American Journal of Environmental Sciences 3 (3): 126-134, 2007
ISSN 1553-345X

Environmental Management Systems in Local Authorities: The Case Study of the Cesana Torinese Municipality, a Turin 2006 Olympic Site

Serena Botta, Claudio Comoglio
DITAG – Dipartimento del Territorio, dell'Ambiente e delle Geotecnologie
Politecnico di Torino – C.so Duca degli Abruzzi 24, 10129 - Torino, Italy

Abstract: Environmental certification according to the ISO 14001 standard and EMAS regulation represents an efficient tool for those organizations who want to continuously improve their environmental performances. Even though first thought up for application to the industrial section, in recent years these schemes have also proved to be valid in organizations with territorial competences, such as local authorities. The case study of the Cesana Torinese municipality, an important ski resort in North West Italy involved in the Turin 2006 Winter Olympic Games, which was one of the first local authorities in Italy and in Europe to apply these schemes, is presented in this paper. In particular, the paper is focused on the method used for the implementation of the scheme and on the main results obtained throughout on the territory, in terms of sustainable tourism, reduction in energy consumption and CO_2 emissions, but also in terms of improvement in the quality of life of the citizens, integrating environmental aspects with social accountability. At the same time, the ability of the management scheme to respond to relevant modifications of the environmental scenario, such as the designation of the area as one of the competition sites for the Turin 2006 Winter Olympic Games, is highlighted.

Keywords: ISO 14001, EMAS, Local Authorities, Environmental Management System, CO_2 emissions, social accountability

INTRODUCTION

The ISO 14001 [1,3] standard and the EMAS regulation [2] (Eco-Management and Audit Scheme issued by the European Community) represent the reference schemes for the organisations that intend setting up continuous environmental improvement and protection policies of the environment in which they work. A particular feature of these schemes is that the paths for their implementation (Fig. 1) include the continuous inspection by independent third parties that have been accredited for such functions by national accrediting organisations (SINCERT in Italy) and by the Ministry of the Environment, respectively. The main purpose of the two schemes is to guarantee a correct management of the activities from the environmental point of view and the commitment to a continuous improvement of the environmental performances of the organisations who voluntarily decide to implement the schemes. These instruments, which were initially only thought up for application to the industrial section, in recent years have also proved to be valid in organizations with territorial competences. Although their application in the former case had the purpose of above all mitigating the environmental effects of production processes that are often impacting, in the case of public administrations (and territorial organisations in general), they offer an efficient management instrument for institutions who have, through political and programmed actions, a significant direct and indirect influence on the management, protection and improvement of the environment and of the territory.

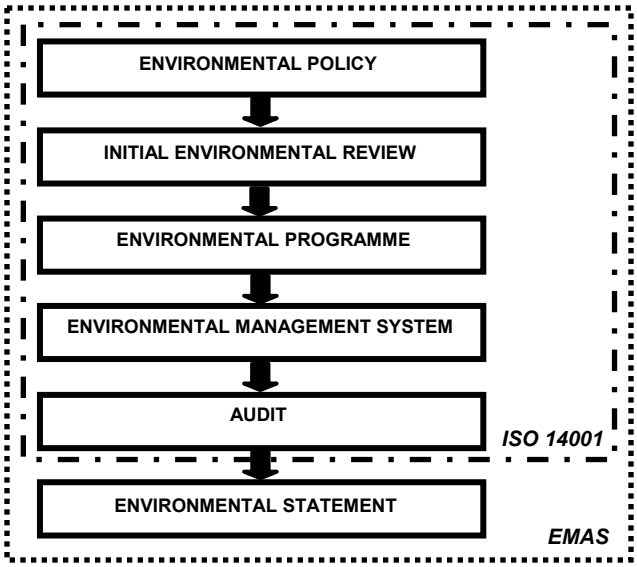

Fig. 1: ISO 14001 and EMAS schemes

Environmental certification of public administrations has undergone a remarkable development in Italy, starting from 2000, with much higher increase percentages than that of the production sector. In Table 1, the trend of the spread of ISO 14001 and EMAS

Corresponding Author: Serena Botta, DITAG (Dipartimento del Territorio, dell'Ambiente e delle Geotecnologie) Politecnico di Torino, c.so Duca degli Abruzzi 24, 10129 - Torino, Italy

Table 1: Number of environmental certificates in public administration compared with total number of environmental certificates (2000-2006)

