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CLUSTER DEVELOPMENT IN TUNISIA

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ABSTRACT

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The author of this thesis investigated the overall cluster development environment in Tunisia, by studying the willingness of UTICA members (the Tunisian Union of Industry, Trade and handicraft, is an employers' organization in Tunisia that represents industrial, trade and handicraft sectors) to get involved in clusters and to identify activities of particular interest.

Qualitative and quantitative research methods were used to solicit information from respondents on clusters in Tunisia. A parallel data analysis helped the author to analyze the operating environment in a pragmatic way, where qualitative research endorsed the quantitative research and generated a complete overview on cluster development in Tunisia.

The theoretical framework emphasized the furthestmost applicable literature on clusters, cluster initiatives and the UNIDO methodology framework of cluster development, endorsed by PESTEL analyses that gave insights on the current political, economic, societal, technological, environmental, and legal aspects that can affect the operating environment of the clusters in Tunisia.

The results generated from this research have shown a growing interest in the cluster concept, in an overall difficult environment dominated by a lack of legal structure and limited resources, the author pointed out the issues that requires immediate action and produced detailed cartographies that could be used in the future for further studies.

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LIST OF ABBREVIATIONS

API	Tunisian Industrial Promotion Agency
CDA	Cluster Development Agent
ENP	European Neighbourhood Policy
EU	European Union
FDA	French Development Agency
FIPA	Foreign Investments Promotion Agency
GDP	Gross Domestic Product
GIZ	German Cooperation
ICJ	International Commission of Jurists
IMF	International Monetary Fund IMF
JAICA	Japanese International Cooperation Agency
OECD	Organisation for Economic Co-operation and Development
TFDCV	Task Force for Cluster Development and Value chain
TIS	Tunisian institute of statistics
TND	Tunisian Dinar
UNIDO	United Nations Industrial Development Organisation
WHO	World Health Organization

1. INTRODUCTION

The industrial sector creates high-quality jobs, facilitates the incorporation of innovations and activates the overall development of the economy. For these reasons countries around the globe, are adopting efficient development models and working on implementing development strategies suitable for different contexts using optimal resources and skills. These strategies and development models must address economic and social challenges in the context of globalization, digitalization and long-term environmental change that requires approaches, which are in alliance with circular and carbon free economy to reach sustainability and economic growth.

Digitalization, the massive use of big data, artificial intelligence, robotics, and the use of new technological solutions can contribute to rapidly modifying work processes and improving social health environments and mobility. Meanwhile, the development of certain sectors, such as nanoscience or biotechnology, challenges businesses to find the opportunity to access the necessary technology, therefore collaboration with educational institutions is necessary and must be effective enough to attract and train young people for current specializations necessary to the overall industrial development.

Equally, new industrial sectors, such as energy, health-tech, ICT and transport, will increasingly need access to advanced technologies facilitating their competitiveness. Thus, they must acquire knowledge capacity and ability to innovate products and processes in order to reach a favorable competitive position on national and international markets.

The previously mentioned represents an important challenge for government, universities and public research centers, which must adapt to the new industrial relation patterns. For these reasons, there is a growing trend towards the creation of technological platforms and clusters, which can play an important role in creating productive ecosystems.

The cluster theory was introduced a long time ago with Alfred Marshall, the Porterian theory of competitiveness (Porter, 1990), is today considered the starting point of the current renewed interest in clusters, because of the impact of clusters on productivity, regional economic development, society and the country overall competitiveness.

(Rosenfeld, 1997; Martin and Sunley, 2002). Therefore, several international organizations, such as the OECD, UNIDO, the World Bank, the European Commission, and others are assessing and using the cluster approach as a tool for economic development, (Enright and Flowcs-Williams, 2001).

The international economy recognize cluster as an important political tool, which allows many regions/countries to obtain developmental effects. Hence, clusters seem to be the answer to tackle issues related to the operating environment of region/nation, such as unskilled labor force, poor research and development infrastructure, unclear public-private responsibilities, and poor shared values. The cluster approach can be a an important tool that work to adjust and transform the overall business thinking and practices, when taking in consideration the renewed understanding of prosperity for the objective of generating not only economic growth but also prosperous society.

Tunisia is facing the urge to fix its current economic systems ravaged by unsolved steady social problems, which resulted a difficult environment for the private sector, and poor economic performance. It is crucial for Tunisia to adopt and transform the overall business thinking and establish new industrial relation patterns that can lead to a better economic environment in order to generate prosperity.

As Professor, Porter quoted in his book “The competitive advantage of nations”: National prosperity is created, not inherited. The need to rethink prosperity was introduced massively at the beginning of the 21st century through several public and private initiatives, to create new strategies for communicating economic, environmental and social policies that work better for everyone after the constant global crises of confidence in the economy, parties and politicians.

The Legatum Institute Prosperity Index gave the most recent definition of prosperity: “Prosperity entails much more than wealth. It reaches beyond the financial into the political, the judicial, the wellbeing, and the character of a nation — it is about creating an environment in which people are able to reach their full potential. A nation is prosperous when it has an inclusive society with strong institutions, an open economy, and empowered people who are healthy, educated and safe (...) most policy-makers tend to focus on

the big fiscal and macroeconomic policy tools, or consider separately the social factors, they rarely consider all together.”

Cluster approach is a political tool that can assist policy-makers and the private sector actors, to share responsibilities and strategic actions in order to reach competitiveness and growth without sacrificing society and environment, taking in consideration the most recent understanding and definition of prosperity and shared value.

This research will focus on the cluster approach as a tool to help the Tunisian stakeholders from private and public sectors to understand the ability of different actors within the private sector and thus establish/improve clusters as a tool to tackle issues related to the overall business and social environment.

1.1. Tunisia

Tunisia is the smallest country of the Maghreb states, located north of the African continent and 140 kilometers from Europe at the level of the Sicily canal, with 163,610 square kilometers and 11,565,204 million inhabitant.

Tunisia's gross domestic product (GDP) reached 39.58 billion dollars in 2018, divided by three sectors agriculture 10.1%, industry 26.2% and services 63.8%, with active population of 4,100 Million people and unemployment rate of 15 % in 2019. (FIPA)

Since 2011, the memorable year of Arab Spring, the Tunisian economy faced several hiccups because of the political, economic and geopolitical upheavals, which have affected the country. The economic stagnation continued for several years after, where Tunisia has failed to increase its export, and the country continued to lose its satisfactory ranking on the global competitiveness index from 40th place in 2009 to 87th in 2019.

In a context of profound changes affecting the political, social and economic system, Tunisia kept facing changes on international scale amplified by globalization and openness to external market.



Figure 1. Map of Tunisia

1.2. UTICA

UTICA (Tunisian Union of Industry, Trade and handicraft) is an employers' organization in Tunisia that represents industrial, trade and handicraft sectors. It was formed in 1947 to represent over 150000 private companies, excluding agriculture, tourism, and financial sectors. (UTICA Website)

UTICA played a major role since its creation, mainly in setting and discussing new industrial policies with the government. Since 2011, and during the democratic transition, UTICA as one of the components of the national dialogue quartet obtained the Nobel Peace Prize 2015, for its success in the mission led to the holding of the presidential and legislative elections, as well as the establishment of the new Constitution of 2014.

Following the economic recession, UTICA is actively working on boosting the Tunisian economy by actively participating, alongside the public authorities, in the development and implementation of economic and social policies favorable to the economic growth and development, and working on promoting the image of the country beyond borders, and developing international partnership.

The French Development Agency (FDA), German Cooperation (GIZ) and the Japanese Agency for International Cooperation (JAICA), invited the Tunisian government to pilot and adopt clusters alongside with UTICA.

2. THESIS PROCESS

2.1. Objective

The international market is shifting speedily towards a new age of industrialization where contemporary technologies are born every day and competition is far more dynamic than ever. Moreover, the world is facing global transition through key change factors related to modern technological development, environmental issues, digitalization, urbanization and the evolutionary role of the consumer. The changes are in strong mutual interaction, which makes prediction of future development particularly difficult. On the other hand, the revolution offered Tunisia a historical chance to join democratic states. Democracy offer diversity, accountability and inclusion economy. Therefore, the Tunisian economy is in the process of liberalization after decades of heavy state direction and participation in major sectors. Today without any doubt Tunisia with its new democracy, strategic location, proximity to Africa and Europe, and its diverse resources may benefit and reach economic development if strategic decision will take place accordingly.

As part of a world that is changing rapidly at unprecedented pace, where industries are shifting to new age of technological trends and market demand, the Tunisian Minister of Industry and Commerce announced in November 2019, the creation of 7 clusters, with the objective of improving competitiveness, innovation and market access. This thesis will study the overall cluster approach in the country through the member companies of UTICA.

Tunisian industry will face major changes in the future, the UTICA members should be able to react effectively to the upcoming changes in the overall industrial and economical adjustments to obtain growth and contribute to the economic development of the country.

UTICA should play an active role in meeting the changing environment, maybe even prepare for it, or even address the necessary changes to enable different actions to make effective use of their future decision in regards to the industrial development, and the overall business environment in Tunisia.

Investing in improving the overall competitiveness of the industrial ecosystem is of utmost importance for the country economic growth, with the objective of improving market access, productivity, and upscaling labour skills and build or use the R&D infrastructure. Therefore, the aim of this thesis is to:

- Investigate the overall environment of cluster development in Tunisia
- Study the willingness of the UTICA members to get involved in clusters
- Investigate the members' level of involvement and ability to cooperate
- Identify activities of particular interest

To meet the main objective of implementing cluster theory in Tunisia, this research intends to gather information from all involved parties and actors in the country. The aim of the project is to find out and document what kind of environmental changes UTICA members might face and/or avoid when establishing clusters.

The purpose of this work is to gather information from different actors inside and outside UTICA in order to identify the changes that are crucial to the overall operating environment affecting the development and sustainability of Tunisian industry. This thesis intends to look at the future role of UTICA and its members, throughout the implementation of cluster initiatives.

The aim is to study the overall knowledge on clusters, the ability of the companies to build a strategic action plan, and to highlight the level of involvement and its limitation in order to identify the work method that can contribute effectively to build strong and competitive clusters.

The aim is to study the necessary element that will identify the best practices to move the UTICA and Tunisian industry to a next level of its life span. Where innovation, internationalization, and competitiveness are the main scoop of the cluster mission. This thesis tend to analyze different issues and proposals to structure and / or build strong clusters.

2.2. Research Questions

This research will study the willingness of UTICA's members to get involved in the existing/newly-born clusters and to predict their involvement level and ability to respond/adapt to changes in the operating environment. The thesis will address the following research questions:

- **Are companies willing to work and cooperate within a cluster framework?**

To answer this question, the author formulated a set of sub-questions for UTICA's members and stakeholders, in order to gather information related to their overall understanding of cluster as a tool for economic development. The sub-questions will lead the researcher to foster the commitment level of cluster stakeholders

- **What are the expectations / particular activities of interest?**

The second part of this study will focus on the companies' expectations from clusters. The formulated questions and sub-questions will give an overview on the expected outcomes or activities that are important to companies.

By the end of this work, the results will give an overview of the current situation, a clear vision of the overall understanding of clusters and expectations that will help key decision makers to generate strategic action plan and well defined objectives.

2.3. Thesis Structure

The overall structure of this thesis is divided into 8 Chapters. The first Chapter gives an introductory overview that includes background information, country overview and the thesis commissioner. Chapter 2 presents the Thesis process, such as objectives, research questions, thesis structure, the methodology and paradigm used for this research project.

Chapter 4 holds the theoretical part of the thesis, it emphasizes on revising the furthestmost applicable literature on clusters, cluster initiatives and cluster development endorsed by PESTEL analyses conducted in Chapter 3 to give insights on the current political, economic, societal, technological, environmental, and legal aspects that can affect the operating environment of the cluster.

Chapter 5 handles the research methods such as the author background, and data collection, in chapter 6, the author identified the need to write the findings related to the preliminary research conducted to identify actors within clusters, and to investigate the current situation. The author produced a comprehensive cartography of current and future clusters in Tunisia.

Chapter 7 is the empirical part of this research, it contains the recent breakdown of the collected information from companies and interviews conducted with important actors inside and outside UTICA, it consist of data analyses and summary. Finally, Chapter 8 is about the conclusion.

2.4. Research Paradigm and Methodology

Research in business defined in the book, “Research Methods for Business”, as a systematic and organized effort to investigate a specific problem with the aim of finding answers. The entire process called research (Sakaran and Bougie, 2016: 2). Research paradigm and methodology, defined as a process in which research questions are formulated and measured to reach the main aim of a study. (Brewerton and Milward, 2001: 5)

To achieve the overall aim and objective of studying the willingness of UTICA’s members to get involved in the existing/newly-born ecosystems and to anticipate their expectations and ability to respond/adapt to changes in the operating environment. A mixed methods research (MMR) is adopted for this work.

Creswell and Clark provide the most comprehensive definition of MMR: “Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data, and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is the use of quantitative and qualitative approaches in combination provide a better “understanding of research problems that either approach alone.” (Creswell and Clark 2007: 5)

The author adopted the qualitative and quantitative research methods to solicit information from respondents on cluster development in Tunisia.

The qualitative research methods defined, as “empirical research where the data are not in the form of numbers” (Punch, 1998: 4). The qualitative part of this study consisted of well-structured interview that allows the interviewee to respond in words, and guarantee the freedom and trust for respondents to deliver opinion and perception about the topic.

A personal interview is perceived by the author to be a practical tool to gain in-depth knowledge about the interviewee’s insights and opinion about the topic. Therefore, a careful research on target interviewees for this part conducted and identified. The interviewer divided the list of interviewees into two-target groups based on their role and position within existing/future clusters.

- Cluster Managers
- Public actors

The quantitative research methods defined, as data that can be interpreted with statistical analysis, and since statistics are based on the principles of mathematics, the quantitative approach is viewed as scientifically objective, and rational (Carr, 1994 and Denscombe, 2010). Quantitative research involves counting and measuring of events and performing the statistical analysis of numerical data (Smith, 1988)

Quantitative research method adopted for this work to understand the ability and the future / current commitment level of companies to clusters, as well as the type of activities that interest companies. A survey for this part designed to generate results in a statistical format, which could be analysed numerically. Quantitative research method is a data-oriented methodology, also known as a scientific method, where results depicted in the form of numerical format and analysed logically. A good survey is good, only when it consists of good questions that lead the researcher to conclude clear results in numerical format. (Zikmund, 2013)

To make sense of the collected data, a parallel data analyses will help the author to analyze the operating environment in a pragmatic way where qualitative research endorse the quantitative research to gain complete view on cluster development in Tunisia.

3. PESTEL TUNISIA

According to Oxford College, PESTEL is an essential analytic tool to identify the external forces facing an organisation; it covers the Political, Economic, Social, Technological, Environmental and Legal aspects in order to assist in anticipating how these factors may affect the overall environment of cluster organization, it gives in-depth an overview of the current situation. (Oxford College of Marketing 2016)

PESTEL analysis supports the theoretical framework of this study. It endorse this research by studying in-depth the macro-environment that can affect current or future cluster organizations. It is essential to study the political, economic technological environmental and legal framework of Tunisia, in order to have a clearer vision of the possible challenges and opportunities for success, or to avoid potential threat or failures.

PESTEL analysis supports decision makers, strategists and leaders to formulate accordingly strategic decisions related to their operating environment.

3.1. Tunisian Political Environment

Political factors determine the extent to which government may influence the economy; it covers political systems and policies that can pose major threats or advantages.

Historically Tunisia known with its political stability that has allowed the country to grow rapidly in terms of prosperity and wealth after the independence from France in 1956, and to gain strategic political and economic partner such as the European Union.

When studying the political environment of Tunisia, one cannot ignore the strong link between the political landscape of today and the political history of the country.

The monarchy abolished after the independence from France in 1956 and Tunisia proclaimed a Republic in 1957. Since the independence, the republic invested mainly in education, healthcare, infrastructure, and women's rights. The successful political vision, led by the first President Habib Bourguiba dominated the political environment for decades, until 1987, when the arrival of Ben Ali to power considered as a break with the past.

Even though the second president of the republic belonged to the same political party in power since the independence.

Ben Ali changed the name of the party to become "Constitutional Democratic Rally", but in reality, he did not change the political practices. It has merged again with total control by the regime, tracking Islamists and the National League for Human Rights. The CDR controlled all possible elections; municipal, legislative and presidential, and dominated the political life, which resulted a poor political landscape, where oppositions are hunted down systematically, sabotaged, and repressed.

