



# Prescriptive conflict prevention analysis: An application to the 2021 update of the Austrian flood risk management plan



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## ABSTRACT

Flood events have become more frequent in Europe, and the adaptation to the increasing flood risks is needed. The Flood Directive set up a series of measures to increase European resilience, establishing Flood Risk Management Plans (FRMPs) at the level of the river basin district as one relevant action. In order to efficiently fulfil this objective, the involvement of stakeholders as well as the analysis of their roles, responsibilities, and demands has been considered to be crucial to develop FRMPs. As a result, the hypothesis tested in this paper is that a consensus solution for the 2021 update Austrian Flood Risk Management Plan is feasible. To demonstrate this, both in-depth interviews and questionnaires to key Austrian stakeholders are implemented. The information collected in both participatory techniques are then used to run a conflict prevention analysis. The results show that (a) improving the coordination among regions and including better land-use planning approaches are preferable to a hypothetical business as usual scenario; and (b) a consensus solution for the 2021 update Austrian FRMP might be achievable on the basis of both a deep discussion on the state-of-the art and green infrastructure development.

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## 1. Introduction

One of the most relevant flood events ever occurred in the Upper Danube basin was recorded in June 2013, with maximum flood discharges at Vienna. This location has been affected by a series of major flood events along history: 1899, 1954, 2002, and 2013 (Blöschl et al., 2013). According to these authors, maximum flood discharges were identified in the year 2013 with  $11\,000\text{ m}^3\text{ s}^{-1}$ ,  $10\,300\text{ m}^3\text{ s}^{-1}$  in 2002,  $9\,600\text{ m}^3\text{ s}^{-1}$  in 1954, and  $10\,500\text{ m}^3\text{ s}^{-1}$  in 1899. The one produced in 2002 has been considered the trigger for the EU Floods Directive (EC, 2015).

Due to the fact that climate change is one more flood triggering factor among others, such as spatial and temporal distributions of rainfall at catchment scale, catchment morphology and runoff response (Garambois et al., 2014), adaptation to climate change has been considered essential for current societies (EEA, 2013, 2014; IPCC, 2014). However, adaptation cannot be implemented in any way, since uncoordinated and disperse pieces of legislation might

reduce disaster response capabilities (Mysiak et al., 2013). As a consequence of the necessity of having a coordinated flood policy, the European Commission launched the Floods Directive in 2007, called 'Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks', with the purpose of setting up a series of measures to increase European resilience to flood risks (EC, 2007). The main objective of this Directive is establishing Flood Risk Management Plans (FRMPs) at the level of the river basin district, with the intention of reducing the potential negative consequences of flooding for human health, the environment, cultural heritage and economic activity (EC, 2007).

In order to efficiently fulfil the objective established in the Directive, a proper involvement of stakeholders as well as the analysis of their roles, responsibilities, and demands has been considered to be crucial to develop disaster risk management plans (Holub and Fuchs, 2009), including FRMPs (Fleischhauer et al., 2012), having noticed that the participation of key stakeholders in FRMPs might increase resilience to flood events (Schelfaut et al., 2011) and stick up for flood risk management inherent complexities (Löschner et al., 2016). As a result of the relevance of including stakeholders in flood governance, this paper pursues the analysis

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of potential stakeholder's agreement with the foreseen 2021 update version of the Austrian FRMP. This analysis is therefore based on both in-depth interviews and questionnaires to Austrian main stakeholders. This conflict prevention analysis will show (a) to what extent the stakeholders will support the inclusion of new measures in the current plan, and (b) the potential stakeholders' coalitions which might come out from the process of updating the current FRMP.

## 2. Theoretical framework of conflict/consensus analysis

The application of conflict/consensus analysis to flood risk management is aimed at determining «the level of acceptability of the risk, caused by the implementation of the regional plan, and the need for mitigation and adaptation measures to avoid/prevent or limit/minimise this risk» (Helbron et al., 2011, p. 94). But implementing those measures might be the origin of conflicts among stakeholders (Menzel and Buchecker, 2013; Tseng and Penning-Rowell, 2012), being the resolution of those conflicts the main objective of conflict/consensus analysis (Stepanova and Bruckmeier, 2013). However, the procedure to be applied to help solving conflicts might differ.

