



**Living Landscapes - Landscapes for living
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Veneto 2100: Living with Water

Enrico Anguillari
Università IUAV di Venezia
enrico.anguillari@gmail.com

What is the future of the Veneto region given the threats posed by rising sea levels, heavy rainfall, floods and drought? What will it look like in 2100? An interdisciplinary group formed by urban planners, anthropologists and visual designers, has imagined how three different territories might be transformed by a number of water threats and possibilities. Widening the riverbeds, establishing spatial corridors to buffer peaks of water flow, replenishing the groundwater through the use of new basins, storing water to counteract periods of drought, reactivating the natural relationship between the rivers and the sea, and accommodating the rising sea water levels are strategies that should work hand in hand with new processes of urbanization and development. In implementing such strategies, water becomes the starting point for rethinking, reshaping and restructuring the territories of the Veneto in an effort to design more resilient cities.

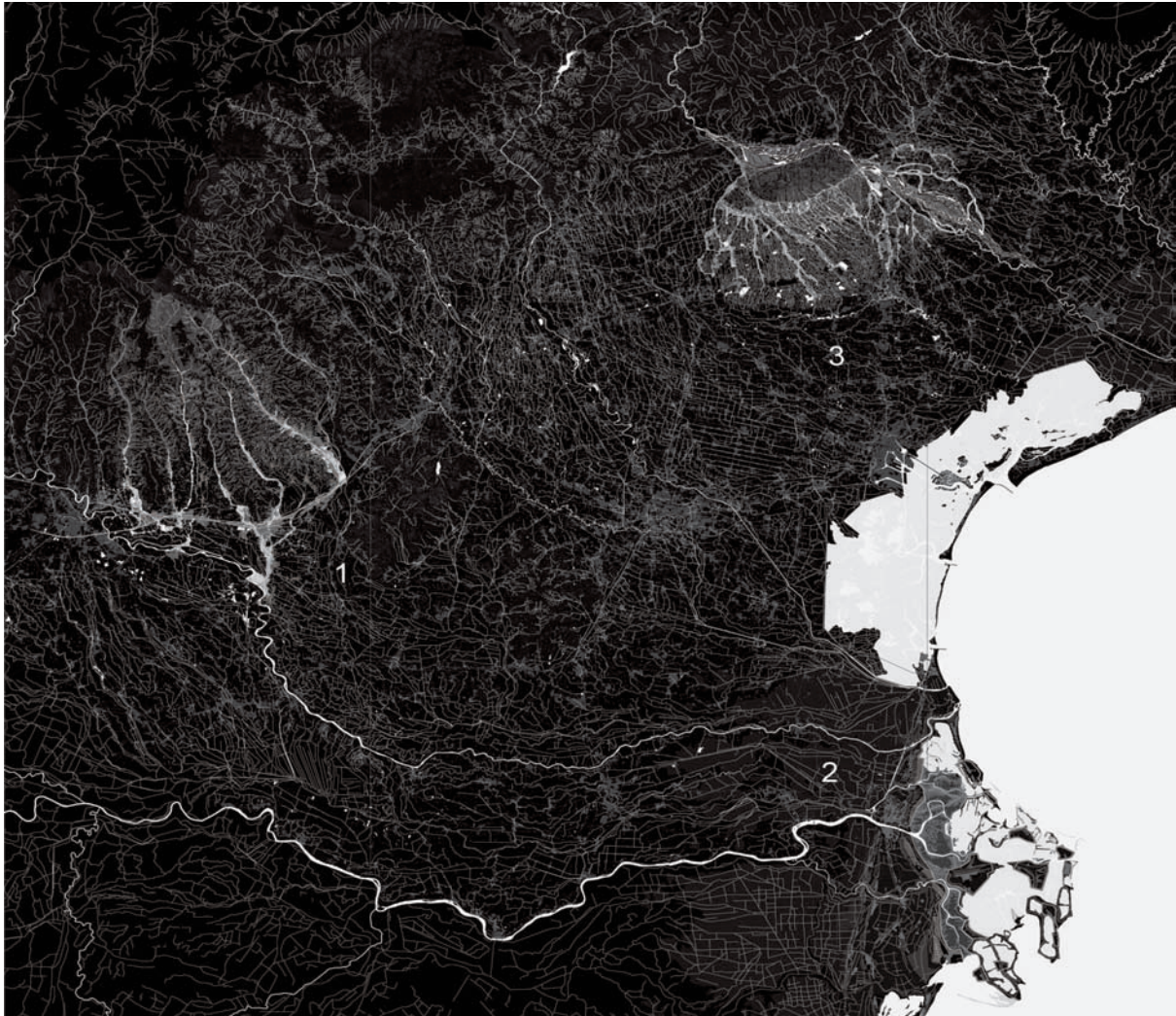


Figure 1 | Veneto 2100 – Living with water¹

1. What if The Monti Lessini Creeks would reestablish a close relation with the valleys, foothills and plains? The Monti Lessini creeks lie in a pattern comblike between Verona and Vicenza that is cut by a corridor of heavy infrastructure and dense construction formed by the A4 highway, the railway, industrial activity and settlements. The danger linked to the creeks is well known: the area's heavy rainfall and the steepness of its valleys make the creeks a constant threat, for they often overflow due to unmanageable amounts of rainwater and the eroded sediment this brings with it. The scenario proposed here suggests creating N–S buffers along the creeks that would make room both for the excess rainwater and for hosting basins, wetlands and woods, diversifying local agriculture and reorienting the urban growth along the valleys, across the E–W corridor thereby gently restructuring this large region into a recreational territory.
2. What if the Po delta would engage with the environmental threats? The shape of the Po Delta is the result of the Venetian Republic's diversion of the Po river in 1604. Today, the delta is a sort of sunken spoon with high borders toward the sea and a low central area caused by the more formal channeling of the branches of the Po River, poor sedimentation and a long period of subsidence. The western border of the delta is defined by a bundle of roads and settlements that lie on a higher sandy dune system running N–S, offering evidence of what the coastline looked like before the river's diversion. Considering that sea level is expected to rise by a metre by the year 2100, will it be sustainable to defend the Po Delta and keep it dry with increasingly higher dikes and enormous energy costs? The scenario proposed here let the seawater invade the delta until the sandy dunes, turning the latter into a backbone that runs from the Venetian lagoon down to Ravenna, and reactivates the natural river–sea relationship by using the



