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Rita Vianello

Global Climate Changes in Venice Lagoon. The Phenomenon of “acqua alta” and the Perception of the Safeguards Works

Introduction

Climate changes consequent to the Anthropocene are affecting ecosystems across the planet. As Bruno Latour explains, we are entering a new period of the geological and human history: air, soil, glaciers, oceans and climate, that we have made “unstable”, interact with us. Our “disturbance” actions have brought consequences throughout the planet (Latour 2015). While Latour insists on man’s part in this, Jason Moore distinguishes between most and less industrialized peoples. The bad ecological practices are enacted above all by capitalist societies and they cannot be attributed to the whole human species (Moore 2015). Facing this situation, scientists are seeking how to mitigate the worst impacts, but there is still a dominant vision of breaking between nature and society, in which people are still seen as the masters of nature. In this respect Philippe Descola hopes to open the debate on the relations between man and environment to find solutions to the environmental problems of our day, since it is now necessary to overcome the nature/culture dichotomy (Descola 2003).

As the debate continues, the increasing temperatures of oceans caused by the introduction of greenhouse gas in the atmosphere, are leading to the rise of sea levels. As a result, it is estimated that in 2100 the global sea level will rise between 25 and 123 cm (Hinkel *et al.* 2014). IPCC Report foresees that in 2033 the rise of sea level will continue during the XXI century at a faster rate than observed from 1971 to 2010. It will rise in more than 95% of the ocean areas and about 70% of coastlines worldwide will experience a sea level change (Intergovernmental Panel on Climate Change 2014). The result will be that entire populations will have to migrate from their lands; it is estimated that 200 million people will become “climate refugees” (Myers 2014). The prevention of flooding in inhabited areas will therefore be necessary and will require expensive adaptation measures.

The effects of global warming and the rise of sea level are visible in the Venice lagoon. During the last few decades, the phenomenon called *acqua*

alta, “high water”, the Venetian expression for the high tide when it submerges the town, is increasingly frequent. First of all, in my article I will explain what the Lagoon of Venice represents from a physical and symbolic point of view. In the second part, the article will describe the long and tortuous process, started almost fifty years ago, of looking for solutions to defend the city from floods. After retracing the various events of the long process of interventions for the lagoon safeguard, I will speak about environmental consequences as well as the reaction and perception of the residents and of the economic groups involved.

Methodology

This research, in accordance with the ethnological methodology, has been based on the observation of places. A strategic role has been reserved to interviews with the inhabitants of the lagoon selected in a heterogeneous way between those favorable and those contrary to the safeguard interventions. Opponents to the mobile barriers project were chosen among the elderly, in order to record the complex process of actions against the high tide from 1966 to the present. Among the economic categories, the lagoon fishermen have most suffered the consequences of the morphological changes caused by the construction of mobile dams. For our choice, interviews were conducted without a predefined scheme. The testimonies have been collected from 2015 to today. Sometimes, during the research, the interviews were not recorded at the request of the informants because of the sensitivity of the topics dealt with.

Ethnographic research was supported by the study of bibliographic material available on the subject, especially the articles published in local journals and written material from environmental association and groups of opponents. This particular subject needed, in addition to the anthropological bibliography, a multidisciplinary approach focused upon, developed by consulting also numerous books and articles of technical, scientific and economic topic.

*The Venice Lagoon**Friendly and enemy water*

The lagoon is a hybrid environment placed between the sea and the mainland. It can be considered a typical transition ecosystem, an unstable border between land and sea, between salt and fresh water. Over the centuries, the riptides generated by tidal flows and the contribution of the rivers, have shaped its morphology creating a wide network of canals, starting from the mouths of the harbour, then divided in secondary ramifications (the so-called *ghèbi*) with more and more reduced sections and more tortuous paths, like a venous system. We can see a specula image looking at the *bricole*, wood poles which mark the navigable routes. The lagoon is an environment where the “aquatic” is the real distinctive element: water covers 67% of the total area, 25% is occupied by *baréne*, sort of islands that are flooded only during the highest tides, and *vèlme*, mud flats, areas that emerge only during low tides, while the built-up area is only 8% (Ghetti 1990: 13). Inside this last area there is Venice, a town composed by 118 islands divided by 177 canals and connected by 354 bridges. The Lagoon of Venice is instable and its actual look is the result of the work of men: for example, the diversion of the rivers since the XIV century, the construction of dams in port entrances in the XIX century, the excavation of news canals in the XX century like the Canale dei Petroli. The problem of natural soil subsidence, to which Venice is subjected, was increased by the pumping out from the ground water table for industrial purposes, while eustasy (the rise of sea level) is related to global climatic changes due to the increase of greenhouse gases in the atmosphere. The forecasting centre and the reports of city tides have estimated the total loss of elevation of 26 cm from 1897, the year of the definition of zero of elevation: +12 cm of subsidence and +14 cm of sea level rise. The result is that between 1926 and 1965 the tides over +110 cm had been 21, but since 1966 they have been 191 (Pavanini 2015). For a city built on water, all this means, first of all, a modified relationship between the residents and the water. The increased frequency and size of *acqua alta*, so more and more often present in the fall and winter months, has the effect to flood Venice, Chioggia and other lagoon towns¹. The most major event happened on November 4th, 1966 when the tide reached a height of 1.94 meters above average sea level, marking an all-time high². Venice, Chioggia and the other lagoon towns were submerged under the tidal wave for two days and, for the inhabitants it became the *Acqua Granda*, the Big Water, the expression to remember the big flood.

Unlike the sea, the Lagoon is a space dominated by the changing tides, and for centuries anthropized by means of fishing equipment and *bricole*, many of which are home of votive *capitelli*, reachable only by boat, the main tool of interaction between inhabitants and territory.

