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Green cities for a better future? – A case study from an alpine region: the Town of Trento

Maria Giulia Cantiani[a], Alessandro Betta[b], Isabella De Meo[c], Federica Maino[d], Alessandro Paletto[e], Sara Tamanini[f]

[a] *Department of Civil, Environmental and Mechanical Engineering. University of Trento, IT*

[b] *Environmental Engineer, Mayor of the Town of Arco (TN), IT*

[c] *Council for Agriculture Research and Economics - Research Centre for Agriculture and Environment. Florence, IT*

[d] *Eurac Research - Institute for Regional Development. Drususalle. Bozen, IT*

[e] *Council for Agricultural Research and Economics – Research Centre for Forestry and Wood. Trento, IT*

[f] *Municipality of Trento, Parks and Gardens Service. Trento, IT*

Highlights

- A new Urban Agenda is crucial in order to shape more sustainable, inclusive, resilient cities.
- In the Alpine Region managers and planners need to know the new order of priorities in values expressed by citizens with regard to urban and peri-urban forests
- The paper illustrates a case study of the town of Trento, in the Italian Alps
- Socio-economic changes, with the introduction of an urban lifestyle, are producing a radical transformation in people's behaviour and attitudes with regard to forests.

Abstract

In a world where, by 2050, 70% of the population will be living in cities, a "New Urban Agenda" is considered crucial in order to form more sustainable, inclusive and resilient cities. This means cities which are liveable both from the natural and human-environment points of view and where citizens are involved in the realization and management of an attractive urban environment of high quality. Given the process of urbanization occurring in many towns of the Alpine Region, managers and planners need to know the new order of priorities in needs and values expressed by citizens with regard to urban forests and those in nearby areas. This paper illustrates a case study of the town of Trento, in the north-eastern Italian Alps, a typical medium-sized alpine town which, despite recent urbanization, is still in close connection to woodlands. The research has been carried out by means of a questionnaire aimed at investigating the relationship between citizens and their forests. In particular, the points of investigation were the main functions attributed to the forests and visitors' preferences of forest features. The results show that urbanization and socio-economic changes, with the introduction of an urban lifestyle, are producing a radical transformation in people's behaviour and attitudes with regard to forests. A survey of this type may be a useful tool in the hands of planners and managers in order to help shape a sustainable urban development.

1. INTRODUCTION

By 2050, 70% of the population will be living in cities and we will be confronted by a "more crowded, urban world" (United Nations, 2012, p. 4).

The world population will be 9.2 billion, 2.2 billion higher than today, with most of the increase occurring in South Asia, in the Middle East and in Africa. There will be an increase of 2.8 billion people living in urban areas, compared to a decrease of 0.6 billion in rural areas. As an unavoidable consequence, there will be a rapid increase in energy demand and deforestation rates, with an augmentation of GHG emissions and a rise in global warming, a global deterioration of urban air quality, a rapid and significant increase in water demand, with two thirds of the population suffering from lack of water (United Nations, 2012).

Taking into consideration all these points, a "New Urban Agenda" is thought to be of crucial importance in order to shape more sustainable, inclusive and resilient cities; in short, "smart cities". Indeed, this was recently proclaimed at the UN Conference on Housing and Sustainable Urban Development (Habitat III), held in Quito (Ecuador) in October 2016 (United Nations, 2016). At the time of the first Conference (Habitat I), held in Vancouver in 1976, only 37.9% of the world population lived in cities, but it was already clear that the phenomenon of urbanization was bound to become worrying, especially in developing countries. Twenty years later, in Istanbul, on the occasion of the 2nd Conference, an urban agenda was deemed necessary, in order to guide sustainable urban development.

Today, rethinking the urban agenda means, among other issues, the necessity of building bridges across physical spaces, that is, urban, peripheral and rural areas. Special attention must be paid to public spaces (United Nations, 2016; Pitlounovà Pancikovà, 2015), in particular, open and green zones which directly affect the well-being of people (Nielsen and Hansen, 2007; Nutsford et al., 2013; Riva-Mossman, 2018; Sangster, 2010) and the conservation of their cultural identity and heritage. Requirements of specific groups of people, such as children, young people and senior citizens, should be especially taken into consideration. The process of urbanization that has occurred in many cities all over the world has involved a radical change in the relationship between citizens and the natural environment. Urban sprawl has generally caused natural-habitat fragmentation, soil degradation and biodiversity decline, entailing a progressive loss of the ecosystem services beneficial to residents. Particular groups of people seem destined to become more and more marginalized by the mainstream of society due to some specific kind of fragility. Rethinking the urban agenda, therefore, implies the need for combining social and ecological perspectives, considering cities and towns as integrated socio-ecological systems (Artmann et al., 2017).

Of all the various meanings that the term "smart city" may assume (European Parliament, 2014), the one that we adopted in our work describes it as the one resulting from actions that have been coordinated in order to consolidate and connect socio-cultural features of the community in the territory. These have the goal of generating sustainable economic development and a higher quality of life, through new forms of governance (Manfredi, 2015). In this framework, a key concern is giving people the opportunity to participate in shaping the kind of city they want to live in. For this reason, decision makers (planners, managers and policy makers) need to know what kind of relationship binds the residents to their environment (Cantiani et al., 2016; Rametsteiner et al., 2009; Schmithüsen & Wild-Eck, 2000). Actually, the governance for smart and sustainable development of cities should be based on a bottom-up approach and require an inclusive and effective dialogue among local authorities, stakeholders and the public at large (Hansen & Pauleit, 2014). The planners' conception of urban spaces should be coupled with the inhabitants' perception and their sense of place. Taking all this into consideration, a long-term research project is being carried out by means of case studies, at the Ecology Lab of the University of Trento.

