Identification of the Environmental Impacts and Description of the Measure of Mitigation and Compensation

Ms. Marilena Flori

APAT

Agency for Environmental Protection and Technical Services

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1.   Environmental risks (a)

DEFINITION	POTENTIAL INTERESTED ELEMENTS	POTENTIAL INVOLVED FACTORS	SEA ENVIRONMENT	LAND ENVIRONM.
Air pollution	Air, vegetation, flora, fauna and public health	Hygienic and sanitary aspects		X
Superficial and underground water pollution	Water environment and public health	Hygienic and sanitary aspects		X
Sea water pollution	Water environment – sea fauna and fish population – sea ecosystem - public health	Hygienic and sanitary aspects	X	
Pedologic and geomorphologic characteristics alteration	Soil and subsoil – social and economic context	Soil use and erosive phenomena	X	X
Water circulation conditions alteration	Soil and subsoil – social and economic context - landscape	Natural heritage	X	

1.   Environmental risks (b)

DEFINITION	POTENTIAL INTERESTED ELEMENTS	POTENTIAL INVOLVED FACTORS	SEA ENVIRONMENT	LAND ENVIRONM.
Reduction/variation of natural resources quality	Vegetation, flora and fauna – hearthly ecosystem – public health and social-economic context – landscape	Natural heritage		X
Reduction/variation of natural resources quality	Sea ecosystem-fauna– social-economic context		X	
Repercussions on social-economic activities, on environmental quality and of local services	Public health and social-economic context			X
Acoustic pollution and vibrations	Public health – noise and vibrations	Hygienic and sanitary aspects		X
Interference with landscape system	Vegetation and flora – soil - social-economic context– landscape	Natural and historic heritage; perceptive aspects		X
Vehicular traffic and connected phenomena increase	Public health and social-economic context	Natural and historic heritage; perceptive aspects		X

2.   Impacts identification

The impacts identification and assessment have been effected through matrixes of cause-effect interaction, that consist in a bidimensional checklist in which an actions list of project actions is made a connection with an environmental elements list to identify the potential impacts areas.

> **The recognized impacts are subjected to qualitative analysis through assessment scales, of foreseen annoyances entity and nature**

GRAVITY	IRREVERSIBILITY (*)	DURATION	SIGNIFICANCE

GRAVITY
- ❑ **H = High**
- ❑ **M = Middle**
- ❑ **L = Low**

IRREVERSIBILITY (*)
- ❑ **I = Irreversible**
- ❑ **R = Reversible**

(*) The irreversible impact is the impact that persists in significant way also after removal of the cause that has produced it

