

TM3. Environmental Management, Impact and Risk Assessment

3.1. Environmental Management

3.2. Circular Economy

3.3. Environmental impact and risk assessment

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TM3- 3.3

ENVIRONMENTAL IMPACT AND RISK ASSESSMENT

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STRUCTURE

Sustainable development and environmental impact assessment

Environmental Agreement; Environmental Permit

Pollution sources, emissions and associated effects / impacts

- Emissions/pollutants/sources
- Impacts and Pollution types

Environmental Risk Assessment

- Environmental Risk
- Tools for risk assessment and management

Case studies / environmental assessment in practice

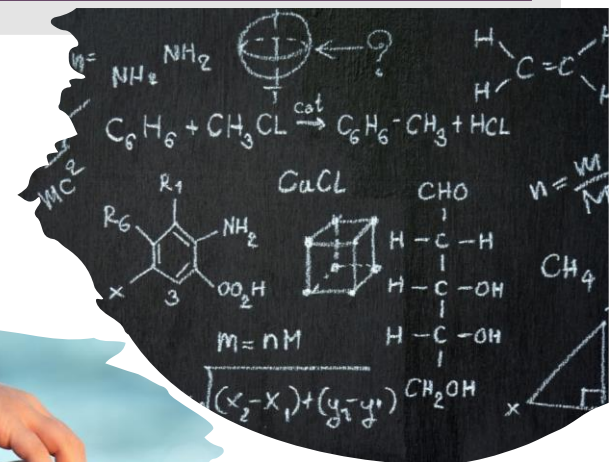


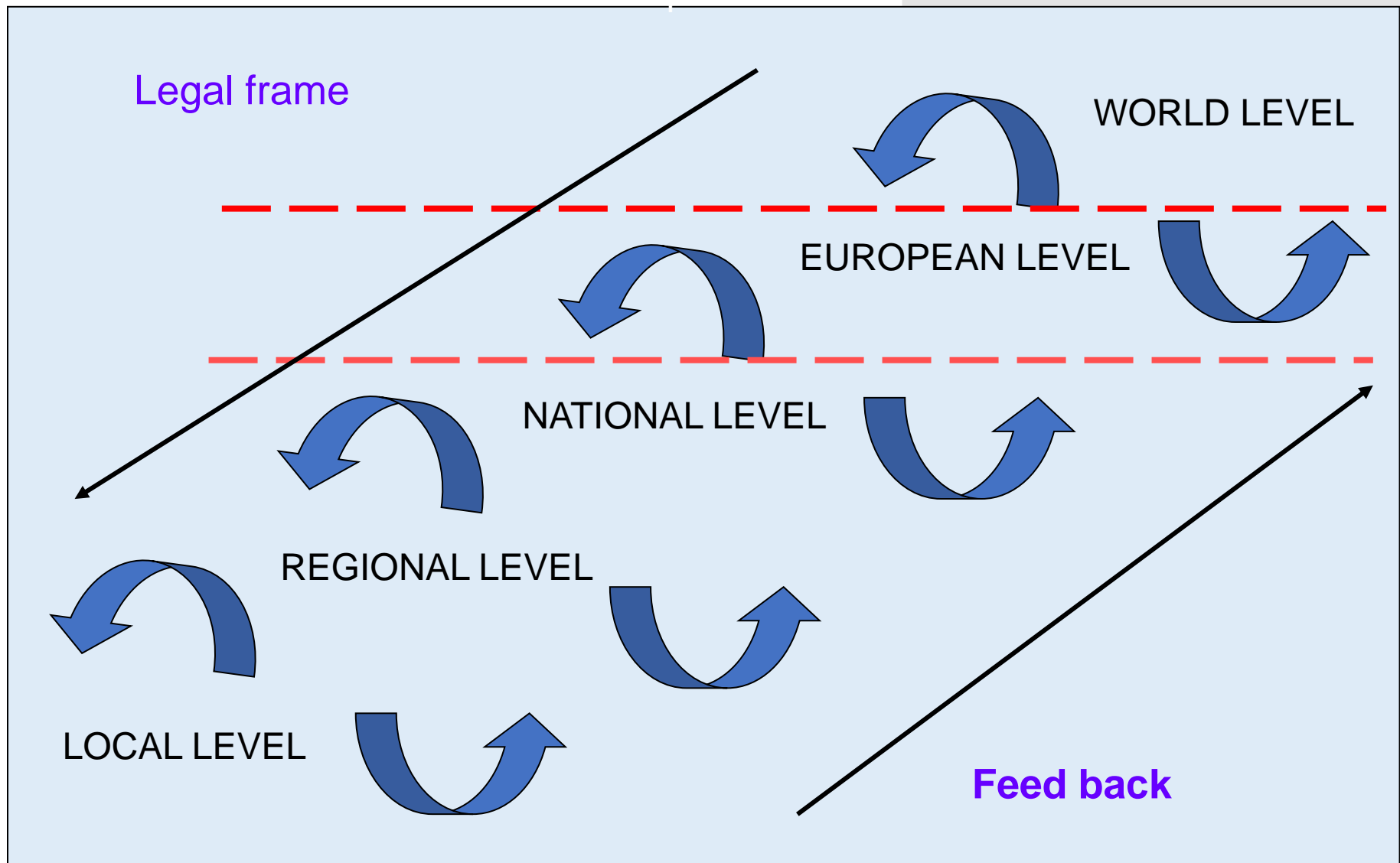
Sustainable development concept