In this article, we refer to some results concerning a case study of the town of Trento. The municipality of Trento, in the north-eastern Italian Alps, well reflects the situation of other towns in mountainous and forested European regions. All around the town, forests and farmlands extend over large areas and are strictly interconnected with the urban expanse. As in many other urban centres of the same size, the ecological links and the socio-economic interdependence between urban and rural areas have always been guaranteed. However, urban development and recent dramatic socio-economic changes have altered the traditional structure, making boundaries between "inside" and "outside" the town both flexible and intricate. The relationship itself between Man and Forest has been deeply modified, bringing with it a different order of priority in values expressed by the population. The aim

of this research is to investigate the connection between citizens and territory, their cultural identity, knowledge of their own forests and the priority of recognized needs and values. Our paper focuses in particular on the main forest functions attributed to forests and on visitors' favourite forest features. Knowledge of peoples' perceptions is in fact an important prerequisite for the involvement of local communities in decisions concerning environmental issues and may provide valuable support for administrators and policy makers when trying to adapt local mechanisms of governance to current and future changes (Cantiani et al., 2016; Dudek, 2016; Hunziker et al., 2013; Šišák, 2011).

2. MATERIALS AND METHODS

2.1 Study area

Trento, chief town of the Autonomous Province of Trento, is a typical medium-sized alpine town, surrounded by mountains that reach heights of about 2,000 m a.s.l.. It extends over a surface of 157 km2 and is organized into twelve administrative districts, six located on the valley floor and six on the mountain slopes. With a resident population of 117,997 inhabitants (Comune di Trento, 2018), Trento has experienced three successive waves of migration. The first wave consisted of villagers migrating away from the valleys of Trentino towards the chief town, the second one was characterized by people moving from the southern to the northern regions of Italy and the third, more recent one, features migrants arriving from various foreign countries. Despite a slowing down of the foreign migratory flow and a stabilizing of the population, there are still many problems associated with the rapid demographic growth and the development of various economic activities that characterized the town after World War II. Today, Trento has to cope with issues such as soil consumption, an urgent need for brownfield regeneration, problems of commuting and transport, ageing population and the poor quality of life in some urban and suburban areas.

Public green areas (parks, gardens, riverbanks) cover a surface of 158 ha (about 13.5 m2/inh.). These areas, together with forests within the town limits, covering 68 ha, are managed by the Parks and Gardens Department of the town. Overall, this is a small surface, but forestland outside town limits covers a huge area, 5,397 ha belonging to the community, which is managed by a special Forest Agency based on forest management plans with multifunctional objectives and particular attention paid to recreation. Despite recent urbanization, urban areas are still in close connection to forested areas, which are easily reached from the town centre (De Meo et al., 2015). Actually, the forests are relatively nearby, considering that it is possible to reach the wooded area in about half an hour by bus, right from the centre of the town, or with a 20 to 30-minute- walk, being in one of the hilly districts. The perception that you have if you just look around you in the centre of town, is a clear vision of "green".

2.2 Sampling and Survey

The 47,615 households in the town were the target of the survey. The sampling was proportionally stratified for administrative districts and identified 1,000 households, randomly selected from the local Registry Office. The survey was based on a self-reporting questionnaire that investigated several topics concerning forest resources and the relationship between society and forest ecosystem services. By means of a self-reporting questionnaire it is possible to collect a large amount of quantitative data without the support of an interviewer. The main advantage of a self-reporting questionnaire is that it can be administered to a large sample of people without much financial cost and in a short time.

The questionnaire was composed of 56 mainly closed-ended questions organized in four thematic sections (Betta et al., 2009). Most of the questions required a "yes" or "no" answer or a multiple-choice answer, but some gave the opportunity to clarify the answer or to express an opinion. This article focuses on the questions concerning the bond with territory and landscape, feelings and emotions provoked by the forest and perceptions of the forest. In particular seven questions were selected (Table 1) investigating the environments frequented by respondents in their leisure time, the features that best characterize the forests' attractiveness for visitors and the most important significance (corresponding to various activities). In this case, people's preferences were investigated by asking the respondents to assess the level of importance assigned to the various kinds of features they look for and activities they carry out in the forest they go to, using a ten-point, Likert-scale

Table 1:   Questions investigating the attractiveness and functions of forests

Question	Options		
In which kind of environments do you spend your leisure time?	High mountains Grasslands Forests Lakes and rivers	Sea Countryside Urban parks Gardens	Urban areas Sports areas
Which forest would you rather visit?	Easy reachable by means of transport	Reachable by a short walk	Far away
On average how often do you go into the forests?	Once a week or more	About once or twice a month	A few times a year
What is your strongest sensation when you are in the woods? (%)	Anxiety Fear	Peace Well-being	Feeling at home None in particular
What do you most associate with the word Nature? (%)	Snow-capped mountains	Forest Ocean	Wind and clouds
What goods and services do you look for from a forest?	Culture Landscape Picnics Walks	Hunting Mushrooms Relaxation Work	Firewood Nature Sports
In your opinion, what is it important to find in a forest?	Benches Meadows Refreshment areas	Car parks Panoramas Vita parcours	Footpaths Peace Wildlife

Source: Authors' elaboration.

response format (from 1 = of very low importance to 10 = of very high importance). The data collected were analyzed statistically with special regard to socio-demographic characteristics (age, gender, origins, level of education).

2.3   Data Analysis

The data collected have been firstly described by means of a univariate analysis, carried out separately for each question. In order to verify if the proximity to the forest may influence people's behaviour, in some cases we divided the sample into two sub-samples, keeping separate families living in the old town centre from those living in the hilly districts.