DURATION
- ❑ **T = Temporary**
- ❑ **P = Permanent**

SIGNIFICANCE
- ❑ **NS = Not significant**
- ❑ **SS = Short significant**
- ❑ **S   = Significant**
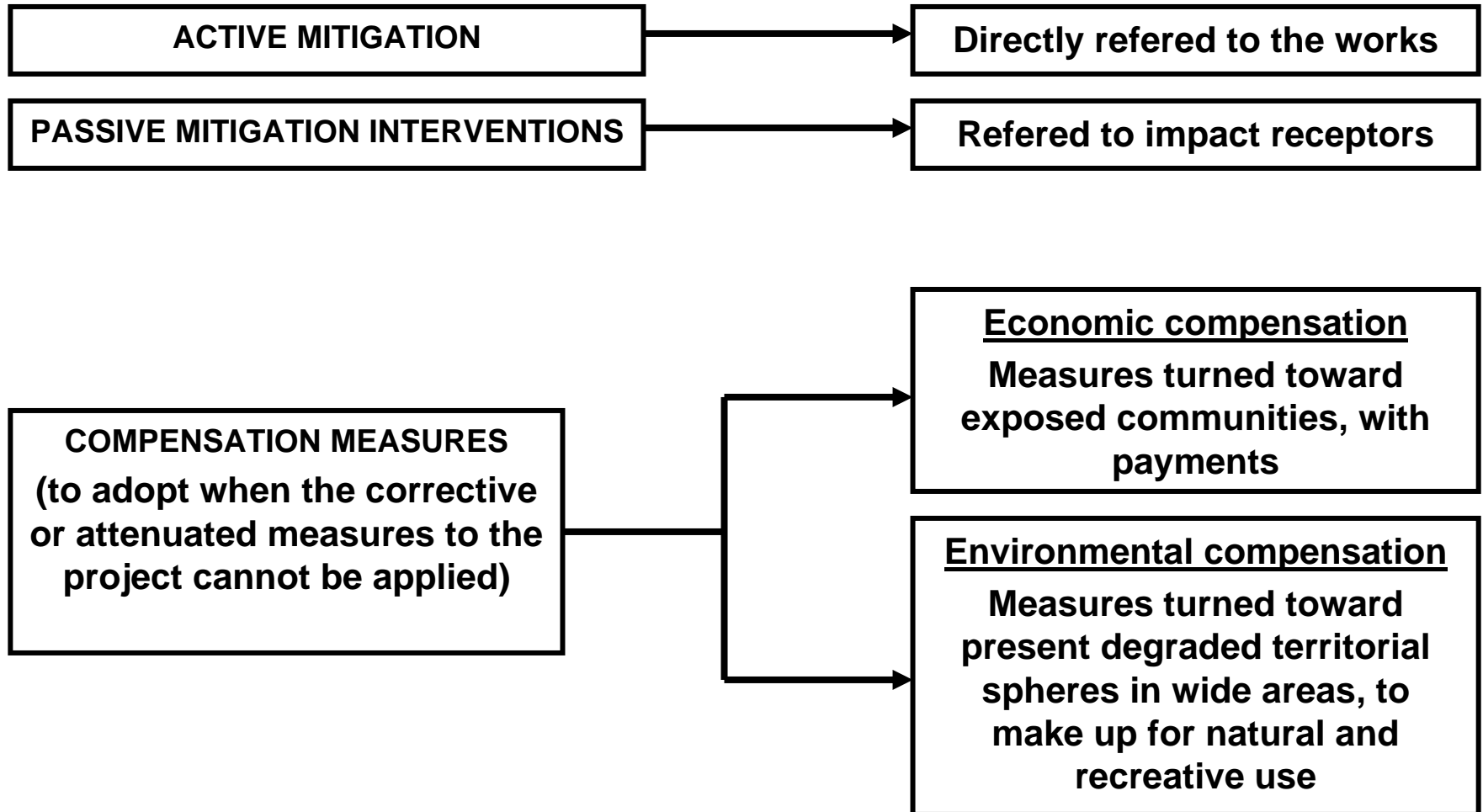- ❑ **VS = Very significant**

3.   Project actions

PROJECT ACTIONS ANALYSED DURING CONSTRUCTION PHASE

- ❑ **heavy motor vehicles circulation from, to and inside the works area**
- ❑ **working machineries functioning**
- ❑ **material provision**
- ❑ **present vegetation and biomass removal**
- ❑ **grounds excavations and bringing backs**
- ❑ **works construction (of engineering, architecture and plant engineering)**
- ❑ **works area and services**

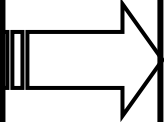PROJECT ACTIONS ANALYSED DURING OPERATION PHASE

- ❑ **vehicles circulation (induced traffic)**
- ❑ **crafts circulation**
- ❑**workings connected with the port functioning (docking, plant engineering, yards for crafts maintenance and washing, refuelling, and so on..) and of the structures inside the dock (road network, parkings, residences, multi-purpose centre, plant engineering, and so on…)**
- ❑ **works volume (buildings plan and disposition of volumes)**
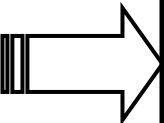
4. Impacts mitigation

ACTIVE MITIGATION	→	Directly refered to the works
PASSIVE MITIGATION INTERVENTIONS	→	Refered to impact receptors

