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R. GENEVOIS & A. PRESTININZI
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DOMINATION OF OR ADAPTATION TO NATURE? A LESSON WE CAN STILL LEARN FROM THE VAJONT

CHIARA BIANCHIZZA(*) & SIMONE FRIGERIO(**)

(*)ISIG - Institute of International Sociology of Gorizia - Via Mazzini, 13 - 34170 Gorizia, Italy

(**)C.N.R. - I.R.P.I. - Research Institute for Geo-Hydrological Protection, Italian National Research Council - C.so Stati Uniti, 4 - 35127 Padova, Italy

ABSTRACT

"Risk perception" for social science implies that risk can be judged through mental models embedded in social/cultural environments and shaped by media and peer influences.

This paper reviews risk perception dynamics in Vajont case. The disaster of 1963 left a strong mark on morphology and history of the communities and in the national public opinion. The event determined the end of a local approach to inhabiting a territory. While inhabitants of Piave valley had adapted to the mountain environment, the national project of producing hydroelectricity embodied a new modernity, aimed at human domination of nature.

The paper analyses public opinion perception about Vajont, both locally and at national level. Local community had opposed to the dam project due to the known instability of the terrain. The national press after the tragedy talked instead about "nature's unpredictability". The paper investigates the contrast between local and experts' knowledge.

The paper also investigates the influence of cultural background in shaping risk perceptions. On the one hand, local communities viewed risks as factors determining adaptation. On the other, the State considered risks as nuisances that could be controlled.

The Vajont case is an important example to be taken into account in the perspective of future developments for territorial management.

INTRODUCTION

As of today, tons of paper have been written about the Vajont catastrophe. Newspapers have reported the chronicles of the days following the landslide into the water reservoir and of the trials, engineers and geologists have studied the technical aspects of the event, legal experts the procedures that led to the progressive land acquisitions in the valley, psychologists the marks left on the survivors by the disaster that took place on the 9th of October 1963, just to mention few of the domains of research that have focused on the Vajont.

50 years later we have no groundbreaking revelations to make, all has been already written and the memory of the Vajont has not found yet a defined place in the history of Italy (ARMIERO, 2011). This paper aims at identifying, though the analysis of the events that led to the Vajont catastrophe, the lessons that can still be learnt for a more respectful and inclusive management of our territories and resources, starting from an in depth literature and press review. This article stems from the idea that, had the Mount Toc not have fallen into the lake, the history of land management that took place in the Piave valley would have led in any case to a social disaster and to the end of a traditional community.

This paper thus focuses on three main issues, all gravitating around the link between power and land management. Firstly, it defines the historical context on which this event took place, namely a moment of transition from traditional and community based land

management to state control over territorial decision making and resources. Secondly, it investigates how a political construct can inform even the scientific opinion in the pursue of a "vision", in spite of the signals that the physical events manifest. In the case at stake the definition of perception of territorial management and risk shifted in the hands of those who were in charge of decisions (the state) and could channel the information and inform the public opinion (i.e. the leading political party through the press), thus covering the voices of those directly involved at local level. Finally, the paper investigates the social destructive dimension of the dam construction for the local communities of Erto and Casso. Longarone was hit more severely that those two villages in the valley by the collapse of the Toc into the reservoir. However, the scope of this paper focuses rather on the dam construction process and its consequences on the communities before and despite the fall of the landslide. The communities of Erto and Casso had since the 1950's been affected negatively by the dam construction, without being involved in any territorial management decision. To understand social implications of territorial decision making, the analysis of the events that led to the catastrophe are thus the core of investigation of this paper.

A BRIEF HISTORY OF THE VAJONT DAM

Many texts and scholarly articles (CIABATTI, 1964; MERLIN, 1983; PAOLINI & VACIS, 1997; GENEVOIS & GHIROTTI, 2005; DELLE ROSE, 2012) just to cite a few have already described in the detail the history that lead to the collapse of Mount Toc into the Vajont lake (MÜLLER, 1961; SEMENZA, 1965; KILBURN & PETLEY, 2003; MANTOVANI & VITA-FINZI, 2003), causing more than 2000 victims and completely washing away villages, communities and a way of life. Thus we refer for completeness to these texts; we here briefly merely summarise the salient steps that lead to the 9th of October as a background to the review that follows.

