RISK AND FAIRNESS AS PLANNING FACTORS: CONSOLIDATING THE SHARED AREA OF INVESTIGATION BETWEEN PLANNING THEORY, RISK THEORY AND ETHICAL INQUIRY

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Abstract

The matter of siting technological risks according to considerations of compatibility between hazards and urban areas has only recently been object of rigorous theoretical definitions in planning literature. This contribution is a further effort in this direction. Its aim is to delimit the shared area of investigation among risk theories, planning theories and ethical inquiry by building upon, particularly, Beck's discourse on risk (1996), the Rawlsian theory of distributive justice (1971) and its transposition into planning theory as done by Moroni (1994, 1997). By elaborating on these writings the contribution proposes that the equal distribution of technological risks in society through spatial planning instruments should be become an explicit aim of the planning practice. This is discussed by referring to a recent case of siting of a CO2 underground disposal in The Netherlands, here only narratively discussed at the end of highlighting some paradigmatic aspects of the relevant decisional process. Indications of the research trajectories to be followed for cementing this theoretical framework on the ground of empirical findings are mentioned in the conclusions.

Key-words: risks; fairness; siting of hazardous technologies; land use planning

1. Introduction

Although it is among the most prominent interdisciplinary themes to have emerged in the past two decades, the prevention of site-specific technological risks has only recently been object of rigorous theoretical definitions in spatial planning literature. The latter has given great attention to the ethical implications of the siting of risk-bearing installations, particularly regarding the legitimacy and fairness of decisional processes (Boholm 2004, Hayden-Lesbirel and Shaw 2005). This paper develops these reflections further. In particular it focuses on the role that considerations of "justice as fairness" may have in guiding planning decisions related to the siting of impacting and risky technologies meant to support the transition towards a non-fossil fuel era. An opportunity to reflect upon these emerging technologies is offered by the recent case of proposed siting of a CO2 underground disposal in The Netherlands, here only narratively discussed at the

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end of outlining the main elements of the relevant appraisal that support our arguments.

The contribution builds upon previous writings that started to explore, respectively, the challenge of distributing technological risks fairly through spatial planning instruments (Basta 2012) and the broader horizons of a planning theory based upon individuals' responsibility of supporting fair siting processes by means of active forms of collaboration (Basta 2012). In order to take these reflections further this paper develops, particularly, the discussion initiated in the former of these writings. At this scope the article starts with introducing Beck's discourse on risk (1982: 1996) and the theory of justice of Rawls (1971) as developed in planning theory by Moroni (1997). The main idea put forward is that of *safety as a primary spatial good*, that is, as a good to be equally distributed in society through spatial planning instruments. The following discussion revolves around the matter of its concrete application to the case of hazardous facilities, with special attention given to the emerging technologies meant to support the transition towards a non-fossil energy era. The focal point of the contribution (which, note, is primarily a theoretical contribution) is adding to the debate on the siting of these controversial installations by discussing the operationalization of the notion of *fairness* as a concrete planning factor. The example to which the paper will refer in order to support its arguments is the recent case of rejection of a CO2 underground disposal by the side of the population of Barendrecht, in The Netherlands. By highlighting some arguably paradigmatic aspects of the relevant controversy the paper highlights some distinctive elements of the increasingly relevant problem of balancing considerations of (global) benefits against considerations of (local) justice when selecting the appropriate site for intruding technologies. It is suggested that opting for the "right" site on the ground of costs / benefits considerations only, while exposing localities to immediate impacts and potential risks, may be not justified when considered under a light of both intra- and intergenerational fairness. The paper concentrates, particularly, on the former point and argues that the criterion of fairness in distributing impacting technologies at regional and national scales should inform the notion of "feasible" site together with all other technology-specific, site-specific and environmental-specific criteria. In the conclusions, some indications regarding the empirical research needed to support these preliminary considerations are given.

In the following sections the theoretical background of the contribution is introduced together with a short story-line of the example the article will refer to along its development.

