

Article

EMAS Regulation in Italian Clusters: Investigating the Involvement of Local Stakeholders

Roberto Merli ^{1,*}, Michele Preziosi ¹ and Ilaria Massa ²

¹ Department of Business Studies, Roma Tre University, Via Silvio D’Amico, 77, 00145-Rome, Italy; E-Mail: michele.preziosi@uniroma3.it

² Management Department, “Sapienza” University of Rome, Via del Castro Laurenziano 9, 00161-Rome, Italy; E-Mail: ilariamassa89@gmail.com

* Author to whom correspondence should be addressed; E-Mail: roberto.merli@uniroma3.it; Tel.: +39-06-5733-5813; Fax: +39-06-5733-5797.

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Abstract: The last revision of the EMAS (Eco Management and Audit Scheme) Regulation encouraged a cluster approach to increase the participation of the organizations and to involve local stakeholders in the commitment to sustainability. Our research activity intends to partially fill the literature gap in the field by investigating the Italian cluster approach to EMAS, characterized by the creation of a cluster Managing Committee (MC)—which can receive an EMAS Cluster Certificate—in order to improve the implementation of the scheme. We investigated the effectiveness of MCs actions on different stakeholder categories in the nine Italian clusters with EMAS Cluster Certificate. We present the results of a survey conducted through different stakeholder categories in the considered clusters. The main goals of the investigation are to determine the effectiveness of EMAS Certificate for: local stakeholder involvement, network creation, environmental performance improvement and the increase in EMAS single registration. We find that EMAS Cluster Certificate is perceived as effective in improving environmental performance of the area and enhancing cluster image. Despite the recognition of these positive aspects, few organizations showed interest in EMAS registration because of the costs involved and the lack of incentives available from public institutions.

Keywords: Eco Management and Audit Scheme (EMAS); Environmental Management System (EMS); Italian clusters; stakeholders; survey

1. Introduction

The scientific community has recognized the existence of a strong interconnection between enterprises and their environment. Enterprises have to deal with different categories of stakeholders to maintain their success [1]. These categories can be identified on the basis of the relationship they have with the companies. Clarkson introduced a classification criterion that distinguished primary and secondary stakeholders. The first group is essential to the company's survival (e.g., shareholders and employees), the second is able to influence companies' decisions, but it cannot directly compromise their existence [2]. Companies must effectively manage various pressure groups adopting strategies to respond to diversified needs [3]. Stakeholder theory has evolved from a purely business and economic to a multi-objective approach acquainting companies also with social and environmental issues [4]. The participatory decision-making mechanisms for environmental matters were eventually incorporated into national and international policies [5]. The creation of partnerships between public and private "entities" helped to create a new form of global governance that performed both with multilateral and international agreements, which involved different stakeholder groups in promoting local development practices [6]. Participation mechanisms have been studied, which were focused on methodologies for stakeholders involvement [7,8]. Agenda 21 is the main international reference for the implementation of multi-level sustainable development policies through the involvement of local groups of interest, carrying out a bottom-up approach. Several studies reported instruments available to local government to assess environmental issues and to spread good sustainability practices [9–13]. During the international Summits of Johannesburg (2002) and Rio+20 (2012), substantial changes were introduced to the decision-making approach, in order to facilitate network creation and to enable interested parties to cooperate in promoting activities linked to the Summits' objectives [10].

With the adoption of the Fifth Environmental Action Programme (5EAP) in 1992, European institutions fully recognized the importance of implementing sustainable development models on a local level, involving all the stakeholders in the area. The broader concept of co-responsibility was introduced among stakeholders [7]. At a later stage, in the Sixth and Seventh Environmental Action Programme, the European Commission stressed the importance of citizens and consumers role: main groups of interest should cooperate to create simple tools to inform about the environmental impact of local production available and to increase the knowledge on voluntary engagement tools.

Growing awareness of public institutions, citizens and consumers towards environmental sustainability [14] has significantly increased the pressure on companies pushing to reduce their negative environmental impacts [15,16]. The pressure imposed by external stakeholders as Public Authorities with strict environmental regulation has forced companies to adopt environmental practices [17]. Furthermore, consumers demand products and services aligned with societal and environmental values [18]. In order to effectively meet these issues and to remain competitive on the markets, companies should implement environmentally proactive practices such as design for environment, Life Cycle Analysis, Environmental Management System (EMS) [19].

The adoption of these tools not only allows a reduction of the negative environmental impacts but it also facilitates the improvement of organizations internal management [20]. Moreover, self-regulation allows companies to run specific procedures for environmental improvement on a voluntary basis.

That enables enterprises to adopt flexible strategies in order to effectively respond to market needs and to increase their competitiveness [21].

The main references for the EMSs are ISO 14001 Certification and the European EMAS (Eco Management and Audit Scheme) Regulation [22].

