Vol. 151, No. 2-3 · Research article

DIE ERDE
Journal of the Geographical Society of Berlin

Justice of compensation for spatial flood risk management – comparing the flexible Austrian and the structured Dutch approach

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Manuscript submitted: 16 October 2019 / Accepted for publication: 14 April 2020 / Published online: 29 May 2020

Abstract

In view of the anticipated climate change, many countries face increasing risks of flooding. Since the end of the 20th century, the traditional hard flood protection measures have been increasingly complemented with spatial flood risk reduction measures. These measures, though in the public interest and as such, benefitting many people, almost inevitably affect landowners adversely. In other words, spatial flood risk reduction measures affect private land. The impact may extend from mere decreases in property values as a result of changes to zoning plans and to obligations to tolerate certain acts related to the construction or maintenance of water defence structures. Most of the time, implementation of spatial flood risk reduction measures thus discriminates between landowners, as some profit from better protection but others are affected negatively by the measures. Spatial flood risk reduction measures thus raise issues of social justice. Compensation plays a crucial role in flood risk management to mitigate the impact on land. How and in which cases this compensation is paid differs from country to country. Some national jurisdictions compensate for loss as a result of lawful administrative acts if and to the extent that it is considered unreasonable for this loss to be the full responsibility of the affected party. In this paper, we compare two different legal compensation frameworks in two European countries: Austria and the Netherlands. Based on a comparative analysis, we discuss how these different compensation schemes affect social justice, both in terms of substantive distributions but also in terms of procedural justice.

Zusammenfassung

Angesichts des zu erwartenden Klimawandels werden viele Länder zunehmend mit Hochwasserereignissen konfrontiert werden. Deshalb werden seit dem Ende des 20. Jahrhunderts neben den klassischen Schutzmaßnahmen vermehrt nicht-strukturelle Maßnahmen zur Reduzierung des Risikos angewendet. Obwohl diese Maßnahmen im öffentlichen Interesse liegen und vielen Personen, Unternehmen sowie auch der kritischen Infrastruktur zugutekommen, wirken sie sich fast zwangsläufig nachteilig auf die Landbesitzer aus, da viele Maßnahmen auf Privatgrundstücken errichtet werden. Dies hat zur Folge, dass es zu Wertminderungen von Grundstücken kommt und dies bis hin zu Pflichten und Verlusten beim Bau von Hochwasserschutzmaßnahmen reicht. Diese Maßnahmen werfen daher massiv Fragen über soziale Gerechtigkeit auf. Beim Hochwasserrisikomanagement spielt deshalb die Kompensation eine entscheidende Rolle, um diese negativen Folgewirkungen für

Thomas Thaler, Neelke Doorn, Thomas Hartmann 2020: Justice of compensation for spatial flood risk management – comparing the flexible Austrian and the structured Dutch approach. – DIE ERDE **151** (2-3): 104-115

DOI:10.12854/erde-2020-467

Privatpersonen zu reduzieren. Wie und in welchen Fällen diese Entschädigungen gezahlt werden, ist von Land zu Land unterschiedlich. Der folgende Artikel beschäftigt sich mit der Frage, wie zwei unterschiedliche gesetzliche Rahmenbedingungen in zwei europäischen Ländern, nämlich Österreich und den Niederlanden, die Frage der sozialen Gerechtigkeit beantworten.

Keywords flood risk management, spatial flood prevention measures, compensation, spatial planning, social justice

1. Introduction

In view of the anticipated climate change, many countries face increasing risks of flooding. In many countries, flood risk management will need to take decisive steps in the coming years to reduce the risk of inundating flood-prone areas. Since the end of the 20th century, the traditional structural flood alleviation schemes have been increasingly challenged and complemented with land use and spatial instruments (*Kienholz* et al. 2004; *Hartmann* and *Driessen* 2017; *Thaler* et al. 2017).