2. Risk and fairness in (planning) theory: some preliminary notes

Rawls' *Theory of Justice* (1971) has been one of the most influential political philosophy theory of the past century. By its side , Beck's discourse on risk (1992) has been one of the most influential sociological theories of the last decades. The essentials of both theories and their relevance to our discussion are shortly recalled in the following.

As known the pillars of the Rawlsian theory are the conception of "primary good" and the two principles of justice. The former refers to the goods each individual would be entitled to following the contract that would regulate individuals' coexistence within a fair society. These goods would be identified by moral judges acting behind the "veil of ignorance"; that is, without knowing what their social, ethnic and religious statuses would be in a real setting. Arguably these moral judges would identify as "primary" the system of liberties and essential means each individual would need in order to develop the own self freely. Such liberties and means are those that can be equally assigned to anybody without violating others' liberties. Freedom of speech, of religious orientation and access to basic education are some examples. The two principles of justice relate to this conception of primary goods by, respectively, stating the obligation of their equal distribution in society (1st principle) and by legitimizing inequalities only when they do benefit the whole up to the most disadvantaged (2nd principle). The distinctive aspect of the Rawlsian conception of justice is therefore aiming, rather than to a restrictive form of social equality, to prime distributive mechanisms that would put all in the same initial condition. In more simple words, the fair society the philosopher had in mind is not a society in which everybody is equal in terms of status and belongings; but rather a society in which everybody has access to the essential means and rights needed to develop the own aspirations. Rather than a radical conception of equality as "leveling differences", the libertarian conception of justice put forward by Rawls is therefore "departing from the same set of essential means". This conception does therefore not exclude differences among social statuses; it does rather exclude the preclusion for some to climb up to higher conditions of education and wealth by guaranteeing to all a common "line of departure".

Beck's discourse on risk (1992) has interesting moments of affinity with this authoritative political philosophy theory. The German sociologist argued that one of the most distinctive developments that took place after World War II has been that of creating yet unknown forms of technological risks, unequally distributed in society next to the historical rooted unequal distribution of wealth. His work *Risk Society* (1992) is a collection of thoughts that revolve around the observation that the current economic development pattern, embraced in late modernity by Western society, is based on a massive introduction of hazardous technologies of unknown risky potentials. These technologies, among which we could cite nuclear, chemical and energy installations, create forms of inequality not only regarding the access to the produced benefits; but also in relation to the exposure to the relevant risks. In this vein Beck argues that current society is a "reflexive society", that is, a society that re-organizes its governing bodies and practices departing from a new awareness of the unwanted consequences that certain choices entail. In this view risks become the inevitable counterparts of the pursue of benefits; and as the former, they are distributed unequally. Note that according to Beck's early writing (1982:1996) the latter are no more tight to the place of origins, as their effects overcome spatial and temporal horizons; however, it is consistent to add that the site-specific among these risks create *de facto* situations of unequal exposure. Thinking of Rawls' idea of

justice, we can hence easily conclude that technological risks are therefore distributed *unfairly*.

The planning literature has been penetrated by both theories substantially, to the point that a thorough referencing of main contributions would constitute a work in its own. In the case of the Beckian discourse on risk the planning literature has given relevance to aspects of the theory other than specifically technological risks, particularly the notion of “reflexive modernity” and the consequent horizons of a reflexive planning discourse (Howe and Langdon 2002). Others instead concentrated on the “ideology of certainty” that kept permeating the planning system until “risky realities” started to be acknowledged as the only possible reality (particularly, Gunder 2008). Rawlsian lines of inquiry, by their side, penetrated the planning literature in, among others, the works of Harper and Stein (1992), Moroni (1997), Stein and Harper (2005) and Fainstein (2010). In light of the scope of this article I will elaborate on these latter lines of investigation more at length.

