

Òikos. A river for everyone, plan for a phytoremediation fluvial park in the Po Valley.

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INTRODUCTION.

The ancient Greek term “Òikos”, between many layers of meaning, express in one word ecology and economy. In a deeper sense, “Òikos” is the environment where our house stay safe. Humankind, like animals, lives in the natural environment, so òikos is also the complex of living entities in the house: the family that occupied the planet Earth. A vast family that comprehends bodies we thought others, but they are actually relatives, altogether launched in a fast circular movement towards a single doom. The OECD, since 2012, has warned about the danger that the constant reduction and degradation of natural capital (ecosystem health), can trigger irreversible changes that will jeopardize two centuries of improvement in quality of life, health and social standards and economic burden, with significant costs at the expense of humanity on the entire planet ^{OECD 2012. Outlook for 2050 <https://www.oecd.org>}

The river park makes the alternative conceivable and it figure out an act of restoring a natural capital to provide ecosystem services, supplied by nature, they are the basis for Green and Circular Economy. Benefits most often not recognized until they are wasted or lost. The river must once again become free ecosystemic resource that crosses the territories, not linked to concepts such as profit derived from the ownership and exploitation, commons natural capital that produces a flow of goods and services based on natural and cultural transformations linked to nature, its protection, to contemplative and recreational enjoyment. The act of restitution to the earth, carried out in the River Park, sublimates the status of common goods, shared environmental, cultural and social value, in the broadest definition of ecosystemic heritage: air quality, landscape, renatured environment, regenerative capacity, life support, recreational and aesthetic usability.

KEY WORDS: downstream communities, aesthetics supply, river continuum concept, landscape ecology, multi-objective landscapes, environmental impact design, phytoremediation, ecosystem services, wild farming, restoration ecology, restitution natural environments, resilience, environmental engineering.

ENVIRONMENTAL PRESENT STATE OF PO VALLEY.

Although Po Valley, as it seeing still the 1950s, was an agricultural area, rich in biodiversity, model of sustainable agriculture integrated with its rivers ecosystem, it

has now become a “green desert”. Due to intensive monoculture and animal husbandry, high inhabitant density, high concentration of industries, which spread of massive doses of GHG (Green House Gas Emission) into the atmosphere, the Po Valley is a pollution hotspot, not only in urban areas, but also in rural locations. Particularly the rural areas are responsible for spreading in the ecological matrices not only CO₂, but even heavy impact nitrogen compounds, like nitrates, CH₄, N₂O, NH₃, pesticide, arsenic, PFSAS, heavy metals. No pollutant is missing.

The beginning of the major reclamations for Po river training date back to 150 years ago. The canalization works, that has been affected the watercourse, had receiving greater impulse among 1919-1970, and completed in the 1980s, so in recent times. Those reclamations indeed got safer embankments and extend cultivated lands for downstream inhabitants, but paying the distraught the regional hydrogeological and ecological structure, and determined the destruction of the gigantic natural apparatus for regulating the waters that made the plain forest of the Po Valley the “Italic Amazon”. Restitutive acts are therefore due, and these are much the more effective, the more advance it is the study of the natural ecosystems.

The river, once restored to its original condition, heals itself and no longer needs man. However, the Homo sapiens species has greatly affected ecosystems. So much so that if the sapiens species would to become extinct, the synthetic substances released throughout the planet would remain to interact with natural ecosystems. Therefore, recreating plant associations in dying environments, where they were previously native, leads to the creation of new biotypes, not to a return to the situation of the past.

The park takes place inside the flood plain between the main embankments of the canalizes Po, along a strip that goes sinuously about 300 km length to 0,800 up to 4 km at the confluence with some major inflowing (Ticino, Adda, Taro, Oglio, Mincio), from the confluence of the Ticino's till to Goro's Po inflowing.

ABSTRACT:

Watercourses drive in the city the territory drained by the network of tributaries. If the soil and water are contaminated, the river will carry poisons where the causes of their production are: anthropogenic danger returns to the city!

The river park is a place where a sustainability relationship is implement with the planet, the only entity and "technology" that supports us; it rejects the tendency to relegate the river landscape in the background of undifferentiated development processes, which still alter the natural eco-hydrogeological structure of the river Po. The fluvial park tends to establish of a multi-objective landscapes, where the needs of downstream communities are connected by an aesthetics settlement of the landscape.

The creation of the park relies on knowledge and skills applied to several interconnected levels, but the project is fluid, exposing it to the forces of nature that dissolve its planning. In this sense, the project of river park is the renunciation of the plan, as history and modernity seem to affirm, because, as we have seen, one is not able to truly govern the processes and the contemporaneity bangs it in the our face continuously.

Renatured watercourse performs hydrogeological regulation better than any human engineering work; it brings high biodiversity, a significant gene pool, fundamental for the ecology of restoration and for microevolution. In an overlay anthropogenic landscape, rivers are the only connecting corridor for others ecosystems and for the mobility of wildlife, renatured or semi-natural rivers are the only connecting corridor for others ecosystems and for the mobility of wildlife and human recreational nomadism.

The bond of the downstream communities with the river is written directly on the landscape, told through the modifications that outline its historical-cultural evolution, extremely rich and diversified, almost never conservative and sustainable. Designing an inclusive fluvial park, environmentally friendly and cultural issues, expression of downstream communities along Po, re-establishes the interaction between others and the watercourse and reconnects communities to the geographic heritage of the river, in the autoecology of the watercourse.