An unpredictable territory

While the global process of urbanization continues, global climate change results in more frequent and more intense flooding and drought. These two phenomena clash as urbanization continues, especially in former floodplains, near rivers and coastal areas, and water use is increasing.

The Veneto region in Italy is no exception, because of its high density and the high productivity of its water-sensitive landscape. Here, the impact of the environment is manifesting itself with increasingly worrying effects. Due to the dispersed character of its urbanization – *città diffusa*– urban patterns integrate diverse programs and water uses that result in widespread episodes of flooding, drought and pollution.

In the Veneto, heavy floods causing serious damage took place in 2006 and 2007. In 2010, between October 31st and November 1st, in an area of 140 square kilometers, 400 mm. of rain fell, more than four times the average seasonal seriously affecting 130 municipalities and a population of approximately 500,000 people. The balance of the damage included 2 deaths, 7,000 displaced people and 230,000 livestock dead or missing as well as the isolation for four days of the A4 highway and the subsequent blockage of goods shipped from throughout Europe (Figure 2).

Conversely, during the summer of 2012, as a result of low precipitation in the autumn and little snow fall during the winter, the Veneto faced a water deficit of nearly 35% below the seasonal average of the last 20 years. There was an approximate absence of 150 liters of water per square meter of land. On the one hand the drought aggravated the conditions of an agricultural economy already in trouble, on the other hand it resulted in a reduction of energy production from hydroelectric sources by 40% compared to the historical average for the period, generating a war of sorts over water between Enel and Coldiretti. The dramatic floods or the extreme droughts that led the regional government to declare the status of water crisis, are events that highlight the urgency of studying the relation between urbanization and water dysfunctions in one of the most productive Italian territories. On the one hand, here as elsewhere, the message of climate change is presented as a message of fear and uncertainty: Al Gore's (2006) 'Inconvenient Truth' presents the risk of big floods as a call for action. On the other hand, while all these issues are becoming increasingly urgent, the current planning systems seem to be inadequate to tackle these vulnerabilities (Secchi, Viganò, 2011).