The planning theorist Moroni (1997) argued in details on the implications of the Rawlsian conception of “primary good” for the spatial planning theory. Replicating the line of reasoning of the moral judges acting behind the veil of ignorance, Moroni argues that decent housing, the access to green areas and to sufficient transport are the "primary" among the spatial goods. Such spatial goods constitute the basic “spatial” condition each individual should depart from in order to pursue the own objectives of self-realization and happiness. As such, they constitute the basic “spatial rights” that should be guaranteed to each member of society up to the most disadvantaged.
A sure point of interest of Moroni’s elaborations is his addition, to the list of primary spatial goods, of a "safe living environment". This entails that, in principle, all members of society are entitled to live in “spatially safe” conditions. Although Moroni doesn’t discuss this point at length, arguably this condition includes living protected from major hazards and being exposed to tolerable levels of risk.
This is in interesting point as it relates to the matter of siting hazardous and risky technologies and planning the surrounding urban areas accordingly. This matter is well known in planning literature, to the point of having given birth to a dedicated literature. Within it, two main lines of investigations can be identified. The first collects contributions revolving around epistemological and normative questions whose primary scope is advancing interpretational instruments for evaluating the implications of the siting of controversial technological installations from the policy and normative perspective (Boholm and Lofstedt 2004, Hayden-Lesbirel and Shaw 2005). Here, identifying the distinctive elements of Not In My Backyard (in the following: NIMBY) vs. non-NIMBY cases in such a way to enable the correct framing of siting controversies is a main point of interest (Boholm 2004, Owens 2004a). Note that several ethicists followed the same lines of investigation (for example Peterson and Hansson 2004; Hermansson 2007), contributing to form an “ethics of siting” literature of fundamental complementary value for the planning scholarly community.

A second mainstream of planning research focused on the more pragmatic problem of advancing analytical instruments that may support a safe allocation of land uses in relation to risks and hazards. Rather than to the debate on the epistemological and normative implications of siting processes, this second literature has rather contributed to establish an interdisciplinary corpus of notions and methods that may support the elaboration of land use plans compatibly with site-specific risks and hazards. Being this literature more focused on the practice than on the theory of siting, the relevant contributions are often based on the analysis of specific cases, hence types of installations together with their geographical implications (Basta et al. 2006; Basta et al. 2008; Schmidt-Thomé 2006, Schmidt-Thomé and Kallio 2006; Menoni and Margottini 2011). Because of its operational emphasis, extra-disciplinary contributions aligned with the scope of this literature are mostly provided by risk analysts (for example Bandini et al. 2006; Christou and Mattarelli 2000).

The scope of this paper is more aligned with the lines of the inquiry of the former literature described and builds, in particular, upon those contributions that investigated what makes a siting process a legitimate and "fair" process (Boholm 2004; Linneroth-Bayer 2005). Nevertheless inputs from the second stream of literature will be recalled when discussing the case-study in section 2.2.

Going back to the notion of primary spatial good as introduced in planning theory by Moroni (1994, 1997), the main theoretical implication is that aim of the planning practice should become distributing spatial safety in society equally up to its most "spatially disadvantaged" members. The main evaluative implication of this position is that there exist a "level" of spatial safety each individual is universally entitled to. Arguably this level has a concrete geographical dimension (for example "distance from", or "emergency routes towards") and its means of distribution are planning instruments: particularly, land use plans.

This is an apparently banal, yet important conclusion. Asserting that spatial safety is a primary good and that there is a level of it that should be equally guaranteed in society entails that safety, and fairness, become concrete planning factors: that is, they are a *dimension* and a *criterion* that should guide planning decisions in relation to risks and hazards. This is not banal especially when thinking that most of siting evaluations, in greatest part taking place under the supervision of institutional actors, are carried out by means of costs/ benefits analyses grounded upon a technical assessment of the risks at issue. Usually such appraisals consider a number of candidate sites and rank them accordingly to a rigorous technical consideration of the economic and social costs, against the benefits, of each alternative. The site chosen as the "appropriate site" is then usually promoted by risk information campaigns meant to enhance a perception of risk consistent with the "technicality" informing its appraisal. The supposed neutrality of the technical appraisal that informs such evaluative processes excludes considerations of subjectivity in risk perception together with distributive considerations, for example in relation to the installation of facilities in areas already exposed to industrial and infrastructural impacts.