The disaster had a stout impact on the environment (PAOLINI & VACIS, 1997) and a huge influence as well on local population in a socio-economical context in different temporal steps (MARCO, 1976; MASCARI *et alii*, 2009; VECCO, 2010). Since 1920 the planning of the dam had started, in the total unawareness of the population about the "Great Vajont" hydro-electric project, designed to transform the valley of the Piave river into a giant source of hydropower for Italy

(SELLI & TREVISAN, 1964). In 1957 the municipalities of Erto and Casso, on the edges of the Vajont torrent, were notified of the beginning of the construction. Local communities opposed to the plan, due to both the land expropriation that this project implied, and to the historically known instability of the terrain of mount Toc, on which the dam walls were to rest upon. 'Toc' in both dialects spoken in the valley means both 'piece' and 'rotten', evident symbol of the oral traditional knowledge that tagged all the relevant geomorphology with evocative names (PAOLINI & VACIS, 1997). However, based on old geological tests and on a permit to construct that SADE (Società Adriatica di Elettricità, a private electricity company with strong support at national level) managed to get from the government in mid-world war II (1943, with only few national commission members present in Parliament to approve the project), works started in the valley and land was expropriated. SADE project became even more ambitious: the height of the dam was increased even before the national permit was obtained and in spite of negative experts' opinion (MERLIN, 1983; BARNABA 2003). In 1959 a 3 million cubic meters landslide slipped into the nearby Pontesei dam lake killing a man at work. The voice of local communities of Erto and Casso once again and with more strength was raised against the construction, claiming strongly a role in decision-making (MERLIN, 1983; SEMENZA *et alii*, 2000). SADE, supported by a government commission that never really took charge of the supervision of the work, stressed the certainty of geology survey performed twenty years earlier, even if a new survey had in the meanwhile revealed a substratum covered by an active formation dipping on left side of the valley. This meant a serious condition of slope instability. This geological survey was however disregarded as not relevant and work proceeded. A first filling of reservoir was accomplished in June 1960 followed by a small rock slide and in November 1960 a huge rock block collapsed into the lake. Nonetheless, the dam construction was pursued in every way and attempts to make the rest of the rock collapse in the lake once and for all, so to continue with the project, were the only measures taken. (BELLONI, 1987). In the meantime, three geological models and monitoring instruments installed revealed potential critical scenarios (SEMEZA, 1960; MÜLLER, 1987) but the outputs were never carefully analysed. In October 1961 the

slope movements started to be monitored by new instruments and the displacement passed the threshold of 1.5 cm per day, especially in November 1962. The movement stopped only in March 1963, with a water level decreased to 650 m (MÜLLER, 1964). At the same time the State acquired SADE and, against all due care recommended by geologists and the worries and continuous protests by the local communities, in May 1963 the company increased the level of water of the reservoir to 720 m, so to deliver the dam as perfectly functional and thus close the transaction with ENEL (the state controlled electricity company). As a consequence in the following months of 1963 the landslide crown started to enlarge and new cracks appeared (DELLE ROSE, 2012). In October the houses were evacuated on the sliding slope and the mayor of Erto forbade access on reservoir, where the water level was being decreased at great speed to avoid the worst. It was too late, and the night of the 9th of October 1963 the catastrophe stroke.

ADAPTING OR DOMINATING? TWO PARADIGMATIC APPROACHES TO NATURE AND RISK

In the 1950s Erto and Casso were rural mountainous villages clenched to the steep slopes of Salta mountain in an impervious valley crossed by the Vajont torrent, an affluent to the Piave river. These settlements dated back to Roman times, when the Northern European tribe of the Cimbri settled in the geomorphologic impervious Piave valley to seek refuge from the Romans, founding Erto. The settlement of Casso seems to have come later on. The communities spoke two different dialects and although administratively part of the same municipality, kept for centuries different political trends and traditions. However, both communities throughout the centuries grew safe and isolated and learnt to live in the harsh nature of the mountainous area. Numerous landslides have been frequent throughout history and the two villages as they stood in the 1950s had been built on the debris of slides occurred in XVI-XVII centuries (MERLIN, 1983). The population adapted to a certainly not easy nature, setting the houses on the more stable, yet less productive side of the valley, and the fields and pastures on the more fertile, yet unstable slopes of the Toc Mountain, on the other side of the Vajont torrent. The adaptation of these communities to the environment they in inhabited is similar in

every way to any other mountain village in Europe until the beginning of 1950s. While in fact until this decade isolated mountain communities throughout Europe had lived and self regulated the territory they inhabited, through an empirical approach to the choice of settling areas (e.g., and like in the case at stake, building in an area subsequently destroyed by a landslide, and thus re-building the village in a safer area), from the 1950s economic development needs imposed often external stresses on the delicate equilibrium of these lands (FAVIER & REMACLE, 2007).