- ... „*the development that meets the current needs, but not compromises the possibility of next generations to meet their own needs.*” (LPM 137/1995,2000)
- **Sustainable development** suppose that society satisfies consumer demand for its members by increasing the production potential, but also through the creation of fair conditions of access to natural resources for all members of society.
- **Sustainable development** is an economic growth without depletion of resources, considering the limit of sustainability and regeneration of ecosystems.

Minimum requirements for achieving sustainable development:

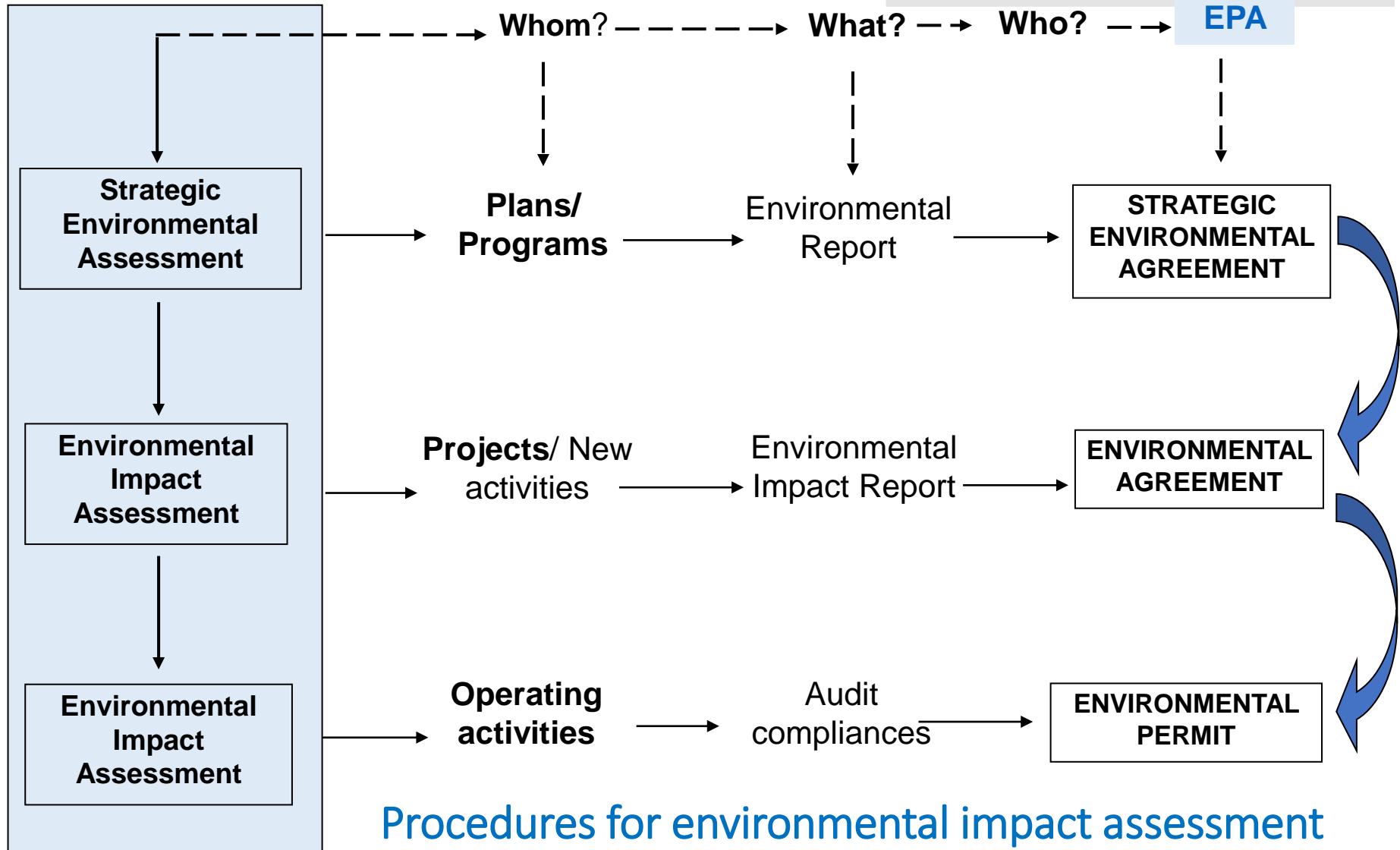
- Resizing the economical growth;
- Eradication of poverty;
- Control of demographic growth;
- Preserve and enhance the natural resources;
- Risk control (ecological, environmental, human health, technological);
- Involvement/participation of government in decision-making process in environmental protection field.





