

Compromise not consensus: designing a participatory process for landslide risk mitigation

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Received: 31 October 2014 / Accepted: 5 November 2015 / Published online: 16 November 2015
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Abstract With the escalating costs of landslides, the challenge for local authorities is to develop institutional arrangements for landslide risk management that are viewed as efficient, feasible and fair by those affected. For this purpose, the participation of stakeholders in the decision-making process is mandated by the European Union as a way of improving its perceived legitimacy and transparency. This paper reports on an analytical-deliberative process for selecting landslide risk mitigation measures in the town of Nocera Inferiore in southern Italy. The process was structured as a series of meetings with a group of selected residents and several parallel activities open to the public. The preparatory work included a literature/media review, semi-structured interviews carried out with key local stakeholders and a survey eliciting residents' views on landslide risk management. The main point of departure in the design of this process was the explicit elicitation and structuring of multiple worldviews (or perspectives) among the participants with respect to the nature of the problem and its solution. Rather than eliciting preferences using decision analytical methods (e.g. utility theory or multi-criteria evaluation), this process built on a body of research—based on the theory of plural rationality—that has teased out the limited number of contending and socially constructed definitions of problem-and-solution that are able to achieve viability. This framing proved effective in structuring participants' views and arriving at a *compromise* recommendation (not, as is often aimed for, a *consensus*) on measures for reducing landslide risk. Experts played a unique role in this process by providing a range of policy options that corresponded to the different perspectives held by the participants.

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Keywords Participatory processes · Theory of plural rationality · Contested terrain · Consensus or compromise · Clumsy solution

1 Introduction

Nocera Inferiore in the Campania region of southern Italy is exposed to multiple natural hazards, including earthquakes, volcanic eruptions, floods and landslides. On 4 March 2005, the highest risk area of the town, the Monte Albino slope, experienced a landslide that caused three deaths and extensive property damage. Three years later, a €24.5 million risk mitigation project prepared by the Regional Emergency Commissariat was rejected by the Municipal Council supported by many citizens and local associations. Six years after that, in 2011, decisions about risk mitigation in Monte Albino were still pending.

This policy stalemate shows how the lack of public support can be a barrier for landslide risk mitigation, and highlights the need for public involvement in the policy process. Landslide policy in Europe, and elsewhere, has traditionally been the domain of experts working in tandem with public authorities and has therefore been framed as a technical and economic rather than a social issue. This is now changing, with participatory approaches increasingly acknowledged as the way to integrate risk management into community planning by considering disasters as “community-based problems requiring community-based solutions” (Schneider 2002: 143; also Mileti 1999; Pearce 2003; Tan et al. 2012). However, the role of technical and economic expertise, though changed, is not diminished. Nor is this changed role particularly new; as early as 1996, the US National Research Council was recommending the addition of an analytical-deliberative process that combines stakeholder dialogue and expert analysis for the purpose of enhancing the science–policy interface in risk management (Stern and Fineberg 1996): a dramatic switch that was matched in Britain, in 1997, by the Royal Society’s “growing consensus” that public perceptions should be included in the assessment of risk (see Thompson and Rayner 1998).

This paper reports on the design and implementation of a 2-year participatory process that engaged citizens and experts in the co-production of landslide risk mitigation options for Nocera Inferiore, and resulted in a compromise recommendation. The distinctive point of departure for this project is the explicit elicitation and structuring, building on the theory of plural rationality, of multiple worldviews (or perspectives) on the nature of the problem and its solution (Thompson et al. 1990; Thompson 2008).¹ Rather than eliciting preferences using decision analytical methods (e.g. utility theory or multi-criteria evaluation), this process draws on research that has demonstrated a limited number of socially constructed views of nature and which has proved effective in grouping participants in participatory processes and thereby arriving at *clumsy solutions*: outcomes, initially “hidden” from all the participants, that enjoy a much higher level of overall consent than any of those in which just one set of actors manages to impose hegemony and “go it alone”. Clumsy solutions thus stand in marked contrast to the more familiar *elegant solutions* which, having been tailored to just one perspective, are exclusive of the others. The prerequisite for a clumsy solution, it follows, are *accessibility* (each voice able to make itself heard) and *responsiveness* (each voice engaged with, rather than dismissive of the

¹ The theory has sailed under a number of names: originally “cultural theory” (which unfortunately risks giving the impression that it is culture that is doing the explaining); more recently “neo-Durkheimian institutional theory” (which, while correct, is too much of a mouthful).

others). Indeed it quite often turns out, with a clumsy solution, that each actor ends up with more of what it wants (and less of what it does not want) than it would have got if it had managed to impose its preferred and elegant solution (see Beck and Thompson 2015 for three case studies in which this somewhat counter-intuitive outcome is demonstrated).²

The discussion begins, in Sect. 2, with a short history and characterization of landslide risk and risk mitigation policy in Nocera Inferiore before turning, in Sect. 3, to a brief motivating discussion on public participation in landslide risk policy. Section 4 sets out the conceptual framing—compromise rather than consensus—thereby foregrounding the *contested terrain*, with its plurality of deeply held and mutually irreducible worldviews (or perspectives), that forms the basis for the design of the participatory process. Section 5 explains the process itself: the preliminary research and then the five meetings by means of which the participants and the experts, through a process of co-production, were able to find their way to a compromise: a clumsy solution. Finally, a discussion of what has been achieved is provided in Sect. 6.

2 Landslide risk mitigation in Nocera Inferiore

Almost 10 % of the 46 thousand residents of Nocera Inferiore, it has been estimated, are at risk from landslides (Italian National Institute of Statistics 2001). On 4 March 2005, following 150 mm of rainfall in just 24 h (Pagano 2009), a landslide caused the deaths of three people when their house was destroyed by the impact of the soil mass. Several other houses were destroyed or damaged, and over 1350 people were evacuated from the area (Ordinanza no. 8822, 2005). Apart from some urgent measures to stabilize the slope immediately following the event, there were no further interventions before our fieldwork began in 2010. In the aftermath of that event, however, many issues emerged on the political agenda, particularly reimbursement to the victims (as required by Italian law) and the reduction of future landslide risk. To facilitate stakeholder involvement, the municipal authorities created a forum on landslide risk management (involving residents, local associations and public agencies) and a fund that was earmarked for the reimbursement of the families and for risk mitigation actions. However, at the time this research project was started—approximately 5 years later—no reimbursements had been made.³

In November 2008, the primary authority for allocating resources for risk mitigation and victim compensation, the Emergency Commissariat, together with the regional Civil Protective Agency, initiated a project for reducing the risk of landslide to residents of Monte Albino (this being in addition to the urgent measures taken immediately after the 2005 event). The total budget for this project, which included structural measures such as

² These voices emanate from the theory of plural rationality's typology of four forms of social solidarity: hierarchy, individualism, egalitarianism and fatalism, as they are called (for example, Douglas 1978; Thompson 2008; Ney 2009). A brief explanation of the theory itself can be found in Linnerooth-Bayer et al. (2015). For a mapping of the similarities and differences between clumsy solutions and other proposed ways of coping with this sort of plurality-“bounded rationality” (Simon 1947), see for instance, “muddling through” (Lindblom 1959), the “garbage can” (March and Olsen 1976), “mixed scanning” (Etzioni 1968), “interactive mixed scanning” (Gershuny 1978), “optimal rational decision-making” (Dror 1968). This mapping also holds for the more recent “sanguine compromise” (Margalit 2014), see Schwarz and Thompson (1990, especially chapter 4: “Beyond the politics of interest”).

³ A letter from the municipal councillor responsible stated: “The funds have not been distributed because of the delays and oversights on the part of the regional Civil Protection. In the years that followed the emergency, the National Civil Protection did not renew the state of emergency requested for the entire territory of the Campania region. As a result, the available funds were never used” (Prot. 300 IESA, 2010).

water tanks and storage basins (resoconto della seduta consiliare del 22 aprile 2008), was €24.5 million. The municipal authorities, supported by citizens and local associations, then refused to endorse this proposal. This was for several reasons, the most important being that the project's costs were not fully covered by regional funds. In addition, certain technical weaknesses were identified, together with the hitherto unaddressed question of how to prioritize the various risk mitigation measures. How (and, indeed, whether) to renovate the hydraulic network was one stumbling-block; another was the failure to adequately consider investments in non-structural and environmentally friendly measures.

