ABSTRACT

The Geography Course, during the fourth year in Architecture Master Degree, approaches the planning problem on the themes of the extraurban territory: vulnerable and regained areas, activities that have to match with a geographical environment and any other matter related with extraurban contexts, are faced as plans to establish a sustainable arrangement of conflicts and disorders.

Obviously the water problem is an important key in the analysis and then in the planning moment, so that we chose the array of six works that cope with water issues, as different matters.

The first plan is about an industrial area on high risk of water-flood, that means both a huge waste of public funds than an exponential growth of engineering hydraulic operas. Is this the only way to follow? This plan shows there’s another solution, based on the respect of nature, water and soils.

The second and third plans are about a saline wedge that is quickly permeating the coastal plains. The question is how to help the recycling process of those soils as fertile ground, and where can be found the water needed for ‘washing’ and irrigating these soils, since water is lessen. Two different plans that can be integrated.

The fourth plan: a lake is drying up. It would be an obvious fate, if it wasn’t happening unnaturally fast. In the past ten years many trials have been done against this drying process: is still possible to think to slow it? This plan tries to slow the evaporation and provides to create the memory place for the lake’s history.

The fifth plan concerns the restoration of a mill’s system in a park, as to produce and partially use the own watermills’ energy.

The sixth project is about a creek itself and its surroundings: tuff-mines, a system of old mills and caves, a nineteenth century’s aqueduct, the natural environment, an archeological area. All those elements convey to a creek-park plan, in order to promote slow walking paths along some fragile parts of the “forra” (a thin water-eroded valley).
I | Introduction

Water is a common element in many of the projects which are developed during the Geography course. These include how to deal with the various problems connected to recovering the territory that has not been urbanized. Water is consequently one of the most influential and reoccurring elements either because there is too much or too little of it, for its protection, for its direct or indirect consequences, and for many other various reasons. Fortunately, the work often involves either how available hydraulic resources can be positively employed to produce the necessary energy for the project or to safeguard it.

Coursework has been divided into two stages: first come the analytical studies: geography and urbanism; the origin, form and significance of the landscape is studied; the specific problem of the area is identified and analyzed; and finally a possible solution is planned or designed.

In this talk I will show some examples which will demonstrate the kind of solutions which have been chosen. The work tends to foresee a formal solution - architectural and urbanistic - to the problem studied, briefly showing the techniques to apply according to their compatibility.

I would particularly like to highlight how, each time, water has been considered in the work shown. The work has an overall picture and is not exclusively concerned with water, even though this is an important part both of the problem and of the solution.

By this, I hope to give you an idea of how many forms and what implications are involved in the study of water in these contexts.

For instance, problems are often to be found in small valleys. Spaces have been carved out by water-proofing and using the flat bottom of the valley without taking into account the overall hydraulic structure (the slopes and bottom) which shows how the valley was formed and its conformation. Another problem might be using the slopes without taking into account the nature of the soil or rainfall.

Another frequent occurrence are the problems connected to the presence or closing down of mines, quarries or landfills. This project is about a creek itself and it’s surroundings: tuff-mines, a system of old mills and caves, a nineteenth century’s aqueduct, the natural environment, an archeological area. All those elements convey to a creek-park plan, in order to promote slow walking paths along some fragile parts of the “forra” (a thin water-eroded valley).

Sometime the alteration of a satisfactory balance might be linked to natural causes, such as the lake which is drying up. It would be an obvious fate, if it wasn’t happening unnaturally fast, it has been speeded up due to climatic changes. In the past ten years many trials have been done against this drying process: is still possible to think to slow it? This plan tries to slow the evaporation and provides to create the memory place for the lake’s history.

I will now illustrate three examples which hint at problems mainly hydraulic and which are considered in the entirety of their context in order to plan a solution.

2 | First case: the valley floor

An industrial area in the countryside near the famous town of Monteriggioni. Being in origin wetlands the area was, up until the 1960s (nineteen sixties), scarcely developed. The small local railway line, which the road to Castellina in Chianti crossed via an underpass, bordered the foothills to the north-west.

Later the Florence-Siena freeway was built alongside the railway, so a highway ramp was planned in that area and thus the semi-marshland in the small basin increased in value.

The territory on which the industrial area lies is at a high hydraulic risk; in fact it repeatedly floods. The area developed chaotically, with no studies carried out beforehand, and without any predefined plan, one after another the industrial hangars were built – between flooding, a dead-end or crooked road – gradually filling the valley floor. Whenever there is a flood, this is followed by new work to drain, channel, contain and hide the flow of water – the cost of which is covered by the community at large. Each time it is back to square one, as you would expect: the area floods as the water hardly tries to follow its natural course.

The problem is easily delineated; is it at all possible to project a coexistence, a compatibility, between the nature of places and the precious (although badly placed) presence of economic activity and employment?

In the meantime let’s take a look at what employment we are talking about: most of the space is taken up by commercial use and not industrial. Nowadays productive activity occupies less than 20% (twenty per cent) of the hangars.

Let us now take a look at the road network: besides the recent and disorderly network, there is a road which runs alongside the conglomeration of the infrastructure; and there are some of the hill roads.

A new area should be made safe from water. The site should be chosen after examining the orography: the boundary of the area at high hydraulic risk highlights the good position of the area and the road which runs alongside at north-west; among the hilltops, which are at low hydraulic risk too, the central hill in front of the highway ramp appears to be particularly well-connected.