This typical story-line replicates in most of documented cases of controversial siting practices referenced in this paper and, as discussed in past literature, stands at the

basis of the arguments that support the NIMBY rhetoric (Hermansson 2007). Here, narrow-minded locals motivated by selfish purposes are seen in contraposition with institutions acting in defense of the general interest. Owens identifies this as the "techno - rational" model of appraisal, consisting in "a process in which scientific advice, grounded in a positivist epistemology, translates straightforwardly into the substance of policy, and a `separation of powers' is deemed to exist between neutral, authoritative experts and the decisionmakers whom they advise" (Owens 2004b, p. 1945). In the specific case of siting of hazardous, risky and stigmatizing installations the advice of the neutral actor (usually a public research or environmental agency) becomes instrumental to the "implicit policy" motivating governmental decisions. Inevitably this creates a form of insolvable epistemological opposition in which two polarized parties have no possibility of dialoguing, being the only "truth" admitted in the arena the one expressed by the third, supposedly neutral, advising actor. Any dialogic solution of the controversy is therefore impossible.
But leaving aside the epistemological implications, this article wants to highlight how this predominant decisional model excludes any distributive consideration. When carried in this way, the inventory of candidate sites and the search for the "feasible" one restricts the assessment to their specific local features, without considering how each site would contribute to the distribution of technological risks at a higher scale; for example the regional or national scale. In other terms, localities already at-risk because of a concentration of industries but offering, precisely for this reason, a pre-existent infrastructure that would facilitate the installation of additional facilities are rarely discarded. Somehow, the possible violation of individuals' primary spatial rights and situations of risk exposure inequality in society keep being excluded from the aspects to be considered prior to legitimize siting decisions.
This will appear particularly evident in the case of CO2 underground disposal in Barendrecht (NL) discussed in the following. After its narrative illustration it will appear clear that whereas the notion of safety as primary spatial good does not solve the inevitable conflict of interests that will continue to animate the debate around controversial siting processes, it may provide those normative fences within which the relevant discussion could be framed. However before this discussion some words of caution that could guide the further reading are provided.

2.2 From theory to practice: some words of caution

In this section I will try to outline the practical implications of the conception of spatial safety as primary good more in details. However I would first clarify some possible deadlocks of my line of reasoning. Note that at the present stage of elaboration this paper does not offer empirically grounded arguments; it only addresses some preliminary considerations around one recent case of siting controversy that are considered paradigmatic in relation to the premises of my discourse. Indications for the further empirical research needed are given in the conclusions.

First of all, the main idea of this paper is that the unequal (technological) risk distribution identified by Beck as a distinctive element of late modernity has to be

approached, in both planning theory and practice, as a problem of inherent ethical nature. It is, in essence, a matter of inequality and of consequent unfairness; something that the planning practice ought to remove. However evidence suggests that this aim is confronted with a number of economic, social and obviously spatial constraints. As documented by Schmidt-Thomé (2006) the concentration of hazardous industries in certain European regions is inherited from the past and mirrors a corresponding concentration of industrial and services productive capacity. The European policy debate around the need to preserve these assets while ensuring a sustainable cohabitation between hazards and nearby population is an equally long-lasting debate. The latter gave birth to regulatory developments of due, yet complex implementation (Basta 2009). The balance between economic, spatial, legislative and ultimately cultural aspects of each national context called to regulate land-uses according to past, present and future risks is still a problematic, when not unsolvable problem (Basta 2011, Basta 2012).

However, underlining the normative deficiencies of the predominant techno-rational evaluative model is a due step forward for developing the relevant debate. This will become clear in the following section, wherein a paradigmatic case of an "unfair" planning practice in relation to a CO2 underground disposal is described.

2.3. The proposed siting of a CO2 underground disposal in a Dutch municipality: NIMBY or unfairness?

The case of the CO2 underground disposal proposed for siting in 2009 in the Dutch city of Barendrecht was discussed, under a different light, in a previous contribution (Basta 2012). The main elements of the story-line of this case will be here shortly recalled so to be discussed in relation with our theoretical premises, particularly in relation to the principle of fair distribution of technological risks through spatial planning instruments.