The symbolic boundaries of the Lagoon are the same as set by nature and are identified by the inhabitants with the *gronda lagunare*, the border between the lagoon and the mainland, that separate the Lagoon from the mainland and with the line of beaches that separate it from the sea. As reported by the Venetian geographer Letizia Cavallo, the Lagoon is characterized by an essential aquatic and insular life style and implies a very close relationship with the water as a source of direct support, as well as in the past, of power and prosperity for the community (Cavallo 2015). All this has made the Lagoon the privileged space of the daily practices for the local population. The deep domestication of the territory emerges especially among fishermen who compare the lagoon area to a rich “country”, where there is always something to catch and where it’s easy to move around. According to what the fishermen explain, the lagoon is like the country is for the farmers, a safe place, protected and well-known where you cannot lose your way and for which you know every nook and cranny visible or invisible because submerged. It is a relationship that the Venetian geographer Gabriele Zanetto, define as

an ancestral connection [with a] watched space with the same love and care that a farmer subjects to his camp [...] the consideration of the lagoon as a closed place, lived in direct contact, immediately productive. This consideration leads us to a survival skill and detailed knowledge, made of odors and colors that make someone able to move, orient but mostly to feel radically integrated, confused, solidarity, with the place in which he lives (Zanetto 1992: 74).

This is the “friendly water”, bringing nourishment and safety because in the lagoon a good sailer will never wreck. It is an anthropological place opposed to sea, symbolically perceived by the population as a space of otherness. It is worth mentioning that the city of Venice, in the course of its long history, has never had the need to equip themselves with defensive walls. It was the same lagoon, wrapping Venice with its water, which defended and protected the city from all enemy raids. Similar to what happens on the mainland, within the natural boundaries of the Lagoon there were, and persist

even today, the customary internal limits designed to preserve their resource exploitation areas from those of the neighbors and to prevent conflicts (Vianello 2004). The lagoon is a territory whose inhabitants have always exploited the rich resources and on which advance the rights. We can also define it as an economic area, even though today the water spaces are “folklorized” in order to increase a tourist imaginary trivialized and that water is stripped of the environmental and social components that make it one of non-exportable lifestyle. The anthropologist Mondardini Morelli gives a first interpretation of the Lagoon as an anthropological place opposed to the sea. An opposition which emerges in ritual practices of sacralisation and control of space, culminating in the Venetian ceremony of the Marriage with the Sea, a ceremony which originally symbolized the political domination of the city on the Adriatic Sea. Explains Mondardini Morelli, citing Cosgrove, that in the performance of this ancient Venetian ceremony «are not the waters of the lagoon to receive the blessing, the wedding takes place in the open sea [...]. The same waters of the Lagoon did not require any control ritual, which constituted a secure element, known» (Mondardini Morelli 1998: 11). The propitiatory aspect also emerges in the words of the praying «for us and for all the sailors might the sea be calm and quiet». At the end of the rite, holy water is poured into the sea in the port of San Nicolò³.

The Lagoon area did not require any risk ritual exorcism because it was historically experienced by the inhabitants as a protected territory and full of acquaintances. By contrast, the sea is the space where the opposition life/death is more vanished, and where, consequently, we will meet many types of ritual for exorcism risk in seafaring and fishing communities in general. The sea water is potentially hostile and dangerous; it is water that can become an “enemy”. In addition to the ceremony of the Marriage with the Sea, to further support this interpretation, we can consider also the feast of St. Dominic held in Chioggia on August 2nd of each year. Chioggia is a typical town specialized on sea fishing. Because of the practice of sea fishing, Chioggia has a sad history of frequent shipwrecks up to fifty years ago when it was still usual to go out for fishing trips with traditional wooden boats: the *bragozzi*. The most important moment of the celebration is also in this case represented by a blessing of the sea. This ritual is not dedicated to ships, fishermen or nets, but it is the sea the unpredictable entities that must be tamed (Vianello 2013). Therefore for fishermen the opposition is not between water and land, but between sea and lagoon. The perception of the sea as a dangerous and foreign

element is revealed also by the spatial arrangement of the houses. For example, in the island of Pellistrina, which separates the Lagoon from the sea, we can observe that all the old houses have their entrance turned on the lagoon side. This is the side of the island where the fishing boats are moored, where public life takes place, where you can walk, repair nets and grill fish, or you can sit on the doorstep to chat while women create their laces. The side facing the sea only shows the back of the traditional houses where there are few windows and runs the only paved road. Finally there is a water that is at the same time friend and enemy: the *acqua alta*. As explain the fisherman Antonio, the “high water” is a blessing when occasionally comes, because with its action purifies the city from frith and prevents illnesses⁴. But the same water becomes an enemy when takes its destructive dimension as it did in 1966. So it becomes a destructive and malevolent force, a force that scares and that must be dammed: the sea should not enter.

*The sea should not enter: the “watershed”
on water perception*

For the reasons already seen, the inhabited lagoon centers are subjected to more frequent and intense periodic floods, which flood the oldest and lowest places of the historical centers. The discomfort caused by the phenomenon affects many aspects of daily life of the inhabitants and economic activities, and causes the deterioration of the architectural heritage and environmental and natural decay. Because of the above-mentioned phenomena, in the future the phenomenon of high waters could worsen and expose Venice and its lagoon to new extreme events such as of November 4th, 1966. We can consider the November 4th, 1966 a “watershed” between the high tide perceptions held by residents before and after the flood, a date that has brought with it the awareness of the danger, and the sea an entity no longer challenged only by fishermen and sailors, but that can get to exert its destructive power even within the sheltered and domestic lagoon. In that moment people began to consider the possibility of submitting the lagoon to protective structures. Beginning from this date, also the definition of “environment” undergoes a transformation; the word is not related to the meaning of simple place, separate from the physical space of the living world, but assumes the modern connotation of «place of relationships among physical, chemical and biological processes in which there is the life of organisms» (Treccani 2015). With this new awareness, in Venice, in the early 70s, the first

Assessorato all'Ambiente (Municipal Department of Environment) of Italy was created. What isn't still clear in 1967 (the first years after the *Acqua Granda*, the big flood of November 4th 1966) is the problem of global warming and sea level rise that was not included among the factors that lead to the exceptional flood, so the only action taken was to stop pumping from the aquifer responsible for subsidence of the town soil (Pavanini 2015: 4). The date of November 4th, 1966 also marks the progressive increase of the exodus of the inhabitants of the cities of the Lagoon to the mainland, to the cities of Mestre and Marghera, attracted in considerable number not only by the employment opportunities offered by the industrial center, but also by modern, healthy and safe housing. In fact, after the flood, a lot of houses on the ground floors in the historic center and in major islands were abandoned because they had become uninhabitable or because judged unhealthy and at risk.