In a second step we carried out the Principal Component Analysis (PCA) in order to identify the main

groups of people based on individual preferences regarding forest features and human activities in forests. With regard to forest features, two main categories were considered (Van Raaij, 1986; Laws, 1995): innate features (e.g., wildlife, panoramas, meadows/open areas, peace and quiet) and man-made features (e.g., footpaths, benches, vita parcours, refreshment areas, car parks). Concerning human activities in forests, eleven potential assets were considered and described in the questionnaire (Pavlikakis & Tsihrintzis, 2006): walks in the forest, hunting activities, sports (e.g., hiking), cultural heritage, picnics, relaxation, landscape contemplation, nature contemplation, workplace, collecting firewood and picking mushrooms.

In this study, PCA was used in order to understand the relationship between people and forests, identifying various types of human behaviour.

3. RESULTS AND DISCUSSION

3.1 *Sociodemographic Characteristics*

At the end of the data collection, 242 completed questionnaires (a response rate of 24.2%) were statistically processed. With regard to the socio-demographic characteristics of respondents, 61.9% of them are male and the remaining 38.1% are female. The majority of respondents are persons who were born in Trento municipality (53.3%) or in other municipalities of the Province of Trento (25.6%), while the remaining 21.1% are persons born in other Italian regions or other countries.

The average age of respondents is 55 years old, with the following distribution by age groups: 7.9% are less than 30 years old, 14.1% 30–39 years old, 16.4% 40–49 years old, 24.4% 50–59 years old, 14.5% 60–69 years old, while the remaining 22.7% are 70 or more years old.

Concerning the level of education, 0.8% of total respondents have no degree, 29.1% have an elementary school certificate, 48.2% have a middle-high school certificate, and 21.9% have a university or post-university degree.

3.2 *The bond with territory and landscape*

The results of the descriptive analysis clearly demonstrate the strong bond between population and territory, the appreciation of the mountain landscape typical of the Province of Trento and the recognition of the importance of the forests in the characterization of such landscape (Fig. 1a).

The results show that the most popular environment frequented by residents in the Trento municipality are forests (18.8% of total respondents) followed by lakes and rivers (16.9%) and high mountain (13.0%). Conversely, only a few respondents declared a preference for more urbanized areas such as: urban areas (8.9%), gardens (8.0%), and urban parks (6.6%). These results confirm the strictly bond between the population of Trento and the natural environments typical of their province (mountains, forests, grasslands, lakes and rivers). This result is also confirmed by the low preferences assigned to an environment unrelated to the mountain context of Trentino like the sea with only 6.4% of total preferences. Besides, high mountains are also quite popular, whereas urban parks are less used for recreational purposes. Regarding lakes and rivers, we found a statistically significant difference between people living in the hilly districts and those living in the town centre (χ^2 test, p<0.05). This is mainly due to the fact that people living in the centre like to go to the river Adige, as they themselves specify. The river flows close to the centre and is so easily reachable. It has grassy banks and a tarmacked track for pedestrians, cyclists and dog walkers.

Concerning visits to the forests, we found there are significant differences in people habits, depending on where they live: people living in the hilly districts visit the forests more often and do not mind a longer walk to reach them (Fig.1b and 2). In addition, the χ^2 test shows a statistically significant difference among families who live in hilly areas and the town centre concerning the willingness to spend time to reach the forest (χ^2 test; p<0.05).
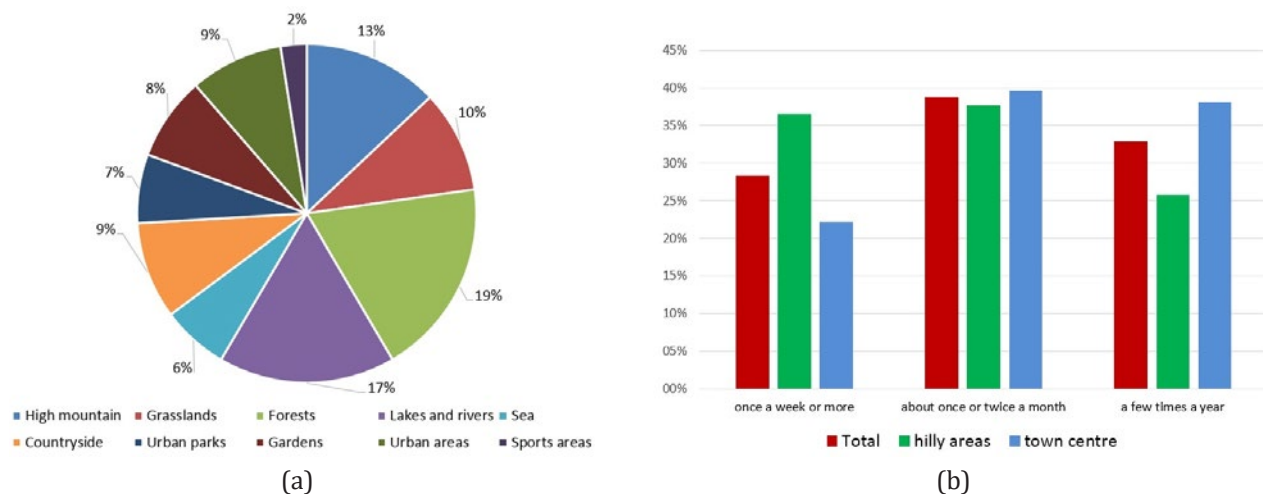

| (a) | (b) |

Figure 1:   Graphs of results: (a) Distribution of people's preferences for different kind of environments where to spend leisure time; (b) Frequency of people's visits.
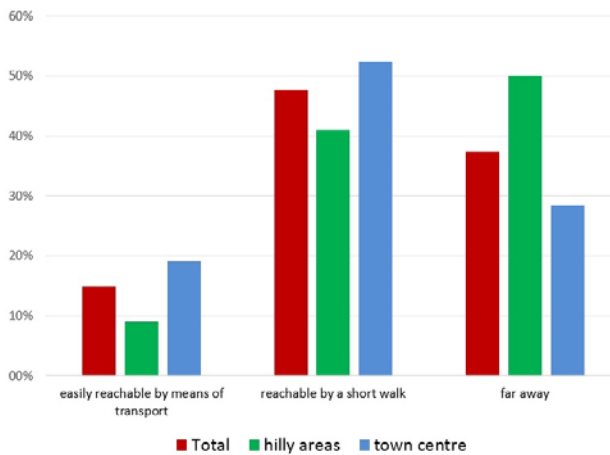
Figure 2:   People's willingness to spend time to reach the forest.