Currently, flood risk management policy tries to implement new solutions, such as so-called spatial flood risk management strategies (*Haupter* et al. 2005; *Thaler* 2014; *Dadson* et al. 2017; *Thaler* et al. 2017; *Milman* et al. 2018). Spatial flood risk management is intent on 'keeping the rain where it falls' to reduce the risk to downstream communities (*Thaler* et al. 2016; *Thaler* et al. 2017; *Machac* et al. 2018; *Collentine* and *Futter* 2018). Strategies seek to harness the resilient and sustainable character of nature to provide short-, medium- and longer-term solutions to managing hydro-meteorological phenomena (*Nakamura* 2003; *Thaler* et al. 2016; *Thaler* et al. 2017; *BenDor* et al. 2018; *Casteller* et al. 2018; *Moos* et al. 2018). It can mitigate flooding and, in addition, provide positive benefits for other water-related risks as well as co-benefits for regions, such as increasing a place's attractiveness (*Nesshöver* et al. 2017; *Raymond* et al. 2017; *UN* 2018). Spatial flood risk management includes, for example, natural water retention measures, space for rivers, or measures for resilient cities (i.e., green infrastructure in cities, green roofs, decentralised rainwater management) (*Viavattene* and *Bryan* 2013; *Dadson* et al. 2017; *Jiang* et al. 2018). These types of strategies are encouraged by the EU Water Framework and Floods Directive, implemented in 2000 and 2007, respectively (*Hartmann* and *Juepner* 2014) and a great deal of academic attention (*Schanze* 2017). One common element of these spatial flood risk management methods is that they essentially require more land (*Hartmann* et al. 2019).

It is, therefore, a key challenge to get such options implemented on land which is often privately owned by farmers, citizens, or other private entities (*Hartmann* 2011; *Thaler* 2014), as this often means a restriction in the use of private property rights (*Rauter* et al. 2019). Here, a central question is how to encourage private landowners to allow spatial flood risk management strategies (*Milman* et al. 2018). A key problem is the temporal and unpredictable (in terms of year and frequency) flooding of large land areas often used for other purposes, such as farmland. Spatial flood risk management, therefore, poses a problem of transferring a risk (or an additional risk) to the land user for the benefits of another user (*Collentine* and *Futter* 2018). A central conflict is that those who bear the burden are not those who gain the benefits of spatial flood risk management strategies. Spatial flood risk management strategies are, then, often easy to design in engineering terms and provide a good complement to local climate adaptation strategies, but the amount of land required to provide sufficient storage in the appropriate place to be useful is a limiting factor (*Thaler* 2014; *Dadson* et al. 2017; *Bornschein* and *Pohl* 2018). For example, in England and Wales, the political definition of flood risk management policy has not yet made it publicly acceptable to sacrifice private land for the sake of the downstream communities as a mainstream strategy (*McCarthy* et al. 2018). This causes extensive debates regarding the preferred form and institutional set up of compensation (*Weikard* et al. 2017).

The use of privately-owned land as a potential storage area is, then, considered to be in the public interest as it would benefit many people, but it is almost inevitable that the landowner will be adversely affected even if the land itself is not actually put into use as

a retention basin (*McCarthy* et al. 2018; *Tarlock* and *Albrecht* 2018; *Hartmann* et al. 2019). The use of land might be affected legally or factually. Legal implications might be, for example, restrictions on agricultural land in flood polders, the obligation to tolerate certain actions related to the construction or maintenance of water defence structures or requirements for rainwater management in the hinterland. Factual implications of spatial flood risk management might be changes in the groundwater level due to dyke relocations. Some landowners, then, are burdened in the realisation of flood risk management (*Gerber* et al. 2017; *Bornschein* and *Pohl* 2018; *Wachinger* et al. 2018; *Scholten* et al. 2019). This prompts the question of whether compensation should be provided to individual landowners. Some national law systems indeed provide for compensation for loss as a result of these lawful but for some individuals disadvantageous administrative acts, if and to the extent that it is considered unreasonable for this loss to be the full responsibility of the landowner, which has strong social justice implications (*Dai* et al. 2019).

