# When a river flows into the sea / workshop report

*text edited by Enrico Porfido / PhD researcher POLIS University*



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## Background[1]

In the last few years, the Albanian Government has started collecting ideas through international competitions, attempting to redefine a new strategy for the Albanian Southern Coastal Area. In particular, the aim of the competitions has been to revitalize and reconsider all the characteristics of the Albanian coast line in terms of tourism and landscape. At a later stage, the Albanian Government focused its interest on river basins, proposing another international competition for the area of Berat, that of the Osumi River in this specific case. The competition addressed the topic of the River and the Osumi Island, specifically in terms of their capacity to be resilient in case of flooding.

Drawing inspiration from this first experience, POLIS University and the IKZH Institute, through the Observatory of the Mediterranean Basin (OMB) - a new unit involved in the applied research field - started to explore a new way of investigating the Albanian landscape, merging PhD workshops with design research topics of present interest. In the framework of PhD activities, the workshop can be seen as an experience with the aim of improving the skills of each PhD student in terms of design approaches as well as research methods.

Considering the previous experience acquired with the Riviera competition, the river basin topic will give an additional contribution to the broader field of investigation related to the water domain in the Albanian landscape. The network created by the rivers, as study subject, can be seen as a natural system that links two different panoramas: the mountains, which constitute the central and the higher part of the country, and the sea.

The river basins in Albania generate a large percentage of water, an important natural resource which is still not fully explored, especially in terms of biological richness, biodiversity, and in terms of touristic potential. The relationship between water basins and historical landscape must be considered as an opportunity to reevaluate the role of the Albanian landscape within the frame of Mediterranean culture; a space of contradictions in which different identities have marked human history.

A well-known French historian, Fernand Braudel, described the Mediterranean as "A thousand things at once. Not a single Landscape, but several landscapes. Not a single sea, but a succession of seas. Not a unique civilization, but a series of civilizations stacked one on top of the other". This quotation highlights the importance of the Mediterranean in terms of diversity and multiplicity of identities. Through Braudel's eyes it is possible to

*Fig1 / Albanian riviera panoramic view*
*source /  Eranda Janku*

*Fig2 / Mediterranean map, drawing by John Thomson 1817*
*source / davidrumsey.com*



view the history of different cultures and traditions, in which the concept of the Mediterranean Basin is seen as a common inspiration ground for all the countries that are washed by the Mediterranean Sea. Considering all the above reflections, one of the main objectives of this workshop was the identification of common characteristics in the riparian environment of the Mediterranean basin.

## Introduction

For many years now, the European Union has been promoting several programs for conserving, protecting and developing the natural and cultural heritage. According to EUSAIR macro-region strategies and the Adrion program[2], Adriatic countries' watershed heritage is not fully exploited in terms of blue technology, touristic, environmental and connectivity potential. Following the European strategies of the Adriatic and Ionian Macro-Region, the workshop will be subdivided into four expertise fields, according to the four EUSAIR pillars: Blue Growth, Connecting the region, Environmental Quality and Sustainable Tourism.

*The overall objective of Blue Growth is about driving innovative and maritime growth in the Adriatic-Ionian Region by promoting sustainable economic growth*[3] and this objective can be reached by promoting research, adapting to sustainable seafood production and consumption, as well as improving sea basin governance.

The "Connecting the Region" challenge deals with the notable disparities between "old" EU state members and new ones. Its main objective is to strengthen reliable transport network and intermodal connection, especially maritime, and to achieve these aims, *better transport and energy connection are compelling needs for the macro-region and precondition for its economic and social development*[4].

Environmental Quality issues concern the ecological status of the marine and coastal environment, and aim at *reducing waste flows to the sea and nutrient flows and other pollutants to the rivers and the sea*[5].

The last important field of expertise based on the EUSAIR pillars is Sustainable Tourism which is focused on sustainable and responsible touristic potential of the Adriatic-Ionian region, promoting responsible tourism behaviour.

The aim of this workshop is to identify possible interesting areas around the Adriatic basin in order to define a new network, focusing more on an Albanian study case in a second phase. The analysis phase is the base for identifying common problems and potentialities and speculating about methodological solutions and possible applications.

The Albanian study case is the Seman River which is formed by the confluence of the rivers Osum and Devoll and flows into the Adriatic Sea. Crossing the western area of the country, it represents a perfect potential connecting point between inland-coast. Because of its morphology, the river can host strongly characterized pilot projects for different application fields.

## The Seman River

The Seman river basin is located in the central region of Albania. The river crosses

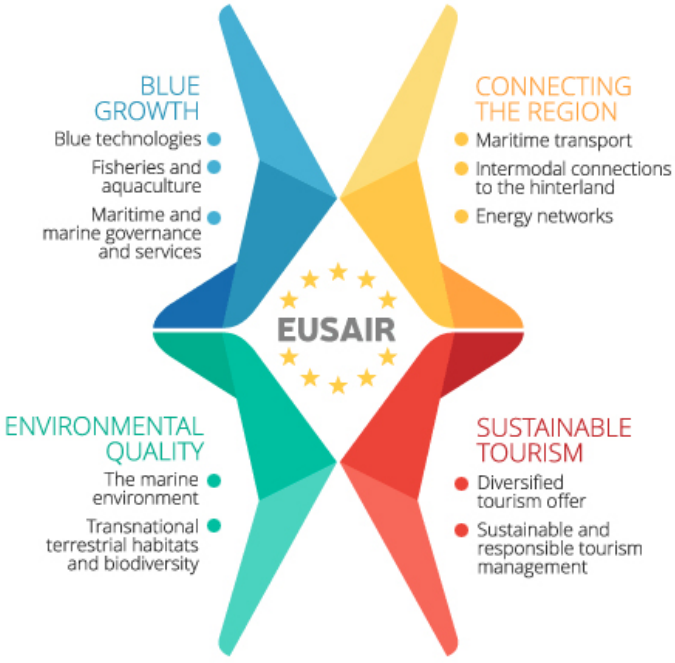



*Fig3 / EUSAIR four pillars*
*source / Europeaan Commission Action Plan, 2014*



and shapes different types of natural systems and landscapes, from the hills where Osum and Devoll rivers merge, becoming Seman, through flat areas where it provides water to urban settlements, to the coast where it flows into the sea.
The potential of this area in terms of economic and touristic development has been already recognized and enlightened in many studies as, for instance, the Albania 2030 Manifesto published by POLIS University in 2014. The main problem derives from the chemical industries and drilling-oil platforms that use it as landfill and then negatively influence all the surroundings. In its waters, large amounts of heavy metals and pollution are discharged. The same water is then used for watering fields and also collects the cities' confused drainage system.
In a region mostly characterized by farming activities and the leftover skeletons of a no-longer productive primary industry, the only solution is a regeneration process based on depollution, environmental restoration and enhancing the values of local heritage.

## Methodology

The workshop was divided in three sessions. The first was based on a desk-research, during which PhD students, coordinated by their supervisors, went through maps and documents concerning the Albanian river basins and, more specifically, Seman. This phase also included lectures by professors on the Albanian context, water management and biodiversity. Afterward, a daily site visit was organized in order to provide the research tools for the following steps. The last four-day session held at POLIS University was focused on data analysis and strategy definition. Round tables and discussions were organized during this working session in order to provide a continuous feedback to the students. On the last day, a public presentation with the participation of external experts took place at POLIS University.

The working phases were five:
- phenomena observation on site during the field trip,
- individuation and organization of the

*1 / The "Background and Introduction" paragraphs are taken and then edited from the workshop description.*
*2 / The Interreg V-B Adriatic-Ionian 2014-2020 (hereinafter ADRION), set up in the framework of the European Territorial Cooperation (ETC) - one of the objectives of the cohesion policy - includes 31 regions from four different ERDF Partner States and four IPA Partner States. The overall objective of the ADRION Programme is to act as a policy driver and governance innovator fostering European integration among Partner States (Albania, Bosnia and Herzegovina, Croatia, Greece, Italy, Montenegro, Serbia, Slovenia), taking advantage from the rich natural, cultural and human resources surrounding the Adriatic and Ionian seas and enhancing economic, social and territorial cohesion in the Programme area. The Programme takes into consideration the experience of the 2007-2013 Operational Programmes (OPs), in particular the transnational South-East Europe programme (SEE) and the cross-border programme IPA CBC Adriatic whose eligible areas overlap with those of ADRION. It also takes into account the results of the SEE in itinere evaluation and the overall programme achievements of the previous programming period.*
*3 / Definition from the Action Plan Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS concerning the European Union Strategy for the Adriatic and Ionian Region, {COM(2014) 357 final} {SWD(2014) 191 final}, European Commission. Brussel 17.6.2014*
*4 and 5 / See above.*


*Fig4 / Site visit map*
*source / drawing by Enrico Porfido*



main causes of problems,
- definition of a general strategy for the whole area,
- definition of strategic actions and
- design of toolkits for agro-puncture interventions.