These standards were intended to reduce the proliferation of national regulations that could hinder trade exchanges and disorient consumers [23]. Certification of high quality environmental management allows companies to differentiate themselves positively in the market. In literature, it is recognized that compare to ISO standard, EMAS scheme imposes strict requirements for environmental impacts quantification and asks for greater transparency in information dissemination by companies [20].

There have been several studies on EMAS, its benefits and its costs. The main benefits are the improvement of legal compliance and the enhancement of companies' reputation. More benefits are related to reduced costs for raw materials, waste management and energy consumption [24,25]. Costs for implementing EMS are relatively high, and represent the main obstacle to their diffusion, especially among Small and Medium-sized Enterprises (SMEs), which account for the majority of European enterprises. Empirical studies found that costs in terms of economic resources, time and skills required for implementing EMAS were identified as the main barriers by SMEs [26]. This problem could be solved by subsidies, incentives, and rewards provision from public institutions, solutions currently not widely spread among Members [27]. Another obstacle to EMAS diffusion is the insufficient promotion of the Scheme by EU institutions [28].

Encouraging coordination and cooperation among organizations fosters the introduction of organizational solutions as a response to difficulties in EMS implementation. Clusters represent one possible model of inter-organizational interaction [29].

In this direction, IOR (Inter-organizational Relationships) theory studies how collaborative approaches among different organizations can lead to a more effective way to deal with complex issues, such as the correct implementation of an EMS. IOR identifies the potential economic and strategic advantages of a participatory approach. The economic advantages are constituted by the ability to gain a better access to resources, such as capital and modern production facilities, economies of scale, and cost-sharing. On the strategic level, the participatory approach will pull skills to develop new products and services, learning from partners, sharing best practices, and gaining access to foreign markets [30].

This is a basic principle of success for any attempt of organizational integration, recognized in different forms of partnerships: joint ventures, company groups, networks, alliances, clusters, *etc.* Integration of organizations into groups (partnerships, alliances, networks, *kairetsu*, clusters, *etc.*) becomes imperative [31].

Many authors have studied the cooperative and the interaction mechanisms within industrial clusters [32], which are areas characterized by a high concentration of SMEs that are specialized in the same economic sector and located in a shared socio-economic system [29]. The competitive factors of these systems consist in the existence of links between local organizations and the interdependence between the companies sharing the same production processes [33]. Innovation and continuous improvement of environmental performance processes within a cluster are similar to processes implemented within companies [34]. In both cases, it is essential to identify the objectives based on the needs of key stakeholders [35]. In Europe there are more than 2000 clusters in which 38% of the European workforce is employed [36].

The vast majority of European clusters is made up of SMEs, which are considered the main drivers for innovation, employment and social and local integration [37]. On the other hand, even if the environmental impact of a single SME could be not significant, SMEs globally account for approximately 64% of industrial pollution in Europe [38]. For this reason, pollution quantification should score and combine impacts of different companies. This cumulative effect is particularly evident for firms located in clusters, where pollution has marked effects locally, particularly on communities [39].

The awareness of these limits increased the acknowledgment of the need to adopt an interorganizational approach to coordinate common environmental management problems [29]. A regional interorganizational approach should implement multilevel governance through the involvement of industries, inter-agency, and local authorities, in defining environmental policies [40].

EU institutions promote the creation of public–private partnerships to encourage the spread of environmental policy instruments for a cluster. For example, the Hackefors Model showed how the network approach has allowed the Swedish SMEs to reduce certification costs for 65% of the EMSs [41].

Italy has pursued the European orientation of stimulating networks in clusters in order to diffuse EMAS registration among local organizations. By reason of the importance of clusters in the Italian economy, in 2005 the National EMAS Competent Body created the EMAS Cluster Certificate. This award is issued to those clusters that implemented an environmental management model based on EMAS Regulation. The purpose of the present work is to analyze the effectiveness of the EMAS Certificate for: local stakeholder involvement, network creation, environmental performance improvement and an increase in EMAS single registration. The level of effectiveness is assessed analyzing the perceptions of local stakeholders sited in nine certified clusters. After this introduction, the second section describes the importance of clusters in the Italian economy and the evolution of the European regulatory framework in relation to the EMAS Cluster approach, concluding with the EMAS certified cluster initiative promoted by the Italian National Competent Body. In Section 3, the research method is presented and the findings are discussed. It is concluded that local stakeholders perceive EMAS certificate as an effective tool for improving environmental performance of the area and they recognize its ability to enhance cluster image. However, there has not emerged a willingness of surveyed organizations to start a single registration path due to the lack of economic resources. The cluster approach encourages networks creation, driving local organizations which join the same environmental objectives to share their resources in order to reduce registration costs.

2. EMAS Cluster Approach

2.1. Clusters in Italian Economy

Italian industrial system is based on small business: ISTAT (Italian National Institute of Statistics) data on industry and services census reveal that in 2009 only 0.08% of companies have more than 250 employees and 99.4% have less than 50 workers. The average size of Italian firms is about 60% compared to the average of other European Union countries, and 95% of companies have less than 10 employees, with a weight of 47% compared to EU average which is somewhere between 20% and 30% [34]. The widespread presence of industrial clusters differentiates the Italian production system from other countries with advanced levels of development [42].