In this paper, we focus on the following research question: how do the procedural aspects of compensation mechanisms affect the amount of compensation (and thereby affect distributive justice)? By comparing the legal compensation system in two countries with different answers to the question (Austria and the Netherlands), we will explore the relationship between procedures and outcomes. In the past two decades, these two European countries have encouraged the implementation of spatial flood risk management solutions to protect communities. In particular, with the implementation of the concept of Room for the River (*Ruimte voor de River* in the 1990s in the Netherlands and *Regionalstudien zu Hochwasser* in the 2000s in Austria), both countries follow a strong policy of implementing spatial flood risk management measures on private land along rivers, which has shown large losses in recent decades: in the Netherlands especially in 1993 and 1995 and in Austria in 2002, 2005 and 2013 (*Hartmann* and *Jüpner* 2014; *Thaler* et al. 2017). However, both countries show two controversial implementation proceedings: an open negotiation framework in Austria juxtaposed with a fixed and prescribed procedure for compensation in the Netherlands. The different compensation procedures will be compared based on the following three research questions:

- Who takes the initiative for the compensation? This can be understood as questions about the following: is compensation awarded by default, or do disadvantaged landowners need to apply? In the latter case, how do the people get informed?
- What is the current procedure for compensation, or is it an open negotiation between the local or national authority and the disadvantaged landowner?
- Which instruments are available to the local and national authority to designate the area as retention basins? Is the negotiation voluntary or do the authorities have the power of expropriation as a backup option?

2. Flood risk management and justice

In the last decade, attention on questions of justice in the context of flood risk management has increased. This literature largely builds on two strands of literature that have emerged from different disciplines: climate justice and environmental justice. Climate justice has its roots in political philosophy, mostly focussing on the distributive questions that are raised by climate change, but also paying due attention to procedural aspects and aspects of recognition (*Schlosberg* et al. 2017; *Patterson* et al. 2018). Environmental justice originally emerged as a social movement in the late 1980s in response to unsafe waste disposal sites and rundown neighbourhoods in the US. Environmental justice as a field of academic research and a policy principle is of a more recent date (*Doorn* 2019). In the wake of its origin in environmental and civil rights activism, environmental justice language has provided a "vocabulary of political opportunity, mobilization and action" to bring to attention previously neglected or overlooked patterns of inequality that negatively impact people's health, wellbeing and quality of life (*Agyeman* and *Evans* 2004: 156).

Current research in environmental justice also includes the distribution of benefits, such as to green and blue spaces (*Mutz* et al. 2002). Although the more conceptual philosophy literature has so far paid relatively little attention to the justice aspects involved in flood risks (*Doorn* 2015), empirically informed literature on justice aspects of flood risk management is growing, focussing on the allocation of resources, wealth, responsibilities and burdens across different members of a community (*Johnson* et al. 2007; *Doorn* 2016; *Doorn* et al. 2018; *Kaufmann* et al. 2018; *Thaler* et al. 2018). There are different philosophical schools

(e.g., utilitarian, egalitarian, libertarian, proportional etc., see *Table 1*) which dictate different interpretations of distribution and engagement of a community in flood risk management politics (*Doorn* 2018; *Kaufmann* et al. 2018; *Thaler* et al. 2018; *Hartmann* 2018; *Bennett* et al. 2019). Most of these approaches could be seen as a response to a utilitarian approach which seeks to maximise the aggregated sum. Hence, how individuals fare within such a system, that is, how risks and benefits are distributed, does not matter within a utilitarian approach to justice. The other approaches all focus on the risks and benefits that are to be distributed; see *Table 1* for a short description of each of these approaches to distributive justice. In addition to discussions of the actual distributional effects of flood alleviation schemes or payments (*Campbell* and *Mancilla* 2012; *Neal* et al. 2014), discussion focuses also on the way in which these schemes or payments are achieved, which is usually captured under the heading of procedural justice (*Johnson* et al. 2007; *Walker* and *Burningham* 2011; *May* and *Morrow* 2012; *Patrick* 2014; *Alexander* et al. 2018). Whereas distributive justice is about the justness of distributions, procedural justice can be conceived as the fairness by which this distribution is decided upon and the question of whether all people have equal access to this procedure (*Doorn* 2019). Procedural justice is strongly linked to the democratic principle that problems that affect a person or group of persons ought to be resolved by the persons affected, either directly or through their representatives (*Vanderheiden* 2008). Procedural justice denotes equal opportunity amongst stakeholders to influence the decision-making process and due consideration of all interests in the resulting outcome (*Paavola* and *Adger* 2006).