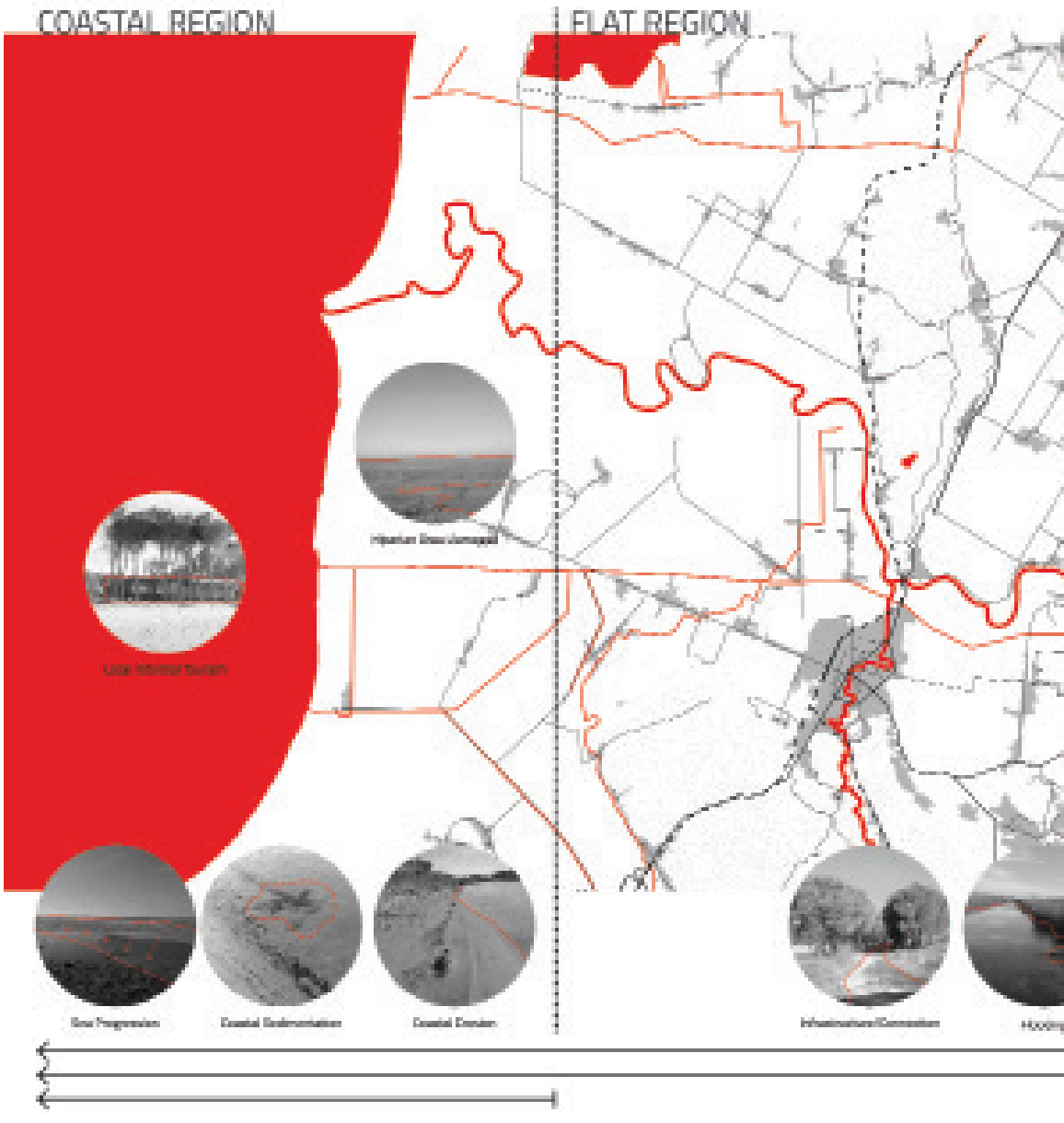
## Territory knowledge / site visit and data collection

The site visit started on the Seman beach and retraced the river path until the starting point, close to Kucova, where the rivers of Devoll and Osumi meet.
The first step consisted in identifying the main problems and mapping them. Figure 7a shows the map with the problematic/ degraded areas.

Starting from the beginning of the river path in the hills, the main identified problems are:
- Deforestation / natural forests are often destroyed and substituted by farming activities and oil drills;
- Shelves erosion / the artificial shelves are not always correctly managed or properly implemented, so they collapse;
- Fragmentation of land property / as a consequence of market liberalization, proprieties have been chaotically divided which resulted in the creation of small and too many properties in a little area;
- Pollution created by factories / the huge presence of a production factory that does not follow a sustainable protocol strongly affects the air, soil and water quality;
- Farming pollution / the use of fertilizers and pesticides affects the air, soil and water quality, especially in rural areas;
- Oil-drill pollution / the oil-drill activity strongly affects the environmental quality due to the old technologies used and incorrect management;
- Floods / heavy rains, low - natural or artificial river banks and absence of an adequate riparian zone cause seasonal floods;
- Settlement pollution / the unorganized and informal settlements are responsible for the wrong development of the entire area. This includes waste production and sewage treatment which are not properly managed and cause pollution.

The central area, the flat region of the basin, mainly hosts human activities and strongly affects the river path not only in terms of pollution but also shape. The most important issues identified are:
- Settlement health risk / people are constantly in contact with stagnant drainage water and waste, since they are close to housing areas. This is dangerous for human and animal health;
- Infrastructure connection with river / the condition of infrastructures makes reaching the river stream difficult;
- Oil-drill activity / oil-drilling activities have an important impact on surrounding areas, soil, water and air. In addition, oil-drilling damages the landscape and its natural and aesthetic features.
- Drains management / vegetation rubbles and wood pieces, plastic waste and damaged banks are visible problems that affect the drain system;
- Waste management / complete absence of waste-collection systems and policies;
- Land fragility / due to all the previous

*Fig5 / Site visit pictures*
*source / PhD international workshop students*


COASTAL REGION
FLAT REGION

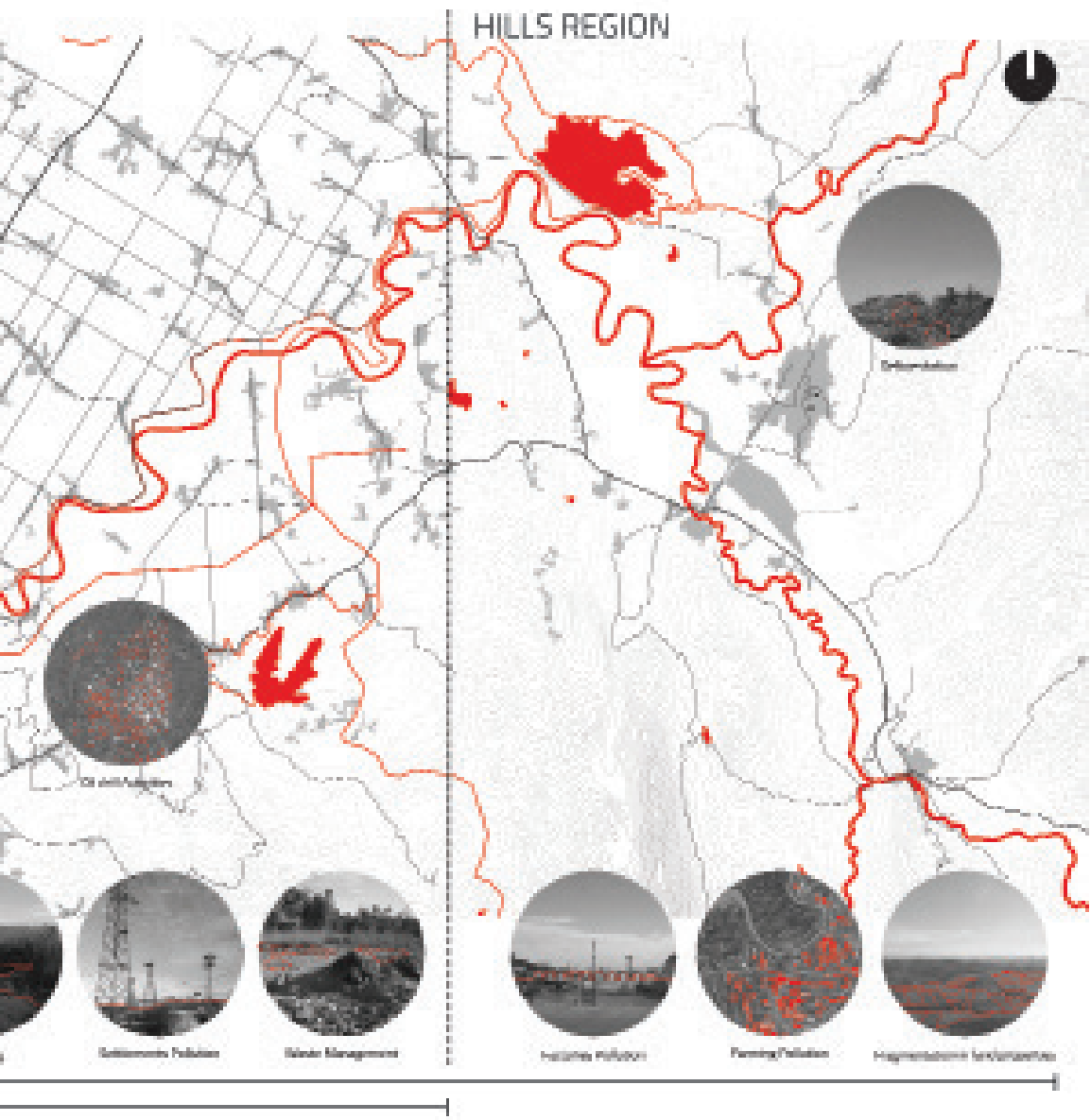
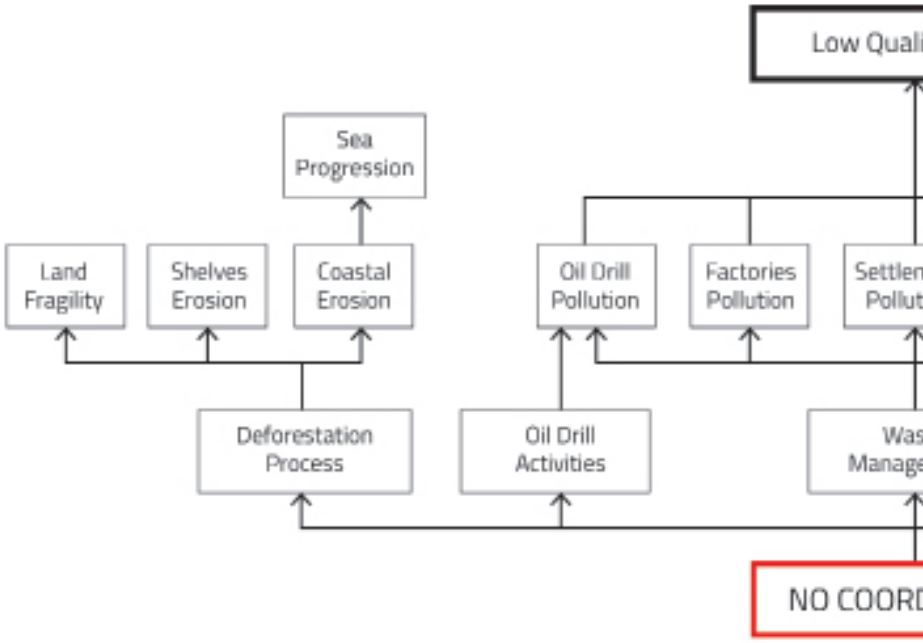



