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Author: Magnani, Natalia

Source: Mountain Research and Development, 40(3)

Published By: International Mountain Society

URL: <https://doi.org/10.1659/MRD-JOURNAL-D-20-00035.1>

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Beyond NIMBY: Mobilization Against Mini-hydroelectric Power in the Italian Alps

Natalia Magnani

natalia.magnani@unitn.it

Department of Sociology and Social Research, University of Trento, Via Verdi 26, 38122, Trento, Italy

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This study focused on new pressures on water resources in relation to the production of renewable energy in Italy. In particular, I considered the conflicts that have emerged in the Trentino region around mini-hydroelectric power

production. Literature critiquing the Not In My Backyard (NIMBY) approach provided the basis for analyzing the characteristics of this opposition movement. I argue that the anti-mini-hydro movements only partially challenge the NIMBY definition. At the discursive level, such mobilizations articulate a broader discourse opposing mini-

hydroelectric production as a climate change mitigation strategy and promoting a vision of the river as biodiversity to be protected. Moreover, at the sociospatial level, the anti-mini-hydro movements reveal an ability to forge alliances among different sectors of broader society. However, no broader discourse is articulated on the energy transition. The anti-mini-hydro movement can therefore be characterized as a form of “localist environmentalism” combining place attachment and nature conservation.

Keywords: mini-hydroelectric power; renewable energy; environmental conflicts; NIMBY; Italian Alps.

Peer-reviewed: August 2020 **Accepted:** October 2020

Introduction

Italy, like other European countries, has committed to generating 28% of its energy from renewable sources by 2030. However, at present, only 17.5% of its energy is from renewables. Achieving the target involves dealing with opposition from local territories—especially rural areas where renewable sources are mostly located (Osti 2013; Gross and Mautz 2015).

In this paper, I focus on a rather neglected renewable energy source, namely mini-hydropower. In both developing countries and industrialized nations, the development of small hydroelectric power has recently been promoted in climate change mitigation projects. Despite its increasing diffusion, there is little consideration in the literature of the social challenges linked to the development of hydroelectric sources. In particular, small hydropower's social and environmental impacts are rarely acknowledged (Kelly-Richards et al 2017).

As stressed by Bracken et al (2014: 93), “mini-hydro is often portrayed as a rather benign technology with respect to other technologies.” Accordingly, most research around this technology has been dominated by a technical approach. However, as will emerge here, in fragile mountain areas, this renewable energy source has important social and environmental implications and is often controversial (Armstrong and Bulkeley 2014; Silber-Coats 2017).

This focus on mini-hydroelectric power production in Italy is particularly relevant because hydroelectric power is the most important renewable energy source for the country in relation to electricity production. Up to the 1960s, about 80% of Italian electricity requirements were satisfied by

these plants, spreading from the Alps to the Apennines (Legambiente 2018). In 2016, the contribution of this source was 15.3% of the net total electricity produced. Installations in recent years use different technologies. They are almost exclusively “run of river” systems producing less than 1 MW of power (mini-hydro). Mini plants represent 69% of the total number of hydroelectric plants. Those producing between 1 and 10 MW represent 23%, while those producing over 10 MW represent 8%. High-altitude rivers in Alpine valleys, which, until recently, were free from plants, are today affected by several requests for diversion for mini-hydro facilities, often involving smaller rivers not registered in the water protection plans and which therefore cannot be controlled (Cozzarini 2018).

Working from these premises, the key research questions I addressed are: Does the movement opposing mini-hydroelectric power production challenge the Not In My Backyard (NIMBY) label it is often given by proponents of the renewable energy facilities? If so, in which ways does it do so? I begin by outlining the theoretical and methodological framework of my research based on a critique of the NIMBY concept. Then, I deal with local mobilization against mini-hydro as it has emerged in Trentino province, in northeast Italy (latitude 46°4'45"48N; longitude 11°7'48"72E). Finally, I draw conclusions from the case study.

Theoretical and methodological framework: critique of the NIMBY concept

The theoretical framework of this study is represented by the literature on renewable energy conflicts and the NIMBY

concept. In this section, I analyze the main features of so-called NIMBYism and its critique.

As argued by Bell et al (2005) and Devine-Wright (2011), accusations of NIMBYism have played a key role in shaping how industry, policymakers, the media, and sometimes even academics respond to the skeptical responses of local residents to projects for renewable energy.

