Wasteland rehabilitation in rural landscape: a project in the Verona plain

Andrea Bortolotti
Latitude Platform a.bortolotti@latitude-platform.eu
Marco Ranzato
Latitude Platform m.ranzato@latitude-platform.eu

01
2018
SECONDA SERIE

Abstract

This contribution presents a design exploration for the rehabilitation of a dumpsite in the municipality of Isola Rizza, Verona (Italy). In the Verona plain, a former district of brick production left in its wake a cluster of water basins and wastelands that are today distinctive of the landscape and object of a territorial dispute among landowners, public administrations, and the local community. A project for the rehabilitation of one of those wastelands, converted into a dumpsite, has been recently developed. It considers the idea of re-organizing the circulation of waste materials and soil involved in the remediation to implement a public park. Although the project has been facing the little consideration given by local regulations to integrated design, it clearly shows the capacity of systemic design to tackle rehabilitation challenges while offering potential spaces integrated with the local ecological and slow mobility networks.

Keywords

Dumpsite Rehabilitation, Integrated Design Project, Wetlands, Verona Plain

Received: April 2018 / Accepted: July 2018

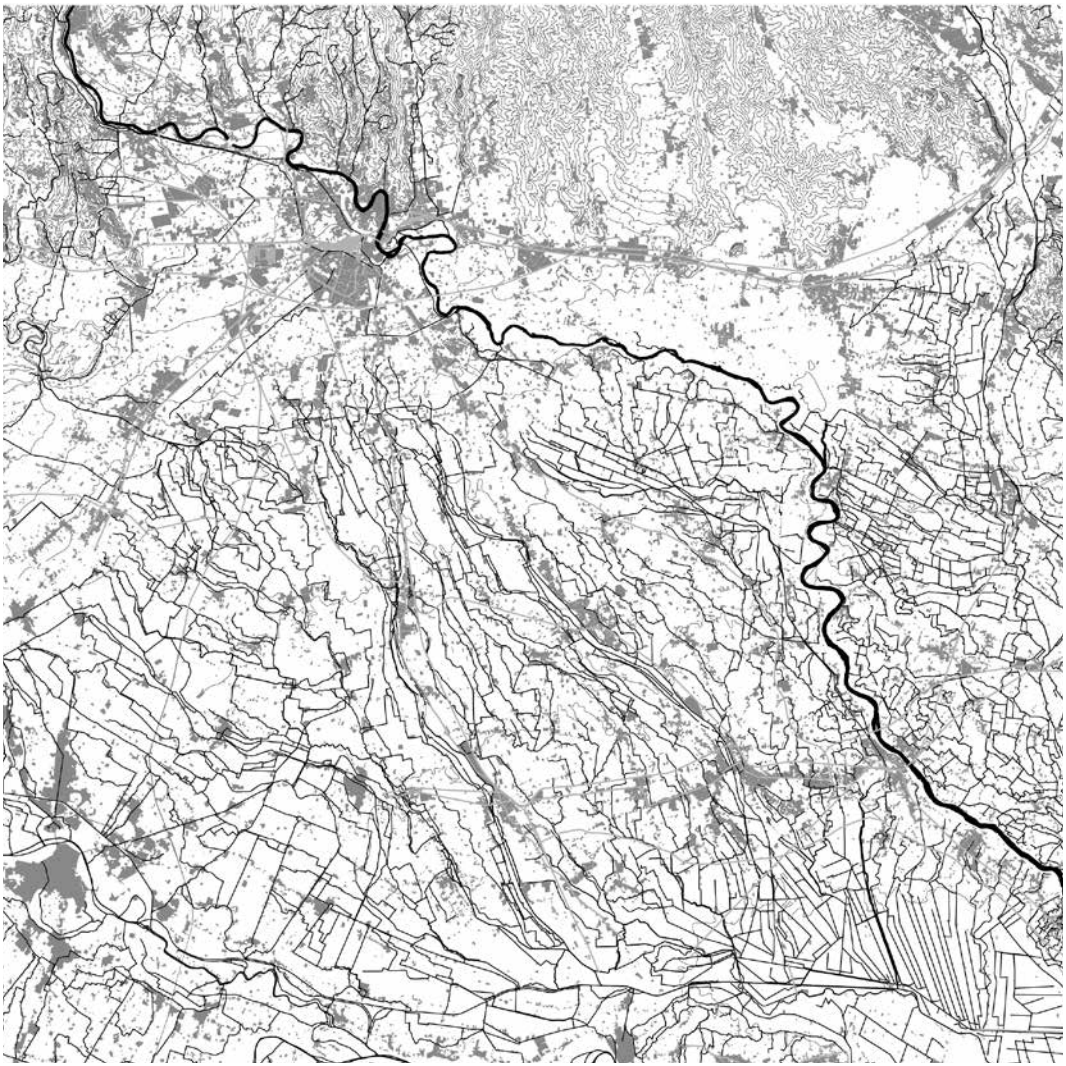
DOI: 10.13128/RV-22961 - www.fupress.net/index.php/ri-vista/