The revolution of 2011 caused a real tsunami in the country, in particular the opening of the political scene to various actors long excluded from exercising any political activity in complete freedom. During the last ten years, a profound transformation of political life took place, as the country emerged from a totalitarian regime with full power to control the political life, to step successfully towards full democratic transition.

Undoubtedly, Tunisia have successfully established a democratic regime that works continuously to establish a state of rights and institutions, but the democratic transition resulted a shaky economy, and unstable political environment, followed by unstable neighbourhood, threats of extremists and few terrorist attacks.

The political situation in the country remains delicate; this situation is generally comprehensive for a country that has just emerged from several decades of dictatorship. The fact of having so much tension in the political life can be explained, by the opening of the political scene to all actors without exception. The appeasement of the political climate and the political stabilization of the country will take time, but it cannot be worse than the era of the democratic transition.

Considering foreign policy, the state maintained the involvement in international institutions, and non-intervention position with full support to peaceful settlements since the independence and after the revolution. (McLarren, Stahl, Krüger, Abderrahim, Besbes 2017)

The state labels its foreign policy as peace-loving country that supports and promotes tolerance, understanding and solidarity. (diplomatie.gov.tn)

The pacific peaceful position of Tunisia and its great involvement in international treaties allowed the country to develop important trade agreements that are crucial to the overall economy to facilitate trade and enhance investments such as:

- Free trade agreement with EU 1996
- Agadir Agreement, free trade with Egypt, Jordan, and Morocco 2004
- COMESEA Common Market for Eastern and Southern Africa 2019

3.2. Tunisian Economic Overview

Tunisia's gross domestic product (GDP) reached 39.58 billion dollars in 018, divided by three sectors agriculture 10.1%, industry 26.2% and services 63.8%, with active population of 4,100 million people and unemployment rate of 15 % in 2019.

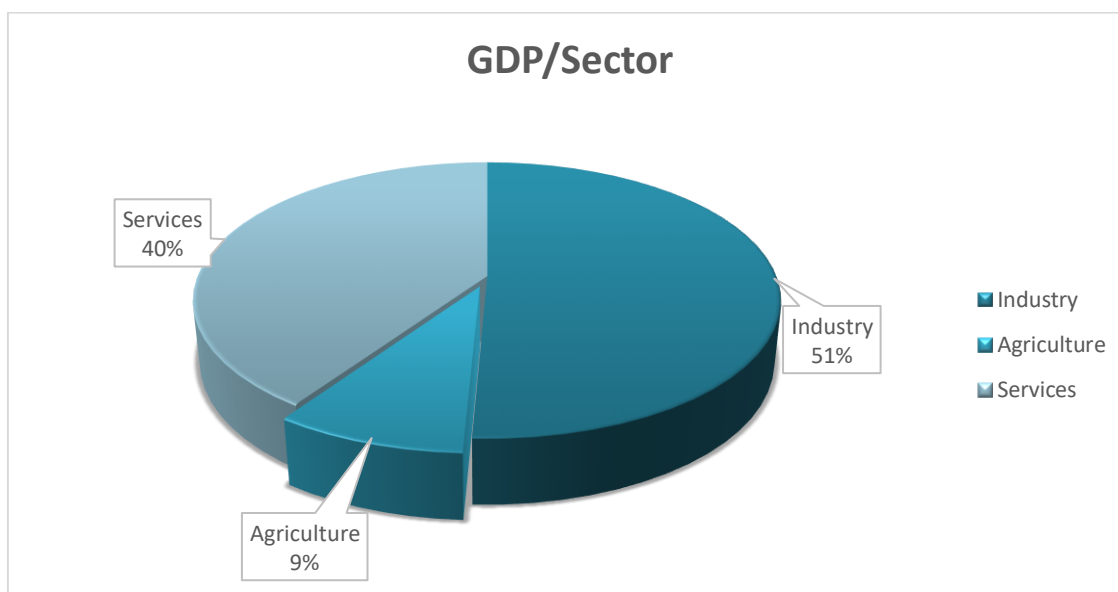


Figure 2 GDP/ SECTOR

Despite the economic stagnation occurred after the revolution, several reports and economists relate the economic recession to public sector-led development model, this model served the country during the 70s, 80s, and 90s with its vigilant macroeconomics management, and the active role of the state in key sectors. Indeed, open offshore to foreign

investments played major role to increase exports, while the protected onshore sector, enhanced the development of the local industrial base, yet the economy relied for decades on the tourism sector and agriculture. This approach failed once facing the political and geopolitical instability occurred after the revolution with the few terrorist attacks that have aggravated the overall security image of the country. The dramatic decline of tourism industry with the increase of unemployment rate mixed with the political instability led to a very critical economic situation that pushed national and international leaders to seek for solutions beyond public sector-led development model.

According to the latest statistics conducted by the Tunisian institute of statistics (TIS), the industry represents 26.2% of the GDP, and employs 42.7% of the active population. The agri-food industry maintained its growth rate, so did the mechanical and electrical industries. Tourism, energy, mining and chemical industries experienced a rapid decline. The overall decline in these industries led to a decrease in total industrial production of 0.5% in 2018 (TIS). The country's industrial sectors are mainly export-oriented. The overall economic development of the country faced a new reality when the democratic transition took place, which resulted noticeable increase of governmental external debt caused by the decline of the tourism, mining and chemical sectors' failure to generate growth.

Today the Tunisian economy cannot rely on Tourism only, and the overall industrial performance needs new structural measurements in alliance with the international market demand.

According to the World Bank and the International Monetary Fund, the Tunisian government needs to reform its governmental policies, reduce governmental expenditure, set tax reforms, tackle corruption and build new strategies to reach economic development.

Without any doubt, the Tunisian economy is transiting a delicate phase under the pressure of the internal and external effects, several national and international organization highlighted, advised and funded the Tunisian public and private sector to adopt a set of strategic reforms to improve the overall business environment, and ameliorate its competitiveness.

3.3. Social Environment

The strategic location of Tunisia and its Mediterranean Sea coastline have attracted conquerors throughout the history, the long periods of Ottoman and French rule with the diverse ethnics groups of Jews, Christians and Muslims played a major role in the composition of its diverse culture. The republic investments in education, healthcare, infrastructure, and women's rights since 1956 resulted a tolerant society and an advanced ranking (8th) on prosperity index report compared to the rest of African countries according to Legatum Institute report 2019.

The evolution of the various social indicators indicates that Tunisia has made many advances in human development over the past thirty years. Social indicators for Tunisia are positive compared to the average for countries in the Middle East and North Africa according to World Bank.

Social development continued to improve since the independence; all indicators are linked mainly to education, vocational training, health and living conditions.

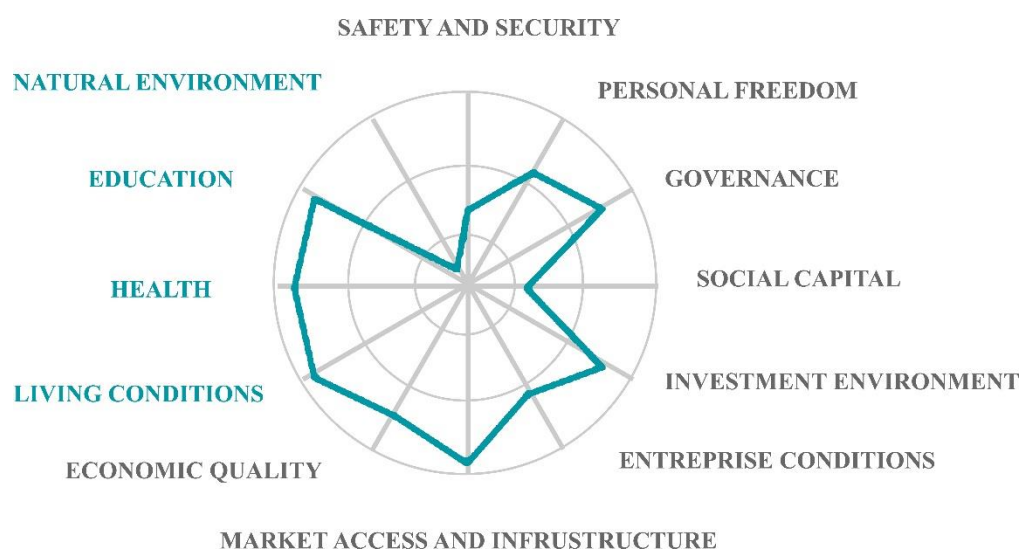


Figure 3 Prosperity Index Tunisia - Legatum Institute 2019

As democracy expands, Labor forces are demanding better living conditions, therefore advanced ranking are considered below the expectations of the Tunisian citizens. In fact, the revolution caused an explosion of social and wage demands after decades of injustice and marginalization in certain region. This phenomenon has affected all sectors of industry, tourism, services, businesses and public administration. The repercussion of these demands presents enormous challenges for the financial and economic balance of the whole country since this phenomenon spares no actor or sector in particular.

According to a survey conducted by the American Chamber of Commerce the labor force of Tunisia, is well educated, hardworking, and easy to develop. The survey is endorsed by international reports ranking Tunisia 1st in North Africa in terms of Talent Competitiveness (Global Talent Competitiveness Index 2018, INSEAD), with 65000 new graduates on a yearly basis of which over 30% studied engineering, computer sciences, multimedia and technical background. Nevertheless, the unemployment rate remain the main challenge, 15 % as for 2019. (API).

The market is incapable to produce quality jobs that meets the educated labour force; the gap is huge between the skills needed by the market and the skills produced by the Tunisian education system, the skills mismatch is a real issue, amplified by an incompetent information system that can offer reliable information about companies' current and future demand for skills.

3.4. Technological Environment

The Tunisian Technological environment seems to be valuable in terms of infrastructure when compared to North Africa. Despite the political instability, Tunisia kept its advanced ranking (1st in North Africa) in terms of innovation, ICT development and transition to E-commerce, according to Bloomberg report and UNIDO.

The Technological infrastructure consist of the following:

- **13 research centers**
 1. CERTE - Water Researches and Technologies Center
 2. CRTEn - Energy Research and Technology Centre

3. CBBC - Biotechnology Centre Borj-Cédria
 4. CNSTN – National Centre for Nuclear Science and Technology
 5. INRAP - National Institute for Physic and chemical Research and Analysis
 6. INSTM - National Institute of Marine Science and Technology
 7. CBS - Sfax Biotechnologies Centre
 8. IRA - Institute Arid Regions
 9. INNTA - National Institute of Nutrition and Food Technology
 10. PIT - Pasteur Institute of Tunis / Medical and Biological Research Centre
 11. CITET - International Center for Environnemental Technologies
 12. CERT - Telecommunication Research and Development Centre
 13. CNCT - National Centre for Cartography and Remote Sensing
- **11 sector specific techno-parks spread over several regions**

The Techno-parks in Tunisia established as part of a policy that aims to facilitate the creation and development of innovative activities based on cooperation between companies, research and training centers. With a sectoral and regional vocation, each Techno-park focuses its activities for the development of its region and the sector in which it is positioned, to stimulate the transfer of knowledge and technologies and strengthen collaborative work through the engineering of R&D projects and clustering initiatives in particular.

1. Ariana : Information and communication technologies
2. Borj Cédria : Plant biotechnology, renewable energy, environment
3. Sidi Thabet : Engineering applied to health & pharmaceutical industries
4. Sousse : Mechanical and electrical industries and IT
5. Sfax : Information and communication technologies
6. Monastir : Textiles and clothing
7. Bizerte : Food industry
8. Gafsa : Industrial & technological activities, services
9. Gabès : Environmental industry & environmental Technology
10. Manouba : Textiles and clothing
11. Médenine : Exploitation and enhancement of natural resources of the Sahara

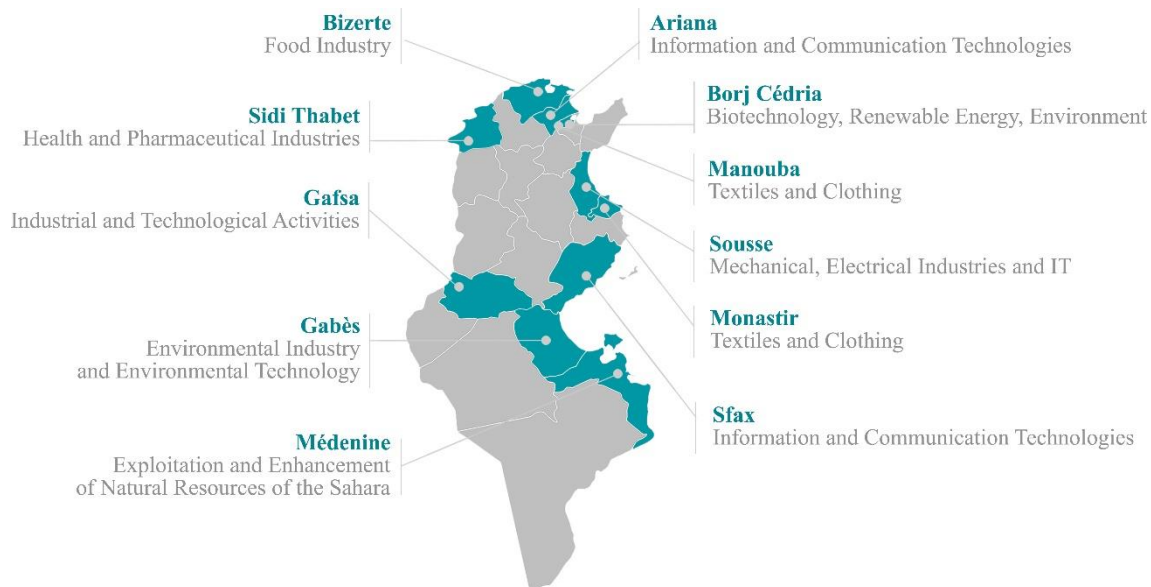


Figure 4 Cartography of Techno-parks

▪ 8 Technical Centers

The Technical Centers under the supervision of the Ministry of Industry and SMEs provide technical assistance to companies in the industrial sectors to provide technical information and certification. They carry out expert missions for administrations, diagnostics, technical training and technical expertise for companies.

1. CETIBA - The Technical Center for the Wood and Furniture Industry
2. CETIME - The Technical Center for Mechanical and Electric Industries
3. CETTEX - the Technical Center for Textiles
4. CNCC - the National Center for Leather and Shoes
5. CTAA- the Agribusiness Technical Center
6. CTMCCV - Technical Center for Construction Materials, Ceramics, and Glass
7. PACKTEC - the Technical Center of Packing and Packaging
8. The Technical Centre for Chemistry

- **15 cyber-parks covering various specialties dedicated to ICT.**

The activities of cyberparks focus on the development of software, website maintenance and creation and services related to remote communication technologies (ICT) and call centers. These cyber parks also work as incubators for businesses operating in ICT sector.

- **The startup Act Tunisia**

The Startup Act Tunisia launched in 2018 facilitated and paved the way for innovation that can contribute to economic growth; the startup act eliminated unnecessary bureaucratic procedure, and facilitated project funding for inventors.

The Startup Act of 2018 considered as the first step towards modernizing the Tunisian economy after the revolution, the adoption of new technologies such as artificial intelligence and block-chain will affect positively the economy, and the overall social understanding of labor market, as new technologies offers new opportunities related to job creation and entrepreneurship. The Startup Act resulted a promising 248 startups. (startup act 2018)

3.5. Environmental Context

The World Health Organization (WHO) ranked Tunisia among the 10 most polluted African countries, the main environmental issues are:

1. Deterioration of water resources
2. Waste management
3. Air pollution
4. Soil degradation and desert encroachment
5. Degradation of the coastal environment
6. Loss of biodiversity

The environmental issue in Tunisia rarely interests the politician, even though the reality on the ground is chaotic. All the governorates of the country seems affected by pollution problems, whether industrial such as in the region of Gafsa, Gabes, and Sfax, or caused by household waste in urban areas such as in Tunis, Nabeul, and Kasserine. The pollution is affecting also natural spaces such as in the region of Jendouba, Bizerte, and Tataouine.

Local and regional authorities still immobilized, with some weak action plan, followed by citizens complain without adoption of responsible behavior towards the environment.

The new constitution of 2014 present “climate security” as the primary goal of the country through the Article 45 "The State guarantees the right to a healthy and balanced environment and the contribution to a secure climate. It is incumbent upon the State to provide the necessary means for the eradication of environmental pollution." (Tunisian Constitution 2014, Art 45)

Despite the legislation and environmental institutions, the country is facing growing economic, environmental, and social challenges that needs response from policy-makers. The political instability, followed by lack of coordination and structured communication between the various institutional actors, led to poor performance, and effectiveness of the environmental action.