The long road to the protection of the lagoon

Following the exceptional flood of 1966, long legislative and technical procedures have been processed to create a good system of defense from the sea.

We can consider as a first step in this process the Contest of Ideas for Defense Works from the High Tide in Venice Lagoon proclaimed in 1970 by the Venice Consiglio Nazionale delle Ricerche (National Research Council) when researchers began to think about the possibility of closing the mouths of the harbour. In 1973 first Special Law for Venice (Law no. 171/1973) declared the preservation of town «of national importance» (Amadori *et al.* 2014). In 1975 the Italian Government announced a new project competition, but none of the five projects presented was considered satisfactory; the projects presented were among the most varied and ranged from dams by means of “ship-door”, to inflatable rubber dams, floodgates to other different systems, sometimes similar to the project under construction. Despite this, the Government decided to acquire all the projects to study them and obtain a very good final project. From here a new long procedure began and on May 1985 the planning and construction work has given in «unitary concession» to the Consorzio Venezia Nuova, CVN abbreviated from now on. After few years, in 1989 the CVN presented a preliminary project called REA, Riequilibrio e Ambiente (Rebalancing and Environment), which involved the construction of a series of movable gates within the inlets to be raised in case of high tide: after a period of 23 years from *Acqua Granda* was born the Mo.S.E.,

Experimental Electromechanical Module. At that time, the end of the work was expected in 1995 and to cost around 1.3 billion of actual Euros⁵.

The opinions about the project were again conflicting and the Environmental Impact Assessment was never approved; on March 15th 2001 the Consiglio dei Ministri (Council of Ministers), President Giuliano Amato, asked a further study about restoring natural hydro dynamism before the implementation work. In opposition to the State institutions, once again the CVN considered as satisfactory the insights presented and approved the MoSE project. On May 2003 the first stone was laid.

But what is the MoSE? The MoSE is a great work of hydraulic engineering to protect the entire lagoon ecosystem from flooding. As illustrated by the CVN, it consists of a system of 78 mobile dams that allow dividing the Lagoon from sea in case of high tide. The mobile dams are divided into 4 groups: 21 in the north and 20 in south Lido, 19 at Malamocco and 18 in Chioggia ports.

The dams will normally be filled with water and place on the seabed (therefore completely invisible) inside cement caissons. During high tide, compressed air will feed in the dams to flush water until they emerge, blocking the entrance of the port and the incoming tidal flow⁶.

It is important to remember that MoSE project is not an isolated work, but it is part of some good and appreciated interventions by habitants and environmental associations that the State has financed to safeguard the lagoon and for habitats recovering: for example salt marshes and shallow waters, the securing of landfills and the channels of the industrial area of Porto Marghera, the reinforcement of the beach to protect from storms. It is the most impressive defence, recovery and regeneration program of the environment that Italy has ever implemented and it represents an important step and example of territory protection (Quaderni del CVN 2010).

The on-going process for the realization of MoSE has involved a very big number of public and private institutions⁷. This big multiplicity of operators has created a situation of poor scientific, but also political, transparency where nobody seems to have real responsibilities. The fractionation of skills has made it difficult to attribute responsibility in cases of damage, design errors, works poorly executed or delays. As a result it becomes difficult to understand who should accordingly take action. In fact, even today we do not know who will manage the closure of mobile dams, opening up a conflict of difficult resolution. Into this process the great absents are the inhabitants, excluded from any decision and without an adequate information campaign. Despite the various negative opinions

obtained by environmental associations, economic categories and a lot of habitants, the CVN saw no need to develop a communication and discussion process (see *Conclusion*)⁸. Into the contest of conflict of competences, poor transparency and low communication the only thing that habitants seem to know very well is the cost of MoSE that was estimated in 1989 at 3.2 trillion Lire (1.6 thousand millions Euro), while today it has risen to almost six billion euro. Unfortunately, from the big costs and the monopoly of CVN have derived the sad events related to judicial corruption⁹.

In 2003 the term of the work was planned for 2012, but at today the end of the works has been postponed to 2018, but probably to 2024 (Dianese 2017).

Mo.S.E. and fishermen

Interventions in the Lagoon environment related to construction of MoSE have involved one of the local trades most in contact with the lagoon: the fishermen, who are the first to notice any slight changes in the Lagoon. In the Lagoon of Venice, most of the local knowledge passed down from father to son for centuries is no longer useful for the geomorphological changes and are abandoned. According to the fishermen interviewed, the works that would have created the worst consequences in the lagoon ecosystem consequences are those started on the inlets for the installation of mobile gates. The reduction of the three gates has compressed the water flow which thereby enters and exits, on the basis of tidal cycles, with greater force. The fishermen, regular observers of every single phenomenon involving the lagoon, have repeatedly denounced the changes in the movement of currents, which would have disappeared from some areas where previously were present, to introduce themselves forcefully in areas where have never existed, distorting the mental map of the places owned. The interviewed fishermen tell that the usual fishing grounds have been abandoned and replaced, whenever possible, with other entirely new. In addition, in the lagoon of Venice they have been created among the fishermen of preferential access to the territory, which involve a common subdivision of the waters into which to fish. Generally, the fishermen of the southern lagoon do not go fishing in the central and northern parts and vice versa. This practice avoids conflicts with other lagoon fishermen. The customary division of space makes it even harder to find new places where to fish (Vianello 2004).