In the wake of this rejection, two Emergency Commissioners were appointed in quick succession and partial responsibility for risk mitigation was devolved from the regional Soil Defense Agency to the local municipal authorities (Scolobig et al. 2011). The latter then contracted external experts and consultants to prepare a risk reduction strategy based on the previously somewhat disregarded “softer” measures, such as maintenance/remediation of the slope and naturalistic engineering works (channel lining, for instance, and vegetated gabions aimed at reducing erosion due to frequent rainfall events). In 2010, this proposed plan was approved by the Conference of the Services: a conference, organized by the municipal technical offices, to discuss and approve an administrative act, decision or project. A private consultant was then asked by the municipality to present a preliminary project, based on a risk assessment study and taking into account a budget of €1.4 million for its implementation. This project was then approved by the local authorities in September 2010. Later that year, following the appointment of the second Emergency Commissioner, the earmarked sum to set up a risk mitigation plan was increased to €7 million. The project had still not been implemented when the fieldwork reported in this paper ended in 2011.

3 Public participation in landslide risk management

In 2010, when the fieldwork for this research started, the municipal authorities were eager to involve the citizens of Nocera Inferiore in preparing a plan for allocating the €7 million for mitigating landslide risk. Their interest in participation was partly motivated by the recent public opposition to the plan prepared by the Regional Civil Protection. The River Basin Authorities were interested because of the implementation of the newly issued European Union Water Framework Directive (WFD) (2000/60/EC), which calls for extensive citizen participation in river basin planning issues. Curiously, despite the many calls for public participation in environmental issues over the preceding two decades, there were, at that time, no documented procedures for actually doing it in relation to landslide risk management. However, it seems likely that the exhortations set out in the Rio Declaration (UNCED 1992), in the Hyogo Framework for Action (UNISDR 2005) and in the European Floods Directive (European Parliament 2007)—which states that “Member States shall encourage active involvement of interested parties in the production, review and updating of the flood management plans...” (Art. 14)—may be extended to landslide risks.

Moreover, public participation has now become a significant theme in the scientific discussion on natural hazards in Europe, even though there are, as yet, few empirical examples (Linnerooth-Bayer et al. 2006; Messner et al. 2006; Junker et al. 2007) as compared to the literature on environmental risks and water management (e.g. Aldred and Jacobs 2000; Kallis et al. 2009; Paneque Salgado et al. 2009; Jackson et al. 2012). At the

same time, the legislative emphasis in the European Union, and elsewhere, on public participation responds to the increasing demands for more transparency and fairness in risk management institutions and procedures (Renn 2008; Rowe et al. 2004; Webler et al. 2001, 1995). Experience has shown that the involvement of stakeholders can increase public awareness, take account of local concerns, bring new options to light, delineate the space for agreement or compromise and, not least, enhance the credibility of public risk management institutions. A participatory process, moreover, can help policy-makers understand stakeholder needs and expectations, and enhance consent by sharing responsibility for the decisions taken (Dryzek 2001; Elster 1998; Steiner 2012; Dietz 2013; Fischhoff 2013).

Despite these benefits, experience has also shown that public participation is not a panacea. Without careful design and management, participatory processes can lead to inefficiencies in the outcomes, stabilize existing and often dysfunctional power distributions, and make ignorance and incompetence the guiding principles for decision making. They can also prolong decision making and immobilize institutions (for problems in deliberation, see e.g. Parkinson 2006; Ryfe 2005; Rosenberg 2007; Van Eeten 2001; Wynne 2007). Particularly problematic in the Nocera Inferiore case was the bounding of the breadth of participation, not only with respect to the number and demographic characteristics of the participants, but also with regard to their knowledge, values, worldviews and standing in the community. Since participation must inevitably be limited to a manageable number of participants (in this case, 16) and thus not fully representative of the community, establishing process legitimacy for both non-participants and policy-makers is far from straightforward. An especially thorny issue (discussed in detail in Linnerooth-Bayer et al. 2015) is how best to include experts and communicate their technical information (which itself cannot be assumed to be value-free) to the participants (Rowe and Frewer 2000). Further challenges relate to the design of the process itself, including how to set and reach objectives through facilitation and other methods.

In short, simply calling for public participation is not enough. Indeed, in the absence of a carefully designed and tested process, it may simply end up compromising the objective of efficient and effective risk reduction while, at the same time, violating the principles of fairness that are held by some of the participants, thereby sapping consent and eroding democracy. Participatory processes, moreover, need to be able to combine technical expertise with the deliberation between the holders of often disparate values and preferences. The keywords, unsurprisingly, have become: *trust-building*, *community development* and *co-determination* (Renn 1998, 2006, 2008). But, and this is the crucial question addressed in this paper, how might these desiderata be achieved: through consensus or through compromise? The latter, we will argue.

4 The case for compromise (and for contested terrains and clumsy solutions)

We can begin with the important distinction between contested terrains and uncontested terrains (Thompson and Ellis 1997). With contested terrains (climate change is currently the prime example), there are contending and mutually irreconcilable definitions of what both the problem and the solution are, and these do not converge as the policy process proceeds (Thompson and Gyawali 2007). With uncontested terrains (the hole in the ozone layer, for instance), there is a single, agreed definition of the problem and of its solution,

and if there *is* some initial plurality, it soon converges to singularity once the policy process gets under way. Proponents of compromise would argue that it is only in the case of those latter—uncontested terrains that happen to display some initial plurality—that consensus is possible. In the case of contested terrains, they would further argue, singularity can only be achieved by the imposition of one definition of problem-and-solution and the exclusion of the others. And that is not consensus; it is hegemony!

So, if we want to avoid imposing hegemony when our intention is to achieve consensus, we will need to know whether the terrain we are dealing with is contested or uncontested.⁴ Proponents of consensus, however, though they identify certain “conditions for authentic dialogue” (Innes 2004: 5), do not explicitly draw that crucial distinction. Participatory processes, they hold, if grounded on consensus building, can and should lead to a transformation of citizens’ preferences. This is accomplished, the argument continues, by persuasion, rather than by coercion, manipulation or deception (Dryzek 2001; van den Hove 2006). “Yes”, reply the proponents of compromise, “but only if the problem is an uncontested one (in which case it would move towards singularity of its own accord, anyway)”. So it is as simple, and as stark, as that.

- Outcomes, in the *consensus paradigm*, are legitimated if they lead to a rationally motivated convergence, with participants striving to apprehend a common interest. In this way, an “optimal” solution, even if provisional, can be found for every controversy. This concept of consensus applies primarily to the rational search for universal norms (e.g. Habermas 1983, 1996), and it forms the backbone of “communicative rationality/discursive ethics”, according to which a convergent outcome should result if certain theoretical conditions (e.g. an “ideal speech situation”) are fulfilled and communicative action, rather than individual strategizing behaviour, is applied (Habermas 1983). However, “consensus building” and “communicative rationality”, though they have much in common, are far from identical. “*Consensus building*”, as Innes is at pains to stress, “grew up as a practice without knowledge of or reference to Habermas”—the originator of the notion of communicative rationality—who, she points out, “is a social theorist not an empirical researcher” (Innes 2004: 10; emphasis in the original). While the force of the better argument is the key concept in communicative rationality, it is the exploration of all interests, along with efforts to satisfy these different concerns, that are crucial for the proponents of consensus building (Susskind et al. 1999, 2002). Even so, Innes concedes that Habermas “offers much” to the consensus building enterprise.
- According to the *compromise paradigm*, however, a consensus can be achieved only if the terrain happens to be uncontested. In all other instances, attempting to transform preferences and values through communication and argumentation—that is, by treating a contested terrain as if it was uncontested—will inevitably result in outcomes that are far from optimal: pessimal, in fact, since they will satisfy just one set of “definition-holders” and reject the rest. True, participants in public fora may sometimes change their preferences in the course of their deliberations, but that change often (always, perhaps) reverses when they return to their institutional and social contexts. The reason

⁴ This distinction, we should mention, has also been cast in terms of *wicked problems* (where the terrain is contested) and *tame problems* (where the terrain is uncontested) with the seven distinctive characteristics of wicked problems clearly revealing that climate change is wicked/contested and the ozone hole tame/uncontested (Rittel and Webber 1973; Verweij et al 2011; Rayner 2014). In other words, these two distinctions—one originating in social anthropology, the other in planning/public administration—are interchangeable.

is that individual preferences, far from being inherent (like a person's fingerprints), are deeply rooted in patterns of social interactions; we are, in Jon Elster's memorable phrase "inherently relational" (Elster 1985: 6).

Devotees of Kenneth Grahame's *The Wind in the Willows* will recall how the boastful and overbearing Toad, when reproached by his fellow creatures of the riverbank for renegeing on his promise to change his ways—made when they had all been gathered in Toad Hall—replied "O, yes, yes, in *there*" (Grahame 1908: 76). And, if we go on to quote Toad more fully, we begin to see some of the perils in trusting in persuasion and de-contextualized deliberation as a way of changing interests and values.

I'd have said anything in *there*. You're so eloquent, dear Badger, and so moving, and so convincing, and put all your points so frightfully well—you can do what you like with me in *there*, and you know it. But I've been searching my mind since, and going over things in it, and I find that I'm not a bit sorry or repentant really, so it's no earthly good saying I am; now is it? (Grahame 1908: pp. 76–77).