Scheme	Type of organisation	2000	2001	2002	2003	2004	2005	2006
ISO 14001	Public administration	2	7	29	47	100	175	278
	All organizations	533	1,185	1,714	2,445	3,740	5,088	6,318
EMAS	Public administration	1	1	2	3	9	17	47
	All organizations	42	83	125	174	256	394	566

certification in public administrations in Italy can be compared with that of the total number of certificates according to the same schemes. This development can be justified by the capacity of these schemes to supply useful managerial, knowledge and organisational instruments to an administration to carry out its planning and operative activities, while fully respecting the environment and the territory, directing the choices towards a territorial planning and coordinating these choices with the indications supplied by the national and regional planning instruments. These schemes also allow the administrations to identify protection criteria for the territory and for the sensitive environmental components, which should be activated according to correct operative procedures, together with monitoring and control procedures of the most significant environmental aspects.

Environmental certification can also have a great political value: the obtainment of a public acknowledgement can in fact improve the image of a town council that has focused its policy on environmental protection.

On the basis of these considerations, the case study of the municipality of Cesana Torinese, an important ski resort in North West Italy which borders on France (Fig. 2), offers some interesting points of reflection concerning an innovative application of ISO 14001 and the EMAS regulation. Cesana Torinese is a mountain municipality that is characterised by an important tourist value and a remarkable territorial extension (121.3 Km^2) in comparison to only 955 residents, a number that undergoes sudden increases in the winter periods when huge tourist flows determine an increase in number of up to 18,000 units. The Cesana Torinese municipality has been ISO 14001 certified since 26 January 2001 and EMAS registered since 26 May 2003. It can be considered a model to evaluate the results that have been reached, and which can be reached, with environmental certification. It also represents an important example of how such an eco-management scheme can efficiently respond to the requirements of an administration, even when this is called upon, after a system has been implemented, to respond to relevant modifications to the scenario of competence, such as the planning and management of the Turin 2006 XX Winter Olympic Games (which was only a hypothesis at the moment of certification), which led to relevant modifications of the infrastructural layout of the municipality and an important increase in the number of tourists throughout the territory.

Fig. 2: The localization of Cesana Torinese.

MATERIALS AND METHODS

A research project was set up in 2000 between the Cesana Torinese municipality and the Department of Engineering of the Territory, the Environment and of Geotechnologies of the Politecnico di Torino with the purpose of innovatively applying an Environmental Management System to a Public Administration, articulated according to the following phases:

- carrying out an Initial Environmental Review: an in depth study of the peculiar features and environmental characteristics of the municipal territory (geographic layout, analysis of the connections and mobility, analysis of the building patrimony, meteoclimatic and air quality situation, geological and geomorphological layout, agronomic-forestry situation, faunal situation, analysis of the areas of naturalistic interest, hydrographical, hydrological and hydrogeological layout), of the conduction and organisation modalities of the municipality activities of competence (territorial and urbanistic planning, water supply and sewage treatment, waste management, building patrimony management, public lighting management, school transport, maintenance of municipal vehicles, cleaning and maintenance of green areas, management of the road work sites, snow removal services, gas and district heating distribution, management of tourist activities and emergency management).
- identification of the critical environmental situations and the significant environmental aspects. Starting from the environmental aspects foreseen in the ISO 14001 standard and the EMAS regulation (emissions to air; releases to water; waste production and management; use and contamination of land; use of

natural resources and raw materials (including energy); local issues (noise, vibration, odour, dust, visual appearance, etc.); transport issues, risks of environmental accidents and impacts arising as consequences of emergency situations; effects on biodiversity), evaluation criteria were established, as objective and repeatable as possible, to identify the significant environmental aspects. The criteria were based on: the capacity of fulfilling the legal prescriptions, the presence of pressure from the different parties involved, the capacity of the individual environmental aspect to be extended on a vast scale, the presence of sensitive receptors, the irreversibility of any eventual impacts and the presence of possible mitigation and/or control systems.

- preparation of an Environmental Programme.
- definition of the Environmental Management System: a set of operative and management procedures documented to guarantee the correct conduction of the activities that have significant potential repercussions on the environment.
- certification of the Environmental Management System according to the ISO 14001 standard and, after the publication of the Environmental Statement [5,6,7] (document drawn up to supply the public and other interested parties with clear information, validated by independent verifiers, on the impact and on the continuous improvement of the environmental performances of the organisation), registration according to the EMAS regulation.
- periodic monitoring of the achieved results through the use of opportune performance indicators in order to verify the congruency of the obtained results with the planned ones.