Alfred Marshall (1842–1924) theorized the first concept of cluster. Giacomo Becattini adapted the concept to Italy, defining clusters as “socio-territorial entities characterized by the active cooperation between a community of people and industrial enterprises in a circumscribed, naturalistically and historically determined area” [32].

Italian clusters present a high concentration of specialized SMEs, often with a strong level of interdependence of the production processes and a strong integration with the local socio-economic environment. Another peculiar aspect is the combination of competition and cooperation among the entities in the cluster [42].

The main Italian productive sectors are: clothing, furniture, mechanical, food and beverage [43].

In 2001, the survey carried out by ISTAT named “Eighth general census on the industry and services” identified 686 Local Labour Systems (LLS). According to the survey, 156 LLS are identified as industrial clusters belonging to four main areas.

In the clusters, over 4.9 million people are employed, which represents over 25.4% of the entire country workforce. In particular, over 1.9 million people are employed in manufacturing clusters which correspond to 39.3% of total Italian manufacturing employment [44].

In 2013, the “Fourth Report of the Observatory Italian Clusters” has been published, which represent the most recent survey on economic trends in the clusters. According to the study carried out on a sample of 101 clusters, during the last two years there was an accentuation of the recessionary cycle, stagnating demand and a slowdown in trade flows. In the surveyed clusters, there are 274.055 companies, 4.5% of Italian firms. They account for 28.1% of the total manufacturing economy, realizing 6.9% (74 billion euros) of the added value and accounting for the 25.6% of total exports [45].

2.2. Evolution of Regulatory Framework

In the late nineties, the first environmental management experiences on a regional scale started. At the time, the first version of the EMAS Regulation was in force (EC Reg. n.1836/1993), which did not make any reference to the possibility of taking advantage of a territorial aggregation for the application of the Scheme [46]. The chemical hub in Gendorf in Germany was one of the most significant European experiments. In 1998, an integrated environmental management system was created which was compatible with the individual EMAS scheme registered companies. Common documents were developed such as Environmental Policy, the Environmental Programs and the Environmental Statement of the entire area [47].

A year later, in the Italian production center of Bayer Filago, some enterprises signed an agreement to elect an Intercompany Environmental Committee with the task of developing and monitoring the implementation of a Common Environment Programme. These pioneering experiences were based on a new interpretation of the industrial site, which was configured as an expanded site, or as the sum of industrial sites involved in the area. The evidence of good results of these projects led to the adoption of Regulation EMAS II (EC Reg. n.761/2001), which emphasized the importance of collaboration between heterogeneous subjects in the territory for the uptake of the Scheme [46].

The EMAS application in districts is the result of a path that began with the second version of EMAS (EC Regulation n.761/2001), where the reference to the role of institutions for the involvement of SMEs was introduced, in particular those located in limited geographical areas, similar to the Italian

districts. The 2001 Regulation made reference to both public actors, such as Local Authorities, and external actors as Chambers of Commerce, Industry Associations and/or categories, as well as to any group of interest in the area [46].

As it is shown in Figure 1, in the following years other regulatory acts contribute to clear EMAS orientation. The opportunity to obtain a common registration and the possibility to benefit from simplifications such as the use of common environmental indicators was given to SMEs of a same territory.

Figure 1. Eco Management and Audit Scheme (EMAS) development in Cluster Approach.

EMAS II - Reg. 761/2001	<ul style="list-style-type: none"> •Role of private and public institutions •Facilities for SMEs in defined geographical areas
Dec. 681/2001	<ul style="list-style-type: none"> •Common registration for SMEs •Cooperation between SMEs of the same area
Rec. 680/2001	<ul style="list-style-type: none"> •Facilities in the phase of audit of SMEs •Simplification of the environmental aspects of SMEs
Rec. 532/2003	<ul style="list-style-type: none"> •Common environmental performance indicators for SMEs

Even though it is not explicitly mentioned in the Regulation, SMEs concentrated in well-defined geographical areas can be compared to Italian industrial clusters. For this reason, the facilitation of EMAS diffusion by a systemic and collaborative approach assumes great importance for Italy.

In 2009, with the enhancement of EMAS III, the EMAS Cluster Approach was introduced (Art.37). Member States have to encourage all third parties (such as local authorities in partnership with the industrial associations, chambers of commerce and other interested parties) to provide assistance to organizations in implementing environmental management system defined by EMAS.

Cooperation between public and private local entities should pursue the reduction of registration costs for SMEs. Synergies among groups of interest should be encouraged to adopt “cluster-based approach”, and a “step by step approach”.

The “cluster approach” is based on a management system created to help groups of organizations which belong to the same sector of activity or, alternatively, localized in the same area. The “step by step” approach aims to increase the number of records of individual organizations planning a path that will gradually increase the attention of organizations and local stakeholders towards environmental protection.