Nevertheless, the country presents a contrasting landscape with enormous potential and resources for endorsing the sustainable development, in regards to water management, waste collection, intra-urban mobility, land use, as well as energy. These issues when addressed seriously through the implementations of the policy recommendations. They can offer opportunities to public and private sector in order to offer a sustainable and healthy environment:

Energy

- Expanding solar electricity generation
- Efficient street-lighting technology
- Support and implement the renewable energy strategy

Water

- The use of Integrated Water Management
- Installation of solar water heaters
- The switch to modern water meters
- Involvement of private sector in operations related to maintenance of water infrastructures

Waste

- Use of the Geographical Information System for waste
- Develop waste to energy and the valorization of waste
- Installation of underground and semi-underground bins
- Creating new mechanisms for feedback and reports

Transport

- Implement innovative traffic management
- Upscale the transport infrastructure
- Provide and support alternative modes of transport
- Improve public transportation
- Framing ride-sharing solutions

Agriculture

- Providing close support for SMEs in the food industry
- Enhance local financial incentives
- Provide training program
- Incentivize solar water pumping systems

Urban planning and infrastructure

- New housing developments and the refurbishment of older dwellings
- Supporting national energy efficiency programs
- Information campaigns and training

3.6. Legal Environment

After the revolution of 2011, the new constitution of 2014 offered a new Legislative Framework

1. Investment Law: Law n°71 of 2016 promulgated on the 30th of September 2016;
2. Fiscal incentives Law: Law n°8 of 2017 promulgated on the 14th of February;
3. Financial incentives Decree: Decree n°389 of 2017 promulgated on March 9, 2017;

The new legislative framework set clear and transparent rules for market access, and a common legal framework for investment, including definitions of terms related to invest-

ment operation and investment's governance authorities, in order to improve the investment's environment by setting new governance institutions and investment incentives. The new legal framework introduces the principle of equality between Tunisian and foreign investors, reinforcing the principle of free international transfer of funds for foreign investors.

Freedom of Investment

Article 4 of the New Investment Law states that investment is free, investment operations must comply with legislation relating to the pursuit of economic activities, and the principle of freedom of investment is equal for both nationals and foreigners.

Labor Law

The Labor Code regulate and govern the labor law, the legislation protects the fundamental rights of workers in the following:

1. Right to organize
2. Right to strike
3. Leave
4. Establishment of working hours
5. Establishment of guaranteed minimum wages
6. Guarantee of social security

Financial incentive

The new regulatory framework offers a huge Financial and tax incentives to all projects and investments of National Interest such as:

- Projects /investments that increases the value added, competitiveness, improve export capacity and technological content of the Tunisian economy on regional and international levels
- Projects and investments that creates jobs and enhance human resources skills
- Projects and investments aim at achieving inclusive regional development
- Projects and investments aim at achieving sustainable development

- Direct investment operations carried out in priority sectors that can create value added and contribute to the overall competitiveness.
- Investment in Water and air pollution treatment
- Projects that adopt clean and non-polluting technologies
- Encouragement of Export and Innovative Sectors
- Young Promoters and startup companies

Tunisia continued to modernize its economic legislation, all projects/investments fall within the mentioned above categories will receive grants up to 70% and financial incentives or tax deduction up to 10 years. The new legislation encourage investments that can contribute to the overall competitiveness, labor skills, employment and sustainability.

4. CLUSTER INITIATIVE AND CLUSTER DEVELOPMENT

4.1. Cluster

Modern economic map of the world, dominated by clusters, which progressively becoming a vital area for innovation, competitiveness and economic prosperity. Clusters are a prominent feature of almost every national, regional, state, and even metropolitan economy, especially in more industrially advanced nations.

Factually, the concept of cluster date back to 1890 with Alfred Marshall, in his book “Principles of Economics”. Where the Marshallian industrial district has been described as, “firms concentrating on the manufacture of certain products were geographically clustered” (Langlois, and Robertson, 1995: 124). The Marshallian concept is discussed further by economists and economic geographers, until the “Porterian Cluster” came to surface and become the leading modern approach of cluster business

Professor Michael Porter’s in his book “on competition” (Porter, 1998: 266) define cluster as follow:

“A cluster is a system of interconnected firms and institutions the whole of which is greater than the sum of the parts. Clusters play an important role in competition, and these raise important implication for companies, governments, universities, and other institutions in an economy. Clusters represent a new and complementary way of understanding an economy, organizing economic development, and setting public policy. Understanding the state of clusters in a location provides important insights into the productive potential of its economy and the constraints of its future development. Paradoxically, then, the most enduring competitive advantages in a global economy will often be local.”

Furthermore, Professor Michael E. Porter, evolve:

“Geographic, cultural and institutional proximity provides companies with special access, closer relationships, better information, powerful incentives

and other advantages that are difficult to tap from a distance. The more complex, knowledge-based and dynamic the world economy becomes, the more this is true. Competitive advantage lies increasingly in local things--knowledge, relationships and motivation that distant rivals cannot replicate.' (Porter, 1998: 77)

During the last decades, clusters have increasingly gained a major recognition from policy makers up to private actors, where cluster organizations around the world may vary in their shapes and forms, as well as in their mission and definition, and how to implement them in a practical context.

To form a cluster, different actors must get involved

- Companies
- Public institution such as ministries, municipalities, regional governments, local communities and national agencies and Private and public-private national/regional organisations (export organisations, Trade unions, chambers of commerce, etc.)
- Capital Providers
- Universities, research institutes, science parks

Clusters explained as the whole eco-system of a certain business where all public organization, support agencies, research institutions and universities of the same business in a certain region are linked to the industry. There are five types of actors in a cluster (Sölvell, Lindqvist and Ketels 2003).

The graph below give a brief overview on actors within a cluster

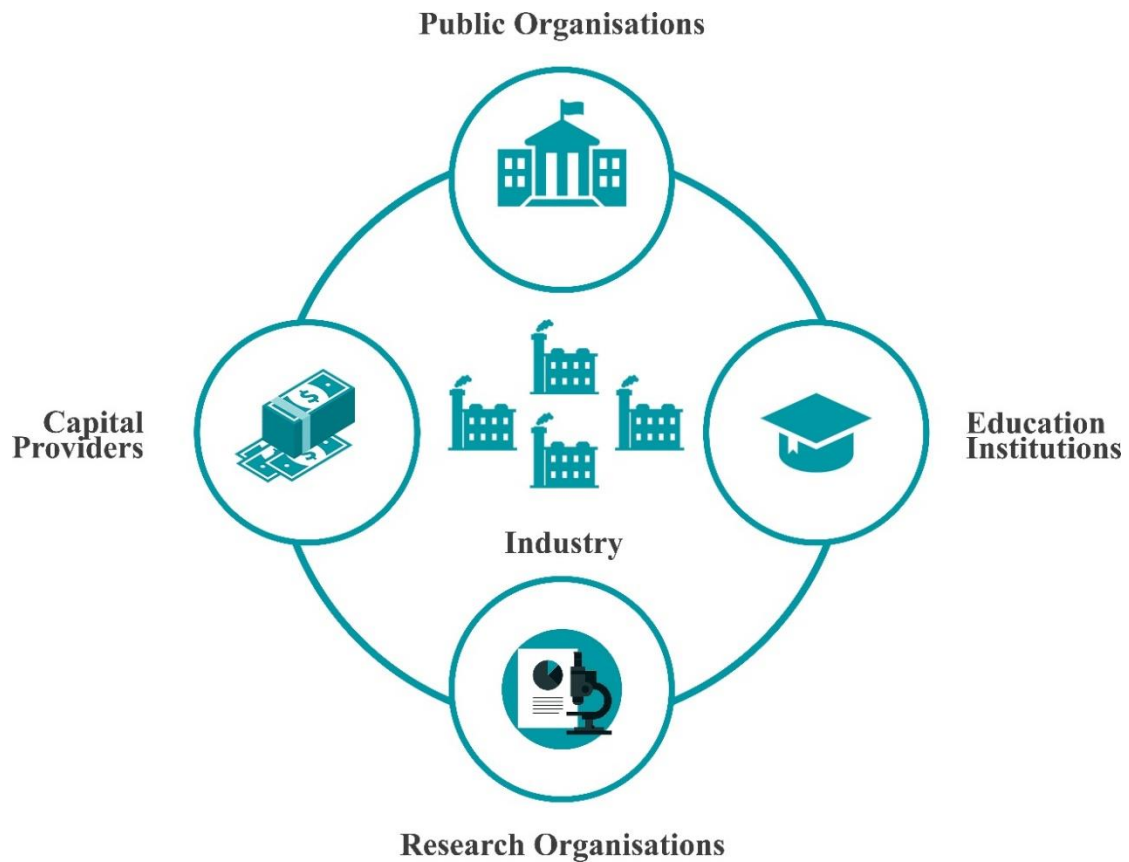


Figure 5 Actors Involved in Clusters

Since Tunisia is a country member of the European Neighbourhood Policy (ENP), one cannot ignore the European approach and policy related to business clusters. On a European level, DG enterprise and Industry, introduced clusters and cluster mapping tools to identify relevant clusters around Europe and their partner countries, since EU political focus stressed on innovation, competitiveness and knowledge-based economy.

The European commission define Clusters as bellow:

“Clusters are groups of specialised enterprises and other related supporting actors that cooperate closely together in a particular location. In working together SMEs can be more innovative, create more jobs and register more international trademarks and patents than they would alone.” (clustercollaboration.eu)

“Clusters are understood as regional ecosystems of related industries represented through a group of firms, related economic actors and institutions that are located near each other and have reached a sufficient scale to develop specialised expertise” (clusterobservatory.eu)

The European Commission has identified clusters as a priority area for action to be taken in support of growth. Several tools, analysis, statistics, reports and platforms have been produced to support clusters in Europe and neighbouring countries, such as the Cluster Collaboration Platform (www.clustercollaboration.eu). The aim is to drive clusters around European states and its neighbouring countries towards excellent clusters that are competitive enough to promote economic growth and prosperity.

4.2. Cluster Initiatives

There is very little studies and theoretical framework on cluster initiatives, although different public authorities has rapidly adopted the Porterian cluster concept, since 1990. The first comprehensive study presented in the "Cluster Initiative Greenbook" published by Sölvell, Ketels and Lindqvist, with a foreword by Michael Porter.

The Cluster Initiative Greenbook define cluster initiative as:

“Organised efforts to increase the growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community” (Sölvell, Lindqvist & Ketels 2003, The Cluster Initiative Greenbook)

6.2.1 Cluster Initiative performance Model

The Greenbook offers a new model to understand clusters, analyse and evaluate cluster initiatives. It offers a performance model, that consist of three main drives and 4 components (Figure 6).

Performance can be evaluated and measured by the competitiveness level, growth and goal fulfilment. The three main drives must be established and implemented carefully in accordance to the following brief descriptions:

- **Process:** By which identification of the value chain is initiated, governance and financial structure are planned, the scope of membership are set, facilitator chosen, and the framework is clarified to create momentum.
- **Objectives:** Any cluster objectives must be in alliance with the aim of improving R&D, intensifying the network and commercial action, using available educational and training institutions, to enhance innovation, technology and expand the cluster.
- **Settings:** By which the business environment is up-scaled and policies are improved to strengthen clusters.

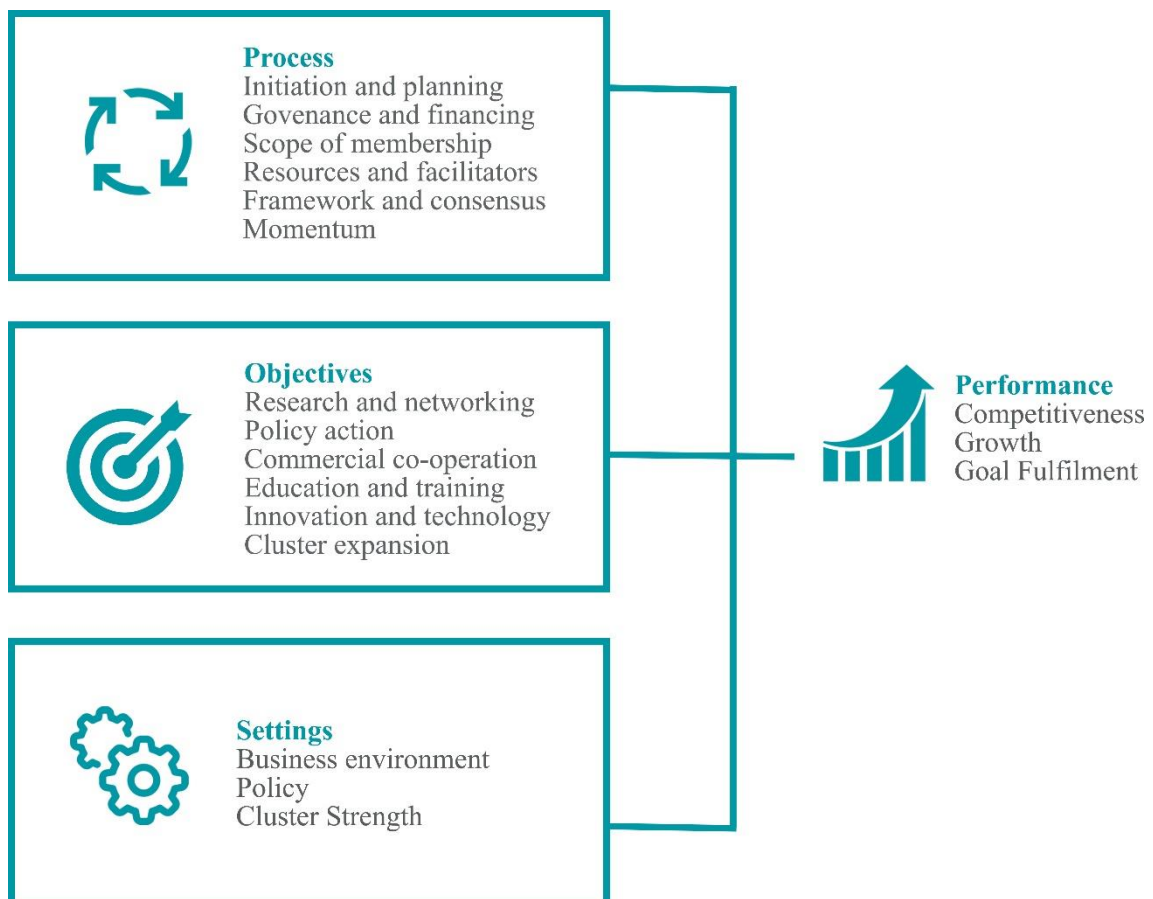


Figure 6. Performance Model

Source: The Cluster Initiatives Greenbook 2. Figure 16 Ch2. P 25)

Every Cluster Initiative is unique, formulated through coherent, private or public initiative settings, financed to meet the pre-established objectives to strengthen cluster actions.

Any cluster initiatives' objectives, initiated by private or public institution, must be designed in a customized framework to meet the characteristics of the industrial and regional objectives. There are no standardised objectives; each cluster initiative objectives must formulate its targets to reach competitiveness and growth.

According to the Cluster Initiative Greenbook, cluster initiatives serves better the technology-intensive/oriented areas such as IT, medical devices, production technology, communications equipment, biopharmaceuticals, and automotive, and cover six main objectives such as:

- Human resources upscaling
- Cluster expansion
- Business development
- Commercial collaboration
- Innovation and technology
- Business environment upgrading

(Ketels, Lindqvist, and Sölvell, 2008: 6)

The Cluster Initiatives Greenbook 2. Through the study conducted on several Cluster Initiatives around the globe in different industrial fields has identified fundamental characteristics and key components to build a competitive initiative. Five major elements are identified:

- Cluster development to re-position the industry
- Strategic reforms of policies, laws and regulations
- Changing the dialogue
- Build the Partnership
- Improve the support for competitiveness

6.2.2 Top-down / bottom-up initiative:

There are few studies on the TOP-DOWN / BOTTOM-UP initiative, several researcher discussed on whether governments must select clusters and force its formation or if it should occur naturally and initiated by firms.

A study conducted on clusters in Germany and European clusters enhanced the bottom-up initiative as the outcome of the research have shown noticeable performance on German bottom-up initiated clusters.

“The best performing clusters in German initiative ‘kompetenznetze.de’ are bottom-up clusters that include almost one quarter of all innovative clusters in Germany. They are initiated outside of funded clusters without any political influence and with 73% of private financing – not public” (Gawarzynska 2010, 67)

Gawarzynska suggests that EU cluster policies need to recognise that innovation can happen in all sectors, and the Open Innovation and Business Success book advised government to support other industries such as agro-food, agriculture and footwear sectors and does not focus only on High-Tech clusters exclusively (Gawarzynska 2010, 68). Gawarzynska presented features of successful clusters, which endorses these feature by the finding outcomes conducted on German clusters:

- Clusters must not be artificially created by public sector
- Clusters must establish cooperation with fellow clusters
- Clusters must have the ability to attract private investments in R&D

4.3. Cluster Development

To study cluster development, literature review are still very limited, and in some cases, it seems to be confusing with no clear standardized theoretical framework.