The ISO 14001 standard and the EMAS regulation were applied to implement, maintain and continuously improve the Cesana Torinese municipality Environmental Management System with the purpose of transferring the environmental protection and improvement requirements that the same standard intended to apply to industrial processes to the complex decisional, planning, but also operative processes that characterise a public administration.

It is in fact important to point out that the ISO 14001 standard defines the modalities with which an Environmental Management System should be established, activated and maintained in an organisation, but the structure of the standard had been defined to be applied above all in the industrial sector: particular attention was therefore paid to the identification of all the processes and all the activities carried out within a public administration in order to obtain a complete and appropriate identification of the significant environmental aspects.

For an environmental characterisation of the site, which in the case of a public administration, extends all over the territory of competence, and of individual environmental components, according to the ISO 14001 standard and the EMAS regulation, it first of all proved necessary to procure all the data derived from the monitoring. In order to reduce the Environmental Management System implementation costs, all the validated information and data available from national and local databanks were in fact collected and used together with data from publications and *ad hoc* studies carried out on the territory. Direct monitoring was limited to those environmental components where it was not possible to obtain a sufficient characterisation from the available data (noise in various places throughout the municipal territory and the quality of the air) and to the measurement of the performances of activities and plants belonging to the municipality (e.g. municipal sewage plant and water main).

A careful analysis of the internal processes and of the organisation and distribution of responsibilities was necessary to obtain a definition of the Environmental Management System in order to identify, together with the municipal workers, possible points of improvement.

RESULTS AND DISCUSSION

Environmental criticalities

After having carried out an Initial Environmental Review, it emerged that the territory had to a high environmental sensitivity that can be ascribed above all to the relevant presence of protected areas, with particular reference to Sites of Community Importance (areas geographically identified and destined to the conservation of the biological diversity present in the European Union territory as established by Directive no. 92/43/EEC of the Council of 21 May 1992 relative to the "Conservation of the natural and semi-natural habitats and of the wild flora and fauna", commonly known as the "Habitat" Directive). Four different biotopes of high naturalistic value due to the presence of autochthonous species that are important for the safeguarding and maintenance of the alpine ecosystem (Table 2), were found on the territory. Another element of concern in the Cesana Torinese territory is that large areas have a delicate hydrogeological equilibrium, due to the presence of numerous watercourses with highly torrential and irregular hydrological regimes, that is, three main watercourses (The Ripa Torrent, the Dora Riparia River and the Thuras Torrent) and numerous secondary tributaries of a temporary nature. The complexity of the hydrographical network and exceptional pluviometric conditions led to a particularly intense flood event in 2000 which involved large parts of the municipal territory.

It is important to point out that the Initial Environmental Review did not highlight any critical elements in terms of environmental quality, that is, the

Table 2: Cesana Torinese biotopes specifications.

Name of the biotope	Type of habitats and relative percentage in the biotope (%)	Total surface (ha)	Surface in the municipality (ha) and relative percentage
Valle Thuras	Inland water bodies (Standing water, Running water) (1%) Heath, Scrub, Maquis and Garrigue, Phygrana (3%) Alpine and sub-Alpine grassland (24%) Coniferous woodland (20%) Inland rocks, Screes, Sands, Permanent Snow and ice (52%)	1,015.00	977.52 (96.3%)
Pendici del Monte Chaberton	Coniferous woodland (41%) Inland rocks, Screes, Sands, Permanent Snow and ice (35%) Heath, Scrub, Maquis and Garrigue, Phygrana (23%) Artificial forest monoculture (1%)	400.00	312.58 (78.1%)
Champlas-Colle del Sestriere	Coniferous woodland (19%) Inland rocks, Screes, Sands, Permanent Snow and ice (8%) Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (1%) Alpine and sub-Alpine grassland (64%) Broad-leaved deciduous woodland (1%) Artificial forest monoculture (7%)	1,140.00	376.41(33%)
Cima Fournier e Lago Nero	Heath, Scrub, Maquis and Garrigue, Phygrana (2%) Alpine and sub-Alpine grassland (52%) Coniferous woodland (42%) Inland rocks, Screes, Sands, Permanent Snow and ice (2%) Bogs, Marshes, Water fringed vegetation, Fens (2%)	685.00	639.52 (93.4%)
	Municipality surface occupied by the biotopes		2,306.03
	Percentage of the total municipal surface		18.73%