Therefore, is there a role for designers in preparing our cities and landscapes for increased risks? In the 2005 Rotterdam Architecture Biennale, the leading theme was 'water' and moderator Adriaan Geuze gave it the title 'The Flood'. The leading idea was the role of designers in water control. Working with water was framed as fighting the enemy and the result as a victory of engineering. The 'water wolf', our enemy, should be tamed. In this view, fear generates the need for simple and safe solutions. It is dreaming of control, of being the master of nature. This attitude has a long tradition in the history of mankind and it was the dominant attitude of modernist design after the Second World War (Tjallingii, 2012).

In the last thirty years, since the publication of the Brundland report (WCED, 1987), however, many people have started to criticize this basic attitude. Several waves of environmental awareness have made it clear that besides the successes of a technocratic approach we have also seen many failures. Both the natural world and our society are far too complex to fit into a simple command and control scheme (Mostafavi et al., 2010).

sediment to construct a new, more resilient delta.

3. What if the Piave River would become a river again? The dry plains of the Piave River are under threat from an ever-increasing risk of flooding due to both the extended, dispersed urbanization of the last decades and the river's dramatic fluctuation during the rainy seasons. The agricultural activities of the area also depend upon the numerous diversions of the Piave, a river that is already at risk because of the exploitation upstream. The scenario proposed here considers giving the river more space and reducing water withdrawals from the other water systems. In 2100, the Piave River periodically expand over a wider portion of its alluvial dry plain. Sandbanks, marshlands, meadows and different flood dable areas offer a variety of conditions for living and other land uses in response of the rhythm of the river's flow. Dry forests colonize the areas of the dry plain that are not impacted by the dynamics of the river's flow. Peaks in the river's flow and the runoff coming from the region's urban sprawl are precious resources to be collected and to irrigate the few remaining agricultural fields.

What made the recent floods so damaging is the combined effects of human control in different parts of the valleys: deforestation, increasing paved surfaces and channelling streams. Will further control be the solution? Contained between higher dikes the floods will be higher and the rivers will flush more rapidly, creating higher peaks downstream. People behind ‘safe’ dikes will care less and yet be more vulnerable in case of unpredictable extreme events. The risk of such events will be higher due to the complexity of urbanised landscapes and the uncertainties of climate change (Figure 3). It is time to change the design attitude from control to interaction with both landscape and land users, maintenance and use of shared territorial resources. ‘Veneto 2100 - Living With Water’² – presented in 2012 at the 5th International Architecture Biennale of Rotterdam titled ‘Making City’ – is a further step on this research-by-design path that leads to realistic and resilient planning and design proposals.

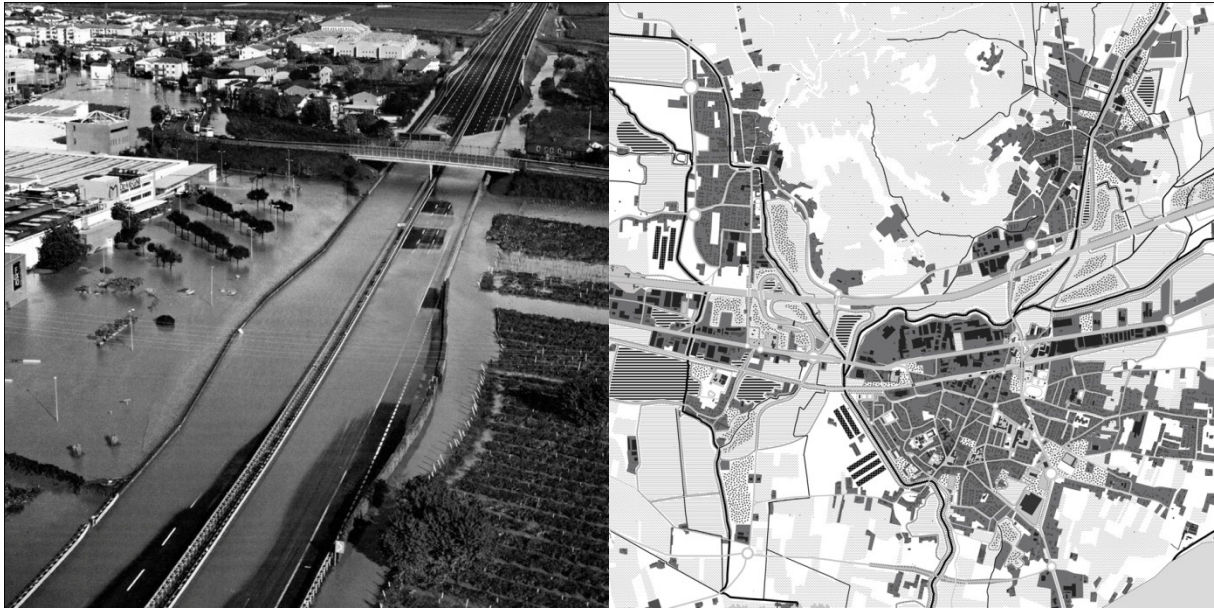


Figure 2 | Flooded A4 highway in Monteforte d'Alpone, 2nd of November 2010.

