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## COMPARATIVE STUDY BETWEEN TWO INNOVATIVE CLUSTERS IN MOROCCO AND ITALY \*

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**Abstract.** The paper takes place in the research field of the European project “Cluster Development Med” (Horizon 2020) focusing on the innovation and technology in the sustainable development area. Authors suggest a comparative study, which allows selecting the most innovative clusters in Morocco and Italy, and making comparisons between and within them. The analysis defines the weaknesses and strengths in the both examined clusters and embrace three dimensions of cluster activity, so called, “Human and Material Resources, Activities, Processes and strategies”. In this paper, we start by giving a global presentation of Moroccan clusters, their history and geolocation. As a first case of study, we focused on the “Maroc Numeric Cluster” (MNC) mainly on its limitations and weaknesses. Thus, in the second case study, we present a cluster that is the beating heart of Italian excellence in the energy sector (Lombardy Energy Cleantech Cluster LE2C). The aim of this paper is to present the LE2C strengths and successful strategies in order to adapt them to the MNC cluster so that it can promote and accelerate again with a successful process.

**Keywords:** Clusters; Maroc Numeric Cluster; Morocco; Italy; Cluster Development Med project; Lombardy Energy Cleantech cluster

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## 1. Introduction

In the Southern Mediterranean countries, as in those of the North, the interest for the organization of the companies in clusters was born from the awareness of the intensification of competition on the international scale and the exhaustion model based on relative advantage represented by cheap labor. Complementary policies of attractiveness of foreign investments (tax exemptions, adaptation of legislation, provision of developed areas ...) aimed at capturing production segments, initiatives in favor of clusters are part of a logic of competitiveness excluding cost of production (innovation, quality, speed, compliance with standards).

Conscious that the choice of location of companies that are subject to strong competitive pressure is based on an overall analysis of the factors of competitiveness, the countries studied (Morocco and Italy) have begun a shift in favor of a built attractiveness. It is this context that justifies today's interest in clusters and policies organizing synergies between production actors and those of innovation.

Spaces of cooperation and mutualisation, clusters lend themselves to inter-company partnerships both inside and outside their own boundaries. They offer potential for segmented production projects, which can indifferently stage multinationals or SMEs (Small and Medium Enterprises). Trained in exchanges, appreciation of complementarities and respective advantages, the entrepreneurs of these groups are natural candidates for co-productions and co-location. This can result in the networking of territories and localized productive systems, a move that can extend to cluster expansion (Gallego, Calame 2012). The concept of a cluster is born from the observation of the spontaneous tendency of the industrial enterprises to regroup to share advantages related to their proximity and to the nature of the economic relations which are established between them. This phenomenon was analyzed at the end of the 19th century by Alfred Marshall, a British economist who studied booming industrial cities like Birmingham and Sheffield (Marshall, 1890).

These ideas will resurface a century later. It was at the turn of the 1980s, in a context of economic crisis and questioning of the Fordist model of organization, that the district of Marshall was rediscovered by a group of Italian economists (Becattini et al. 1978) who were interested in producer groups in the northern regions of Italy, which were remarkably competitive in their markets. They will designate these concentrations of both specialized and territorialized enterprises of industrial districts. From these first discoveries, economists will not cease to be interested in this notion of agglomeration of companies, commonly called cluster.

Their recognition increased in the 1990s with the work of Michael Porter in which he identifies a number of factors explaining the competitiveness of countries: clusters would be one of them (Porter, 1998). Later, he explains the causes. The combination of competitive and cooperative relationships between co-located firms would lead to better learning, a stronger diffusion of innovation, and thus a greater competitiveness of industries located in a cluster. He therefore will insist on the importance of the proximity of the actors in the constitution of a cluster, preliminary necessary to his phase of maturation marked by the formation of a network that is to say a systemic form of cooperation which promotes the knowledge. However, talking about clusters does not only concern geographical and physical relations, but especially the social and human relationships between a wide range of members such as institutions, universities, research centers and companies, where synergy between the public and private sectors becomes even more important (Monni, Spaventa 2007, 2009; Zemlickiene and al. 2017; Ahmed et al. 2017; Lincaru et al. 2018; Razminienė, Tvaronavičienė 2018; Havierníková, Kordoš 2019).

To promote and stimulate inter-cluster cooperation, especially between North and South, networks of clusters must be formed. The ClusDevMed project already plays a role in networking dynamics. This cooperation offers opportunities to intensify research and technological potential, to improve competitiveness, to support regional

socio-economic development and to strengthen the market placement of new and innovative products. These cooperative approaches often fail due to resource constraints, capacities, instruments and funding. However, there are more than 2,000 Clusters in the European Union covering all sectors and capable of producing a cross-sectoral framework, as well as clusters and related networks in the southern Mediterranean countries, constituting a great potential for clustering transnational (European Commission, 2014).