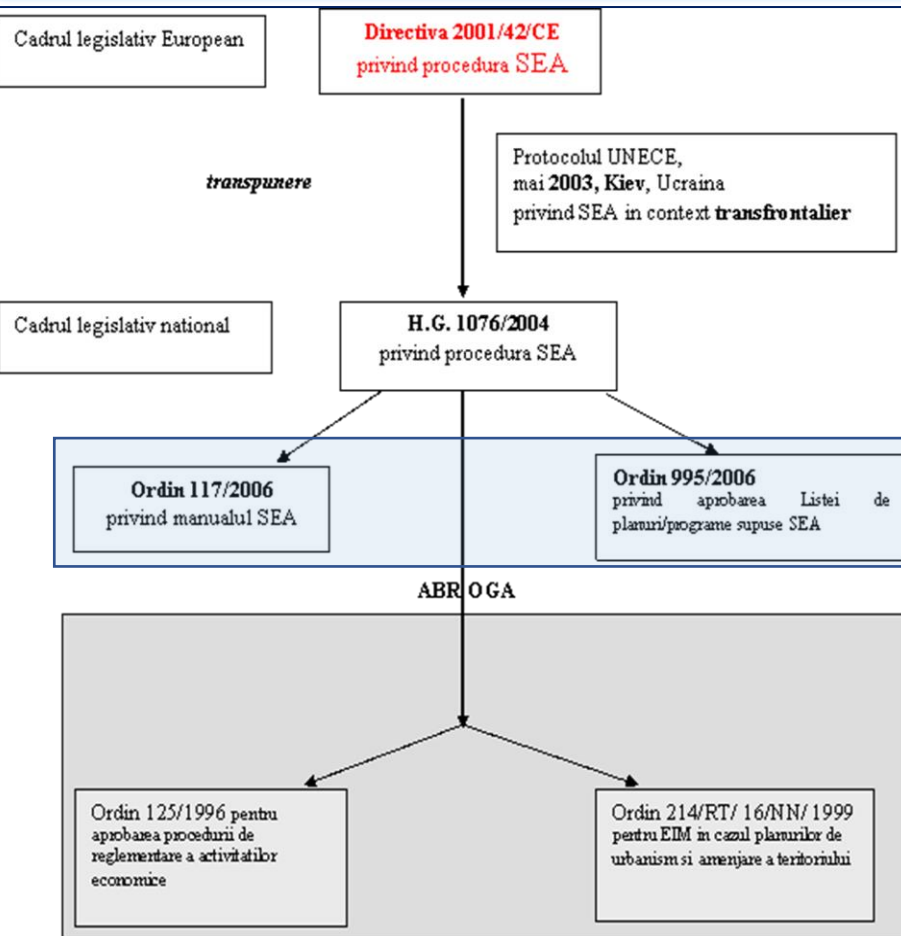
Environmental assessment

- **Environmental Agreement** –EPA’s decision that allows the project owner to implement the purposed activities within the project. It is a **technical-administrative document that establishes the ways of project implementation**, considering the environmental protection.
- **Audit compliance** – documents used to obtain the **environmental permit**, and which are prepared by accredited environmental experts.
- **Integrated Environmental Agreement** –EPA decision that allows the project owner to implement the purposed activities within the project, **activities underlined in IPPC Directive**. It is a technical-administrative document that establishes the ways of project implementation, considering the IPPC directive regarding