In an attempt to comprehensively understand people's choices and life habits, the questionnaire investigates not only the values that are commonly attributed to the forest ecosystem, but also those that involve the emotive sphere and the sense of cultural identity of the population. Well-being and peace are definitely the strongest sensation that people get when they are in the wood. Very few people have a sense of anxiety, nobody feels afraid (Fig.3a). The forest constitutes a very important presence in the collective imagination of the inhabitants of Trento, to the extent that it is identified with the very idea of Nature itself (Fig.3b).

Other studies highlighted the preferences of tourists and residents in Province of Trento for the fol-lowing three elements of the landscape (Pastorel-la et al., 2016; Pastorella et al., 2017): lakes and rivers, mixed forests with coniferous and broad-leaved species, and grasslands. In addition, those studies highlight on the one hand the close rela-tionship between mountain and local community and on the other the importance of the mountain landscape as an attractiveness factor for tourists and hikers.

3.3   Forest Features

The results show that the perceived most impor-tant forest features are: peace and quiet and wildlife (mean = 9,3, SD = 1.4), followed by footpaths (mean = 7.8, SD = 2.4) and panoramas (mean = 7.8, SD = 2.3). Conversely, the respondents consider the fol-lowing forest features as marginal: car parks (mean = 3.6, SD = 3.1), vita parcours and benches (mean = 3.7, SD = 3.0).

With regard to the socio-demographic characteris-tics of respondents, the results show that females prefer two forest features - footpaths (mean females = 8.4, SD = 2.0; mean males = 7.5, SD = 2.5), and wildlife (mean females = 9.1, SD = 1.7, mean males = 8.6, SD = 2.2) - compared to males. Conversely, more males prefer car parks (mean males = 4.0, SD = 3.2; mean females = 3.1, SD = 2.9) than females.

Concerning the age of respondents, we have iden-tified three age-related trends: the preferences for footpaths (from a mean value of 7.3 people with 30-39 years old to a mean value of 8.2 for people with more than 70 years old) and for benches (from a
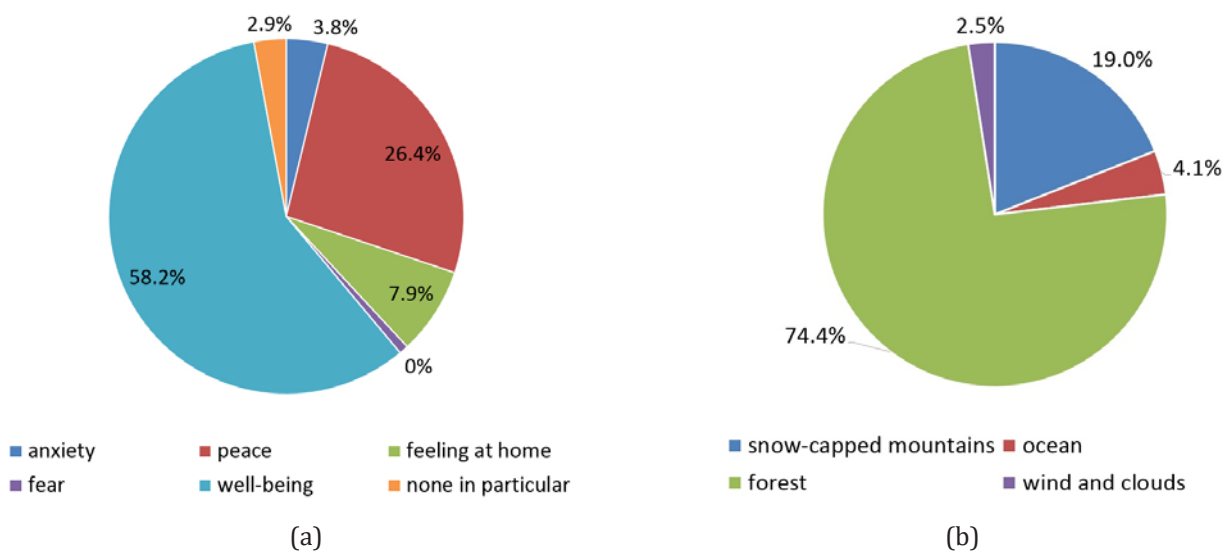

| (a) | (b) |

Figure 3:   Graphs of results: (a) People's emotions with regard to forest; (b) People's idea of Nature.

mean value of 3.0 for people with less than 30 years old to a mean value of 4.6 for people with more than 70 years old) increase with advancing age, while the preferences for open areas/meadows decrease with increasing age (from a mean value of 7.0 for people with less than 30 years old to a mean value of 5.5 for people with more 70 years old).

Regarding the level of education of respondents, the perceived importance of some forest features decreases with higher levels of education. This is the case for footpaths (from a mean value of 8.2 for people with an elementary school qualification to a mean value of 7.2 for people with a university degree), refreshment areas (from a mean value of 5.1 to 3.9) and car parks (from a mean value of 3.9 to 3.3).