Even Chioggia's sea fishermen have difficulty because of the construction work. Roberto Penso, a fisherman in Chioggia, denies that «on the mat-

ter of Mose no one has asked the opinion to us, the fishermen, who live the problems of the sea and the lagoon every day». Sea fishermen are struggling with the new breakwater dams, especially with bad weather, in carrying out the maneuvers to return to the harbor. In the area of the harbor mouths, fishermen encounter many dangerous heavy boulders up to 10 quintals, residues of stone loads from Croatia brought to build largest barrier of stone (Belloni 2016)¹⁰. Finally, when the dams will lift the fishing boats will not be able to return from the sea to the lagoon. Ports-refuge have been provided, but fishermen consider them unsafe¹¹.

This survey carried out by the fishermen, was partly confirmed by the engineers of the CVN interviewed during the research. They explain, not without accentuated derision against the fishermen and their knowledge of current (once again we see the dichotomy between technical and local knowledge thought), which were provided for both the change of the input speed of water and the resulting changes in its distribution within the lagoon basin, but not with certainty all of the paths that the water would have chosen¹². The environmental impact of the work to protect Venice from high tides was also noticed by non-professional fishermen who expose the changeovers hydrodynamic. One of these fishermen, Antonio, who loves scuba diving, said angrily that all the inhabitants of the seabed are gone. Antonio explains during an interview in 2015 that:

They have changed the currents, they have already changed all the seabed. You cannot fish. The flora and fauna that live on the seabed, these depths that were inhabited by lobsters, sea bass, pores crabs, *peòci* [mussels], they have all disappeared. And they were coming back [after problems with algae in early 2000], and now they are all gone. They threw stones, changing currents. The current is much stronger [...] They have reduced the breakwaters and the current is not spread, is directed like a highway and then destroyed the seabed, digging holes.

A colleague adds that, while diving, he noticed a strange powder, according to him a kind of special underwater cement, which kills everything it meets. The current of the incoming tide has spread it to hundreds of meters, also inside the lagoon areas, turning into desert what once was similar to a meadow. Graziano Bognolo, fisherman of the island of Giudecca, adds that there are also many more algae both in the lagoon and in the sea where they are transported by strong currents up to 6 miles and water has become more turbid (Belloni 2016).

But not only fishermen of breakwaters de-

nounce as nefarious interventions operated by the MoSE engineers. Even the fishermen of clams are up in arms against the Magistrato alle Acque (Venice Water Office), by which depend the concessions for lagoon fishing and the protection of the Lagoon. Seventy fishing-cooperatives in October 2012 have claimed compensation for multi-million euro in damages and wrote a complaint to the European Union and Procura della Repubblica (Public Prosecutor Office) for the repeated deaths of clams that have suffered in recent years because of works for the Mose (La Nuova Venezia 2012). According to consortiums and cooperatives of Chioggia and Pellestrina clam gatherers who joined to the complaint, the clams have been poisoned by near works of excavation related to MoSE. The Water Authorities have denied involvement in work in progress at the inlets and accused the increase of the water temperature and the resulting anoxia. The battle looks long and difficult, and two years before, in 2010, a cooperative of Sottomarina (a village near Chioggia) had reported a strange death of clams and the presence of contaminated water and full of sediments in the close areas subject to interventions by the CVN. Other fishermen again, this time the ones specialized in the spring fishing of cuttlefish in the inlets, explain that since the inputs are restricted they cannot position the nets because the strong current rips. They therefore had to resign themselves to move the net in the sea, and to abandon what was a traditional seasonal fishing technique. The fishermen and shellfish farmers talk about conspiracy and complain that the project was really an excuse to steal public money, because they say during the meetings: «under water only fishes feel well!». According to the interpretation of the anthropologist Dalla Bernardina, the perception of an altered balance as a punishment consequent to its profanation seems to be a feeling common to many western societies, both seafood that peasant, as also in the Christian culture, that influenced over the centuries the formation of European thought (Dalla Bernardina 2010: 70). A vision shared by Mary Douglas who in *Risk and Blame* interprets the defensive reactions of modern men facing the dangers and natural catastrophes such as the search of someone/something to blame, not unlike from the non-industrialized societies (Douglas 1996).

An interpretation very adapt to our object of study where fishermen denounce a moribund lagoon and residents fear an uncertain future and devoid of the usual cultural, emotional and landscaping references.

There is today a sort of ideological battle where everyone says that defences are necessary, but there isn't any according about what interventions to do and what alternative project is better. It is a battle where two kinds of knowledge are in conflict: local knowledge and scientific knowledge, or rather its application in engineering key. Palsson explains that nowadays scientists present themselves as analysts of material word, unaffected by any ethical consideration. This implies a radical distinction between laypersons and experts (Palsson 2010). According to Tsing when these scientific experts create models of analysis on a global scale, the local dimension disappears (Tsing 2005).

It is a vision that in Venice has been taken over and that led to a top-down approach, depriving the inhabitants and economic categories of forms of negotiation and sometimes antagonistic to the traditional activities. But what are the objections raised by the inhabitants? What are the mechanisms that lead them to consider the opposite of what it is asserted in the technical and experienced, now commonly perceived as truthful and certain knowledge (Gallino 2007)? The environmental and territorial conflicts around the MoSE have led to the formation of various social movements and spontaneous committees of citizens organized into real movement forms of opposition and protest. We can define these movements as «networks of informal usually relations based on shared beliefs and collective strategic actions oriented to the transformation of the institutional structures of a given society. Social movements arise from the mobilization of specific categories of subjects of conflicting issues and public interest and solicit the testing of alternative solutions hegemonic social order» (Rossi, Koensler 2012: 4). As Palsson affirms, environmentalists have the responsibility to meet members of other species, to follow the inhabitants of the animal kingdom and the ecosystem of the globe. The risk is otherwise to fetishize nature, thereby setting it apart from the word of humans (Palsson 2010: 70).

