Importance of public participation in END implementation: some experiences from Italian agglomerates and infrastructures

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ABSTRACT

Information, communication and participation are important keywords for a correct and effective implementation of Directive 2002/49/EC, the Environmental Noise Directive (END). Following the article 9 of END, information to the public must be ensured by Member States as the strategic noise maps are adopted and the action plans are drawn up. Data should be made fully available and disseminated to the public, information must be clear, comprehensible and accessible.

Sometimes the participation of public is needed to make the best choice among different solutions for actions of noise reduction plan and acoustic quality improvement in strategic action plans, sometimes the public can be involved, as main stakeholder, in the definition of policies for noise control at local level including regulations for the correct use of entertainment areas and quiet areas as well.

In this paper a general review of different scenarios where participation of the public is preferable since it can give crucial contributions is shown. The review is integrated by some examples of good and useful information and participation activities derived by strategic noise mapping and action plans implementation for agglomerates and infrastructures of transport.

Keywords: Participation, Information END

1. INTRODUCTION

According to the definition given by US Environmental Protection Agency (1), public participation can be any process that directly engages the public in decision-making and gives full consideration to public input in making that decision. Public participation, considered as a process, consists of a series of activities and actions aiming to both inform the public and obtain input from them.

With regard to noise policies, public participation actions can be very meaningful if they succeed in collecting public orientation on specific points of decisional processes regarding noise management and control planning in urban areas, identified on acoustic climate basis as critical areas, being them either hotspot or quiet areas.

Public can be involved in decision on general strategic choices and on specific issues as well, not just asking “what do you want?” but proposing checklists of problem and solutions, list of possible expectations, being careful in checking that expected solution are actually feasible.

Perception of annoyance and general comfort as well as quality of life indicators can be crucial in the definition of effective solutions to noise induced problems. In the EU countries, following the disposals of END (2), methods like questionnaires, surveys, soundscapes analysis are frequently used in combination with traditional methods for mapping territory and planning noise management and control, adding information and preferences of residents to measured data.
2. PUBLIC PARTICIPATION IN THE ENVIRONMENTAL NOISE DIRECTIVE

Communication and dissemination strategies are actually required by the Environmental Noise Directive (END). The Directive provides indications and recommendations about items such as noise mapping, action planning, quiet areas, underlining the importance of communication and dissemination towards citizens. Among the actions reported by the END, in order to reach objectives defined in Article 1, the main activities that shall be progressively implemented are noise mapping and action planning. END makes necessary the determination of exposure to environmental noise, through noise mapping, by methods of assessment common to the Member States, ensuring that information on environmental noise and its effects is made available to the public. Furthermore, the adoption of action plans by the Member States, based on noise mapping results, aims to preventing and reducing environmental noise where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good. In this frame, public participation must be considered. Articles 8 and 9 of END strongly address participatory design and awareness-raising activities. Public participation should regard all the noise policy stakeholders (such as citizens, communities, policy makers) giving them the opportunity to influence decisions on noise management and control that affect their lives.

Public participation in decisions regarding the action plans, considering both the strategic and punctual levels, does not necessarily mean to follow all the public inputs, doing all what the public wants, but to consider a collection of views and concerns on determined issues.

Various methods and approaches has been applied for managing public participation, the better ones consider as much as possible inputs from a wide spectrum of stakeholder, and produce analytic results in a wide range of views and concerns.

Sometimes the opportunities for influencing the decision of noise policy makers and solutions designers could seem small and limited, while at other times the public participation can have a great deal of influence.

In any case, this potential influence must be considered in designing a successful public participation program.

The Public participation spectrum of stakeholder engagement and/or popular participation for environmental assessment and decision making (3), based on the five-steps procedure (Inform, Consult, Involve, Collaborate, Empower) can be adapted to noise policies and noise actions required by END as shown in figure 1, where specific reference to strategies and actions of Action Plans is made. In the following chapters some examples of participation of the public, extracted by Italian experience of END implementation are shown.

![Figure 1 – Flowchart of public participation in the frame of END implementation](image-url)
3. PARTICIPATORY DESIGN IN ACTION PLANS

3.1 Participatory design and Awareness campaigns in Italian experiences

In the definition and implementation of action plans, participatory design and awareness-raising activities can play decisive roles as they are valuable tools for informing, consulting, and involving the communities in the intervention designing process.