The ClusDevMed Cluster Development Project aims to create the conditions for strengthening existing clusters in the Mediterranean region, with the support of other EU expertise and policies. One of its aims is to bridge the gap between different actors with the same goals, and find a way to create a common approach to finding a solution to the "food / water / energy" nexus.

## **2. Clusters in Morocco: state of art**

Morocco has embarked on a very ambitious investment program: The investment planned for the major sectors amounts to 5.6 billion euros for the period from 2008 to 2020. However, Djeflat (2012) considers that Morocco's development prospects and the success of socio-economic changes depend on the conditions of socialization and development of the younger generation. As a result, the implementation of a strong public policy for young people regardless of their region, social and material status, gender, education and the nature of their activity has become a pressing necessity. The challenge of this communication is the development of appropriate public policies for the development of innovation in Morocco.

### **2.1. History of Clusters in Morocco**

In Morocco, the first analyses on clusters date back to the beginning of the 2000s. They are carried out by the Directorate of Spatial Planning (Ministerial Department of Habitat), which is responsible for the National Spatial Planning Scheme. Conducted by academics, statistical work and field surveys on Local Productive Systems or LPS have identified about fifty agglomerations of specialized institutions accounting 35% of Moroccan manufacturing employment (Paulette 2014). In this mapping, some activity sectors dominate. In the industrial sector, we find textile-clothing (Tangier, Casablanca, Guercif and Taza), mechanical and electrical subcontracting (Casablanca) and information and communication technologies (Casablanca). In the region of Fez, it is the leather sector and the brassware that dominates, while it is tourism in the Ziz Valley (Courlet 2015; Bouayad, Eddelani 2008). A study conducted by the Department of Studies and Financial Forecasts (DEPF) of the Ministry of the Economy and Finance, converged on the same observation, namely a high concentration of industrial employment in labor-intensive industries such as the clothing and fur industry (32%) and the food industry (16%) (Moroccan Ministry of finance, 2009).

Shortly after the initiative of the Directorate of Regional Planning, the Ministry of Industry, Trade and New Technologies (MCINET) embarked on the path of a policy oriented towards the emergence and support for innovative clusters with high technological potential in the industrial and technological sectors. Such a policy in favor of clusters is part of a strategic approach by the Moroccan authorities to support the dynamism of productive sectors for which plans have been adopted: Pact for Industrial Emergence, Green Morocco Plan for agriculture, Blue Plan for tourism, Halieutis Plan for Seafood, Solar Plan, Wind Plan....

Adopted in 2006, the Emergence Pact sets the strategic objectives of the country's industrial policy by targeting "the key sectors for which Morocco have competitive advantages and which represented 70% of industrial growth until 2015". The Industrial Emergence Pact also provided for the creation of sector-based Integrated Industrial Platforms (2IP). Two of them are intended to accommodate automotive companies and one for the aviation industry. Projects to open training centers (four institutes of the automotive trades, an institute of aeronautics

trades) were also intended to promote the development of these industrial sectors. At the same time, support schemes for entrepreneurship and innovation have been decided to encourage private initiative.

Launched in 2009, the Innovation Strategy called the "Morocco Innovation Initiative" complements the Emergence Pact. Its medium-term objective is to "position Morocco in the club of technology- producing countries, to allow the emergence of a high value-added economy but also to strengthen the image of Morocco at the international level and its attractiveness for investments. In the longer term, it is a question of preparing growth relays that would become vital for the national economy ". This strategy is accompanied by quantified objectives: the production of 1000 Moroccan patents and the creation of 200 innovative start-ups by 2014. The promotion of clusters corresponds to one of these main projects.

In April 2014, a new strategy was launched, the Industrial Acceleration Strategy for the 2014-2020 period, aimed at the emergence of efficient ecosystems. Its objective is to "boost" high-performance ecosystems in order to form complete value chains in Morocco.

Since COP 22 (Conference for Climate Change in 2016) the notion of the cluster has become more common in Morocco. Several organizations have been created to promote some sectors and to change the economic and industrial situation of the country. These clusters act on different axis: numeric, environment, industrial and social. Several incubated projects follow the strategy of the different clusters (mobile application, E-learning ...)

## 2.2. Different clusters in Morocco

Being an emerging country, Morocco is trying to attract large contractors to outsource allowing growth for the country. As a result, it was necessary to strengthen the industry / training link and stimulate inter-firm cooperation in innovation for a certain attractiveness and competitiveness. Several clusters were created.

The following table 1 lists the most recognized Moroccan clusters in order of seniority (MCINET, 2019).