COMPENSATION MEASURES
(to adopt when the corrective or attenuated measures to the project cannot be applied)

Economic compensation
Measures turned toward exposed communities, with payments

Environmental compensation
Measures turned toward present degraded territorial spheres in wide areas, to make up for natural and recreative use

5. Mitigation actions during construction phase (a)

Measures for air pollution reduction during construction phase	• Loads covering during transport • Damp cleaning of vehicles tyres • Reduction of not asphalted areas inside yards • Predisposition of raining plants for materials storage areas • Planning of humidification operations of transit top, of paths and of raised planes where working motor vehicles pass • Attention to loading and unloading times, to rational arrangement of unloading piles • Modest speed of working motor vehicles in working areas • Plasticized panels laying toappend to fencing nets for populated areas protection • Works area lay-out definition

Measures for noise and vibrations produced by construction activities reduction	• Machineries selection in accordance with the regulations • Gummed rather than tracked machines use for ground movement • Silencers and catalytic converters installatin on machines in case lacking • Plants orientation with noise emissions at strong direction • Anti-vibrant bases for fixed machinaries; new machines use • Motor vehicles and equipments maintenance

5. Mitigation actions during construction phase (b)

Measures for impacts containment on soil, subsoil and water environment

⟹

- •Planning aimed to control natural resources use, optimizing the reuse and/or the digging materials removal
- •All resulting materials in the sea elimination , to assign the same to reuse
- •Working activities organization with precise execution of periodic controls
- •Landscape re-insertion of areas subjected to permanent morphologic modifications

Prescriptions for induced by working activities impacts reduction

⟹

- •Choice among the most safe products
- •Way choice to use particular substances
- •Working ways definition to prevent polluting substances spreading in environment
- •Use of potential noxious products for environmental at suitable distance from territorial sensitive areas like rivers
- •Check that all substances are held in suitable and not damaged containers
- •Containers removal in according to the regulations
- •Workers formation and information about the forms of all substances correct use

Working areas bringing back

6. Mitigation actions during operation phase (a)

AIR	→	The vegetable barriers foreseen in green settlement that will be made, will be considered a mitigation measure towards present receptors in the portual area

WATER ENVIRONMENT	→	• They are'nt foreseen mitigation actions for waste waters channeled to the sewer and for waste placed in dumping • The foreseen measures for saline wedge (infiltration points sealing), for transition waters (direct needs from municipal net) and for internal waters stagnation (ricircle and oxygenation system), have a strictly planning character

SOIL AND SUBSOIL	→	• Soil occupation, like morphology change, cannot be mitigated • Provision of materials that are necessary to works will be made in quarries already present on territory

VEGETATION, FLORA, FAUNA AND ECOSYSTEMS	→	Linear, areal and punctual green elements formation are defined to shape screenings with the aim to filter pollutings and noises; moreover they have the main function to reform an ecological connecting, seat of habitat development for land fauna

6. Mitigation actions during operation phase (b)

PUBLIC HEALTH AND SOCIAL-ECONOMIC CONTEXT

→

- Negative impacts (concerning public health) mitigations are the same used for air, noise, vibrations and landscape:
- To minimize the annoyances derived by traffic increase with a rationalization circulation planning
- The impacts concerning social-economic context are positive:
- Tourist and/or commercial services offer
- Additional services offer to improve the cultural, commercial and recreative system
- Market value increase for surrounding buildings and areas
- New employment opportunities offer
- Possible development of new economic activities induced by works

