environment

- ❖ SOTUGED: Specialized in diverse industrial waste management and valorization.

Industrial pole of Gabes

The very existence of the pole plays a deterministic role in boosting the region's competitiveness. Created in 2010, the company aims to strengthen the regional and national economy through technological content that is innovative, friendly to the environment and economical in terms of energy.

Politech-Gabes is a public private partnership (PPP) under the legal form SA (société anonyme) and it holds a share capital of 5 million dinars. POLITECH Gabès directs its missions & projects to the following Strategic Intervention Areas (SID):

- ❖ Eco technologies (Water, Chemicals-Environment and Waste Recycling).
- ❖ Renewable Energies.
- ❖ Valorization of resources (Useful substances, products of the Oasis).
- ❖ Building materials, Building materials.
- ❖ GEOTHERMIA applied to agriculture.
- ❖ Promotion of ICT, logistical services, handicrafts & eco-tourism.

Although the pole's work is quite recent and cannot be measurable to some extent, promising initiatives are being made showing proof of good scientific policy practices. The pole identifies the region's

strengths and weaknesses and works toward building a regional knowledge economy through various tools and programs.

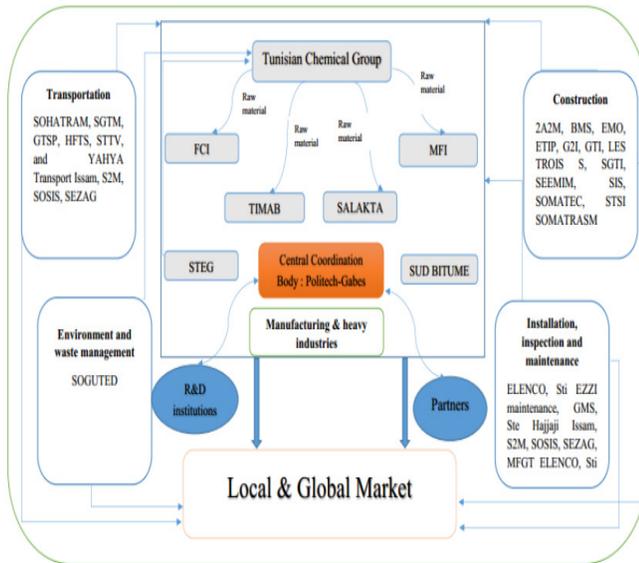
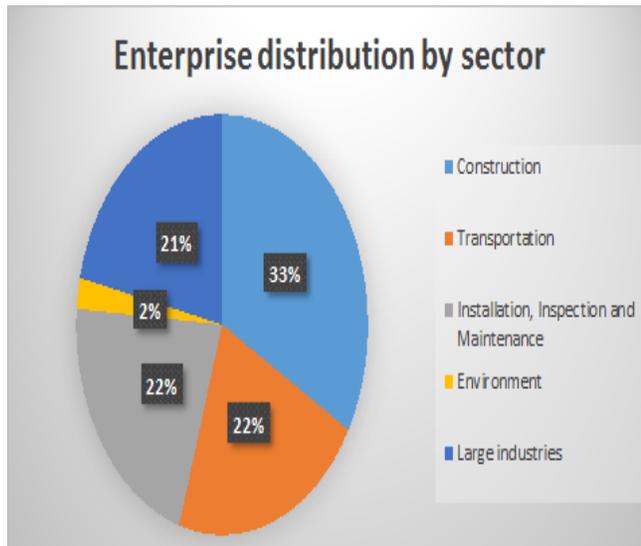


Figure 5 Map of the phosphate cluster of Gabes



I. Mediterranean Food Industries: an innovative enterprise led by a local female leader setting the example for “clusterpreneurship” opportunities in Gabes

“The idea came from wanting to start a business in my region, Gabes”, Said Nejlachàabane who is a

female entrepreneur born, raised and graduated from the higher institute of management of Gabes (ISG), in an interview to the leManager magazine. “And just like that, I began thinking of promoting an activity relative to phosphate. The Tunisian Chemical Group exported phosphoric acid without transformation. I then, said that there lies a business opportunity and that I could intervene at this level.” MFI started in 2007 with a single line of production of 700 tons. The product, which is Bi-Calcic, is 18% phosphor and 26% calcium. Nejla affirms that the beginnings were difficult in terms of getting the right recipe. For that reason, MFI relied on highly competent and experienced experts whom have worked for the company in freelance and guided their technicians through intensive R&D[4]. MFI eventually produced its own patent in processing Phosphor and Calcium using an advanced Phosphoric Feed Grade technology, which is registered at INNORPI. Today the company’s revenues have grown exponentially. It exports to clients in 22 different countries and employs over 200 personnel, with a large number of them graduates.