Figure 3 | Soave, Monteforte, San Bonifacio³.

Making a city

How do we make a city? And how do we deploy making a city in responding to pressing ecological and socio-economic issues? With these questions the ‘5th IABR’ called on everyone involved, public officials, policy makers, politicians, designers and citizens. Our future is the future of our cities, so let us actively reconsider the future of cities by joining together to develop new ways of citymaking. ‘Making City’ started from the proposition that the current circumstances, made even more pressing by the financial crisis, provide the opportunity to give the process of city making a new impetus with a multidisciplinary and proactive approach.

2 Veneto 2100 – Living with water is a research by: Enrico Anguillari (urban design), Valentina Bonifacio (antropology), Latitude Platform (coordinator / urban design), Studio Iknoki / Unità di Crisi (visual design).

3 Today the heavy infrastructure bundle that divide Soave and Monteforte from San Bonifacio, cutting the Tramigna and the Alpone creeks is a priority for preventing the risk of flooding. But this can also become a chance to rethink the crossing and the connection between the N and S sides of the dense corridor. Facilities and new basins for pick storage and irrigation, as well as the ones for the compensation of the industrial areas are some of the key actions that can be pursued to realize fluid passages for water and people. Another strategic project is the diversion of both the Tramigna and the Chiampo creeks. Thanks to that, the critical point where the Chiampo joins the Alpone close to Monteforte – which is where the dyke broke down in 2010 – can be alleviated by rerouting a considerable amount of water below San Bonifacio and meeting the Alpone downstream, after the dense settlements.

aches which link new planning strategies to new alliances rooted in specific knowledge and local conditions. 'Making city' is therefore working on the world after the crisis, a world that will look different from the world as we know it (Brugmans, Petersen, 2012).

The announcement of the Biennale was therefore aimed at research and spatially/politically innovative projects, which focused on relations between management policies, planning tools, and the design of cities and territory. Within this context, proposing a research project based on the water systems of the Veneto makes sense as a reflection on the concept of territorial-collective infrastructure, in particular on water as main support and theme that can help in constructing a renewed interpretation and a project for the contemporary city. Following water, as well as other fundamental infrastructural layers, not only forces us to consider the overall functioning of the territory and the dynamics with which, by ridges, it invests the valleys, plains and lagoons; not only obliges us to cross places and parts too often excluded from our reflection (agricultural areas and reclaimed lands, systems of irrigations and drainage, marginal areas, wetlands, marshlands, sandy banks, gravel pits, dikes, meadows, lagoons, woods...), but also builds up a different point of view about the traditional themes of urban planning and design: settlements, productive systems, the forms of welfare.

Working with the theme of water also allows one to call to light the ambivalent nature of the area and its facilities. It is a 'common resource' but also a 'common hazard', and the territorial project cannot disregard the governing of the same. In this way as merely crossing a complex and minute amount of the materials and the signs that have given depth to the palimpsest of the Veneto's topography is it possible to highlight how this territory is first of all a deposit of thousands years of planning and governing water, to recognise the individual and collective responsibility that, day after day, creates conditions of greater risk.

It is necessary to read how the social, political and economic dynamics in this land have brought diffuse wealth, but have also increased the exposure to collective risk. By conceiving both territory and risk as 'commons', different ways of transforming the territory can be devised, at the same time carefully preserving existing resources while constructing a new kind of landscape (Figure 4; 5).