*Fig6 / Geolocalization of the main problems identified in the site field source / PhD international workshop students*






problems, natural and geological characteristics are strongly modified and they can cause landslides.

The coastal area has specific issues related to the presence of the sea:
- Cost erosion and deposition, sea progression / the sea line constantly changes due to the loss of the river banks, with the sea that constantly steals land to the branch extension . Those phenomena need to be contextualized in a bigger frame of sea-related issues.
- Incorrect Riparian area management / the total or partial absence of vegetation along the last part of the river allows any kind of deposit to reach the sea;
- Local tourism / in pine forests there are many informal shelters/houses used in the summer period by informal touristic activities such as restaurants or temporary accommodations.

After having identified the main problems, the following step was to classify them and clarify their hierarchy. The problems have been divided into three main categories, based on their origins: water and natural features; human settlements and connected actions; human productive processes. Figures 8 and 9 show those considerations in a diagrammatic way. The circle diagrams demonstrate that the main issues of the Seman basin area is the low-quality pollution, a result of all three categories. The tree problem shows that the main issue is the absolute absence of coordination between thematic policies: environmental, land propriety/use and production. It also allows the identification of five important problems to address: the deforestation process, oil-drilling activity, waste management, fragmentation in land property and local informal tourism.

## Overall strategy / balancing the transformation factors

The overall strategy aims to define a sustainable development approach to the territory based on the rebalance of natural, socio-cultural and economic factors.
Those elements differently affect the river path and influence the entire territory.

The methodological approach consists in identifying three main systems:

Natural Water / the system identified in the entire path of the Seman River. This is a sequence of natural landscapes requiring urgent preservation actions.
Anthropic Water / the area related to the human activities: the artificial drain which goes through Patos-Marinza, the Gjanicë tributary that flows from Belsh's oil refinery to Fier, the agricultural area and settlements of the drain from Fier to the Adriatic-Ionian Sea.
Interactive Water / the area where the river flows into the Adriatic-Ionian sea, bringing with it human and natural features inherited by the previous steps.

The strategy finds its application in two ways: territorial actions and tool kits. The territorial actions attempt to provide an answer to the different issues according to their localization. The tool kits answer to the five main problems identified by the tree problems in a more punctual way.

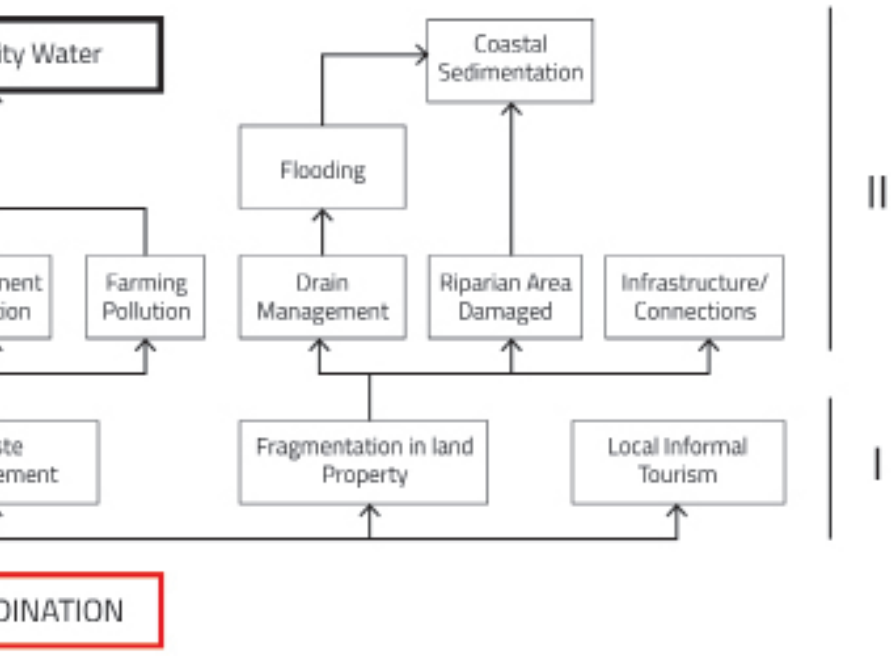



*Fig7 / Seman basin problems tree*
*source / PhD international workshop students*



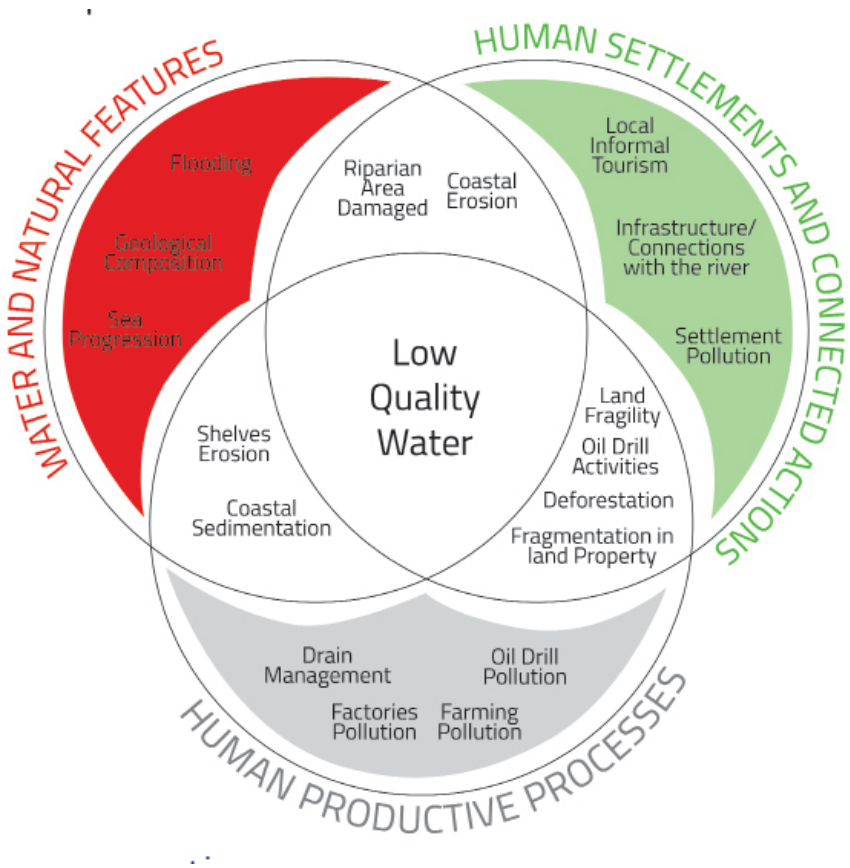



*Fig8 / Circle diagrams for classifieng the main problems causes*
*source / PhD international workshop students*

