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Article

Cultural Influences on Flood Control Policies in Central Europe: A Literature Review

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Abstract

Flood risk management research increasingly recognises that technical and institutional solutions alone are insufficient to reduce flood impacts under accelerating climate change. While comparative studies have examined governance structures and policy instruments, considerably less attention has been paid to how regional cultures shape citizen participation and, in turn, influence policy effectiveness. This literature review addresses this gap by examining how cultural mechanisms mediate flood governance outcomes in Central Europe and China, with particular attention to the Rhine and Yellow River Basins. Drawing on interdisciplinary literature spanning flood governance, cultural geography, disaster studies, and public participation, the review demonstrates that flood policies operate through culturally embedded interpretations of risk, responsibility, and authority. In Central Europe, traditions of local self-organisation and participatory governance support bottom-up engagement in flood preparedness and risk-sharing. In contrast, long-standing state-centred flood cultures in China have fostered strong reliance on structural protection and administrative control, while limiting autonomous civic participation. By reframing culture as an active policy mechanism rather than a passive contextual factor, this review highlights why flood management strategies with similar technical rationales generate divergent participation patterns and resilience outcomes across regions. The findings suggest that culturally insensitive policy designs risk underperforming, even when engineering capacity is high. The article concludes by outlining implications for flood governance, arguing that integrating cultural mechanisms into policy formulation is essential for enhancing public engagement, legitimacy, and long-term flood resilience.

Keywords: flood risk; flood management; sustainable environment; cultural influences

1. Introduction

Flood governance does not yield uniform outcomes across regions with similar levels of flood risk. Even where comparable engineering measures, legal frameworks, and technical expertise are in place, substantial differences persist in citizen participation, public trust, and policy acceptance. Empirical studies have shown that such variations cannot be fully explained by hydrological conditions or economic capacity alone (Morrison et al., 2018; Mees et al., 2016). Instead, flood policies are embedded within broader social contexts in which risk is interpreted, responsibility is allocated, and collective action is either enabled or constrained.

In recent decades, flood governance research has increasingly emphasised citizen participation as a core component of resilience-based approaches. Participation is expected to enhance preparedness, strengthen risk awareness, and improve policy legitimacy (Plate, 2002; Wolff, 2021). However, comparative research across Europe and beyond indicates that participation remains highly uneven in practice. While some regions exhibit strong bottom-up engagement and shared responsibility, others rely predominantly on state-led intervention with limited civic involvement, even under similar policy frameworks (Mees et al., 2016; Kundzewicz et al., 2019).

This unevenness has often been attributed to differences in institutional design, governance capacity, or economic development. While these explanations are valuable, they overlook a critical dimension repeatedly observed in historical and comparative studies: the role of culture in shaping how flood risk and governance are understood at the societal level. Cultural factors—including collective flood memory, historically embedded state–society relations, and normative views of human–nature interaction—shape whether citizens perceive flood risk as a personal responsibility or a matter of state control (McEwen et al., 2017; Engel et al., 2014). As a result, culture operates not merely as a contextual background but as an implicit mechanism that influences participation, compliance, and policy effectiveness.

The contrast between Central Europe and China provides a particularly instructive lens for examining these cultural mechanisms. Both regions have long histories of severe flooding and extensive experience with large-scale flood control, yet they display markedly different patterns of civic engagement. In the Rhine River Basin, traditions of local self-organisation, volunteerism, and participatory governance have fostered active citizen involvement in flood preparedness and risk-sharing. In contrast, in the Yellow River Basin, long-standing state-centred flood management traditions have reinforced expectations of governmental responsibility and comparatively limited autonomous participation (Chen et al., 2012; Christian Wohlfart et al., 2016).

Against this background, this study examines how differences in citizen participation in flood prevention policies may be understood through a cultural lens. The central question of this study is whether the factors influencing citizen participation in flood prevention policies are related to cultural differences across different regions. By focusing on the Rhine River Basin in Europe and the Yellow River Basin in China, the article reviews and synthesises interdisciplinary literature on flood governance, cultural memory, civic engagement, and public well-being. Through this comparative perspective, the study seeks to clarify how culturally embedded understandings of risk, responsibility, and governance shape participation patterns and influence the effectiveness of flood policies.