In the course of 2009 the municipality of Barendrecht, in the southern part of The Netherlands, engaged an open conflict with the Dutch government in relation to the proposed siting of a CO2 underground disposal. The local population opposed the pilot-project, which should have led to the installation of the disposal within the following few years, principally on the ground of its impacts on the local real estate market and the image of the town. Meaningfully, manifests claimed "we do not want to become the national CO2 dumping place" Following the first episodes of local opposition the debate on the technological option of CO2 underground disposals became of national resonance, leading several Dutch municipalities to reject, in advance, the possibility of being candidate sites for future disposals. Somehow, an initially "local" case of opposition to a specific installation became a sort of national movement against the very technology.

By its side, the Dutch government kept defending the project on the ground on the own policy objectives of climate change response. The promoter of the pilot-project was a known (inter)national oil corporation, acting in concert with the government at the end of promoting Carbon and Capture technology as a means for abating carbon dioxide emissions. This technology allows to capture emissions "at source" and

storing them underground into exploited gas fields. In order to assess what the best possible location for the disposal could have been the Dutch government delegated a feasibility study to the Applied Research Institute (in the following: TNO). 12 possible locations, precisely 7 off-shore and 5 inland locations, were considered in the relevant study (Breunese and Remmelts 2009). Among the 12 candidate sites the municipality of Barendrecht was the more densely populated. Nevertheless the geological characteristics of the gas field underneath its surface and some key technological constraints (among which the length of the pipelines connecting the points of emission, specifically the nearby refineries, to the storage), led the research agency to conclude that Barendrecht was the most suitable candidate site for proceeding with the pilot-project. The government defended this choice by recalling the main national interest, specifically alleging that "capture and storage of CO2 is a necessary transition technology to help cut carbon emissions" (Reuters, November 18, 2009).
The story-line of the Barendrecht case recalls the typical "techno-rational" model of appraisal mentioned above (Owens 2004b). The "owner" of the decision making process was the central government who, consistently with an explicit policy objective, delegated the inventory of possible sites to a supposedly neutral advisory body. The latter assessed a number of candidate sites on the basis of several criteria, among which the geological characteristics of available gas fields, the costs of each alternative and the technological requirements to be met (Breunese and Remmelts 2009). Among the candidate sites the area of Barendrecht was the most densely inhabited; nevertheless the main reason for its indication as suitable site seemed to be the criterion of cost-effectiveness, which explicitly related to the distance between CO2 sink and sources. The distance between the exploited gas field of Barendrecht and the source of CO2 emissions was estimated 20 km; all other sites were in the range of 75 up to 210 km. Here, "the fact that the Barendrecht field is located under a built area is not of a (geo)technical nature and therefore impossible to weigh against the other geotechnical factors considered" (Breunese and Remmelts 2009, p. 26).

By looking at the media that broadcasted the controversy the citizens of Barendrecht manifested against the pilot-project on the ground of their concerns regarding, particularly, the feared economic impacts of the installation on real estate market values and on the image of the locality, already "featured" by the massive presence of industries and refineries in the nearby area of Pernis, and the risks of release of CO2 from the underground with all possible environmental and health consequences. In both cases, the reasons for opposing the installation seemed to depict a NIMBY story-line: *not here, not now*.

But a different outlook on the opposition to the installation could be considering the already high concentration of industries in the area and its being inhabited in comparison to the other clear sites that were considered. The point of attention here is whether the fact that the site chosen was the only inhabited site, already dealing with the proximity of major industrial installations, was a factor to be considered prior to achieve the conclusion of its "feasibility" for the proposed project. When reading the technical report of TNO it emerges with clarity that the inventory of

candidate sites did not consider this aspect; being the evaluative criteria solely of geo-technical and economic nature, the study did rather allegedly neglect it. The chosen technical criteria did evidently exclude any other consideration regarding the impacts and risks distribution each site would have created at regional and national scale. In this perspective, more than something to consider in advance the population of Barendrecht seemed rather the problem to solve. When looking at the following rejection of the installation by the side of the local population, questions of ethical relevance do therefore inevitably arise. Is it fair not to consider the exposure of citizens to the impacts of installations among the criteria of appraisal of different candidate sites? Thinking in Rawlsian terms, is the individual right to spatial safety violated when not doing it? Should the facility at issue concretely benefit the whole, and hence social inequality being justified, shouldn't the most disadvantaged being compensated with other forms of primary benefits that could counterbalance their increased exposure to impacts and risks?