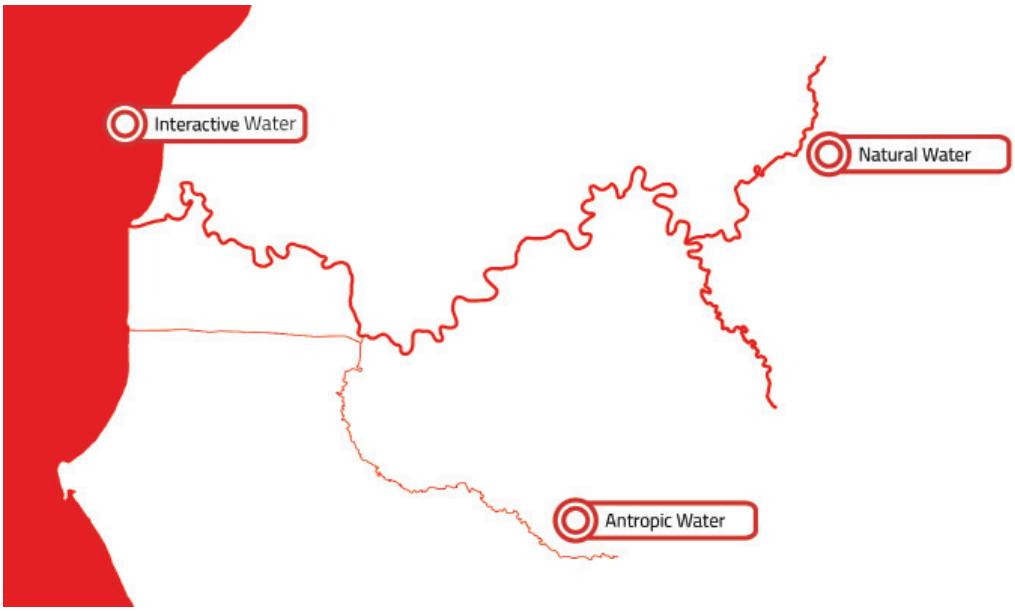



*Fig9a / Diagrams explaining the strategic approach source / PhD international workshop students*



## Strategic actions / territorial interventions

The strategic actions try to give an answer to the different issues, categorizing them through localization. Action 1 works along the entire river at a territorial scale. The sub-actions proposed are related to the redefinition of river paths and the re-naturalization of the Seman River, land fragmentation and bioremediation areas. Action 2 works on the urban areas, dealing with human presence and effects on the territory. Action 3 is mainly focused on the coastal area, in terms of nature protection and preservation.

## Action 1 / when the nature meets the water

This action works along the entire river path and it tries to give a general answer to the environmental issue through a re-naturalization process, anti-fragmentation land policies and bioremediation.

The re-naturalization process starts with the reforestation of the river bank erosion, caused by mountain dams, and continues with the river bank reconstruction and management. The main goal is to realize efficient riparian areas along all the river path in order to restore the natural landscape. In the flat region, before the oil drilling area of Patos-Marinza and the urban settlement of Fier, a series of abandoned existing caves and agricultural areas are allocated as detention basins in order to prevent the risks of flooding.

The anti-fragmentation process acts homogeneously on the territory trying to solve a problem that also exists in other areas of the country. Property fragmentation is reduced thanks to the coordination of the owners lowering the number of the existing drains and managing the remaining ones.

In order to decrease the pollution of Seman in the Patos-Marinza oil-drilling area it is realised a phytoremediation system as natural technology able to purify the soil.

## Action 2 / when the man meets the water

This action is strictly related to the human presence on the territory, both in terms of pollution caused by industries and human settlements.

Punctual interventions aim to solve localized problems. An example is the Gjanicë area. The Gjanicë oil pollution is solved through the importation of water treatment plants close to Belsh's oil refinery.

The re-use of abandoned structures aims to provide services that are otherwise absent. The disused nitrate factory of Fier is transformed into a sewage treatment system for all the area settlements. This intervention allows the renovation of an existing abandoned heritage, reconverting it both in functions and use.

In order to make the agricultural lands more productive, the solution is to reduce property fragmentation through farming coordination and cooperation so as to achieve a more efficient drainage management. The connection between the existing roads and the new public services like waste and sewage collection systems allow the reduction of sprawl by increasing the existing settlements down the main roads.

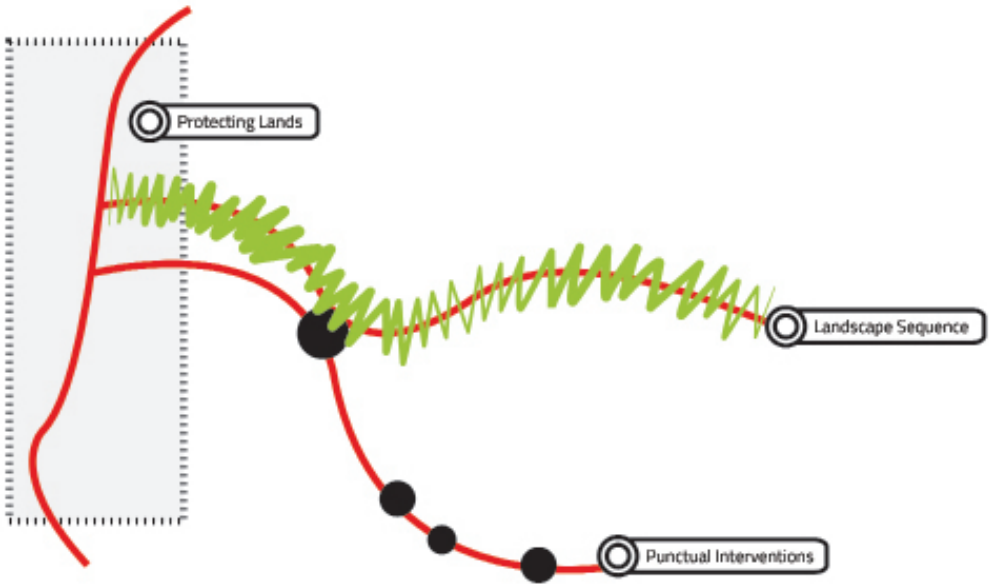



*Fig9b / Diagrams explaining the strategic approach source / PhD international workshop students*



**Action 3 / when a river flows into the sea**

When the river flows into the sea, it transports all its problems to the open sea, adding their effects to an already dangerous situation in terms of world environmental issues such as coast line transformation, for instance.

The institution of a protected area represents the first step towards starting a sequence of preservation interventions and valorisations actions. The adjacent existing protected natural area of the Karavasta Lagoon is enlarged in order to create an ecologic corridor that connects the regional heritage. This area includes the natural heritage as far as the Apollonia archaeological park and industrial archaeology spread around the territory.
The coast erosion, sedimentation and sea progression are solved through sand dunes management, wooden sea walls and reforestation of the existing pine forests with proper tree species. In particular, the river mouth riparian area will be refurbished. The coastline consolidation is as much of a fundamental phase for ensuring a future to for the coastal region as the reforestation process.

**Tool kits / punctual interventions**

These actions are implemented through precise tool kits, which at the same time act on the five main issues identified as main causes in the problem tree (see above). Those are instruments of intervention in terms of policies and physic actions. Possible financing sources have been hypothesized for each one.

**Tool kit 1 / Deforestation**

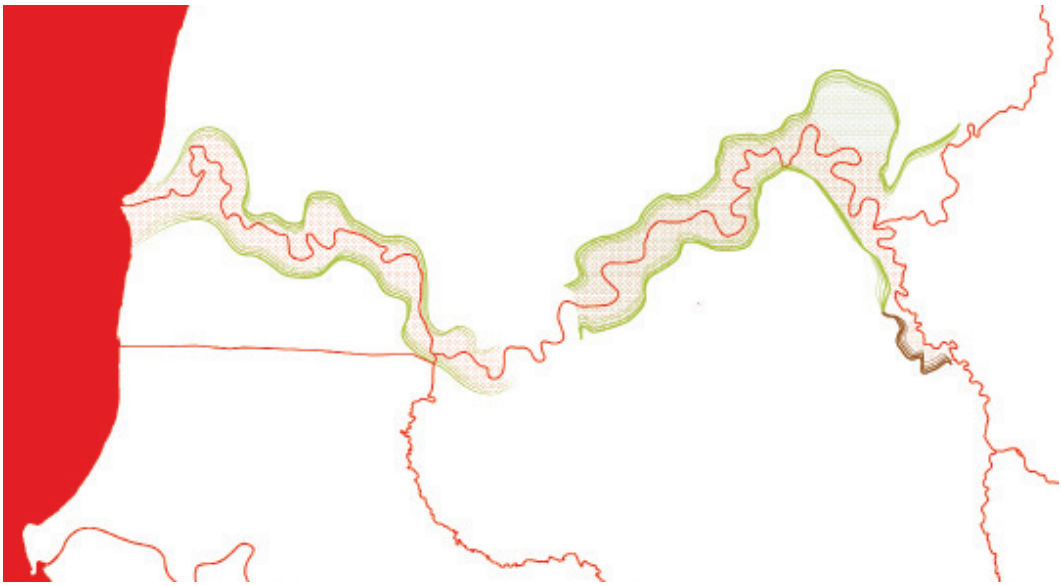
The first action needed is the regeneration of the riverbanks with the creation of detention basins, starting with the planting of new trees in protected areas.
How can that be done?
Capacity Building / The Governance starts to teach the inhabitants, with the help of education authorities, how to use the detention basins (what and how to plant there).
Financing / Ministry of economy can lead the financing derived from the Oil Industry sector to river regeneration (soil management for the creation of riverbanks, planting trees).