A rural, isolated population that had learned to live in a difficult environment is thus what SADE finds on the sides of the Vajont in the 1950s when the dam project started.

While these two communities are one of the actors of this story, SADE is the counterpart. While these two villages embody a traditional way of living, that sees nature as source of both nurture and peril and thus deals with it with a mixture of fear and care, SADE represents the opposite side of the coin and embodies a large scale world view that since the beginning of the 20th century has grown in Europe.

River basin management in this sense was associated with the so called "hydraulic mission" (MOLLE, 2008b), in a nationalist (in the case of Italy, fascist) attempt of government self sufficiency. Also this was in turn based on a modernist concept of domination of nature (DELLE ROSE, 2012) through improved technological discoveries and knowledge and based on an ideal scenario of "zero risk" (BIANCHIZZA *et alii*, 2011) through a man-made control of nature.

Territorial and river basin management has been throughout history a concept embodying different ideological and in turn political constructs (MOLLE, 2008b). We will later see (following session) how this was in turn used by SADE to strengthen the legitimacy of their agenda and to meet with state approval, by delivering the answer to a national view of development that was embodied by more and cheaper electricity for all. In this sense, the "hydraulic mission", pursuing an aim that was considered a state priority in terms of development, justified the breaking of regulations and the enrooting of whole communities in the light of "national, common interests" (MERLIN, 1983).

What happened in the Vajont between 1950s and 1963 is only one example of the many such cases throughout the whole of European alpine region. As

said in the introduction to this paragraph, starting in the 1950s many infrastructures such as highways, roads, pipes, dams have been built in alpine valleys by external companies with the approval and support of states, regions and provinces, without consulting local population. These infrastructures in most of the cases have been ultimately adding elements of danger in areas of human settlement, implying the construction of even more novel structural elements. This mechanism is an example of changes to the territory and subsequent interactions between different phenomena that potentially enhance the danger for settlements that had adapted for centuries.

This in turn has created a always greater distance between the mountain territory and its inhabitants, producing a void of knowledge and memory as well of participation. All these had all been elements endogenous to alpine communities and as consequence of the "infrastructuralisation" that never involved local communities in the 1950s, have been progressively disappearing (FAVIER & REMACLE, 2007). Thus today, with all the emphasis that is put on integrated basin management, it is important to remember what was eradicated in the 1950s and to create chances for participatory approaches to land management, thus delivering empowerment and responsibility over territorial management to residents and thus guaranteeing more sustainable and feasible land uses. The idea of domination of nature has been a failure and the unquestionability of experts knowledge has started to collapse since the 1980s (HOEPPNER *et alii*, 2010), when the developed choices made in the previous decades had started to show their limits.

It is important to stress however that a change of trend is not so easy as territorial management is always related to issues of power. It has been observed (MOLLE, 2008b) that even today, after all the failures in territorial management that we have seen in the past, socio economic forces and webs of power that stand behind water resources management do not take into appropriate account natural limits.

PILOTING OF PERCEPTION: POWER VS EVIDENCE

It has been already observed (SWYNGEDOUW, 1997) that wherever space re-organisation takes place, there develops a struggle for control and in turn, power (MOLLE, 2008b). In the case of Vajont, power of