Indeed, the acronym NIMBY has a long history in environment–society relationships. It emerged in the 1970s and 1980s in relation to the phenomenon of opposition to the localization of nuclear plants and high-emission industries, becoming a widespread practice in the United States, and then also in Europe. The dispute prominently featured committees of citizens who mobilized spontaneously and who were united by attachment to a locality. The press and representatives of institutions and companies developed a short and effective label to identify these citizens: NIMBYs.

As emphasized by Freudenburg and Pastor (1992), three main assumptions implying specific views of the public are associated with the term NIMBY: selfishness and consideration only for their own particular and local interests; irrationality and a lack of balance in the assessment of the risks leading them to oppose the initiatives; and superficiality and ignorance of the actual consequences of the initiatives proposed.

In the academic literature, many critical analyses of the NIMBY label can be found. Many social scientists (eg Wolsink 1994, 2000, 2006; Devine-Wright 2005; Burningham et al 2006; van der Horst 2007) have argued, based on empirical research specifically in the context of renewable energy sources, that the NIMBY concept is a misleading way of understanding local objections. Indeed, many consider the NIMBY syndrome to be a myth. These studies have critically deconstructed the assumptions upon which the NIMBY concept is based.

First, regarding the accusation of selfishness, the action of opposition committees often focuses less on the localization of the plant than on the mode of intervention or type of solution proposed to solve the problem. In particular, Wolsink (1994, 2000, 2006) stressed that objectors generally question the need, and the social and environmental desirability, of the facility to be placed anywhere, not just in their “backyard.” The term NIABY (Not In Anybody’s Backyard) is used to refer to protestors who contest a facility in principle rather than one in a specific locality (Schaffer Boudet 2011).

Second, several studies (Davies 2006; McClymont and O’Hare 2008; Rootes 2013) have stressed that, in many cases, the action of the committees has moved beyond the limits of the narrow localization battle by forging alliances with other local committees and with supralocal associations.

Another key assumption of the NIMBY concept concerns the question of emotionality, excess of concern, and the overestimation of risks that are not supported by rational arguments. Here, empirical research has highlighted the observation that local committees often demonstrate a reasonable assessment of the risks involved in the implementation of the planned works, while the proponents and administrations, and respective experts, underestimate the damage. These aspects clearly emerge when the local committees themselves resort to counterexpertise (Pellizzoni 2011; Kasperson and Ram 2013). The expansion of the

debate stimulated by these committees often results in constructive support of a different, more sustainable technological and organizational solution (Magnani 2012).

Assumptions concerning the consequences of the NIMBY approach have also been contested, in particular, questioning the idea that opposition to renewable energy plants is necessarily negative. Many studies (eg Bell et al 2005; Wolsink 2006; Sébastien 2017) have shown that local opposition movements do not necessarily produce mistrust, but they can instead favor the strengthening of proximate social links and the mobilization of some forms of social capital.

Building on this literature review and critique of the NIMBY concept, in this study I focused on grassroots protests that have emerged against mini-hydro in Trentino province, Italy. My key research questions were: Do the anti-mini-hydro movements in Trentino challenge NIMBY definitions? If so, how?

In answering these questions, I analyzed movements against mini-hydro in northern Italy in relation to the following key dimensions derived from the literature review: (1) ability to reframe the issue in terms of general interest; (2) mobilization of counterexpertise; (3) ability to elaborate constructive alternative solutions for the energy problem; (4) ability to join supralocal networks; and (5) ability to create and mobilize forms of social capital.

I used a qualitative investigation, based on thematic analysis of 10 semistructured interviews conducted between May and July 2019 with representatives of the committees in Trentino province that have emerged to oppose the mini-hydroelectric power plants. The respondents were selected through a snowballing approach, starting with key leaders of the committees and then expanding the sample. Particular attention was given to including representatives of the different stakeholder groups participating in the committees, namely local citizens, fishing enthusiasts, and environmental and tourist associations. The interviews were structured according to the 5 key analytical dimensions highlighted above. The main objectives of the interviews were to reconstruct the discourse articulated by the committees and to identify social practices around the river promoted by the opponents.

This study does have some limitations. In particular, I only interviewed representatives of the committees, while the possibly diverging positions of local citizens who were not members of the anti-mini-hydro social movements were not investigated.