Although compensation is an instance of redistributing costs and benefits with the aim of correcting for distributive injustices, this paper also focuses on the procedural aspects of particular compensation schemes. The reason is that most scholars working on justice hold that distributive justice cannot be achieved if the procedure itself is unjust. An extreme position is taken by libertarian philosophers, who defend the view that procedural justice is ultimately all that matters. If a distribution is achieved through a justified procedure, the resulting distribution can, therefore, be considered just (cf. the American philosopher *Robert Nozick* (1974) for a defence of this view). Most people reject this extreme view and consider the justness of a procedure to be largely a function of whether the outcomes it tends to produce can be considered just (*Miller* 2017). But also, then, the question of how people are treated in the procedure is of value, even if it does not affect the outcome itself (*Doorn* 2019). Fair decision-making processes reflect the recognition of people as members of the community. Empirical studies have shown that people often care more about being treated fairly by the institutions they have to deal with, than whether the ultimate outcome is to their own personal advantage (*Lind* and *Tyler* 1988).

3. Methods

This paper presents the social justice implications of compensation for spatial flood risk management, mainly implementation of flood storages, wetlands, river restoration or river and watercourse management (*Dadson* et al. 2017). We selected spatial flood risk management strategies that require privately

Table 1 *Concepts of social justice in flood risk management. Source: adapted from Kaufmann et al. (2018); Thaler et al. (2018); Bennett et al. (2019)*

Concepts of social justice	Short description
Utilitarian	Allocation of resources so that the highest benefit for the community is obtained. Distribution of costs and benefits is not taken into account.
Egalitarian	Allocation of resources so that inequality between different actors is reduced.
Libertarian	Main focus lies on the individualistic role in flood risk management, where the public administration should not infringe on private property for the implementation of large flood alleviation schemes. Flood risk management limited to provision of hazard information.
Proportional	Dictates that an individual person should not have to carry a disproportional burden of something that benefits the collective as a whole.
Prioritarian	Flood risk management policy should focus on the most vulnerable members within the community.

owned land. This paper chooses an international comparison, which allows us to evaluate and reflect upon national flood risk management policies (*Chappell* 2010). An international comparison provides the "opportunity to develop a deeper understanding of specific areas" (ibid.: 183). In addition, a key advantage of using a comparative technique is the achievement of more in-depth knowledge about how policy processes influence the implementation of spatial flood risk management strategies (*Sartori* 1970, 1991). The comparison is mainly based on semi-structured in-depth interviews, analysis of legal and policy documents to assess the institutional and legal framework and a literature review of the national and regional compensation mechanisms for implementation of spatial solutions in flood risk management in both countries. We conducted semi-structured, in-depth interviews with 27 experts at the national, regional and local level to determine the practical use of compensation schemes. The interviewed experts came from national, regional and local levels (academic organisations and consultancy (n=5), practitioners at a national level (n=3), practitioners at a regional level (n=10) and local mayors (n=9)) and were directly involved in the planning process of spatial flood risk management strategies. The selection process was based on a snowball technique. The interviews were conducted face-to-face or by phone and lasted (on average) between 60 and 90 min. each. The interviewees were asked about the planning and decision-making process, the role of different stakeholders within the planning and decision-making process, procedure within the negotiation process and the influence of the legal framework in the implementation process. Each of the interviews was recorded, transcribed and coded with Atlas.ti. The different methodological approaches were used as complementary observations to assess and interpret our results. The analysis of the literature review and legal framework are crucial to understanding and assessing the current compensation scheme in both countries. Especially, legal frameworks provide formal rules for flood risk management, which define the tasks, duties and responsibilities of each actor and stakeholder (*Hodgson* 2006).