residents over their own territory was progressively, constantly and illegally taken away by the electricity holding company and by the State. The communities rebelled and protested, on the basis of their own right over the land and of their inherited and long established knowledge of the terrain and its instability. However, these protests were largely disregarded. This happened for two main reasons. On the one hand, concerns about geological instability were met by SADE with sarcastic remarks on the superstitious approach to nature of ignorant mountain men. This is due to the always greater value that in the years of the Italian economic boom the "experts'" opinion played against traditional knowledge. All that was traditional and not based on "science" was disregarded and catalogued as old fashioned, as well as opposed to "development". The dominant communication model between science and lay people at the time was the so called "deficit model" (HOEPPNER *et alii*, 2010), assuming that scientists/experts were sources of absolute authority, while the audience (in this case the inhabitants of Erto and Casso, people with no formal scholar education) had no relevant knowledge and needed to be educated. On the other hand, protests about land expropriation could not go very far as the bureaucratic machine of the state required "papers" as sole proofs of property. Property of land in this isolated valley had instead been transmitted throughout the centuries from one generation to the other through traditional rights of use, with no particular attention to cadastre registration practices. Thus when compensation had to be asked, only old documents with the names of the ancestors that had first acquired the land were usable and thus money transfers could not be made to the current land owners. People was thus forced to sell the land at the price offered by SADE (much lower than market price), as they could not act legally against the electricity company with no documents proving their property. Also, several lands, on paper municipality properties, were in fact managed and owned by citizens, that kept them as part of a communal territorial management plan and benefited in turn from the harvest (ARMIERO, 2011). However SADE bought them as municipal property, totally disregarding these ancient customs of land regulation. (MERLIN, 1983).

Besides the silencing that took place in the valley in the decade of the dam construction, also at national level the issue was never addressed. SADE hid behind

a popular intellectual project of domination of nature, which was largely used at time by states to strengthen their power by delivering what they called the "fruits of development" (MOLLE, 2008b) (in this case, hydroelectricity) to the nation.

During the dam construction only one national newspaper, L'Unità, through its journalist Tina Merlin, followed the events that led to the collapse of Mount Toc and to the disaster that followed. Merlin also reported news about residents' protests, illegality of the land expropriation, abuse of power on the side of SADE, data on slope instability. Although Merlin presence in the Vajont valley was constant throughout the years, only few articles appeared in the newspaper she worked for, and nothing on these issues was ever published in other newspapers (MERLIN, 1983; REBERSCHAK, 2003). The land expropriation of mountain people and the end of a traditional community was not relevant for the public opinion if compared to the progress that the construction of a hydroelectric dam would foster. It is important to stress that the L'Unità, the only newspaper that published some articles on the Vajont before the catastrophe, was the press of the PCI (The Italian Communist Party), the opposition party at the time in Italy. One of the main Italian newspapers, "the newspaper" for north-eastern Italy, Il Gazzettino was owned partly by SADE, partly by FIAT, partly by Mr Volpi and partly by Mr Cini, the two heads of SADE. Certainly Il Gazzettino would have never published anything on the protests in Erto and Casso. Volpi and Cini, part of the fascist governing elite, at the end of the war repaired in Switzerland, where they tried to clean their past from fascist memories. Giving a lot of money to the Committee for National liberation and handing in Il Gazzettino" to the Christian Democrats (DC), the majority party governing the country after 1947, Cini and Volpi obtained a political 'cleansing' and could benefit again from all the privileges of power (DE MARCO, 1976). Now, with the newspapers owned by the majority party (the government), with hydroelectric projects being part of nationalist programme of development attached to a "nirvana concept" (MOLLE, 2008a) of progress, the dislocation of residents in Erto and Casso, the lack of transparency of the procedures and the geological risk had no space for the press and thus for the public opinion. Furthermore, this was to be observed even more acutely in the period after the catastrophe stroke. Man-

made projects depicted as symbols of development and progress, landslide as fatality of nature, charity towards the survivors as elevating virtue for the nation. No space for real equity claims, no attention to the social disruption that had slowly but inevitably operated for decades in the Vajont.

After the disaster, once the Vajont dam had become officially State property, the public opinion perception started to be largely informed and influenced by the leading majority party, who had at the time control over the press.

The catastrophe filled the first pages of all national newspapers, radio and television programs in a global and widespread mass media session. Since the beginning a palpable pressure led comments and judgments in a single direction, avoiding discussions on responsibilities and dangerous statements for SADE or the State. A quite hypocrite trend tried to establish a "false serenity" after the event, including themes like "the cruelty of nature", describing an "unpredictable accident" in a tone of pathetic resignation. Questions on the tragedy grew quickly but they were smoothed by generalities like "fatality of nature" or "nothing more can be done" (ISNENGI, 2003). However, in the valley and in Longarone isolated debate, desire to separate judgments, complaint against unclear liability became livelier among people, against the "untouchable" SADE that had left them out of decision-making and had made them victims of a tragedy in the name of "engineering progress".