2. Theories Affecting Flood Policy

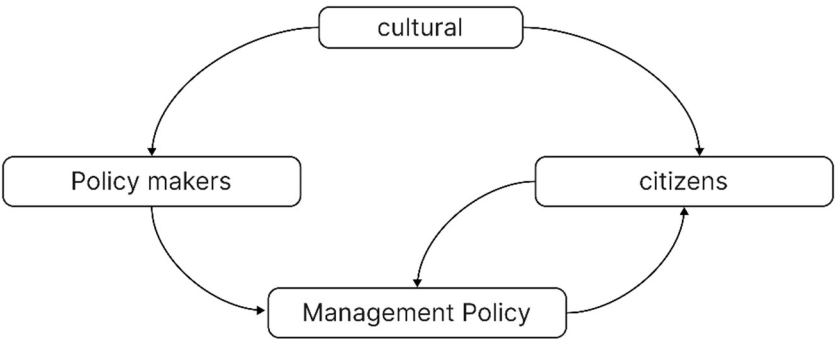
2.1. *From Flood Defence to Participation-Oriented Governance*

Early flood governance approaches were predominantly centred on structural protection, treating flood risk as a technical problem to be managed through engineering interventions such as embankments, dams, and drainage systems. Within this flood defence paradigm, citizens were largely positioned as passive recipients of protection, with limited expectations of public involvement in decision-making or preparedness (Morrison et al., 2018).

As flood risks intensified and the limitations of purely structural solutions became increasingly evident, flood governance frameworks began to incorporate principles of integration and resilience. These approaches emphasise adaptability, learning, and the distribution of responsibility across multiple actors, including local communities and individual citizens (Dordi et al., 2022). Within this shift, citizen participation is no longer viewed as supplementary, but as a necessary component of effective flood risk management. Participation is expected to enhance risk awareness, preparedness behaviour, and policy legitimacy, thereby improving governance outcomes beyond what technical measures alone can achieve (Plate, 2002; Wolff, 2021).

2.2. *Citizen Participation as a Governance Variable, Not a Universal Outcome*

Although contemporary flood governance frameworks increasingly promote citizen participation, participation does not emerge uniformly across regions. Empirical studies demonstrate substantial variation in how citizens engage with flood prevention policies, even where formal opportunities for involvement exist (Mees et al., 2016). These differences manifest in levels of preparedness, compliance with risk-reduction measures, trust in authorities, and willingness to share responsibility for flood risk.



Importantly, this variation suggests that participation cannot be understood solely as a function of policy design or institutional provision. Rather, participation operates as a governance variable whose expression depends on how citizens perceive flood risk, interpret their roles, and evaluate the legitimacy of policy interventions (Peng et al., 2020). This observation is central to comparative flood governance research, as it raises the question of why similar policy frameworks generate divergent participation outcomes across regions.

2.3. Culture as an Influencing Factor Shaping Participation

Existing explanations for variation in citizen participation in flood governance have largely focused on institutional arrangements, governance capacity, and socio-economic conditions (Kundzewicz et al., 2019; Dordi et al., 2022). While these factors are important, they do not fully capture why citizens across regions interpret flood prevention policies and their own responsibilities in fundamentally different ways.

Cultural perspectives offer an additional explanatory layer by highlighting how shared values, historical experiences, and normative expectations shape perceptions of risk and governance. Collective flood memory, culturally embedded views of authority, and prevailing understandings of human–nature relations influence whether flood risk is perceived as an individual responsibility, a collective task, or primarily a matter of state control (McEwen et al., 2017; Engel et al., 2014). These cultural orientations do not determine participation outcomes, but they condition how citizens respond to policy initiatives, shaping willingness to engage, comply, or rely on governmental protection.