4. Two different approaches to compensation[1]

4.1 Austria

The Austrian legislation includes various provisions for intervening in and restricting current land uses. Since the beginning of the 21st century, Austrian flood risk management has demonstrated a strategic shift from focussing only on structural defences to using natural water retention strategies. In overall, the Austrian flood risk management policy envisages the implementation of flood storages or ensuring natural retention areas in a watershed-wide concept (on an inter-communal co-operation basis) or within a community. In particular, the Austrian Water Act (*Republic of Austria* 1959) explicitly includes the possibility for voluntary purchase of private land for flood risk management. This is in contrast to other forms of infrastructure development, such as road and railways, as there, the Austrian government has the instrument of compulsory land use acquisition (*Republic of Austria* 1957, 1971).

The implementation of spatial flood management strategies is usually planned on agriculturally zoned land. The public administration establishes a contract between local landowners (usually full-time farmers) and the federal water authority to use the land for controlled floods in the designated area (*Republic of Austria* 1959). The policy is based on a voluntary purchase policy, where farmers are compensated by the public administration. In addition, the public administration usually does not make the actual acquisition of the land; the landowner can still use the land, except to build a residential or non-residential building on the plot. The public administration only purchases the land that is needed to build the embankment for the flood storage. The main reason is the aspect of land management; if the public administration owns the retention area, they need to hire or lease back the land to the farmers. Usually, the negotiations are organised face-to-face; one party will be the mayor, the other party the farmer, accompanied by a member of the agricultural chamber. Here, the farmers show a much stronger position of power as farmers can block the implementation process. In particular, farmer representatives have played a central role in the negotiation process and agreement with local landowners, because they have had a close and well-established relationship with the local farmers. Nevertheless, the national and regional level delegate the task to the

local level without any transfer of any additional resources, such as knowledge. Consequently, power in the relationship lies mainly on the side of the farmers in a similar way to French law (*Cans* et al. 2014; *van Doorn-Hoekveld* et al. 2016). Overall, public administration follows two main principles, the 'equality principle'[2] and the protection of property.

The compensation between the public administration and local landowners aims only to reimburse for the restriction of land uses and not for damage to the land resulting from future flood events. This is usually one-off compensation directly after the agreement similar to that in other forms of infrastructure developments. The level of compensation is closely based on the negotiation between private landowners on the one side and public administration on the other. Usually, the mayor negotiates with private landowners and, in the case of farmland, also with the farmers' association. The aim of compensation is a restorative function so that affected landowners should find themselves in the same financial position as before any land was acquired for flood prevention purposes. However, the public administration has no fixed-prepared legal and political framework and strategy that dictates how to compensate private landowners. As a result, the level of compensation is based on individual negotiation between different parties (mayor vs forest and farming landowners) in contrast to other forms of infrastructure developments, where the public administration has an upper limit to the level of compensation. On roads and railways infrastructure projects, if no agreement can be reached between both parties, the public administration has the power to organise the fixed price-level of compensation based on jurisdictional decisions (based on public interest). However, the use of compulsory purchase order (by court decision) is rarely the case in Austrian flood risk management policy with the consequence of a long time-lag in the planning and implementation phase of flood storage; therefore, if the private landowner rejects the offer, the public administration has to re-design or refuse the flood risk management plan for the community or watershed.