Introduction

In ancient times, a vast system of wetlands was stretching over the low plain south of Verona (North East of Italy) along the borders between the Veneto and Lombardy regions. These wetlands originated in the depression between the Po and Adige rivers – two of Italy's mayor watercourses –occupying more than 30,000 hectares of surface (Mastini, 2013). At that time, the Verona low lands were replenished by the flooding of the two rivers and by a number of springs that flowed into formerly carved riverbeds and rambled into marshy grounds (fig. 1).

These extended wet areas looked like a large expanse of reeds, wet meadows, shallow lakes, and scattered hygrophilous woods of poplars and willows, offering the "spectacle of one of the most extensive backcountry marshes in Italy", at the foot of the Alps (Mastini, 2013). Later on, different cycles of land reclamation occurred: initiated by the Romans, continued by the Venetian Republic, they were concluded by the Italian State in the 1950s. Through the regimentation of the watercourses and the realization of new canals, locks and bridges, the territory was progressively dried up. The post-war economic boom which took place in Northern Italy happened here a little later. Also for this reason, urbanization is less dispersed than in other parts of the so-called Megalopoli Padana, an extended tapestry of settlements that stretches all along the Po river basin from Turin to Venice (Turri, 2000). Instead, the Verona low lands appear as a depressed, mainly rural area where industrial and agricultural activities cluster around specialized districts of small and medium enterprises.

During the post-war economic growth, in the upper part of the former Verona's wet landscape, a few dozens of kilometres from the city of Verona – where the Adige river bends towards South – a district flourished around a proto industrial production of construction bricks. Before hydraulic works of dykes and diversions prevented river overflows, the water used to spill over this low-lying area releasing deposits of fine clay. Given this resource, many brick furnaces established over the time in the area. Most furnaces arose beside pits where the clay was extracted removing the shallowest layers of soil. Many clay pits, on average of two meters deep, spread over the landscape at the expense of agriculture. Later on, between 1950 and 1970, the mining activity underwent a significant development. Thanks to modern technologies that allowed digging deeper – up to six meters – and controlling water infiltration during digging operations, the landscape of clay pits further expanded. Due to the deep mining and the high water table, the reclaimed landscape started to get its former wet character back. The mining ac-



tivity advanced at such a pace that, in the sole small municipality of Ronco all'Adige – 6.000 inhabitants, the clay pits have covered up to half of the total municipal surface (fig. 2) (Veneto Progetti, 2009).

The temporal succession of dry and wet conditions sounds remarkable for the history of this apparently ordinary landscape (see Latitude Platform, 2015). However, the soil exploitation talks only for the most visible part of the recent socio-natural transformations occurred in the area. Before the 1980s, the mining activity had very little laws and regulations and it was common practice to use the exhausted open pits as dumpsites for unsorted waste materials. This occurred to many pits in the Verona plain. Official information about the use of exhausted open pits as dumpsites is not available, yet there is a common agreement about the dissemination of this practice as well as a diffuse apprehension about the risk related to it. The exhausted pits have become the receptacle of hazardous materials, which endanger the quality of the underground waters.