Finally, people who were born in Trento assign a higher importance to peace and quiet (mean = 9.4, SD = 1.0) and car parks (mean = 3.8, SD = 3.1) than people of other parts of Province of Trento or other Italian regions (peace and quiet mean = 9.0, SD = 1.9; car parks mean = 3.2, SD = 2.8). Probably, these two aspects are related to the urban lifestyle: on the one hand, the forest is seen as a place to find peace and quiet, but on the other hand, people want to find car parks close to the forest.

The PCA made it possible to identify two components that together explain 48% of the variability.

Such components correspond to two main groups of respondents (Fig. 4): people who consider the forest in terms of "contemplation"; and people who consider the forest in terms of "usage". People belonging to the first group prefer the innate forest features (peace and quiet, wildlife, panoramas and meadows), while people in the second group prefer the man-made forest features (footpaths, vita parcours, refreshment areas, car parks and benches). The second group of people is mainly composed of elderly persons and those with a sedentary lifestyle.

Results show that the respondents like the feeling of being in a forest accompanied by a deep sense of peace, but without sacrificing basic facilities such as car parks and footpaths. This phenomenon is typical of post-modern societies (Inglehart, 1997), where people look for easy ways to be in contact with nature, without sacrificing their comforts. The decision makers – local managers and planners – need to consider these aspects in order to include such a community's demand in the planning strategies. In the last few years, the Province of Trento has developed important changes in forest legislation and planning, aimed at a multifunctional forest management based on the close-to-nature principles (Wolynski et al., 2006). The Forest Service of the Province of Trento drafted
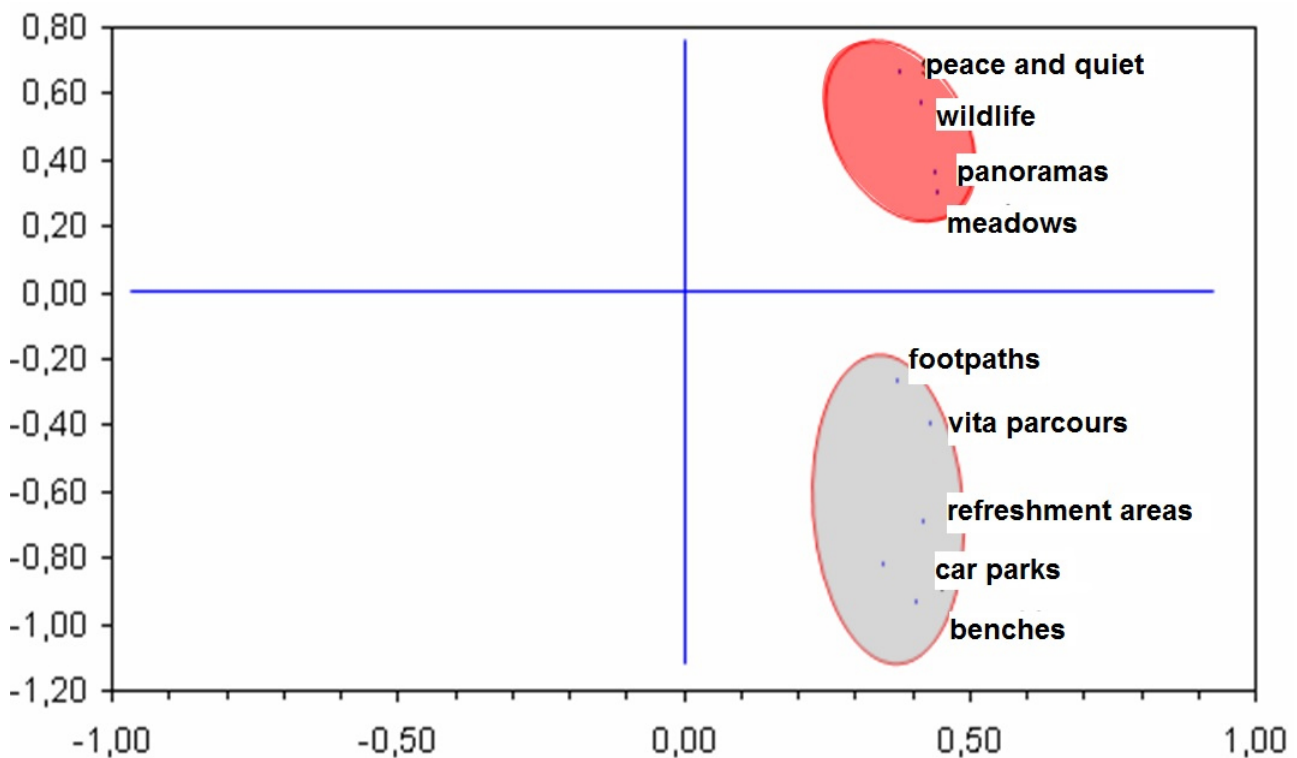

Figure 4:　　　Forest features - results of the Principal Component Analysis (PCA).

guidelines for the management of public and private forests aimed at ensuring both soil protection and biodiversity conservation and also at meeting the recreational demands of residents: some outdoor activities - such as walking, picnicking, landscape viewing, and mushroom and berry picking - have become an increasingly important issue (Paletto et al., 2012).

Furthermore, the forests of the Province of Trento are important, not only for the local residents but also for people coming from other regions of the country and from abroad. Tourism is an important element of the local economy of the province. Therefore, it is crucial to look for management strategies resulting in meeting residents' demands and tourists' requests (Paletto et al., 2013).

3.4   Human activities in forests

The results show that for respondents the most important human activities in forests are (Fig. 5): contact with nature (mean = 8.9, SD = 1.7) and walks in forest (mean = 8.9, SD = 1.8), followed by relaxation (mean = 8.8, SD = 1.8) and cultural heritage (mean = 8.0). Conversely, the human activities considered less important by respondents are hunting (mean = 0.3, SD = 2.0), and workplace (mean = 0.9, SD = 2.0).