**Tool kit 2 / Oil drill activities**

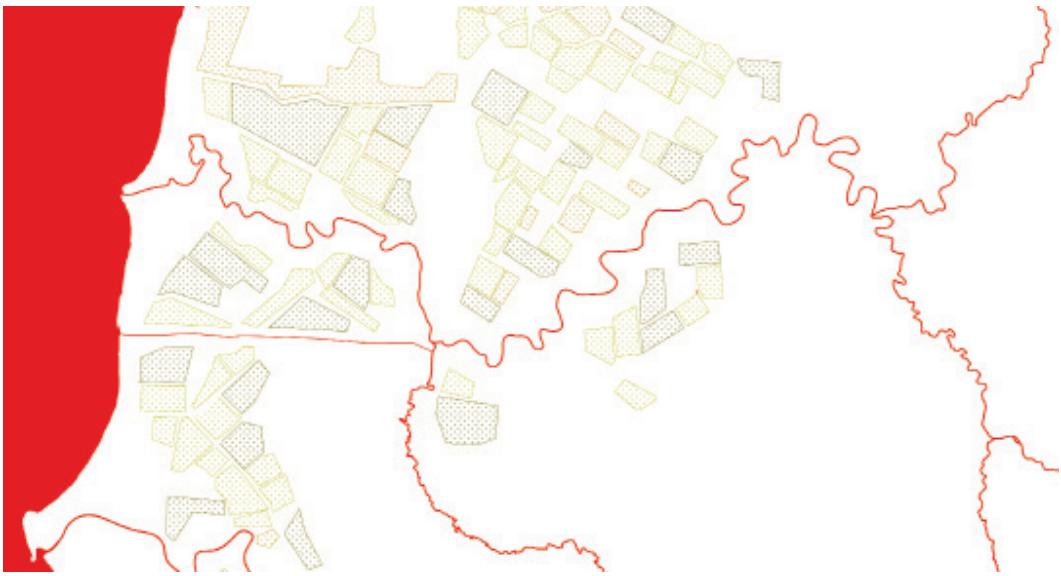
In order to avoid land consumption in the oil-extraction areas, equipment and oil tanks should be placed in denser sites, away from the river, in order to create an area of phyto-purification in the vacant areas.
How can that be done?
Regulation Codes / The Government should provide regulation on oil-drill extraction areas in order to create exclusive areas for better managing and improving health security.
Capacity Building / Creation of a Specific Agency for Oil Extraction Areas that will monitor the public health impact on the surrounding municipal areas.

**Tool kit 3 / Waste Management**

In order to avoid the extreme pollution of the river, the Municipality has to implement different kind of actions: the creation of waste factory treatment plants and solid



Action 1.1 / re-naturalization

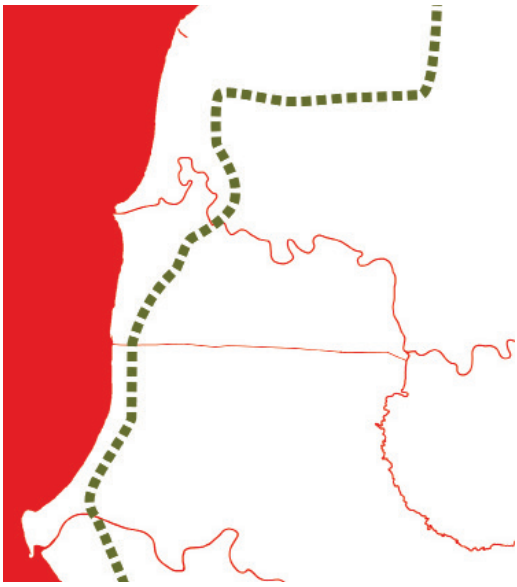


Action1.2 / anti-fragmentation

Action1.3 / bioremediation

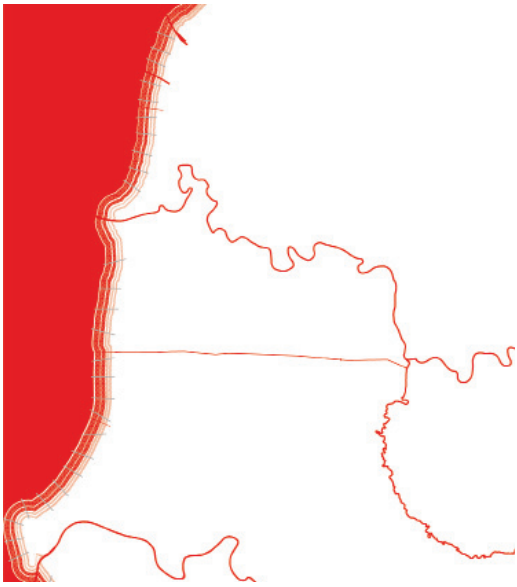
*Fig10a / Diagrams for Action 1*
*source / PhD international workshop students*

Action 2.1 / puctual depuration



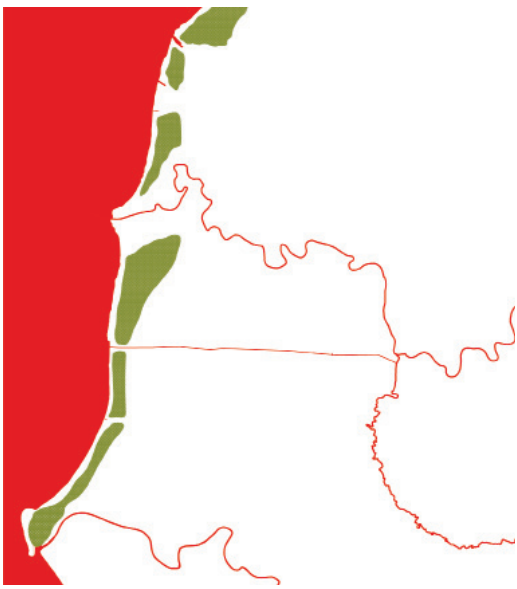
Action 3.1 / park institution

Action 2.2 / sewage collector



Action 3.2 / coastline consolidation

Action 2.3 / urban consolidation



Action 3.3 / reforestation process



*Fig10b / Diagrams for Actions 2 and 3*
*source / PhD international workshop students*