And this Toad-like tendency for transformed values and preferences to revert has led some authors (e.g. Rescher 1995; De Marchi 2003; Stirling 2006; van den Hove 2006) to argue that consensus-seeking is neither desirable nor sustainable for reaching a policy recommendation.

Now, with these two paradigms clarified, together with the making explicit of the crucial distinction between contested and uncontested terrains, we can turn to the normative reasoning that has been developed from the consensus paradigm, and to the difficulties that it has run into. Difficulties so profound, we will argue, as to progressively shift it ever closer to its rival: the compromise paradigm.

- Communication, according to Habermas, allows disputants to incorporate their opponents' interpretations of the conflict into their own, in such a way that "the divergent situation definitions can be brought to coincide sufficiently" (Habermas 1983: 100). Indeed, consensus building practitioners set out to resolve conflicts by creating new areas of understanding and by establishing a new and common language among the initially opposed actors. "Fine", proponents of compromise would say, "but only so long as the terrain is uncontested". But proponents of consensus, ignoring that proviso, go on to argue that clashes and disputes can be avoided, and differences reconciled and embraced in spite of their depth, in a unifying dialogue. But if these differences are indeed "deep", proponents of compromise would point out, then that indicates that we are probably dealing with a contested terrain, in which case the "new and common language" will be working its magic, not by unifying, but by excluding.
- Susskind et al. (1999: 6), backing off a little, define consensus building as follows:

"... a process of seeking unanimous agreement. It involves a good-faith effort to meet the interests of all stakeholders. Consensus has been reached when everyone agrees they can live with whatever is proposed after every effort has been made to meet the interests of all stakeholder parties."

Here, proponents of compromise would point out, consensus has not actually happened—the interests of the stakeholders remain unconverged—and the outcome looks more like what they call a "clumsy solution" than a meeting of minds by way of a unifying dialogue.

- Innes (2004: 7) similarly breaks ranks by setting out a list of conditions that will have to be satisfied if a process is to be labelled “*consensus building*”: a full range of stakeholders, a task that is meaningful to the participants and promises a timely impact, participants making their own ground rules (for agenda-setting, behaviour and so on), a process that ensures a mutual understanding of interests and avoids positional bargaining, a dialogue where all are heard and respected, and so on. Again, we see the divergent interests “understood” and “respected” but not converged. Similarly, we can expect those stakeholders (if they genuinely encompass the “full range”, that is) to have different ideas of what is a “timely impact” (and also of what sort of task is “meaningful”) and of how the agenda should be set, and also to be prone to sneaking in some of that “positional bargaining” while no one is looking. Indeed, taken together, these conditions, proponents of compromise would point out, ensure not consensus but the “accessibility” and “responsiveness” that (as we have already mentioned) are the prerequisites for clumsy solutions.

Increasingly, it becomes apparent, the proponents of consensus, like those creatures of the riverbank trying to get Toad to change his ways, have set themselves an impossible task (at least when it comes to contested terrains, and most terrains these days—largely as a result of the massive increase in the reach of governments (Ney 2009)—are contested). Social actors, we are told, apprehend a common goal, set their antagonistic differences aside, and adopt a collective and interactive mode of cooperation in order to reach a shared and common objective (except, of course, when they don’t). The plurality of standpoints and their accompanying conflicts, it is asserted (Habermas 1983, 1996), are overcome but not directly dealt with, actors do not walk off in different directions but follow a new and common path, and all participants find their way to a fresh option that they all value more than the ones they variously preferred when they first entered the deliberation (except, of course, when, like Toad, they don’t). Participants, we are assured should be drawn by the search for the common good, be it through the consensus-bringing force of argumentative speech (Habermas 1983, 1996) or through interest-based negotiation and mediation (Susskind et al. 1999; Innes 2004). But if, like Toad, they don’t do as they are told, we are left without any consensus. All of which raises two questions: How do we cope with that, and could it be that this lack of consensus is all to the good? After all, if the plurality was rendered singular we would no longer be able to find our way to clumsy solutions!

Unsurprisingly, some authors, realizing that this is their predicament, have argued that consensus and plural rationalities are not mutually exclusive concepts: that they can coexist by operating at different levels, or along different dimensions. Dryzek and Niemeyer (2006), for instance, hold that plurality at the “simple level” (opposed values, beliefs and preferences down there among the grassroots) does not mean that consensus cannot be attained at the “meta-level” (a detached viewpoint, high above the fray, where it is possible to acknowledge that plurality without feeling obliged to join in and take sides). “Well yes”, say the proponents of compromise, “but if you do that you have shifted yourself across to the other paradigm!”

Indeed, Innes tacitly acknowledges this when she cautions that consensus building, far from being a one-size-fits-all solution, “is only appropriate in situations of uncertainty and controversy where all stakeholders have incentives to come to the table and mutual reciprocity in their interests.” So it is inapplicable in these situations characterized (a) not just by uncertainty, but by contradictory certainties and b) by the absence of mutual reciprocity in their interests. In other words, it is appropriate for tame problems and inappropriate for wicked ones.

In sum, whenever there is a plurality of mutually irreducible definitions of problem-and-solution and where those definitions, far from converging as the policy process gets underway, reinforce one another, we are faced with a contested terrain. The socially constructed “contradictory certainties” that constitute this contested terrain are usually contained within the wide uncertainties that are so typical of those terrains; they do not require that water should flow uphill or that the laws of thermodynamics be rewritten (for a salutary instance of a contradictory certainty straying beyond those bounds—the once-influential and now discredited theory of Himalayan environmental degradation—see Ives 2004; Thompson and Gyawali 2007).

Since each of these sets of contradictory certainties is all the time defining and refining itself in contradistinction to the others (each one’s solution being, in large part, the others’ problems), consensus—getting from plurality to singularity—can only be achieved through hegemony: pushing one “voice” to the point where it silences the others. So Habermasian consensus—where all the voices come together through a process of deliberation—is a non-starter. That, at any rate and as we have argued, is the reasoning behind the compromise paradigm. But this is not a negative verdict, because the contested terrain, precisely because of all the contradiction it contains, is, when it comes to policy design, a valuable resource.

None of the certainties is wrong (provided, that is, that it remains within the aforementioned uncertainty bounds); each, rather, is providing a distillation of wisdom and experience that is missed by the others. And we would not want to discard most of that by plumping for just one of them (which, if you think about it, is what happens with a consensus). On top of that, since each of these contending voices is providing a clear statement of how a sizeable portion of the populace feels we should live with one another and with nature, it is important (if we value democracy, that is) that none of them be excluded from the policy process. Compromises that are arrived at by respecting and responding to all the contradictory certainties, and by striving to give those who are gathered at each of those “rallying points” on the contested terrain more of what they want (and less of what they do not want)—clumsy solutions, that is—can maximize organizational learning, husband consent, and avoid technological lock-ins by guiding us towards “non-foreclosing options” (Beck et al. 2013).

In all the instances of clumsy solutions that have been identified so far—the handling of radioactive materials in hospitals (Rayner 1986), for instance, rat-infested slums transformed into Glorious Heritage (Thompson 1979), pension reform in Europe (Ney 2009), “goods only” ropeways in Nepal (Thompson 2013) and Arsenal Football Club’s new stadium (Thompson 2008)—these positive features are clearly discernible. However, all those clumsy solutions were arrived at by *accident*, usually as a result of some serendipitous event enabling excluded voices to force their way into an insufficiently pluralized policy arena. The challenge, therefore, is to get clumsy solutions to happen *by design*. And that is precisely what our participatory process has set out to achieve in Nocera Inferiore.

5 The design of the participatory process

The full design of the process required three components: the eliciting of the plurality of public voices, the implementation of an analytical/deliberative engagement aimed at reaching a compromise (i.e. a clumsy solution), and a set of “outreach activities”, by which those who were not themselves participants in the formal process were kept

informed and enabled to make their contributions. While much of the detail of this participatory process—in particular, the elicitation of the three “narratives”, and the co-generation (with the experts) of the three “mitigation packages” appropriate to those narratives—is already set out in the paper “Expert engagement in participatory processes: Translating shareholder discourses into policy options” (Linnerooth-Bayer et al. 2015), our aim here is to clarify not the process itself but its design.

Our aim, in other words, is to go beneath the specifics of Nocera Inferiore and to tease out the design principles inherent in the process itself: principles that should then hold, not just for landslides, and not just for Nocera Inferiore, but for natural hazards of all kinds, everywhere. Such principles, extracted from this specific instance of public participation that has evidently been successful, could then be drawn on in relation to hazard management planning in general. The effective combining of stakeholder dialogues and expert analysis, as we have already seen, has been called for (increasingly) over the past couple of decades. Moreover, it is now becoming mandatory, in the European Union, across many classes of natural hazard. And, if such processes are to be mandatory, it is vital that they be effective.