NOISE AND VIBRATIONS

→

During operation phase, the vegetable mitigative actions, realized with the linear, areal, punctual green elements formation, will form screenings with the aim to filter, besides the pollutings, also the noises and vibrations
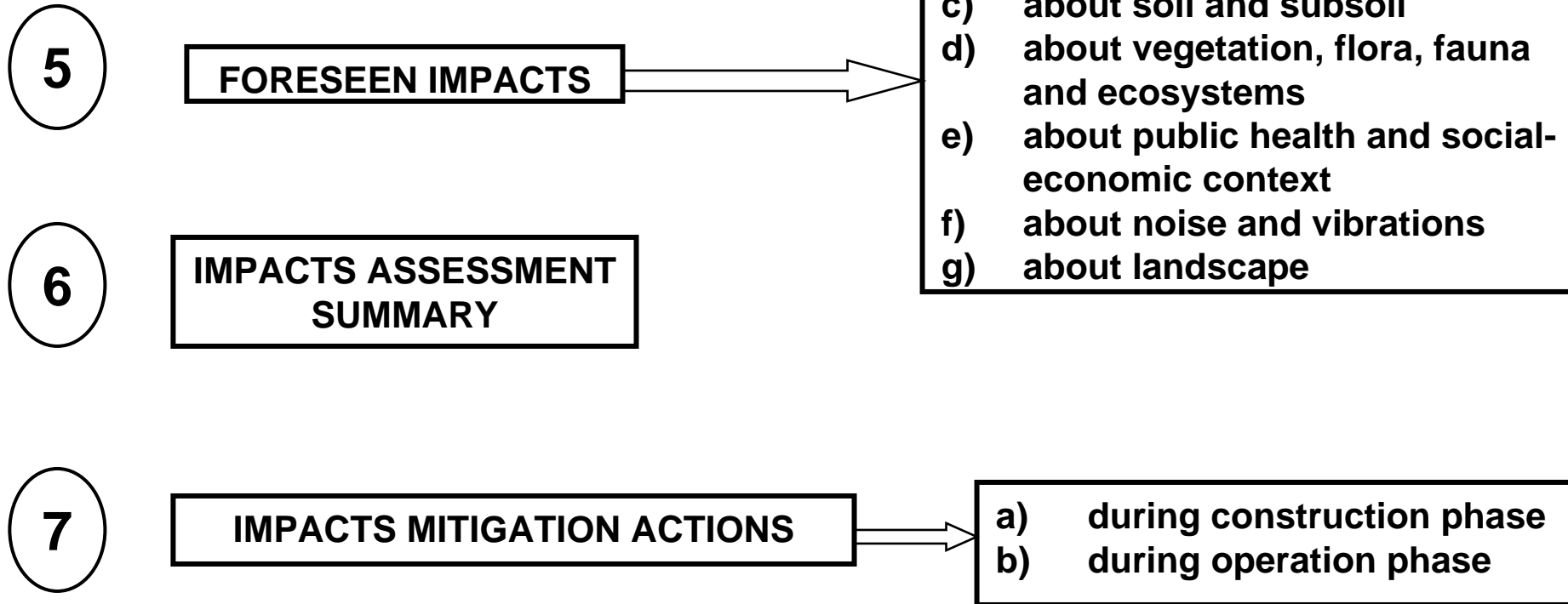
LANDSCAPE