In the Cluster Policies Whitebook by (Andersson, Serger, Sörvik and Hansson 2002, 1), the opportunities and issues that arise in the development of clusters have been highlighted. The Whitebook explain how clusters are a spontaneous phenomenon that can gain place on larger scale through time. Furthermore, the Whitebook explain how clusters are

associated with potential benefits, where costs and risks are also involved, therefore, one cannot underestimate clusters. Effective and careful implementation will lead to success and minimize failure.

Besides the Whitebook the United Nations Industrial Development Organization approach to cluster development for inclusive growth, produced a systematic methodology for cluster development project in 23 countries including Tunisia. The UNIDO methodology offer enterprises, institutions, support agencies and relevant actors a developed model to undertake joint actions to foster the complete cycle of cluster development as shown in the graph below.

UNIDO emphasize and require a strategic approach in order to overcome limitations, and aim at formulate, implement, monitor and evaluate cluster development.

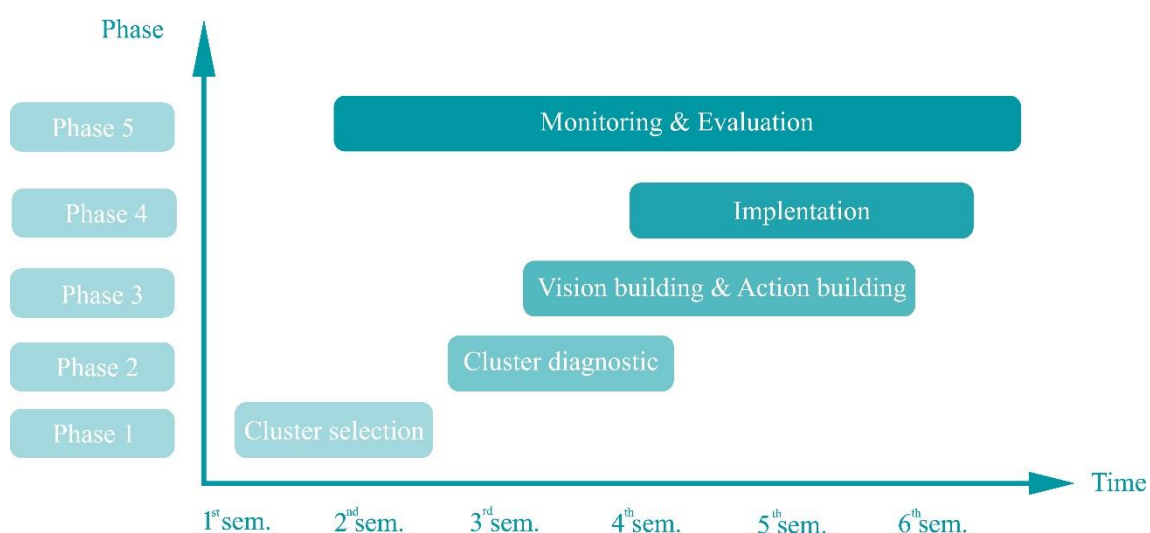


Figure 7. UNIDO Cluster Development Approach: CDA and Institutional Capacity Building

Source: The UNIDO Approach to Cluster Development, Key Principles and Project Experiences for Inclusive Growth: 17

4.3.1. Phase 1: Cluster Selection

During this phase, UNIDO suggests concentrating the focus on existing clusters or priority clusters that are naturally interconnected, this suggestion is in alliance to cluster mapping theory explained by Porter.

The considered criteria to select a cluster consist mainly on critical mass of companies belonging to the same business or segment, have enough geographical concentration to establish formal and informal relationships, with the presence of several steps of the value chain with objective to serve a demand which is not only local.

These criteria will help to identify potential clusters and assist in cluster selection phase, it is highly recommended to appoint during this stage/phase a Cluster Development Agent (CDA) to establish a relationship with cluster members, in order to assist during the next phases, the settlement of objectives and action plan.

4.3.2. Phase 2: Cluster diagnostic

According to the Whitebook, this phase is called building the base. It consists of two major steps:

1. Initial analysis
2. Group formation

According to UNIDO, cluster diagnostic can help in understanding the socioeconomic and institutional environment of the cluster, detect potential opportunities, and provide baseline for monitoring and evaluation to build initial trust between CDA and cluster members.

A work group must be formed during this stage, the theoretical framework emphasize on conducting SWOT analyses, to understand the overall environment and culture opportunities, in order to identify current position and initial competitiveness diagnosis. The analyses give an overview of the priority action and support needed within a cluster.

4.3.3. Phase 3: Vision building and action planning

The UNIDO approach on vision and action planning phase, emphasis cluster stakeholders to formulate shared vision for their future cluster performance and the overall cluster development path. The cluster stakeholders must produce a roadmap that can translate the shared vision into action plan through realistic and achievable development strategy.

The roadmap and the well-defined action plan can assist the cluster stakeholders to evaluate, review and adjust to changes accordingly.

4.3.4. Phase 4: Implementation

This phase referred to the execution of the action plan, the main responsible of the activities described within the action plan is the CDA (or Cluster Manager). His role is to build / ensure the capacity needed for the overall implementation of activities that will contribute to the achievement of objectives.

4.3.5. Phase 5: Monitoring & Evaluation

The entire UNIDO's cluster development process enhances capacity and trust building activities during the design of the action plan, and throughout the implementation, monitoring and evaluation phases.

The monitoring and evaluation is a continuous process throughout the designing of the result chain until the analysis of the inputs and expected outputs of project activities.

(The Unido Approach to Cluster Development, Key Principles and Project Experiences for Inclusive Growth)

5. RESEARCH METHOD

5.1. Research Setting

Since 2012, the author has worked as a Business Development Manager at the Technology Centre Merinova Oy, the owner of the Energy Vaasa Cluster. The author was involved in several internationalization projects funded by the European Commission, DG Enterprise and Industry. REINA I and REINA II (Renewable Energy Internationalization) assigned by ESCP (European Cluster Partnership) with main mission to support SME's to internationalize beyond Europe and within the neighboring countries of Europe, with the aim to boost growth, jobs and investments in Europe. Four European energy clusters from Finland, Spain, Portugal and Austria were involved. The aim was to intensify cluster collaboration across borders and sectoral boundaries, and to support the development of ESCPs to lead international cluster cooperation in fields of strategic interest.

The author was also involved in TCE project "TCE-Towards Cluster Excellency". Within TCE project, the aim was to meet the European Commission objectives of creating excellent world-class clusters across Europe; a course was implemented in Barcelona. The author obtained a certification in the field of Cluster management, and certified as cluster manager by the Cluster Development Agency. The aim of the course and study visits to different successful clusters around Europe was to learn and observe the best practices for developing and/or improving cluster organizations management and services, with the main objective to gain economic development and improve competitiveness.

Despite the academic background of this study, the author gained through over seven years of work experience a great knowledge on cluster development and cluster management methods through different implemented cluster initiatives in Europe from a practical perspective that can endorse the author in evaluating and analyzing the results of the collected data.

5.2. Data Collection

Taking in consideration the large sample of UTICA members, the quantitative research method seems to be the best practice in this case to gather information based on clear

answers to specific questions. The designed survey must result data that can be analysed through numerical comparisons and statistical analyses. (The survey attached to this paper in Appendix 2)

As described in the research methodology of this paper, a qualitative research method is also used for this work, in order to uncover trends in thoughts and opinion within the actors outside UTICA and the current/future clusters' actors such as cluster managers, public authorities, and techno- parks. Qualitative research methods will allow the interviewee to respond in words and will give the freedom to deliver opinions, and perception about the topic (Appendix 1 & 3)

The collected data must be in alliance with this paper's objectives described in chapter 2. This part will assist the thesis commissioner and the current/future cluster stakeholders to better understand the overall cluster environment and companies' ability to operate within clusters.

5.2.1. The survey

A survey was sent to companies using the platform of networking of different actors in strong relation with Tunisian companies, such as UTICA's members, different current clusters and techno-parks. The author used an online platform called analyzer.com. The layouts offered on the website are simple and efficient, after adding the research questions using the graphic and technical layout of the website.

Following the creation of the survey the website analyzer.com, generated a link, this link distributed exclusively to entrepreneurs and companies' owners, the distribution of the survey happened through UTICA, the presidents of the sectorial federation, and the existing clusters by email. The author sent reminders later by email and phone, to increase the level of participation.

The questionnaire consisted of three main settings:

- **Multiple-choice questions:** the respondent needs to pick one or more answers carefully selected and given in advance

Are you willing to financially commit to Clusters? If yes in which area

- No I'm not committed to financially contribute in any activities
- R&D
- MARKETING
- MARKET ACCESS / EXPORT & INTERNATIONALIZATION
- TRAINING

- **Dichotomous questions:** the respondent needs to answer by yes or no

Have you been involved in any type of cluster activity/project/work?

- Yes
- No

- **Importance questions:** the respondent needs to rate the importance of the thematic

If you are / get involved in cluster what would be the subject of cooperation or type of activities you would get involved actively?

R&D	1	2	3	4	5	6	7	?
MARKET RESEARCH/STUDIES	1	2	3	4	5	6	7	?
INTERNATIONALIZATION & EXPORT PROMOTION	1	2	3	4	5	6	7	?
TRAINING	1	2	3	4	5	6	7	?
FINANCIAL AID/ INVESTMENTS	1	2	3	4	5	6	7	?
PRODUCT DEVELOPMENT	1	2	3	4	5	6	7	?

5.2.2. The interview

The author followed the layout of the pre-designed questions (Appendix 1+3), but during some interviews, the discussion led the author to develop questions, to uncover ambiguity related to interviewee's answers.

The qualitative research method helped the author to understand the overall cluster environment, and to identify the area that will help in understanding the factors that are crucial to the overall cluster development in Tunisia.

The first phase of this part consisted on identifying the actors; a research was made that resulted a list of important actors within the cluster development in Tunisia, and it led to the following list of interviewed actors:

- Interview with current cluster managers or cluster main stakeholders
- Public Actors :
 1. Executive Director of TASK FORCE: Public initiative to identify, map and develop clusters of particular interest and of an added value
 2. Techno-parks that host clusters or played major role on creating clusters.

The author paid great attention to current clusters and their managers and/or main stakeholders.

All interviews conducted in March and April over the phone using WhatsApp, and in some cases endorsed by presentations or exchange of information by email if needed. The language used is French and Arabic. Therefore, the author translated the answers into English

6. CLUSTER DEVELOPMENT IN TUNISIA

Before proceeding with the data analysis, the author chose to give an explanatory background of the collected data and background information that can be useful for understanding the cluster development in Tunisia, and could be used as a base for future research.

6.1. Public Policies and Cluster Initiative

The government relates the clustering movement through the establishment of techno-parks in 2000. This dynamic approach interested companies, young entrepreneurs, and the digital sector mainly, but in reality, techno-parks did not intensify the flow of collaborative projects between companies, or contributed to the development of employment and exports. (API, industrial review 2018)

According to the annual industrial review published by the Tunisian Industrial Promotion Agency (API) in 2018, the statistics showed a weakness recorded in the implementation of collaborative projects within the techno-parks. The industrial review based the evaluation on the Global Innovation Index report 2017 ranking (pillar 5; of company sophistication, innovation ratio, and cluster development index). According to the GII report, Tunisia ranks 97th with a score of 36.3 in regards to the level of cluster development. API linked the weak performance to the following:

- The need to redefine the mission and role of techno-parks, and their relation to clusters
- The need for an appropriate cluster legislative framework
- The absence of public funding tools
- The need to train cluster managers

After the incentive measures to make the Tunisian industrial environment open to innovation and competitiveness, tackling economic stagnation, and unemployment, the country committed to develop the interconnected and interdependent ecosystem through Clusters approach. The cluster approach as a tool for economic growth started to attract the

government's interest, allowing sectoral strategic segmentation with local competitive advantage to cover the entire value chain of certain strategic sectors.

The Government assigned 13 experts from the public sector to work within a newly established technical platform on identifying strategic sectors, map its value chain and work on the necessary reforms. The Task Force platform was formed under the governmental decree n°2018-710 of 14 August 2018 to develop value chain and clusters to create employment and increase the exports.

6.2. Tunisian Map of Clusters

The author gathered information on Tunisian Clusters from business articles, industrial reviews, and business reports conducted by national and international development agencies.

The research led to the conclusion that there are currently 16 clusters in 9 different regions of the country. Therefore, a current map of the clusters was produced accordingly. It was necessary for this study to translate some of the clusters' names from French to English to help the reader understand the activity type of the clusters. During the research phase of this project, the author identified both types of initiatives explained in chapter 4 of this paper, in the cluster initiatives section. Both initiative models; Top-down and Bot-tom-up initiatives are experienced. In addition, a third type of cluster initiative was identified which the author preferred to categorize as a "mixed initiative", so it would be easier to evaluate Tunisian cluster initiative in the future.

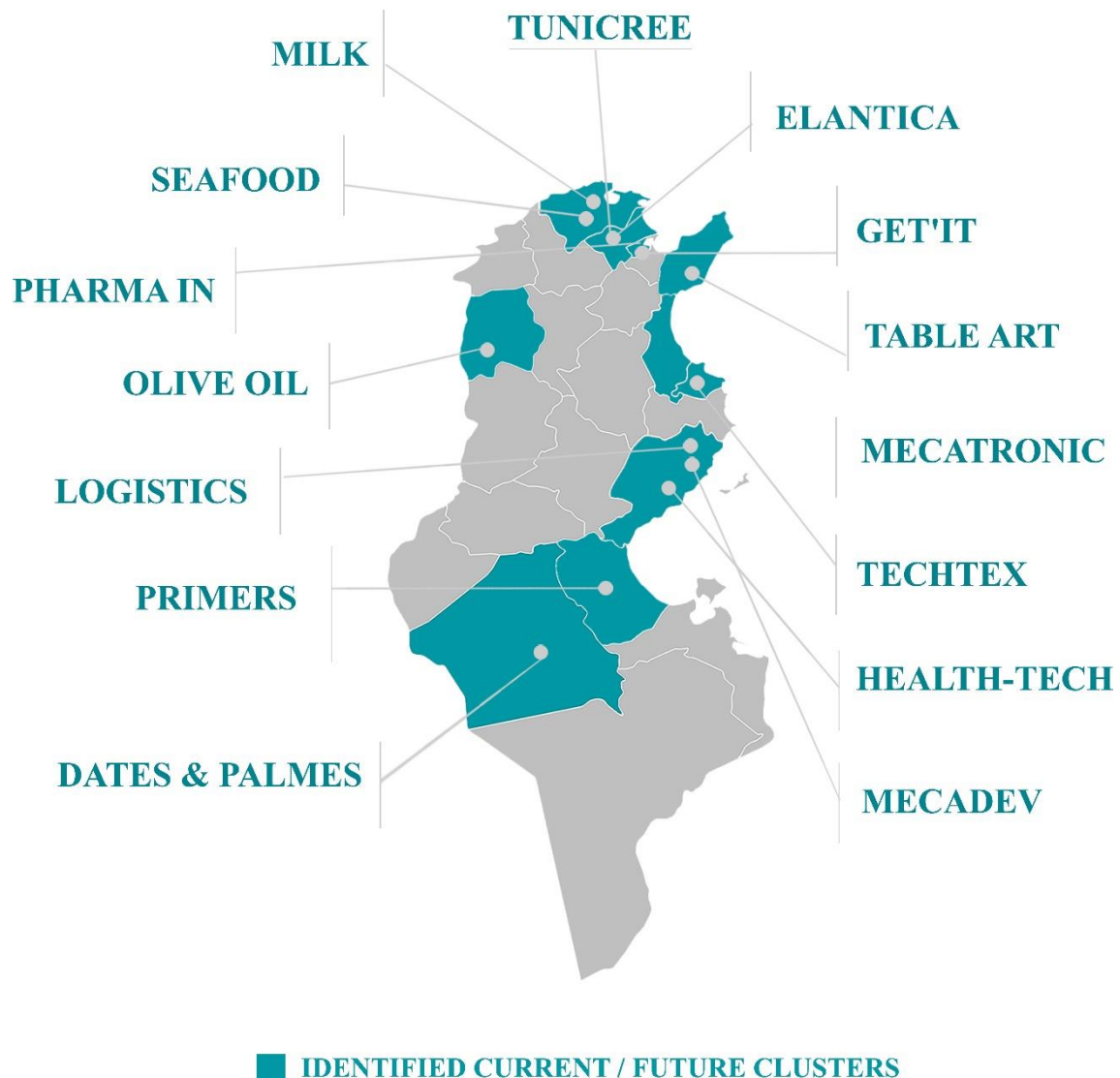


Figure 8. Cartography of Tunisian Clusters

To better understand the Tunisian map of clusters, the author divided clusters by its mode of emergence and the approach adopted by decision makers that have contributed to cluster formation.