Mobilizations against mini-hydro in the Trentino region

In this section, I focus on social movements against mini-hydroelectric plants in the Alpine area of Trentino. This context is particularly interesting because small hydropower development typically affects mountain areas, which are especially sensitive to climate change and are rich in both biodiversity and cultural diversity (Kelly-Richards et al 2017). Moreover, this geographical area was chosen as a case study because it is one of the mountain regions of Italy where conflicts over mini-hydro first emerged and where attempts to regulate this use of water were first adopted.

The management of water is an old issue for the Trentino region. As early as 1996, fishing enthusiasts, environmentalists, canoeists, and spontaneously formed committees joined together in the Committee for the Defense of Trentino Waters. For a decade, this committee engaged in various environmental battles to prevent intensive hydroelectric exploitation and to promote careful planning of the use of public water and the implementation of European water directives. The result of that period of mobilization was the implementation of the Minimum Vital Flow (*deflusso minimo vitale*, DMV), a decisive tool used to restore life to small and large rivers. Indeed, Trentino was the first region in Italy to adopt this tool. The DMV defines the minimum quantity of water that must remain in the river after diversion. Another important step was the approval in early 2006 of the first *General Plan for the Use of Public Waters*.

Following the approval of these policy tools, rivers that until then had almost disappeared from the landscape acquired new life. Moreover, a moratorium until 2006 resulted in no new concessions being issued for small diversions.

However, since 2007, there have been increasing requests for mini-hydroelectric plants by public bodies, consortia, mixed companies, and private companies. These are favored by incentives for renewable energy production and the possibility—also extended to private actors—of obtaining a “declaration of public utility urgency” on the basis of the importance given to renewable energy in the fight against CO₂ emissions. This “declaration” implies a specific governance of hydroelectric plants that gives priority to decisions at the provincial level while depriving local municipalities of the right to oppose the plants. Moreover, in 2016, the provincial government of Trentino and the utility Hydro Dolomiti Energia (HDE) SpA, the dominant energy utility in the region, concluded an agreement with the aim of reducing the DMV in some rivers in order to increase green electricity production.

In response to the ensuing attempt to reduce the DMV and increasing requests for diversion by mixed and private companies, in 2017, citizens and associations decided to reactivate the Committee for the Defense of Trentino Waters. This united all the committees for the region's 4 small rivers (Noce, Fersina, Sarca, Arnò). The committee included 4 environmental associations (WWF Trentino, Legambiente, Italianostra, Mountain Wilderness), the local canoe club (Canoa Club Trento), the regional federation of Trentino fishing enthusiasts, and 3 local committees for the protection of individual rivers (Friends of Sarca, Permanent Committee for the Protection of Noce River, Committee for the Protection of Arnò River).

Protecting the river: biodiversity and the local eco-economy

In its public meetings, the Committee for the Defense of Trentino Waters articulated a broad common discourse on the different issues presented by mini-hydroelectric power production. First, it has the potential to increase flood risk, because, as also stressed by Bracken et al (2014: 95), it alters the flow of water through the river. This is especially worrying in a situation where there is already an increased threat of localized flooding due to climate change. Second, there is an effect on biodiversity, wildlife, and habitats. Altering sediment transfer and flow rates in rivers will

transform the number and characteristics of species, and habitats will be transformed (Bracken et al 2014: 95).

The committee thus redefined mountain waterways as having important heritage in terms of biodiversity and value in terms of the environment and landscape. In this representation, rivers are considered common assets to be protected as sources of ecosystem services. Among these, we can include recreation. As argued by one of the leaders of the committee: “Indeed, the river represents a common good because it satisfies the human senses: the view of the river and of the vegetation, the water noises and the scent of wet moss. Preserving the river means preserving the pleasure that comes from the relationship between humans and the river. These experiences must be safeguarded not only for the inhabitants, but also economically, as they are linked to experiences of mountain tourism.”

In this view, hydroelectric plants were not opposed because of their location, but because they threatened a different paradigm of development for Alpine valleys based on a new local eco-economy (Kitchen and Marsden 2009) centered on sustainable tourism. As stressed by the interviewees, “local politics should focus on supporting the sustainable river economy made of rafting, fishing, and camping, since in these recreational activities an environmental protection dimension adds up to an economic dimension.”

Mobilizing local social capital

The above representation of the problem led local committees to create broader alliances with tourist associations and rafting centers. This was linked to the fact that some Trentino rivers are almost entirely free from hydroelectric plants and thus are especially suitable for rafting.

