

**COMMODITY SCIENCE
IN RESEARCH AND PRACTICE**

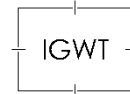
**TOWARDS QUALITY
– MANAGEMENT SYSTEMS
AND SOLUTIONS**

Edited by Tadeusz Sikora, Joanna Dziadkowiec

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THE ENVIRONMENTAL MANAGEMENT SYSTEM: A VECTOR FOR THE TERRITORIAL DEVELOPMENT. THE EXPERIENCE OF THE TOWN OF GIAVENO (ITALY)

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Introduction

Among the environmental tools that can be adopted by local authorities, in the past few years the Public Bodies have shown a growing interest in the application of the Environmental Management Systems - EMSs (Ridolfi, Andreis, Panzieri & Checcherini 2008).

The EMS started to be adopted *in primis* by manufacturing industries that since the 1970s, with the development of environmental studies and increased public awareness, had to question themselves about their relationship with the environment (Beltramo, Duglio & Bianco 2012).

Interestingly, in the previous years the environmental certification has become a useful tool for improving the environmental profile of a public administration and for giving proof of the efforts to preserve nature (Ridolfi, Andreis, Panzieri & Checcherini 2008).

There are two main tools used to plan an EMS: the ISO 14001:2004 international Standard and the European Eco-Management and Audit Scheme (EMAS Regulation EC N. 1221/2009) that have seen different trends of adhesion.

The Italian data show quite 20,000 ISO 14001 certificate sites (ACCREDIA 2014) and “only” 1,600 (ISPRA 2013), but as far as the different economic sectors are concerned, it is possible to note that in the ISO 14001

field the public administration represents 2.65% of all the certificate sites while in the EMAS context this percentage increased by more than 20 point (achieving 25%). The principal motivation should be investigated in the different level of communication: in fact, EMAS Registration requests the publication of the “Environmental report”. For a local authority, this report can play an important role in encouraging private bodies to focalise their attention toward sustainability commitments (Petrosillo, De Marco, Botta & Comoglio 2012).

However, after the first revision of the ISO 14001 Standard, an EMS planned thanks to its application is able to consider both the direct and indirect aspects (ISO 14001 2004). As further proof of this last assumption, the EMAS Regulation officially recognizes the ISO approach and documental structure in its Annex II (EMAS 2009).

Methods

The project concerns the planning and implementation of an EMS for the Town of Giaveno. Among the different tools available, the Administration of Giaveno opted for the ISO 14001:2004 Standard.

The Town of Giaveno has developed several projects concerning the environment and the Administration felt the need to have a tool able to “systematise” the past and future experiences and give an updated and clear idea of all the actions and their interconnections. In addition, the Administration aimed at especially focusing on agricultural and local food products, which represent a fundamental character of this semi-rural area. In this general context, the ISO 14001:2004 Standard seemed to be the most useful and convenient tool.

In fact, the ISO 14001 sets standards for maintaining and improving the environmental performance of the organisations (ISO 2004) by the introduction of the Deming Cycle approach, divided into four phases - Plan, Do, Check and Act - under the umbrella of the continuous improvement concept (Salomone 2008).

The ISO 14001 Standard is divided in five sections. After the definition of an environmental policy, in the Plan phase the attention is paid to the evaluation of the direct and indirect environmental aspects and impacts and their relevance, the evaluation of the regional and national legislation and the identification of clear objectives and programme. The Act phase is dedicated to the implementation of all the necessary procedures in order to achieve the objectives afore-mentioned. The procedures involve the identification of roles and responsibilities (with the identification of an Environmental manager), training, communication, management of documents, operational control and emergency. In the Check phase there are all the necessary actions to verify the

correct implementation of the EMS in terms of performances, evaluation of the non conformances, corrective and preventive actions and records. Finally, the Act phase represents the stage in which the organisation's top management has to review the EMS and re-determine objectives and the environmental policy (González-Benito & González-Benito 2005).

This systemic approach (guaranteed by the ISO 14001:2004 Standard) has been evaluated by the Administration of the Town of Giaveno as the most reliable tool in order to start the process of the environmental management certification.

