

ENVIRONMENTAL IMPACTS

Type of Impacts

We can identify five types of Impacts:

Biological and Physio-chemical Impacts;

- **Social Impact;**
- **Cultural Impacts;**
- **Health Impact;**
- **Economic Impact.**

ENVIRONMENTAL IMPACTS

Type of Impacts

We will summarize about:

- Social Impact;
- Cultural Impact;
- Health Impact;
- Economic Impact.

We will investigate:

Biological and Physio-chemical Impacts

ENVIRONMENTAL IMPACTS

Social Impact

A study of socio-economic impacts would examine project action that alters the existing social and economical condition of communities within or around the project location.

Socio-economic impacts may prove either adverse or beneficial. For example, an expanded irrigation facility designed to enhance agricultural production would be beneficial; while the project might also result in water-logging that could produce a salinity problem with is adverse consequences.

ENVIRONMENTAL IMPACTS

Social Impact

Social impacts can be subdivided into the following:

- **demographic impacts:** such as displacement and relocation effects; and changes in population characteristics;
- **socio-economic impacts:** including income and income multiplier effects, employment rates and patterns, prices of local goods and services, and taxation effects;
- **cultural impacts:** traditional patterns of life and work, family structures and authority, religious and tribal factors, archaeological features, social networks and community cohesion;
- **institutional impacts:** including demands on the government and social service, NGOs housing, schools, criminal justice, health, welfare and recreation;
- **gender impacts:** the implications of development projects on the roles of women in society, income-generating opportunities, access to resources, employment opportunities and equity.

ENVIRONMENTAL IMPACTS

Cultural Impact

Project impacts on cultural heritage should be considered. Areas of study should include historic sites, religious shrines or areas, or traditional practices that may be affected.

Cultural resources refer to archaeological, historical, religious, cultural and aesthetic values.

A project that involves a large-scale modification or disturbance of land and is located in an area where there are cultural resources, requires an intensive survey by qualified archaeologists. On the basis of findings of intensive survey the decision-makers have to decide, whether or not the project should go ahead or whether to adopt project alternatives or devise mitigation measures to be adopted. In all these processes, involvement of local communities is necessary.

ENVIRONMENTAL IMPACTS

Health Impact

Traditionally, health issues have been given little attention in EIAs. Even when social impacts were being investigated, the effects of a proposal on individual mental and physiological well-being (health status and trends) were often omitted or treated in an unsatisfactory manner.

Some groups of individuals may be more exposed to harmful pollutants and their health status will decline. Also, some groups may suffer a decline in their standards of living and become poor. Such a change in socio-economic status can be accompanied by increased morbidity and mortality due to poor nutrition, unsanitary living conditions and reduced physical and financial access to healthcare facilities. Health impacts also can occur directly from development, particularly from hazardous installations, when an accident occurs, such as the release of a certain amount of a toxic gas or an explosion (Bhopal disaster is an example).



ENVIRONMENTAL IMPACTS

Economic Impact

The focus in economic impact assessment is the estimation of the change in economic variable caused by:

- project construction and operation;
- workforce requirement and the income earned by workers;
- materials and other inputs for the project;
- capital investment.

A thorough analysis of the labourforce and the local economy requires information on:

- the categories of labour available;
- the categories of labour that are highly demanded and employed, not employed and partly employed;
- estimation of unemployed labour; proportion of female looking for employment;
- the number and type of employment likely to be generated by project implementation.

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Impacts in this category relate to effects on biological resources such as *vegetation, wildlife, crops, and aquatic life*.

Impacts affecting soil and land forms, or creation of a propensity for *soil erosion, floods and sedimentation*, would be considered as physical impacts.

Chemical impacts relate to project activities that cause a *chemical change in air/water/soil* quality. Smoke emitted from a brick factory, for example, may change the amount of sulphur dioxide (SO₂) content of ambient air, while untreated effluent discharged directly into a river by a paper factory may change the chemical characteristics of the river.

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

The biological component covers all elements, including different forms plant life, structures, functions and their interaction with other components of an ecosystem. Another component of a biological system is the animal life, which ranges from microscopic protozoans to large animals such as elephants occupying different niches in trophic-dynamic systems.

The biological systems interact with physical elements such as air, water, soil, rocks and solar radiation, giving rise to a system known as an ecosystem. The material-cycling, assimilative, and productive roles of an ecosystem are the process that maintain the balance of nature. However, human activities which are intended primarily for self benefit tend to destroy the natural balance.