**Table 1.** Moroccan clusters

Cluster Name	Localisation	Release date	Sectors	Status and Financing
AHP	Agadir	2009	Halieutics resources	Public
MNC	Casablanca	2011	ICT- Information and Communication Technologies.	State subsidies during the first 3 years, then self-financing obligation
CE3M	Mohammedia	2011	Electronics-Mechatronics	State subsidies during the first 3 years, then self-financing obligation
MENARA	Marrakech	2012	Agribusiness - Cosmetics	Association created with state funding for the first 3 years, then self-financing obligation
EMC	Casablanca	2013	Renewable energy and environmental services	Non-profit organization
C2TM	Casablanca	2013	Textile- Clothing	Non-profit organization
MDC	Casablanca	2014	Textile- Clothing	Non-profit organization

CISE	Casablanca	2014	Environmental Services	State subsidies during the first 3 years, then self-financing obligation
Solar Cluster	Casablanca	2015	Energie renouvelable et services environnementaux	Launched by masen, through the financing of 5 innovative projects
AgrInnov Cluster	Meknes	2016	Agrobusiness	MedZ in partnership with the Ministry of Agriculture
CHTC	Casablanca	2016	Textile	Ministry of Commerce and Industry and membership fees about 10% of the budget funding.

*Source:* formalized with secondary data collected on the clusters' websites

➤ **Haliopolis Park**

The AHP cluster was designed to support the development of companies operating in the fisheries sector through the promotion of joint actions to increase their performance in national and international markets, through research and innovation.

Agadir Haliopole is a cluster and a competitiveness cluster serving the fishing sector and the seafood processing industry. It has been created to foster the development of in-depth cooperation between fishermen, industries, laboratories, research institutions and training on operational objectives allowing players to compete in the global market and respond to changes in the sector (Agadir-Haliopole, 2019).

➤ **MNC-Cluster**

Morocco Numeric Cluster is a public / private mixed governance structure comprising several actors: State, Large companies, SMEs, education and research operators and aid and financing organizations with the ultimate goal of bringing innovative projects to the fore. And with high added value in the 4 niches of ICT excellence of the Cluster namely: Mobile services, security, electronic banking, numeric rights, multimedia and software packages (MNC, 2019).

➤ **CE3M-Cluster**

The Electronic, Microelectronic and Mechatronic Cluster of Morocco animate and structure a major area of innovation and specialized skills in Electronics, Microelectronics and Mechatronics. The collaborative projects of this cluster are involved in the creation and production of products and services that can stand out at the national and international levels, and meet the innovation needs of SMEs and Major Moroccan and foreign clients. This Cluster also develops industry-research-training partnerships, nationally and internationally, in the Electronics, Microelectronics, Railways, Aeronautics, Automotive, Medical, Energy and all integrating electronics industries sectors.

The objectives of the CE3M are to promote innovation, strengthen the Moroccan industrial potential in the Electronics sector, create the appropriate environment for the emergence of high value-added activities by bringing together the various actors around structuring projects (Universities, Laboratories, technical centers, major contractors, SMEs / SMIs, institutions ...) (CE3M, 2019).

➤ **MENARA-Cluster**

The MENARA cluster "Marrakesh Exclusivity Network for Advanced Research in Art's living" is a Moroccan association specialized in the agri-food and luxury cosmetics industries.



Its ambition is to enable it to increase its competitiveness and seize opportunities for development of international markets by focusing on innovation and the development and visibility of the Moroccan agri-food and cosmetics industry on an international scale (MENARA-Cluster, 2019).

➤ EMC-Cluster

Energy Efficiency of Building Materials is the first cluster in Morocco on the theme of energy performance in buildings. It is a non-profit association that was founded in 2013. It is supported by the Ministry of Industry, Trade, Investment and Numeric Economy (MICIEN).

A program contract was signed between the MICIEN and the EMC Cluster in October 2014, committing the cluster to carry out an annual action plan and respond to certain indicators.

The EMC Cluster has set itself the goal of pooling skills in the field of energy efficiency of building materials, notably to: optimize the energy consumption of companies specializing in the building materials industry, improve the competitiveness of the building materials industry building materials industry by providing innovative solutions in terms of energy efficiency and promoting collaboration between companies in the building materials industry (EMC-Cluster, 2019).

➤ C2TM-Cluster

The Cluster of Moroccan Technical Textiles was created in 2013. Founding members include companies, public and private institutions as well as educational and research institutions. The main purpose of the Cluster is to position the Moroccan companies' offer in high-value technical textile sectors, and to stimulate innovative collaborative projects in this field.

Among the axis selected: Improving the competitiveness of member companies through innovative products with high added value in the technical textile sectors, capturing a share of the internal market and gradually moving towards exports (C2TM-Cluster, 2019).

➤ MDC-Cluster

The Moroccan Denim Cluster (MDC) is the result of collaboration between the Moroccan Association of Textile and Clothing Industries (AMITH), and the Ministry of Industry, Trade, Investment and Industry and also Numeric Economy (MICIEN).