NejlaChaabane, who was elected “Woman Entrepreneur of the year” by leManager magazine, sets the perfect example for innovation driven business within an industrial cluster. The female entrepreneur have identified an opportunity and seized it. The company’s main strength is its innovative recipe that resulted in high quality and competitive product. In the end, the company has made 500% increase in turnover from its creation until today.

This example shows that great business opportunities exist within the industrial cluster of Gabes, and Tunisian industry clusters in general. Yet in spite of this remarkable growth and expansion in the regional industry tissue, the Tunisian economic development policy seems to overlook the importance of cluster-based

development. Therefore, more research should be focused on building capacity capable of drawing national and regional strategies for a more decentralized development in Tunisia.

V. CONCLUSIONS

The implantation of the first Tunisian Chemical Group production units in Ghannouche-Gabes triggered a domino's effect in terms of business creation. The existence of the first industries opened opportunities for entrepreneurs in various sectors thus producing the detailed outline above[5]. However, this concept has led into a new insight for economic development policy in Tunisia in the aim of improving regional competitiveness, and as a result national prosperity, wealth generation and eventually building a knowledge based economy. Hence, the following principles are formulated as a guideline for policy makers for making future economic development strategies:

- ❖ Focus on competitiveness, not job creation: Region are considered competitive to the extent that firms operating there compete successfully in the regional and global economy while maintaining higher standard of living for the average citizen.
- ❖ Approach economic development from a cluster perspective, reflecting the core drivers of wealth and jobs: Scientific research done at Harvard University by Michael Porter found a strong correlation between regional economic development indicators and cluster dynamics and growth[6].

- ❖ Build on existing and potential strengths: Every region is endowed with its own resources and particularities that distinguish them amongst other. Thus, policy should be addressed in a way that promotes creative construction on regional endowments.
- ❖ Develop an overall strategy: Sequence and prioritize, meaning that a holistic view driven by a long-term objective should be developed and publicly announced, understood and committed to[7] and[8].
- ❖ Make data driven policy: No more guessing! Policy should always be evidence based. Studies, statistics and expert opinion should be included in the policy making process in tendency to perform better.

REFERENCES

- [1] Feldman M.P. and Francis J., *Entrepreneurs and the Formation of Industrial Clusters*. www.cs.jhu.edu/~mfeldman/Feldman%20EFIC.pdf
- [2] Porter M (1998). *Clusters and the new economics of competition*, Harvard Business Review. <https://hbr.org/1998/11/clusters-and-the-new-economics-of-competition>
- [3] Maturana B., Salmon K., Espinosa J., Brekelmans R. (2015). *The Automotive Cluster in Morocco*. Competitiveness and recommendations for future growth: Harvard Business School.
- [4] Bellon B., Ben Youssef A., M'henni H. (2006), *Nouvelles technologies et management dans les pays du Sudméditerranéen*. Revue Française de Gestion, 2006/7 - No 166. p. 173-189.
- [5] Ben Slimane S. and M'henni H. (2018), *L'entrepreneuriat innovant dans les pays du Maghreb: vers de nouveaux champs d'investigation*. Marché et Organisations, 2018/3 (n° 33), p.11-18. L'Harmattan.
- [6] Ben Youssef A., Elaheebocus N., M'henni H. et Ragni L. (2013): *Are Technoparks High Tech Fantasies? Lessons from the Tunisian Experience*, European Review of Industrial Economics and Policy, Number 5.
- [7] M'henni, H. et Arvanitis R. (2012): *La résilience des systèmes d'innovation en période de transition : la Tunisie après le 14 Janvier 2011*. Revue Tiers Monde. Octobre-Décembre 2012, pp.57- 81.
- [8] Arvanitis R, M'henni H, Tsipouri L. (2009), *Existe-t-il un gouvernement des systèmes d'innovation en Afrique du Nord et au Moyen-Orient? Maghreb-Machrek*, N 4. pp. 65-84.