The case study

The Town of Giaveno is situated in the Province of Turin (Piedmont Region, in the North-West of the Italian Alps), 32 km from Turin. Giaveno represents the principal municipality of the Sangone High Valley.

The surface of Giaveno is about 78 km², 6,674 ha of which can be considered mountain (3,400 ha slope more than 20°) and 502 ha are composed of hills. The urban context of Giaveno is strongly fragmented because of the presence of 108 hamlets in which approximately 17,000 inhabitants dwell. As a consequence, the great majority of the area is dedicated to agriculture (92% - 6,634 ha) while the urbanised area consists of 7.175 ha, and represents only about 8% of the total. 74% of the agricultural areas is represented by woods, 18% is devoted to grazing, 6% is arable and only 2% (114 ha) contains unproductive lands (Town of Giaveno 2007).

The most recent Regional Censuses show a decrease in the number of farms of the Town of Giaveno that passed from 472 to 115, resulting in a total arable land of about 2,047.03 ha (Regione Piemonte 2014). The great majority of farms are family-run businesses and the 40% of managers are less than 39 years old. As far as the livestock is concerned, there are 67 farms, 46 of which exclusively dedicated to cows.

If the attention is concentrated on the products of Giaveno, the most important element of the Town (and of all the High Sangone Valley) is represented by the different kinds of boletus mushrooms.

Other typical products are the "Cevrin" of Coazze" and the "Tuma del lait brusc" cheeses. The former is also presided over by Slow food, an Italian Organisation which aims at preserving and improving traditional food products.

The economic fabric consist of 343 unites in the industrial sector, 322 in the trade market, 23 in the institutions and 380 units in other activities.

As far as the demesne of the Town of Giaveno is concerned, the Municipality owns and manages 21 green areas (for a total of 40,785 m²), 15

real estates, 10 schools and 25 among motor vehicles and other mechanic vehicles.

Furthermore, Giaveno has 97 employers without taking into account the politic administration and the fixed term contracts. Figure 1 shows the location of the case study.



Figure 1. The Town of Giaveno

Source: elaboration from Google maps, Preliminary Environmental Analysis document

Discussion

The EMS architecture of the Town of Giaveno: main characteristics

The EMS architecture of the Town of Giaveno follows the classical levels defined by the ISO 14001:2004 Standard and reported in the Documental Pyramid (Figure 2).

In the first step, the Environmental Preliminary Analysis, the attention has been focused on the evaluation of the direct and indirect environmental aspects and impacts and on the analysis of the Italian legal requirements. The activities of the Town of Giaveno have been divided into two groups, direct and indirect, as reported in the following list.

1. Direct activities:
 - a. Offices.
 - b. Management of the real estates.
 - c. Management of the property.
 - d. Snow clearing out.
 - e. Management of the graveyard.
 - f. Green areas.
 - g. Management of the road network.
 - h. Public lighting.

- i. Eco - centre (the centre in which citizens can deliver some kind of waste such as electric devices and hazardous waste).
2. Direct activities:
- a. Offices.
 - b. Management of the real estates.
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 - e. Management of the graveyard.
 - f. Green areas.
 - g. Management of the road network.
 - h. Public lighting.
 - i. Eco - centre (the centre in which citizens can deliver some kind of waste such as electric devices and hazardous waste).
3. Indirect activities:
- a. Distribution of water and sewage.
 - b. Collecting and management of waste.
 - c. Competitive public tenders.
 - d. Suppliers of goods and services.
 - e. Emergency maintenance of real estates, property and green areas.