The MDC is a non-profit association, which brings together a large number of companies and organizations whose activity is linked to the sportswear and denim sector, including weavers, clothing manufacturers, dishwashers and accessories manufacturers, training institutions for textile trades in Morocco (School of Textile and Clothing Industries / Casa ModaAcademy), the textile and clothing technical center (CTTH) and promotional organizations (MOROCCO EXPORT) (MDC-Cluster, 2019)

➤ CISE- Cluster

The Industrial Cluster for Environmental Services Morocco is a group of companies and public institutions, higher education and research with activities aimed at finding alternatives to polluting production processes. It was created in 2014.

CISE Morocco is part of a context where the industrial sector of environmental services meets a clear rise. Today there is a clear need to prevent and eliminate industrial pollution, but also to conduct an optimized management of the stock of natural resources. It is a real challenge for companies that would allow the development of new production materials with, by extension, the creation of new markets and green enterprises (CISE-Cluster, 2019).

➤ Solar Cluster

As an association of actors in the solar sector, the Solar Cluster is an innovative platform that works to develop a competitive solar industrial sector, in line with the objectives of the NOOR Solar Plan. Its objective is to contribute to capacity building and development of industrial skills in the fields of solar and green technologies.

Since its launch in 2014, the Solar Cluster has contributed to the creation of synergies between public and private actors, entrepreneurs and researchers, with the aim of fostering the emergence of a competitive solar industrial sector in Morocco, particularly through the development of skills and strengthening the industrial capacity of Moroccan clean technology players (SolarCluster, 2019).

➤ AgrInnov-Cluster

The AgrInnov Cluster is an association that brings together and animates a network of economic actors, institutions and research and training centers, in the biotechnology and agro-resource processing and non-food processing sector.

This heterogeneity of actors has been evolving since 2015 within the framework of a vision resolutely focused on innovation development, and creation of collaborative projects with strong development potential in the agribusiness sector.

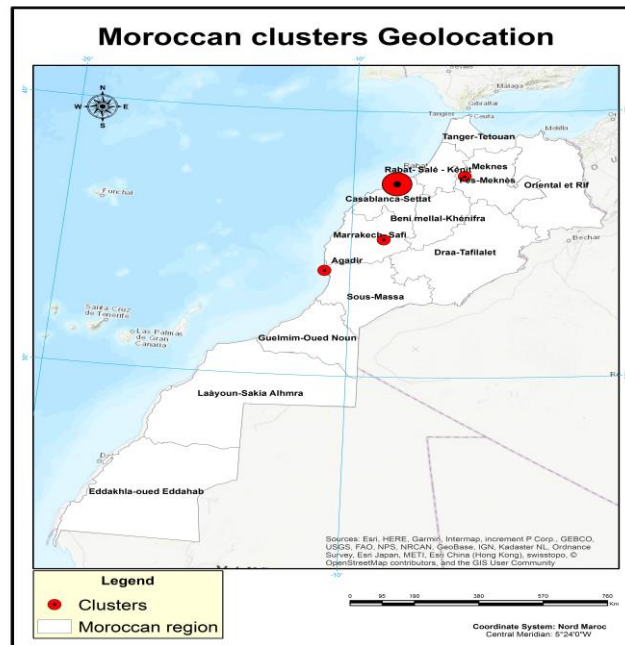
AgrInnov identifies expectations, identifies good practices, coordinates actors and pools resources to enable the deployment of innovative projects and the provision of concrete solutions for the performance and competitiveness of the agribusiness sector, at national and international level.

Its ambition is to give the Moroccan product a label of excellence emanating from its originality and its benefits, to improve the competitive positioning of its members, by allowing them to develop, and to conquer international market shares in their fields (Agrinnov, 2019).

➤ CHTC-cluster

The Casablanca Home Textile Cluster was created in 2016. It brings together 120 companies representing 70% of the national production of Home Textiles for an annual turnover of more than 3 billion dirhams and employing 22,000 people. The cluster is supported by the European Union, the Italian Agency for Development Cooperation, the Union for the Mediterranean and the United Nations Industrial Development Organization (UNIDO). On the Moroccan side, the cluster is supported by powerful companies, including AMITH, public institutions (Morocco SME, Morocco Export) and research educational institutions (ESITH ...) (Tazi N., 2019).

Moroccan clusters are located in different regions as shown in the following map:



**Fig. 2.** Moroccan Cluster Geolocation



### 3. First case study: Maroc Numeric Cluster

The "Maroc Numeric 2013" strategy (MN2013), adopted by the Moroccan government in 2008, pursued some of the objectives set by the MN2013 and gave the growing importance of the Information Technology (IT) sector. It represented 7% of GDP, 25% of growth and 60% of employment. This strategy focused on extending the use of information and communication technologies (ICT) by the public, government and companies from 2008 to 2013 through an investment of 5.2 billion DH. The objective in terms of human capital was to reach 30000 profiles trained in IT and 3000 profiles trained in offshoring (IT) as part of the emergency plan until 2013 (MNC, 2019).