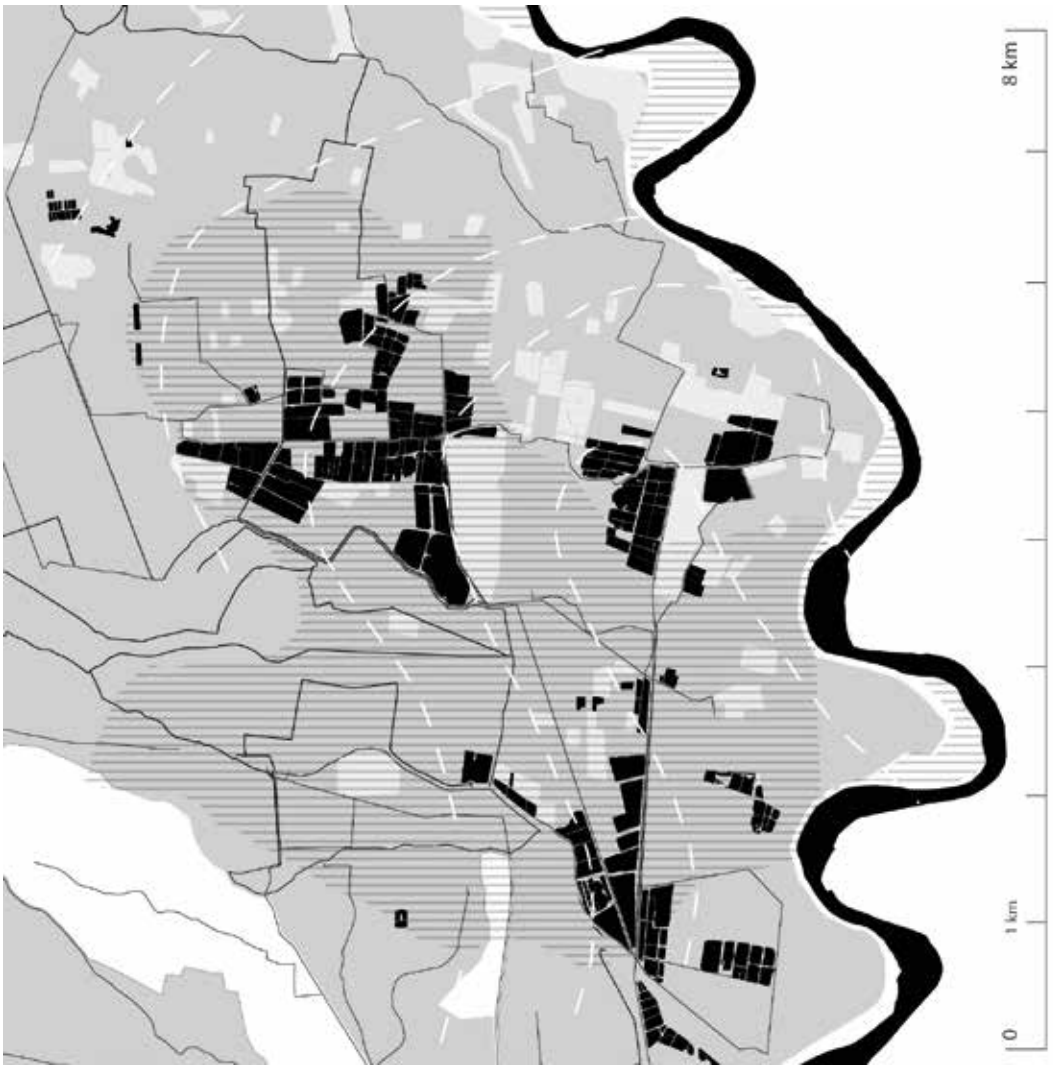
opposite page
Fig. 1 – The Verona plain in the Po Valley. Hydrography is in black, built up areas are in grey. The Adige River crosses the plain from the mountain foothills in the North to the drainage channels on South passing by the city of Verona.