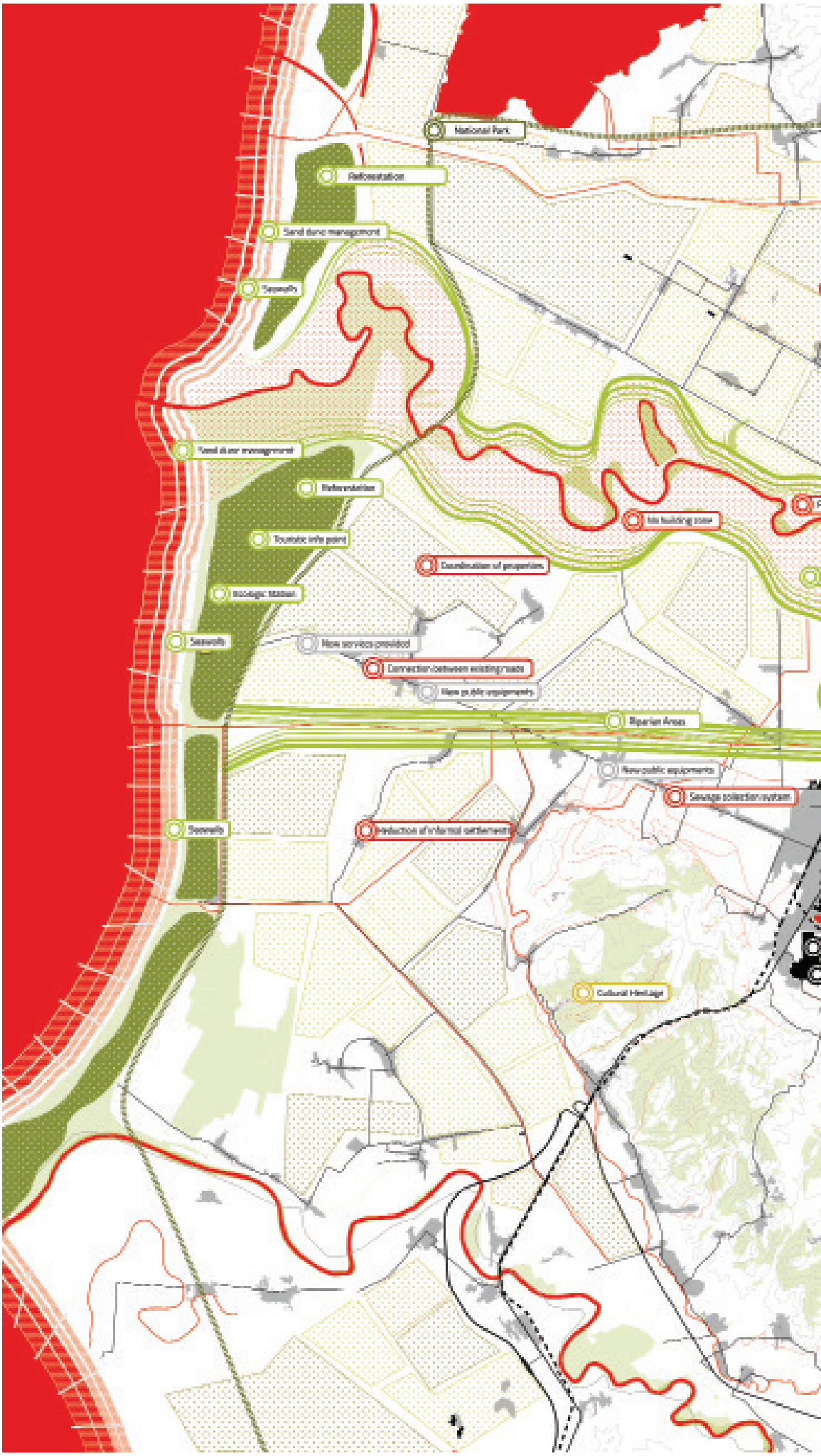
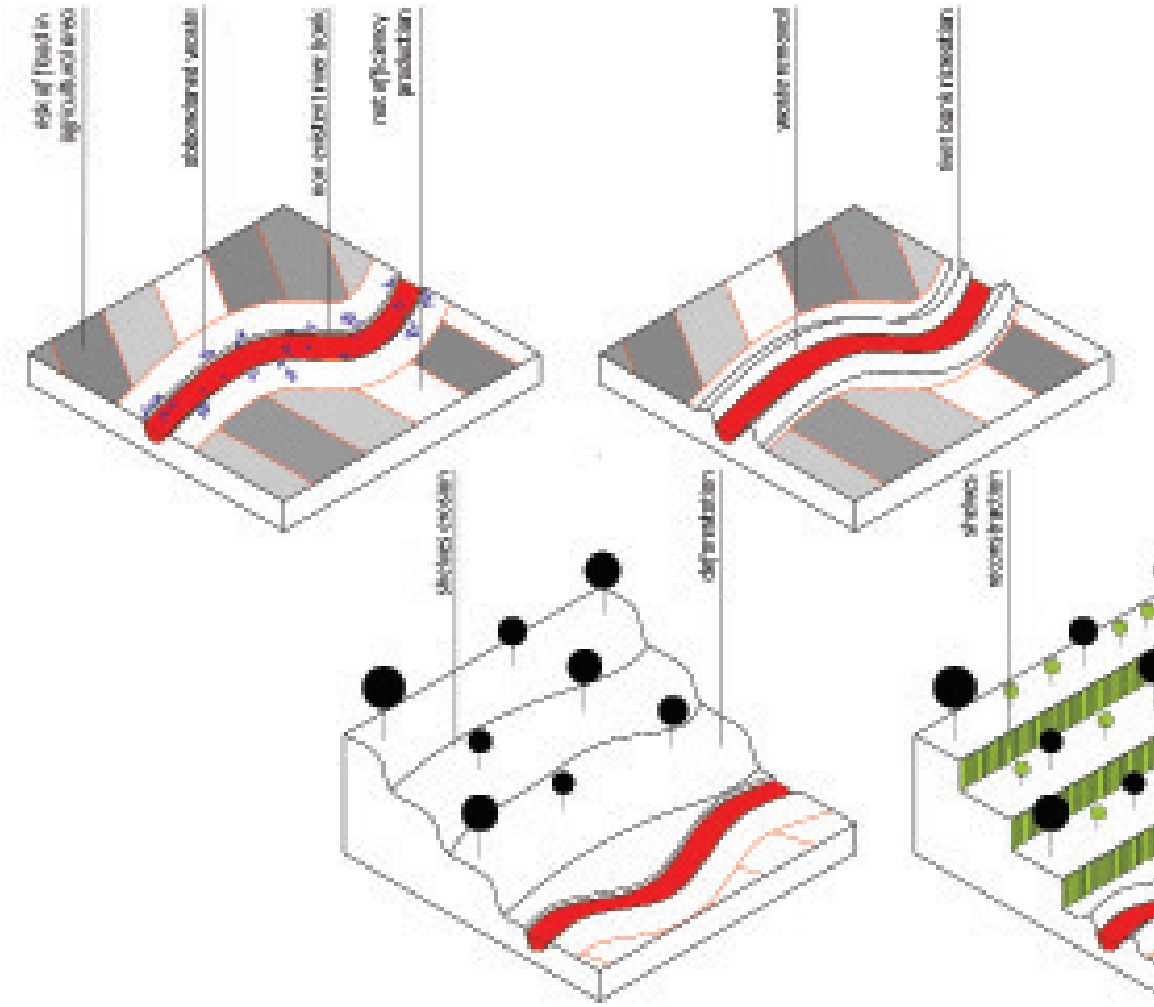

National Park
Reforestation
Sand dune management
Seawalls
Sand dune management
Reforestation
Touristic info point
Ecological Station
Seawalls
Seawalls
No building zone
Coordination of properties
New services provided
Connection between existing roads
New public equipments
Riparian Areas
New public equipments
Sewage collector system
Reduction of informal settlement
Cultural Heritage


*Fig11 / Masterplan*
*source / PhD international workshop students*





waste collection areas. Regarding the river, the most important action is the reforestation and cleaning of the path.

How can that be done?
Financing / The Municipality supervises and funds the waste bins of separate collection for all kinds of uses.
Partnership / With private stakeholders for waste management in order to create a center of depuration and recycling.
Incentives / Push the recycling of waste in the single neighborhoods by proclaiming higher taxes for the ones who do not follow the policies.
Capacity Building / Creation of educational campaign for waste collection, in partnership with schools.

## Tool kit 4 / Fragmentation in land property

The extreme fragmentation leads production to be local and not developed. The creation of an agricultural consortium will lead that market to a more competitive development. This will be done by keeping and renewing some of the existing canals. Meanwhile, with the changing of scale of this kind of market, some free areas can be converted into detention basins to prevent the flooding outside boundaries and erosion in non-monitored areas.

How can that be done?
Capacity Building / At a Municipal level a solution is needed for a consortium development in order to make a common issue of land use.
Regulation Codes / The Government should provide internationally approved certification for agriculture goods (technology) and products.

## Tool kit 5 / Local Informal Tourism

This action will be developed on the whole coastline. In order to avoid costal erosion positioning seawalls and a better organization of dune management are needed. It is necessary to remove the informal touristic structures and to create an authorized Touristic Info Point. Reforestation will be coupled with the enlargement of the Natural Park in the southern area. Another important thing is the reconnection of the sea area to the Heritage Sites of the region, providing accessible transportation systems.

