The Need of A Geographical Plan for the Redevelopment, Promotion and Rational Use of the Po River

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Abstract: The various territorial issues connected to the presence of the Po River offer the geographer a serious analysis, who is interested in environmental protection as well as human protection. These issues outlined need to be examined not only under a sector-based point of view, but using a general inter-disciplinary vision without forgetting the moral perspective.

Key words: Po River, geographical plan, socio-economic effects, environmental impact

1. Introduction

In the framework of the “big issue” of the evolutionary dynamics and geographical space organization, the importance that the study of physical environment can assume appears to be essential: causes, precarious situations and main resources need to be taken into consideration [1]. In particular, situation and resource evolution analysis will lead to tendency recognition and thus to the statement of precise diagnoses on imbalances derived from their abuse, as well as the ones worth valuing and using [2].

Before focusing on the recognition of the physically anomalous or risky situations, we need to stop and consider what natural resources can be considered this way.

It is known that the concept of resource is connected to the concept of need; thus a resource is a natural fact or event, and its reasonable quantity, quality and distribution will fill a need, that can’t necessarily be an economic one [3]. Needs change over time, though, as technologies and life-styles do; therefore it can happen that facts and events previously considered useless or even damaging, today can be true resources, while, on the other hand, natural realities that used to be resources, are not considered like that today. It must be observed that, even considering only the current period, things are not easier, as a fact or an event is hardly ever a resource for all the activities connected to man’s different needs; for instance Summer rain is a resource for agriculture, but not for tourism [4].

Proceeding with these topics can lead back to the past, when we highlighted “conditioning” deriving from natural environment pros and cons, or on topics useless to our goals; yet, it appears valuable to point out risks that exaggerated and superficial argumentations have.

Previous considerations lead us to consider those physical facts and events, “available goods”, which take place in space and time, showing some negative part, though, in some sector as far as their lack or surplus is concerned, as natural resources, and aim of study. Space needs to be taken into consideration with its features: absolute and relative dimension, absolute and relative position, verticality and horizontality; soil is worth being studied, as well, because of its articulations in lithotypes and geomorphological
events, useful to human activities; analyses on water, energy resources and on raw materials (quantity, quality, use, etc.) are very efficient [5]; these are regarded as assets and therefore analyzable as fundamental “emergencies” of the territory, used by man for sure, but with a new perspective, derived from a plan to avoid waste and imbalance [6].

We found useful to hint at physical environment and natural resource concept, as the perfect knowledge of these realities and their dynamics allows to achieve a geographical plan as a goal, consisting in all the choices that take into consideration different territorial situations and different human situations, underlining both their dynamics and interdependence [7].

Knowing deeply the situations and, as a consequence, physical environment potentialities, man can conveniently graduate his presence and his different activities on territory [8]. At this point, it’s clear that geographers in the past had already understood and debated these issues, but their researches weren’t well-known and completely utilized. In fact, G. Merlini and U. Toschi discussed about atypical industries in 1934, didn’t they mean an unbalanced territory, as it received a “geographical object” different from the one that it should have accepted to harmoniously develop [9]? And aren’t there metropolis examples of areas where the natural environment at first, and the human one then declined because of high concentration and exploitation levels? And the areas that didn’t develop connected to environmental and natural situations are abandoned or under-exploited [10].

It’s easy now to identify what Geography can do and has to do, starting from the physical environment analysis to obtain planning efficiency [11]. In fact, after studying physical environment potentialities, geography has to suggest and plan — increasing or decreasing some “geographical object” presence, dimension, typology, position if needed — in order to let environmental realities can continue their evolution more balanced [12]. This is the most true, complete and long-lasting form of planning. That’s to say, actions and interventions, that go beyond the restricted conception of planning, promote, without setbacks for the existing components, the harmonious development of the whole reality, considering the perfect relation between man and nature, that geographers have been pointing as the only chance for evolution [13].