necessity of rectifying or upgrading compromised areas or of having to set up measures for an improvement of one or more environmental components. The main elements that emerged from the Initial Environmental Review which can be considered significant are instead characteristics of territorial fragility, that is, elements of particular value which, if not correctly managed and protected, could undergo damage even of an irreversible nature. As far as the management of the activities conducted directly or indirectly by the municipality is concerned, the only one that highlighted significant environmental aspects (Table 3) is that of territorial planning. The other activities and services, because of the reduced dimensions of the municipality, in terms of population, available resources and infrastructures, were not considered very relevant; while a consortium management together with neighbouring municipalities was identified and established for the environmental services that were more difficult to manage (water supply and sewage treatment, waste collection and distribution of gas for heating purposes). These considerations and the tourist nature of the Cesana Torinese municipality made it necessary to carry out an in depth study of the environmental aspects that that were caused by activities performed not only by the municipality itself, but also by third parties on the territory and in particular the activities of tourist accommodation, management of the ski plants and transport.

From these analyses, a close relationship emerged between the management difficulties of the environmental services throughout the territory and the presence of huge tourist flows, which have a very discontinuous nature in the municipality of Cesana with peaks of short length: over the weekends in winter the presence on the territory increases from about 1,000 inhabitants to about 16,000-18,000, most of whom are concentrated in the hamlet of San Sicario, one of the sites of the Turin 2006 Winter Olympic Games, with its modern tourist infrastructures and connections to an important ski area.

In the light of the results of the Initial Environmental Review, the municipality drew up an Environmental Programme and an Environmental Management System with the purpose of setting up continuous environmental improvement projects throughout the territory and of guaranteeing a correct environmental management of its activities and those of third parties.

Environmental Programme

The Cesana Torinese municipality set up its first Environmental Programme in January 2001 with the purpose of protecting the environmental characteristics of value throughout in the territory but also of improving the quality of life of the citizens and tourists. Although it is generally possible to say that the quality of an environment always influences the quality of life of the citizens, this is even more so in a mountainous environment where the life of the citizens is conducted in a delicate equilibrium with the territory and with the different environmental components. Furthermore, the activities of the citizens are often connected to the tourist market and the possibility of economic development is consequently closely connected to the quality and safeguarding of the territory.

Table 3: Significant environmental aspects.

Activities	Responsibility	Significant Environmental Aspects
Territorial planning	Cesana Torinese municipality	Emissions into the air Use and contamination of the ground Use of the natural resources and raw materials Transport problems Effects on the biodiversity
Integrated water service	Cesana Torinese municipality (till June 2003) Regional Consortium (since July 2003)	Discharges into the water Use of natural resources and raw materials Effect on the biodiversity
Waste management	Public waste management consortium	Production and management of waste Emissions into the air
Tourist activities	Private companies	Discharges into the water Production and management of waste Use of the natural resources and raw materials Transport problems Effects on the biodiversity

The objectives were chosen taking into consideration not only the results of the Initial Environmental Review, but also:

- the measurability and concreteness of the intervention (possibility of measuring the advancement of the works and of setting up a concrete project throughout the territory, also from the point of view of transparency with the citizens);
- the requests by the citizens and the different parties involved;
- the possibility of supplying concrete, educational and demonstrative examples of the setting up of correct environmental practices.

Macro-environmental objectives were then defined on the basis of these considerations, each of which contained intermediate targets and distinct interventions, but all of which were conducted to reach the objective. These objectives were made public, both as far as intention and intermediate and final results are concerned, in order to involve the community in the projects undertaken in the territory, but also in order to receive suggestions and requests from the citizens. The following main objectives established and activated by the Cesana Torinese municipality constitute a valid example for other similar municipalities that decide to undertake an environmental improvement project, as they are relative to themes that, even considering the local requirements and particular features, can deal with valid themes that can be applied to any situation.