In Venice one of the most active citizens groups facing the promoting institutions is the movement of the No Mose¹³. The different movements in Venice are conceived as a delicate system, complex and valuable, whose management logic should meet the principles of precaution and reversibility, in particular a capillary maintenance widespread than not resilient engineering logic (Cavallo 2015). But all citizens contest the costs. They say that the MoSE costs much higher than other projects proposed and of the systems with which other countries have faced the problem of flood as like the surge barriers

on the river Thames to protect London from tidal surge and the Delta Works to protect Netherland from the North Sea¹⁴. But these barriers and dams systems have a very big impact on the landscape. Another point very contested is that, given the complexity of the project and the CVN monopoly lasted for about 30 years, it will be difficult in the future to find different managers to dealer it¹⁵. A problem that is linked to the issue of maintenance costs that are expected as a very large is a defect that in 1990 the Consiglio Superiore dei Lavori Pubblici (Superior Council of Public Works) had already reported (see point 3): the expected maintenance work is estimated between 12 and 80 million of euros per years (Pietrobelli 2016). To this figure must be added the cost of one hundred and ten million euro for the construction of two special boats that will raise the gates and bring them in Arsenal for maintenance (one already made). To allow these large boats to be able to dock, it was necessary to build a wharf in cement under the Arsenal walls with a consequent landscape impact (Vitucci 2015).

Talking with informants, the long gestation of the work would be its biggest problem too: being designed about fifty years ago and carried on with a very long time, at its conclusion is obsolete. Some Venetian experts on landscape underline a fundamental defect in the dichotomy of thought possessed by the engineers and the rest of the people: the engineers of MoSE proceeded on the assumption that it is the environment that must adapt to the work and not vice versa¹⁶. It's a rigid and outdated vision, but in Venice it was deliberately carried out.

A further criticism concerns the very long lead time, partly also caused by conflicts between the parties involved and whose consent is often obtained through corruption of influential persons institutionally. Consequently, there would be no certainty of judgment, the opinions being bribed opinions. Despite the situation of conflict, any policy action was taken in favor of the inhabitants, as for example in the lagoon fishing industry, which is in crisis for many years: the older fishermen now retire and leave the craft, while young people choose to work elsewhere and abandon their places of origin. The result can be seen circling among the most peripheral of the lagoon that are being depopulated of their original inhabitants of the islands. In Burano and Pellestrina islands there are over than 100 homes for sale and locals are gradually replaced by temporary stays of tourists (Corriere del Veneto 2014). The lagoon landscape is thus gradually changing: the fishing net structures become rarer and mussel farms are in many cases abandoned. In many lagoon areas where once you could see the fishermen at work, now we see a landscape abandoned, where many

structures, such as sheds for tools on stilts, are in a state of neglect. The purpose for which they initially opted for the MoSE project was admirable. In fact, to preserve as much as possible the balances and the lagoon landscape was requested by Comitatore (Big Committee), a committee for the coordination and control of the project, that the works respond to three essential criteria: the experimentation, reversibility, gradually. According to the citizens committees none of these directives, attached to the political and institutional level, has been realized. Opponents to the project explain that the MoSE actually was never really tested. A first test, involving only a few gates and in optimum weather conditions, was made only in 2014. Subsequently, a further test was done in May 2016 during which some gates were not raised due to the deposit of sand and sediment. During a third test in September 2016, other gates have presented difficulties in returning to their housing for the same reasons (Nuova Venezia 13.09.2016). These are the problems that in 90's some researchers of CNR had already raised, but which were not taken into account by the engineers. As regards the experimentation, opposition movements and hydraulic experts believe that it was made in a too small scale (on model 1 to 80) to be reliable (for more details see D'Alpaos 2010). The real first experimentation will only be possible if it will be completed the work in one of the three inlets. The MoSE, denounce the citizens, would be really a great experiment. Finally, MoSE would not respond even to the reversibility criteria: the gates were set on installations not removable, nor to those of gradualness because it must be completed and installed entirety. By admission of the CVN, the realization of MoSE was preferred to other projects for its low impact on the landscape. The MoSE was originally proposed as a perfect project because innovative, protective of the environment and invisible, as completely submerged. Less impacting than those built on the Thames or Holland that with their size hide the landscape similar to a high Wall. Except that, CVN has built an entire man-made island in the middle of the harbor entrance of Lido and have added new breakwaters and prepared the ports refuge. For these reasons, the local opposition groups still today prefer to MoSE some of the old alternative projects (see Point 4).

Finally, as required by scientific mentality with which it was developed and carried out the project, the life of MoSE is only 100 years «The MoSE can protect Venice and its lagoon from high tides up to 3 meters and a rise of up to 60 centimeters above sea level in the next 100 years»¹⁷. So, in the end, it is an expensive work with a long and complicated implementation, impacting on the landscape, culture and

local activities, but temporary. Prevailing scientific purpose was to protect Venice for a limited time on hold in the meantime that the progress of science allows other more viable solutions. For all these reasons and because it is also uncertain if the project will really work, in March 2015, one of the many local movements, the association Ambiente Venezia (Venice Environmental), has made a complaint on MoSE to the Tribunale Permanente dei Popoli (Permanent Peoples' Tribunal) of Turin (Pavanini 2015). The not negotiated and antagonistic approach to local activities and citizens (including local administrative institutions and research organizations) applied by the CVN leadership has established in the lagoon a conflict relationship because of lack of communication (we do not know yet if it was a deliberate choice or misjudgment), an attitude that a whistleblower, a former researcher CNR, describes the great arrogance. They have missed especially forms of communication, mediation and negotiation with the economic categories most exposed to the consequences of the defence works. The lagoon fishermen were seen by CVN as a category in part sacrificed in front of the higher common good of protection from high waters, discarding any loss of forms of cultural heritage. Ultimately, an economic system, because in reality the MoSE became especially this one, it did succumb those deemed less important and therefore expendable.