6.2.1. Bottom-up Tunisian Clusters

Within the framework of Think-Tank and following broad consultation with companies and the civil society of the Sfax region, the diagnosis led to a better understanding of the region's potential that helped the local actors to produce the development strategy for Sfax 2030. As a result, three (3) regional clusters were identified in the region of Sfax:

1. Health-Tech Cluster (Technologies related to healthcare 2017)

2. MecaDev Cluster (Mechanical industry 2017)

6.2.2. Top-Down Tunisian Cluster Initiative

New clusters have emerged as part of the development program initiated (and financed in some cases) by international development agencies such as FDA, World Bank and UNIDO. This category will be divided into two sub-category

Clusters initiated and funded by UNIDO:

- 1) Table art Cluster (home objects 2015)
- 2) Creative Tunisia (7 newly established clusters November 2019)

Clusters initiated and funded by AFD

- 1) Mechatronic Cluster (attached to Techno-park Sousse 2012).

6.2.3. Mixed Initiative

Clusters as part/result of techno-parks activities:

All clusters initiated by companies and Techno-parks generally benefit from large business premises, working spaces, laboratories, and research centers. The Techno-parks invited companies and encouraged them to cooperate among each other, universities, and other public institutions. The clusters initiated by Techno-parks are:

- 1) Milk Cluster, attached to the Techno-parks Bizerte
- 2) Seafood Cluster, attached to the Techno-parks Bizerte

Clusters identified by the World Bank and initiated by companies:

These clusters and their potential suggested and highlighted by the word bank, the companies took the initiative to form clusters and work on the identified opportunities. The World Bank did not offer any financing for these clusters.

- 1) ELANTICA Cluster (Electrical industries)
- 2) GET' IT (ICT industries)

Clusters identified by UNIDO formed by companies:

- 1) TUNICREE Cluster (Renewable Energy and Energy Efficiency)

The graph below is a cartography of Tunisian Clusters by its mode of emergence produced and developed by the author for it would be easier to evaluate Tunisian cluster initiative in the future. The map is missing Creative Tunisia clusters, as the project started in November 2019 and consists of identifying 7 creative clusters within art and handmade sectors)

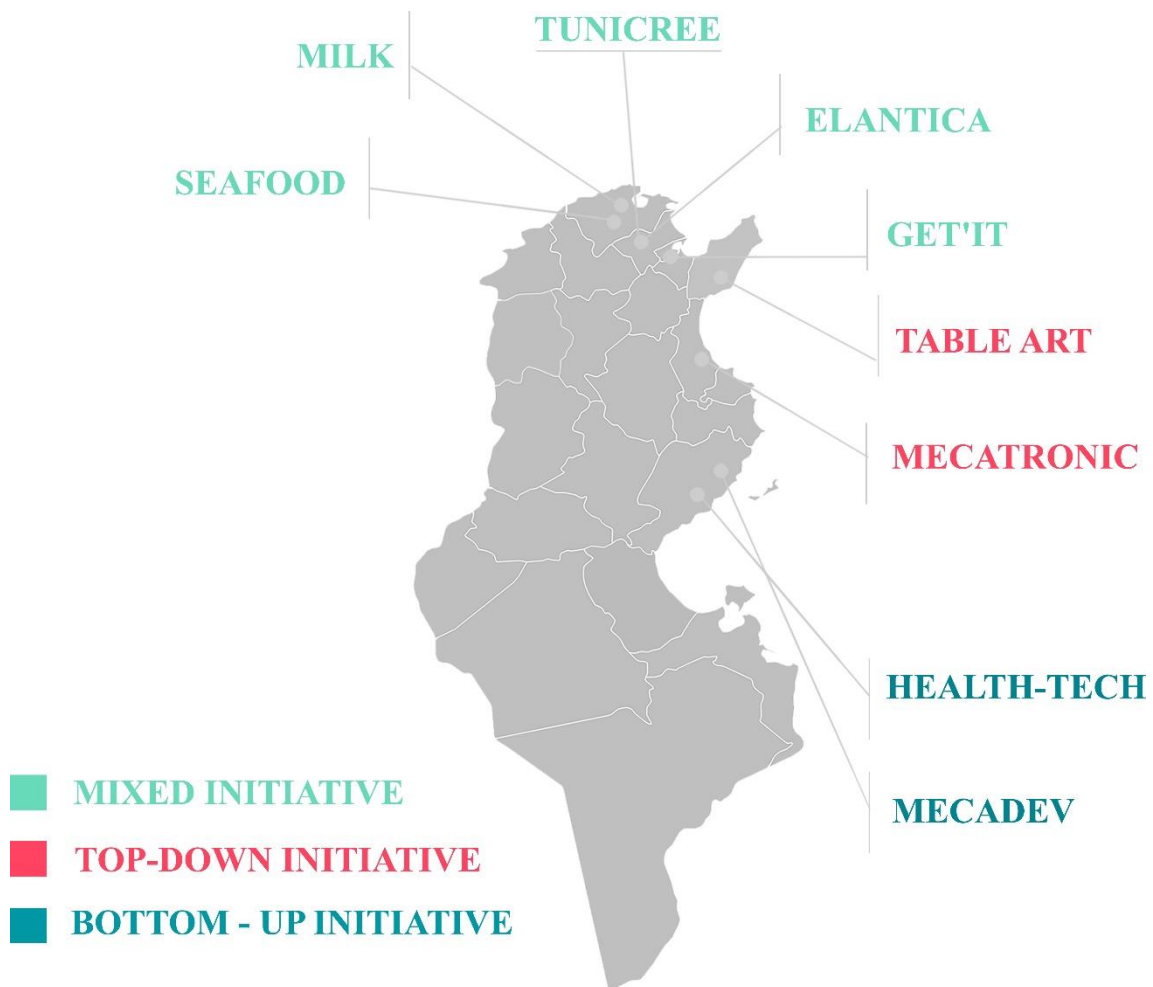


Figure 9. Cartography of Cluster Initiatives in Tunisia

6.2.4. Other Clusters

The author failed to gather information about six clusters, the initiative and other related information. Therefore, these clusters are excluded from this research.

1. Pharma IN Cluster
2. Olive Oil Cluster
3. Dates and Palm tree Cluster

4. Logistics Cluster
5. Primers Cluster, attached to the Techno-park Gabes.
6. TECH-TEX Cluster, attached to techno-park Monastir.

7. ANALYSES OF THE DATA

7.1. Interview:

An interview is defined as when an interviewee and interviewer discuss a matter (Seale, Gobo, Gubrium, Silverman, 2002: 16) with the objective of collecting information that represents an individual or group perception on specific field. The interview must be based on trust. This method gives the freedom for the interviewee to deliver elaborated answers that help the interviewer to understand the matter from an experimental perspective that will allow the interviewer to observe and analyse the topic properly.

The first group of the interviewees are cluster managers/presidents of current clusters, henceforth referred to as interviewees in this section. The interviewer used the same questions for this group, (Appendix 1).

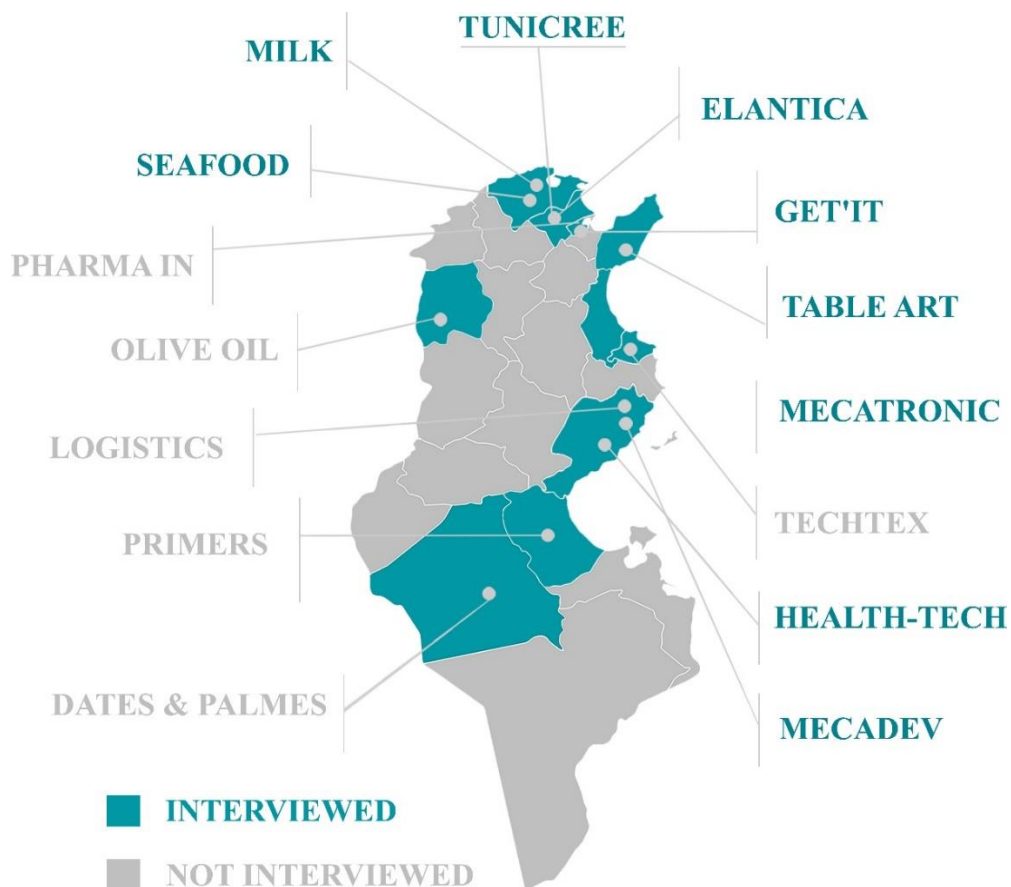


Figure 10 Cartography of Interviewed Clusters

7.1.1. Cluster Managers

- **Question 1: Legal framework and general information**

As mentioned in the appendix 2, the first question consisted on gathering general information about existing clusters such as the year of establishment, legal form of the cluster, and number of cluster members.

In this section, it was understood that 80% of the interviewees have used the legal framework of associations to establish the current clusters. The clusters representatives expressed an ease of using this legal framework to operate. They set a clear membership fee for participants from the private sector. Public institutions they contributed financially in very few clusters, but in most cases, public institutions are simply invited to be part of the association without any financial commitment.

The most expressed opinion on public participation:

“The government is incapable of creating change; we want to be the change.”

“It is difficult to collect money / fees from public institutions, it is highly bureaucratic but some of them contributed financially through sponsorship or through other forms of support. They decide we do not force them.”

The membership fee is set freely. A remarkable difference regarding the setting of the membership fee from cluster to cluster was noticed. Based on that, the author identified no impact caused by the cost of the membership fee on the number of participants in clusters. In some clusters, the membership fee was very high (2000 TND), comparing to the lowest membership fee in other clusters (200TND), but the number of participants was equal in both cases. Therefore, the membership fee did not have a direct impact on the number of participants within a cluster, probably because companies decided already among themselves during the establishment of the cluster and jointly they set the membership fee. Nevertheless, this may affect the number of potential new participants if the cluster tends to expand in the future.

The public sector participation in clusters remain low in all clusters, with a noticeable participation of technical centers, universities and/or vocational schools in almost all clusters.

The oldest cluster was established in 2012, while 7 new clusters are in the process of establishment (mapping started November 2019), and 3 new clusters are formed without a legal structure in 2019.

The interviewer observed no direct impact of the cluster age on number of participants, but throughout the interview, the author identified a performance indicator related to the background and reasons for establishment that will be explained next.

- **Question 2: Background of establishment, and general understanding**

The reason behind this question is to understand which background factors led to the establishment of current/future clusters and to investigate the knowledge level of clustering and cluster development. The author identified the following

Two (2) old clusters initiated by UNIDO program and FDA are identified. Both clusters received funds for mapping actors within the value chain of the sector of each cluster, working on collaborative projects. The two clusters faced certain ease in implementing development projects that motivated companies to be active in implementing a constructive and valuable action plan and generate results.

As for the rest of clusters, the main reasons for establishment was the general interest in the cluster concept, without any funds or financial support. They consider clusters as a useful American approach/tool of generating growth by doing business differently. Interviewees believe / hope to cut with the colonial school of conducting development and doing business, labelled as the “sophisticated and bureaucratic French approach”. Common interest and regional competitiveness are the main reasons for the establishment of these clusters with no funding. This group of clusters consists of bottom-up and mixed initiatives as explained in the previous chapter.

Moreover, in this section the author identified two different experiences related to the cluster financial structure that will explain the impact of the financial structure under question 3.

- **Question 3: Cluster Manager**

Throughout this section, the author observed a critical issue, as 90% of the clusters have no CDA. This is controversial when compared to the theoretical framework of the cluster development Phase 1 & Phase 4 described in this paper, Chapter 4.

The main reason behind this question was to investigate if existing clusters have implemented and followed the necessary phases of cluster development guidelines explained in Chapter 4.

The existing clusters operate without a CDA. They mainly relate this to their limited resources and to the overall financial issue of existing clusters. The collected membership fee does not generate enough resources to cover costs related to the recruitment of a cluster manager, the clusters operate as a working group, discuss matters related to the overall sector they belong to and implement identified actions accordingly.

Another issue besides the financial struggle is the characteristics to identify the cluster manager; the interviewees highlighted an issue related to cluster manager recruitment, such as the skills needed to select a cluster manager. In this section, the literature and theoretical framework limitation were identified. There are few specific academic studies on managerial skills of cluster manager that can assist members to identify and select potential manager.

Currently 90 % of the existing clusters established within the legal form of an association have a cluster president or legally the president of the association. All of them are coming from the private sector with entrepreneurial background.

The Table Art cluster, funded by UNIDO program have a cluster manager, trained outside Tunisia and certified as a cluster manager, the cluster have clearly implemented the cluster development phases 1 until 5. In such case, the cluster manager contributed on the analysis, roadmap, action plan and activities, which has generated remarkable results. Following his successful experience, UNIDO assigned him to manage and develop seven new clusters. This raised a question mark about the future of Table Art cluster.

- **Question 4: SWOT/PESTEL analysis and roadmap**

Despite the financial issue, the author identified that all clusters have conducted several analyses certain clusters (2 clusters) have used external experts to assist in producing professional SWOT and PESTEL analyses; others have done it within the cluster members in order to avoid extra costs.

All interviewees highlighted the importance of the analysis that have resulted in the following:

- Identified issues related to the sector
- Positioned themselves in the national and/or international market
- Set short and long- term objectives
- Build an action plan
- Identified actors from the public sectors
- Identified opportunities related to the sector

The analysis led to the production of action plan and activities of particular interest, it was observed that a relation between the action plan and the financial structure of each cluster.

- Funded clusters enjoyed a more elaborated action plan and activities than other clusters with limited resources.
- Clusters with limited resources tend to prioritise actions over other, based on the costs related to the type of activities.

Overall, this section is in alliance with the cluster development theory Phases 1, 2 and 4 from Chapter 4. Even though without a cluster manager, many clusters have found their way to establish relatively certain trust and build common vision through cluster diagnosis, using the President of the association (cluster) as a temporary manager/facilitator, that work voluntarily to serve the cluster objectives and deliver results. This would serve the cluster in the short term, in the long term clusters must assign a proper CDA.

- **Question 5 + 6 Cooperation**

In the interview, the interviewer divided this section in two parts:

1) Cooperation between clusters and Public institutions

In Chapter 3 of this thesis, the author conducted a PESTEL analysis to understand the overall environment and examine the external factors that may affect clusters mission, many clusters highlighted the political instability that slowed their businesses during the last decades but simultaneously they presented a great optimism in this particular area.

In regards to the social and technological environment, all clusters have at least cooperated with the educational and technical centers; other clusters receive continuous support from techno-parks.

Most of the interviewees showed a particular interest in cooperating with public institutions and gave several examples on past/recent and ongoing cooperation particularly with vocational schools, universities, technical centers and techno-parks.

Within this section, most of the interviewees presented their hope to reach better cooperation environment with public institutions in the future, suggesting legal reforms related to clusters and governmental support.