4.2 The Netherlands

Dutch law offers several provisions for acquiring access to land for flood risk management in general, including land intended to be used as retention polders. Usually, the water authorities do not attempt to acquire full ownership of the land because of the high costs involved; however, if certain criteria are met (public interest and a strict necessity of acquisition), the Dutch law allows for expropriation. Also, though, if the specific flood risk management measure requires that the authorities have full ownership of the land, the expropriation instrument requires that the authority and the landowner first try to enter into a voluntary agreement.

In the event that the flood risk management measure does not require that the water authority has full ownership of the land, the Dutch Water Act allows for the imposition of 'duties to tolerate' (*gedoogplichten*), which means that the landowner needs to tolerate that his or her land is used as a retention area, which may also restrict the use of the particular land. These duties to tolerate should, therefore, be seen as a type of regulatory taking. They can, in certain cases, be imposed by order and, in other cases, operate by force of law (*Van Rijswick* and *Havekes* 2012). Since these obligations can only be imposed if the specific land is designated for a particular flood risk management function (mostly as a retention area), the spatial designation is already considered to be a harmful act.

A landowner whose land has been designated as a retention area can suffer harm in several ways. The designation may include a duty to tolerate particular acts that are themselves harmful, for example, certain maintenance works. Secondly, the market value of the property may decrease for the very reason that the property has become designated as a retention area. The latter may especially be the case when the designation as a retention area includes land-use restrictions. Damage resulting from the designation of a flood retention area, including its development and putting the area into use as a retention area, may be eligible for compensation on the grounds of two different schemes: compensation for lawful administrative acts (*nadeelcompensatie*) and compensation for planning loss (*planschade*). Since these compensation schemes are based on different principles, the amount of compensation, as well as the required procedure, may also differ.

The amount of compensation for loss resulting from lawful administrative acts is based on the 'equality principle' (*Tjepkema* 2010), which dictates that an individual person should not have to carry a disproportional burden of something that benefits the collective as a whole (reflecting the 'proportional' view

on distributive justice in *Table 1*). The equality principle has been laid down in the Water Law. For those administrative acts not covered by the Water Act, the equality principle is recognised as a "rule of responsible public administration" (*Needham* 2006: 144), which means that courts recognise the principle as an accepted codex for governmental activities (*Needham* 2007). In the Dutch case law that arose in the 1970s, two constituent requirements emerged concerning applications for compensation for loss resulting from administrative acts: there must be an *abnormal burden*, in the sense that the burden exceeds the normal societal risk, as well as a *special burden*, in the sense that it affects only a limited group of citizens. There is also a general causality requirement. Of these requirements, the criterion of the abnormal burden is, in practice, the most important criterion for defining the possible compensation. Losses are compensated only if they exceed the normal societal risk. This means that not all loss is compensated. For entrepreneurs, a threshold of 10-15% of the yearly gross revenue is often applied as the normal societal risk. For loss of property value, a percentage of the property value is often applied as the normal societal risk, below which the damage will not be compensated; however, the exact threshold percentages differ. In 2013, a formal law was accepted by Parliament according to which the compensation for loss resulting from lawful administrative acts is to be codified in the General Public Administration Act (*Algemene wet bestuursrecht*). With the codification of the compensation scheme, many governmental bodies, including the water authorities, have developed guidelines for demarcating the normal societal risk, so that the principle can be applied in a more uniform and also more predictable way.

In the national Room for the River projects, the Ministry of Transport, Public Works and Water Management tried to purchase all land and buildings in the area covered by the plan on an amicable basis as far as possible. The property owners were, therefore, first asked to enter voluntarily into negotiations on the purchase price, including compensation. The price of the property was established by independent experts. Property owners could request to consult their own advisors, the costs of which were reimbursed if the involvement of the advisor led to an agreement. If it was not possible to come to a voluntary agreement, the Ministry started an expropriation procedure. In these situations, the prices of the property, as well as any compensation costs for the legal advice, were established in court.