2.3. European Clusters Approach Experiences

Since the releases of EMAS III, several projects to apply the EMAS scheme at a cluster level have been implemented in Europe, frequently receiving financial support.

The Move-It! project had the objective to reduce internal and external cost for SMEs to implement EMAS in five European countries (Belgium, Germany, Bulgaria, Cyprus and Estonia), involving 15 touristic clusters. Based on the EMAS cluster approach, it has involved various local stakeholders such as SMEs, Local Authorities and Tourism Agencies. At the same time, with the diffusion of EMAS and the European Ecolabel, the other common goals were to enhance the economic development and to strengthen regional identity. The project involved 144 companies and 110 of them were labeled or

recognized by the end of project in June 2012. Furthermore, it provided training to regional agents and consultants, and specific environmental performance indicators [48].

Another project which aims to diffuse EMAS scheme in clusters is known as “PROSPEC”. In the European Union territory, there are more than 123,000 industries operating in the printing sector. The challenge of improving their environmental performances has been financed by the EU Eco-Innovation Programme, established in 2006 [49]. The PROSPEC project was outlined in 2009 [50]. To implement the cluster approach introduced with EMAS III, the PROSPEC project main goal was to involve printing SMEs in signing a Cluster Membership Agreement in order to create partnerships to develop an EMAS cluster methodology and reduce the costs of establishing an EMS (Environmental Management System) and those for audit and verification. At the moment, two PROSPEC Consortiums are setup in the United Kingdom and three are operating in the Greek printing clusters [51].

Another experience that deserves to be mentioned, even if it was developed outside Europe, concerns the local development programs implemented in some regions of the United States. Since 2005, the EPA Headquarters, with the National Environmental Policy, has been directing the implementation of REMS (Regional Environmental Management System) [52]. These systems aim to encourage a local participatory approach to achieve a high level of environmental protection [53]. A significant case is represented by the REMS implemented in Region 3 by the State of Virginia. This project, called V-REMS, involved 50 organizations including local and federal agencies, and private organizations. The initiative has encouraged the increase of trust among the partners and is based on the ISO 14001 standard applied on a local level [54].

2.4. Italian EMAS Cluster Certificate

Since the enhancement of EMAS II, in Italy numerous initiatives have been promoted to apply EMAS scheme for local development, leveraging on synergies and cooperation between SMEs. The Tuscany region has been the first in implementing experimental process to define an institutionally recognized model for applying EMAS to clusters. In 2001, three Tuscan clusters received EMAS recognition for their common efforts in eco-efficiency [55].

In 2005, the Italian Committee published a specific position about the application of the EMAS Regulation in specific areas called Homogeneous Production Areas (HPA) (Position Paper-28.01.2005).

The position allowed the possibility of applying the EMAS Regulation to HPA, encouraging the establishment of a representative body (Managing Committee-MC) with the task of coordinating local stakeholders to improve local environmental performance and spread EMAS registrations among single organizations located in the HPA. The MC was responsible for the creation of the necessary synergies for accession to the Scheme of companies in order to remove all the burdens that the SMEs could not afford individually [55].

EMAS III Regulation inspired the Committee for the Eco-label and Eco-audit, with the support of ISPRA, the drafting of a new Position on the “application of the EMAS Regulation developed in the clusters”, which replaced the one adopted in 2006.

This document, issued in 2011, introduced a new framework, encouraging organizations located in Italian districts to apply to EMAS. Compared to the previous one, this position not only stressed the registration of single organizations, but also the possibility to involve all stakeholders to improve

clusters environmental performances and to activate a transparent and efficient communication with the public. The new dispositions rose from the awareness that commitment of just a few firms would not be sufficient to obtain a significant environmental improvement of the whole area. According to the innovations introduced by EMAS III, environmental performance key indicators are the fundamental elements to successfully implement the EMS (Table 1). In fact, the regulation required that the MC uses key indicators to monitor the environmental performances of the area and hires indicators on stakeholders' communication [56].

Table 1. Managing Committee Composition, Functions and Requirements to issue EMAS Cluster Certificate.

Cluster Managing Committee		
<i>Composition</i>	<i>Functions</i>	<i>Requirements</i>
- Public bodies: local authorities	- Improving environmental performance of the cluster	- Common Environmental Policy/Program
- Private bodies: Chamber of Commerce and Business Associations	- Diffusion and promotion of EMAS	- Cluster environmental core indicators - Internal and external communication

The EMAS cluster approach is an innovative way to promote local sustainable development policies. It provides essential support to single organizations which want to pursue a path of sustainable management of their activities. In fact, the joint application of the proposed simplification procedures could remove many obstacles to SMEs Registration.

In addition, the new approach has the prerequisites to effectively contribute to the sustainable development of the territory. The orientation assigned to MC a task of primary importance in guiding local environmental policies. It has thus set up an "extended governance in which choices emerge as a result of a complex process shared by different actors". That encourages the collaboration of public and private entities [56].