The solution consists in leaving the space in the basin subject to flooding free from buildings and roads, which could be used as a kind of park, exposing water courses and streams of water to the open air, reestablishing where possible its original course and removing any waterproofing. Due to the lack of appropriate space, in order to provide a rational use of the necessary road network and for a better configuration and functionality of the whole setup, it was found the solution to choose separate locations for the main present activities: the commercial area on
one side and on the other the industrial and logistic area. The commercial area benefits from the nearness to the “water park” and is built in a fan shape between the northern curve of the railway line on the hill side and the “water park” in the valley. It is served by the existing road and has parking spaces alongside the railway line and under the base of the building. Using concrete stilts resolves the problem of a hybrid location (land-water) for the commercial buildings. This orientation is chosen to allow for the use of roofs made of photovoltaic solar panels which supply the buildings with the energy they need. The industrial and logistic area is situated on the hillside of the small outcrop opposite the highway ramp. A road is already there so all that is needed is to complete the final piece of the route for heavy vehicles. The way the area is set up is studied in relation to its hillside context. What has been learned from Renzo Piano’s work for the Paul Klee Foundation is applied to this specific situation.

3 | Second case: the valley slopes.

In the media valley of Greve, in the heart of the Chianti region, the hills are made by Pliocene sediments which are rich in sand and clay: so they are often subject to landslides or mudslides. All the famous countryside of northern Tuscany is based on having hydraulic control of these soils: small half-moon shaped walls, terraces supported by stone walls or by pressed, grassy ground; buildings on hilltops and roadways on crests and ridges of hills; steep or oblique drainage systems and ditches; the staggered, geometrical planting of trees and shrubs on terraces or in the “cavalcapoggio” shape, for the cultivation of the mixed crops necessary and essential for the survival of sharecroppers’ families; planting cypresses alongside the most important of the very sloping roads, in order to strengthen their edges and prevent erosion.

With the coming of mechanization all this was first abandoned and then destroyed: the present monoculture of olive trees often use the technique of the staggered planting of trees, while vineyards are mostly situated along the lines of maximum slope (rittochino), producing washouts and an increase in landslides and mudslides.

In this case the job consisted in the choice of conditions, size and hydraulic layout necessary to recover these soils in the safest way possible for wine production. The Guidelines set down by the Region of Tuscany have been studied and the solution - which seemed to be the most suitable considering the features of the slopes - was chosen: the interconnected surfaces. However, this solution conjured up an image of something massive, and so the landscape was analyzed to define the form and extent of intervention in, so that it would seem more like an evolution of the existing landscape, without creating a gap between what was and what it was to be like, but trying to follow its own predominant rules in a positive fashion. This hydraulic solution was integrated with a system of collection and distribution of irrigation water. The simulation carried out seems to have proved that the method used for research into the compatibility between our hydraulic solution, vineyard and existing landscape was right.

4 | Third case: saline infiltration.

In the plain around Grosseto, the saline wedge has almost reached the base of the hillsides. The excessive use of groundwater for irrigation purposes has been the major cause and the extent with which wells have been dug is the proof of this. Climatic change has made the situation worse. Not until very recently has anything been done to oppose this, and we are still a long way from any substantial improvement. Farmers have accordingly transformed their crops, planting tomatoes, for example, instead of maize. Due to this they will, as long as is possible to do so, cultivate soil which is even more saline, although obtaining an ever decreasing production, they will, for the moment, have increased revenues.

Who knows how things will develop later! What the two projects have in common and what will determine what is to be done, is the need to find water: to substitute drawing water from well for irrigation and to wash the soil of its saline content. Furthermore, these two coordinated projects are also linked to a third (developed for a thesis): the reopening of the drainage channel of the River Ombrone, to the north of the city. The first project aims to recover water from urban sewage, taking this water from the sewage treatment plant, situated to the south-west of Grosseto. If this water has not been too treated (this verification was not possible in the time available), it will be put into a constructed wetland from which it will pass into the San Rocco canal, where it will increase the low flow. From here it will also pass into the canal which leaves it to take water towards the south, including all channels connected to these. The San Rocco canal is actually an important waterway which runs along the plain between Grosseto and its coastal resorts. The road link between the two runs alongside, but there is no sign to indicate its importance or role. The project “eco-boulevard” will channel new waters into the old canal, planting the banks to continue the process of treating the waste water with a system of wetlands. Also included in the project is a tree-lined pathway and cycle lane – separated from the road – which shows the urban use of the rural connection. In this way, having tall trees running alongside, there is automatically a long signpost by which one can identify the canal, both in terms of panoramic measurement and as a reference point in the plain. The second project aims to collect water from the River Ombrone, during its periods of peak productivity, in suitable reservoirs situated in a bend in the river, to preserve it for times of drought. There would be a continual interchange between the two. The problem of evaporation of water in
the reservoirs and the energy necessary to regulate its movement is resolved following the example of a plant in Chicago. A raft frame supports photovoltaic solar panels, and the electrical control units and controls are set in small turrets on board.

5 | Conclusions

Many other cases could be referred, but the time request for this paper does not allow to talk on. I do hope that the method of integrated analysis and planning I have presented in these cases have been of interest. The problems being of a hydraulic nature, or regarding agriculture use or regarding produce from the soil or regarding landscape, are in these cases one and the same. An altered and malfunctioning hydraulic system; a system of residual cultivation; a system not worrying about what the future may bring; a system of exploiting resources ignorant of the context in which they are found; a misplaced system of signposting. These are all the same problem in the same place at the same time.

The method is complex, holistic and cannot be any other due to the widely diverse problems connected to the many aspects of anthropization and all natural elements. Recovering non-urbanized territory is one of the most urgent issues facing urban-land planners and architects, as well as all those experts in fields of study connected to the numerous problems in the matter of the survival and management of natural resources.
References

For the essential considerations on planning projects such as these, see of Susanna Magnelli:

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