In some strategic actions and in numerous local interventions that can be found in the action plans of agglomerates and infrastructures in Italy and in other EU countries, a participatory design scheme based on soundscape analysis has been developed and implemented. This approach is based on interviews to stakeholders and questionnaires filled by residents and citizens (end users) living in the interested areas during the ante operam time. The analytical results can be used by policy makers and planners in designing noise mitigation solutions and, more generally, territorial requalification actions. Stakeholders opinions have been collected on strategic issues. End user questionnaires have been defined to collect the perceived level of acoustic comfort and acoustic quality of investigated areas, aiming to carry out, via simple analysis, useful results for designing phase.

Noise Awareness campaigns have been set as integrating part of the plans: informative materials on noise and its effects have been produced and distributed with specific attention to situations where the presence of high level of exposure to both environmental and occupational noise has given to noise the entity of a true public health problem. Some ideas for original solutions have been derived from feedbacks to awareness campaigns.

3.2 The participatory design scheme and its application

The above mentioned assessment follows a scheme based on ante-operam surveys, data analysis, design, and post-operam surveys. During the ante-operam surveys, when public participation can be decisive, questionnaires have been articulated in three sections, containing, respectively:

a) urban area layout, with significant sub-areas delimitation, general data (age, sex, occupation) of respondents, activity and timing data, describing their presence in the area;

b) cataloging, according to a scale of importance, of the perceived environmental conditions and problems, including noise;

c) proposed solutions aiming to improve the environmental quality and the acoustic comfort of each area and sub-area, to be selected or rated as preferred.

In the Italian experience, the scheme has been successfully applied to urban areas with different characteristics, like squares in residential areas, noisy suburban districts, schools and surrounding playgrounds.

For all these areas, ideas for requalification has been shared and progressively detailed by common people and stakeholders, involved in a designing pattern, from the very beginning. Designers have been required to be able to transform a situation of perceived discomfort in a pleasant one, with reference to the same representative sample of “users”.

For example, in squares located in residential areas, where traffic is the main source, but noisy activities of square users are sources as well, listening campaign and questionnaires have been organized for all categories of square users:
- parents and little children;
- youngsters and students (teenagers);
- elderly people;
- residents;
- commercial activities facing the square.

Following the results of questionnaires and of soundwalks with binaural recorder performed in the sub-areas of the square, a new soundscape-based layout of the square has been designed, considering both the sound pleasantness for the users and the noise control towards the dwellers.

In schools and playgrounds public participation to solution design has generated original solutions, consisting of:
- non intrusive barrier, for reducing noise in a visually pleasant way, well integrated with the space and, above all, enjoyed by the children during playtime;
- games (and sound-based games) with educational purposes;
- wooden outdoor furniture like little houses and mobile amphitheater where teachers can give lesson in outdoor spaces with good room acoustics features.

In noisy suburban districts, where multiple concurrent sources are responsible of constant
annoyance and limit the presence of people in outdoor spaces, the participatory scheme assumed a more strategic attitude and consists in proper strategic actions, like:
- modification of road conditions and traffic directions;
- creation of a low speed zone to discourage traffic crossing area, to built new or improve existing pedestrian paths and bicycle lanes;
- connection of green areas via new pedestrian patterns;
- installation of sound sculptures in green areas, making them attractive for residents and passers that can listen to composed soundscapes, mix of natural and artificial sounds typical of the area, capable to mask the residual pollutant traffic noise and, at the same time, to enhance the sonic footprint of the area.

Figure 2 shows three examples of actions referred to case studies of the three mentioned categories (noisy suburban area, square in residential area and school with playground). All the solutions are inspired by public participation and participatory design.