When the prevention of a risk is seen as a risk

So far we have seen how the MoSE is experienced by most of the inhabitants as invasive and potentially dangerous action to the Lagoon, people and activities, and how all this has developed conflictual processes of public spaces. Now we talk about the most intimate emotion tied to the places and the landscape. First we must ask ourselves what are the places. To answer, we quote an article by anthropologist Gianluca Ligi, where he explains that from an anthropological point of view, a place is not just a trivial fragment of an ecological environment but rather is a «shared history environment» and is inseparable from the emotional dimension of the people (Ligi 2013: 119-129). This is due to the relational settings because our world is made by people who share the same spaces, but also the gestures, language, practices and daily reports. Places, in interpreting Ligi, are first of all, relations between people, contexts where they develop social and affective practices. The natural environment becomes at this point the landscape, our landscape, for reconstructive work, symbolic and emotional of human cognition. Tim Ingold dwells on an interest-

ing perspective that aims to displace the separation between humans and their environment by posing the idea of landscape as a continually unfolding story, in which we are constantly perceiving and immersed (Ingold 2000).

Applying this concept to the Venice lagoon, we derive that, even more than other “places”, it is a shared space by only a few: to attend the lagoon is necessary to know how to go by boat (which becomes the instrument of direct contact with the “lagoon environment”) and the exploitation of its resources was first necessary to develop a complex set of material culture and local knowledge, and finally all this was shared. A place being a mere spatial element becomes cultural heritage thanks to our lives, our personal stories. Cavallo reports that, once there is a kind of fully shared lagoon life, water spaces are differentiated and practiced on the basis of specific features and functions that make it dense places of social meanings (Cavallo 2015). In this investigation, often persons answer in reference to their memories of the places of the lagoon in order to compare them with the current situation; in fact, rather than talk about how were those places before and after the interventions of the CVN, they tell their personal stories inextricably linked to the landscape emotions. Here's an informant remembered nostalgic when he was a boy and came out with his boat, with a girlfriend, wandering through the channels of the minor islands which at the time did not have the stone banks built by the CVN, but sloped toward the water covered by the branches of the vegetation. Another recalls how the waves caused by their passage were quietly absorbed by the mud and vegetation, while today they seem endlessly bouncing from side to side of the rocky shores. Fishermen recall when they were fishing with their parents and grandparents in places where now they can no longer stay. It is quite clear that what they say are above all stories of emotions and feelings.

Today everything has changed, they explain, and is no longer as good as before. Without going into details, the extensive work carried out in recent years by CVN forever changed what was the perception and memory of familiar places. Many popular landmarks always shared with their group, fishermen, friends, hunters and others, have failed or have been processed more or less quickly. The result was a sense of disorientation that made it even more difficult to accept the MoSE project, well beyond technical concerns and the question of costs. Hence the complaint «is no longer as good as before»: the reproduction of the places of the lagoon from its inhabitants is not perceived positively. This is not a drastic change as can happen in the event

of a sudden catastrophic event, nevertheless the irreversible transformation is experienced as a loss, the loss of something fixed in the memories and will never return. This transformation of the external environment amounts to a transformation of everyday life: you do not go in the sun with your family in that channel or you can no longer fish in the usual place. We must redefine the places, as always says Ligi during his article¹⁸. However, it becomes difficult to redefine the places when you fear that some dangerous events can get in the future. From what I have obtained from the interviews and talks, the inhabitants as well as being concerned about the geomorphological changes in their lagoon, live in a state of anxiety about what will happen once the MoSE system will work. No one is sure of its proper functioning, and all answer vaguely «we hope that it works». The fear felt with greater force is related to the possible failure of the system, all or any of its parts and that it processes high water habitual in a violent wave that overwhelms everything. Also human error is taken into consideration for the complexity of the system. After nearly fifty years of proposals, projects and conflicts, the perception of the Venetians feel really itself as a serious and potential risk for the city, its lagoon and its inhabitants. In Venice, we encounter a perception of risk among the inhabitants, reflecting what Mary Douglas wrote in 1996. According to Douglas, the entire knowledge of modern men cannot protect them from all the dangers and disasters that modern technology seems to have increased rather than limited (Douglas 1996). Gibson and Venkateswar ironically stress as humans have become so powerful that we are now a force of nature, yet our self-appointed dominant place is instable and we may not be able to repair our planet (Gibson and Venkateswar 2015).

Conclusion

There is evidence that the Earth's climate is warming at an unprecedented rate, with the consequence of a rapid rise in sea levels (IPCC Report 2014). In Venice, where the phenomenon of *acqua alta* becomes more and more frequent, it was decided to realize the project MoSE. But the difficulties of implementation, the only engineering approach and the antagonism with the inhabitants, the lack of forms of negotiation-mediation between the parties involved have created conflicts today which are hardly solvable. Unfortunately, as demonstrated by Latour, in the negotiations the only certain actors are the states or their local representatives, and not all instances and controversies are present and consequently heard (Latour 2010).

As Rolston (Rolston 1988) and Jonas (Jonas 1990) say, each society has its own vision of nature with which to confront and only in recent times has there begun questions about human duties to nature and to feel the need to get out of an anthropocentric vision to process what Jonas calls the «principle of accountability» ethical turn to the future. As a result we feel today the need to start the collective environmental policies, with a shared code of ethics by all social actors, citizens, entrepreneurs, administrators, governments, with the aim of safeguarding the environment against damage intervention on it (Bianchi 1996). How this is feasible is still under discussion: the center of this debate is the issue of risk management and its assessment and its social acceptability. In Venice we find the example of MoSE, where engineers and technicians are carriers of an environmental culture instrumental to man. Faced with problems of acceptance of this technology from large parts of the population, the establishment responses were based on a judgment of “ignorance” of the “common people”. The case of MoSE represents a model of widespread opposition between the “technocentric” approach, owned by CVN, which considers that the control of a risk is feasible only through sophisticated management techniques, and the “humanistic” approach that emphasizes the importance of the individual, the society and the culture, supported by opponents.

Notes

¹ *Acqua alta* is the term used in Venice to indicate the exceptional tide peaks that occur periodically in northern Adriatic Sea. The peaks reach their maximum in the Venetian Lagoon, where they cause partial flooding of Venice, Chioggia and islands. The phenomenon occurs mainly between autumn and spring when the periodical tides are reinforced by the prevailing seasonal winds which hamper the usual water reflux towards the sea.