For a long time press and television, in fact, have been debating topics regarding natural environment issues and their negative consequences on it and on population lifestyle and on economy, above all in industrialized and highly populated areas. Pollution, natural oases, agritourist areas, alternative energy resources, change in means of transport, etc., are the main issues, those who have driven researchers’ and journalists’ attention and are well-known to nowadays public opinion [14].

Many people don’t clearly understand that those issues, but not only them, coexist and are reciprocally influenced in every geographical entity, creating bigger involutions and diseconomies in natural and human environment, often irreversible, than those that can be evaluated taking into consideration every single cause. We need to become conscious of the need to examine issues connecting them to a bigger picture of the territory, where they create an inseparable system. There are extended areas, that can’t be identified as clear geographical entities, where you can organically plan reality, but there are other ones, for instance the Po river basin, where not only is planning possible, but needed as well, in order to highlight issue entirety and extent and from where it is possible to decide redevelopment planning choices [15].

2. Environment, Resources and Cartography

The Po river starts from a 2000 metre source as a small torrent, but it becomes powerful; it flows through the Padana plain, that he has always contributed to create and it’s got its delta, with different branches, in the Adriatic sea [16]. The Po delta has a value, naturalistically speaking, that exceeds national limits and can be compared to Danube, Rhône and
Guadalquivir rivers, which are now National Parks because of the conservation of their paludal areas.

The Padana plain represents one of the oldest highly populated areas in Europe. Its origins are connected to the Po river and glaciers, its ground is alluvial and soft and, despite at the beginning it wasn’t that fertile, thanks to man’s work it changed its features.

The Padana plain has been considered one of the most important European wheat belt for centuries, but cultivations changed over the years, and the area has housed, well distributed, secondary and tertiary sector activities. Cultivations vary from paddies to orchards and vineyards, but you can find willows, mulberries, elms as well; industrial crops and lawns offer a beautifully varied landscape. Industries, small and medium workshops are present everywhere and are not always depending on big cities [17].

In the areas in front of the Adriatic sea, lastly, tourist activity development hasn’t completely canceled wide lagoons and marshes, where fishing and hunting are still possible (in the equipped areas you can fish 7000 kgs/ha of basses, mullets, gilthead breams and eels per year).

The 30% of Italian population live in the Padana plain area, where you can find also 51% of industrial production, 25% of agricultural production, 50% of livestock and most of the energy production [18].

These few figures show the importance of the Padana plain area, where the Po river, with its direct and indirect influence, has always been the main character (think about floods) stressing both social and economic development. Yet, the Po River today is very polluted! In its flow you can find dregs, urban and industrial waste, fertilizers, other waste, both solid and non-recyclable, and liquid, coming from its tributaries [19].

Damages to population health and to economy are not quantifiable, so we can suggest just a general idea.

The huge quantity of nitrogen and phosphates the Po has and carries to the sea derives from agriculture (over-using fertilizers and pesticides), from livestock (industrial swine breeding with more than 5,000 animals), but above all from industry (sugar factories, canning industries, distilleries and refineries) and from domestic sewage and it also caused the eutrophication. This is the growth and the development of microscopic seaweeds that invade and pollute, after their death, bathing areas, but during the growing period they steal oxygen to the habitat and, as a consequence, to fish, as well.

The same substances, if appropriately collected, separated and selected, could be conveniently used to fertilize (fertigation) and thus not scattered in the sea where they are noxious [20]; unfortunately, with regards to this issue, there aren’t any real initiatives.

It is know that riverbed water is connected to aquifers, as well, not only to superficial ones; therefore river pollution affects them making water used by industries, farming and privately less potable. Some kinds of pollution negatively influence connections between riverbeds and aquifers. This is the case of the accidental spill of CONACO crude oil (Pavia), that damaged 240 kms of banks out of 800 kms [21, 22].