2.4. Linking Theory to the Central Question

Taken together, these theoretical perspectives suggest that citizen participation in flood prevention policies cannot be explained by governance frameworks or technical measures alone. Participation emerges at the intersection of policy design and culturally embedded interpretations of risk and responsibility. This insight directly informs the central question of this study: whether the factors influencing citizen participation in flood prevention policies are related to cultural differences across different regions. Addressing this question requires comparative analysis that considers not only institutional arrangements, but also the cultural mechanisms through which policies are interpreted and enacted in practice.

3. Cultural Background as an Implicit Determinant of Civic Participation

Citizen participation in flood prevention policies is shaped not only by formal institutional arrangements, but also by deeper social factors that influence how risk, responsibility, and authority are interpreted. Comparative studies indicate that citizens’ willingness to engage in preparedness activities, comply with risk-reduction measures, or contribute local knowledge is conditioned by culturally embedded expectations regarding who should act and how flood risk should be managed (McEwen et al., 2017; Peng et al., 2020). In this sense, culture functions as an implicit determinant of

participation by shaping the cognitive and normative foundations upon which policy interventions are received.

One key cultural factor influencing participation is collective flood memory. Historical experiences of flooding, transmitted through narratives, commemorative practices, and local knowledge, shape how communities perceive flood risk and evaluate the necessity of engagement in prevention measures (McEwen et al., 2017). Where floods are remembered as recurrent and manageable events, citizens may normalise exposure and rely on established protection systems, potentially reducing incentives for individual preparedness. Conversely, where flood memory emphasises disruption, loss, and uncertainty, citizens may exhibit heightened risk awareness and a greater willingness to participate in preparedness and mitigation activities. These patterns suggest that participation is influenced not only by objective risk levels, but also by culturally mediated interpretations of past flood experiences.

Cultural expectations regarding the relationship between citizens and the state further shape participation in flood prevention policies. In contexts where flood control has historically been framed as a central government responsibility, citizens may perceive participation as secondary or unnecessary, even when policy frameworks encourage involvement (Kundzewicz et al., 2019). By contrast, in settings characterised by traditions of local self-organisation and shared responsibility, participation may be viewed as a normal and legitimate component of flood governance (Mees et al., 2016). These culturally embedded views of authority and responsibility influence whether citizens interpret participation as an obligation, a right, or an optional activity, thereby shaping engagement outcomes across regions.

Cultural understandings of the human–nature relationship also influence participation by shaping perceptions of appropriate flood management strategies. In some cultural contexts, flooding is interpreted as an inevitable or natural process that should be accommodated rather than resisted, which may support acceptance of adaptive measures but simultaneously reduce motivation to actively participate in prevention efforts (Engel et al., 2014; Hardwick & Stephens, 2020). In other contexts, where floods are framed primarily as threats to be controlled, participation may be oriented toward supporting structural protection or compliance with administrative measures. These differences illustrate how cultural interpretations of nature shape not only policy preferences, but also the forms and intensity of civic engagement.

Taken together, these cultural dimensions—collective flood memory, expectations of state–citizen relations, and interpretations of human–nature interaction—do not determine participation outcomes, but they condition the factors influencing whether and how citizens engage in flood prevention policies. By shaping risk perception, responsibility attribution, and policy legitimacy, culture operates as an implicit mechanism linking flood governance frameworks to participation patterns. This perspective directly informs the central question of this study: whether differences in citizen participation across regions are related to culturally embedded interpretations of flood risk and governance.

4. Methodology

4.1. Research Design

This study adopts a qualitative research design, combining a structured literature review with a comparative interpretive approach. This design is appropriate for addressing the central question of whether the factors influencing citizen participation in flood prevention policies are related to cultural differences across regions. Rather than testing causal relationships through quantitative modelling, the study synthesises and interprets existing empirical and theoretical research to identify how culturally embedded mechanisms shape participation patterns within different flood governance contexts.