As anticipated at the present stage of elaboration the paper does not provide definitive replies to these questions; it only outlined a framework that allows to pose them with a certain rigor. Preliminarily, it is reasonable defending that when among the criteria used to review the 12 sites the criterion of "not exposing inhabitants to impacts and risks" or "not worsening pre-existent conditions of risk exposure" would have compared, the site of Barendrecht *could* have been discarded; or even not being considered at all. On a marginal note, it is important to notice that this could have steered the following national debate on Carbon Capture and Storage technology towards a different direction.

These hypotheses do not intend to promote a firm position regarding the specific case narrated here. However it is suggested that distributive considerations among the criteria to be accounted when evaluating the "right" site for an impacting installation may provide the normative solidity to the appraisal seemed to miss here. This is further discussed in the following, where suggestions for steering the (empirical) research in a direction capable of providing more definitive indications are given.

3. Towards a planning theory of fair risk distribution? Conclusions and ideas for discussion

This paper recalled some main political philosophy, sociological and planning theories at the scope of identifying some possible shared areas of investigation. In particular, the contribution intended to sign some trajectories of research that could provide valuable answers to the problem of justifying decisions related to the siting of hazardous site-specific installations by considering multiple perspectives, and particularly a perspective of fairness. Risks, fairness and siting of hazards are therefore the three key-words that best summarize the ideas that were here taken together.

These research trajectories are surely promising, as they do tackle the emerging problem of balancing global vs. local risks when siting energy facilities meant to support a transition towards a non-fossil energy era. Emerging technologies like CO2 underground disposals and renewable energy facilities are indeed serving the global objective of abating climate change; however they do also create impacts on localities of sometimes controversial pre-assessment. Here, distributive considerations regarding individuals' right to access an equal level of spatial safety may become the normative boundaries within which framing siting decisions, and thereby interpreting possible controversies.

The lack of such considerations in the predominant techno-rational model of appraisal described above was illustrated through the example of a recent case of opposed siting of a CO2 underground installation in a Dutch municipality. This case can be seen under different lenses when considering a more equal distribution of impacts and risks at regional or national scale as a neglected criterion of the evaluative process. Among 12 candidates the Dutch government opted for the only densely inhabited one, known for being already exposed to a massive presence of industries in the nearby area of Pernis. The latter area was indeed the main source of CO2 emissions. Considering the characteristics of the gas field underneath Barendrecht and its vicinity to the source, it resulted both economically and technologically sound to site the sink there. However, the criterion of fair risk distribution in society could have provided a normative perspective on this decision and possibly led to different results. But beyond this hypothesis, it would have at least provided a shared normative ground upon which basing the debate, whose only possible outcome under the present conditions could have been solving the polarization between the government and citizens with either a forced prosecution of works or the sinking of the project.

These are only suggestions that call, of course, for sound empirical research. In particular a needed research effort is keeping documenting the "specifics" of each risk-bearing technology and its set of technological and spatial implications in such a way to identify, with rigor, the consequent ethical implications. This is currently under development in the context of the Network Infrastructures & Mobility course at the Environmental Science Department of Wageningen University. The research conducted in the framework of this area of teaching approaches major infrastructural projects from a threefold perspective. This includes a dimensional, an impacts and risks and the ethical perspective. In the course of 2012 this threefold outlook will lead to elaborate guidelines for performing an integrated Spatial Ethical Technological Assessment (SETA) of infrastructural projects, ranging from individual installations like the one discussed in this article to major energy and transport networks.

The undergoing elaboration of SETA guidelines is obviously not meant to prevent the possible opposition of citizens confronted with the siting of intruding technologies; but only to provide a solid normative ground upon which basing the discussion among involved parties. This paper wished to sign some possible research trajectories that promise to lead to its establishment.