3. Survey Investigation on EMAS Applied to Italian Clusters

3.1. Goal of the Survey

The survey aimed at investigating the actions implemented by MCs, which have obtained an EMAS Cluster Certificate. The considered aspects refer to the main tasks that the position attributes to MCs. The survey investigated the effectiveness in:

- Improving cluster image
- Improving cluster environmental performance
- Improving relationships with local stakeholders
- Improving the awareness of EMAS Cluster Certificate
- Helping local organizations in achieving EMAS registration.

The impact of these actions was calculated on the basis of the strengths and weaknesses of MC actions. In addition, the level of effectiveness perceived by different categories of local stakeholders

has been measured. Both members of MCs and external parties have been selected as respondents for the analysis.

The interviewed stakeholders' categories are:

- Managing Committees
- Chambers of Commerce
- Municipalities
- ISO Certified Organizations
- EMAS Registered Organizations

3.2. Methodology

The respondents belong to the stakeholders' categories settled in cluster areas which have obtained an EMAS Cluster Certificate. Currently, in Italy, there are nine MCs which have received one. The investigation took into account the nine clusters that were certified on November 1 2012.

Respondents were selected using the official documents produced by clusters MCs. For each cluster, the specific geographical area within which the reference population was selected has been identified.

Two categories of companies were selected, using the prevalent NACE codes of each cluster. In order to select EMAS registered organizations, the ISPRA database has been used, whilst the database provided by ACCREDIA (Italian National Accreditation Body) was the source used to select ISO 14001 certified organizations. As shown in Table 2, questionnaires have been divided into sections. Public organizations were asked to indicate the actions promoted to implement local sustainable development, how the MC involved them in defining cluster EMAS policy and their interest in EMAS Registration. Private organizations were asked about benefits perceived due to EMAS Cluster Certificate. EMAS Organizations were also asked to assess the Registration Scheme. ISO 14001 organizations, instead expressed their interest in starting EMAS recording path.

Table 2. Questionnaires structure.

Stakeholder Category	Sections Structure
MC	Section 1: Interest and participation of the organizations Section 2: Operative modalities Section 3: Role of the MC
Municipalities	Section 1: Policy and investments to promote local sustainability Section 2: EMAS Cluster Certificate Section 3: EMAS registration
Chambers of Commerce	Section 1: Policy and investments to promote local sustainability Section 2: MC and cluster certification
EMAS Organizations	Section 1: Information on the organizations Section 2: EMAS assessment Section 3: Relationship among organizations and MC
ISO 14001 Organizations	Section 1: EMS evaluation Section 2: EMAS Cluster Certificate Section 3: EMAS registration

The survey has been carried out using the feedback of five different qualitative questionnaires with multiple-choice questions and a Likert Scale, ranging from 1 to 6, with 1 corresponding to not appreciated/not difficult/not important and 6 corresponding to very appreciated/very difficult/very important. The choice of having no neutral or mid-point on scale pursues to encourage a definite choice by respondents, reducing answers' uncertainty [57].

Respondents were contacted by phone and then invited via email to complete the questionnaires available on an online platform. Tables 3 and 4 show the numbers of referred population for each category and the respective percentages of respondents.

3.3. Survey Population and Respondents

In the beginning, the main demographic characteristics of the cluster were identified, then the composition and the main areas of intervention of the MCs.

Table 3. Main characteristics of clusters with EMAS certificate.

Year	Cluster	Firms	Municipalities	EMASreg.	ISO 14001	MC Composition
2006	HPA of Ravenna	20	1	9	32	Local authorities
2006	Furniture cluster of Livenza	800	18	4	8	Firms, local authorities
2007	Tanning cluster of the Vicenza area	813	17	0	28	Local authorities
2008	Paper cluster of Capannori	339	13	13	10	Local authorities , chamber of commerce, industrial association, trade unions
2009	Tanning cluster of Solofra	400	4	0	9	Local authorities , chamber of commerce, industrial association, trade unions
2009	Touristic system of the Polesine area	1340	14	1	4	Local authorities, chamber of commerce, park authority
2010	Tanning Cluster of S. Croce sull'Arno	8185	7	3	17	Local authorities, tanning consortium association
2011	Paper cluster of Frosinone province	74	16	0	1	Local authorities, University, chamber of commerce, trade unions, regional environmental agency
2012	Chemical-Pharmaceutical cluster of Latina	120	6	0	6	Local authorities, chamber of commerce, industrial association

Subsequently, after a telephone contact, the population's units have been checked, verifying that each organization was effectively located in the corresponding clusters. In Table 4, for each stakeholder category, the real population size and the final percentage of respondents have been reported.

Table 4. Population and respondent percentage.

Category	Managing Committees	EMAS Organizations	ISO 14001 Organizations	Municipalities	Chambers of Commerce
Population	9	30	67	67	9
Respondents	89%	66%	54%	30%	78%

The categories of respondents for which the highest participation rate was found were MCs and Chambers of Commerce. The lowest percentage of responses occurred in the Municipalities. This may be due to the small size of Municipalities, where administrations often lack the human resources responsible for environmental management.