Under some conditions, it was possible for property owners to keep their property outside the dykes and to enter into an 'inundation agreement' with the State. With the agreement, a) the property owners consented that the property could be used for inundation; b) the State guaranteed full compensation for flood damage in exchange for this, and it also guaranteed the option of selling the property in the future at the value of property inside the dykes. People who did not wish to enter into an agreement could still apply for compensation under the equality principle as well as compensation for planning loss under the existing legal provisions. The Ministry of Transport, Public Works and Water Management works opened a special office to handle these requests in such a way that people did not have to look for the correct legal provision on which to base their claim.

The Dutch legal system provides for broad coverage of damages if a particular piece of land is designated as a retention area: the reductions in property value due to spatial planning decisions as well as the damage as a result of the imposed duties to tolerate are, in principle, eligible for compensation. In the case of compensation, based on the equality principle, part of this damage is considered to be the property owner's own risk, and only when a certain threshold is exceeded will the remaining damage be compensated. For the planning loss, the compensation is more generous, although this category has also moved toward less generous compensation. Hence, although the exact amounts may still differ, there is some convergence between the different schemes and with the formal recognition of the equality principle in the General Public Administration Act, this will probably further converge.

5. Comparison of both systems

This paper presents the social justice implications of using retention areas on private land for flood risk management strategies. The Dutch system is more problematic from a procedural justice point of view. Once an area is designated as a retention area, the water authority is quite powerful. Some duties to tolerate operate by force of law, but some need to be imposed by order. In those situations, the law prescribes that governmental bodies first have to try to enter into a voluntary agreement; for example, when inspectors need to access a piece of land. However, if this is not possible, and the public interest is sufficiently urgent,

water authorities have the option to impose these duties by order once a particular piece of land has been designated as a retention basin. Which type of interests can be considered of sufficient importance are laid down in the law, and landowners are able to appeal. The fact that the water authorities are able to enforce the duties to tolerate against the wish of landowners suggests that the public interest prevails, which suggests a utilitarian approach to social justice. The compensation should then be seen as a correction for reasons of fairness (proportional), as the burden would be considered undue if it were carried disproportionally by a limited number of citizens. On the other hand, by defining procedural justice based on who has the power to make decisions and whether the outcome of policy decisions includes fair treatment of everyone involved, the Dutch policy presents itself as structured and organised around criteria of procedural fairness.

In contrast, the Austrian policy envisages a more unplanned – a less predefined and more open – approach to negotiations and dealings with private landowners. Many flood storages in Austria are used for agricultural purposes. However, when needed, these areas are inundated. For such cases, contracts between the farmers and water authorities are established to compensate for the damage resulting from the controlled flooding of the areas. Private landowners are quite powerful, even if the water authority designates an area as a retention area. The contract needs to be achieved through a voluntary agreement, but with the consequence that, if private landowners reject the offer, the water authority needs to re-design the flood risk management plan for the watershed. Further, the local authority has – in contrast to the Netherlands – no clear regulation guidance (such as a guidebook) regarding the organisation of this negotiation process. In addition, the expenses for compensation are much higher than in the Dutch system, as the Austrian legal system does not envisage an upper limit, so in many instances, compensation can be as high as ten times the market value of the land. Consequently, this negotiation process is also costly in terms of time and other resources, as private landowners can stop the negotiation and implementation process at any time. In terms of procedural justice, the Austrian system allows for a broader participation process in contrast to the Netherlands, suggesting a libertarian approach to social justice. The Austrian compensation scheme in flood risk management focuses on the principle of maximum liberty for private landowners. Therefore, private landowners have a strong position in the negotiation and planning process; however, the Austrian system generates higher distributional inequality, as society needs to compensate at a much higher cost than the Netherlands. This also implies a stronger role for landowners in the negotiations. This is mainly caused by water authorities placing the responsibility of land negotiation on the mayor without providing any further resources, for example, knowledge about how to negotiate or standardise procedures. Consequently, it is possible for single landowners to hinder the implementation of spatial flood risk management plans and thereby force the restart of planning the flood management scheme. This has a strong negative impact on the level of procedural justice, as communities who might benefit from the scheme are excluded from the outcome of the planning process.