The promotion of sustainable tourism

The correct valorisation and promotion of natural and environmental resources can lead to the development of quality tourism, that is, of a tourism that can guarantee sustainability of the resources from which it derives. From this point of view, the Cesana Torinese municipality set up a project entitled “Montagna Viva” (The live mountain), which has made it possible to upgrade the connection routes between the small isolated villages in the Thuras valley (an area of high naturalistic value characterised by the presence of small isolated hamlets). A path and trekking network has thus been realized that can be used for a naturalistic type of tourism, but an improvement in the conditions of life of the local population has also been obtained as the interventions that have been carried out, thanks to important water regimentation interventions and control of the delicate hydrogeological equilibrium, make it possible to have a path connection that can be used throughout the entire year (the maintenance of which has been entrusted to local workers), but which also allows a local social-economic development thanks to the reintroduction of agricultural-pastoral activities and the creation of micro-accommodation, which has arisen in response to the requirements of this new form of tourism.

Another example of sustainable tourism is the “I monti nati dal mare” (The mountains that have arisen from the sea) project, which has led to the creation of 6 trekking itineraries over a total of 38 km. These itineraries have been defined so as to allow people to appreciate and learn about the particular geological characteristics of the peaks that can be found on the territory, peaks that bear witness of an extinct paleo-geographic environment, that is, a fragment of the ancient pre-alpine ocean which contains rocks, fossils and coral cliffs that date back to about 200 million years ago. A rock garden has been created as part of this project, that is, an area that is available to children and scholars which has been equipped for play, sports and teaching activities on the theme of geology.

The main result of the valorisation projects throughout the territory, apart from the already mentioned small local accommodation situations (bed and breakfast and farm holidays), has been an increase in tourism in the months at the beginning and end of the summer, that is, in the months that are traditionally dedicated to mountain trekking, thus a new tourist vocation has been

created in Cesana Torinese that is very different from the mass tourism of the winter skiing period and more environmental friendly.

Reduction of energy consumptions and CO_2 emissions

The local administrations are the expression of state authority closest to the citizens and the citizens themselves expect to see correct environmental behaviour on their part, above all when, as in the case of energy consumption, a policy of environmental protection corresponds to a reduction in costs and public expenses. From this point of view, the Cesana Torinese municipality decided that energy savings and the introduction of renewable energy sources would represent very up to date ways of offering the citizens an educational and concrete example of sustainable behaviour.

The municipality set up the Environmental Energy Plan in 2003 [8], that is, an analysis of all the energy consumption throughout the municipal territory and, on the basis of the results, established a series of interventions with the purpose of reducing energy consumption, of introducing the use of renewable energy and of reducing CO_2 emissions. The Environmental Energy Plan considered the consumption data relative to the 2000-2003 period (Table 4) and found a mean energy consumption of 538,503 GJ which determined an overall emission of 43,378 t of CO_2.

Table 4: Consumption data relative to 2000-2003 in Cesana Torinese.

Type of consumption	Entity of the consumption (GJ)	CO_2 emissions (t)
Electric energy	42,038	6,189
Petrol derivatives for heating purposes	406,423	30,854
Methane	4,148	218
Transports	77,814	5,538
Ski plants	8,083	579
Total	538,506	43,378

The data relative to the consumption generated throughout the whole municipal territory compared with the consumption of the municipality Administration alone for the carrying out of its activities (electric energy, heating, transports) and available from 2000 as part of the monitoring conducted for the Environmental Management System [5,6,7], has shown that that the latter only influences the overall consumption on the territory by 0.5 %, that is, there is a mean yearly consumption of 2,780 GJ and a CO_2 emission of 209.62 tonnes.

It is therefore obvious that the improvement interventions should have been directed towards the habits and supply modalities of the citizens in order to maximise both the educational affect and the results in energy-environmental and economic terms.

The main projects that were planned and set up by the Cesana Torinese municipality to put their energy and environmental policies into practice are shown in Table 5.

From the table it can be deduced that CO_2 emissions have already been reduced by 23% thanks to the interventions that have already been carried out, while a further lowering of 0.5% will be obtained once the other works have been completed. The setting up of a district heating network with a cogeneration plant in San Sicario was particularly important as it is the area in the municipality where there is the highest concentration of accommodation for tourists and where almost all the tourist infrastructures are located and it represented 63% of the CO_2 emissions for heating over the entire municipal territory. This project, apart from reducing the overall CO_2 emissions by 22%, also made it possible to eliminate the previously used individual boilers. This obviously offers advantages as far as the control of atmospheric emissions, the introduction of methane instead of the more impacting diesel oil and the overall consumption reductions are concerned.