² www.comune.venezia.it/maree, last accessed on March 4th 2017.

³ Interview with the fisherman Antonio Scarpa, December 12th 2015.

⁴ Before the construction of breakwaters in the XIX century, the ceremony took place in the open sea.

⁵ On March 15th, 1990, the *Consiglio Superiore dei Lavori Pubblici* (Superior Council of Public Works)

expressed a negative opinion, since the project raised several problems of management, maintenance and high costs. At the time, the project did not guarantee sufficient reliability, but other works of hydrological restoration were anyway authorized. Despite the negative assessment, CVN decided to proceed with the development of the general project.

⁶ Their dimensions are variable in order to adapt to different depths: the thickness varies from 3.6 meters at the North of Lido, to 5 meters in Chioggia; the lengths vary from 18.5 meters at the North of Lido to 29.2 meters at the mouth of the harbor in Chioggia, while the length of all dams is 20 meters. The operation of emersion of the dams, in accordance with the directions of the CVN, should take 30 minutes. At the end of the high tide, the dams are re-filled with water and, in just 15 minutes, repositioned in their housing on the seabed. A passage for merchant ships was left open at the Malamocco inlet, while smaller ones are left in the other two inlets for fishing vessels, emergency vehicles and private boats.

⁷ The CVN was created by the merging of companies and constructions cooperatives, national and local, and it was the sole-concessionaire of the project, in contrast with the general principles of the EU Treaty which establishes the terms of the competitions (*Corte dei Conti*, Court of Auditors, relation on the Law 798/1994). The President of the *Consiglio dei Ministri* (Council of Ministers), some ministers, the President of the Veneto Region, the Mayors of Venice and Chioggia, some local authorities and the *Magistrato alle Acque* (Venice Waters Office) are also part of CVN.

⁸ In this period many people reacted to the feeling of exclusion even with the dissemination of jokes on the social networks. This can be interpreted as a complaint, in an ironic terms, for the incompetence of the institutions.

⁹ In fact this monopoly has permitted the creation of a system of corruption, illegal financing of political parties, tax fraud and false billing system (the monopoly was made possible by the law 798/84, which provided the possibility to entrust a consortium of companies behind private negotiation and without any tender). In June 4th 2014 the *Guardia di Finanza* (Financial Police) arrested 35 persons and informed 100 more of being under investigation. Among the arrested people figured: the president of CVN Giovanni Mazzacurati, the manager of the firm Mantovani S.p.a. Pierniorgio Baita, the former Minister of Infrastructures and Transport (2008-2011) Altero Matteoli, the former governor of the Veneto Region (1995-2010) Giancarlo Galan, the regional minister Renato Chisso (elected in 1995 to the Regional Council of Veneto, between 2000 and 2005 regional minister of Environment and Transports, between 2005 and 2010 minister of Infrastructures and till 2014 member of the

Regional Council), the Venice Mayor Giorgio Orsoni (between 2010 and 2014), the retired General of the *Guardia di Finanza* Emilio Spaziantè and the europarlamentary Amalia Sartori (1999-2014) (Fazzino 2014). The legal process is still on-going and since December 1st 2014 the CVN is controlled by an extraordinary administration (Decreto Legge 24.06.2014 no. 90 art.32, comma 1).

¹⁰ www.estnord.it, last accessed on July 15th 2017.

¹¹ The presidents of the main fishing cooperatives tend not to expose themselves publicly to avoid conflicts with the local construction cooperatives who have been entrusted with MoSE's works.

¹² The meeting took place in the headquarters of the CVN 10 April 2011.

¹³ www.nomosevenezia.eu, last accessed on February 16th 2017.

¹⁴ www.i-storm.org, last accessed on January 27th 2017.

¹⁵ Interview with L. Alberotanza, former director of the *Centro Previsioni e Segnalazioni Maree* in Venice (Centre For Forecast and Reports on Venetian Lagoon), December 14th 2016.

¹⁶ Interview with the Venetian architect P. Rosasalva, May 30th 2015.

¹⁷ www.mosevenezia.eu, last accessed on February 27th, 2017.

¹⁸ Interestingly, if you visit the Infopoint of the CVN at *Arsenale* of Venice and you scroll through the comments and messages left by Italian and foreign tourists, these are almost all positive and often enthusiastically in sharp contrast with the judgment of people who lives in the lagoon.