4.2. Literature Search and Selection

Literature was collected through a structured and targeted search strategy across major academic databases, including Web of Science, Scopus, ScienceDirect, and Google Scholar, complemented by Chinese academic databases to capture region-specific scholarship. Search terms combined governance-, participation-, and culture-related keywords, such as *flood governance*, *flood management*, *citizen participation*, *cultural memory*, *religion*, and *water culture*, together with regional identifiers, including the Rhine River and the Yellow River.

The search covered publications available up to December 2024. An initial pool of over 100 publications was identified and subsequently refined through a multi-stage screening process to ensure relevance to the research question.

4.3. Screening Criteria

The screening process applied three criteria. First, purely technical or engineering-focused studies that did not address governance, citizen participation, or social interpretation were excluded. Second, studies were retained if they examined at least one participation-related dimension, including risk perception, responsibility attribution, public trust, governance legitimacy, or collective behaviour. Third, priority was given to publications enabling cross-regional or historical comparison, particularly those addressing flood governance in Europe, China, or both.

Following this process, approximately 30 core publications were selected for in-depth analysis. These works span interdisciplinary perspectives from flood governance, cultural geography, disaster studies, and environmental policy.

4.4. Analytical Framework

To analyse the selected literature, the study employed a qualitative coding framework designed to capture how cultural mechanisms influence factors underlying citizen participation. Each publication was coded across five analytical dimensions:

- (1) governance orientation (e.g. state-led, participatory, or hybrid);
- (2) conceptualisation of citizen participation (e.g. preparedness, compliance, or co-production);
- (3) cultural drivers (e.g. collective flood memory, religious narratives, or local identity);
- (4) interpretations of responsibility and policy legitimacy; and
- (5) reported implications for policy effectiveness and public well-being.

This framework enables systematic comparison across regions by focusing on how participation is framed and enacted rather than on institutional structures alone. Culture is thus operationalised as a set of interpretive mechanisms shaping participation-related factors within flood governance.

4.5. Comparative Logic

The comparative analysis focuses on the Rhine River Basin and the Yellow River Basin as historically flood-prone regions with extensive experience in flood governance but contrasting cultural and state-society traditions. Rather than treating these basins as exhaustive case studies, they function as interpretive anchors through which broader patterns in European and Chinese flood governance literature can be examined.

This comparative logic supports the identification of culturally mediated differences in participation by holding exposure to flood risk broadly constant while examining variation in how participation-related factors are framed and enacted across regions.

4.6. Limitations

This study has several limitations. First, the analysis is restricted to literature published in English and Chinese, potentially excluding relevant scholarship in other European languages. Second, as a literature-based review, the study relies on existing interpretations and reported findings rather

than primary empirical data. Finally, while the comparative approach highlights culturally embedded patterns, it does not establish direct causal relationships between culture and participation outcomes. The findings should therefore be interpreted as identifying plausible mechanisms that warrant further empirical investigation.

5. Specific Impact of Religion and Local Culture

5.1. Chinese Philosophical Traditions and Flood Governance

In the Chinese context, long-standing philosophical traditions have shaped societal understandings of flood risk and governance, with implications for citizen participation in flood prevention policies. Classical narratives surrounding flood control—such as the story of Yu the Great—frame water management as a central responsibility of political authority, reinforcing the expectation that large-scale flood mitigation should be organised and delivered by the state rather than by individual citizens or local communities (Liu, 2012).

Broader cosmological ideas, often summarised as the principle of harmony between humans and nature, further contribute to these expectations by portraying floods as recurring natural processes that require ordered management rather than collective civic intervention (Yan, 2019; Li, Shen and Wang, 2024). Within this cultural framework, citizens may place strong trust in state-led engineering solutions while perceiving limited necessity for autonomous preparedness or participatory decision-making. Importantly, this orientation does not imply disengagement or indifference, but rather reflects culturally embedded assumptions about the appropriate division of responsibility between the state and society.