To focus on the nature of these conflicts and to investigate the social dynamics, we worked together with anthropologists and communication designers⁴. In fact the two disciplines find a common point in 'how the territory is perceived by those who live in it' and they can support one another through the use of instruments and direct methods to listen to, to understand, and to represent the ways in which a community describes itself and tells its story. While the anthropologist is inclined to listen, trying not to insert his own interpretive categories but trying to establish a close and intimate relationship with his subject, the communication designer is intended as a specialist in bringing forth information and re-proposing it: that is, identifying the most appropriate tools or 'communicative artefacts' to return, for example, to the geography of the actors, the plot of powers, to generate a critical discourse in the same territory, to discuss and exchange information (Bonifacio, Bonini Lessing, 2012). The different relations with water disclose specific urban, spatial and social issues that become fundamental when we aim at designing, planning or simply dealing with the city making process.

4 The most substantial phases of field analysis took place during two didactic activities conducted by the research group at the IUAV in Venice. Specifically, during the Erasmus IP Program on the Po Delta 2011, coordinated by Maria Clara Tosi, and during the fall-winter semester 2011 at European Postgraduate Master in Urbanism, led by Paola Viganò. The results are published respectively in: E. Anguillari et al. (eds), 2012 and in: E. Giannotti, P. Viganò (eds), 2012.

Idioms and actors - perceived problems

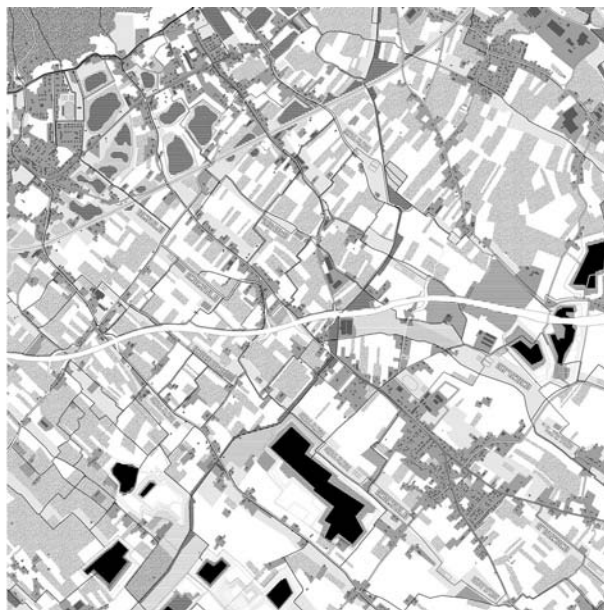
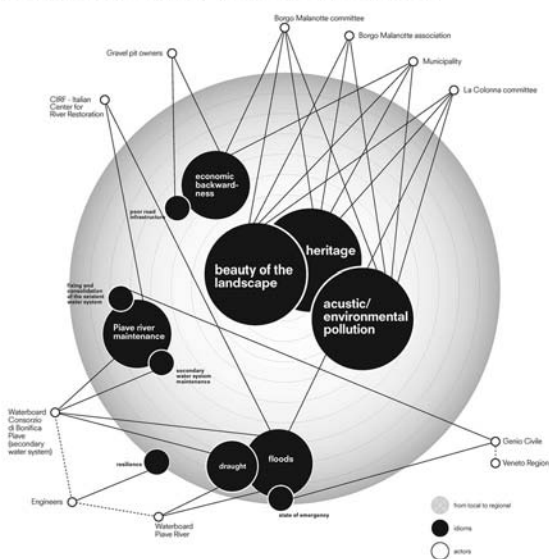


Figure 4 | Idioms and actors, perceived problems.

Figure 5 | Inhabited Dry Woodland.⁵

Think about your future!

For the Unesco-IHE Institute for Water Education, societies are vulnerable to floods due to three main factors: exposure, susceptibility and resilience. That is the extent to which a system, a territory, a population that is exposed as susceptible to an event and its ability (or inability) to cope or, more precisely, to adapt to that event. Is expressed by the formula: $Vulnerability = Exposure + Susceptibility - Resilience$ (Balica et al., 2012).

Today, most of the vulnerability studies which investigate areas with high flood risks focus only on some of the aspects that characterize vulnerability and propose a very sectoral (technical) analysis of the territories and their urbanity. Following the Unesco-IHE definition we can notice that many flood vulnerability studies that investigate specific territories lack of a deep understanding of susceptibility, especially concerning the relation between civil society/local institutions (their perception of vulnerability) – territory (measurable vulnerability) – policies (prevention/intervention).

This is because the susceptibility is an intrinsic condition of the territory that describes its ability to absorb the risk. It is a condition that exists independently of the occurrence or nonoccurrence of an event. It therefore has a direct correspondence with the propensity to perceive the problem from the population and local institutions.