With the first two components—eliciting the public voices and implementing their engagement—there is much in the way of generalized design, and we will be devoting considerable space to them. But with the third component—the outreach activities—this is not really the case, beyond the general stipulation that there should be some reaching-out. So we will deal with that first.

5.1 The outreach activities

Throughout the process, there was a range of activities that were aimed at providing information to, and soliciting concerns and views from, those on the outside of the formal proceedings (which, as we will explain, become too cumbersome beyond a limited number of participants). Most notably, one website and an online group were created featuring as online discussion forums (http://safeland.iiasa.ac.at/index.php/Main_Page; <https://www.facebook.com/groups/mitigazionedelrischiodafrana/>). As well as the upload of the documents related to the participatory process (e.g. power point presentations, agendas and minutes of the meetings), questions due to be considered in each of the public stakeholder meetings were posted on the website, and residents and officials on the “outside” were able to post their comments and opinions, which could then be inputted to the formal proceedings. In addition, eight informal parallel meetings were held with the local authorities, voluntary associations working on natural disasters and community leaders to inform them about the process.

Also (and this could well be a general feature of public participation processes) the Nocera Inferiore case attracted considerable media attention as well as interest from local NGOs, students and citizens. For example thanks to the help of students, three videos were prepared on the process. In addition, thanks to further support from local municipal councillors, press releases, two television interviews, three radio programmes and 15 articles in the local and national press were generated. Lastly a simulation exercise was prepared and conducted with more than forty doctoral students in the context of an International Summer School organized by the Department of Civil Engineering, University of Salerno.

These outreach activities had an actual impact on the participatory process, especially inputs received via email and the Facebook group, sometimes critical comments, were taken into account in the preparation of the meetings. Moreover members of local NGOs

organized dissemination activities independently from the process, and the key results of the participatory process have been presented at several meetings (e.g. Legambiente, Engineering association, University). The Facebook group, in particular, has been particularly active and continues to provide an open forum for discussion on risk mitigation issues.

5.2 Eliciting the public voices

The desk study, together with the 43 semi-structured interviews, revealed a range of views on landslide risk, with the markedly different “certainties” as to what both the problem and the solution are, revealing the existence of a contested terrain. This then provided the basis for a public questionnaire which, after its piloting, was administered (online and through a local association) to the public and resulted in 373 responses. The aim of the questionnaire was to obtain a representative sample of views on the different options for reducing landslide risk: through, for example, structural and non-structural measures, warning systems and emergency response plans. Table 1 summarizes the research phases, including methods and tools used to elicit stakeholders perspectives.

On the basis of the results from the questionnaire, the desk study and the interviews, and drawing on the theory of plural rationality, three characteristic discourses were constructed. Discourses are interpreted here as shared, structured ways of speaking, thinking,

Table 1 Research phases, methods and tools

Phase	Main aim	Methods and tools
Case study analysis	Describe and understand the case study	Literature review and desk study Semi-structured interviews (43) Focus groups (2) Participant observation (6 months)
Questionnaire survey	Collect data about residents' opinions and attitudes regarding landslide risk, risk mitigation, risk management and emergency planning	Questionnaire piloting (20) Self-administered questionnaires (373) collected by local association volunteers (351) and online (22)
Participatory process	Promote useful dialogue and deliberation among participants with the intent of identifying sustainable risk mitigation strategies	Public open meeting Meetings (5) with selected residents (16) Evaluation and feedback about the process through questionnaires Informal meetings with local authorities and community leaders (8) Parallel meetings in working groups organized autonomously by the participants (6)
Communication and education activities	Facilitate communication and information sharing; legitimize the process in front of a wider public	Website Online discussion group Videos to promote the participatory process (3) Press releases, contacts with local media (2 TV interviews, participation in 3 radio programmes, 15 newspaper articles of local and national relevance) Simulation exercise with students Continuous contacts with local authorities

interpreting, conveying and logically connecting ideas (Potter 1996; Gee 2010). Before presenting the discourses, we should stress that the methodology of discourse analysis does not provide a “truth”, but rather a situated reading of a certain topic or problem. Discourse analysis does not consider any accounts derived from the interviews to be true or false descriptions of “reality”, but investigates how different ways of describing the environment, the society, or events are produced within discourses. Keeping this in mind, we first analysed the transcripts of the interviews and identified recurrent themes and ideas, with a focus also on how interviewees connected one idea to another. This was the basis for the draft discourses that were subsequently presented during the participatory process in order to ask participants for a “reality check”, and for feed-back on how the discourses represented (and did not represent) their views (more information in Linnerooth-Bayer et al. 2015). As a result, the following three characteristic discourses were constructed.

- The *safety first* discourse is more hierarchical than the others, in that it emphasizes the importance of expert-driven safety: in this case, in the form of top-down passive mitigation measures. Far wiser, those who take this view hold, to provide protection before lives and property are lost than to spend possibly greater sums on compensating victims once disaster has struck. Protection, however, does not automatically mean large, unsightly and expensive concrete structural measures; the job can be done with a careful mix of active measures, such as cleaning out drainage ditches and properly managing forests. Even so, limited passive measures, such as decanting structures and storage basins, will be necessary. Trust in government, and in expert knowledge, is a prerequisite in this worldview.
- The second discourse—*careful stewardship of the mountain*—is more egalitarian, with its emphasis on active and naturalistic engineering measures, and on the equitable sharing of risk. It is largely due to unsustainable human interventions—road-building, for instance, and industrial activities—that Mount Albino has become subject to dangerous landslides, and climate change can only worsen the situation. If residents are to be protected, the natural cycles and the evolving mountain terrain will have to be respected. Since expensive passive structural measures (with just a few exceptions) do not do that, they will only aggravate the problems. Instead, we need to take a more holistic and ecological view of the mountain and its maintenance.
- The third discourse—*rational choice*—is more individualistic, in that it emphasizes trade-offs and the right of individuals to decide for themselves. Since landslide risk is not the only concern of the residents, and probably not the main one, it is important that scarce public resources are allocated across the spectrum of competing projects. And to do that you will have to calculate the costs and the benefits to the residents. Relocating those few householders who are most at risk, for instance, will likely be much more cost effective than across-the-board mitigation measures.

While it is difficult to deny a certain validity in this *rational choice* line of argument, its economic framing does not fit comfortably into the other two discourses. Indeed, for each of them, it constitutes *uncomfortable knowledge*: knowledge that will have to be marginalized in some way—by “barring” it, for instance, or “adjusting” it—if the discourse itself is not to be rendered incoherent. And the same, of course, holds for each of the other two discourses. Hence the mantra “wicked problems, uncomfortable knowledge, clumsy solutions” that helps us treat a contested terrain as something very different from the more familiar uncontested terrain (for uncomfortable knowledge see Bloor 1982, for the different ways of marginalizing it and thereby preserving the

coherence of the discourse/paradigm see Lakatos 1976, and for the mantra itself see Beck and Thompson 2015).

A figure showing the locations of these three discourses within the plural rationality framing, a brief explanation of the theory itself, and especially a longer and more detailed version of the discourses, including interviews' excerpts, can be found in Linnerooth-Bayer et al. (2015). More interview excerpts, and information on the process of identification of recurrent themes and topics, are reported in Scolobig et al. (2011, pp. 90–101; 173–185). The questionnaire and its results are set out in Scolobig (2015) and in Scolobig et al. (2011). The discourses have also been validated in several phases of the participatory process. For instance at the beginning and at the end, we asked participants whether the discourses represented their views, we collected their feedback on how to improve the discourse description in order to represent local views in the best possible way, and we then included these findings in a new version of the discourses.

5.3 Implementing the analytical/deliberative engagement

With these three discourses encompassing the *requisite variety* (all the “active” voices, that is, the fatalistic discourse—“Nothing we could do would make any difference”—tends to distance itself from active participation), we could move on to the second component. This was the design and implementation of a process that would combine public participation and expert input in order to seek out a compromise: a clumsy solution. This, as we have already argued, is in marked contrast to an elegant solution, which is what you get with a participatory process that, in somehow eliminating the contested terrain, arrives at what looks like a consensus.

We say “looks like”, because consensus, we have argued, is a valid goal only when there is no contested terrain. But if the terrain is contested, then consensus can be achieved only by one of the contradictory certainties marginalizing the uncomfortable knowledge that is inherent in the others. And that hegemonic outcome is invalid, since it imposes just one definition of problem-and-solution on a set of equally legitimate and mutually irreducible certainties that together constitute the contested terrain. Hence the “requisite variety condition” (see Ashby 1968; Thompson et al. 1990).