As listed in ISNENGI (2003) all the newspapers approached the catastrophe with perspectives and aims linked to their own political alliance and social approach. The majority of the press, however, was with the majority position, which was the leading party's position which was the government that owned ENEL that owned the Vajont dam. It seems only a riddle, but it is simply the chain of power that from government led to press and thus to the information delivered at national level. Here we briefly summarise some of the main newspapers approaches.

Il Giorno oriented its articles towards a passive and quite pitiable mode, citing "*similar tragedies are not remarkable, and sadly suffered as a defeat*". A pure biblical submission to a "over-human" disaster emerged, with the call to human solidarity expressed by sentences such as "*these consequences can only enlarge human conscience*". The newspapers often

made a link to national or foreign case studies like Gleno (1923), Lago Cerreto (1935), Frejus (1959) in which other dams collapsed and caused victims. None of them was however even remotely comparable with the Vajont catastrophe and the cases were often quoted in a comparative attempt to exalt the Italian Vajont dam manufacture over the others. In those cases, in fact, it was the dam itself that had broken, while in Vajont the dam is still standing nowadays. Thus, the social and human dimension of disaster was by the Italian press overshadowed in favour of the national pride conveyed by the dam, symbol of the proudest engineering construction in the name of progress competition. The dam resisted to the violence of the slide, a daring project as a "proud dream of hydraulic engineering". Sentences like "*Man wins over nature by damming the river and transforming water in energy*" and "*the nature took revenge on human structures and man-made projects*" were found in the newspaper articles commenting the disaster, emphasising a fatalist view of the event and painting an heroic human struggle against greater forces. A dimension of severe fatality become perceptible, and the call of the Minister of Public Works that "*fatality cannot justify these tragedies and government has the compulsory role to bring out all details*" seemed to get lost in the populist propaganda that led to no real attribution of responsibility¹.

Il Corriere della Sera highlighted the amazing damage and incomparable catastrophe, describing the events as a series of single reports, with images, records and post-event feelings, like "*the railway disappeared, only two kilometres afterwards Longarone, sleepers, binaries and wood emerged again*". The event was detailed both for enormous dimension and for direct consequences, described by eyes and shocked behaviour of survivors. "*No more houses, no people, no churches, no roads, no bridges*". The huge wave wore away everything on one side of the valley. Afterwards "it moved back on the bottom side of villages and dragged bodies, trees, cars and houses". The physical disaster is clearly transposed in a psychological deep consequence. "*The wave moved back two or three times. Every time it torn, excavated, smashed*

and split the past, hiding bodies and villages under ten meters of sands and gravel". Survivors lost identity of their past and sentences like: "*I knew Longarone in every corner, now I don't know where I am*" were quoted. Villages crumbled, destroyed. "*The Major, nuns of nursery schools, the pharmacist and police cops are missing*" said a municipal technician, but similar lists became heavy loads for all families. "*Nobody cries here in Longarone*", "*this man has been working for six hours with his pick to find his wife and son*" convey a frightful feeling of impotence. A feeling to be "over the boundary" grew between local people, as testified by fear and bad sensations recorded after the catastrophe. "*We were waiting for the dam to fall...*". The survivors of Longarone town council met to decide first aid rules and plan. They were astonished, tired, out of reality. Between them lawyers, journalists, politicians started a exploitation on responsibilities, roles and consequences of the disaster. Survivors dealt with a daily smarting sufferance, but their pain was omitted and blinded by a furious hatred against the State, that they deemed corrupt and useless.