With regard to gender, males prefer activities that make direct use of the forest such as hunting (mean males = 0.8, mean females = 0.1), firewood gathering (mean males = 2.2, mean females = 1.8) and mushroom picking (mean males = 5.8, mean females = 5.3), while females prefer more contemplative activities such as relaxation (mean females = 9.1, mean males = 8.7), contact with nature (mean females = 9.3, mean males = 8.7) and forest walks (mean females = 9.2, mean males = 8.6).

Concerning the age of respondents, it is interesting to emphasize that older people prefer picking mushrooms more than younger people (from a mean value of 3.8 for people under 30 and 7.1 for people aged 60-69) while older people and younger people have a more marked preference for the forest's cultural values than people between 30
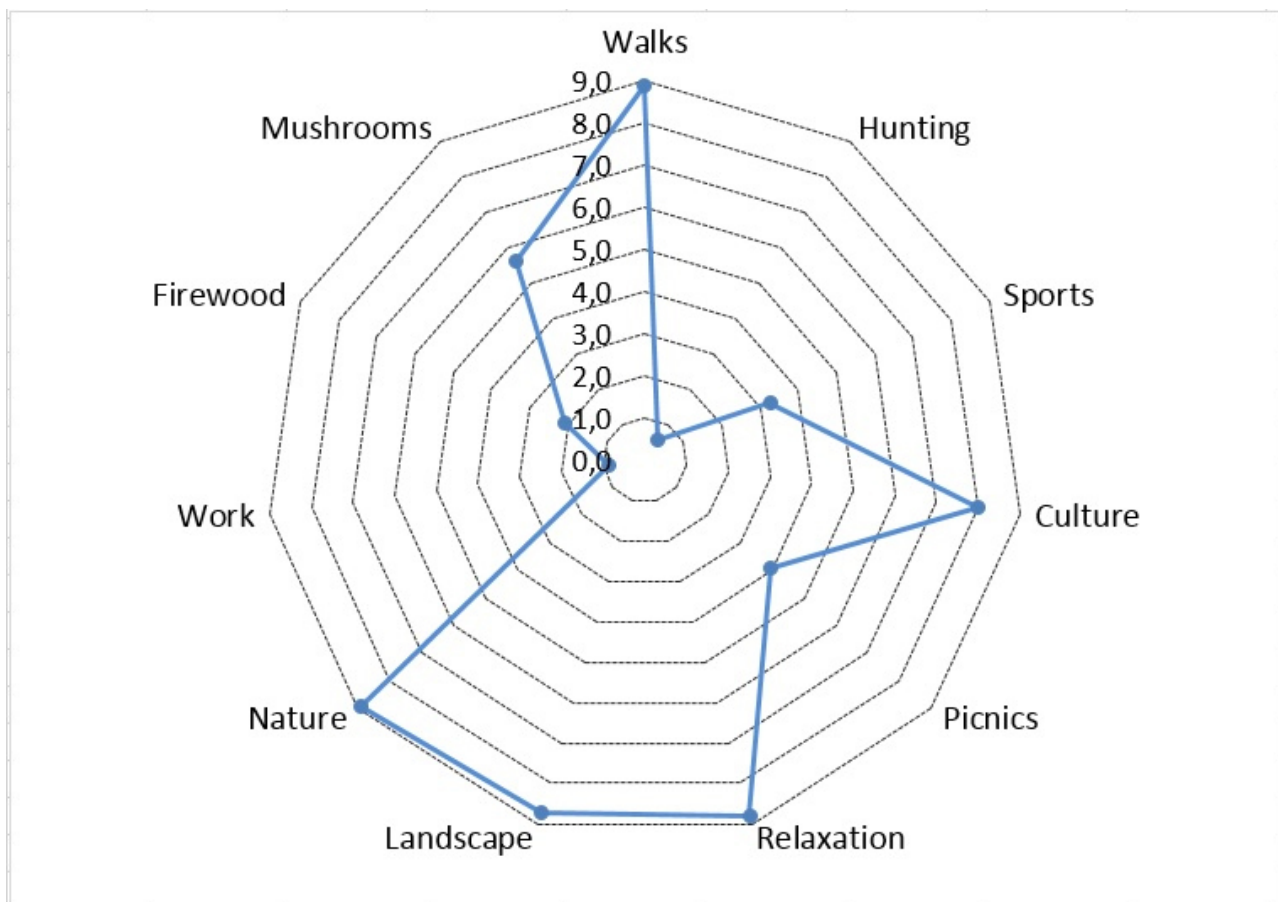