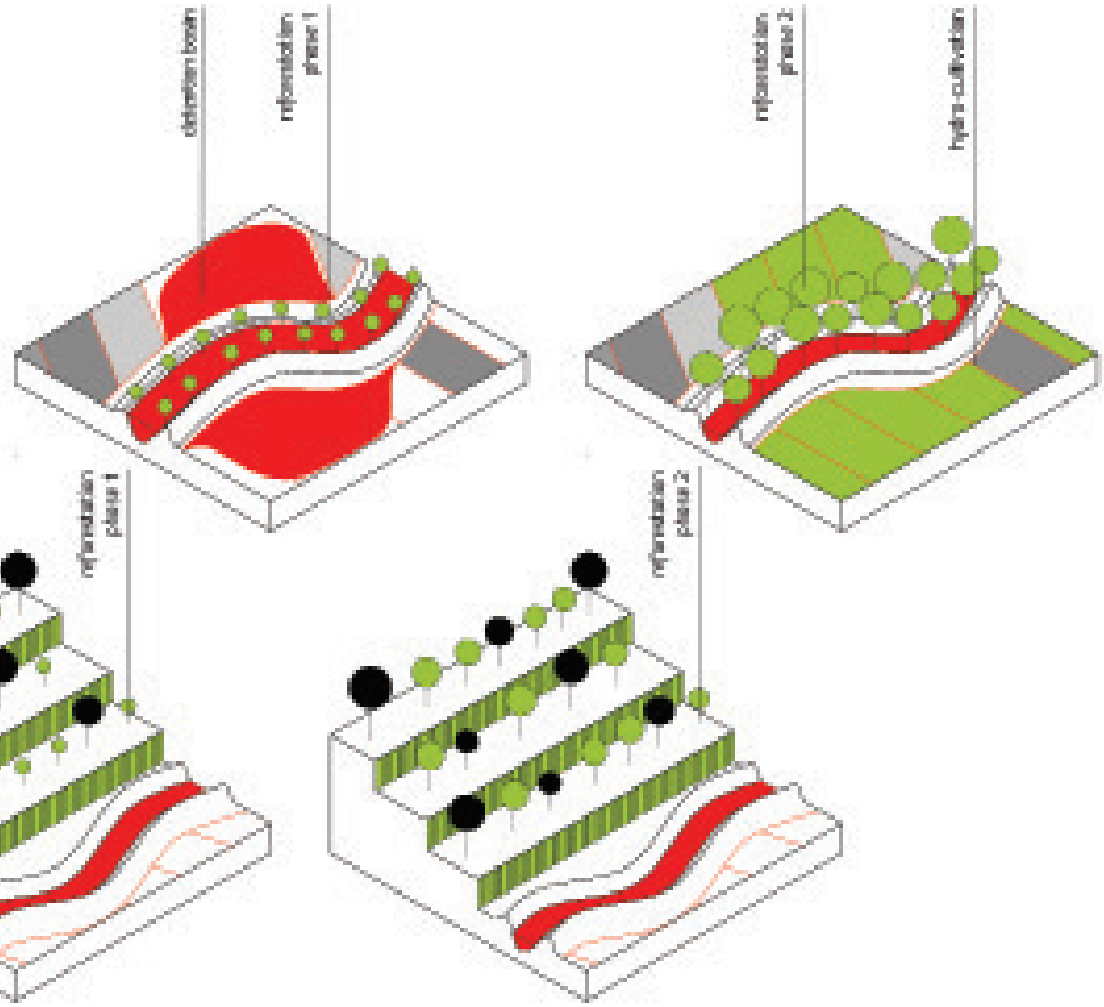





*Fig12a / Deforestation Tool kits*
*source / PhD international workshop students*

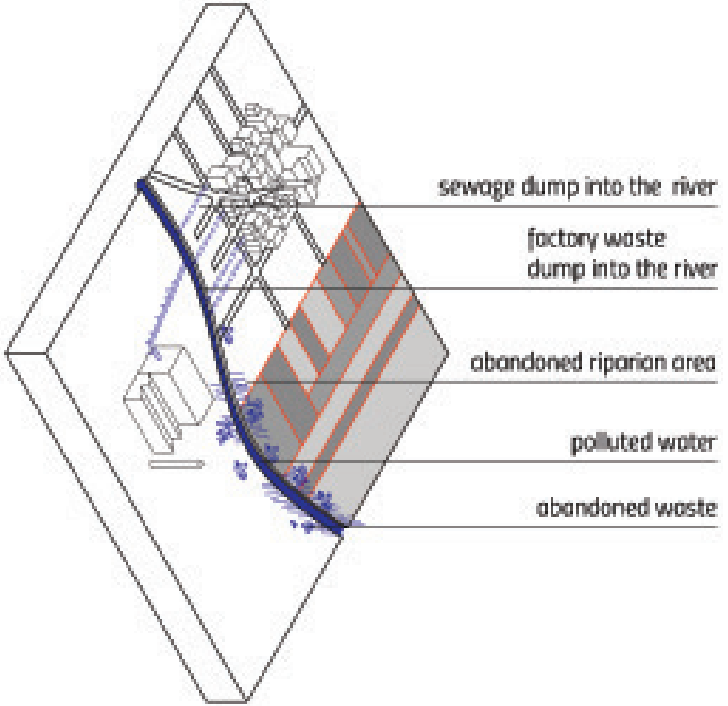
How can that be done?
Regulation Codes / The Government and Municipality will provide exceptional authorizations for those who want to invest in the touristic sector and force out spontaneous investment. Touristic investment should provide info points, sea watch guards, naturalistic and heritage tours.

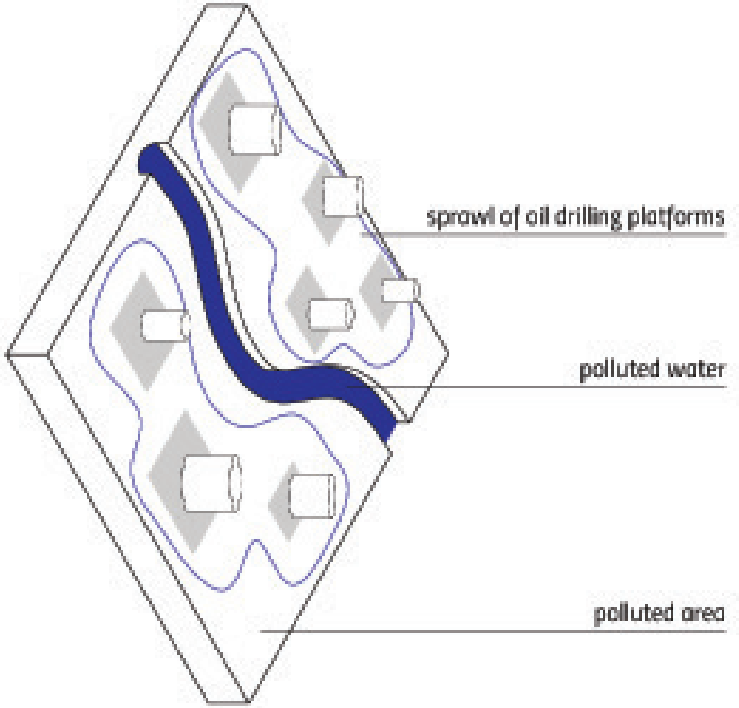
## Conclusions

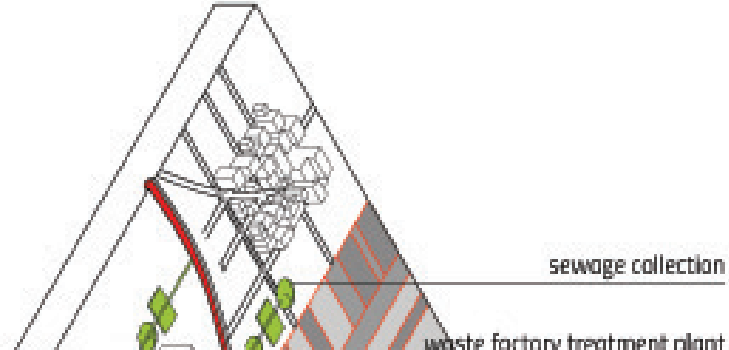
From a methodological point of view, the workshop experience emphasizes the necessity of a multidisciplinary approach in developing territorial strategies. The presence of urban planners, biologists and architects allows the joining of different knowledge fields and the analyses of the same issues from different points of view.

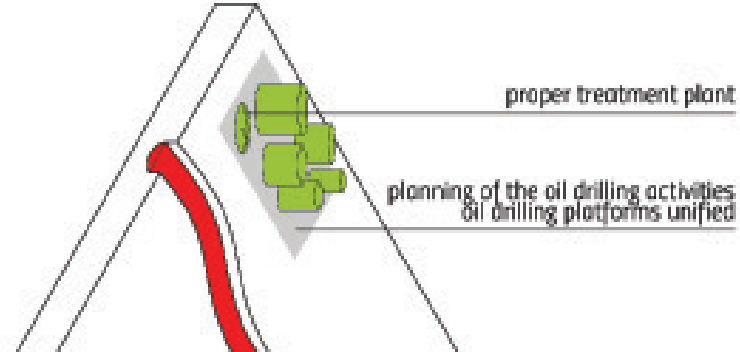
The strategy proposed finds a direct link to all the four pillars of the European strategies of the Adriatic and Ionian Macro-Region. The Environmental Quality issue is a constant in all the actions and tool kits designed, while the other pillars are more related to specific actions. For example the Region Connection is a theme of Action 2, while Blue Growth and Sustainable Tourism are more evident in Action 3.

