Project GIOCONDA

YOUNG VOICES COUNT in DECISIONS on ENVIRONMENT and HEALTH

environment and health | noise pollution | air pollution

PROJECT DESCRIPTION

In 2010, during the Fifth Ministerial Conference on Environment and Health, Ministers and Representatives of the Member States of the European Region of the World Health Organization (WHO), responsible for health and environment, took a commitment, signing the Parma Declaration ("Protecting the health of children in a changing environment"), to reduce the percentage of diseases of environmental origin. Air pollution is recognized as the main risk factor for the health of people living in cities. In public health studies noise emerges more and more as a significant risk factor, mainly in urban environments and in specific areas such as agglomerations with high-traffic or in areas near airports. LIFE Gioconda verified that the topic "noise" is not known and dealt with in a systematic way and there are no common tools for increasing public awareness.

Scientific research shows that young people are particularly vulnerable to environmental pressures and their effects on health. The Gioconda project developed a **model for assessing the state of the environment and health in different Italian areas involving children and teenagers from first and second grade secondary schools**, aged 11 to 17 years.

OBJECTIVES

Awareness and ability to improve the community environment can be decisive in contributing to form a responsible and active citizenship. **The involvement of young generations in decision-making processes contributes to widening the knowledge and transforming participation into a habit that will accompany the young citizens for all their lives.** In addition, participation provides decision-makers with a more concrete area of comparison, allowing them to build relationships of trust and to share paths, facilitating transparency and mutual accountability. In this sense, Gioconda's activities allowed to define an innovative methodology to support environmental and health policies and, at the same time, acted in favor of integrating environmental issues into all policy areas, including educational issues and the production of local risk maps.

PROJECT PHASES

The project was articulated in 6 main steps run by management and coordination activities:

1. **Study of the socio-economic and health status of four areas** (Ravenna, San Miniato in the Lower Valdarno, Naples and Taranto) and policy analysis performed on the basis of the collected data and a series of interviews with local administrators, representatives of associations and local schools.
2. **Monitoring of major air pollutants and noise, inside and outside the schools** in the four areas involved in the project using the systematic sampling methodology developed within the project which was then made available to local authorities.
3. **Educational activity with students** in a research-action path starting with a questionnaire on their risk perception and developing then recommendations to their city-administrators concerning environment and health issues.

4. **Construction of a platform where to compare risk perception of the students and where to make available the data on air pollution** (PM_{10}, NO_2) detected by the closest control unit to each school.
5. **Evaluation** of steps 3 and 4 through a series of interviews; replication of the activities in other territories and systematic evaluation of the whole project progress.
6. **Networking**: seminars, conferences and meetings leading to a proposal to create a network enabling knowledge transfer and exchange (*KTE - Knowledge Transfer and Exchange*) among non-expert public, researchers and decision-makers of public administrations.

PROJECT RESULTS

GIOCONDA has contributed to the integration of local environmental problems into the health and urban environment management policies in the four target areas of the project, collecting data on air quality and noise. The **systematic sampling methodology**, developed under the coordination of ARPA Emilia Romagna, is part of the methodological achievements of the project and was proposed to the competent authorities which can repeat it in their cities and schools.

The project was implemented in 4 areas in Italy, very different among them for the environmental characteristics and socio-economic development; in each area 2 schools were involved, one first grade and one second grade secondary school:

1. **Naples**, a real Italian metropolis, marred by a high rate of air pollution (Junior High and High School "Umberto I" and the State Unified School "Bovio Colletta");
2. **Taranto**, the city where there is the largest iron and steel plant in Europe, as well as other industrial plants and a large area of the Navy (First Grade Secondary Institute "Ugo De Carolis" and State Industrial Technical Institute "Pacinotti - Fermi")
3. **Ravenna**, surrounded by an important industrial area and a port with a long experience of public commitment towards sustainable development (Scientific High School "A. Oriani" and State Unified Institute of Sea and the Navy of Ravenna);
4. **Lower Valdarno** (San Miniato, Montopoli, Santa Croce and Castelfranco di Sotto) characterized by the Arno Valley and by gentle hills, with small municipalities, farms and craft leather factories with a history of strong environmental pollution, already dealt with and limited in the '80s with modern fume and water purification systems, and where environmental awareness is integral part of the cultural heritage (State Unified School "M. Buonarroti" and Technical Institute "Cattaneo" of San Miniato).