3.3 EU funded projects and public participation

Recently, some Life+ projects on END implementation have been funded. Among them we can mention: project HUSH (Harmonization of Urban noise reduction Strategies for Homogeneous action plans), project NADIA (Noise Abatement Demostrative and Innovative Actions and infomation), project HARMONICA (HARMOnised Noise Information for Citizens and Authorities), project QUADMAP (QUIet Areas Definition and Management in Action Plans9 and Project DYNAMAP (Dynamic Acoustic Mapping - Development of low cost sensors networks for real time noise mapping). All of them (4,5,6) considers communication and public participation at different levels. Referring to this point, HUSH experimented a participatory design based on a soundscapes analysis approach, by using the results of an end user questionnaire submitted in two pilot cases as one of main aims for the intervention designing. Referring to the QUADMAP contribution, in the selection phase the involvement of citizens is provided by collecting their opinions about the potentiality of an area to become a Quiet Urban Area. Moreover, in the analysis phase non-acoustical data are collected in terms of questionnaires and interviews about citizens' noise perception and expectations for an acoustical and social improvement of the areas. Regarding NADIA, dissemination activities were tailored to the characteristics of the several audiences involved in the project. The most successful dissemination actions were carried out in schools thanks to lectures specifically design to the students’ level (primary or high schools). The materials prepared for these events (i.e. e-books and board games) encouraged active participation. Other dissemination activities were carried out for technicians, other stakeholders and citizens. Sometimes the attendance to meetings of residents and other end users, was not satisfactory. This lack of participation can be recognized as a demonstration that European Union should set up further strategies aimed at increase the citizen’s awareness on noise issues, also basing on EU funded projects experiences.

3.4 Smart solutions for public participation

Noise affects human’s health and reduce quality of life in urban areas, but it can’t be addressed as an isolated pollutant. Strategic solutions for noise control should always be connected with more general strategies for urban management (traffic, urban mobility, energy efficiency, air quality, etc.). The Environmental Noise Directive, introducing the strategic approach for noise maps and action plans aiming to mitigate the effects of environmental noise and to increase the quality of life in urban areas as well, seems to orient the policies towards smartness. But, how to define, measure, compare the smartness of noise mitigation and control solutions in cities. Different methods and measurement indices have been developed so far according to the several meanings of the concept of smart city. Rating systems through synthetic quantitative indicators are receiving increasing attention among city managers and policymakers. All of them include noise control and acoustic wellness as elements of smartness: in the smart city approach, investments in infrastructures and communication are oriented to improve sustainable economic development and quality of life in cities, through participatory actions and stakeholder involvement, in a similar way to what the END requires in terms of information to the public and participation. In a smart planning and management of noise issues in urban environment special relevance must be given to awareness and participation of citizens. Methods for representing the smartness of urban transport system and urban planning solutions (included quiet areas and noise mitigation plans) can be found in some recent researches (7,8).

We can find experiences of smart environmental planning and original solutions for noise reduction
and control in urban areas, including: noise from transportation, neighborhood noise and, more in general, contribution to a better acoustic climate of cities. All aspects of acoustic planning and design that can be connected to the development of greener and sustainable cities can be considered. The main idea is to explore different scenarios and approaches to noise reduction and quiet areas protection in a widespread context of urban plans and to discuss common problems enlightened by project results, orienting future noise policies and joint activities among different cities with similar problems as well. A serendipic approach to noise reduction solutions could result in added value to the acoustic benefit at the same cost, that means to achieve the primary objective of the design (compliance to a law, a noise limit, an insulation level), with one or more free secondary pleasant and unexpected added benefit.

Figure 2 - Examples of participatory designed solutions (noisy suburban area, school, square)
4. NOISE AWARENESS CAMPAIGNS AND PUBLIC PARTICIPATION

4.1 The INAD activities

The International Noise Awareness Day campaign was launched by the American Center for Hearing and Communication in 1996 and it is celebrated every year on the last week of April.

In general, during this event, students and teachers are invited, with the help of expert acousticians, to study and work for giving their direct contribution to the campaign in terms of participative design of quieter schoolyards and green areas open to neighborhood as well as more comfortable classrooms.

Since 1995, every year, some private and public institutions, together with schools, in a growing number of nations, organize initiatives involving students and citizens.

The event involves also Communities regarding the noise problems in public spaces and neighborhood. Some city administrations in the frame of the INAD activities, have involved schools in projects of noise mitigation that are part of Noise Reduction Plans, required by National Legislation and/or Action Plans, according to Directive 2002/49/EC.