The workshop results are strategic actions that need to be further developed. The PhD students' contributions in this chapter deal with some of the previous themes and try to answer them in a more specific way, according to their personal research fields and knowledge.


sewage dump into the river
factory waste
dump into the river
abandoned riparian area
polluted water
abandoned waste


sprawl of oil drilling platforms
polluted water
polluted area


sewage collection
waste factory treatment plant


proper treatment plant
planning of the oil drilling activities
oil drilling platforms unified

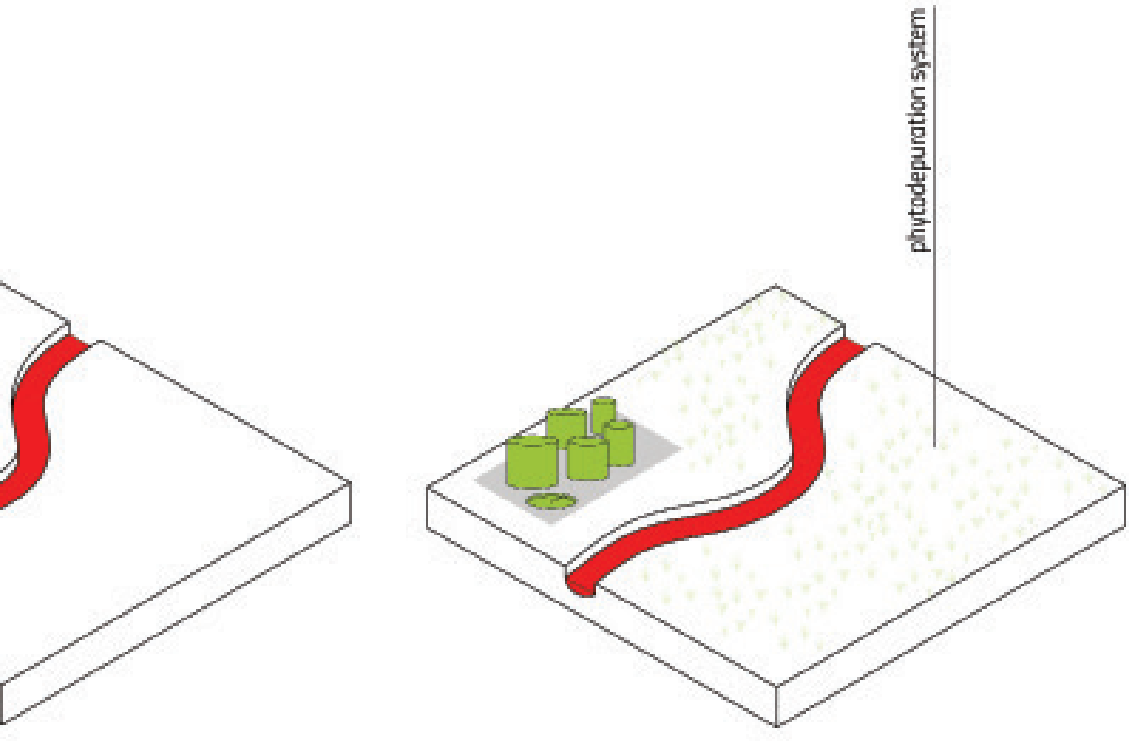





*Fig12b / Oil drilling system Tool kits*
*source / PhD international workshop students*

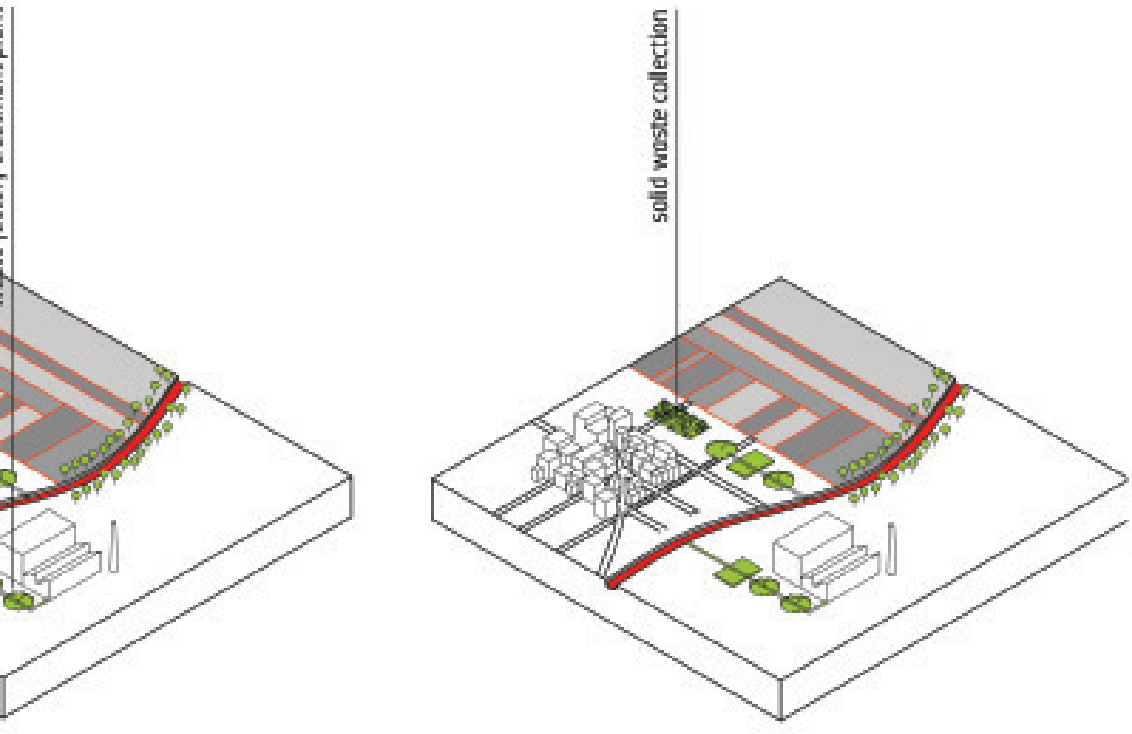
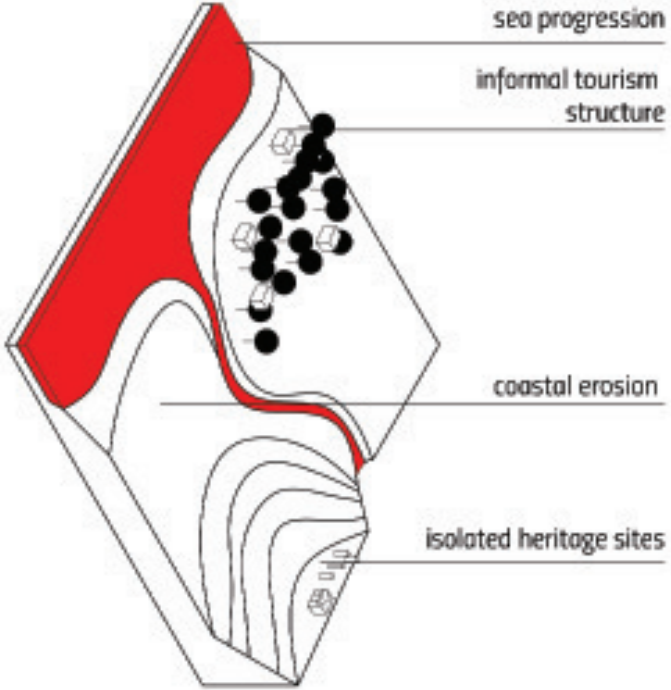
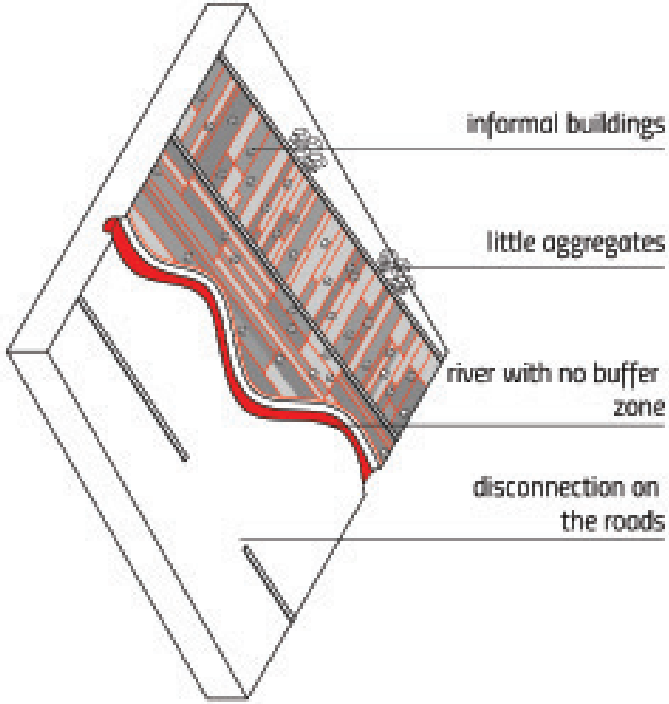



*Fig12c / Waste management Tool kits*
*source / PhD international workshop students*


sea progression
informal tourism structure
coastal erosion
isolated heritage sites


informal buildings
little aggregates
river with no buffer zone
disconnection on the roads


wooden sea walls

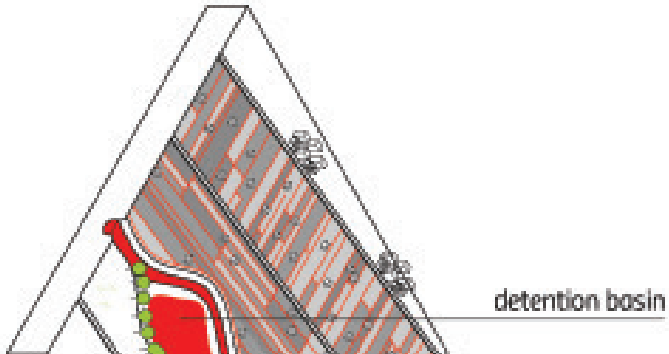

detention basin

*Fig12d / Anti-fragmentation Tool kits*
*source / PhD international workshop students*




*Fig12e / Seman National Reserve Tool kits*
*source / PhD international workshop students*