One cluster highlighted the importance of public institution and the valuable contribution in adjusting, developing and expanding the value chain of the cluster for example the TUNICREE Cluster and the role of the National Agency of Energy Efficiency.

Other clusters highlighted the importance of the cooperation with vocational schools. They defined the market needs of labour force and the skills required to vocational schools in order to avoid mismatch of labour skills.

2) Cooperation between companies

In this part of this section, cooperation among members is considered case by case, in some projects companies tend to cooperate greatly while in most projects the cooperation seems to be difficult, interviewees relate this section to a certain cultural belief that must be adjusted with time in order to reach better cooperation environment.

They referred this part to the overall business thinking and practices, where business culture plays a strong role when discussing cooperation among companies. Historically the

Tunisian industry competed with each other in the internal market, it is difficult to bring them to the same table and invite them to openly share information and cooperate. Nevertheless, a few success stories have been highlighted; cooperation among companies within a cluster and cooperation between inter-sectorial clusters have been also successfully witnessed or shown interest among some clusters.

- **Question 7: Current action plan and type of activities/projects**

All of the interviewed clusters conducted at least one project related to the following

- 1) Joint export promotion or joint market research
- 2) Training is part of their current/future activities and focus.
- 3) Marketing and communication activities to address national and international market or showed particular interest and need for improvement in this field.
- 4) Few clusters have highlighted activities related to R&D

It was identified that the type of activities have no relation with financial struggles experienced within unfunded clusters.

Funded clusters during the establishment phase (Top-Down clusters), failed to produce an action plan after the funding has ended, they link activities with resources, while clusters established without funding (Bottom-Up +Mixed Initiative), have maintained an action plan in accordance to their resources. This is in alliance to the top-down/bottom-up approach presented in chapter 4.

Almost all clusters have shown great interest to export promotion, networking and market knowledge and gave priority to these type of activities.

- **Question 8: Internationalization / export activities**

All clusters from funded and unfunded clusters have worked on Internationalization and export promotion. Despite the financial structure, all clusters paid particular focus on this section.

It was noticed that the vast majority of interviewees prioritize internationalization and export promotion over other activities. The aim is to reach new markets, and work jointly on mega-project.

- **Question 9: Role of UTICA**

The interviewees mentioned that the relationship is very strong with UTICA, and they consider that UTICA will play a major role in discussing and suggesting legal reforms related to industries and clusters. All clusters enjoy total independence and freedom to operate.

Two clusters highlighted a good relationship with UTICA, but they rely more on the newly established regional employer union to work on the legal reforms needed.

7.1.2. Public Actors

The interview for this section was based on interaction and questions related to the mission and objectives of public sector and their relationship with current/future clusters. (Appendix 3)

- 1) Task Force

The first interview was conducted with the technical platform of Task Force (TFDCV), introduced in Chapter 6 of this work within public policies and cluster initiative section. The platform consists of 13 experts from different public institutions. The TFDCV project is a 5 years program, divided into 3 phases.

- Phase 1: focuses on mapping clusters and implementing strategic segmentation.
- Phase 2: consists mainly of the following:
 - Evaluation of the attractiveness of the segments identified during phase 1 of the project.
 - Identification of the international purchasing criteria of the advanced buyers.
- Phase 3: identify the factors that will improve the overall cluster development of the identified segments.

Currently TFDCV identified priority sectors related to the export ratio of certain sectors in the less developed and marginalized regions of the country such as the olive oil industry. The TFDCV identified relevant companies and interviewed them directly via the Task Force experts, in order to understand issues related to their sector of activities that requires immediate reforms.

As a conclusion, the evaluation of TFDCV role and mission within the overall cluster development in Tunisia is hard for two reasons. First, the program is newly established where outcomes and results can neither be evaluated nor identified at this stage. Second, TFDCV is the first Top-Down Tunisian initiative. The Top-Down approach is a very divisive topic internationally, and generated lower impact/results on a European level (as mentioned in Chapter 4, Top-Down/Bottom-Up initiative section. Additionally, the author identified no relationship between the TFDCV and existing clusters. When questioned about existing clusters, the interviewee expressed that current clusters are not in their mission's agenda or part of their scope of work. It is clear that Task Force program tend to cover specific sectors, and has neither intention to investigate current clusters, nor to add their identified issues to the list of the reforms that needs an immediate public action.

2) Techno-parks

The Techno-parks are public / public-private institutions introduced in the country 20 years ago as explained in Chapter 3, mainly focuses on the technology transfer by improving capacity building, work environment, business exchange and assist newly born high-tech companies to integrate into the market.

The first established cluster was initiated and financed by the FDA, and implemented in Sousse Techno-park. The experience attracted other techno-parks to assist and enhance companies to form clusters in their regions. After the FDA program ended, Sousse Techno-park struggled to finance the costs related to the recruitment of a cluster manager and to generate new roadmap with action plan and clear objectives. It was also mentioned that it was difficult to motivate members to be active without any available funds. Nevertheless, during the program the cluster generated great results where companies worked on developing high-tech solutions resulted by the strong cooperation between research

centers and private sectors. The Sousse techno-park, assigned an employee to work part time on the cluster.

The Biotechnology techno-park of Bizerte, is a public-private institution established in 2006 with 5 Million euros capital, focuses on creating synergy between research centers, educational institutions and private sector to serve the agro-food industries.

The Techno-park is actively working on improving the overall agro-food sectors, it was within the LACTIMED project that employees (two employees) of the biotechnology techno-park travelled to Spain to get professional training related to cluster development. Following the training, the biotechnology invited important actors from three sectors and worked on mapping the value chain of these sectors.

Currently, three (3) clusters are formed without any legal structure, actively working on establishing association for the following sector of activities:

- Seafood Cluster
- Cattle Milk cluster
- Goat Milk Cluster

The author in this research combined the Cattle Milk and Goat Milk clusters into one cluster labelled in this study by Milk Cluster, as development objectives for this activity are similar, and will be merged in the future.

All clusters have identified cluster presidents among the current identified companies, actively working on product development, packaging, marketing and internationalization to address the local and international market.

7.2. The survey

Since the aim of this study consisted mainly of measuring the willingness of UTICA members to get involved in clusters, forecasting the commitment level and ability to cooperate and identifying activities of particular interest. The distributed survey consisted of 10 questions (Appendix 2), as described in data collection section of Chapter 5 of this paper. The total number of participants reached 81 respondents; the aim was to reach 100

participants. Nevertheless, the number of samples collected was sufficient to proceed further with the analyses.

The researcher used English language as the main language of the survey, no translated survey distributed for this part of the research.

- **Question 1: Does the Company I represent belong to the (Future) cluster?**

This question will allow the author to understand the respondent sector of activity, and sectors involved / interested in cluster approach. The survey was widely distributed among companies' owners, as the researcher used English language as the main language of the survey, this may explain the high number of respondents from export oriented sectors.

Most respondents are coming from the Electrical, Mechanical and ICT sectors. These sectors kept evolving and growing despite the political instability in Tunisia explained in Chapter 3 of this paper. The political instability had low impact on these sectors mainly because they are linked to international market.

Other sectors represented in this survey by 12% consisting mainly of respondents from the automobile and aeronautic industries.

The graph below explains the respondents sector of activities in percentage.

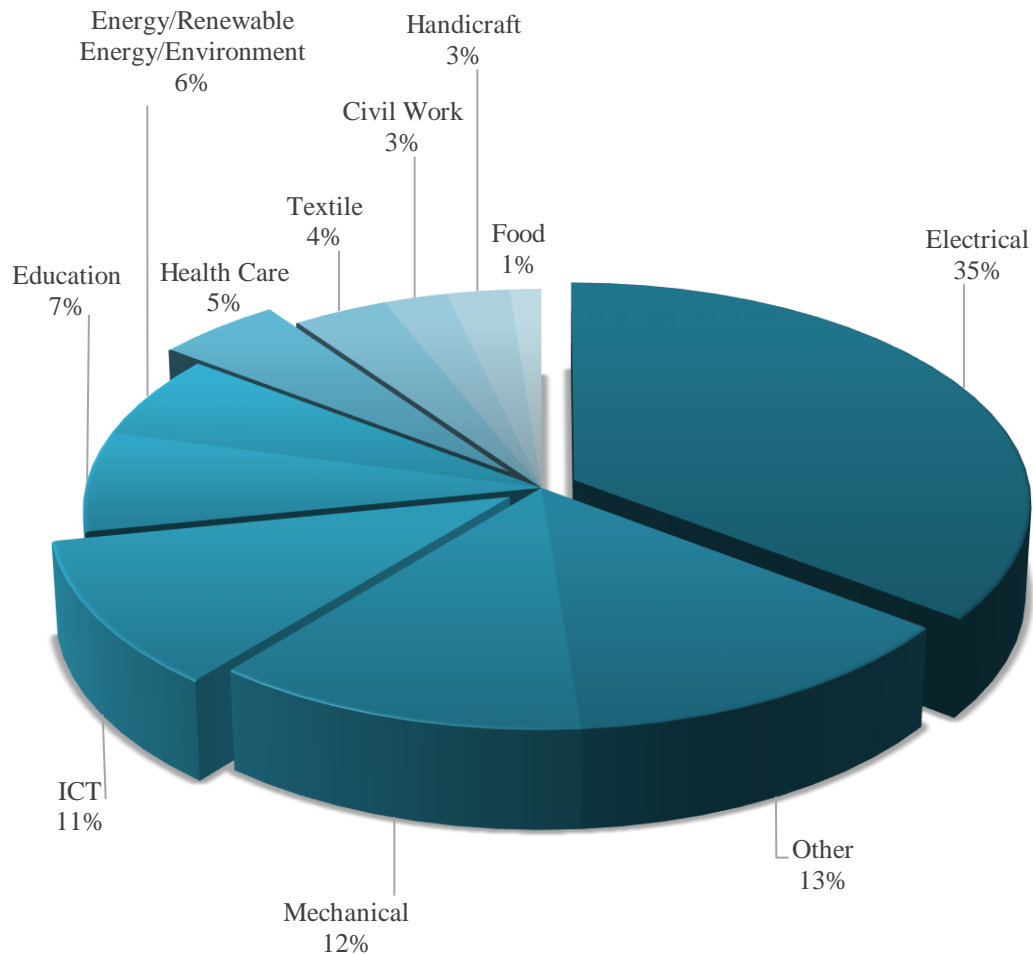


Figure 11. Respondents Sector of Activities

▪ **Question 2: Have you been involved in any type of cluster activity/project?**

A surprising result within this section was that 86% of the respondents have been already involved in cluster activity. Therefore, most of the respondents are familiar with the general understanding of cluster concept.

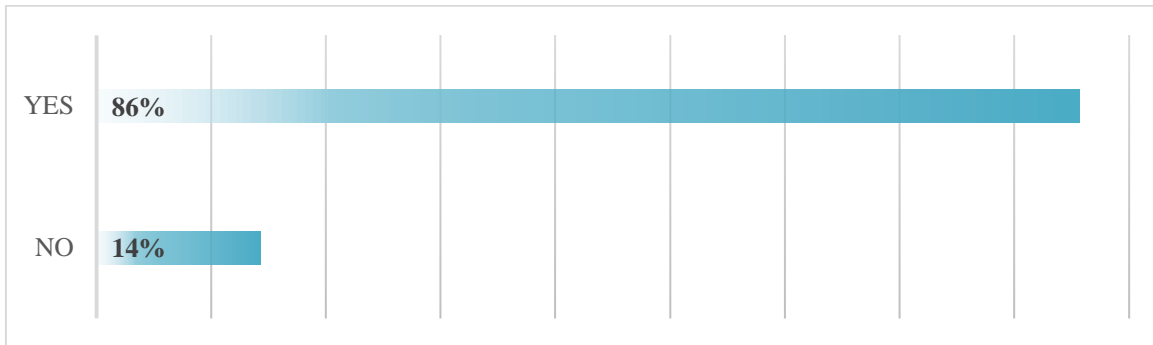


Figure 12. Familiarity with the Cluster Concept

- **Question 3: Are you familiar with clusters stakeholders outside the industrial sectors, such as universities, research centers, vocational schools, national agencies, and public authorities?**

A general understanding of the overall cluster environment and actors outside the private sector is necessary for the development of the cluster. This question highlighted the knowledge level of the companies related to their operating environment, and public sector role.

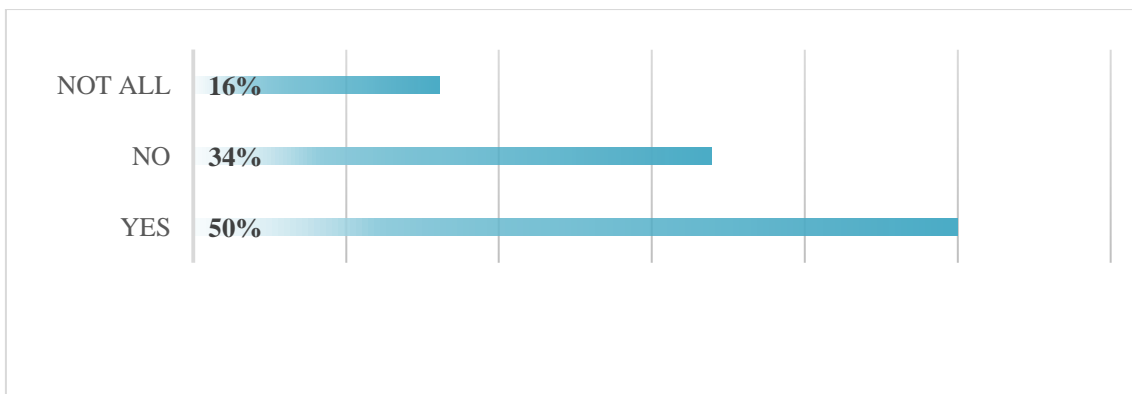


Figure 13. Familiarity with Public Actors

The results presented in the diagram above, show a relatively good result; as 50% of respondents are familiar with all actors outside the private sector; this explains that 50%

of companies are aware and/or have conducted the mapping and identified important actors from the public sectors. 16% of respondents have partial knowledge of public actors, and 34% of the respondents do not have any idea of the actors from the public sectors. This result will lead to an immediate suggestion to cluster managers/presidents to improve their mapping, and improve the identification of actors from public institutions.

- **Question 4: Do you think that cooperation between businesses and public organizations is necessary for the development?**

Despite the fact that 50% (16%+34%) of the respondents in the previous question are not familiar and/or lack the knowledge of all the public actors, 95% of all the respondents believe that cooperation with public institutions is necessary for the development. This also shows a great willingness of the private sector to cooperate with public organizations. Only 5% of respondents think that cooperation between businesses and public organizations is not necessary.

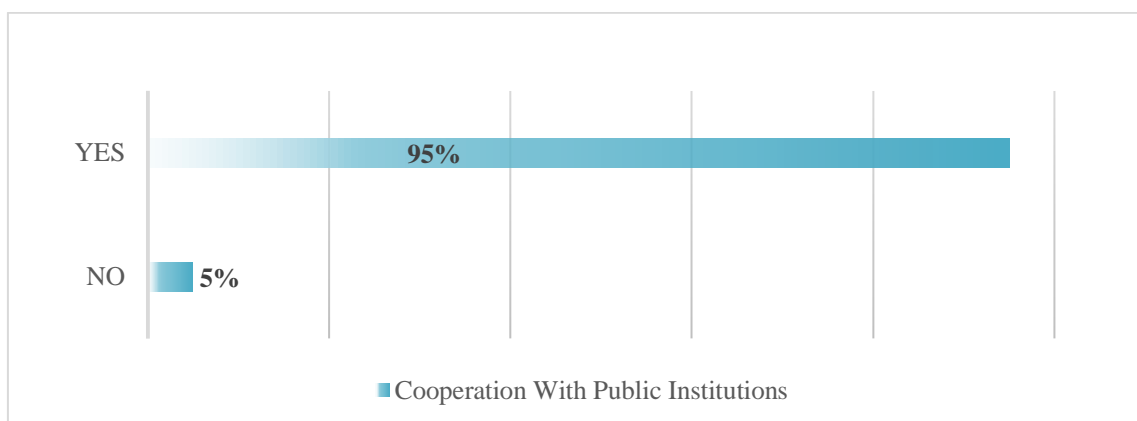


Figure 14. Cooperation with Public Institutions

- **Question 5: How do you see current / future cooperation with competitors?**

In this section of the survey, the author identified a remarkable similarity with the results generated from the interviews conducted with cluster managers in question 5+6. Cooperation difficulties noticed among cluster members by the interviewed cluster managers.