3.4. Managing Committees Survey Findings

MCs were asked to express an opinion about improvements obtained with the activities carried out in the clusters. In particular, a judgment was required about the issues identified according to the tasks assigned by the Position Paper to the MC (Table 5).

Table 5. Improvements obtained thanks to the EMAS Cluster Certificate.

Improved Aspect	Mean (Ranging from 1–6)
Involvement of local stakeholders	4.38
Environmental performance of the cluster	4.25
Involvement of the organizations regarding sustainability	3.50
Increase of EMAS-registered organizations	2.88
Ability of the organizations of the cluster to obtain bureaucratic/administrative simplifications	2.63
Ability of the cluster to attract investments	2.50
Overall mean	3.35

According to MCs' perceptions, the achievement of obtaining an EMAS Cluster Certificate increased their ability to involve local stakeholders and it improved the cluster's environmental performance. Less positive effects have been observed concerning new EMAS registrations, the capability to attract new investments and bureaucratic/administrative simplifications.

It was then asked of MCs what were the main difficulties encountered in carrying out their activities. The main difficulties were about the diffusion of EMAS registrations and the financial support provided to organizations in order to obtain EMAS (Table 6).

Table 6. Main difficulties identified.

Difficulty	Mean
Involvement of organizations in order to start the EMAS registration path	4.63
Funding supply for organizations	4.57
Support in terms of human resources for organizations	4.14
Sharing of operative tools with the organizations	3.57
Communication with the organizations	3.00
Communication with the stakeholders of the cluster	3.00
Overall mean	3.82

3.5. Local Stakeholders Survey Findings

Other categories of stakeholders were questioned about the efficacy of MCs in performing their tasks. In particular, they were further asked to provide an opinion on the effectiveness of the actions carried out in order to:

- Improve environmental performances
- Improve the cluster image
- Economically support local organizations
- Create a network among local organizations

The perceptions of each category of local stakeholders have been compared, and Tables 7 and 8 show the main positive aspects identified by the respondents. The investigated aspects relate to a positive perception about the improvement of environmental performance and image of the cluster.

Table 7. Improvement of Clusters' environmental performances.

Improvement of Clusters' environmental performances	Mean
Municipalities	4.11
EMAS Organizations	4.05
Chambers of Commerce	3.57
ISO 14001 Organizations	3.00
Overall mean	3.68

Table 8. Improvements of Clusters image.

Improvement of Clusters image	Mean
Chambers of Commerce	4.43
EMAS Organizations	4.30
Municipalities	4.28
ISO 14001 Organizations	3.67
Overall mean	4.17

According to respondents, a slight improvement is related to the ability of the MCs in reducing clusters' environmental impacts.

In particular, only EMAS organizations and Municipalities believed that actions taken were effective.

Territorial policies implemented by MCs are designed to combine productivity and environmental sustainability. Despite the intense industrial activity carried out in the analyzed clusters, these areas are perceived as committed to continual improvement of their environmental performance. Cluster image improvement is perceived by both public and private organizations interviewed.

In Table 9, we reported instead the actions of MCs that were perceived as less effective.

One of the main functions of MCs is to financially support local organizations for spreading EMAS registrations. The efficacy of this action is considered to be rather low. It is noteworthy how EMAS registered organizations assigned the lowest score because they have not received support for the maintenance and renewal of registration.

Table 9. Financial support for EMAS registration.

Financial support for EMAS registration	Mean
Chambers of Commerce	3.57
ISO 14001 Organizations	3.10
Municipalities	2.94
EMAS Organizations	2.10
Overall mean	2.90

A negative feedback was also assigned to the ability to create networks between organizations. The tools provided to share information and help communicate between different organizations were thus not perceived as effective (Table 10).

Table 10. Creation of network among Clusters' organizations.

Creation of a network among Clusters organizations	Mean
Chambers of Commerce	3.86
EMAS Organizations	3.10
Municipalities	3.06
ISO 14001 Organizations	2.94
Overall mean	3.24

The MCs as coordinators of clusters environmental policies have to increase the level of knowledge of the certificate among local organizations. It has been asked of organizations if they were aware of EMAS Cluster Certificate release (Table 11).

Table 11. Companies' awareness of the EMAS Cluster Certificate.

Company category	Level of awareness
EMAS organizations	72.72%
ISO 14001 organizations	50.00%

As showed in Table 11, not all the contacted organizations were aware of the EMAS Cluster Certificate. Just 50% of ISO 14001 certified organizations knew about it. This evidence is significantly negative because the interviewed organizations are the ones interested in environmental issues due to the implementation of certified EMS.