integrated pollution prevention and control requirements. **It can be given for one or more installations/processes/activities developed on the same site.**

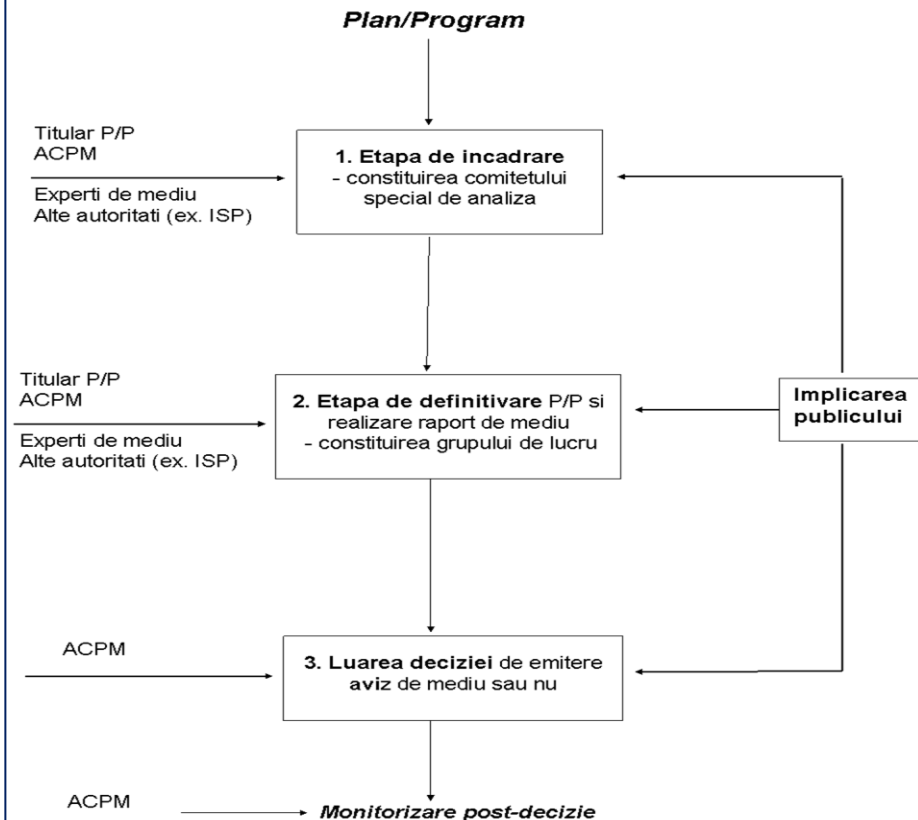


Procedures for environmental impact assessment

STRATEGIC ENVIRONMENTAL AGREEMENT



ETAPELE PROCEDURALE DE EVALUARE STRATEGICA A MEDIULUI



ENVIRONMENTAL AGREEMENT

Governmental Decision no. 445
from **8/04/2009**
referring to environmental impact
assessment procedure, modified by
Governmental Decision no.

17/2012.

Appendix 1. **LIST** of projects/new
investments that are mandatory
under EIA

Appendix 2. **LIST** of projects/new
investments that are recommended
to be under EIA



Ministerial Order no. **135 from**
10/02/2010 referring to the
methodology on EIA for private and
public projects.