Today, in the Verona plain, brick production has declined. Due to the crisis of the regional real estate market, and the introduction of stricter laws and concessions for the mining activity, the brick industry has known a strong recession and the local mining activity has almost disappeared. As a result, some of the former pits have been partially filled to be returned to agriculture or to be replanted with poplar trees. However, the great part of the abandoned clay pits continues to rule the landscape in the form of many water expanses. They have an indissoluble presence in the contemporary landscape of the area and in the life and memory of the local community. A certain number has been converted into fish farms or ponds for sport fishing. However, all over, animals and plants have repopulated with a great biodiversity typical of the transitional zones between water and terrestrial environments. This wet condition recalls the original local landscape characterized by marshes and hygrophilous woods. The former pits have medium slope banks, sometimes covered with thick vegetation hedgerows, other times with well-maintained lawn and tree rows (fig. 3). The ensemble of wet areas extending for 500 ha over the municipalities of Ronco all'Adige, Roverchiara and Isola Rizza is a unique resource for the region. Because of its rich biodiversity, some of the wetlands are enlisted among the regional natural areas worth of conservation (Provincia di Verona, 1994).

It is known that, nowadays, European and Regional programs and directives recognize the ecological importance that these habitats have for many plant and animal species, whose biological cycle is related to water. They are resting areas for migratory birds. They have a role in regulating floods events. They contribute to the natural treatment of water. They are also meaningful with respect to the long history of human activities and interplay with the landscape, and are thus a landmark of the local identity. For all these reasons, landscape reclamation programs are high in the political agenda. Besides the celebration of these wetlands as regional biodiversity hotspots, an integrated process of reclamation has to be worked out in order to tackle the pollution issue caused by their past exploitation as dumpsites.

Regional constraints and opportunities

Within the framework of a comprehensive regional vision, the former clay pits of Ronco all'Adige, Roverchiara and Isola Rizza could become the asset for an integrated landscape and environmental management. Other studies by the authors (see for instance Ranzato, 2011) have already investigated possible scenarios of rehabilitation of the former clay pits within integrated territorial strategies. On



the one hand, the former clay pits can play a fundamental role for the regulation of the local water cycle. They can provide an important volume to stock water and regulate seasonal excess, shortage, and water quality. The area surrounding the former pits of Ronco all'Adige, Roverchiara and Isola Rizza is periodically facing flood risk and, due to the high water demand by agriculture during dry summer periods, water shortage. At present, these opportunities have not been fully taken into account by local regulations.

By contrast, the clay pits have also negative implications on the water cycle. With the withdrawal of the top clay soil layer, the mining activity has altered the groundwater table so that it flows under pressure few meters below the ground surface and which today re-emerges in the open clay pits. In addition, fish farms require a constant water temperature and circulation, which is provided by extracting groundwater with steady temperatures from deeper aquifers. The water is then discharged, both by gravity and through pumps, into the surface wa-

Fig. 3 – The former clay pits of Ronco all'Adige, Roverchiara, and Isola Rizza. (Photo: Basilio Rodella Bams Photo, Consorzio di Bonifica Veronese).

opposite page
Fig. 2 – The former clay pits of Ronco all'Adige, Roverchiara, and Isola Rizza. Surface water and the pits filled with water, in black; the filled up pits, in light gray; a section of the catchment, in dark gray; the floodable areas, horizontal dark grey lines pattern; groundwater levels, white dotted lines. Source: Regione Veneto. Elaboration by the authors.

ter network. As a result, the aquifer is largely exposed to the activities taking place on surface, engendering the risk to increase the percolation of fertilizers and others pollutants into the ground. Aquifer's contamination is a serious issue for the local community, whose drinking water supply depends on groundwater. Periodically, due to the presence of nitrates in the supply network, the municipalities in the province of Verona are forced, at the request of the Regional water board, to enact ordinances that prohibit the use of the public water (Albi, 2014). In order to preserve the quality and availability of potable water, integrated long-term measures that do not weight on the scarce public finances are needed. On the other hand, the clay pits can be revitalized to foster a greater number of interactions between the natural environment and the local community. Feeding the imaginary of its inhabitants is key, as it is stimulating local associations of environmentalists, and grassroots' engagement in local activities and development. An example in this respect is offered by the experience of a group of nature photographers, which have shown how, in the span of 10 years, and through appropriate measures like graduating water levels to create a variety of wet areas, an abandoned clay pit can trigger processes able to regenerate a strong ecological complexity. Indeed, the area has become the nesting place for many birds' species and rare amphibians have reappeared (Mastini, 2013).