→

- Foreseen vegetable actions perform, at the same time, the task to mitigate impacts derived by air, bright and acoustic pollution
- They reconstitute the ecologic connecting elements and visually screen the works
- Dune zone recostruction interventions
- Linear interventions with tree lines to create vegetable barriers
- Vegetation eecostruction interventions
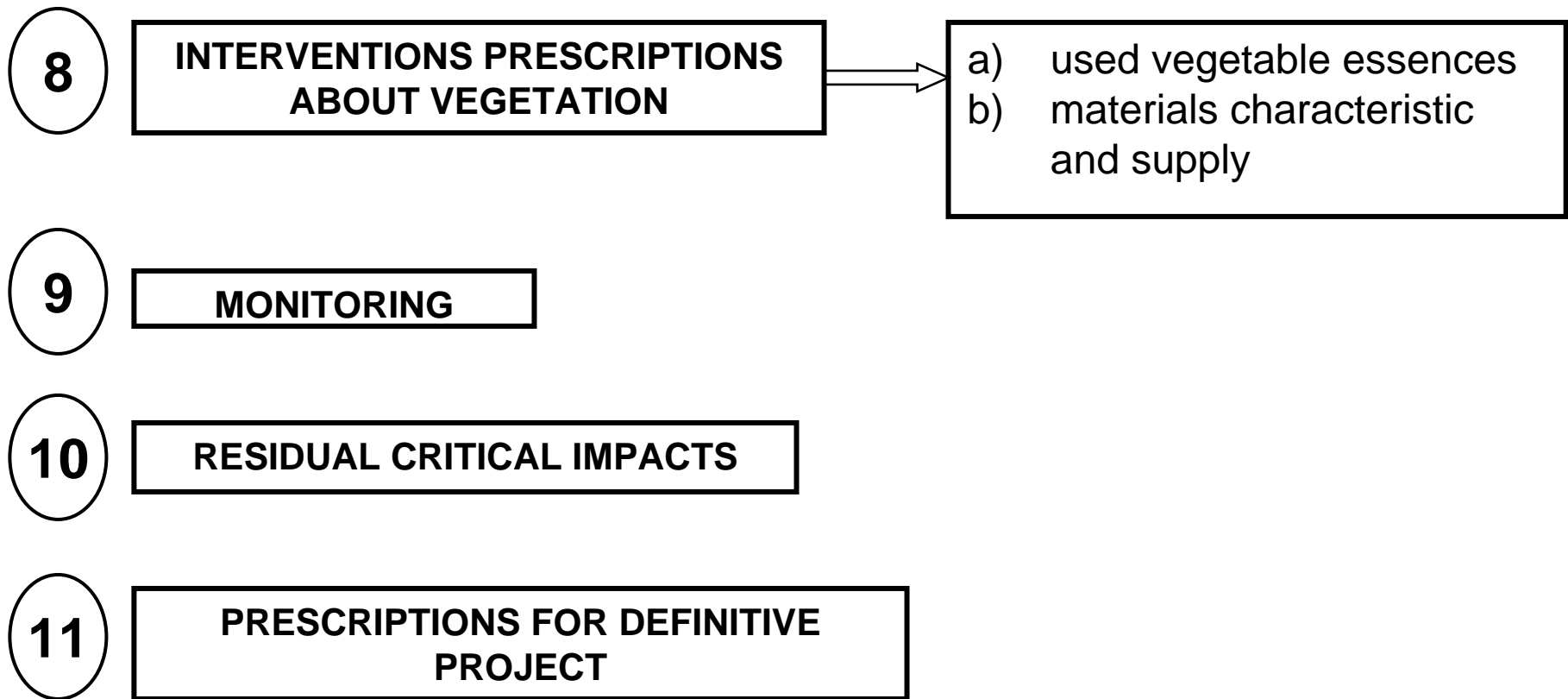- Equiped green arrangement interventions

7. Example of environmental phase report contents Second part (impacts and mitigation measures) (a)

(1) POST-OPERAM SITUATION

(2) ENVIRONMENTAL RISKS

(3) ANALYSIS OF IMPACTS TIED TO PROJECT CARRYING OUT

(4) IMPACTS ANALYSIS ON SINGLE ELEMENTS ⟶
- a) used methodology
- b) project actions during construction phase
- c) operation phases

7. Example of environmental phase report contents Second part (impacts and mitigation measures) (b)

5 | **FORESEEN IMPACTS** ⟶

- a) about air
- b) about water environment
- c) about soil and subsoil
- d) about vegetation, flora, fauna and ecosystems
- e) about public health and social-economic context
- f) about noise and vibrations
- g) about landscape

6 | **IMPACTS ASSESSMENT SUMMARY**

7 | **IMPACTS MITIGATION ACTIONS** ⟶

- a) during construction phase
- b) during operation phase

7. Example of environmental phase report contents Second part (impacts and mitigation measures) (c)

8 | **INTERVENTIONS PRESCRIPTIONS ABOUT VEGETATION** → a) used vegetable essences
b) materials characteristic and supply