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

The study and the assessment of the biological and physio-chemical impacts consist of 4 steps:

- analysis and assessment of different environmental components (air, water, vegetation, etc.);
- determination of “*Critical areas*”;
- determination and assessment of the impacts during the construction and during the operation of the structure (road, railway, airport, etc.);
- determination of the mitigation measures.

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Analysis and assessment

For the analysis of every single environmental component (air, water, soil, etc.) we must identify, first, the extension of the land to study and the global environmental system interfered by the structure (road, railway, airport, etc.).

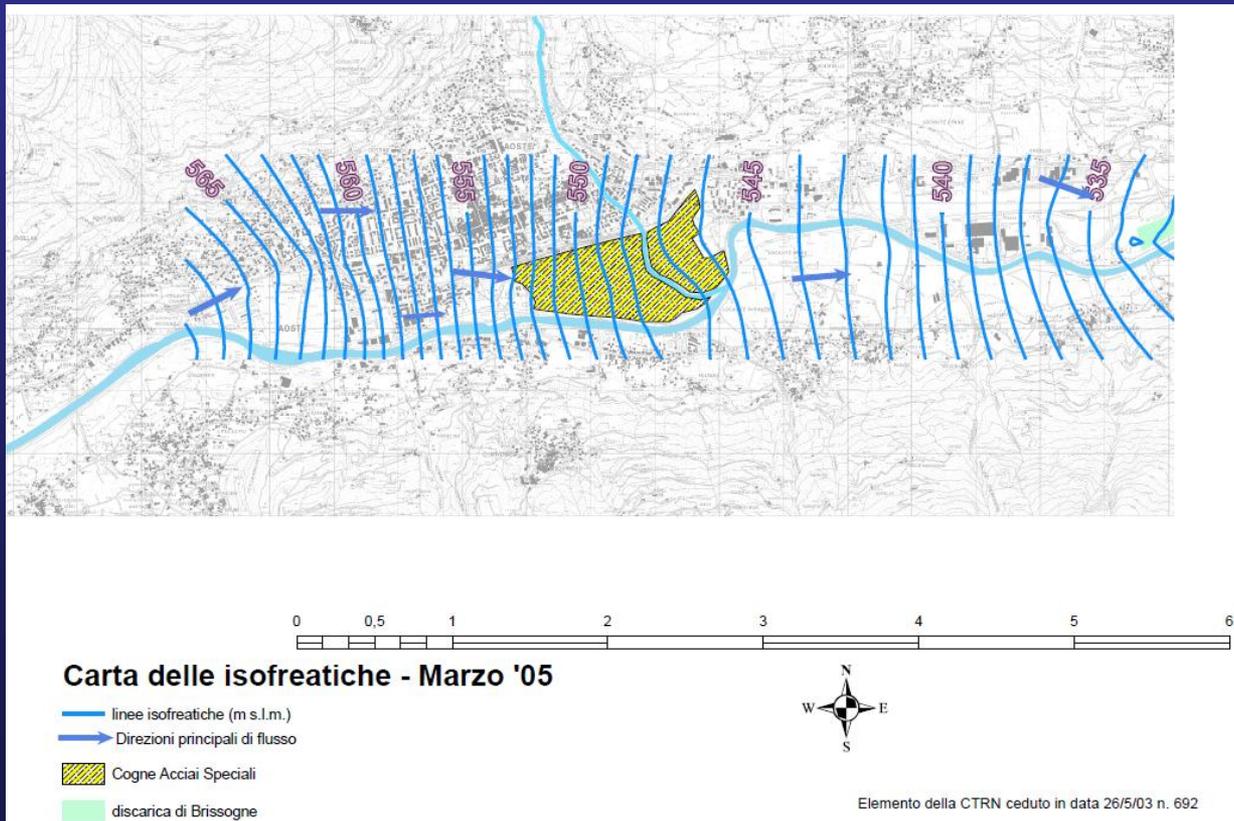
We can study and analyze the environment and its single components with:

- bibliographic research;
- field research;
- laboratory test;
- monitoring.