5.2. Ritual Practices, Symbolism, and Perceived Legitimacy

Historical flood governance in China has also integrated symbolic and ritual practices into large-scale hydraulic interventions, linking material flood control measures to moral and cosmological legitimacy. Ritual activities associated with dyke construction and river management, documented during the Ming and Qing dynasties, connected flood control projects to broader cultural narratives of order and protection (Liu, 2012).

Such practices can indirectly influence contemporary participation by reinforcing the perception that flood governance derives legitimacy from alignment with authoritative knowledge and symbolic order rather than from deliberative or participatory processes. Where legitimacy is culturally associated with expert authority and state stewardship, citizen participation may be interpreted as secondary to compliance with officially sanctioned measures. In this sense, cultural symbolism conditions how citizens evaluate the relevance and effectiveness of participatory engagement within flood prevention policies.

5.3. Religious Narratives and Community Engagement in Europe

In several European contexts, religious traditions have historically influenced interpretations of flooding and community responses to it. Christian narratives have at times framed floods as moral trials, natural tests, or expressions of divine will, shaping how responsibility for flood risk is perceived at the community level (Hardwick and Stephens, 2020). Empirical studies demonstrate that such interpretations do not necessarily discourage engagement, but may instead foster strong place attachment, communal solidarity, and mutual assistance during flood events (Engel et al., 2014).

In regions where religious or faith-based networks overlap with local governance structures, these cultural frameworks can support informal participation through volunteering, collective preparedness, and local knowledge exchange. Participation in such contexts may therefore take socially embedded forms that complement, rather than replace, formal policy mechanisms. This illustrates how religious culture can shape not only whether citizens participate, but also how participation is organised and expressed.

5.4. Local Culture, Place Attachment, and Participation Readiness

Beyond formal religion, local cultural identities and place-based meanings influence citizen participation by shaping emotional attachment to flood-prone environments. In European floodplain communities, strong identification with rivers and landscapes can foster both acceptance of periodic flooding and willingness to engage in collective preparedness efforts (McEwen et al., 2017).

However, such attachments may also generate ambivalence toward specific flood-prevention measures, particularly when interventions are perceived to disrupt valued landscapes or cultural heritage. In these cases, participation may be directed toward negotiating policy design rather than simply supporting protective infrastructure. This highlights how local culture conditions participation readiness by shaping perceptions of acceptable trade-offs between safety, heritage, and environmental change.

5.5. Comparative Implications for Participation Factors

Taken together, religious beliefs and local cultural traditions influence key factors underlying citizen participation in flood prevention policies, including perceptions of responsibility, legitimacy, risk interpretation, and acceptable forms of engagement. These cultural mechanisms do not determine participation outcomes, but they condition how policy initiatives are interpreted and enacted across regions.

In a comparative perspective, the contrast between China and Central Europe illustrates how similar flood risks can be associated with different participation patterns, driven by culturally embedded understandings of governance and collective action. This supports the central question of this study by demonstrating that factors influencing citizen participation are closely related to regional cultural differences, operating alongside institutional and technical considerations.

6. Civic Engagement

Civic engagement plays a central role in contemporary flood governance by linking policy design to societal response. Beyond formal institutional arrangements, the effectiveness of flood prevention policies depends on whether citizens are willing and able to engage in preparedness activities, comply with risk-reduction measures, and contribute to collective action. As such, civic engagement constitutes a key mechanism through which flood governance outcomes are realised in practice (Plate, 2002; Wolff, 2021).

Early flood governance approaches largely excluded citizens from decision-making, positioning them as passive recipients of state-provided protection. Within this flood defence paradigm, engagement was neither expected nor institutionally supported, and flood risk was treated primarily as a technical problem to be addressed through engineering interventions (Morrison et al., 2018). Over time, however, the limitations of this approach—particularly under conditions of increasing climatic uncertainty—have prompted a shift toward governance models that emphasise shared responsibility and public involvement (Dordi et al., 2022). In this context, civic engagement has been reframed as an essential component of resilience-oriented flood management (McEwen et al., 2018).