References

Bandini et al, 2006. Application of land-use planning criteria for the control of major accident Hazards: a case-study. Journal of Hazardous Materials 136, pp. 170–180

Basta C., Neuvel J. and Zlatanova S., 2006. Risk-Maps Informing Land Use Planning Processes. Journal of Hazardous Materials 145, 1-2, pp. 241-249

Basta C., Struckl M. and Christou M.D., 2008. Implementing Art. 12 of the Seveso II Directive: Overview of Roadmaps for Land Use Planning in Selected Member States, JRC Technical Report, EUR23519 EN

Basta C. 2009. Risk, Territory and Society: Challenge for a Joint European Regulation, PhD Thesis, Delft University of Technology.

Basta C., 2011. Siting Technological Risks: Cultural Approaches and Cross-Cultural Ethics. J. Risk Research, 14(7), pp. 799-817

Basta C. 2012. Risk and Spatial Planning. In Roeser S. (Editor in Chief), Handbook on Risk Theory. Springer: Berlin

Beck U., 1992. Risk Society: Towards a New Modernity, Sage: London

Boholm A. and Lofsted R., 2004. Facility Siting: Risk, Power and Identity in Land Use Planning. Earthscan: UK

Boholm A., 2004. What are the new perspectives on siting controversies? Journal of Risk Research 7 (2), pp. 99-100

Breunese J.N. and Remmelts G., 2009. Inventory of potential locations for demonstration project CO2-storage, TNO-034-UT-2009-02024, The Netherlands

Christou M.D. and Mattarelli M., 2000. Land-use Planning in the Vicinity of Chemical Sites: Risk-informed Decision-making at a Local Community Level, Journal of Hazardous Materials 78, pp. 191-222

Fainstein S.S., 2010. The Just City. Cornell University Press: US

Gunder, M., 2008. Ideologies of Certainty in a Risky Reality: Beyond the Hauntology of Planning, Planning Theory 7:2, pp. 186-206

Hayden Lesbirel S. and Shaw D., 2005). Managing Conflict in Facility Siting. Edward Elgar: Cheltenam

Harper T. and Stein S., 1992. The centrality of Normative Ethical Theory to Contemporary Planning Theory. Journal of Planning Education and Research 11 (2), pp. 105-116

Hermansson H., 2007. The Ethics of NIMBY Conflicts, Ethical Theory and Moral Practice 10 (1) pp. 23-34

Howe J. and Langdon C. (2002), Towards a Reflexive Planning Theory. Planning Theory 1 (3), pp. 209-225

Linneroth-Bayer J., 2005 "Fair strategies for siting hazardous waste facilities", in Lesbirel S.H. and Shaw D., eds, *op. cit*.

Menoni S. and Margottini C. (eds), 2011. Inside Risks: A Strategy for Sustainable Risk Mitigation, Springer Verlag: Milan.

Moroni S., 1994. Territorio e Giustizia Distributiva (English trans.: Territory and Distributive Justice), Angeli: Milan

Moroni S., 1997. Etica e Territorio (English trans.: Ethics and Land Use). Angeli: Milan;

Owens S., 2004a. Siting, Sustainable Development and Social Priorities, Journal of Risk Research 7 (2), pp. 101-114

Owens S., 2004b. New agendas for appraisal: reflections on theory, practice, and research. Environment and Planning A 36, pp. 1943-1959

Peterson M. and Hansson S. O., 2004. On the Application of Right-Based Moral Theories to Siting Controversies. Journal of Risk Research 7 (2), pp. 269-275

Rawls J. 1971. A Theory of Justice. Harvard University Press: New York

Schmidt-Thomé P., 2006. Integration of Natural Hazards, Risk and Climate Change into Spatial Planning Practices, PhD Thesis No.193 of the Department of Geology, University of Helsinki;

Schmidt-Thomé P. and Kallio H., 2006. Natural and Technological Hazard Maps of Europe, in P. Schmidt-Thomé (eds), Geological Survey of Finland, Special Paper n. 42

Stein S.M. and Harper L.T., 1993. Rawls's 'Justice as Fairness': A Moral Basis for Contemporary Planning Theory. Planning Theory 4 (2), pp. 147-172