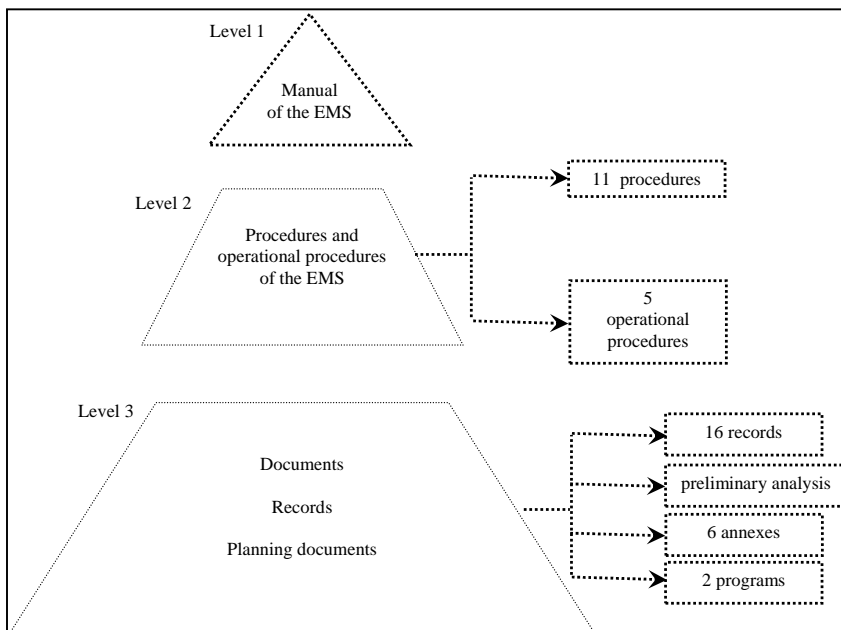


Figure 2. The EMS Documental Pyramid of Giaveno

Source: Internal data

For each direct activity the Administration calculated the Significance of the deriving impacts (water, waste, emissions, soil, etc) in accordance with a dedicated procedure. Furthermore, some indicators have been elaborated in order to verify the trend during the years and define new environmental objectives for the Town of Giaveno.

The evaluation of the Significance of the direct and indirect environmental aspects normally represents a critical point in the EMSs (Babakri, Bennett & Franchetti 2003). Being aware of this problem, the Administration of Giaveno opted to apply the well-established methodology in which two elements are simultaneously considered: the Probability (P) of occurrence of the environmental impact and the Severity (Se) of the same impact (Johnston, Hutcinson & Smith 2000; Zobel, Almroth, Bresky & Burman 2002; Zobel & Burman 2004; Pöder 2006). In fact, this methodology has been applied to all the environmental aspects resulting from the aforementioned direct and indirect activities. Furthermore, Se is divided into different components depending on the kind of activity (direct or indirect). Thus, the Significance (S) of the impact is represented by the following formula:

$$S = P * \sum_{i=1}^n Se_i$$

Se changes depending on the kind of activity.

For the direct activities Se is divided into:

- Se₁ – Respect of the legal requirements
- Se₂ – Conformity with the Environmental policy
- Se₃ – Impact level of gravity

For the indirect activities Se is divided into:

- Se₂ – Conformity with the Environmental policy
- Se₃ – Impact level of gravity
- Se₄ – Level of authority

Se₂, Se₃ and Se₄ can assume a value from 0 to 3, depending on the position of the activity. Conversely, Se₁ can assume only two values, 0 or 1, but if the result is 1, it has automatically a High Significance, because the activity is not managed conforming to the legal requirements.

Depending on the different scores given to the Probability and the Severity, S can assume a total score from 0 to 4 for the impacts deriving from the direct activities and from 0 to 6 for the indirect activities. In the Town of Giaveno, the highest levels of S have been achieved for the following impacts of the direct activities, as reported in Table 1.

Table 1. Highest level of Significance for the direct activities of the Town of Giaveno

	Activity	Environmental aspect	Level of S	Comment
Direct activities	Management of the real estates	Energy consumption	Level 3 on 4	
		Waste	Level 3 on 4	
		Air emissions (in case of fire)	Level 4 on 4	In case of Emergency
	Management of the property	Emissions	Level 3 on 4	
		Consumption of non renewable resources	Level 3 on 4	
	Snow clearing out	Waste	Level 3 on 4	
		Soil	Level 3 on 4	
	Public lighting	Electricity consumption	Level 3 on 4	
	Green areas	Waste	Level 3 on 4	
		Consumption of no renewable resources	Level 3 on 4	
	Eco-centre	Air emissions (in case of fire)	Level 4 on 4	In case of Emergency
		Soil	Level 4 on 4	In case of Emergency

Source: Internal data processing

After defining the S of the impacts, It is important to measure and quantify of the impacts for calculating the indicators. In the EMS of Giaveno, 16 records were elaborate and 5 of them are useful to quantify water, energy and natural gas consumptions.