9 | **MONITORING**

10 | **RESIDUAL CRITICAL IMPACTS**

11 | **PRESCRIPTIONS FOR DEFINITIVE PROJECT**

8.   Contribution to Working group n. 2

•**In the previous slides are synthesized:**

• environmental risks (definition, potential interested elements, potential involved factors) concerning sea and land environment

• impacts identification, on the basis of their typology (gravity, irreversibility, duration and significance)

• project actions identification (during construction and operation phases)

• mitigation actions description (typology: active, passive, compensation measures) and divided into construction and operation phases

•**And are described:**

• an example of report contents about environmental phase, concerning impacts and mitigation measures

8.   Contribution to Working group n. 2

These informations give the first contribution to Working Group n. 2 : "Analyse and complete the supplied form regarding EIA critical points"

Application of EIA methodological scheme concerning the environmental phase (in terms of impacts and mitigations) to some possible planning typologies of works in coastal areas (a port, an industry and a tourist-hotel or residential centre…)

The following form (concerning the environmental phase) will be assigned and compiled by participants (associated in groups)

8.   Contribution to Working group n. 2

EIA PHASES (impacts and mitigations)	DOCUMENTS		
	REPORTS (*)	MAPPINGS (**)	TABLES, GRAPHS, and so on...
AIR			
WATER ENVIRONMENT			
SOIL AND SUBSOIL			
VEGETATION, FLORA AND FAUNA			
ECOSYSTEMS			
PUBLIC HEALTH			
NOISE AND VIBRATIONS			
IONIZING AND NOT IONIZING RADIATIONS			
LANDSCAPE			

(*)   To indicate typical contents
(**) To indicate the type of mappings, the description scale, a typical legend

8. Contribution to Working group n. 2

On the basis of methodological instructions, two matrixes are to be compiled
(one for the <u>Construction Phase</u> and one for the <u>Operation Phase</u>),
describing, for all environmental involved element:

1) risk typology
2) relative impact description
3) impact presence – correlation among impacts and systems (intersection among lines and columns of matrix)
4) impact gravity (high, middle, low; reversible and irreversible; temporary and permanent; significance)
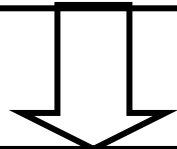
| MATRIX OF CORRELATION CAUSE/EFFECT (CONSTRUCTION PHASE) | MATRIX OF CORRELATION CAUSE/EFFECT (OPERATION PHASE) |
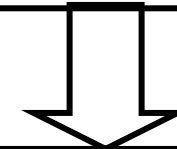
8.   Contribution to Working group n. 2

An example of the synthesis that can be optained for a tourist port planning is given by the following table:

1. Air quality
2. Superficial and underground water quality
3. Sea water quality
4. Pedologic and geo-morphologic sides
5. Sediments aspects
6. Vegetational and faunal aspects
7. Ecosystems

8. Landscape perceptive aspects
9. Social and economic aspects
10. Hygienic and sanitary aspects
11. Noise and vibrations
12. Morphologic aspects
13. Natural landscape aspects
14. Anthropic landscape aspects
15. Landscape perceptive aspects

8.　　Contribution to Working group n. 2

ENVIRONMENTAL RISKS:
environmental conditions alteration possible phenomena, that could start with works carrying out and that show with the impacts

FORESEABLE IMPACTS:
Positive and negative effects induced by works carrying out

X　　CORRELATION AMONG IMPACTS AND SYSTEMS

CORRELATION AMONG ACTIVITIES AND IMPACTS

GRAVITY	Negative impacts	Positive impacts
(H) high	H	H
(M) middle	M	M
(L) low	L	L

IRREVERSIBILITY / REVERSIBILITY
I　　irreversible　　　　R　　reversible

DURATION
T　　temporary　　　　P　　permanent

SIGNIFICANCE
NS　not significant
SS　short significant
S　　significant
VS　very significant