3.6. Survey Findings: Local Authorities Involvement

As public authorities, Municipalities and Chambers of Commerce have among their tasks the coordination of the promotion of local sustainable development policies. For this reason, they are more involved than other stakeholders' categories in the MCs activities. So, the expectations of public stakeholders in carrying out MC actions were also investigated. The results were compared with benefits actually found.

The municipalities have been asked to evaluate the effectiveness of EMAS Cluster Certificate in raising clusters' competitiveness. The average rating is 3.6. This value ranks between "cheap" and "quite" effective. Only 22.2% felt the tool to be "effective" or "very effective".

Table 12 shows how respondents perceived the benefits due to the EMAS Cluster Certificate, with an average value of 3.32. The improvement of environmental performances (4.11) and the improvement of the reputation of the territory (4.28) present the highest level of perceived benefit (Table 12).

Table 12. MC activity-Municipalities' main expectations compared with the obtained benefits.

Aspect	Level of Relevance	Level of Obtained Benefits
Strengthening Cluster reputation/accountability	4.89	4.28
Improvement of environmental performance of the cluster	4.74	4.11
Economic development of the cluster	4.37	3.17
Brokerage for funding and incentives	4.32	2.94
Communication with citizens	4.21	2.89
Promoting synergies with local institutions	4.16	3.72
Involvement in local development projects	4.06	3.00
Promoting synergy with local enterprises	3.63	3.28
Increase competitiveness of the cluster	3.63	3.00
Communication with organizations	3.40	3.10
Creation of multi-stakeholder network	3.00	3.06
Overall mean	4.04	3.32

The Chambers of Commerce considered the increase in the competitiveness of enterprises to support the cluster and economic development of the territory as the main benefit coming out from the achievement of the EMAS Cluster Certificate. Both aspects are in fact considered as “important” and “very important” by 85.71% of the respondents.

The establishment of MCs aims to foster dialogue and collaboration among local stakeholders in order to promote sustainable development. For this reason, MCs' activities could be suitable to amplify the action of Chambers of Commerce. Table 13 shows relevant aspects for Chambers of Commerce and the benefits achieved as a result of MC intervention. Respondents have experienced an actual increase in the competitiveness of cluster enterprises and an improvement of cluster image from obtaining EMAS Certificate. These aspects drove the Chambers' decision to join the Protocol.

Table 13. MC activity-Chamber of Commerce main expectations compared with the obtained benefits.

Aspect	Level of relevance	Level of obtained benefits
Increase competitiveness of the cluster	5.00	4.57
Economic development of the cluster	4.71	4.00
Strengthening district reputation/accountability/image	4.57	4.43
Promoting synergies with local stakeholders	4.57	4.00
Improvement of environmental performance of the cluster	4.43	3.57
Promoting synergies with local administrations	4.29	4.00
Creation of multi-stakeholder network	4.00	3.86
Involvement in local development projects	4.00	3.43
Brokerage for funding and incentives	3.71	3.57
Overall average	4.37	3.93

The implementation of the EMAS scheme at the district level has enabled local authorities to take advantage of the tools necessary to meet their expectations of sustainable growth in the area. Table 14 presents Pearson correlation value for both Municipalities and Chambers of Commerce. There is the evidence that expected benefits and benefits actually obtained are well related.

Table 14. Pearson Correlation between relevant aspects and related benefits obtained.

Correlation Municipalities			
	Relevance	Benefits	
Relevance	Pearson Correlation	1	0.624 *
	Sig. (2-code)		0.040
	N	11	11
Benefits	Pearson Correlation	0.624 *	1
	Sig. (2-code)	0.040	
	N	11	11
Correlation Chamber of Commerce			
	Relevance	Benefits	
Relevance	Pearson Correlation	1	0.771 *
	Sig. (2-code)		0.015
	N	9	9
Benefits	Pearson Correlation	0.771 *	1
	Sig. (2-code)	0.015	
	N	9	9

* Correlation significant at 0.05 level (2-code).

MCs numbered among their objectives the increase of awareness and responsibility of local authorities about cluster environmental aspects. The ability to communicate is one of the major elements of MCs' action. Municipalities have been asked to express their opinion about the improvement of relations with the local groups of interest; the findings are not positive, with just a slight level of improvement in stakeholder relation management (mean value 3.20). Forums that were established to plan and coordinate interventions necessary for pursuing common environmental objectives have increased communication among MC members. This trend was not supported by an appropriate communication addressed to stakeholders external to the MC. MCs did not contribute to increasing local communities confidence in the Municipalities efforts in improving environmental cluster performance.

Also, the Chambers of Commerce were questioned on the possible improvement of relations with stakeholders through MCs' actions. It was noted that activities carried out for the release of EMAS Cluster Certificate have contributed to improving the relationship with local interest groups "reasonably well". The most significant improvements have concerned the relationship with the Public Administrations (4.86) and trade associations (4.71).