The former clay pits could therefore compensate water stress and increase landscape quality and biodiversity through an ecologically sound and low cost design. Softening the slopes' profile of the water expanses, for instance, would greatly benefit the biodiversity. It would increase the transitional surface

zone and enhance the roots filtering capacity of the wooded hedgerows. Although the former clay pits represent a great opportunity for the area, their private ownership regime makes it still difficult to imagine an integrated development. For some time, local municipalities have advanced different proposals to return the quarries to the community through public-private partnership.

The vision for the Polandro, Isola Rizza

The project for the rehabilitation of the Bastiello quarry, in the municipality of Isola Rizza, provides an interesting example of public-private partnerships developed around a former clay pit that is now a wasteland. The Bastiello quarry belongs to a private land of 40.000 m^2 located not far from the urban centre of Isola Rizza, in the Polandro area (approx. 1 km). During the 1980s, this former clay pit has been heavily exploited as dumpsite (fig. 4). Nowadays, it appears as a barren wasteland, which hides the underground environmental damage. In 1992, the site has been sequestered and since then is pending for remediation. In 2009, the quarry has been included in a priority list of sites to be reclaimed by the province of Verona (Simone et al., 2014, R02.1). Recently, a local private waste management company interested in enlarging its business offered to recover the site without any cost for the local administration, leaving the area in public hands once finished with the reclamation. According to the proposal, the excavated waste would have to be allocated in a municipality's landfill nearby, the expansion of which is still pending approval. In order to transform it in a new public green area, the ground would have to be filled with gravel and topsoil from certified excavation sites as well as with the uncontaminated soil eventually found on site (Simone et al., 2014, R02.1). A concern arose about the fact that the future public green area would come to exist in a rural environment, mainly surrounded by agricultural fields. It was hence thought to carefully measure the intervention scope with respect to the needs of the possible future users.

In order to frame the project within a wider planning strategy, the Water Board *Consorzio di Bonifica Veronese* (responsible for the surface water management in the catchment of the Verona plain) took over the initiative to propose a possible integration of the project with other ongoing local initiatives. The water board was interested in the implementation of a system of touristic paths, which would enhance the existing pedestrian and cycling mobility along the rivers' embankments and the rural dirt roads.

Within this framework, the design practice Latitude Platform has been appointed to develop, in collab-

opposite page
Fig. 4 – The Bastiello dumpsite is located in the 'Parco del Polandro', a public park ideally part of a larger vision for the valorization of ancient hydraulic buildings (Gangaion and Botte Vecchia) and the regional slow-mobility and touristic tracks along rural roads and the Adige river. (Photo: Latitude Platform, 2014).

oration with the Water Board and the local municipality, some design reflections for the area. The proposal take into account the presence, in the immediate vicinity, of two ancient buildings of hydraulic regimentation, one of which has been recently renovated and that will open, eventually, as an 'Ecomuseum' displaying the history of the local landscape. It considered the unique value of the surrounding agricultural landscape that, although threatened by environmental degradation and fragmentation, is still characterized by open large extension favouring broad panoramic views, and the amenities already present in the Polandro area that could be thought as a one-thing with the new park. Concerning the last point, it appeared relevant that another clay pit previously recovered in the area today functions as an artificial water pound dedicated to sport fishing and is managed as a semi-private space by a local association. Beyond this recreational angling, a private wood patch towards the close by urban settlement of Isola Rizza has been repopulated with a variety of tree species and it is made available by the owner for educational and recreational purposes.