Figure 5:   Respondents' preferences for human activities in forests (mean value).
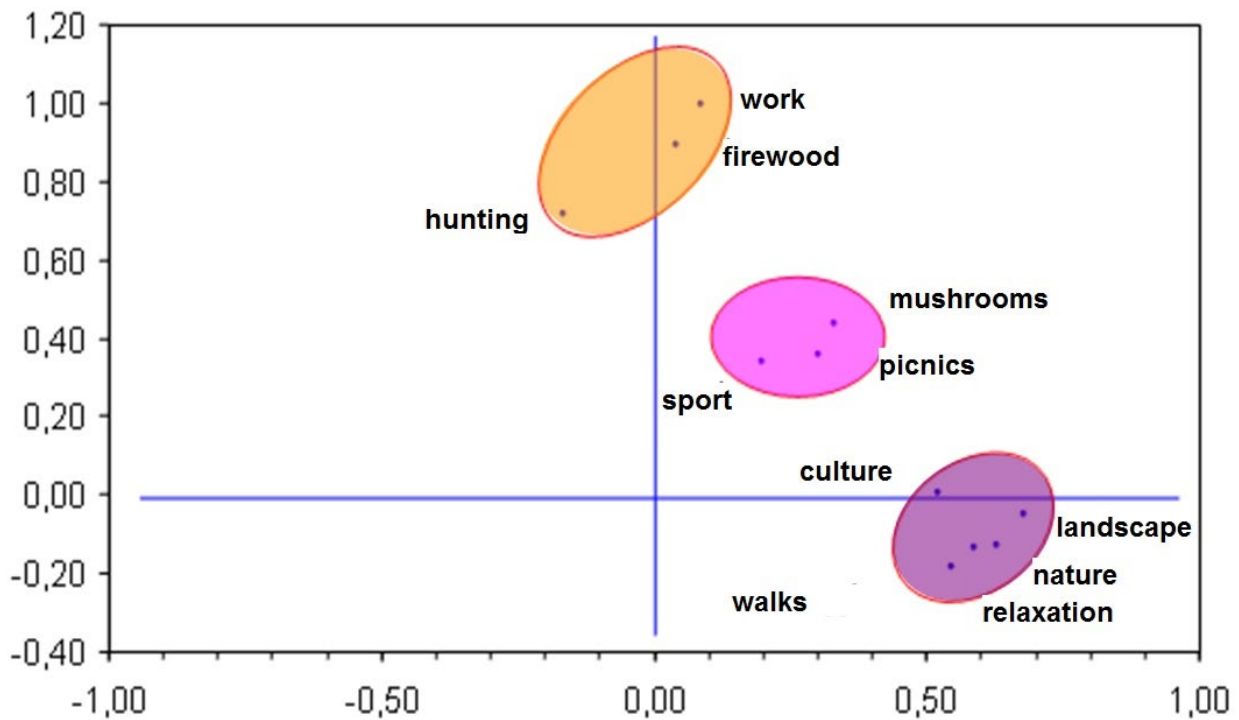
Figure 6: Human activities in forests - results of the Principal Component Analysis (PCA).

and 59. This preference for cultural values on the part of younger people may be explained considering that people between 30 and 59 are more active in the world of work and have less free time than younger people. These latter, in fact, assign greater importance to recreational activities in the forest (e.g., walking, hiking) which are conventionally included in the category of cultural values. As for the older people, their preference for cultural values is probably due to the fact that they are the custodians of the local community's cultural identity and of traditional ecological knowledge.

With regard to the level of education, the results show that people with a lower level of education assign higher values to almost all human activities. Conversely, the level of education does not seem to affect two human activities: walks in the forest and nature contemplation.

Finally, the origins of respondents are not a key variable to explain the differences in their preferences for human activities.

In this case, the PCA enabled us to identify three components that together explain 50% of the variability (Fig.6). Each component is characterized by a particular main function: production, recreation and nature conservation. In particular, people who chose answers concerning production, main-

ly males, were only a few, but they assigned a particularly high score. This group of people conceives the forest as a place to supply the local society with goods. The second group includes people - composed mainly of young people - who consider the forest as a place for sports activities and picnicking. The third group includes people - composed mainly of older people and females - who perceive the forest as a place for relaxation and landscape and nature contemplation.

Results clearly show that different activities are considered important by different groups of people, confirming that attitudes towards forests are influenced by diverse factors such as age, gender and reasons for going into the forest, especially when considering people belonging to an alpine community who are familiar with forests. Possible conflicts between users can arise from different attitudes and interests, so it is advisable to provide appropriate and timely information regarding the aim of various management strategies. In 2007 the Forest Law was revised in Trentino, and the forest planning structure changed, introducing a regional-level of planning in order to take into account long-term interests and, by means of a single planning drive, to address the various problems and possible conflicts related to the various for-

est functions (Paletto et al., 2013). In this context, the results of the present case study may prove a useful point of departure in the participatory planning process required by the law.

4. CONCLUSION

Although forests provide a host of goods and ecosystem services to residents and tourists, forest management planning in Italy often does not sufficiently take into consideration their preferences concerning recreational and green infrastructures. The inclusion of social preferences in planning strategies is a key point if a rational and sustainable use of urban and peri-urban forests, and green infrastructures is to be guaranteed.

In this sense, the research proved to be effective in highlighting people's needs and the values they attribute to the forests. It is clear that the town is undergoing a delicate time of transition from a traditional way of life, characterized by an economy in which the activities of the primary sector still retain a certain degree of importance, to a distinctly urban lifestyle. The relationship of citizens with the forests surrounding the town is itself dramatically changing. As recently as a few decades ago, these forests were not "urban forests", in the classic sense, but part of the forested territory, having always been managed as commons for the purpose of supplying provisions and support services for the community. The emergent preference of the population for a different order of priority of goods and ecosystem services provided by forests poses a real challenge for future management.

Surveys of this type may help in opening up dialogue between the community and public administrators and may be useful tools in the hands of planners and decision-makers in focusing attention on the evolution of society's demands. This is a crucial prerequisite when trying to shape sustainable urban development, and, in the long-term, is particularly important during periods of rapid change, such as the ones we are experiencing today.

REFERENCES

Artmann, M., Bastian, O., & Grunewald, K. (2017). Using the Concept of Green Infrastructure and Ecosystem Services to Specify Leitbilder for Compact and Green Cities – The Example of the Landscape Plan of Dresden (Germany). *Sustainability, 9*(2), 198. doi: 10.3390/su9020198

Betta, A., Cantiani, M. G., De Meo, I., & Maino, F. (2009). La percezione del bosco da parte delle comunità locali: un caso di studio nel Comune di Trento. *Forest@-Journal of Silviculture and Forest Ecology, 6*(5), 320-332. doi: 10.3832/efor0594-006

Cantiani, M., Geitner, C., Haida, C., Maino, F., Tattoni, C., Vettorato, D., & Ciolli, M. (2016). Balancing economic development and environmental conservation for a new governance of Alpine areas. *Sustainability, 8*(8), 802.