Moreover, the committee, in many cases, extended its battle from stopping single projects to a broader fight for extending the border of local natural parks. This happened in the case of Arnò river, where the committee proposed extending the boundaries of the Adamello Brenta Park. It was also the case for Noce river, where the proposal to create a river park was conceived as a tool to transform the valley into a protected area. In a park, rivers are considered ecological corridors and must hence be kept free from artificial impacts.

The interviews revealed that, far from producing mistrust and social conflict, movements against mini-hydroelectric power production in Trentino often instigated new collaborations over the river involving local inhabitants and local institutions. This happened, for example, in the case of Arnò river, where various initiatives to valorize the local river were undertaken. A painting competition was launched, focusing on the river and the various forms of water in art. Moreover, with the help of experts from the local museum of natural sciences, citizen science initiatives were organized. With the help of a mountain guide, a river track was created.

Mobilizing the expertise of river ecologists

Rather than being based on an irrational approach to the issue, the Committee for the Defense of Trentino Waters sought the expertise of river ecologists in their reframing of mini-hydro as a threat to biodiversity. In particular, a

professor from the local University of Trento was mobilized by the committee to support their battle. Public meetings were organized to explain river ecology to the population.

River ecology considers the resilience of river systems. Rivers are complex systems characterized by processes of recycling, through which all the material that arrives in the river (such as leaves, sewage, etc) is consumed by microorganisms, purifying the water.

The discourse of the professor from the University of Trento stressed that in the Anthropocene, the ability of rivers to self-purify is compromised by anthropic pressures. These include, primarily, organic pollution, which can be from a point source or diffused. Indeed, in addition to industrial chemical waste streams, which are identifiable and quantifiable at precise points of the river, there is also more widespread pollution linked to intensive agriculture—for example, in Trentino, the case of Val di Non's intensive apple orchard cultivation. In this case, the problem is that riparian areas—so-called buffer zones—have been cultivated all along the rivers. As a result, they are no longer able to absorb the polluting substances that end up in the rivers. Beyond pollution, intensive agriculture's irrigation requirements also compete with hydroelectric exploitation of water.

The river ecologist supported the position of the committee. He argued that building mini-hydroelectric plants in mountain rivers is not only damaging from an economic point of view, but also ecologically unsustainable, because mountain rivers do not have the resilience and capacity for self-purification that lowland rivers have. They are fragile ecosystems because they contain only a few self-purifying elements. They have a reduced cycling capacity, and therefore the impacts of a hydroelectric power plant on water quality are proportionally much higher than in large rivers.

Developing alternatives: the modernization of existing hydroelectric plants

At the center of the narrative of the Committee for the Defense of Trentino Waters is the denial of mini-hydro as a tool for climate change mitigation. Even if all of the approximately 2000 plant projects in the preliminary investigation phase in Italy were implemented, the percentage energy contribution is calculated to be approximately 2% of Italy's annual energy consumption.

Data from the energy service manager (Gestore dei Servizi Energetici [GSE]) also show that hydroelectric energy production has been decreasing since 2014. In 2017, in particular, it decreased despite the fact that 538 new plants came into operation. This is due to weather factors resulting from climate change; future forecasts suggest that this will be the dominant trend.

According to the committee, the construction of mini-hydroelectric power plants should thus be discouraged since there are no advantages. Instead, the priority should be the modernization of large hydroelectric plants, which can produce 10% more energy, making mini-hydro unnecessary. According to this view, there is a reversal of the “small is beautiful” perspective: A few large, efficient plants are preferable to many small plants, as an interviewee stressed.

The alliance with the Free Rivers Italia association

In its fight against mini-hydro, the Committee for the Defense of Trentino Waters moved beyond local campaigns, forging an alliance with a supralocal organization, the Free Rivers Italia association. The association was created in 2016 with the goal of uniting all the different issues over rivers that have emerged in the various Italian regions in recent decades. Its key objective is to exert pressure on the Italian state and regions to safeguard the rivers of the Alps and the Apennines, keeping them free from hydroelectric and irrigation exploitation.

The Free Rivers association has 2 aims: First, they demand that plants below 3 MW should not be considered to be of public relevance. This would allow local municipalities to oppose unwanted projects. Second, they argue for the abolition of eco-incentives for hydropower. According to the committees, the eco-incentives are the only reason that small hydro survives. They are seen as a form of environmental injustice, since they translate into cost to the public for the advantage of a few generators or distributors.