The process was initiated with a public meeting attended by over 100 residents and officials, who were informed about the SafeLand project and, more specifically, about the plans for a public participatory process that would make recommendations on landslide risk management to the municipal and regional authorities. At this meeting, anyone wishing to participate in this process was asked to submit an application and, from those 16 participants were selected. Table 2 shows how the applicants were distributed in terms of gender, education, age, profession, risk exposure (aiming at half of participants living in the most endangered areas) and opinions about risk mitigation. The latter were important in assuring that the three main discourses (or voices) revealed initially from the interviews and desk study were represented in the deliberative forum.

The participatory meetings (there were five in all; one more than anticipated) were facilitated by the researchers and consisted of working groups, expert presentations and consultations. During the process, several parallel meetings were organized; for example, with the working group leaders, to discuss a compromise proposal and collect their feedback. Participants also organized meetings outside of the structured process and facilitated them themselves. After each meeting, minutes were circulated among participants and uploaded online in order to make the information available to the interested

Table 2 Characteristics of the selected residents

Variables	Distribution
Gender	56.2 % male, 43.8 % female
Educational qualification	Low (31.2 %), medium (37.4 %), high (321.2 %)
Age	15–30 (25 %), 31–45 (25 %), 46–55 (31.2 %), 56–75 (18.8 %)
Profession	Entrepreneur (18.8 %), trader (6.2 %), teacher (18.8 %), worker (6.2 %), housewife (6.2 %), unemployed (6.2 %), retired (18.8 %), student (18.8 %)
Risk exposure	Yes—living in Monte Albino (43.8 %), no—56.2 %)
Risk mitigation priorities ^a	New protection works (25 %), better territory management (23 %), cost–benefit analysis (25 %), other (25 %)

^a Elicited by the question (parentheses added): Which of the following statements best reflects your opinion?

It is a priority to build new structural measures for risk mitigation (safety first)

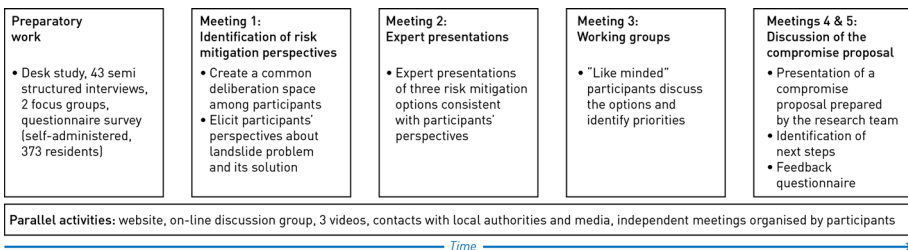
It is a priority to guarantee better territorial management and the sustainable development of the entire area (careful stewardship)

It is a priority to calculate the costs of risk mitigation and to compare them to the benefits, while also taking into account other risks and priorities (rational choice)

There is nothing to do; landslides will always happen (fatalism)

Other (Specify)

Table 3 Key phases of the participatory process



public. The facilitation has not always been an easy task: especially in the later meetings, conflicting views, opinions and interests became quite clear. The task of guaranteeing neutrality, transparency and process fairness has therefore been difficult on some occasions (a quite common problem in participatory processes, see also Krütli et al. 2010). For a description of the process, see Scolobig et al. (2011). The discussions during the meetings were recorded and transcribed (in Italian), and key contents were then summarized (in English) (see also Scolobig et al. 2011). Table 3 summarizes the key phases of the participatory process.

At the first meeting, participants voiced their opinions and perspectives about the landslide problem (its causes, scope and seriousness) and its solution. Table 4 provides an overview of the problem, as voiced by the participants, including factors contributing to landslide risk in the community (e.g. industrial activities on the slopes), the deficit in risk

Table 4 Views of participants on the landslide risk problem and its solution

Problems contributing to landslide risk

Factors increasing landslide risk	Inadequate monitoring and control of the territory Unsustainable forest management and agricultural practices Industrial activities and man made interventions Uncontrolled urban development Lack of maintenance of river channels and concrete on river beds
Risk awareness and communication	Low risk awareness and knowledge on the side of the residents Lack of information provided by the local authorities about risk areas Inadequate attention given to warning communication
Risk zoning	Disagreement with or lack of understanding of risk zoning criteria Trade-off between high safety standards versus economic development: landslide risk zoning hinders the economic and agricultural development of monte albino Risk maps proved to be unreliable after the 2005 event
Institutional issues	Fragmentation of competences and responsibilities among the different authorities dealing with risk mitigation Political instability as a barrier for effective decision making

Solutions for risk mitigation

Investment in structural (passive and active) and non-structural measures
“Soft” risk mitigation measures based mainly on natural engineering
Upslope structural risk mitigation
Mix of active and passive measures
Relocation
Elimination of the quarry
Improvement of the emergency plan
Reactivation of the mitigation works built at the time of the bourbons
Natural park at the toe of the slope

Procedural needs

Territorial survey presidium (i.e. experts dealing with risk management issues)
Cost–benefit analysis of the possible measures to be adopted

awareness and communication (e.g. inadequacies in the emergency warning system), problems of risk zoning (including the conflict with economic development) and institutional deficits (e.g. the fragmentation of responsible authorities). A variety of solutions were also voiced, including passive measures (usually structural) that intercept the run-out when a landslide occurs, and active measures to improve the slope stability. In addition, participants suggested policy interventions to reduce landslide risk exposure, including land-use legislation and regulations, risk mapping, and even relocating homes and other structures from high-risk areas. Particular attention was given to warning systems (which require monitoring technology) and evacuation plans. (A more detailed description of the problems and solutions listed in Table 4 can be found in Scolobig et al. 2011.)

As with the preparatory interviews, the same three distinct and, to a considerable extent, mutually irreducible perspectives are clearly evident in Table 4, with each specific concern being associated with one or the other of the discourses (e.g. soft mitigation measures based mainly on natural engineering reflects the “careful stewardship of the mountain” discourse). In other words, this table provides us with a sort of content analysis of the contested terrain, the preservation of which, as we have argued, is crucial if we are to find our way to a compromise: a clumsy solution. And this contested terrain was then the basis

for the next meeting: the meeting that brought together the public and the technical experts. The various items in this Table 4, of course, are specific to Nocera Inferiore (and some of them to landslide risk more generally), but, we would contend, a table *of this general form* should be a key component in the design of any participatory process.

For the second meeting, landslide experts at Salerno University prepared three different risk mitigation packages (options), each roughly consistent with one of the three perspectives on the landslide policy solutions that were voiced at the first meeting (as well as being revealed in earlier investigations). The co-production of these options is described in detail in Linnerooth-Bayer et al. (2015). They were arrived at through dialogues between the participants, with their “lay” knowledge of landslide risk, and the university staff, with their “expert” knowledge: in technical terms, their knowledge of the rainfall-induced mass movements (debris flows and debris avalanches) (Hungri et al. 2001) and mass transport phenomena (hyper-concentrated flows) (Cascini et al. 2015; Costa 1988; Coussot and Meunier 1996). Building on this knowledge, and on the participant perspectives, the following three packages of mitigation packages were constructed. Each, as well as being tailored to one of the perceptions, respected the legal requirement to reduce risk to the inhabitants in a cost-effective way, and each was consistent with the budget constraint of €7 million (Cascini et al. 2015; Narasimhan et al. this volume). We will provide just thumbnail sketches here, the packages being set out in considerable detail in Linnerooth-Bayer et al. (2015).

Safety first A number of the participants viewed public safety as the first priority of any risk mitigation strategy and felt that this would be best achieved with a prudent use of active measures (such as cleaning drains and properly managing the forests) and passive measures (such as decanting structures and storage basins). Consistent with this perspective, the Salerno experts constructed a mixed package consisting mainly of anchored sheet pilings (active) across the slopes, as well as passive storage basins at the toe of the catchments. These measures were designed to protect against hyper-concentrated flows triggered by rainfalls having a return period of 200 years. In addition, as with the other packages, an improved warning system and a core of experts monitoring the site (along with a territorial survey) would complement the structural engineering investments.

Careful stewardship of the mountain Other participants put the emphasis on sustainable development and on the ecologically informed maintenance of the mountain. To these participants, the underlying causes of landslide risk are largely those anthropogenic activities that have destroyed the ecosystem and degraded the mountains. Risk mitigation should respect nature and follow sustainable principles, and these are inconsistent with, for example, massive concrete passive measures. The Salerno experts therefore constructed a risk mitigation package that emphasized active control measures (such as erosion control across the rills, water tanks in the piedmont urbanized area, and the planting of oak trees at the toe of the Mount Albino slopes). In addition, a part of the €7 million would be invested in improving the warning system and instituting a territorial survey.