Comune di Trento (2018). Trento Statistica. La Popolazione al 31 dicembre 2016. http://www.comune.trento.it/Aree-tematiche/Statistiche-e-dati-elettorali/Statistiche/Avvisi/La-popolazione-al-31-dicembre-2016 [21/11/2018]

De Meo, I., Paletto, A., & Cantiani, M. G. (2015). The attractiveness of forests: preferences and perceptions in a mountain community in Italy. *Annals of Forest Research, 58*(1), 145-156. doi: 10.15287/afr.2015.308

Dudek, T. (2016). Needs of the local population related to development of forests for recreational purposes: example of south-eastern Poland. *Journal of Forest Science, 62*(1), 35-40. doi: 10.17221/99/2015-JFS

European Parliament (2014). Mapping Smart Cities in the EU. http://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET (2014)507480_EN.pdf [07/08/2017]

Hansen, R., & Pauleit, S. (2014). From multifunctionality to multiple ecosystem services? A conceptual framework for multifunctionality in green infrastructure planning for urban areas. *Ambio, 43*(4), 516-529. doi: 10.1007/s13280-014-0510-2

Hunziker, M., Frick, J., Bauer, N., von Lindern, E., & Graf, O. (2013). La population Suisse et sa forêt. Office fédéral de l'environment, Berne et Institut federal de recherches sur la forêt, la neige et le paysage WSL, Birmensdorf.

Inglehart, R. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies*. Princeton, US: Princeton university press.

Laws, E. (1995). *Tourism destination management: Issues, analysis, and policies*. New York, US: Routledge.

Manfredi, F. (2015). *Smart Community. Comunità sostenibili e resilienti*. Bari, IT: Cacucci Editore, Collana Lum School of Management.

Nielsen, T. S., & Hansen, K. B. (2007). Do green areas affect health? Results from a Danish survey on the use of green areas and health indicators. *Health & place, 13*(4), 839-850. doi: 10.1016/j.healthplace.2007.02.001

Nutsford, D., Pearson, A. L., & Kingham, S. (2013). An ecological study investigating the association between access to urban green space and mental health. *Public health, 127*(11), 1005-1011. doi: 10.1016/j.puhe.2013.08.016

Paletto, A., Maino, F., De Meo, I., & Ferretti, F. (2013). Perception of forest values in the alpine community of Trentino region (Italy). *Environmental management, 51*(2), 414-422. doi: 10.1007/s00267-012-9974-7

Paletto, A., De Meo, I., Cantiani, M. G., & Maino, F. (2013). Social perceptions and forest management strategies in an Italian Alpine community. *Mountain Research and Development, 33*(2), 152-161. doi: 10.1659/mrd-journal-d-12-00115.1

Pastorella, F., Santoni, S., Notaro, S., & Paletto, A. (2016). La percezione sociale del paesaggio forestale in Trentino-Alto Adige: casi di studio a confronto. *Forest@-Journal of Silviculture and Forest Ecology, 13*(1), 73-89. doi: 10.3832/efor2119-013

Pastorella, F., Giacovelli, G., De Meo, I., & Paletto, A. (2017). People's preferences for Alpine forest landscapes: results of an internet-based survey. *Journal of Forest Research, 22*(1), 36-43. doi: 10.1080/13416979.2017.1279708

Pavlikakis, G. E., & Tsihrintzis, V. A. (2006). Perceptions and preferences of the local population in Eastern Macedonia and Thrace National Park in Greece. *Landscape and Urban Planning 77*(1-2), 1–16. doi: 10.1016/j.landurbplan.2004.12.008

Pytlounovà Pancikovà, M. (2015). *Guide to the Metropolitan Plan of Prague – A brief summary of the Concept of Justification*. Prague institute of Planning and Development.

Rametsteiner, E. Eichler, L., Berg, J. (2009). *Shaping Forest Communication in the European Union: Public Perceptions of Forests and Forestry.* Rotterdam, NL: ECORYS.

Riva-Mossman, S. (2018). Aging in Resilient Communities – An Alpine Case Study: the Senior Living Lab Experience. *Journal of Aging Science, 6*, 193.

Sangster, M. (2010). Well-being and nature: policy convergence in forestry, health and rural development. *Swiss Forestry Journal 161*(3), 62–68. doi: 10.3188/szf.2010.0062

Schmithüsen, F., & Wild-Eck, S. (2000). Uses and perceptions of forests by people living in urban areas: Findings

from selected empirical studies. *European Journal of Forest Research 119*, 395–408. doi: 10.1007/BF02769152

Šišák, L. (2011). Forest visitors' opinions on the importance of forest operations, forest functions and sourcesof their financing. *Journal of Forest Science, 57*(6), 266-270. doi: 10.17221/135/2010-JFS

United Nations (2012). Back to our Common Future. Summary for Policymakers. SustainableDevelopment in the 21st century (SD 21) Project. http://www.um.org/esa/dsd/dsd_dsd21st/21_index.shtml [12/10/2018]

United Nations (2016). http://habitat3.org/wp-content/uploads/New-Urban-Agenda-GA-Adopted-68th-Plenary-N1646655-E.pdf [14/04/2017]

Van Raaij, W. F. (1986). Consumer research on tourism mental and behavioral constructs. *Annals of Tourism Research, 13*(1), 1-9. doi: 10.1016/0160-7383(86)90054-X

Wolynski, A., Berretti, R., Motta, R. (2006). Selvicoltura multifunzionale orientata alla qualità. Caratterizzazione di una faggeta in provincia di Trento. *Sherwood 118*, 5-12.