Another intervention carried out by the Cesana Torinese municipality, in collaboration with the neighbouring municipality of Claviere, is the construction of a hydroelectric plant located on municipal land which will have a potential of about 20,450,000 kWh at full regime, which represents more than double the annual energy needs of the entire municipal territory. The hydroelectric plant will help prevent emissions of about 11,000 t of CO_2, compared to the same quantity of electric energy produced from fossil sources.

The illustrated set of interventions make it possible to show the concrete environmental improvement contribution that can be determined, even by small municipalities, thanks to the aim for continuous improvement requested by ISO 14001 and the EMAS regulation: the correct environmental behaviour of citizens can in fact be significantly influenced by the planning choices made by a municipality and by the consequent availability of the public infrastructures for the use of renewable energy sources or at least for a correct use of the fossil sources (district heating and highly efficient plants).

Environmental Management System

In order to obtain ISO 14001 certification and EMAS registration, it is necessary to define an Environmental Management System, in other words, a set of procedures formalised on the correct ways of carrying out activities potentially connected to significant environmental aspects. While such procedures play a particularly important role in industrial processes, in the case of a public administration they must mainly be aimed at identifying the environmental repercussions of

Table 5: Cesana Torinese projects for consumption and CO_2 emissions reduction.

Project	State of activation	CO_2 emissions before the intervention (t)	CO_2 emissions after the intervention (t)
Setting up of a cogeneration plant with district heating network to service the hamlet of San Sicario (500,000 m^3 of accommodation reached)	Completed and functioning since October 2005	27,175	17,275
Installation of 180 m^2 of solar panels with hydrogen sub-stations on congress and accommodation building belonging to the municipality for a volume of 26,000 m^3	Completed and functioning since December 2005	242	148
Installation of a biomass (local wood) and methane plant to heat the only 2 buildings belonging to municipality	In the design stage	150	20
Distribution of wood for heating purposes to the farm holiday/ small accommodation structures to substitute diesel oil	In the design stage	27	0
Installation of a diesel oil and biomass (local wood) plant and a district heating connection to the Champlas Seguin hamlet	In the design stage	354	283
Total emissions of CO_2		27,948	17,726
Avoided emission of CO_2		10,222	

the activities of third parties throughout the territory, whether already under way or at the design stage. These requirements become even more important in the case where a small organisation is involved in the construction of large works or in the organisation of large events: in this case, the Environmental Management System should supply the staff with the means, in terms of knowledge and evaluation schemes, to identify the environmental aspects that could arise out such of variations in scenario, thus allowing them to face them already during the planning stage. A particularly significant example in this context was the designation of Cesana Torinese as one of the competition sites for the Turin 2006 Winter Olympic Games for the biathlon, female alpine skiing, bob, sleigh and skeleton events. This designation in fact implicated the creation of numerous infrastructures throughout the territory, connected in a direct (sports plants, accommodation structures, etc.) and indirect (road infrastructures) manner to the Olympic event and the consequent massive presence of tourists and operators foreseen during the events. Although the planning and design of the works were completely organised and coordinated by the organisation committee (TOROC – Turin Organising Committee of the XX Winter Olympic Games), the municipality, in virtue of the direct involvement of its land, was able to actively participate in the approval phase, in order to obtain as compatible a design of the works as possible with the high level of naturalistic value of the sites. Though aware of the impossibility of influencing any decisions (definition of the competition sites) and the inevitable environmental modifications due to the construction of complex and extended infrastructures (for example, the bob track), the Administration was in fact able to express opinions and observations concerning the environmental aspects connected to the construction (and future management) of the infrastructures, with particular reference to the visual impact of the works, to the implications on the traffic and to the post-Olympic use of these structures. The Administration obtained the acknowledgement of numerous prescriptions and the planning of many environmental compensation interventions. Among the results that were obtained, mention can be made of: the remodelling of the bob track profile in such a way as to integrate it more with the natural slope of the mountain, the reuse of existing paths for the renewal of the ski lift plants, the upgrading of already existing buildings for the creation of centres for the journalists and accommodation for the athletes, the use of wood and bio-architectural techniques for the new constructions to be used in the post-Olympic stage (the municipality would have a new building available which could be used as a social centre for the local population) and the use of temporary structures for structures that would not be used after the event (tribunes, journalist and athlete accommodation structures). During the Olympic Games, the municipality, in agreement with the local tourist agencies, in view of the numerous tourists and spectators present throughout the territory and because of the desire to make the public aware of the environmental themes, supplied a leaflet written in several languages, together with the information usually distributed to tourists, on the correct behaviour that should be undertaken as far as the production of waste, respect of the naturalistic areas and transport modalities are concerned.