Rational choice According to the view of a small number of participants, the risk mitigation issue should be framed as a rational choice, taking account of the costs and benefits of the different mitigation measures, and also of other possible uses of public funds. Because structural protection measures are costly, and landslides infrequent, relocation could be the most cost-effective option and should be carefully considered. The Salerno experts duly designed an option that included the relocation of the most vulnerable homes, together with other, mainly active, measures that they considered to demonstrate a high benefit/cost ratio (for a full cost–benefit analysis of mitigation measures, see Narasimhan et al. this volume).

Trade-offs, of course, were not entirely absent from the other two mitigation packages; how could they have been, given that each of them, like it or not, had to comply with the €7 million fixed sum! But, while trade-offs are the essence of the Rational Choice perspective, they are something that is, as it were, external to the considerations that loom large in the other two. In consequence, trade-offs, as we go from one perspective to another, do not conform to a “single metric”: the costs and benefits of the same measures are shaped very differently. The costs of relocation in the Rational Choice option, for instance, are much lower than in the other two (which, in turn differ from one another), where they are variously seen as social, cultural and environmental, not just economic.

A related, and crucially important, finding from this second meeting was that, when asked to choose the perspective with which they most closely identified, the participants reported no difficulty in settling on just one, together with its associated mitigation package. They also confirmed that the three narratives represented the full range of relevant public perspectives.⁵

In other words, no one found him/herself torn this way or that, and no one felt him/herself to have been missed out. So this provides empirical confirmation of the theory-based claim that the three narratives constitute a “proper typology”: a typology, that is, in which the categories are mutually exclusive and jointly exhaustive (once we have allowed for the fatalist perspective, that is). This finding, moreover, undermines the criticism that has frequently been levelled at the theory of plural rationality by those who see themselves as post-essentialists (or post-modernists) and who claim that it cannot possibly capture the full richness of the empirically observable variety (e.g. Renn 1992). This criticism, along with others (some mutually contradictory) that have been levelled at the theory, is assembled, and largely refuted, in 6 and Mars (2008). The way was then clear for the third meeting.

At the third meeting, participants were divided into three working groups of “like-minded” persons, made up of those preferring each of the three narratives and their associated mitigation packages. Those few participants who chose the third package later showed a preference for a mix of packages 2 and 3. At first sight, aggregating similar persons appears to contradict the purpose of the participatory process, which is to reach compromise among dissenting perspectives on a common policy path.

To facilitate discussion, participants were provided with the following materials: a stylized description of the discourses behind the packages, a visual representation/plan of the mitigation packages, and a comparison of these packages on the basis of criteria identified during the previous meeting. Table 5 provides a synthesis of the commonly voiced opinions and priorities that were debated in each working group.

The picture that emerged from the working groups revealed a striking accord among the participants, insofar as the positions were not strongly polarized. Most participants agreed that active measures should be prioritized over passive ones, that an integrated system of monitoring and a territorial survey were needed, and that an improved warning system was essential. This relative lack of polarization, we should note, is in marked contrast to the initial elegant solution, back in 2008, that was so resoundingly rejected by the local authorities and the residents of Nocera Inferiore. So the participation process, even by this

⁵ This can be explained by: (i) the initial selection process aimed at selecting participants with different views and perspectives; (ii) the fact that the discourses were constructed based on the information collected through the document analysis, interviews and the first meeting; (iii) the reinforcement in the informal meetings outside the formal process meetings; (iv) the fact that, from the beginning, the participants knew that the mitigation packages were the starting point for the discussions that followed in the meetings and that a compromise solution was to be found.

Table 5 Commonly voiced opinions and priorities

Working groups	Commonly voiced opinions	Priorities
<i>Safety first</i> (preferring package 1)	(Only few) passive control works Control works upstream rather than downstream Relocation of some houses, if it is a feasible and cost effective Budget constraints need to be taken into account for decisions about investment in passive versus active works	Active control works on the most endangered slopes Improvement of the warning system Improved mountain maintenance with a special focus on limiting illegal buildings Construction of few passive control works, mostly to integrate the active ones.
<i>Careful stewardship of the mountain</i> (preferring package 2)	Equity in risk distribution, i.e. assuring the same safety standard for each slope Sustainable development for the entire area Forestation (chestnuts) Emphasis on active measures using natural engineering techniques Construction of few water tanks Maintenance or river channels and concrete on river beds essential	Stabilization of the open slopes Erosion control works along the hill slopes Forestation in the mountain area compatible with trees plantation to stabilize the soil and risk reduction on the open slopes Explore building water tanks upslope to avoid expropriation of private houses/properties Territory monitoring and control
<i>Rational choice</i> (preferring packages 2 and 3)	Warning communication and training for locals Need to better understand which open slopes pose the highest risk	Warning and evacuation plan Forest assessment plan Forest and river basin cleaning Active mitigation measures Relocation Tree barriers Natural park and forest maintenance

stage, had evidently moved things on in a constructive manner. Still, there remained many differences: on which slopes, for instance, should the (limited) passive mitigation structures be built? And which homes, if any, should be relocated? And can the small retention basins be built in non-visible areas? It was these, along with other related and still contested issues, that were addressed in the fourth meeting.

To prepare for the fourth meeting, and to give the participants a concrete package to debate, the Salerno experts drafted a proposal for a compromise mitigation package that combined elements of all three packages. The proposal was built on the areas of agreement, while, at the same time, striving to steer an even-handed path through the areas of disagreement. It included:

- an integrated system of monitoring;
- stabilization of the open slopes with naturalistic engineering works;
- relocation of a maximum of four households at the toe of the open slopes;
- a storage basin at the mouth of each catchment;
- erosion control works along the rills using material provided by the forest; and
- improvement of the warning system and institution of a territorial survey.

The compromise proposal was intensely debated, and an extra (fifth) meeting was scheduled by the participants to continue the debate. Two issues, in particular, were strongly contested.

The first concerned the structural measures, the specific locations of which (unlike with the earlier technical options) were indicated in the proposed compromise package. Some of those, it turned out, were to be sited on private properties in the piedmont area, and this caused dismay among those affected (the properties typically comprising a house and some surrounding land). The unsightly structures, they felt, would lower their property values, on top of which some of their land would be expropriated by the state. In consequence, self-interest (the so-called NIMBY syndrome: Not In My Back Yard) tended to override these participants' perspectives (see, for example, Cialdini 2000; Couzin et al. 2011; West and Bergstrom 2011).

The second concern similarly arose from hitherto unspecified measures—in this case, the relocation of four homes in the highest risk areas—being clearly indicated. Again, there was resistance to what was seen as the imposition of an unfair burden, the state being entitled to compulsorily purchase the properties without the inclusion of any element of compensation. Despite these two “bones of contention”, the discussions did eventually move towards a clumsy solution: a clumsy solution, moreover, that was largely based on the compromise package provided by the Salerno experts. The six storage basins, however, continued to be resisted by those participants who owned properties that would be expropriated or otherwise impacted, and this is something that has still to be resolved. In addition to what had been proposed by the experts, the participants recommended the implementation of a “forest assessment plan” (so as to guarantee what they saw to be the sustainable management of the forest; an initiative that saw professional foresters joining the geo-morphologists in the expert ranks). They also called for the organization of simulation exercises and other initiatives (so as to increase residents' awareness of risk and to improve their knowledge of emergency plans). And the relocation of the four (at a maximum) homes was rejected, with the participants recommending that the funds allocated for that purpose be used instead for the improvement of the warning system.

Admittedly, after all these meetings, this is still not a 100 % agreed solution, but clumsy certainly. And incomparably more acceptable and effective (by all the sets of criteria inherent in the three narratives) than the elegant (and one-way, top-down) solution that was proposed, and so resoundingly rejected, back in 2008!

The local authorities reacted very positively to the presentation of the research results. However, at the time of this writing we can still not say the “final word” about the implementation of the proposed clumsy solution. One of the most critical problems has been the transferring of the allocated funding for risk mitigation. On 16 April 2015 (with the decree n. 214), the first tranche of the funding for risk mitigation has been finally transferred to the municipality of Nocera Inferiore (<http://www.agro24.it/nocera-inferiore-montalbino-sbloccati-i-finanziamenti/>). Yet, there is still some way to go before the finalization of the risk mitigation measures on the Monte Albino slope.

6 Discussion and concluding remarks

The analytical-deliberative process in Nocera Inferiore proved to be an important innovation in many ways. As a first landslide participatory process, it demonstrated the feasibility and value of involving citizens along with experts in an issue that was characterized by complex technical, economic and social considerations. It also demonstrated the feasibility of participation in an unstable and changing institutional environment, and showed that citizens with diverse backgrounds, interests and worldviews can engage constructively

in a participatory, and expert-informed, process for the purpose of providing insights to the public authorities responsible for landslide mitigation. It enabled and facilitated not only a two-way learning process, but also network building, improved understanding of landslide risk issues, and concrete actions to mitigate the risk. The process proved important, not only for providing public policy input but also for raising awareness among those who directly participated and among those who (since it is not feasible to involve everyone) were on the outside of the formal process. And, most tellingly of all, it broke the existing, and years-long, deadlock.