The MN2013 strategy was structured around three strategic priorities:

- Make high-speed Internet available to citizens;
- Bringing administration closer to the needs of the user through an innovative e-government programme;
- Encourage the computerisation of SMEs (Small and medium-sized Enterprises) and develop the sector by providing support to local actors.

MNC sets out five major agreements:

- Develop the cluster and its ecosystem;
- Develop innovative projects;
- Mobilize the TIC sector skills better;
- Facilitate access to the Moroccan market for innovation;
- Connect Moroccan innovation to over the world.

It also sets out four strategic programmes, including:

- Axis 1: Social transformation;
- Axis 2: Implementation of user-oriented public services;
- Axis 3: Computerization in small and medium enterprises (SME);
- Axis 4: Development of the IT industry.

Futhermore; it includes two accompanying measures: human capital development and Numeric confidence. The financial resources allocated in this strategy are about 5.19 billion DH. The budgets for axis 1: "Social transformation" and axis 2: "User-oriented public services" represent almost 83% of the overall budget.

#### 3.1. Weaknesses and limitations of the MNC cluster

The Court of Auditors carried out an evaluation of the MN2013 strategy in 2014 (Benbrahim 2019). It thus examined the progress review, and evaluated the modes of its governance, its management and assessed the achievement of the strategy's objectives through the analysis of its indicators by comparing them with international ICT indicators. This resulted to the gaps and dysfunctions in the identification of the ideal strategy supposed to take Morocco out of numeric weakening. Rarely has a national strategy been so criticized.

The financial package was limited to determining the overall amount allocated to each of the 4 axis without presenting the funding sources. No budget has been set aside for the implementation of the first accompanying measure "human capital". The national information and numeric economy technologies Council (CNTI) has not been established. There is a general delay in the implementation of all actions and projects planned. The progress report; as at 30 June 2013; of the 4 axis and 2 accompanying measures of MN2013 shows that the latter is lagging behind in the implementation of all the actions and projects planned.

Indeed, only 11% of the actions programmed for the first axis have been achieved. The equipment projects for teachers and students in engineering schools and universities, namely Nafida and Injaz, have been successfully implemented. However, the equipment in primary, middle and high schools (GENIE Plan) has been delayed with a production rate below 71% in multimedia suitcases (VMM) and 24% in multimedia room equipment. Satellite schools with almost 1 million pupils (nearly 13451 in total) remain excluded from GENIE's scope of action. In addition, 20% of the initial projects were cancelled or have never started. This is the case for the implementation

of a University information system. This is the case of the project to promote low-cost equipment and the GENI-SUP project to set up an information system in Universities. The strategy has, however, gained points in Internet penetration in homes and its democratization. The rates have thus increased from 14% to 39% between 2008 and 2012. However, it maintained significant disparities between urban (51%) and rural (16%) (Court Of Auditors, 2014).

For the second axis, the progress report on the 69 projects envisaged at E-Gov level shows that only 36% of the projects were operational and 3% were in progress, while 38% of the programmed projects were late or problematic, while 22% did not start. Of the 13 projects identified as "Must have" priorities by the strategy, only the electronic certification project has been implemented. The "e-consulat" project was in progress. Of the 11 overdue projects, the local authorities' information system had not yet been launched. E-Gov services and projects carried out reached 42 out of the 89 planned.

The 3rd axis of the "MN2013" plan was divided into 9 actions. The assessment of their implementation shows that only two of the planned actions were carried out (22%), five were in progress (56%), one action was blocked (Rawaj TI), while the training action for correspondents and accountants was not achieved. A total of 295 companies out of the 3000 targeted companies (10% of the objective) benefited from "Moussanada TI" to equip themselves with professional information systems. With regard to the "Infatih" programme, 3040 SME managers obtained the Numeric licence, compared with the target of 10,000 beneficiaries (30%).

For the implementation of the fourth axis, 14 actions were planned and divided into 15 projects. The results of their achievements show that only 4 actions (27%) were carried out, 9 were in progress (60%), while two actions did not start. The main actions implemented are: the Moroccan Innovation Centre, Maroc Numeric Fund, Technopark Casa and Cluster TI. This strategy envisaged 5 actions of human capital measurement, three of which have not started yet, that are: The implementation of a mechanism to manage training plans; the development of PPP (Public, Private, and Partnership) training initiatives and the improvement of the employability of second cycle university graduates. Of the five indicators set for this axis, only one was monitored. This is the turnover of IT offshoring which has increased from 0.76 billion DH in 2008 to almost 2 billion DH in 2012 but still remains far from the 6 billion DH targeted. In terms of the "human capital" support axis, 3000 IT offshoring profiles were created as part of the emergency operation, but information is lacking to assess the progress of the training of another 30,000 profiles that the strategy has defined as needs of the IT sector.