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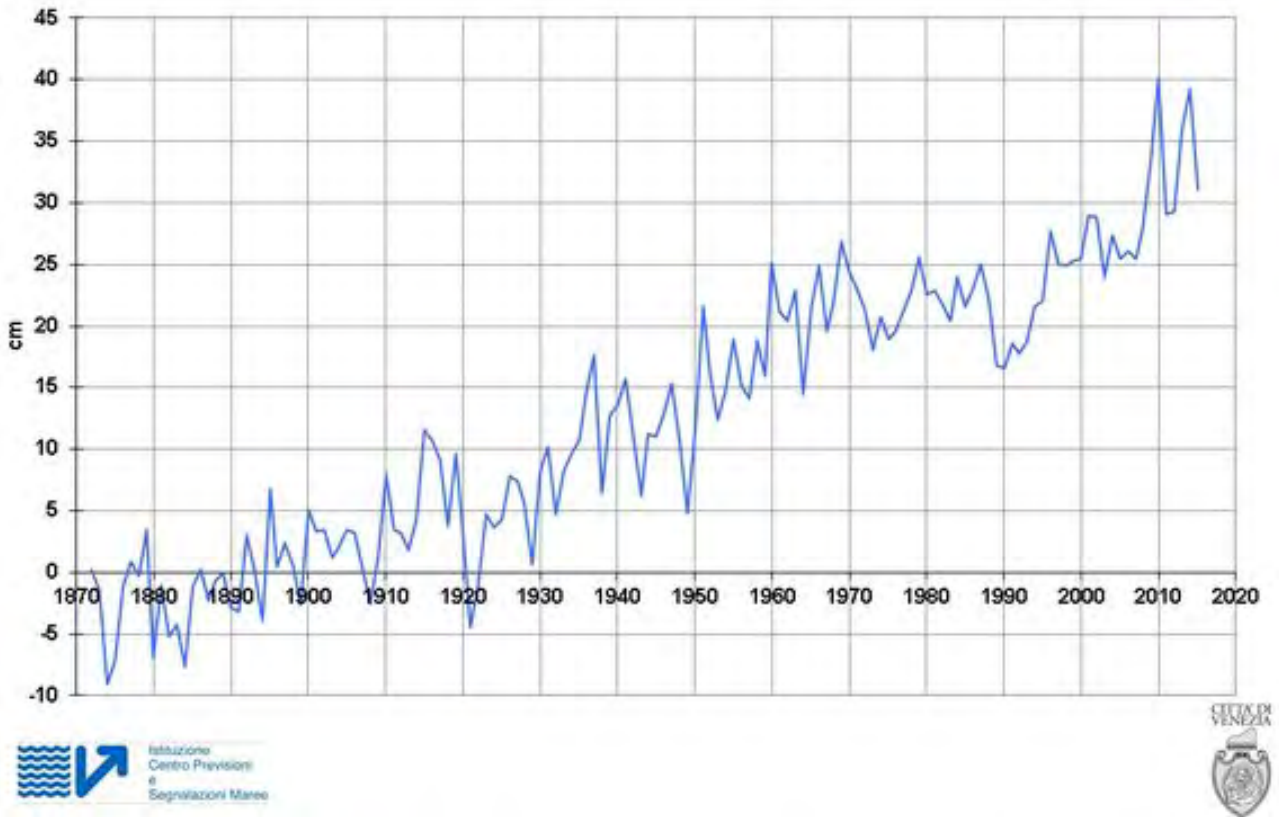
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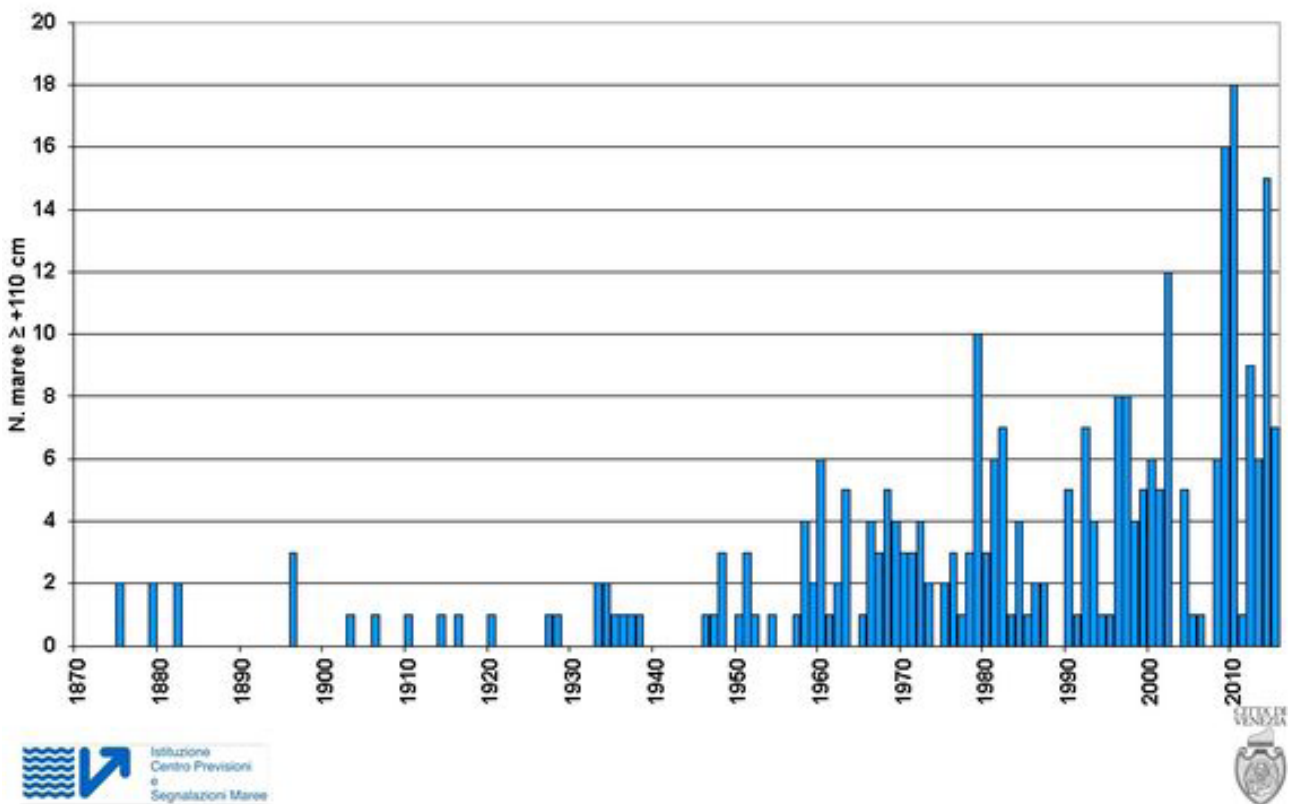
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1. Changes in the average sea level in the Venice Lagoon (source: Archivio Comune di Venezia)



2. High tides frequency (source: Archivio Comune di Venezia)



3. *Bricole* in the Lagoon



4. *L'Acqua Granda*, the extraordinary high tide on Novembre 4th 1966



5. Mechanism of operation of MO.S.E.



6. Mobile dams (note the defective and not working dam)



7. Surge barrier on the river Thames at Woolwich Reach (South of London). The barrier has been operational since 1984



8. The surge barrier of Maeslantkering on the confluence of the rivers Oude Maas and Nieuwe Maas, Netherlands (opened on May 10th, 1997, after six years of construction)



9. The MoSE construction works in the inlet of Lido (between the island of Lido and the locality Punta Sabbioni, in the North of the Venice Lagoon) with the new artificial island