Environment and territory

How man modifies the environment

The environment is a system whose processes are continuously interacting with the organisms that live in it. We have seen, for example, that rainwater changes the Earth's surface, and that vegetation plays an important role in rock disintegration and soil formation. There are many human beings in the environment. Man is the only individual to be able to build and use equipment that can modify the landscape in a very short time. Nature would take thousands of years to produce the same changes as the ones produced by man. Human activities on the environment strictly depend on the type of economic activity and how society is organized. In some cases human activities aim at recovering environmental upheaval. As a consequence, man can be considered as an important landscape-modifying agent.

The construction of big works

The building of dikes, piers, roads, energy plants, etc. modifies the landscapes and interferes with natural processes. These changes have to be kept in mind during the first planning stages.

Let us image to stop a river flow by building a dike. We will have to take the following aspects into consideration:

- the stability of the building;
- the quantity of river sediments that will not reach the sea but that will deposit on the dike lake;
- the danger of erosion for the beaches that are located close to the river mouth.

The accurate study about the environmental compatibility of a building during its design is called assessment of environmental impact.

Surface water erosion

In order to stop surface water erosion it is necessary to reduce water speed. At this regard and in order to protect a riverbed, men build river bridles, i.e. a series of steps along the river flow. In order to prevent floods, instead, artificial banks are built. When building them, it is important to calculate the natural space the river needs in order to let floodwater drain off.
In order to reduce the quantity of water of a riverbed during a flood, water tanks (that can provisionally transmit a certain quantity of water) and drainage channels (that divert the river flow) are designed.

How to protect from landslides

Landslides provoke serious damages to things and people and they can be prevented by consolidating the area at risk. First of all it is necessary to detect the sliding land and avoid building or excavating in the area. Moreover, it is necessary to prevent big quantities of water from running on the surface of this land: drains have to be built and vegetation growth is to be encouraged. Support walls or gabionades are built to contain material that otherwise would move to the bottom of the slope.

Vajont landslide

In 1957 a dike in the Vajont river started to be built. Above the dike a lake was formed and geologists highlighted that the mountainsides that surrounded it were not stable: the sedimentary rocks on the sides were set on poorly compact layers of clay. After a first landslide, on 9th October 1963, 300 million cubic metres ran from the Toc Mountain to the lake and provoked a wave of 40 million cubic metres of water that went over the dike. The effects were devastating since the wave swept Longarone village and other villages away. In this case human responsibility is obvious, as the geologists' studies were not taken into consideration, nor during the dike designing stage or after the first landslides.

Environmental Impact Assessment

The Environmental Impact Assessment was born in the United States in 1969 from the National Environment Policy Act (NEPS) and it anticipated, by almost ten years, the basic principle of the concept of Sustainable Development, defined as a “sustainable economic development that meets present needs without compromising future generations ability to meet their own needs” enunciated by the World Commission on Environment and Development, Our Common Future, in 1987.
In Europe, this procedure was introduced by EEC Directive 85/337/EEC (Council Directive dated 27 June 1985, on the Assessment of the Effects of Certain Public and Private Projects on the Environment), and was subsequently implemented in the regulations of the Member States, soon becoming a fundamental instrument in environmental policies.
EIA is a study that evaluates the consequences that a project will have on the territory and on its inhabitants. The examined territory must not only include the areas that are in the immediate vicinity, but it must include all the areas that are near and far, that may feel the impact of the project on the environment in some way.
Environmental Impact Assessment Studies must provide competent authorities the elements for them to decide, as follows:

- Global environment and Project description stage, which also includes atmosphere, hydrosphere, biosphere and anthroposphere;
- Identification and assessment stage, of the impacts of the project on the environment, such as interferences and environmental components;
- General assessment stage, by the party proposing the project or intervention, after having defined the chosen methods and criteria.

EIA is also a process in which the citizens participate, and in this way are informed of the complex environmental and social condition. This enables citizens to control the coherence and the efficiency of the work carried out by the competent authorities and enrichen the decision-making process, with their observations.

Floods

In Italy watercourses are often characterized by dry periods and short but intense floods due to heavy precipitations. The water rise provokes an increase in the water running speed. As a consequence, the water goes out of its banks. Deforestation, fires, buildings in risky areas are some of the reasons why these phenomena occur.
The waters of the Po river run inside the artificial banks that stretch for 510 km, out of 652 km of the river total length. In this way the danger of sudden floods increases, the water goes over the artificial banks and invades the nearby areas by provoking serious damages to agriculture and inhabited centres.