Another line of argument concerns the need to revise the tools for assessing environmental impacts and regulating the relationship between the river basins and water extraction. In particular, the DMV does not adequately evaluate the functionality and quality of river waters. This is because it gives one static measure of the minimum volume of water required for river vitality, while mountain rivers in particular are characterized by variable water flows. Instead, the ecological flow is proposed as a measure. This attempts to identify the range of energy necessary to maintain the ecological functional capacity of rivers.

Finally, the Free Rivers association points to the problem of control and respect of the DMV and of the maximum extractable quantities. Due to an inadequate sanctioning system, increasingly scarce surveillance activity in remote locations, and the poor civic sense of the concession owners, much of the local committees' work is dedicated to documenting abuses and alterations of the intake works. Accordingly, to improve transparency and democratic control, the association recommends that an external commission be appointed in each region to monitor the data on river waters.

Discussion and conclusions

This article has highlighted the observation that the development of mini-hydropower in fragile mountain areas has environmental and social consequences, rather than being just a technological artifact. In particular, the discourses and practices of social movements opposing mini-hydro in the case study of Trentino were investigated in relation to a critique of the NIMBY concept. We can conclude that the movements' anti-mini-hydro stance only partially contradicts NIMBY definitions.

First, at a discursive level, it emerged that the committee against mini-hydro in Trentino, far from being just focused on the fight against the localization of facilities in its “backyard,” elaborated a broader discourse. It criticized mini-hydro in general as a threat to biodiversity and as an ineffective climate change mitigation strategy under current climate conditions. To articulate such a narrative, the committee drew on the expertise of a river ecologist. The

expert, a specialist in river system resilience, highlighted the specific fragility of mountain river ecosystems.

However, regarding the development of alternative sociotechnical solutions to energy and climate issues, the discourse of the committee appears to be tenuous. It is limited to arguing in favor of the modernization of existing large hydroelectric plants. Moreover, it did not consider formalized procedures, such as multicriteria evaluation or stakeholder analysis, which could improve hydropower projects (eg Rosso et al 2014).

As we have seen herein, the NIMBY syndrome seems to have been overcome in the context of biodiversity issues. This is not so much the case in the context of energy issues.

Mixed results can be also found at the level of the alliances and social relationships mobilized. The committee was able to connect its opposition to a broader campaign, that of the national Free Rivers association. This association addresses general issues of environmental justice, especially in calls to abolish national incentives for mini-hydropower.

Committees against mini-hydro have the ability to develop and mobilize local social capital by envisioning new heterogeneous alliances among different stakeholders, such as the fishing association, the natural park, or the tourist sector. At the base of these extended alliances, there is an attempt to demonstrate the presence of a common interest against the diversion of rivers for hydroelectric purposes that spans different sectors of the local community.

These broader networks often defy NIMBY definitions. In this context, it should be highlighted that they did not seek any alliance with decarbonization movements, campaigns boycotting traditional energy players, or community energy transition projects.

The opposition movements to mini-hydro did have a social impact. For example, the Committee for the Defense of Trentino Waters implemented various initiatives aimed at promoting resocialization with local rivers, helping people to rediscover key ecosystem functions of the river for mountain valleys. However, the social impact that was promoted only aimed to create protest networks and did not foster community energy projects or alternative energy networks.

In conclusion, these results are in line with the literature analyzing forms of collective mobilization of civil society in the energy transition. In Europe in general (see Smith 2012) and in Italy in particular (Magnani and Osti 2016), there is a separation of social movements mobilizing against facilities for renewable energy production and movements promoting proactive initiatives around bottom-up community initiatives.

The social movement against mini-hydro analyzed here can be described as a form of “localist environmentalism.” This kind of collective movement linking environmental and territorial concerns has recently emerged as new form of environmentalism in other controversies in Italy (see Della Porta and Andretta 2002; Della Porta and Diani 2020). Its main characteristics are attachment to a place and its natural elements, like rivers, and the will to protect nature (eg through the creation of natural parks) against human/technological intervention. However, unlike the NIMBY approach, it includes the ability to network with heterogeneous interest groups and national campaigns, and, unlike formal environmentalism, which takes a broader ecosystem perspective, it is distinguished by an

attachment to nature as a local place (Devine-Wright 2011). These differences from both the NIMBY approach and from formal environmentalism make it a new phenomenon. It will be interesting to observe whether such movements of localist environmentalism eventually develop a stronger interest in working collaboratively towards alternative solutions.

ACKNOWLEDGMENTS

The author would like to thank the two anonymous referees for their valuable suggestions on a previous version of the paper. The author would also like to thank Gaia Giongo for her help during field research.

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