By studying susceptibility this work aims to offer design scenarios that oblige us to rethink the relationship between politics and urban design, considering the specific social, environmental, institutional qualities as a fundamental layer for design and prevention.

5 In 2100 the dry plain at the foothills of Montello appears as an extended inhabited dry woodland perforated by urbanized patterns, water storage basins, the new Pedemontana motorway and a series of parallel strips running NW-SE. Due to the reduction in the precipitation patterns and the closing of water intakes from the Piave River, agriculture retreats to leave space to dry woods and dry meadows. Rainwater is a precious resource to store. The elements of the former irrigation system are renewed to perform as drainage canals which deliver rainwater in basins designed to store water. Along these drainage lines new settlements, facilities and passageways are inserted. The dismissed railway crossing the plain becomes a new West-East backbone that supports the slow fruition of the landscape. South warding, patches of agriculture become more extended since they are supplied by the water stored upstream.



The investigation aims at constructing a new set of planning tools, using case studies in the Veneto region. In doing so, it underlines the importance of local stakeholders and the social aspects that influence the region's vulnerability.

The three case studies were chosen because they paradigmatically pertain to the relationship between hydrological vulnerability and perception of the problem by the local population.

At one extreme, the land between the Lessini and the plain of the River Adige (between Verona and Vicenza), represents the loss of the historic relations between the settlements and of economies with rivers. Monteforte d'Alpone was one of the areas hit hardest by the flood of 2010. For years, the problem has been underestimated by the institutions, gradually weakening the perception of risk by the local population. At the other extreme is the case of the territory of the Po delta (between Rovigo and Ferrara), wherein the apparent fragility of an area that is almost entirely below sea level means that the local society lives with the efforts needed to counter the risks to which they are exposed.

Between these two examples lies the case of the high plains of the Piave, also known as "dry plains", which stretch between the towns of Montebelluna, Treviso and Castelfranco. Here there is some awareness of plumbing problems arising from the river Piave and the secondary hydraulic network, but at the same time there appears to be very clear conflicts between different socio-economic actors in the management of these problems.

Given the increasing frequency of extreme events to which the territory is subjected to the base of the construction of the scenarios is implicitly the question: what would happen if by 2100 the Veneto became a more resilient territory? The proposed study seeks to imagine an area that is able to absorb the pressure and adapt to change (Figure 6; 7).

Until today, monumental water works have gone along with the obsessive reiteration of small scale changes, all justified by the hunger for economic growth. Unfortunately, most of these operations were grounded on the logic of resistance rather than on that of resilience. While craving growth, the primary importance of growing within the environment, together with its basic mechanisms, has been forgotten.

Therefore the path towards resilience asks for a radical shift in designing the future and in the setting up a system of infrastructure needed to make possible the practices of a present and future society. In this sense, the way towards a resilient Veneto cannot be just a matter for technicians and politicians. It is much more a cultural evolution. The careful understanding of our present system's dysfunctions is crucial as is the awareness about possible trends that will press the future of the region and its local landscapes. What are the goals in the short and long run? How should the ecosystems perform? What are the challenges they will have to face? What are the opportunities?

In a region where preservation is the mainstream, the logic of resilience would inevitably crash on the cultural inertia of its inhabitants. For this reason, building a resilient Veneto requires the direct participation of its inhabitants, the sound collaborations of the activities and practices carried out in the territory.

The willingness to change of Veneto can be realized by implementing the existing carrying structures and injecting resilient devices among the landscape patterns. A whole resilient picture built through the spreading of strategic spatial elements for resilience. Rain gardens, floodable areas, storage basins, meadows, floodplains etc. can actually find space in the territory and be integrated in the social and economic structure. The importance of these explorations lies more in the force of some projections and in the effort of representing how the future might be if they would actually be realized rather than in the ultimate precision of the data. The process of observing, listening, understanding, synthesizing and representing through an interdisciplinary understanding is the real backbone of these design experiments. The results aim at provoking a reaction, stimulating a debate, reflecting on possible solutions, refining ideas. In this sense the scenario is a media and not a product; its value is to trace a line, not to build a street.