The MN2013 strategy has been defined as priorities, initiatives and actions. However, it has not been complemented by sectoral strategies defining the detailed content of projects and actions as well as the processes for achieving the established objectives. Similarly, and despite its importance; the accompanying measure relating to "Human Capital" has not benefited from the development of a specific strategy detailing its content and the process of implementation of its various actions as well as the definition of target populations.

No prioritisation between the different actions and projects was observed. However, such an approach is necessary to ensure coherence and synchronization in their implementation. This is the case of the "GENIE-Sup" programme, which has been delayed, compared to the time-limited "Nafid@" and "INJAZ" programmes and has only benefited to a limited number of teachers and students.

Some strategic and structuring projects for the administration and users could not be implemented due to the unclear vision for implementation. The case of projects relating to the unique identifier of citizens and the unique identifier of companies was mentioned.

### 3.2. Strategy proposed for the period 2015-2020

After the construction period (2011-2014), a development and acceleration phase (2015-2020) has been assigned to the MNC. The table 2 below presents the observations made in 2014 and the discussions held to achieve the fixed objectives for the two periods:

**Table 2.** MNC Strategic Plan in 2015-2020

	2011-2014 Report	2015-2020 Reflections
Projects	Personalized support but difficult to maintain due to the increase in the number of projects. Number of supported projects to be developed in relation to the cluster's ambition	What added value does the MNC project bring to the Moroccan ecosystem compared to other innovation promotion organizations?
Networking	Complex organization and logistics for each new event. Complexity in establishing a common thread over time to which initiatives can be linked.	How can MNC events be made more effective and members more involved in the animation?
Formations	Significant workload for a result that is now uncertain. Audience difficult to gather in sufficient number to make the sessions attractive.	Is training facilitation a legitimate and priority added value for MNC?
Governance	Some structuring governance topics: thematic focus, partnership strategy and international presence	How can MNC's organization be optimized to better meet the fixed strategic objectives?

The MNC's new strategic plan (2015-2020) aims to meet the challenges of the digital innovation ecosystem in the following fields:

- To be based on all categories of companies VSE (Very Small Enterprises), SMEs, and large Accounts, which support Moroccan innovation;
- Be inspired by the development models of other relevant partner clusters;
- To support Morocco's digital development priorities;
- To allow Moroccan R&D (Moroccan association for research and development) to create value through uses;
- To capitalize on the expertise of the MNC ecosystem.

The Ministry (MCINET) defines the expectations towards the cluster which must participate in the digital development in Morocco because information technologies are an important mean for the country development.

The 2020 challenges are based on the following axis:

- To spread the culture of innovation throughout the ecosystem in order to contribute to the development of the country;
- To bring out innovative projects in Morocco through the animation of ecosystem actors;
- To anchor Morocco's leadership in digital innovation in the African continent.

The professionalization of project support and networking are the priorities of the 2020 strategy. To achieve it, it is necessary to focus on market trends and innovation in use through focused thematic commissions, industrialize project support and set up an innovation accelerator as well as an active collaboration between principals and innovative companies.

The new strategic plan aims to meet the challenges of the digital innovation ecosystem, which is focused on 4 thematic areas and 3 areas of added value. The following table 3 shows the MNC structure:

**Table 3.** Thematic poles and axis of the MNC

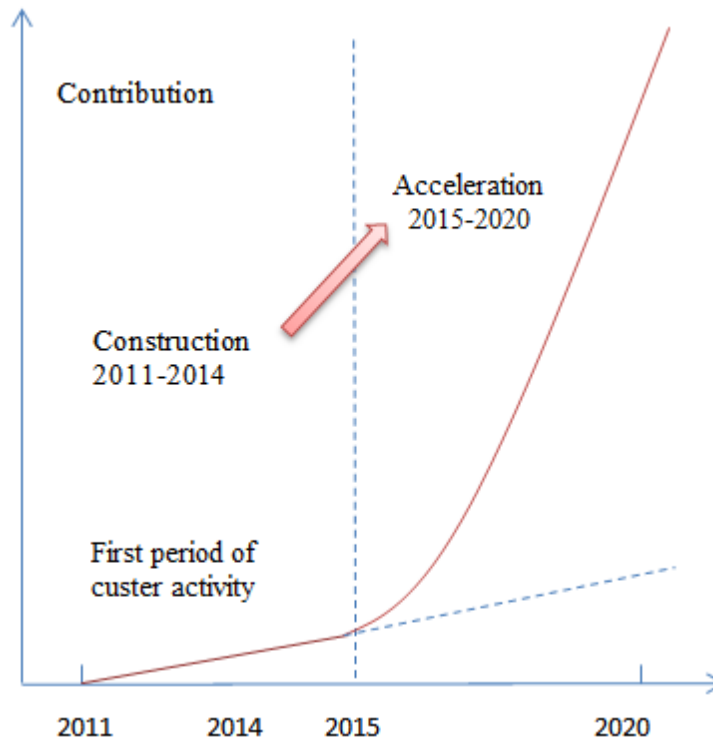
		Axis de travail		
		Projects	Networking and events	Monitoring and knowledge
Thematic Poles	Digital GOV pole	Smart cities, citizens services (health, justice, agriculture...), Open data, Cartography...		
	Mobility pole	Mobile services & applications, connected objects...		
	Trade & Media pole	E-commerce, Digital Marketing, payment methods, Electronic Press...		
	Infrastructure pole	Cloud, Security, Software Publishing, Fiber Plan, Big Data...		