6. Conclusions and policy implications

The findings presented in this paper show that both systems have strong social justice implications when using retention areas for flood risk management strategies. In the Austrian governance arrangement, the landowners are shown to have a strong position in the negotiation process, as the policy approach prescribes that a voluntary agreement be reached. This contrasts with the Dutch system. In Austria, the agreement of private landowners is crucial, because not much can be done without their cooperation and involvement in the planning and negotiation process. Successful implementation depends on the negotiation and understanding of the best outcomes for the private landowners. Consequently, the allocation of compensation is much higher in Austria, with all its negative consequences for the national taxpayer because of the solidarity-based funding system. By contrast, the Dutch system has a stronger utilitarian rationale, with little room for private landowners to negotiate higher compensation. Here, the decision criteria are more transparent for the public, as opposed to the Austrian flood risk management policy. Hence, from the perspective of equal treatment of citizens, the Dutch system scores higher on procedural justice. The Austrian compensation scheme allows subjective criteria to influence the level of compensation, which results in distrust within the community. However, if we focus on the power aspect of procedural justice and the question of whether citizens have a genuine opportunity to appeal to decisions that affect them, we could say that the Dutch system scores lower on

procedural justice. In the Netherlands, there is a power asymmetry between the authorities and the landowners, as the water authority can make the final decision about the level of compensation. Additional contextualised case studies are needed to further distil the social justice implications of different compensation mechanisms.

This contribution adds to the body of literature exploring the implementation and implications of spatial flood risk management (*Schanze* 2017). The focus on compensation is important in this, as using private land is a crucial factor for successfully implementing these measures (*Hartmann* et al. 2019). Consequently, spatial solutions have wide-ranging implications for social justice. The main questions arising from the foregoing are as follows: who gets compensated at what level, which land should be protected and which land needs to be inundated. In this, the countries across the world follow different policies as these two examples have shown. Following a utilitarian approach would make it likely for private land in rural areas to be inundated to protect urban areas, causing a problem as communities in the past allowed residential and non-residential buildings in flood-prone areas. On the other hand, following a libertarian policy direction would endorse communities who gain from spatial solutions having to pay for the solutions. Elitist policy does not differ based on whether households can afford it or not, however. This can have enormous impacts on the willingness and ability to implement spatial solutions. On the other hand, prioritarian or egalitarian policies would include that spatial solutions should mainly reduce the risk for deprived communities rather than focussing on protecting high-income communities. In sum, the link with social justice shows the political normative dimension of spatial solutions. Including social justice in the decision-making process is, therefore, crucial to reduce future conflicts and to be more inclusive in flood risk management policy.

Notes

[1] The protection of property as laid down in Article 1 of Protocol No. 1 of the European Convention for Human Rights (ECHR) also provides a legal ground for compensation (*Doorn* 2019). However, in practice, the national schemes have a wider coverage of compensation for harm experienced by a landowner than the European protection of property (*Sanderink* 2015), so we will limit our discussion to the national schemes.

[2] The full name of the principle is 'égalité devant les charges publiques', which translates literally as the principle of equality of public burdens. The origins of the principle can be traced to French law. The equality principles provide compensation for loss as a result of lawful government acts if and to the extent that it is considered unreasonable for this loss to be the full responsibility of the affected party.

Acknowledgements

Thomas Thaler received financial support from the Austrian Climate and Energy Fund and his work was carried out within the Austrian Climate Research Program (funding no. B769942). The work of Neelke Doorn has been supported by a grant from the Dutch National Research Council NWO (grant no. VI.Vidi.195.119). The paper is also linked to the European COST Action LAND4FLOOD: Natural Flood Retention on Private Land (CA16209).

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