The participants provided feedback through a questionnaire that was administered at the final participatory meeting. It showed (in line with Toad of Toad Hall) that few participants significantly changed their preferences during the process, and mainly those not living in the Monte Albino piedmont area. Indeed most participants, and particularly property owners in the high-risk areas, became more entrenched as the process proceeded. This is mostly due to the progressive realization that their own properties would have been affected by the implementation of the compromise solution. Not surprisingly, their worldviews were reinforced in support of and justification for their perceived interests. Notwithstanding the particularly difficult issues of relocation and compensation, the participants reached a compromise on recommendations for active and passive mitigation measures, for a warning system, and for a territorial survey. And, of course, they also, in the process, increased that fatalism-lessening prerequisite for democratic governance⁶: their *social capital* (as famously demonstrated, in Italy, by Robert Putnam, 1993).

In sum, the results of the participatory process demonstrated that it is feasible to organize an expert-informed participatory process that respects and builds on the conflicting perspectives of citizens. Starting with a very broad indication of divergent views, the range of policy options was extensively deliberated through the participatory process, which, thanks to its explicit legitimation of the contested terrain, was able to progressively converge on a clumsy (and expert-guided) solution, clumsiness by design, in other words.⁷

There was thus a process of reasoning and argumentation, which, however, did not lead to a general consensus on the problem itself. Participants, rather, stuck to (indeed, refined and narrowed) their deeply held beliefs and views and, at the same time, moved towards a compromise. Experts, moreover, could constructively contribute to this compromise by providing inputs that respected the divergent and plural perspectives. The public officials, who had hitherto had to resort to the “one-way model”, confirmed that this “two-way model” has certainly helped in mitigating the landslide risk in Nocera Inferiore. And, perhaps more importantly, it has established a democratic process of public participation

⁶ An excess of any one solidarity, the theory of plural rationality holds, will be deleterious, as too will its exclusion. The relationship, in other words, is “curvilinear”. But fatalism is to some extent the odd one out, in that, unlike the other three solidarities, it does not generate any of the three kinds of social capital—bonding (egalitarianism), bridging (individualism) and linking (hierarchy)—that are now recognized (Szreter and Woolcock 2004). Fatalism does have its part to play (see Underwood et al. 2014, where fatalism, so as not to offend certain CEOs, is re-labelled pragmatism) but, because of its social capital-eroding tendency, in much smaller doses than with the other three solidarities.

⁷ Of course, if there is no clumsy solution “out there”. You will not (and the risk of sounding like Yogi Berra, who famously said “If you don’t know where you’re going you may end up some place else”) find your way to it. The claim, therefore, is that, if you can ensure those two pre-requisites—accessibility and responsiveness—you are more likely to find your way to a clumsy solution, if there is one. The participatory process in Nocera Inferiore was designed to do that, and did, as is evident from the three distinct engineering solutions. It also arrived at a clumsy solution: the compromise that incorporates elements of all three engineering solutions, but was clearly distinct from them, is evidence of that.

that can be extended to landslide risk (and other natural hazards) facing other communities in Italy and elsewhere.

Acknowledgments The research described in this paper was supported by the European Community's Seventh Framework Programme through the grant to the Safeland Project (<http://www.safeland-fp7.eu/Introduction.html>), Grant agreement: 226479. The paper reflects the authors' views and not those of the European Community. Neither the European Community nor any member of the Safeland Consortium is liable for any use of the information in this paper. We thank the 43 local stakeholders, who devoted their precious time to the interviews and meetings. The same gratitude goes to the numerous volunteers of seven local associations providing help to collect the questionnaires, as well as for the 373 survey respondents. We gratefully thank our Safeland partners at the University of Salerno (Italy), Prof. Leonardo Cascini and Prof. Settimio Ferlisi, for their support and cooperation during all the research phases. We also thank Sandro Bösch at ETH Zürich for his creativity and patience in optimizing the figures. Finally, we would like to dedicate this work to the victims of the 2005 landslides and to their families.

References

- Aldred J, Jacobs M (2000) Citizens and wetlands: evaluating the Ely citizens' jury. *Ecol Econ* 34:217–232
- Ashby W (1968) Variety, constraint and the law of requisite variety. In: Buckley W (ed) *Modern systems research for the behavioral scientist*. Aldine, Chicago, pp 129–136
- Beck M, Thompson M (2015) *Coping with change: urban resilience, sustainability, adaptability and path dependence*. UK Government Office for Science. www.gov.uk/government/publications/future-of-cities-coping-with-change
- Beck M, Walker R, Thompson M (2013) Smarter urban metabolism: earth systems re-engineering. *Eng Sustain* 166:229–241
- Bloor D (1982) Polyhedra and the abominations of Leviticus: cognitive styles in mathematics. In: Douglas M (ed) *Essay in the sociology of perception*. Routledge and Kegan Paul, London, pp 83–102
- Cascini L, Ferlisi S, De Chiara G (2015) Quantitative risk analysis for hyperconcentrated flows in Nocera Inferiore (southern Italy). *Nat Hazards*. doi:10.1007/s11069-015-1784-9
- Cialdini R (2000) *Influence: science and practice*. Allyn & Bacon, New York
- Costa JE (1988) Rheologic, geomorphic, and sedimentologic differentiation of water floods, hyperconcentrated flows, and debris flows. In: Baker VR, Kochel RC, Patton PC (eds) *Flood geomorphology*. Wiley, New York, pp 113–122
- Coussot P, Meunier M (1996) Recognition, classification and mechanical description of debris flows. *Earth Sci Rev* 40:209–227
- Couzini I et al (2011) Uninformed individuals promote democratic consensus in animal groups. *Science* 334:1578–1580
- De Marchi B (2003) Public participation and risk governance. *Sci Public Policy* 30:171–176
- Dietz T (2013) Bringing values and deliberation to science communication. *Proc Natl Acad Sci* 110:14081–14087
- Douglas M (1978) *Cultural bias*. Occasional paper no. 35. Royal Anthropological Institute, London
- Dror Y (1968) *Public policy re-examined*. Chandler, Scranton
- Dryzek J (2001) *Deliberative democracy and beyond*. Oxford University Press, Oxford
- Dryzek J, Niemeyer S (2006) Reconciling pluralism and consensus as political ideals. *Am J Polit Sci* 50:634–649
- Elster J (1985) *Making sense of Marx*. Cambridge University Press, Cambridge
- Elster J (1998) *Deliberative democracy*. Cambridge University Press, New York
- Etzioni A (1968) *The active society*. Free Press, New York
- European Parliament (2000) Directive 2000/60/EC of the European Parliament and of the council of 23 October 2000 on establishing a framework for community action in the field of water policy. www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:en:NOT. Accessed 15 April 2013
- European Parliament (2007) Directive 2007/60/EC of the European Parliament and council of 23 October 2007 on the assessment and management of flood risks. www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:en:NOT. Accessed 15 April 2013
- Fischhoff B (2013) The sciences of science communication. *Proc Natl Acad Sci*. doi:10.1073/pnas.1213273110
- Gee J (2010) *An introduction to discourse analysis: theory and method*, 3rd edn. Routledge, London