The strategy designed by Latitude mainly advantages on the earthworks. The operation of excavation is at the centre of the conception of the park. The core idea is to introduce an exception into the predominant horizontality of the plain landscape. Just in front of the shallow depression resulting from the waste removal, a raised counterpart arises on the opposite side, shaped to build a privileged point of view towards the surrounding landscape. The cleaning up of the site with the digging up of waste on the one side, the carryover of new topsoil and the realization of the park on the other, are conceived as a single intervention also in order to reduce the general operational costs. Depression and relief would stand as signs of this very last excavation process. After extraction and cleaning up of the waste, the hollow of the former clay pit is meant to be only partially covered in order for the ground level to be just above the water table (approx. 3 m deep). Most of the good soil will be deposited on one side of the area to form the relief. The new rise makes the order of magnitude of an excavation process readable, while in the surrounding abandoned pits the water hides the excavation depth. The realization of an 'observatory' at the top of a large and slightly vegetated slope responds to the need of experiencing the whole surrounding landscape. Rather than enclosing the area with visual barriers made of tree masses or fences, the site would be open to the landscape. The strong visual relationship is revived also by the entering path connecting the site to the main road and from there to the urban centre. The slow mobility network would extend to the

other important natural and historical spots of the surroundings. The new park is designed to be flexible and open to a variety of uses served by two fixed elements: a projecting roof in the lower part, almost hidden at the level of the campaign, and an equipped platform in the highest point (fig. 5,6,7).

Conclusions

In a large part of the Verona plain where land reclamation had largely shaped the landscape, wetlands have returned as legacy of the mining activity. The post-natural ecologies generated in the former clay pits are now recognized as integrated part of today's landscape: into these wastelands, new natural cycles are taking place; they are considered important ecological carrying structures and ecosystem service providers; not only academics and professionals, but also citizens and local associations acknowledge their value and struggle for their conservation.

The design project conducted by Latitude for the rehabilitation of the Bastiello quarry, one of this former clay pits, reveals the systemic character of design – versus narrow, technical understandings of the area. The proposal advantages on the inner qualities of the clay pits landscape and places the intervention within a wider natural and recreational regional network. In the project, the elements surrounding the site, like the nearby wood-patch and the rural landscape of the Polandro area, are visual cornerstones around which the accessibility to the site is re-shaped. Technical issues and landscape features are combined in order for the space to offer a multiplicity of functions. For a rural landscape facing struggling economy, multiplying the opportunities related to a project is deemed more than an option.

The proposal for the rehabilitation of the Bastiello quarry, however, also highlights that, unlike a mere technical intervention, a design project could also upset arrangements and assumptions underlying the initial proposal. While expanding synergies, the design process brings out potentials and win-win combinations that conflict with rigid private-public agreements and dictates of current praxis. In the agreement between the private company appointed for the dumpsite rehabilitation and the municipality, waste materials are brought to a sanitary landfill located in a nearby municipality and owned by the same company. Instead, 'costly' quality soil is brought to the site in order to fill the 'new' hollow. In the region, this is praxis in dumpsite remediation. Notwithstanding, the design project considers the opportunity of partially preserving the wet character of the area which will appear after remediation. Accordingly, the area whose imprint corresponds to the former clay pit would be only partially

Fig. 5 – The vision for the Polandro: an open park made of a large and soft slope visually and spatially connected to the surroundings areas, axonometric view. (Photo: Latitude Platform, 2014).
Fig. 6 – The vision for the Polandro: longitudinal section. (Photo: Latitude Platform, 2014).
Fig. 7 – The vision for the Polandro: the landscape observatory. The image illustrates the idea at the core of the project proposal: the exception of a privileged, single elevated point in front of a vast horizontal landscape (Photo: Latitude Platform, 2014).

filled in order for the ground to just exceed the level of the water table.