The year 2100 represents a horizon sufficiently long enough to strengthen the argument, elaborating proposals which are at times drastic with radical images. This is because the scenarios, as they have been understood in this work, do not necessarily wish to propose a desirable future and are not the restitution of a

territorial project or, as with the modern city, the ‘design of a Design’ (Ascher, 2001)⁶, but aim to bring to the extreme consequences the initial hypotheses and then, eventually, revise objectives and tools. Compared to a plan or to a project, the scenario is based on guidelines more reflective and adaptable to an uncertain future, articulations a constant and diversified “coming and going”, the long-term and short-term, large-scale and small, the general interests and special ones.

In this sense ‘Living With Water’ is both a question and a response, how do we live with water? Shouldn’t we learn how to co-exist with flood vulnerability, developing a more flexible and comprehensive way of living/urban model? (Latitude, 2011)

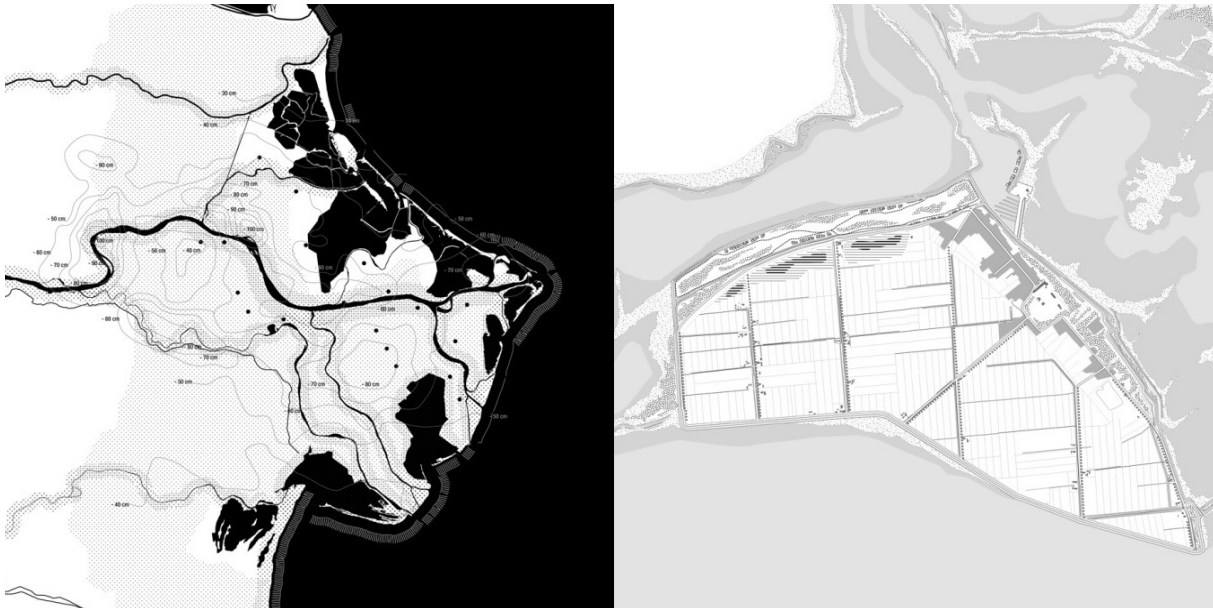


Figure 6 | Environmental pressures.⁷

Figure 7 | Islands.⁸

6 Elle est dessin d’un dessin is a play on words based on the subtle nuance that distinguishes the meaning of “dessin” (design, composition) and that of “dessein” (intention, purpose, design). Translator’s Note (N.d.t.) edition Italian of F. Ascher, *Les Nouveaux principes de l’urbanisme*, Editions de l’Aubre, 2001. it. ed. *I nuovi principi dell’urbanistica*, Naples: Tullio Pintori editore, 2005, 29.

7 Environmental pressures including: water pollution, eutrophication, hydraulic risks, increased salt wedge levels, salinization of soils and water shortages. Due to a decrease in the rivers water flow and upstream sediment trapping, the Po river delta is undergoing a progressive erosion of its coastlines. Due to the methane gas extraction, the Po delta faces significant land subsidence and salinization. Because of that and the estimated sea level rising a large part of the Po delta territory runs risk of flooding.

8 The village of Boccasette becomes an island maintaining part of the of the reclamation landscape. New constructions are disposed along the dykes on a dry riverbed. A harbor reserve the connection within the lagoons and a complex system of low islands emerged by the fish farms shallow water.

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