- Gershuny JI (1978) Policymaking rationality: a reformulation. *Policy Sci* 9:295–316
- Grahame K (1908) *The wind in the willows*. Methuen, London (1975 edition)
- Habermas J (1983) *Moral consciousness and communicative action*. MIT Press, Cambridge
- Habermas J (1996) *Between facts and norms: contributions to a discourse theory of law and democracy*. MIT Press, Cambridge
- Hungr O, Evans S, Bovis M, Hutchinson J (2001) A review of the classification of landslides of the flow type. *Environ Eng Geosci* 7:221–238
- Innes JE (2004) Consensus building: clarifications for the critics. *Plan Theory* 3:5–20
- Italian National Institute of Statistics (2001) 14° Censimento Generale della Popolazione e delle Abitazioni. ISTAT, Rome
- Ives J (2004) *Himalayan perceptions: environmental change and the well-being of mountain peoples*. Routledge, London
- Jackson S, Tan P, Nolan S (2012) Tools to enhance public participation and confidence in the development of the Howard East aquifer water plan. *North Territ J Hydrol* 474:22–28
- Junker B, Buchecker M, Müller-Böcker U (2007) Objectives of public participation: which actors should be involved in the decision making for river restorations? *Water Resour Res* 43:1–11
- Kallis G et al (2009) Beyond the manual: practicing deliberative visioning in a Greek island. *Ecol Econ* 84:979–989
- Lakatos I (1976) *Proofs and refutations: the logic of mathematical discovery*. Cambridge University Press, Cambridge
- Lindblom C (1959) The science of ‘muddling through’. *Public Adm Rev* 19:79–88
- Linnerooth-Bayer J, Vari A, Thompson M (2006) Floods and fairness in Hungary. In: Verweij M, Thompson M (eds) *Clumsy solutions for a complex world: governance, politics and plural perceptions*. Palgrave Macmillan, Basingstoke, pp 181–204
- Linnerooth-Bayer J, Scolobig A, Ferlisi S, Cascini L, Thompson M (2015) Expert engagement in participatory processes: translating stakeholder discourses into policy options. *Nat Hazards*. doi:[10.1007/s11069-015-1805-8](https://doi.org/10.1007/s11069-015-1805-8)
- March JG, Olsen JP (1976) *Ambiguity and choice in organisations*. Bergen University Press, Bergen
- Margalit A (2014) *On compromise and rotten compromises*. Princeton University Press, Princeton
- Messner F, Zwinner O, Karkuschke M (2006) Participation in multi-criteria decision support for the resolution of a water allocation problem in the Spree basin. *Land Use Policy* 23:63–75
- Mileti D (1999) *Disasters by design: a reassessment of natural hazards in the United States*. National Academies Press, Washington
- Ney S (2009) *Resolving messy policy problems: handling conflict in environmental, transport, health and ageing policy*. Earthscan, London
- Narasimhan H, Ferlisi S, Cascini L, Faber M, De Chiara G (this issue) A cost-benefit analysis of mitigation options for optimal management of risks posed by flow-like mass movement phenomena. *Nat Hazards*
- Pagano L (2009) The role of rainfall history on the interpretation of flowslide triggering in pyroclastic soils. In: Picarelli L et al (eds) *Rainfall-induced landslides: mechanisms, monitoring techniques and now-casting models for early warning systems*. Studio Editoriale Doppiavoce, Naples, pp 216–223
- Paneque Salgado P et al (2009) Participative multi-criteria analysis for the evaluation of water governance alternatives: a case in the Costa del Sol (Malaga). *Ecol Econ* 68:990–1005
- Parkinson J (2006) *Deliberating in the real world: problems of legitimacy in deliberative democracy*. Oxford University Press, Oxford
- Pearce L (2003) Disaster management and community planning, and public participation: how to achieve sustainable hazard mitigation. *Nat Hazards* 28:211–228
- Perri G, Mars G (2008) Introduction. In: Perri G, Mars G (eds) *The institutional dynamics of culture*, 2 vol. Ashgate, Farnham, pp 1–12
- Potter J (1996) *Representing reality: discourse, rhetoric and social construction*, 1st edn. Sage Publications Ltd, London
- Putnam R (1993) *Making democracy work: civic traditions in modern Italy*. Princeton University Press, Princeton
- Rayner S (1986) Management of radiation hazards in hospitals: plural rationalities in a single institution. *Soc Stud Sci* 16:573–591
- Rayner S (2014) Wicked problems. *Environ Sci* 23:4–6
- Renn O (1992) Concepts of risk: a clarification. In: Krinsky S, Golding D (eds) *Social theories of risk*. Praeger, Westport, pp 53–79
- Renn O (1998) The role of risk communication and public dialogue for improving risk management. *Risk Decis Policy* 3:5–30
- Renn O (2006) Participatory processes for designing environmental policies. *Land Use Policy* 23:34–43

- Renn O (2008) Risk governance: coping with uncertainty in a complex world. Earthscan, London
- Rescher N (1995) Pluralism: against the demand for consensus. Oxford University Press, Oxford
- Rittel H, Webber M (1973) Dilemmas in a general theory of planning. *Policy Sci* 4:155–169
- Rosenberg S (2007) Rethinking democratic deliberation: the limits and potential of citizen participation. *Polity* 39:335–360
- Rowe G, Frewer L (2000) Public participation methods: a framework for evaluation. *Sci Technol Human Values* 25:3–29
- Rowe G, Marsh R, Frewer L (2004) Evaluation of a deliberative conference. *Sci Technol Human Values* 29:88–121
- Ryfe D (2005) Does deliberative democracy work? *Annu Rev Polit Sci* 8:49–71
- Schneider R (2002) Hazard mitigation and sustainable community development. *Disaster Prev Manag* 11:141–147
- Schwarz M, Thompson M (1990) *Divided we stand*. University of Pennsylvania Press, Philadelphia
- Scolobig A (2015) Stakeholder perspectives on barriers to landslide risk governance. *Nat Hazards*. doi:10.1007/s11069-015-1787-6
- Scolobig A, Bayer J, Cascini L, Ferlisi S (2011) Design and testing: a risk communication strategy and a deliberative process for choosing a set of mitigation and prevention measures. Deliverable 5.7, SafeLand Project, Living with landslide risk in Europe, WP 5.2, European Commission 7th Framework Programme. <http://www.safeland-fp7.eu/results/Documents/D5.7.pdf>, 239 pp
- Simon HA (1947) *Administrative behavior*. Macmillan, New York
- Steiner J (2012) *The foundations of deliberative democracy*. Cambridge University Press, Cambridge
- Stern P, Fineberg V (1996) *Understanding risk: informing decisions in a democratic society*. National Research Council, Committee on Risk Characterization, National Academy Press, Washington, DC
- Stirling A (2006) Analysis, participation and power: justification and closure in participatory multi-criteria analysis. *Land Use Policy* 23:95–107
- Susskind L, McKernan S, Thomas-Larmer J (eds) (1999) *The consensus building handbook: a comprehensive guide to reaching agreement*. Sage, Thousand Oaks
- Susskind L, Fuller B, Ferenz M, Fairman D (2002) *Multi-stakeholder dialogue at the global scale*. Consensus Building Institute, Cambridge
- Szreter S, Woolcock M (2004) Health by association? Social capital, social theory and the political economy of public health. *Int J Epidemiol* 33:650–667
- Tan P, Bowmer KH, Mackenzie J (2012) Deliberative tools for meeting the challenges of water planning. *Aust J Hydrol* 474:2–10. doi:10.1016/j.jhydrol.2012.02.032
- Thompson M (1979) *Rubbish theory*. Oxford University Press, Oxford
- Thompson M (2008) Organizing and disorganizing: a dynamic and non-linear theory of institutional emergence and its implications. Triarchy Press, Devon
- Thompson M (2013) Clumsy solutions to environmental change. In: Sygna L, O'Brien K, Wolf J (eds) *A changing environment for human society*. Routledge, London, pp 424–432
- Thompson M, Ellis R (eds) (1997) *Culture matters*. Westview Press, Boulder
- Thompson M, Gyawali D (2007) Uncertainty revisited (new introduction). In: Thompson M, Warburton M, Hatley T (eds) *Uncertainty on a Himalayan scale*. Himal Books, Lalitpur
- Thompson M, Rayner S (1998) Risk and governance part 1: the discourses of climate change. *Gov Oppos* 33:139–166
- Thompson M, Ellis R, Wildavsky A (1990) *Cultural theory*. Westview Press, Boulder
- UNCED (1992) The rio declaration on environment and development. www.unesco.org/education/nfsunesco/pdf/RIO_E.PDF
- Underwood A, Thompson M, Ingram D (2014) All on the same train but heading in different directions: risk attitudes among insurance company management and implications for forming a risk culture. *Intelligent Risk* August: 044–052
- UNISDR (2005) Hyogo framework for action 2005–2015: building the resilience of nations and communities to disasters. www.unisdr.org/wcdr
- Van den Hove S (2006) Between consensus and compromise: acknowledging the negotiation dimension in participatory approaches. *Land Use Policy* 23:10–17
- Van Eeten M (2001) The challenge ahead for deliberative democracy. *Sci Public Policy* 28:423–426
- Verweij M, Ney S, Thompson M (2011) How to curb global warming: when it may or may not be occurring clumsy solutions for a wicked world. In: Verweij M (ed) *Clumsy solutions for a wicked world*. Palgrave Macmillan, Basingstoke
- Webler T, Kastenholz H, Renn O (1995) Public participation in impact assessment: a social learning perspective. *Environ Impact Assess Rev* 15:443–463

- Webler T, Tuler S, Krueger R (2001) What is good public participation process? Five perspectives from the public. *Environ Manage* 27:435–450
- West J, Bergstrom C (2011) Can ignorance promote democracy? *Science* 334:1503–1504
- Wynne B (2007) Public participation in science and technology: performing and obscuring a political-conceptual category mistake. *East Asian Sci Technol Soc* 1:99–110