The proposal also foresees that most of the soil originally intended to fill the remediated pit is instead located just on the side to form an observation point. Ultimately, the design process could have gone even further, especially if local legal procedures were more flexible. The rise envisioned in the project could have been designed considering the re-use of the non-dangerous waste of the dumpsite itself. In other words, a more consistent hypothesis could have been considered, that is sorting the waste extracted, securing it by isolating the non-dangerous waste, covering the top soil with a water-tight foil, and placing the non-dangerous waste for rising the observation point. Projects like the *Volgermeerpolder* in Holland (Vista Architects), the *Vall d'en Joan* in Spain (Battle and Roig), or the Freshkills Park in the US (Field Operations) have shown how it is possible to secure environmentally damaged sites such as former sanitary landfills while including new park-like uses on the same site. Actually, during the process, the design considered the possibility for a shorter cycle of material reuse. However, the option was difficult to practice because it would have asked for further studies and, in short, it would have altered the established private-public agreement. This shows how design could bring solutions that go beyond and challenge current practice but systemic ideas could result useless if the institutional arrangement is rigid and/or design comes late in the process.

The design vision for the Polandro has however found the interest of the local administration and was used as a strong point during a past election campaign (2014). Besides the willingness of the local municipality and the positive reception of its citizens, the project was stuck in the bureaucratic machine. Therewith, soon after a strong criticism aroused around the real sustainability of the entire process. Some local politicians and citizens' committees have pointed out that the disposal of 13,000 cubic meters of non-dangerous waste – out of the overall estimated 25,000 cubic meters which will be extracted from the dump site – was used by the private company to obtain the permit needed to extend their own landfill located in the nearby municipality. Critics also contested that the company's landfill expansion was explicitly required in order for the private company to raise the bill for carrying out the remediation of the Bastiello quarry (Simone et al., 2014, R03.1). In a time where the new regional waste plan excludes the opening of new landfills, the entire operation has been strongly criticized as a ploy of the private company to extend its activity and business (Vesentini, 2014). Paradoxically, the

missed opportunities highlighted by the design project, that is the possibility of re-using onsite the non-dangerous waste extracted from the dumpsite in order to build the rise, would have allowed overcoming the local criticism. This shows that design could play a crucial role if it was understood as a proactive tool rather than a mere act of plotting.

References

Albi L. 2014, *Rassegna dei casi di inquinamento nelle acque sia superficiali che profonde a Verona e Provincia*, paper presented at the conference "Lo stato delle acque in provincia di Verona", 01.02.2014, Verona, unpublished.

Latitude Platform 2015, *Landscape Traces and Stories*, Research report for the Consorzio di Bonifica Veronese, Verona, unpublished.

Mastini B. 2013, *Le zone umide nel veronese tra passato e presente*, in Atti e Memorie dell'Accademia di Agricoltura Scienze e Lettere di Verona, Verona.

Provincia di Verona, 1994, *L'ambiente naturale*, Agenda 21 - Rapporto sullo Stato dell'Ambiente, Verona.

Ranzato M. 2011, *Integrated water design for a decentralized urban landscape*, Ph.D. thesis, University of Trento.

Simone P., Angeloni A., Condorelli M., 2014, M. R02.1 - *Progetto Definitivo di Bonifica, Progetto Definitivo per l'Ampliamento dell'Impianto di Smaltimento D1 per Rifiuti non Pericolosi in Località Ca' Bianca in Comune di Zevio (VR) e Progetto di Bonifica Cava Bastiello in Comune di Isola Rizza (VR)*, INERTECO S.r.l.

Simone, P., Angeloni A., Condorelli M., 2014, M. R03.1 - *Progetto Definitivo, Progetto Definitivo per l'Ampliamento dell'Impianto di Smaltimento D1 per Rifiuti non Pericolosi in Località Ca' Bianca in Comune di Zevio (VR) e Progetto di Bonifica Cava Bastiello in Comune di Isola Rizza (VR)*, INERTECO S.r.l.

Turri E. 2000, *La Megalopoli Padana*, Marsilio Editore, Venezia.

Veneto Progetti, 2009, *V.A.S. Rapporto ambientale, Rapporto sul Quadro Conoscitivo*, in «Piano di Assetto del territorio, Comune di Ronco all'Adige».

Vesentini G. 2014, *Ampliamento in vista per la discarica Cà Bianca?*, Zevio Bene Comune, August <https://sites.google.com/a/zeviobenecomune.org/zeviobenecomune/comunicati-stampa/ampliamentoinvistaperladiscaricacabianca> (08/15).