4. Research Findings

The analysis showed heterogeneous effects regarding MCs communication activity oriented to increase organizations' awareness about the EMAS Cluster Certificate. Not all organizations knew

about the existence of the EMAS Cluster Certificate. This is probably due to the scarcity of tools available to help create networks among the different stakeholder categories and organizations. This situation has highlighted a lack of good practices and information sharing that would have fostered the awareness of the Certificate.

The most critical aspect of MCs' actions is related to the diffusion of EMAS registrations among organizations. The study found that only a small fraction of organizations are registered compared to the total population of the enterprises included in the clusters. The main reason for this result should be found in the scarce financial support to the companies and in the lack of bureaucratic/administrative simplification to obtain EMAS registration.

Respondents judged MCs' assistance in improving clusters environmental performances as fairly positive. In particular, Municipalities are the more satisfied stakeholder category in regards to the effectiveness of these actions.

MC intervention has been perceived as very positive concerning cluster image improvement. The results obtained by the MCs fulfilled the high expectations of the stakeholders. The most significant evidence was observed in clusters that started local sustainable development programs at least a decade ago. The type of interventions and the high number of interest groups involved make these efforts productive in the medium term. This is the case of the Capannori cluster, which started implementing an EMAS local approach in 2002 and where the best feedback has been registered.

A limitation of the research consisted in comparing feedback related to initiatives implemented for different time ranges. This aspect entailed that clusters with diversified levels of development were analyzed. Another factor that contributed to the increase in the heterogeneity of the analyzed data was the economic sector. Despite the methodology for EMAS cluster implementation providing defined steps, each MC had to interface with different critical environmental issues due to its specific productive process.

In regards to the improvement of the relationships among local authorities and local stakeholders, Municipalities perceived a low level of improvement whilst Chambers of Commerce considered the improvement of relationships as remarkable. In any case, the improvement has been more significant among institutions, whilst lower results have been registered in communications among cluster organizations and citizens/consumers.

5. Conclusions

The Italian experience of EMAS Cluster Certification represents an opportunity to promote participatory development mechanisms. This experience is perfectly aligned with the international community orientation that emphasized the importance of implementing strategies for sustainable development involving the different categories of local stakeholders. Because of their heterogeneous structure, formed by the agreement among public and private entities in the clusters, MCs are the appropriate bodies to implement mechanisms to involve all interest groups. Moreover, the community orientation of the EMAS cluster approach well suits the Italian productive structure.

MCs can provide cluster companies with operational tools to reduce costs for implementing EMAS, such as providing common audit cycles, sharing documents (like environmental policy and

environmental statements) and free training of employees. The survey showed that in clusters where these tools were available, MCs' actions to diffuse EMAS were perceived as more efficient.

MCs should strengthen their efforts in raising awareness among organizations in order to increase the uptake of EMAS Registration, and they must set up effective communication channels to increase knowledge of the certificate and provide recognition for the achieved results. In the future, it would be interesting to broaden the research using quantitative indicators to assess environmental improvement initiatives promoted by MCs. Further studies could be addressed to evaluate the use of the indicators presented in Annex IV of EMAS Regulation to monitor the progress clusters' environmental performances and to connect this to the environmental policies implemented.

Another positive aspect of EMAS implementation in Italian clusters concerns the perception of an effective environmental performance enhancement of these areas, both from the local community and external stakeholders. MCs should cooperate with local organizations to create local marketing strategies in order to effectively communicate clusters' environmental efforts [58]. Local marketing strategies can be an important support to overcome the economic crisis. Made in Italy and sustainability are factors with a high business potential, especially in manufacturing clusters [59,60].

The EMAS Cluster Certificate fully exploits that potential using the cluster EMAS logo that accounts for credibility and concrete commitment of local stakeholders to implementing sustainable policies. The logo allows enhancing and positively differentiating local production.

MCs have a key role in creating mechanisms for communication and networking between various potentially interested parties (include examples such as website, forums, *etc.*). Their actions have the main purpose to improve the relations among the local stakeholders and for this reason the survey involved both local authorities (Chambers of Commerce and Municipalities) and organizations with certified EMS (EMAS or ISO 14001). The Second Position Paper also assigned MCs the task to improve relationship among local organizations and citizens. Future investigations will consider this category of stakeholders. In particular, the objective will be to assess their knowledge about the EMAS Certificate obtained by the cluster MC and to investigate their perception of the usefulness of this instrument in improving environmental quality. It would be desirable to extend the research to citizens and consumers to assess how they perceive MCs, and public and private organizations' commitments. Results would be useful to evaluate the efficacy of Municipalities' and enterprises' efforts in communicating their challenges and their achievements.

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Author Contributions

The present paper is the result of the full and equal cooperation among all the Authors, who had the following roles and accomplished the following tasks.

All the authors contributed to survey and research design. Michele Preziosi and Ilaria Massa participated in data collection and data analysis. Roberto Merli coordinated and supervised the research project and carried out a detailed revision. All the authors analyzed the results, discussed the research findings and agreed upon key results. All the authors drafted the manuscript, and approved the final one.

Conflicts of Interest

The authors declare no conflict of interest.

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