The data and the elements synthetically presented in this article show how the implementation of an Environmental Management System to a territorial situation has determined significant managerial and

organisational improvements of the activities. The implementation of this system has in particular made the evaluation of the environmental consequences of all the activities conducted on the land systematic and of priority importance. The Environmental Management System should be conducted together with, and have the same importance, as evaluations of a technical and economic nature. This approach, first activated for only the potentially most impacting activities from an environmental point of view (management of the sewage plants, construction of infrastructures, etc.) have been extended over the years to all the activities carried out on the whole territory, including those that only have limited or indirect repercussions on the environment.

As regards the continuous improvement required by the reference standards, the projects planned for 2007-2009 have the purpose of consolidating the improvements connected to the objectives already dealt with from 2001 onwards: during the activation of the previous programme, clear positive advantages emerged, which can be shown by numerous indicators, as far as the promotion of sustainable tourism and the reduction of energy consumption and CO_2 emissions are concerned, and their continuation would allow excellent results to be obtained and a maximisation of the benefits for the territory and the population.

In the case of sustainable tourism, the improvement indicators are the already mentioned increase in tourists, but also a remarkable increase in the value of the property throughout the entire municipal territory, which in the last year was evaluated at about +9.5% compared to a mean value of +2% in the surrounding Olympic municipalities, a sure sign of a renewed attractiveness of the territory where the Administration has invested a great quantity of resources to improve the quality of the environmental services and to look after the territory.

As far as the reduction in energy consumption and CO_2 emissions is concerned, the positive results can be measured directly from the reduction of CO_2 emissions obtained in just three years (2004-2006), which has been estimated as 23%, without the citizens having been subjected to additional costs for the interventions but rather by attempting to follow the initiatives of the municipality with direct economic advantages for the citizens and investments by third parties on the territory. Hypothesis are at present being considered concerning the division of the profits, that will derive from the sale of the electric energy produced by the hydroelectric plant at present under construction to the national supplier, among the local resident population. A study is also being conducted to allow the organisations who, in compliance with the Kyoto Protocol and national standards in force, have to reduce their level of CO_2 emissions, to finance projects for the energy upgrading of the certified public administrations or those that have concretely demonstrated their efforts towards the environment, with particular reference to heating and transport.

Another field of work foreseen for the next three-year period, which was already started at the end of 2005, is the social and ethic field: the growth of quality tourism in a territory that does not offer other resources apart from tourism and which in the last decade, like all other mountain areas, has undergone intense phenomena of population loss, has in fact highlighted the theme of the quality of life of the citizens. This theme has been dealt with by integrating, for the first time in a public administration, the requirements of the ISO 14001 standard and the EMAS regulation with the principles of the SA 8000 standard (Social Accountability), the only standard at present available as far as the protection of ethic-social rights is concerned, but mainly directed towards the relationship between workers and companies. The effort of the Cesana Torinese municipality was directed towards transferring the general principles of the standard to the protection of the social necessities and of the quality of life of the citizens resident in isolated or poor areas. This innovative approach of integrating environmental certification with SA 8000 requirements is at present under examination by the European Community in order to be included in the next revision of the EMAS regulation. The first result of this programme was the publication of a Social and Ethic Programme, structured and managed in a similar way to the Environmental Programme, with the objective of creating direct interventions and projects on the territory to guarantee the availability of services to the citizens and to start a continuous dialogue with them in order to better understand their necessities and expectations, for example, through the yearly distribution of a questionnaire to all the citizens to ask for opinions and suggestions on the supplied and planned services, the setting up of a home delivery service for the elderly and of a shuttle bus to connect Cesana Torinese with the main service centres (hospitals, public offices).

In short, it is possible to state that the pioneer and innovative application of an Environmental Management System to a mountain and tourist municipality, has made it possible to obtain both short term results in a strictly environmental sense, but also results in the long term, above all concerning an improvement in the quality of life of the local citizens and as a systematic method to communicate and respond to the requirements of the citizens, which are fundamentally and principally duties of the local administrations. The Cesana Torinese experience has also contributed in a fundamental way to the spread of

the Environmental Management System in public administrations in Italy, constituting a valid and repeatable model for numerous other situations: the obtaining of the ISO 14001 certification during 2006 by all the other mountain communities that participated in the Olympic event is an example of this result.

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