Source: <http://www.marocnumericcluster.org>. Consulted on January 22, 2019

The MNC focuses on the following 3 commitments for 2020:

- Industrialize the support of innovative projects and promote collaboration and innovative entrepreneurship,
- Facilitate market access for Moroccan innovation and connect it to the international market,
- Produce knowledge to support and guide Morocco's digital transformation.

The following figure 2 illustrates the breakdown of the objectives of the 2015-2020 acceleration plan for MNC in relation to the launch period.



**Fig. 2.** Proposed acceleration scenario

Source: <http://www.marocnumericcluster.org> consulted on January 22, 2019

#### 4. Overview of the Italian Clusters

Italy's production system is characterised by the predominance of micro and small firms. However, looking at the production system of Italy only through the lens of business size classes can be misleading because it overlooks the key role of inter-firm collaboration. Industrial clusters are the most notable example of business collaboration. Local clusters are a widespread phenomenon in Italy, especially in the centre and north of the country. Since the 1970s, they have frequently been cited as success stories in the academic debate and in public policy practices (e.g. Piore, Sabel 1984; OECD 2007). Clusters, also known as industrial districts (*distretti industriali*), are local concentrations of SMEs that adopt different specialisations within the various production phases of a particular industry. One of the features associated with their success has been intensive interactions among their constituent SMEs in areas including supply, marketing, innovation and labour use, supported by shared values and norms and local proximity".

In Italy, the most common definition of clusters, or more precisely industrial districts, is provided by the National Statistical Office, ISTAT (Italian statistical office). This classifies a local labour market area as a cluster for purposes of national policy support if it satisfies three requirements: there should be a higher percentage of employees in manufacturing than workers in agriculture; there should be a specialisation in one particular manufacturing industry; and there should be a high concentration of workers in firms with less than 250 employees - all compared to the national average (ISTAT 1997). Regional governments may choose to adopt other definitions of a cluster for their own support programmes, and the two sets of definitions now co-exist. ISTAT currently identifies 156 clusters in the country, which tend to be concentrated in the economically-stronger regions: 42 are in the North East, 39 in the North West, 49 in the Centre, and 26 in the South. These clusters have been traditionally important contributors to Italy's international trade performance. In 2011, the exports of Italian cluster firms accounted for approximately 30% of total national manufacturing exports (Intesa Sanpaolo 2013). Some clusters hold significant shares of world markets, as for example Sassuolo with 27% of world exports in ceramic tiles, Prato with 4% of the textile world market, and Arezzo with 3.5% of world jewellery sales (Fortis, Carminati 2009). The main markets are in Europe, with Germany remaining the key destination. However, emerging economies, mainly China, Russia and Brazil, are increasingly important trade partners, absorbing 35% of the total cluster exports in 2012, compared to 26% in 2002 (Intesa Sanpaolo 2013).

The number of clusters has fallen somewhat since 1991, when some 199 clusters were counted. Some vanished because the number of local labour markets, which underlie the definition of clusters, was reduced by ISTAT in order to increase their size. Others have died out because they no longer met the ISTAT classification criteria. In Padua (mechanical industry) and Udine (furniture), the weight of local business services increased due to the growing importance of outsourcing from manufacturing firms to local service firms. These clusters no longer met the criteria of having a focus on manufacturing. In other clusters, the size of firms increased and thus the criterion of small firm predominance was no longer satisfied. Examples are Sassuolo (tiles) in Emilia Romagna, Florence (leather), Carrara and Pietrasanta (ornamental stones) in Tuscany, Castel Goffredo in Lombardy (tights), and Treviso in Veneto (textile and garments).

There has also been a more recent reduction in the number of firms, total employment and manufacturing employment in Italian clusters in the wake of the global economic crisis. From 2008 to 2010 the rate of growth in employment was -4.8% in industrial clusters and -3.2% in Italy as a whole, while for manufacturing employment the decrease was of -9.1% and -8.8% respectively.