This question endorses the opinion of the interviewed cluster managers, as 50% of the respondents consider cooperation with competitors difficult, and 4% consider it hard. 40% of the respondents consider the cooperation possible and fruitful.

This result leads the author to two assumptions; the cooperation with competitors depends on the lack of trust probably resulted by the failure related to the recruitment of CDA, who is the main responsible of establishing trust among members, and /or to business culture. Several interviewees highlighted the role of the business culture and old business belief and practices as explained within the data analysis of the interview question 5+6. Therefore, this factor needs immediate action plan or must be included as one of the main target that needs further research and/or improvement.

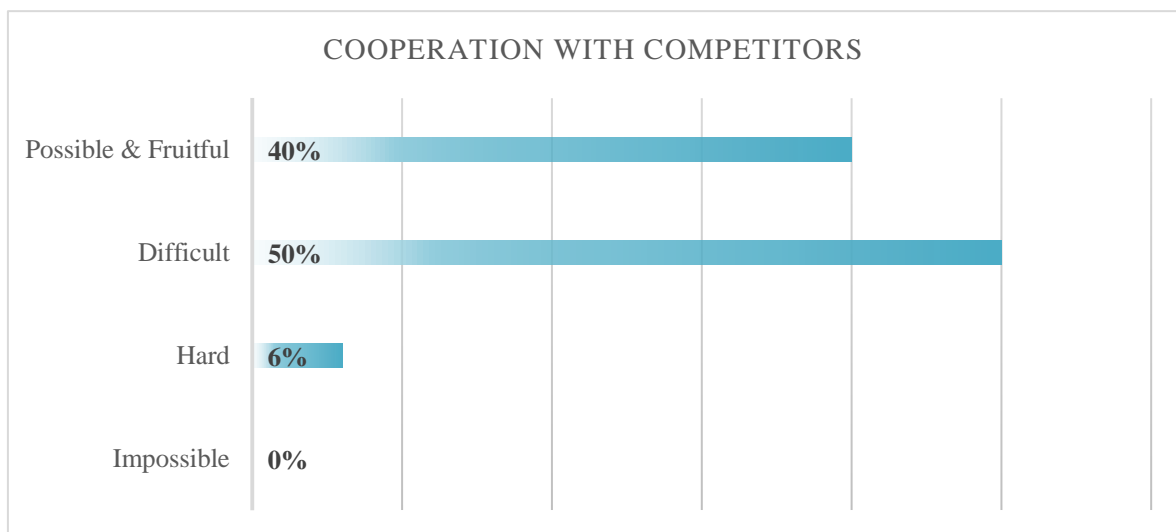


Figure 15. Cooperation with Competitors

- **Question 6: Are you willing to financially commit to clusters? If yes in which area?**

Using this question the researcher aims to investigate the willingness of companies to commit financially, and to which area.

The results show that companies are willing to commit financially to different areas. A particular interest in internationalization and export promotion (30%) is noticed. This finding is in alliance to the results collected from the interviewees, which prioritize internationalization (as can be seen under question 8 of data analysis of the interview section).

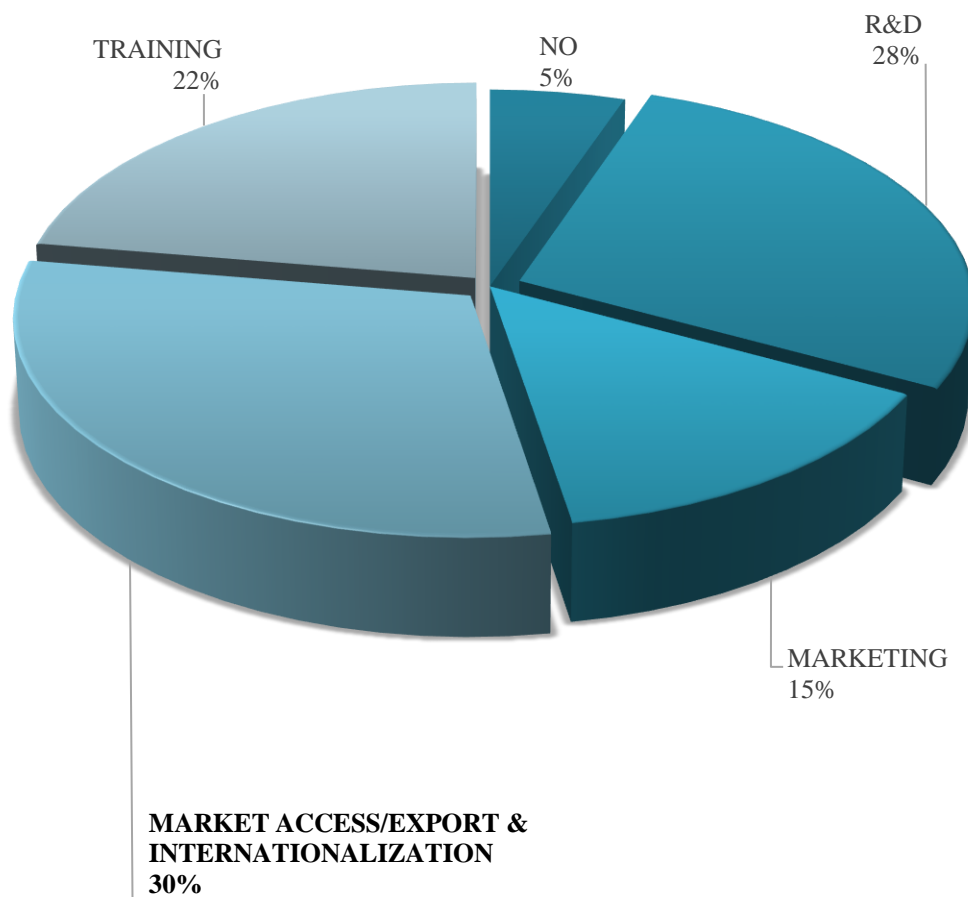


Figure 16. Financial Commitment

Respondents selected training with 22% and marketing with 15%. The results are also in alliance with the interview-collected data section, question 7. R&D is selected as the second most prior area that companies are willing to financially commit to, which has not

been strongly highlighted by interviewees. This finding suggests that cluster managers/presidents must focus on addressing activities/project proposals related to research and development.

Only 5% of respondents showed no interest in financially committing to any type of activities, further research might be required to investigate the reasons behind the lack of financial commitment.

- **Question 7: Ability to share information within the cluster members**

Information sharing is still doubtful based on the collected results; companies are hesitant, or require further explanation on what type of information should be shared within the cluster members. 71% of respondents rated their ability to share information with cluster members by 3, which means it depends on the information.

This is again in alliance with the results of question 5 of this survey, where companies consider cooperation among competitors difficult. In addition, this result is in coherence with the interview-collected data of question 5+6.

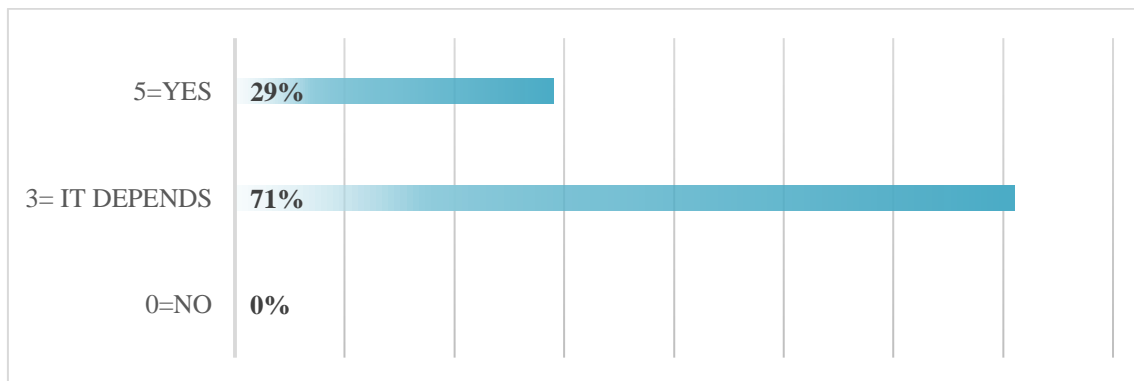


Figure 17. Ability to Share Information with Cluster Members

The chosen metric value of 3=it depends (of the type of information to be shared), led the author to the first assumption related to trust issue highlighted in the data analysis of question 5 of the survey; companies are willing to share information if trust is established. This is only the author assumption, which suggests future studies.

It endorses the cultural issue highlighted by the interviewee in question 5+6 in this chapter, interview with cluster manager section.

- **Question 8: Ability to cooperate with universities**

The ability to cooperate with universities is greatly positive and strong, as 74% of the respondents choose (5=YES) the highest metric value of importance used to measure importance and translated by YES.

This can be explained by the strong presence of universities in all clusters as explained in question (1) on current clusters general information of the interview (previous chapter).

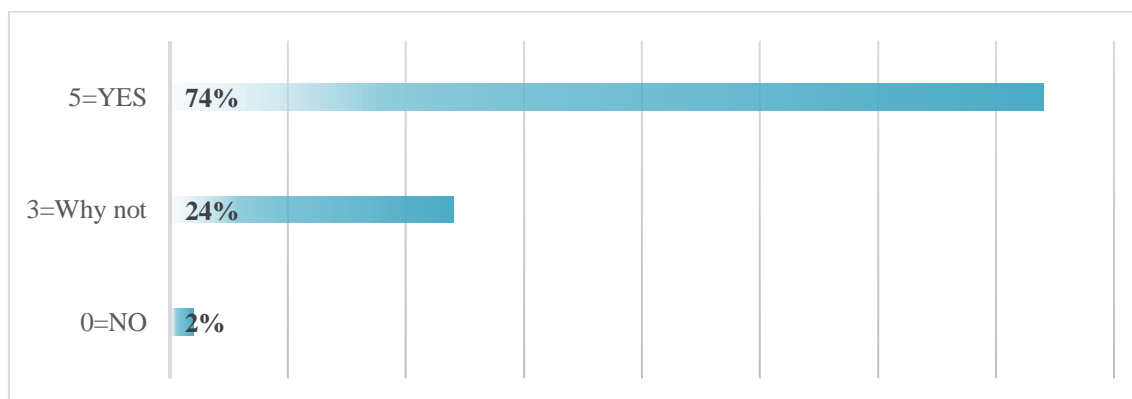


Figure 18. Ability to Cooperate with Universities

- **Question 9: If you are / get involved in a cluster what would be the subject of cooperation or type of activities you would get involved in actively.**

The philosophy behind this question is to identify motivational factors that attract companies to be and/or to remain active. It was purposefully formulated with an elaborated type of activities comparing to question (6) of this survey.

The author noticed that companies tend to prioritize R&D over training when financial commitment needed (as seen within the results of question 6 of the survey). However, when financial restrictions are lifted, companies tend to prioritize training over R&D, one explanation could be that companies view training as an activity rather than as an investments.

One more result which could be observed is that either with or without the financial factor, companies still prioritize internationalization, market access and export promotion over other activities, which matches with the data collected from the interview section in question (8).

The graph below may help the interviewed cluster managers/ presidents and other relevant cluster stakeholders to develop activities that interests companies based on this finding.

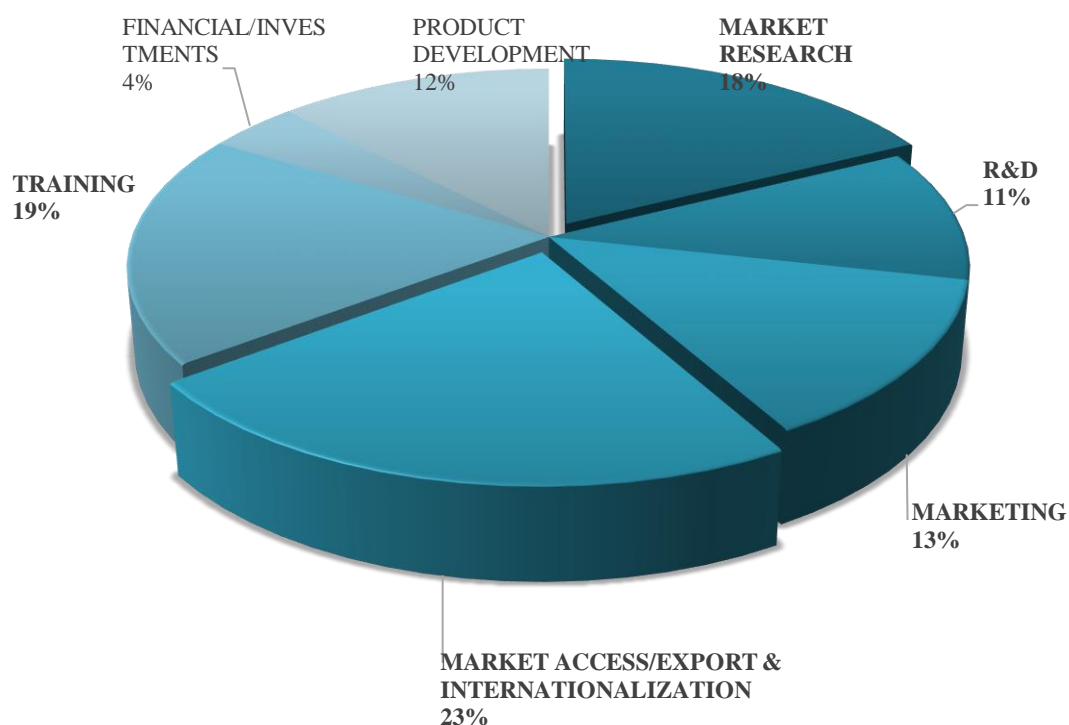


Figure 19. Activities of Particular Interest

According to this result, activities important to companies are as follow (in descending order):

- 1) Market access / export & internationalization
- 2) Training
- 3) Market research
- 4) Product development
- 5) Marketing

6) R&D

It is clear that Tunisian companies are seeking for market knowledge and internationalization. Therefore, clusters must provide the required knowledge and support.

- **Question 10: In terms of development, what do you expect from clusters?**

In this question, expectations are tightly oriented towards the market; the respondents expect market knowledge and internationalization activities from clusters by 62% (30% Internationalization + 32% Market research)

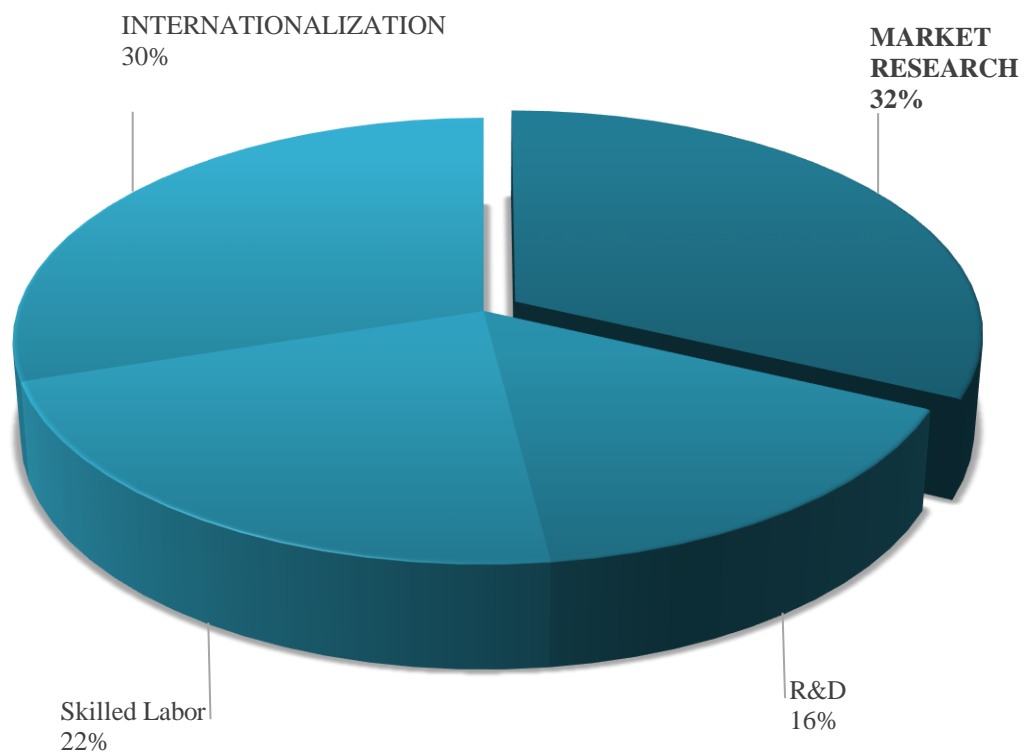


Figure 20. Expected Outcomes from Clusters

This is in alliance with the PESTEL analysis conducted in chapter 3, where the author explained the failure of the Tunisian economy to increase its exports since the revolution.