Yet, it had been observed before that biological balance of larvae (fish fauna nourishment), which lived along banks, was altered; that the percentage of hydrocarbons present in water used for irrigation and bovines was rising so much that diseases were spreading among animals; that in some paddies, plants were presenting traces of noxious substances in their roots and that underground filtering was compromised [23].

Because of the increasing demand of water for civil uses, watering and industries and because of the progressive depletion of Padana Plain aquifers, irreversible Po River pollution has to be considered as a priority. Yet, we don’t need to cry wolf, but we need to understand the dramatic situation created by pollution, which is involving the ecosystem in its whole.

Unfortunately, instead, appropriate and consistent actions are still missing, there are in fact few laws regarding this issue: among these we can find an anti-smog law made by Merli in 1966 (law n. 319), not
yet completely implemented in the territory. It is clear that the first steps have been taken under a localized point of view to make a quick fix to temporary, but unbearable, situations. Public authority initiatives (above all Piedmont, Lombardy and Emilia-Romagna [24]) have more incisiveness and immediacy, but they didn’t had tangible results, maybe because of a disconnection of the central power.

Moreover, other issues are added up. Firstly, territory water security: 1951 and 1966 floods are to be remembered and they led Po River Magistrate to face new studies on Padana plain hydraulics (Fig. 1). One hopes to obtain precise information about great works needed to overflow regimentation to avoid floods [25].

Another problem is the need of a huge amount of water, taken from the Po river, from its tributaries and from its many reclamation and compensation canals, to satisfy the increasing irrigation needs of the Padana plain agriculture (nowadays 65% of the water collected is destined to agriculture). The toxic substances accumulation often makes water unusable or detrimental to farming, causing reduction not really to product quantity, but quality, with a reduction of agricultural profitability, influencing tertiary sector activities connected to agriculture, in addition to public health damage.

The problem connected to water extraction is tightly related to summer droughts and to the lowering riverbed, depending on the removal of sand and gravel, as well as on the more general event of subsidence of Eastern Padana plain, accelerated by methane extraction. Speaking of which, Agriculture Ministry has got studies underway to identify tendencies and variations which can appear in 20-30 years.

The always increasing price of terrestrial means of transport makes the need to use productively Po river resources truer and truer [26]. Internal navigation, in fact, should gain great importance as far as Italian economy is concerned, as it’s more and more integrated in the European context, where, for instance, Rhône, Elbe, Rhine and Seine rivers are vital arterial river roads not only for the states they are in Refs. [27, 28].

River transport costs are comprehensively lower than road transport, a 70% less: the fact that fuel for waterways is 50% less expensive than fuel for land transport makes the difference [29]. It’s logic that river transport needs to be efficiently implemented in the Padana plain area and the Po river has to be the main road of the network (Fig. 2) [30].

Fig. 1  Polesine Area and Po River Delta Flooded in November 1951 (TCI Cartographic dpt.) [31]
1. River breaking banks
2. Flooded areas
3. Final Considerations

We have got a river, a true natural heritage, that should be protected, controlled and rationally used. Yet, there isn’t a working tool that could lead the development required; a project, thoroughly planned, that could direct interventions and financial subsidies, taking priorities into consideration, to create a complete territorial plan.

Facing Po river basin problems avoiding sector-based studies, and observing their complexity could mean to solve most old and recent river issues.

All this would allow to permanently set riverbeds, revitalize internal navigation, develop tourism, collect water for agriculture in the most appropriate areas, better use altitude differences to produce clean electric energy, limit the penetration of salt water, that tends to go upstream along the delta during dry periods, polluting aquifers.
A global project would be necessary, as we have already said: geographers will contribute to understand the global and uniform vision of social and territorial problems [32].

This essay is meant to be a call for those who recognize environmental protection as well as human protection, to take an interest to these themes not sector-based, but with a scientific and inter-disciplinary vision, not forgetting the moral perspective.

References


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