New common Ministerial Order from
Environmental Ministry, Ministry of
Internal Affairs, Ministry of
Agriculture, Ministry of Development
(in Ro and En, 2010).

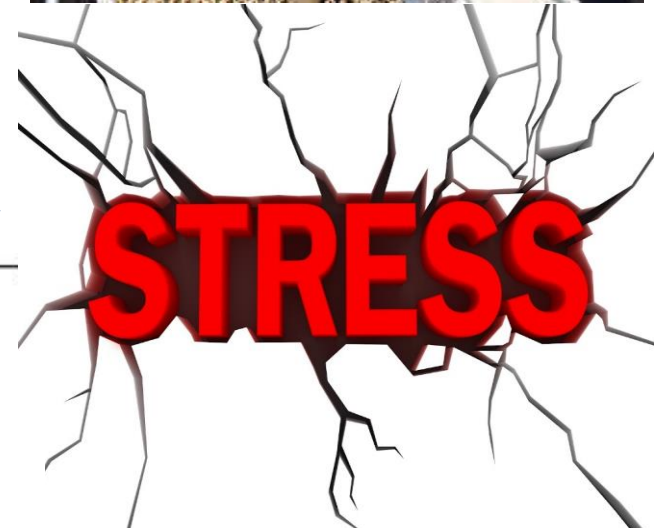
New regulations released in 2020,
2021, 2022

www.mmediu.ro

ENVIRONMENTAL PERMIT

- **LIMITATIONS**

- Terms (new, confused ...)
- Bureaucracy
- Time consuming
- Regulations (**dynamic**)
- Environmental experts/ **consultants**
- **Environmental authorities**





Pollutions sources

Emissions and associated impacts



Main emissions: particulate matter (dust), noxes, gas house, waste, demolition/ construction waste, waste waters, chemicals, pesticides etc.

Negative effects in air quality, water, soil and ecosystems and human health.



The play of environmental impact assessment

- In Europe the **first actions** related to environmental impact assessment promotion took place in **1975**, when the European Committee reached the Decision regarding the need of environmental impact assessment and the Action Plan (elaborated in 1977). **In 1980, Official journal published the first draft of European Committee Decision regarding the environmental impact assessment.** Thus, that involved the implementation of this decision in all countries, EU members.
- The **EC Directive 85/337/EEC** has been approved by EU Ministers on 27th of June, 1985, and it was scheduled for implementation on 3rd of July, 1985. This Directive 85/337/EEC regarding environmental impact assessment for public or private projects was amended by Directive 97/11/EC from 3.03.1997, due to the feedback from practical activities of environmental impact assessment and the experience from different countries on directive implementation (feedback process).

Types of impacts considered by environmental impact assessment

“Human environment” is generally defined “to include natural and physical environment and the relation between human beings – environment, which means, that economical or social effects don’t replace the environmental impact assessment.

If there is made an environmental impact statement and there are evaluated economical and social effects, next to those natural or physical effects, then environmental impact statement will estimate all these effects (magnitudes) on human environment”.

EIA - evaluates direct, indirect, cumulative and synergic impacts on biophysical and socio-economic environment

- **The impact on biophysical environment** refers to the impacts on: human health conditions, air, soil, water quality, flora and fauna preservation and its habitat, cultural patrimonium, heritages etc.
- **The impact on socio-economical environment** includes the impacts on following components: human population, style of life, jobs, etc. There are also taken into account the **consequences** of relations between the components mentioned above, i.e. ecosystems, interactions, etc. The evaluated effects are those related to pollution and excesiv use of natural resources.

Types of impacts analysed by EIA

“environmental impact” – is the negative influence on physical environment and EIA is required.

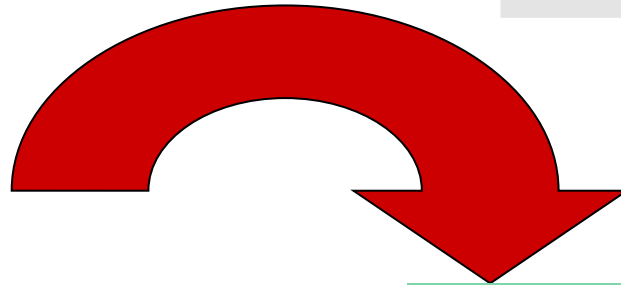
- Direct impact
- Indirect impact
- Cumulative impact
- Synergic impact

(for each proposed alternative)
on bio-physical and socio-economical
environment.