The park is inspired by the ecological themes of classical Latin literature, which draws from the Golden Age the expression of ecosystem services, and from the topos of "locus amoenus" the frame within which the elements that compose the park comes to life.

The interconnect Gardens: hygrophilous woods, arborescent galleries, wetlands, grassland, orchards, muddy riverbank, temporary ponds, dunal systems, make up flood plain. They are design to stir up two levels of interpretation in the visitor. On the one hand, the sensitive world that delights the park user; on the other hand, the interiority that the landscape designer hopes to arouse along the visitor's stay.

Many of the natural compositional elements are direct to the interiority of people: the glowing lights that vibrate in the cool shade, the colors of the blooms, the symphonies of greens, the accents of the buzz of pollinators, the ions breeze that spreads from murmur of waters. The River Park contains the natural elements of the landscape, the garden, and the educational park, the incredible naturalistic views, magnificent in their botanical richness. Subjected to a geometric arrangement or a landscape script, the composition of the park is based on phytosociology to set up the panoramas and scenarios accorded to the knowledge of contemporary ecology, in the frame of the picturesque tradition of the natural landscape.

Deep psychological benefits can be obtained from the river park: they come from the awareness of how it gives me relief to know that I am crossing a wood of Viminal willows, while their discreet lives clean the earth of man's poisons, digesting heavy metals thanks to the wood that supports them. It gives me relief to know that when I die Mother Earth will still be able to welcome me, thanks to those willows, which I have returned to Earth.

Those who know how to listen can have the gift of hearing the voice of the goddess echoing among the trees hit by the current. Science, applied to invisible and silent bioremediation, becomes magic. Thus, as willows break down pollutants, their branches can be intertwined to create shapes not yet imagined, or useful structures for furniture, chairs and tables will literally grow on trees. Art and creativity come to a deeper understanding, so their aesthetics forms, inspired and applied to "green liver" concept interact and activate the vegetation-enhanced bioremediation.

Installing that river park means therefore an exercise of active citizenship to sustainable development. Getting voice and political actions, pushing communities to retrieve, protect, and improve landscape quality. Conceive holistic approaches to support participatory meta-design, think to different spatiality, original places, different and independent, in order to react to plans, which fell from top, often affecting disastrously to territories and individuals quality of life.

Walking, gathering, hunting, tell stories: the oldest activities of humankind. If a territory is not recounted, how can it be loved and protected? Another important educational aspect exercised by the river park, is the historical landscape linked to gathering food, agriculture, wandering mills, fishing, hunting, enjoyment.

In the past, in order to exploit the driving force of the river, even in the low-flow season, adjacent to the "piarde" (floodplains above the steeply inclined embankment on low-flow channel), numerous wandering floating mills were moored for milling grain. New mills should be used for the production of electricity, without any destructive intervention of the natural hydrology of the river.

OBJECTIVES AND PURPOSES:

Restoration of the only authentic humid forest lowland, clouds factory, natural capital from that flows ecosystems services, the more valuable, the more is poisonous the anthropogenic environment that presses at the borders. The more resilient the more the entire drainage basin should be devoted to widespread park for vegetation-enhanced bioremediation, regulates and stabilizes the landscape and the climate.

Before to start with serious and organized afforestation programs within the flood plain among main embankments, it will therefore be necessary, recreate the conditions for naturalization of perfluvial habitats. Bringing back the original conditions of the natural hydrology of the Po as anastomosed river (composed of

sinuous and braided channels): the shifting bed, banks, meanders, oxbows, and the flood plain without intensive agriculture or forestry. The simplification of the landscape (monocultures), lead to loss of biodiversity.

Fluvial Park does landscape with restorative acts, integrates hydraulic, biological, defense practices of the soil, phytocoenoses, insect and animal communities, and restores connections in natural landscape ecology and anthropic relationship systems. The naturalized river constitutes a bioremediation organism of restitution to nature, through that continuum consisting of exchanges between macroinvertebrates – water – soil – plant – vertebrates – atmosphere. The River Park restores those injured resources, takes the river to the state of nature, recognizing its ecosystemic capital, it carry out mechanical and biological action to remediation of the natural matrices. Furthermore, the natural control of the fluvial dynamics brings to a higher resilience as regards maximum unexpected flood in the territories crossed from the river. The deterioration of a river purification system, particularly along the riparian belt, has negative repercussions on the efficiency of other ecosystems, e.g., soil protection. The communities of macroinvertebrates, vertebrate organisms, plants association, interconnected to create a super organism that has favorable habitats in biological systems (river continuum concept). The park organically return watercourse to supply the spiraling of nutrients and makes them available to the land for wild and organic farming, but Even the agricultural fields that counterpoint to the Park may take fertility from it. That will give a higher quality of crops and livestock products, instead of high quantities. Any intensive tillage in the river park are not allowed, in favor of extensive ones. Pastures, livestock, forestry, organic crops of grains, vegetables, fruit, and protection of pollinators. Plants for food processing not only, but also into other forms such cosmetics or herbal medicine, in this case universities can help communities to develop small chemistry laboratory for a horizontal concept of economic development. A registered trademark, to protect the agricultural products grown in the park, whose origin evokes the purity of pre-agricultural cultures, can enhance organic productions even more. In the wake of restitution agriculture, a better quality of the air we breathe is also cultivated. To protect natural ecosystem services, must be obligatory confers legal personality on the river Po, recognizing its right to respect its hydrology, environmental, landscape and cultural characteristics. Ecological corridor for a network of widespread biodiversity, a decontaminating organism for restitution to nature: an òikos.

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