However, some activities not directly conducted by Giaveno are a fundamental importance for the improvement of citizens' quality of life. The Town of Giaveno consists of more than 100 hamlets deployed on a vast area. For this reason, some public services, such as waste collection and transport, water supply and treatment of sewage, are essential. In the EMS of Giaveno attention has also been paid to the definition of indicators deriving from indirect activities carried out by external enterprises.

Strong points in the application of an EMS to the Town of Giaveno

The Public Administration of the Town of Giaveno has to deal with a complex territory, most of which situated in a mountain context. Hence the adoption of an EMS plays a fundamental role in appraising public activities as well as the landscape and territorial aspects.

The EMS in accordance with ISO 14001:2004 Standard allows:

- to acquire a methodological tool orientated towards the environment with positive repercussions for other activities of the Public Administration;

Table 2. Set of indicators for direct and indirect environmental aspects

Direct environmental aspects	Indicator
Water	% variation of the consumption in the offices
Energy	% variation of the average annual consumption [year (n-1) year (n)]
	% energy used for public lighting upon the whole energy consumption
	% energy for other uses upon the whole energy consumption
	% variation of natural gas consumption [year (n-1) year (n)]
	% variation of diesel oil consumption [year (n-1) year (n)]
	% electric energy produced by renewable sources
Raw materials	% variation of paper consumption [year (n-1) year (n)]
	% of the recycled paper upon the whole used paper
	% of green public procurement upon the whole procurement (in euro)
Indirect environmental aspects	Indicator
Water	Water consumption in the municipality district (m ³ /year)
Waste	% of separate collection of waste
	Per capital waste production (kg/inhabitant*day)

Source: Internal data

- to check all the environmental aspects of the activities of the Town of Giaveno and to draw a clear picture, useful to the public administration, employers and citizens;
- to have a tool that proves the awareness of the Town of Giaveno to the environment. This fact is important to create a dialogue between citizens and the Public Body, improving the trust;
- to rationalise activities: the EMS is able to reduce costs thanks to the evaluation of indicators and to pay more attention to the use of natural resources as well as non-renewable energy sources;
- to monitor the environmental data in order to give the necessary information for making resolutions in a coordinated and effective way. In this context, the EMS is a strategic tool for the territorial planning.

The EMS also shows some critical aspects. The most relevant of these is the great effort required of the Public Administration. This effort is necessary for increasing the stakeholders' awareness (employers, citizens, economic activities of the area) of the added value expressed by the EMS.

In the case of the Town of Giaveno, the EMS allows for the systematizing in its objectives and programmes all the necessary actions for enhancing

sustainability, as well as involving the economic sectors of this territory (above all agriculture and tourism).

Among the EMS objectives for the Town of Giaveno, it is possible to notice:

- the use of renewable sources in real estates;
- new buildings according to environmental criteria for energy efficiency;
- the creation of a label of quality for traditional food products;
- the environmental evaluation of the supply chain.

Conclusions

By applying EMS to the Town of Giaveno, some strong points as well as some critical aspect are noticed. As a public body, some difficulties in the adhesion to a voluntary tool, such as the ISO 14001:2004 Standard (or the European EMAS Regulation), can be connected to a general complexity resulting from applying a semi-rigid architecture to the system with the, often, last minute necessities of the citizens.

In fact, there are only 17 municipalities with an EMS certified (Accredia 2014) in the Piedmont Region. This represents only the 1,4% of the total (Piedmont Region has 1,206 municipalities). From this point of view, Giaveno surely shows a high level of excellence in the management of its environmental aspects as well as in the start-up of several initiatives in order to develop the territory.

As in other mountain areas, it is important to remember that Giaveno is witnessing a high depopulation trend. The last data collected by the Piedmontese Agricultural Census (Piedmont Region 2014) report a drop in the number of farms (from 1,108 in 1982 to 181 in 2010).

Both the farmers and the Town of Giaveno are trying to find the solution to this negative trend. Farmers are adopting strategies focused on business diversification (organic agriculture, educational farms, etc) and the Town of Giaveno has planned a tourism-orientated plan in which the agricultural production can play an important role for the development of this area.