The project carried out several activities to effectively involve young people and make them protagonists of an action of participatory democracy, managing to build a dialogue between schools and local administrations on the themes of environment and health through the use of a governance tool capable of supporting local administrations in decision-making and of effectively realizing the concept of "scientific citizenship".

Through the **air quality** and **noise** **measurement campaigns** carried out during the 2014-2015 school year in the 8 schools involved, the values of Particulates (PM_{10} and $PM_{2.5}$), Nitrogen Dioxide (NO_2) and some Volatile Organic Compounds (VOCs), particularly Benzene, were monitored for each target area.

The below table summarizes the data gathered in the measurement campaign:

Instrumentation used	• Active samplers for atmospheric particles • Passive samplers for gases • Sound level meters and sound boxes
Positioning	• Inside the schools (up to 4 indoor sites) • Outside the schools (up to 3 outdoor sites) • At an air quality monitoring station of the regional network

Sampling period	• In wintertime (November 2014 - March 2015)* • In summertime (April 2015 – July 2015)
Monitored pollutants	• Atmospheric particles (PM_{10} e $PM_{2.5}$) • Gaseous air pollutants (NO_2, VOCs, H_2S) • Equivalent sound levels

Just to give an example, here is the **link** of the graphs that summarize the **results of the air quality monitoring in Taranto, in the 2 schools involved in the project**: First Degree Secondary Institute "Ugo De Carolis" and the State Industrial Technical Institute "Pacinotti-Fermi". In the same table it is also shown a comparison between the data collected within GIOCONDA and those of the ARPA Puglia control units.

In order to analyze the results of noise monitoring, the GIOCONDA team has developed **a global indicator, the GNS** (Global Noise Score)**, which summarizes the acoustic situation of the classroom** and considers: the sound level that characterizes the indoor and outdoor environment (measured in L_{eq}), facade insulation, wall insulation, reverberation time and an index of speech intelligibility. For the GNS a scale of scores was prepared, divided by classes, obtained starting from the scores assigned to the single indicators, based on the limit values according to Italian laws and on quality values deriving from Italian and European studies. This indicator was developed and tested by iPOOL S.r.l, a spin-off company of the National Research Center.

Results of the noise measurements (link to the graph) reveal a negative situation in most of the classrooms: in the 8 schools of GIOCONDA about 75% of the classes obtained low score (meaning "poor" and "very poor" air quality). The causes are mainly related to maintenance problems of the window frames that impact very negatively.

The most important output of the project was the creation of the GIOCONDA *on line* platform that offers schools and administrations various tools to engage in dialogue on the environment and health:

- **1 video tutorial** to explain the platform's functionalities;
- **1 guide for teachers**, with all the details of the activities that can be carried out in the classroom;
- **1 guide for decision-makers**, to understand how and why to activate GIOCONDA, and 1 **sheet for the calculation of the costs and benefits of environmental improvement interventions** that can have an impact on the health of citizens, accompanied by 1 **video tutorial**;
- **1 procedure to carry out environmental monitoring on air quality and noise** in your area, if dedicated resources are available;
- **1 interactive map** that instantly highlights: all the schools in the Italian territory; control units of the ARPA monitoring network 2 of which collect data on major pollutants (PM_{10} e NO_2); presence of industries, main roads, ports, airports, railway stations near the schools; municipality, province and region boundaries; socio-demographic characteristics of the interested territory (provincial data); data on schooling; data on population's life expectancy;
- 1 questionnaire on the perception of **risk from air pollution and noise** that, at the end of the compilation, calculates the risk perception index (RPI) for the individual, the class, the school, the city, the region;
- **1 air quality index**, represented by icons, in the chosen school area, to be compared with the RPI;
- **dedicated space to upload recommendations** for decision-makers;
- **2 brochures** illustrating the operation of the platform to schools and public administrations: **brochure for schools** and **for local administrations.**