Types ...

- **Direct impacts/effects** are those induced by activities/actions that take place **in the same time and place**.
- **Indirect impacts/effects** are defined as being induced by activities/actions that **appear later on** in time and different places, and are likely predictable.
- **Cumulative impact/effect** is the impact resulted from a sum of various impacts from other activities added to those from past or current impacts/effects.



Receptors ...

- Environmental receptors** (water, air, soil);
- Ecosystems receptors** (human beings, flora, fauna);
- Exterior environment** (structures, buildings, etc.).

Organizations and personnel involved in EIA

Project owner

- ☐ Managers
- ☐ Responsible of administrative departments
- ☐ Technical personnel

Competent Authorities

- ☐ Decision factors,
- ☐ Responsible of specific department
- ☐ Technical personnel
- ☐ Others

Consultants

- ☐ Consultancy companies
- ☐ Environmental experts
- ☐ Managers
- ☐ Universities, other research institutes

Public

NGO, citizens, EIA centers, mass media, other agencies

Procedures and indicators in EIA

- What is an **environmental indicator**?
- Which are the indicators used for EIA?
- What kind of **impact** is described by each indicator?
- What type of **pollution** is associated to each impact?
- When the measures for pollution prevention, control and remediation are recommended and when are mandatory?
- **IPPC**

Environmental Indicators

- **Minimum accepted environmental objectives** refers **to the set of environmental targets** established by EPA, based on conclusions from audit compliance. This set of environmental objectives describes the **qualitative and quantitative environmental targets** and **maximum period** of time allowed to fulfill the environmental requirements, according to the current regulations.
- **Alert level** represents the pollutants concentrations in air, water, soil from emissions or discharges, and it has the play to announce the environmental authorities to be aware about a **likely negative impact** on environment and it starts an additional monitoring and / or minimizing the quantities of pollutants discharged into environment.
- **Intervention level (maximum allowed concentration)** represents the level of pollutants concentrations in air, water, soil or emissions / discharges at which the environmental authorities will have to take all measures for pollution control and remediation due to the **significant negative impact**.
- **Likely significant pollution** is the case when the concentrations of pollutants are higher than alert level, but lower than maximum admissible level. **Significant pollution** is the case when the concentrations of pollutants are at or higher than maximum admissible level, concordant with environmental regulations.

***Plan of measures** proposed by the owner of implemented activity and contains steps that need to be followed in a very specific period of time established by EPA within Environmental Permit, with the purpose to fulfill the environmental requirements.*

The program for conformation has **2 sections** that refers to:

1. measures needed to reduce the current and predicted effects induced on environment by certain activities;
2. measures needed to remediate the past effects induced on environment by certain activities.

The program for conformation is required to any activity in operation or post operation and has done injuries to environment. The evaluation of injuries are done by audit compliances considering the environmental state of the art and necessary measures and action to reduce and remediate the negative effects. The conformation program established the measures needed to fulfill the environmental requirements, the steps, deadlines, costs and responsible persons for each action.