#### 4.1. The second case study: Lombardy Energy Cleantech Cluster (LE2C)

The Lombardy Energy Cleantech Cluster is the only energy and environmental production network officially recognised by the Region of Lombardy, whose traditions and skills are deeply rooted throughout the area. It is a cluster based on the MULTIPLE HELIX model (Peris-Ortiz, 2016), creating an "extended laboratory" where it is possible to develop projects across research, innovation and training. In addition to companies, the cluster encompasses entrepreneurial associations, universities, knowledge and research centres, specialist bodies, public administration and financial institutions. It is active in a wide range of international networks, including the Vanguard initiative, which focuses on advanced manufacturing for energy-related applications in extreme environments and the subject of bio-economy. It was also a founding member of the International Cleantech Network (ICN), a global network of Cleantech and Energy clusters (Cluster Collaboration, 2019)

The LE2C is the beating heart of Italian excellence in the energy sector, with over one hundred companies, generating €23bn and employing 31,000 people across the entire Region. It is Located in Lombardy Region, one of the "4 Motors for Europe" region; second region for Energy production. The cluster has collaborations between SMEs and large companies also intersectoral. It is also able to cover the entire supply chain for the conventional, waste to energy and biomass power plants. It has had a gold certification for its excellent cluster organization, as well as a relevant international presence that presents 70% of members export covering 98 countries.

LE2C MNC sets out five major agreements (Energy Cluster mission, 2019):

- *Promoting systemic action with the local area*

Through collective initiatives facilitating collaboration and the exchange of skills and expertise between companies, research centres and universities, the cluster boost research, innovation and technology transfer by identifying guidelines for research and development for all enterprises, as well as securing the associated funding.

- *Impacting regional policy*

It influences regional policy in order to promote the interests of its associates, interacting with the institutions and actors responsible for setting market regulations.

- *Providing support to companies*

The cluster supports the growth of SMEs, increases visibility of the entire industry in the market and sets up a "recognised" production system, ensuring high quality production based on a value chain approach.

- *Accelerating innovation*

It provides innovative systems, creates a well-structured network of relationships and information exchange in which companies can act as a single strong and united entity, combining competitiveness and cooperation.

- *Promoting internationalisation*

This Cluster supports internationalisation by monitoring markets and encouraging long-term partnerships and collaborations with companies and networks at the EU transnational and international levels.

#### 5. Conclusions: Comparative study between MNC and LE2C

The project started with a mapping of all the companies enrolled in cluster organization to determine each role among the supply chain in the power generation field. The mapping methodology used, which was considered by other clusters/international actors as best practice, consisted in different steps:

- The choice of boundaries: First identify the productive system, then define the companies and the structure of the productive system and finally classifying them in a pyramid.
- The classification of the enterprises by market areas and commissions: classifying them in market areas of the cluster (for example Nuclear Power Plants, Renewable Energy, Hydraulic and Geothermal Power Plants, etc.)



- The organisation of the companies in working groups/commissions: space where common interests and needs of the enterprises are developed for the implementation of joint projects, thanks to the consistency in terms of clients, product and technologies.
- Subdivision of the market areas of the conventional power plant and waste-to-energy and biomass plant in different islands: services and products which characterise the different plants (boiler island, turbine, BOP, treatment and distribution island), in order to identify the joint potentials of the companies.

The final objective is to promote the single supplier to think less in terms of single components' cost and more in terms of finished product's cost. The result of this process is that now the companies can offer together a complete package to the clients, also on a turnkey basis.

For this reason we can say that the Energy Cluster is moving from a supply chain a value chain: the companies members, thanks to the sharing of knowledge, know – how and the Technology Integration fostered by the cluster, can offer an innovative offer characterised by more high quality in terms of technological components and less costs.

They become stronger and more competitive because:

- They operate in an organized network which facilitates communications throughout the entire chain in order to optimize services and final costs.
- They increment their skills thanks to the knowledge shared over the entire production process by uniting competitiveness and cooperation.
- They can exploit advantages deriving from relations with institutions, the world of research, centres of excellence and big clients.

The aim of this paper is to identify and characterize the approaches and strategies for the success of the LE2C with a view to applying them to the MNC cluster, for the success of its 2015-2020 strategy. We chose the MNC because it is considered to be a program that has institutionalized a digital approach in Morocco. The program experienced a rupture in its deployment and difficulties in governance and inter-administration coordination.

For the success of the new MNC 2015-2020 strategy, the cluster must take action to:

- Formalize the process of developing and adopting digital strategies,
- Ensure the mobilization of all stakeholders,
- Define precisely the terms of reference of digital strategy design studies and their deliverables and have them validated by a specialized committee.

It must therefore ensure the prioritisation of objectives and provide an adequate planning through the clear identification of the human and financial resources necessary for its implementation. The latter must constantly monitor Morocco's ICT indicators and its world ranking and work to improve them, particularly for strategic aspects directly related to the competitiveness of the national economy and the development of the information society. The MNC must support the growth of VSEs and SMEs in the market and also provide an innovative system. Finally, the cluster must ensure that the ministries and agencies responsible for implementing the strategies have adequate skills, especially in project management, to enable better control of turnaround times.

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