In our opinion, if the main goal of public bodies can be reached in the administration of a territory, the EMS can be a vector for the correct management of the actions, because it provides a dedicated architecture. The implementation of the ISO 14001 Standard for the Town of Giaveno means the engagement of the community in the decision of the local development.

However, if a wider perspective is adopted, it is necessary to take into account not only the direct and indirect aspects of the Town of Giaveno, but also to create the networking with other neighbour administrations (Beltramo,

Duglio & Quarta 2011) in order to supply an environmental and territorial management perspective to contiguous territories. In fact, the initiatives adopted by the Town of Giaveno are in collaboration with the principal actors that are involved in the territory: the University of Turin, the Agency for the Environmental Protection of the Piedmont Region, the Province of Turin, “Turismo Torino” (association for the promotion of tourism in the Province of Turin) and the main trade associations.

In conclusion, in this context the EMS of the Town of Giaveno could represent the starting point for a more widespread implementation of the environmental management to the all Sangone High Valley.

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References

ACCREDIA (Sistema Italiano di Accreditamento), *Banche dati*, <http://www.accredia.it/>, accessed 23 January 2014.

Babakri K.A., Bennett R.A., Franchetti M., 2003, *Critical factor for implementing ISO 14001 standard in United States industrial companies*, Journal of Cleaner Production, 11, 749-752.

Beltramo R., Duglio S., Bianco A., 2012, *Integrated Management System: the application of the Italian BEST4 Scheme. State of the art in Italy and proposal for its evolution*, Forum Ware International, 1, 1-14.

Beltramo R., Duglio S., Quarta M., 2011, *SGAP – Sistema di Gestione Ambientale-Paesaggistico. Una metodologia per la gestione integrata dell’ambiente e del paesaggio*, Aracne Editrice, Rome, Italy.

Town of Giaveno, 2007, Local strategic plan of the Municipality of Giaveno, Town of Giaveno, Italy.

European Commission, 2009, *Regulation (EC) N. 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisation in a Community Eco-management and audit scheme (EMAS), repealing Regulation (EC) N. 761/2001 and Commission Decisions 2006/681/EC and 2006/193/EC*, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009R1221:EN:NOT>, accessed 25 February 2014.

González-Benito J., González-Benito O., 2005, *An analysis of the relationships between environmental motivations and ISO 14001 Certification*, British Journal of Management, 16(2), 133-148.

ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale), *Elenco delle Imprese registrate EMAS in Italia*, <http://www.isprambiente.gov.it>, accessed 23 January 2014.

Johnston A., Hutcinson J., Smith A., 2000, *Significant environmental impact evaluation: a proposed methodology*, Eco-Management and Auditing, 7, 186-195.

Petrosillo I., De Marco A., Botta S., Comoglio C., 2012, *EMAS in local authorities: suitable indicators in adopting environmental management systems*, Ecological indicators, 13, 263-274.

Pöder T., 2006, *Evaluation of environmental aspects significance in ISO 14001*, Environmental Management, 37(5), 732-743.

Regione Piemonte, Censimento generale dell'agricoltura 2010, <http://www.sistemapiemonte.it>, accessed 24 February 2014.

Ridolfi R., Andreis D., Panzieri M., Checcherini F., 2008, *The application of environmental certification to the Province of Siena*, Journal of Environmental Management, 86, 390-395.

Salomone R., 2008, *Integrated management systems: experiences in Italian Organizations*, Journal of Cleaner Production, 16, 1786-1806.

UNI EN ISO 14001, 2004, *Environmental Management systems. Requirements with guidance for use*, ISO, Geneva, Switzerland.

Zobel T., Almroth C., Bresky J., Burman J.O., 2002, *Identification and assessment of environmental aspects in an EMS context: an approach to a new reproducible method based on LCA methodology*, Journal of Cleaner Production, 10, 381-396.

Zobel T., Burman J.O., 2004, *Factors of importance in identification and assessment of environmental aspects in an EMS context: experiences in Swedish organizations*, Journal of Cleaner Production, 12, 13-27.