In Italy the Acoustic Society of Italy (AIA) involves schools of different level in educational events on the theme of Noise Awareness (9,10). Original materials are produced and distributed in schools and communities, initiatives are organized aiming to: inform and increase awareness of students and citizens, measure and assess noise in schools (indoor and outdoor); design solutions for noise mitigation and improve acoustic climate; describe soundscapes of schools and scholastic gardens; write and/or draw an advertising campaign on noise; understand, define and observe a "quiet diet"; distribute and collect questionnaires and interviews about sound quality in schools and in living environments; invent games and playing activities related to acoustic

4.2 Projects in schools at Florence

In Florence the Noise Action Plan, integrated with Noise Reduction Plan has given to schools the highest priority for remediation. Many interventions have been planned and realized for improving noise quality of inner spaces. Room and building acoustics of classrooms and other teaching spaces have been considered, improving insulation of facades and partitions and optimizing reverberation; acoustic comfort of other common spaces, like canteens and meeting rooms, has been increased as well.

In the frame of HUSH and QUADMAP projects (10,11), some interventions of environmental noise reduction in courtyards and outdoor areas of primary schools have been developed according to the participatory design. In all these case studies the results of acoustic measurements in ante operam scenario had shown the need to protect school gardens and outdoor areas from traffic noise emitted by nearby road infrastructures. This need has been confirmed by the non-acoustic investigation. For this reason, the intervention proposed has been noise barriers, realized via a participatory design process.

The first intervention, as pilot-case of HUSH Project, regards the acoustic requalification of the courtyard of “Don Minzoni” School in Florence.

In this project teachers and pupils have been involved into the project. Class produced ideas and drawings about the design of the school courtyard. The school has followed the INAD experience during the three years for designing and construction of the intervention.

Figure 3 – Some drawings that inspired the design of the new garden of “Don Minzoni” School

The second intervention, as pilot-case of QUADMAP Project, regards the noise reduction of the garden of “Dionisi” School in Florence.

The intervention defined and built according to the indications emerged by end users questionnaire
consisted of a blackboard noise barrier proposed by children.

Figure 4 – Blackboard barriers for outdoor lessons at “Dionisi” School

The third intervention, in another pilot case of QUADMAP Project, regards the noise reduction of the garden of “Vamba-Montessori” School in Florence, where the implemented solution for noise reduction in the courtyard has been a green barrier that can be used for botanical lessons and experiments. From the non-acoustic investigation also the need of a space for outdoor teaching emerged. To do this a wooden gazebo in the garden area protected by the barrier has been designed as well. Both this elements (gazebo and barriers) designed according to end users preferences are now regularly used for external teaching.

Figure 5 – Green barrier for botanical experiments at at “Vamba-Montessori” School

The fourth intervention, case study of HUSH project, consist in a strategical action of noise masking for the school courtyard of “Paolo Uccello” School that has been developed according to the participatory design scheme.

The school staff expressed the desire of not adding a barrier, being more interested to create a pleasant soundscape in the garden to make it more attractive, reducing as far as possible the traffic noise impact. The intervention consists of the introduction of sound sculptures in the scholastic garden to compose soundscapes as a mix of natural sound and artificial sounds typical of the area with the aim of masking the traffic noise in active mode.

Figure 6 – Noise masking at “Paolo Uccello” School
5. CONCLUSIONS

Noise is an important element for the quality of life of urban areas. Its influence should be properly evaluated, considering also the inter-relationships among noise and other factors of global environmental comfort. Policy makers should start to consider acoustics and noise control as a matter of smartness in cities and as a good indicator as well. Public participation contributes to better decisions because decision-makers have more complete information – in the form of additional facts, values, and perspectives obtained through public input – to bear on the decision process. They can incorporate the best information and expertise of all stakeholders. Decisions are more implementable and sustainable as they consider the needs and the interests of all stakeholders, that, by the way, can better understand problems and solutions, being more invested in the outcomes.

The European Noise Directive 2002/49/EC (END) provides indications and recommendations about noise mapping, action planning, quiet areas and about the communication and dissemination towards citizens.

In this article a definition of a public participation procedure for definition and implementation of action plans starting from noise maps and legislation requirement is shown, as implemented in some Italian case studies, considering its application in the frame of some EU funded projects, with particular reference to Life+ HUSH and QUADMAP projects.

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