A direct and heavy accusation by L'Unità coped with the incongruence of a general awareness of the hazard and the total laziness to protect people, goods, and land in spite of continuous alarms and support required by local people. "*The Vajont catastrophe is the tragic end of a brutal misuse of land, water and of the local population*". It is a public accusation against public interest, economic power and a global corruption of the entire socio-political system. "*It was a murder!, and the victims claim justice*". This voice remained isolated as those of the survivors to the catastrophe. At national level, charity and solidarity for the destroyed villages was abundant. The public opinion was channelled to aiding those in need, but no debate emerged, that could have been useful for looking ahead, crafting the way in which land management and territorial decision making could have been better performed. The awakening of pity and solidarity had succeeded in piloting the public opinion towards emotional involvement and diverting it from what would have been a righteous demand for respectful and inclusive land management and for the questioning of the almighty power of politics and politicians. This vast review of newspapers presentation of the facts of the Vajont is functional to the highlighting of the enormous value that

¹ *The trials of the Vajont last for many years, the webs of power remained untouched and the trail led to a final sentence that was deemed as very unsatisfactory by the survivors (MERLIN, 1983; FABBRI, 2003)*

the piloting of public opinion towards a certain perceived shade of an event has in the silencing of real management issues in favour of political choices. This has always to be kept in mind when dealing with territorial management. Choices affecting the territory have impacts at local level that are often overlooked and hid, by the simple diversion of the issue towards its more emotional or rhetoric tones, creating a widespread perception that has the illusion of being freely formed but is instead often craftfully shaped by the dominating political interests.

THE SOCIAL DISASTER INSIGHTS FOR TERRITORIAL MANAGEMENT

When interviewed after the disaster and asked why they had not left the valley, some of the inhabitants of Erto-Casso replied that they had imagined and hoped that experts and politicians, that had reassured them for years about the safety of the dam, had known more than what they did (PCI, 1963). It is a rather symbolic answer that contains a lot of information about the social disruption that had taken place in the previous decade in the valley. People who had inhabited and made a living out of inhospitable environment for their whole lives, that had learned from experience and from the knowledge of their ancestors how to read events and act accordingly, found themselves slowly but surely expropriated of the reliability of their own knowledge, in favour of the opinion of experts, in front of the voice of science. This is emblematic of an approach to science already described in the previous paragraphs, where the dichotomy expert/traditional knowledge results in a victory of science over experience. This victory led not only to the disaster of the Vajont and many others alike, but also to the progressive disappearance of such traditional knowledge in Europe in the last 50 years and in turn to the de-responsibilisation of mountain inhabitants from their environments (BIANCHIZZA *et alii* 2011). What happened in Erto and Casso, including the creation of committees that asked to be listened on the hazard that the mountain represented, was a diffused phenomenon into the Italian Alps at the time. A larger movement existed, called *Comitato per la Rinascita dell'Arco Alpino (Committee for the recovery of the Alps)*, that involved communities that had been affected by the savage land expropriation that was making space to hydroelectric dams (ARMIERO, 2011).

In the spirit of the time, all oriented towards mo-

dernty, there was no space for peasants, their needs and their knowledge (MERLIN, 1983; PAOLINI & VACIS, 1997; ARMIERO, 2011).

The community started to crumble into pieces, land was taken away and people were left with no sources of income. This led to migration and thus to the end of a way of living the mountains, even before the Mount Toc had fallen into the artificial lake.

The customs for land management were disregarded, traditional and experiential knowledge were not taken into account, responsibility of the inhabitants over their territory was broken. This trend, that characterised the land management policies at national level from the 1950s (BIANCHIZZA *et alii*, 2011) has left a mark on our mountains.

It meant no more maintenance of the land, creation of new alien infrastructures to reduce an added danger that derives from a non-adaptive use of the territory and in turn an increase of risk. This, together with the detachment of mountain people from their land that they can no longer decide upon, leads to depopulation of mountain areas.

Today the insights from the case of Vajont are especially precious. In the face of climate and socials change, sustainable management of the land, repopulation of mountain areas, re-creation of a link between inhabitants and territory, valorisation of traditional knowledge and creation of integrated approaches to local development are increasingly gaining space in the definition of a new way forward (MOLLE, 2008a; IPCC, 2007).

It is important to recall the Vajont as a cautionary tale in this perspective. A state-centred approach, with no care about experience and traditional knowledge, and that did not include local development as criteria for decision making has proved to be a failure, in the Vajont and in many other cases across the Alps (PELLING, 2007; PLANALP, 2010). The rural society that had adapted to mountains has already disappeared with all its inherited knowledge. Still, the Vajont reminds us that power and "visions" it conveys are often capable of covering the signs and voice of evidence. When thinking territorial planning and management, this should be carefully taken into account and by strengthening the link between people and their territory and their participation in decision making a tool could be devised to stop the massive machine of political power from crumbling people, communities and a sustainable future under its invasive force.

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