Testing of the GIOCONDA platform took place in 2 schools of the Lower Valdarno (Montopoli and Marti), in 1 school of Bitonto (Technical Economic Institute "Vitale Giordano") and in 3 schools of Ferrara (State Unified School "Filippo De Pisis", Technical Industrial Institute "Copernicus-Carpeggiani", State Industrial Institute "Vergani-Navarra").

The GIOCONDA **platform can be activated by administrations interested in collecting the recommendations of first and second grade secondary school students**, including their ideas in the formulation and management of local policies, and to **understand how citizens perceive (air and noise) pollution** in their city, as well as to stimulate dialogue with citizens on the basis of available scientific data. Furthermore, GIOCONDA provides a tool for calculating the costs and benefits of the

environmental measures undertaken.

Another useful tool for collecting information on environment and health was the questionnaire on risk perception and *willingness-to-pay* for environmental improvement measures, which health economists use to measure the indirect costs of actions that are implemented. Knowing the perception of risk, first by the construction in class of a "mental map" of the risk issue and then by the questionnaire, allows to talk about science starting from everyday life experience. Questionnaires' data, grouped by class and then by city, well reflect the students' sensibility, state of knowledge, awareness and trust: all elements of great value for public decision-makers who can thus at best integrate it in their policies. **Results of the questionnaires, presented and discussed in the schools, helped to provide local authorities with specific recommendations to improve the state of the urban environment.**

The project involved a total of **26 schools, of about 2.000 students and 120 teachers**. There were 200 public administrators and local players who took part in the participatory process, as well as 200 researchers who worked on the analysis of environmental data.

Just to give an example we refer to the **recommendations made by the students of the Scientific High School "A. Oriani" and the State Unified Institute of Sea and the Navy of Ravenna**, who worked together with their teachers and the experts of the GIOCONDA team in a participatory event in the framework of the *Almagià Artificia* on October 27, 2015. During this great teamwork three main themes emerged as underlying the recommendations for a healthier living in a non-polluted environment: environmental participation and communication; environment and health starting from the measured data; and city mobility. The slogans contained in the "**Recommendations of the guys and girls of Ravenna**" are the summary of the requests addressed to policy makers and experts of the administration and of all the governing bodies of the strategic sectors of health and environmental issues.

The activities implemented in the schools of Gioconda were the basis for the construction of a dialogue between teenagers and administrators, and the recommendations represent the synthesis of the path built in the schools.

The project was also included in the educational offer of "Education Centers for Sustainability" in the cities of Ravenna and Ferrara and in some municipalities of the Lower Valdarno.

The results of the project were also included in the Emilia-Romagna Regional Environmental Education Plan, while the recommendations elaborated by the classes involved in the project in Ravenna were integrated in the Sustainable Urban Mobility Plan 2016 of the city. Analogous paths are underway also in Ferrara. The administrators of all the cities involved in the project received with interest the proposals to organize a **"City Council for girls and guys"** and enriched their programs with new ideas and proposals which will be further developed thanks to the GIOCONDA platform. Finally, an **agreement** was signed with the Tuscany Region for the implementation of the GIOCONDA results in the Amiata area.

Following the National Thematic Meeting held on 13 April 2016 in Florence organized by the GIOCONDA project and entitled "Participation, risk perception, knowledge transfer and exchange on environment and health issues", the *LIFE KTE EnvHealth - KTE in Environment and Health* network was established. The network, connecting the LIFE projects MED HISS, PERSUADED, AIS, MAPEC, CROME, HIA21, GHOST and MERMAIDS, aims to share the issues related to environmental and health KTE between researchers, administrations and various players involved in the area.

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GIOCONDA

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LIFE

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687,612

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Region
Toscana

Description

Toscana, Campania, Emilia-Romagna, Puglia