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Analysis and assessment

Some examples of struments and methods for analisys and assessments:



BIBLIOGRAPHICAL
DATA

Component: water

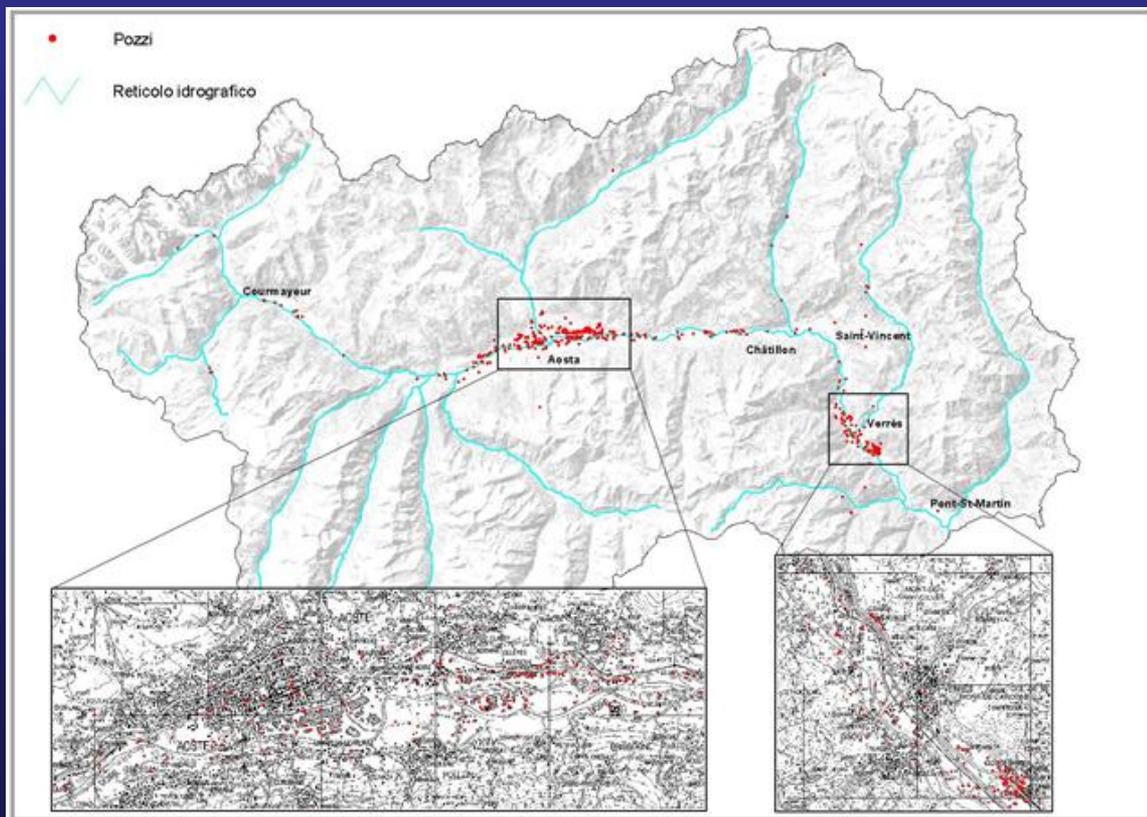
Water-bearing

Isophreatic

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Analysis and assessment

Some examples of struments and methods for analisys and assessments:



BIBLIOGRAPHICAL
DATA

Component: water

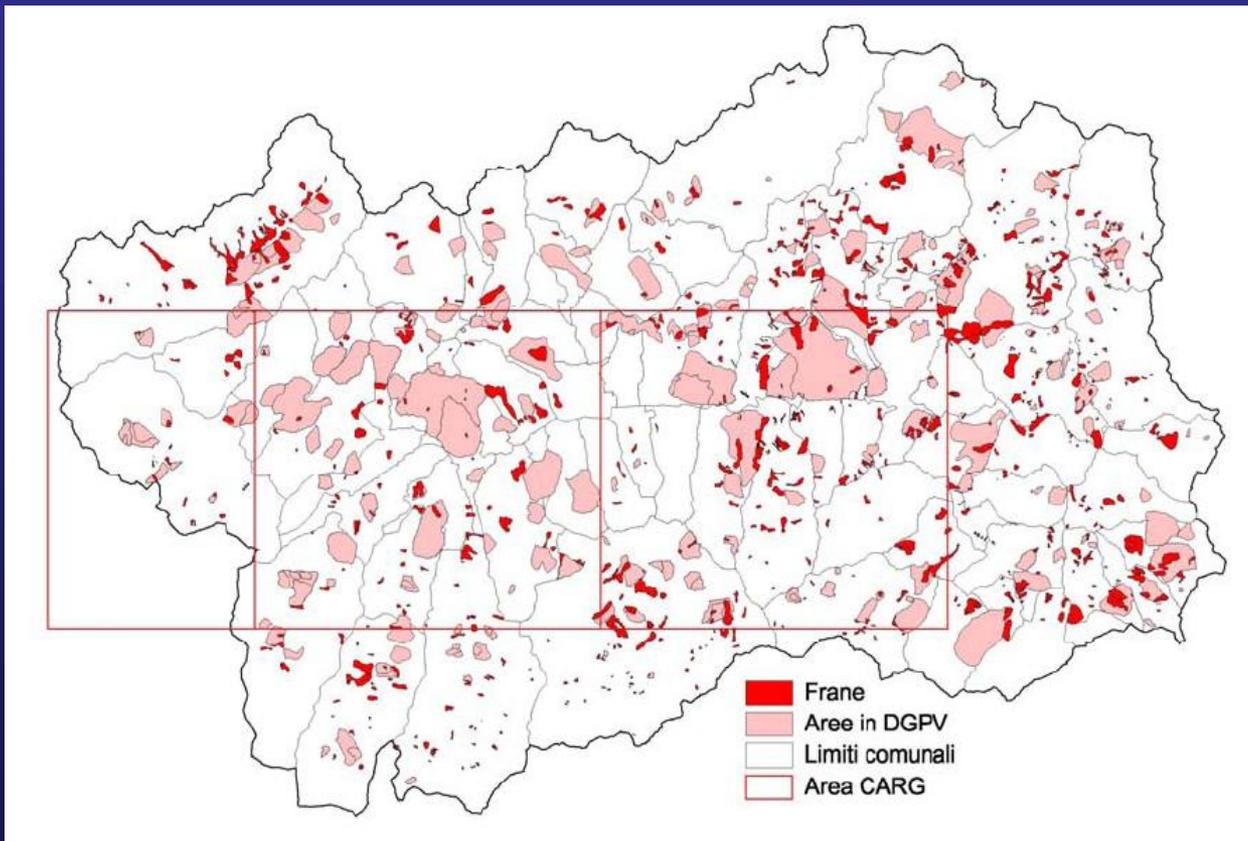
Water resource study

Well

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Analysis and assessment

Some examples of struments and methods for analisys and assessments:



BIBLIOGRAPHICAL
DATA

Component: soil

Landslide

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Analysis and assessment

Some examples of struments and methods for analisys and assessments:

FIELD DATA

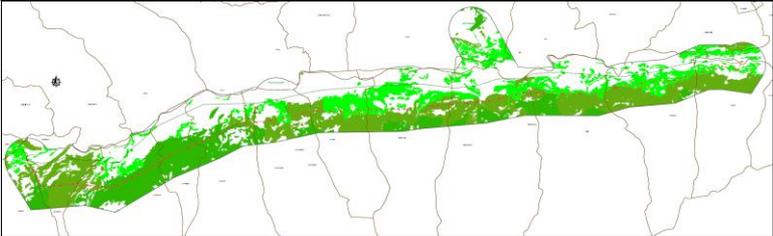
Component: vegetation

Form

Corridor

Power line

Surveys



STRALCIO CARTOGRAFICO



DENOMINAZIONE ASSOCIAZIONE VEGETAZIONALE	BOSCHI DI LATIFOGIE E CONIFERE		
CATEGORIA	<input checked="" type="checkbox"/> NATURALE	SEMINATURALE	ARTIFICIALE
SUPERFICIE	4839,25 ha		
SPECIE PREVALENTI	Quercus pubescens, Castanea sativa, Pinus spp., Picea spp.		
DESCRIZIONE			
INTERESSE ECOLOGICO			
SENSIBILITA'	<input checked="" type="checkbox"/> ALTA	MEDIA	BASSA

VEGETAZIONE, FLORA E FAUNA – Associazioni vegetazionali

BIOLOGICAL AND PHYSIO-CHEMICAL IMPACTS

Critical areas

At the end of the analysis we can provide sensible and critical areas, little portions of the total investigated area in which one or plus of the following conditions are present:

- presence of high esteem elements for which protection is priority (Park, particular species of bird or plant, etc.);
- presence of special peculiarities of vulnerability (superficial water-bearing, high permeability ground, spring, etc.);
- criticality already in act (landslide, degraded areas, etc.).

So, from the analysis of the single environmental components, through the assessment of the sensibility value of each components, we arrive to provide critical areas in which impacts operate strongly ([example 1](#), [example 2](#)).

ANALYSIS → SENSIBILITY → CRITICAL AREAS