It can also be understood that the noticeable focus on internationalization and exports by the majority of the respondents, is in alliance with question 1 of the survey, where the author highlighted the remarkable number of participants from export-oriented companies.

However, in terms of development, companies are also expecting clusters to improve and upscale the labor force (According to 22% of the respondents). This is also in alliance with the Social environment part conducted within PESTEL analyses (Chapter 3), where the author highlighted the mismatch between the labor markets and skills produced by the educational institutions. This part of the result preaches for enhancing cooperation between private sectors and educational institutions. This assumption can be supported by the positive response rate collected in question 4 and 8 of the survey as well as question 5+6 of the interview.

32% of respondents chose market research. This led the author to highlight the companies' need for market knowledge and analyses that can assist companies to better understand market trends and opportunities related to market access.

In the end, these expectations could be transformed into objectives that need to be addressed through an action plan.

7.3. Summary of the Data and Suggestions:

Since the aim of this thesis is to study the overall cluster environment, the commitment level of companies and their ability to work within cluster framework, in order to identify the best practices that can contribute effectively to build strong and competitive clusters. The research outcomes led to several interconnected results

To summarize the results that emerged from the collected data, and the deep research made on clusters in Tunisia, it is necessary first to highlight that cluster concept introduced 7 years ago in the country through a Top-Down cluster initiative. Since 2012, the author noticed a growing interest in the cluster concept, resulted up-to-day 16 established clusters with a total number of 298 members, actively involved in clusters and working on different development projects

The cluster concept is relatively growing at unprecedented pace, attracting companies and public actors. The graph below produced by the author to present the growing interest on clusters, and to give a brief overview on their initiative background for further related studies on cluster development in Tunisia.

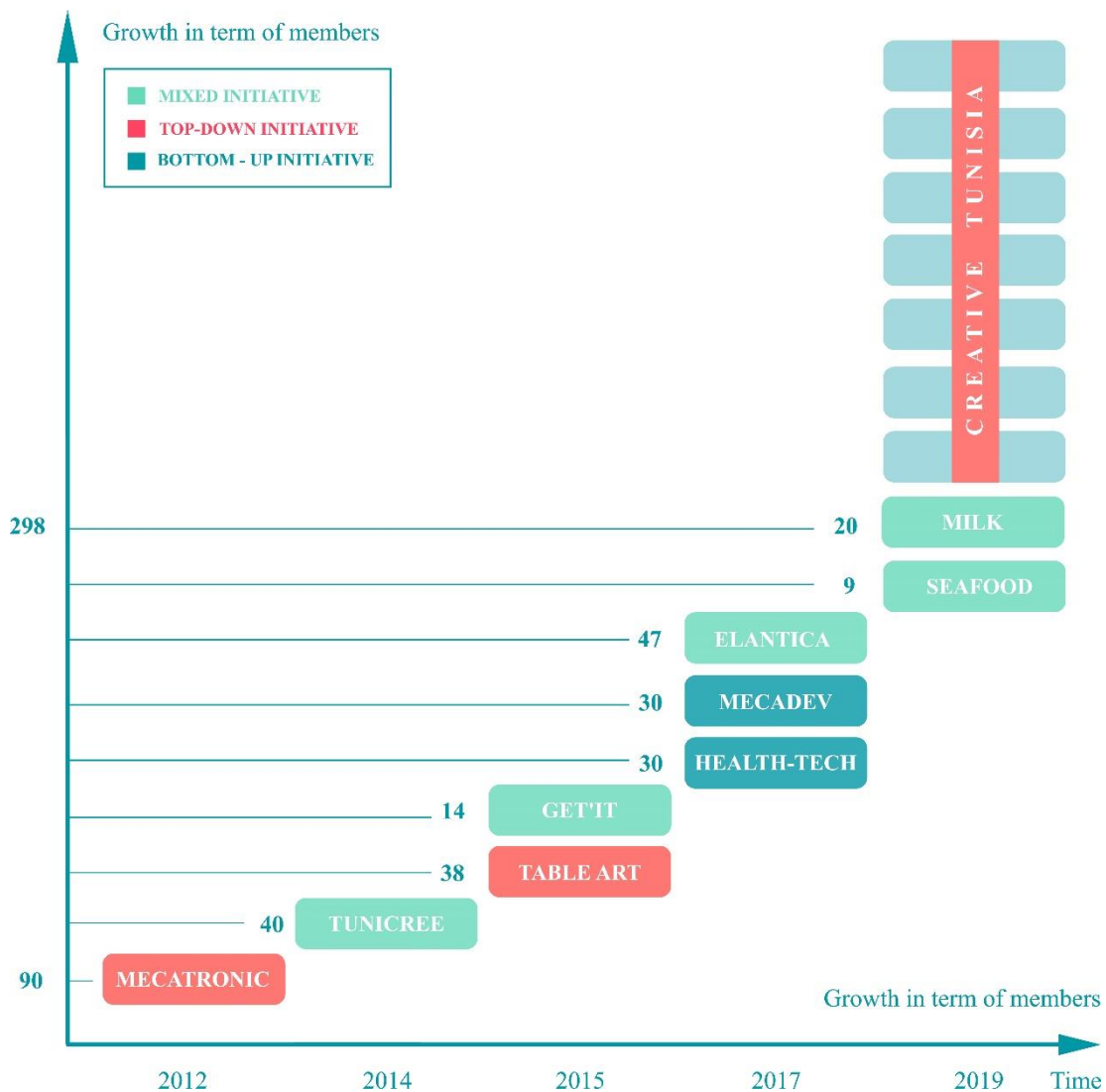


Figure 21. Growth of Clusters in Tunisia

The growing phenomenon of clusters in Tunisia requires several structures related to governmental policies, training, and financial support, highlighted by cluster managers, companies and others.

The overall operating environment of clusters is relatively difficult, dominated by a lack of legal structure and limited resources. The government and influential support organization such as UTICA must act accordingly to set policies that promotes cooperation between companies, educational institutions, research agencies, and social intermediaries to create a favorable environment and conditions for cooperation.

Companies, public authorities, and other public-private institution must recognize that they are all part of the economic development and each one of them have a significant role to play. This study shows that cooperation between all actors need to be improved through the intensification of communication.

Moreover, current clusters and future clusters must recognize the important role of the CDA, allocate necessary resources to cluster management training and costs related to the recruitment of cluster managers to avoid conflict of interest that may arise in the future between members and current clusters' president (as explained in question 3, cluster manager section)

The recruitment of cluster manager is an important key for establishing trust among members and provide availability for full-time work dedicated to serve cluster members and deliver results related to their goal fulfillment (as mentioned in theoretical framework chapter 4). Based on the work experience and knowledge in the field presented in chapter 5 of this paper and the certified training in clusters and cluster management the author suggests an immediate action plan for all clusters to mobilize necessary resources related to cluster management training and study visits to successful clusters internationally. Training may help generating good clusters and cluster managers, offered by certified European institutions based outside Tunisia. Clusters and public authorities must cooperate among themselves to efficiently generate resource to cover costs related to training. Further studies are recommended to identify the managerial skills of facilitators and CDA that suits the Tunisian business culture and mind-set.

Despite the fact that cooperation and ability to share information between competitors is relatively difficult, companies' willingness to work within clusters is observed greatly, with a noticeable ability to cooperate with universities and ability to invest in market research, internationalization and R&D (as described in the previous section question 6 8

and 9). It is suggested that companies must learn to trust each other and improve cooperation among competitors and cross-sectorial clusters to reach the expected results.

The private sector and public actors tend to prioritize internationalization and market research over other activities.

The recognized given nature of the economic, political and social factors (PESTEL chapter 3) influenced the overall economic growth. Therefore, companies expect results from clusters that are in accordance with the improvement needed to tackle these factors, which explains the growing interest on cluster concept. Every current/future cluster must address the following activities described in the graph below and presented in question 10 of the previous section



Figure 22. Activities of Particular Interest

It was also noticed that the environmental issue is still neglected by clusters, which led the author to suggest immediately an action plan that addresses these issues and transform it to opportunities, as it can generate profit and offer better business and social environment.

Information collected through the interviews and the survey revealed the reliance on UTICA to play a major role to invite public authorities to set the necessary reforms needed throughout the implementation of cluster concept in Tunisia.

It is also highly recommended to avoid top-down initiatives, and to establish clusters based on funds availability. Clusters must be born naturally and learn how to generate resources that sustain their existence, afterwards mobilizing funds for well-defined projects.

The author believes that there are several other potential clusters that will be born with time, such as the gaming, media, robotics, healthcare, furniture, fashion and education clusters, some clusters with close similarity to other clusters must merge into one cluster; this is possible only if mapping and management will be conducted properly to identify and deliver final objectives.

8. CONCLUSION

The aim of this thesis is to study the overall cluster environment in Tunisia, the commitment level of companies and their ability to work within cluster framework. The results/findings of the empirical part of the thesis greatly met the aim of the study. The results generated an in-depth overview of the current situation of clusters, and identified factors that need immediate reforms. The validity and reliability of the results rely on the mixed methods research model adopted for this work, as 10 clusters out of 16 have been interviewed together with 3 actors from the public sector and 81 companies participated in the survey. The great response rate and information gathering from several actors was challenging, but generated an advanced study on cluster development in Tunisia.

The conclusion consisted mainly on suggestions on how and what to address in order to assist UTICA to address main factors crucial to the overall cluster development in Tunisia

The current overall operating environment of clusters is relatively difficult, dominated by lack of legal structure and limited resources. The growing phenomenon of clusters in Tunisia requires several structures related to governmental policies, cluster training, and financial support. Therefore, UTICA should play a strong role to improve the regulatory framework and financial structure by addressing policy makers and public authorities to set the necessary reforms crucial to the overall cluster development in Tunisia.

Current clusters and future clusters must recognize the important role of the Cluster Development Agent, allocate necessary resources to cluster management training and costs related to the recruitment of cluster managers to avoid conflicts of interest that may arise in the future between members and current clusters' president. The role of Cluster Development Agent should not be neglected. Further studies related to the recruitment of cluster manager will assist UTICA and current clusters to define the necessary skills of a CDA. UTICA can suggest to its members to implement properly the cluster development methodology, through informative sessions/ seminars and workshops to increase the awareness of the theoretical framework of clusters and to highlight the role of CDA.

Combining the theoretical framework on cluster initiatives based on the research made by Monika Gawarzynska 2010 on German and European clusters and the empirical part

of this thesis, it is highly recommended to avoid cluster funded initiatives, and clusters that carry behind its initiative political agenda. The results showed that top-down initiative did not sustain their existence and faced several issues after the funding has ended. Therefore, it is highly recommended to avoid top-down initiative. Clusters must be born naturally and learn how to generate resources that sustain their existence. Tunisian companies must initiate the cluster formation and take the lead.

The bottom-up and mixed cluster initiative can offer opportunities not only for the industry to improve its overall performance, but also for the Tunisian government and its policy makers to establish trust and be part of the change, by supporting firms and clusters through increased communication.

Clusters must address activities of particular interest expected by companies to attract new members. It is highly suggested to properly conduct cluster diagnosis and mapping that will help clusters to set clear objectives related to companies' expectation, and needs.

In a political environment ravaged by politicians thinking more about the elections and numbers they can show, and do not care about creating a real economy in the country. The private sector must behave differently, reshape the dynamics of the industry, define the necessary reforms, use available resources and learn how to work towards a common goal. Historically the Tunisian industry competed with each other in the internal market, in short-term this would be acceptable, but in the long-term, this will not serve anyone. Therefore, in order to find a position within a highly competitive international market, companies must learn and commit to work together and carry common objectives to address the international market.

Companies, public authorities, and other public-private institutions must recognize that they are all part of the economic development and each one of them have a significant role to play. This study shows that cooperation between all actors need to be improved through the intensification of communication where UTICA should play a major role to link all actors and bring them to work on common goals important to the overall economic development.

Expertise within the Cluster Development field is highly needed in Tunisia; this need could be transformed into profitable business, offering cluster diagnosis expertise, mapping tools, cluster management training and other related services to the private and public sectors in the country.

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APENDECIES

APPENDIX 1

Interview-Group 1:

Introduction of the research topic

Name & Last name of the interviewee

Questions:

- 1) Name of the cluster, and general information of clusters: such as number of the cluster' members, and legal form
- 2) Background and reasons for establishment.
Why a cluster? What is the general understanding and knowledge about clusters approach and/or what are the reasons behind the establishment?
- 3) Do you have a Cluster Manager/CDA or cluster facilitators?
- 4) Have you conducted a cluster Mapping, SWOT or PESTEL analyses before or during the establishment phase?
- 5) How do you see cooperation between the cluster and the public institutions?
- 6) How do see cooperation between companies?
- 7) Have you prepared a roadmap with clear objectives and action plan? and what are your current activities/projects?
- 8) How do you value Internationalization and export activities?
- 9) What is the relationship between UTICA and the cluster? and how do you see the role of UTICA within the cluster?
- 10) What are the challenges and strengths of the clusters?

APPENDIX 2

The Survey Questions:

Q1: The Company I represent belong to (Future) Cluster

- Environment Energy and Renewables
- Health Care
- Textile/Fashion
- ICT
- Electrical
- Mechanical
- Civil Work / Construction
- Education
- Food
- Handicraft/Artisanal
- Other

Q2: Have you been involved in any type of cluster activity/projects/ work?

- Yes
- No

Q3: Are familiar with Cluster stakeholders outside the industrial sector? Such as universities, research centres, vocational schools, national agencies, and public authorities...

- Yes
- No
- Not all of them

Q4: Do you think that cooperation between businesses and public organizations necessary for the development?

- Yes
- No

Q5: How do you see current / future cooperation with competitors?

- Hard
- Difficult
- Impossible
- Possible and Fruitful

Q6: Are you willing to financially commit to clusters? If yes in which area

- No I'm not committed financially contribute in any activities
- R&D
- Marketing
- Market access/ Export & Internationalization
- Training

Q7: Ability to share information within the cluster members

- 0= Not at all
- 3= It depends on the type of information
- 5= Yes / why not

Q8: Ability to cooperate with universities

- 0= Not at all
- 3= It depends on the type of information
- 5= Yes / why not

Q9: If you are / get involved in cluster what would be the subject of cooperation or type of activities you would get involved actively? Rate the activity 7=very important – 1=Less important

R&D	1	2	3	4	5	6	7
Market research	1	2	3	4	5	6	7
Internationalization & Export Promotion	1	2	3	4	5	6	7
Training	1	2	3	4	5	6	7
Financial Aid / Investment	1	2	3	4	5	6	7
Product Development	1	2	3	4	5	6	7

Q10: What do you expect from clusters?

- R&D
- Market information and access
- Skilled labour force
- Internationalization activities

APPENDIX 3

The interview Group 2

- 1) What is The Task force?
- 2) How do you see the governmental role within cluster development
- 3) Do you have any relationship with current clusters?
- 4) Do you have any relationship / cooperation with UTICA

The Interview Group 2

- 1) What is Techno-park?
- 2) How do you see the techno-park role within cluster development
- 3) Why did the techno-park establish the cluster /clusters?
- 4) Could you give an overview about the management of cluster?
- 5) Do you have any relationship with companies?
- 6) Do you have any relationship / cooperation with UTICA?

APPENDIX 4

The interview group 1 in numbers

	YEAR OF ESTABLISHMENT	MEMBERS	LEGAL FORM	FUND	CLUSTER MANAGER	SWOT/PESTEL	ROADMAP	MEMBERSHIP FEES
ELANTICA	2017	47	GIE	NO	YES	YES	YES	YES
MECATRONIC	2012	90	ASSOCIATION	YES	NO*	NO	NO	NO
MECADEV	2017	30	ASSOCIATION	NO	NO	YES	YES	YES
HEALTH-TECH	2017	30	ASSOCIATION	NO	NO	YES	YES	YES
TABLE ART	2015	38	ASSOCIATION	YES	YES	YES	YES	YES
TUNICREE	2014	40	ASSOCIATION	NO	NO	YES	YES	YES
MILK	-	20	NO	NO	YES	YES	YES	NO
SEAFOOD	-	9	NO	NO	NO	YES	YES	NO
GETI	2015	14	GIE	NO	NO	YES	YES	YES
Creative Jamisia	2019	-	NO	YES	YES	YES	NO	NO
Tech-TEXCluster								
PHARMA-IN								
DATES & PALM								
OLIVE OIL								
PRIMERS								
LOGISTICS	-	-			-	-	-	-


INTERVIEWED

NOT INTERVIEWED