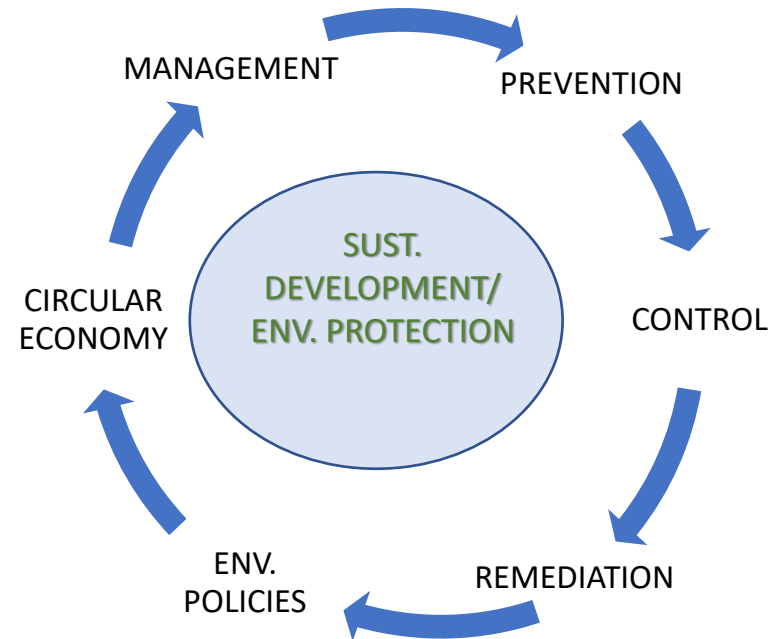
To elaborate the program for conformation, the followings need to be considered:

- The conclusions of Environmental Reports and audit compliances;
- The environmental tasks established by Environmental Protection Agency taking into account the necessary measures and actions for environmental protection, and not only.
- The environmental information from the activity/project owner regarding the emissions and discharges of pollutants into environment;
- Other studies, environmental offers, documents etc.,
- Recommendations, comments from NGO etc.

Environmental risk assessment



- Examines the probability and the severity of the main components of an environmental impact.
- The necessity of additional information regarding the risks related to the identified pollution or to the pollutant activities developed on a site may determine the environmental competent authority to request a risk assessment with the aim of evaluating the probability of harm and finding the possible prejudiced entities.
- Not every site affected by a certain pollutant will exhibit the same risk or will need the same measures of remediation.



Risk assessment involves:

1. the **estimation** - the identification of:

- the hazards,
- the magnitude of the effects and
- the probability of occurrence.

2. the **quantification** of:

- the danger importance and
- consequences for humans and/or environment.

The quantitative risk assessment encloses five stages:

- description of the aim;
- identification of the hazard;
- identification of the consequences;
- estimation of the magnitude of the consequences;
- estimation of the probabilities of the consequences.

According with Romanian Order no. 184/1997 ...

... the risk is the probability that a negative effect will occur in a specified period of time:

$$\text{Risk} = \text{Danger} \times \text{Exposure}$$

The risk assessment implies the identification of the hazard and of consequences that may appear as a result of occurrence of the events considered as risk sources. In function of the importance of the consequences one may decide if there is necessary or not to take remediation measures.

Concordant to the Romanian Order no. 184/1997...

... the risk quantification is based on a simple system of classification, where the probability and severity of an event are descendent distributed, being assigned with an arbitrary score:

Simplified model

Probability

3 = high

2 = medium

1 = low

Severity

3 = major

2 = medium

1 = insignificant

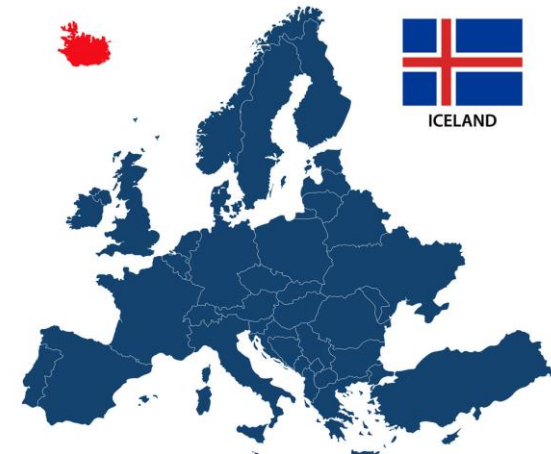
$$R = P \times S$$

The risk may be calculated by multiplying the two factors (probability, severity) in order to obtain a comparative number, for example 3 (high probability) x 2 (medium severity) = 6 (high risk).

This allows the comparison of different risks. The greater the results, the bigger the priority should be given to risk control – risk management.

When a big number of important pollutants are considered for assessment, an increased attention should be paid to a clearer manner of presentation (e.g. matrix).

Case studies





Case studies / EIRA in practice



Transilvania
University
of Braşov



Quiz / Test – 20/30 min

Evaluarea impactului asupra mediului (google.com)



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