Griewald and Rauschmayer (2014) suggest that understanding the conflicts need a capability approach based on both semi-structured interviews with stakeholders and document analyses. The authors analysed a flood protection conflict produced by the implementation of measures based on cutting down trees in a protected area in Leipzig (Germany). Their conclusions indicate that the adoption of capability-based analysis might bring useful insights in the understanding of conflicts, improving flood risk governance. Helbron et al. (2011) proposed the use of environmental indicators within a Strategic Environmental Assessment approach to manage flood risk policy conflicts. This method of analysis was not however based on stakeholders' involvement, but on potential conflicts that might arise in land-use planning. The authors highlighted that the application of this method is useful for the identification of potential conflicts, providing a good framework for the proposal of specific measures to minimise flood risk in urban areas.

Integrated assessments can also be found in the literature, such as the one implemented for air pollution management (Corral-Quintana, 2004), water resources management (De Marchi et al., 2000; Paneque-Salgado et al., 2009), sustainable mobility planning (Hernández-González, 2014; Hernández-González and Corral-Quintana, 2016), flood risk management (Löschner et al., 2016), or coastal management (O'Toole et al., 2013). These studies showed

that conflict analysis might be handled through the use of methodology combinations, such as institutional analysis, participatory techniques, and multi-criteria evaluation methods. These studies revealed that conflict/consensus analysis might either end well (reaching consensus or compromise solutions), indicating that collaboration among institutions and stakeholders might reduce conflicts and help conflict resolution (Löschner et al., 2016; Lubell, 2004; Sabatier et al., 2005), or might not (compromise solutions cannot be found and polarised positions between stakeholders linger on).

Among the studies that have found compromise solutions is the one developed by De Marchi et al. (2000). This analysis was conducted in Troina (Sicily) focused on water resources management. The problem began with the perception of an under-exploitation of the potential availability of water resources. The authors found that the best alternative, based on the multi-criteria evaluation, was an information campaign on the functioning of the water cycle. However, this alternative was considered socially unstable. Therefore, an alternative based on the combination of producing bottled mineral water and recreational activities in the forest was considered a good compromise solution, on the basis of stakeholders support.

Nevertheless, as pointed out above, conflict resolution is not always achievable. Corral-Quintana (2004) highlighted that even though a common agreement on air pollution policies in Tenerife (Canary Islands) could have been obtained, power relations exerted by several stakeholders pushed the business as usual situation forward. The same conclusions were detected in the analysis developed by Hernández-González (2014) and Hernández-González and Corral-Quintana (2016). These researchs developed a conflict analysis after assessing different sustainable mobility policies in Tenerife. Although the scientific assessment and stakeholders preferences mostly coincided, the union of local governments and regional lobbies held back sustainable options. Paneque-Salgado et al. (2009) also detected that local governments might not be willing to implement alternative water management policies other than their own proposal, albeit better and more socially accepted policies have been found.

Feliciano et al. (2014) pointed out that solutions to climate change mitigation in rural areas might be difficult to achieve as a consequence of physical-environmental constraints, lack of information and education, personal interests and social values. Other authors mention that conflicts exist since participation practices are politicised and some powerful groups are very active in pursuing their personal interests in the decision-making processes (Kuhlicke et al., 2016; Tseng and Penning-Rowell,

**Table 1**  
Different methodologies to handle conflicts.

Environmental conflict	Methodology	Source
Transport planning	Multi-criteria and stakeholder analyses	Bana e Costa et al. (2001)
Natural resources management	Longitudinal approach	Blackstock et al. (2015)
Coastal fisheries	Stakeholder analysis	Bruckmeier and Larsen (2008)
Climate change mitigation	Stochastic Actor-oriented model	Ingold and Fischer (2014)
Farmland uses	Direct interviews and document analysis	Darly and Torre (2013)
Water resources management	Collaboration analysis	Lubell (2004)
	Advocacy coalition framework	Lubell et al. (2014)
	Multi-group evaluation	Giordano et al. (2007)
	Bayesian Belief Network	Giordano et al. (2013)
Flood protection	Capability-based analysis	Griewald and Rauschmayer (2014)
	Use of environmental indicators	Helbron et al. (2011)
	Exploratory research approach	Thaler and Levin-Keitel (2016)
Management of hill areas	Adaptive conjoint analysis	Morgan-Davies and Waterhouse (2010)
Reuse of brownfields	Multi-criteria decision analysis	Morio et al. (2013)
Land-use planning	Social impact assessment	Peltonen and Sairinen (2010)
	Content analysis of print media reports	von der Dunk et al. (2011)
Biodiversity management	Conceptual framework	White et al. (2009)

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