Existing research identifies multiple dimensions of civic engagement in flood prevention, including participation in planning and consultation processes, adoption of household-level preparedness measures, compliance with evacuation and land-use regulations, and involvement in community-based initiatives (Mees et al., 2016; Al-Mueed et al., 2021). These forms of engagement are closely linked to cognitive and social factors such as risk perception, trust in authorities, perceived responsibility, and self-efficacy (Peng et al., 2020). Where citizens understand flood risk, trust governance institutions, and perceive participation as meaningful, engagement is more likely to occur and contribute to policy effectiveness (Wolff, 2021).

Importantly, civic engagement does not emerge automatically in response to policy invitations or formal participation mechanisms. Comparative studies demonstrate that similar governance frameworks can produce markedly different engagement outcomes across regions (Mees et al., 2016;

Kundzewicz et al., 2019). In some contexts, citizens actively contribute to flood prevention efforts and view participation as a legitimate and necessary responsibility. In others, engagement remains limited despite the presence of participatory instruments, with citizens relying primarily on state-led protection measures. This variation suggests that civic engagement is shaped not only by institutional design but also by deeper social and cultural factors that influence how participation is interpreted and valued (McEwen et al., 2017).

From a policy perspective, this unevenness has significant implications. Low levels of civic engagement can undermine flood prevention strategies by reducing preparedness, weakening compliance, and limiting the effectiveness of early warning and response systems (Wolff, 2021). Conversely, high levels of engagement can enhance policy legitimacy, improve information flows between authorities and communities, and strengthen collective capacity to cope with flood risks (McEwen et al., 2018; Houser et al., 2022). Understanding the conditions under which civic engagement emerges is therefore critical for improving flood governance outcomes.

In light of these observations, civic engagement should be understood not as a uniform policy outcome, but as a socially mediated process shaped by context-specific factors. This perspective aligns directly with the central question of this study, which asks whether the factors influencing citizen participation in flood prevention policies are related to cultural differences across regions. Examining civic engagement through this lens provides a necessary bridge between flood governance frameworks and the cultural mechanisms discussed in subsequent sections.

7. Differences in Civic Engagement Between China and Europe

Comparative research reveals marked differences in civic engagement patterns between China and Europe, despite shared exposure to flood risks and increasing convergence in technical flood management approaches. These differences are not limited to institutional design, but reflect divergent cultural interpretations of responsibility, legitimacy, and appropriate forms of participation within flood governance (Mees et al., 2016; Kundzewicz et al., 2019).

In many European contexts, civic engagement has become an institutionalised component of flood governance. Citizens are commonly invited to participate in flood risk planning through public consultations, stakeholder workshops, and opportunities to comment on draft flood management plans (Mees et al., 2016; Charalambous et al., 2018). Beyond formal participation mechanisms, volunteer-based initiatives and community organisations play an important role in disseminating flood risk information, supporting early warning systems, and promoting household-level preparedness (McEwen et al., 2018; Al-Mueed et al., 2021). These practices reflect long-standing cultural traditions of local self-organisation, horizontal trust, and shared responsibility, which frame participation as both legitimate and necessary for effective flood prevention.

By contrast, civic engagement in flood governance in China remains more limited and uneven. Flood prevention policies are predominantly organised through centralised administrative structures, with decision-making authority concentrated at the governmental level and implementation carried out through hierarchical systems (Kundzewicz et al., 2019; Liu et al., 2024). Within this governance context, citizens often perceive flood control as a primary responsibility of the state, reinforced by historical reliance on large-scale engineering solutions and firm trust in governmental capacity (Chen et al., 2012; Christian Wohlfart et al., 2016). While public compliance with flood-related directives is generally high, opportunities for autonomous participation in planning or preparedness activities are comparatively constrained.

Importantly, these differences should not be interpreted as a simple absence of engagement in China. Instead, civic engagement tends to take more indirect or compliance-oriented forms, such as adherence to evacuation orders, acceptance of land-use restrictions, and cooperation with state-led emergency responses (Kundzewicz et al., 2019). Participation in this context is shaped less by deliberative involvement and more by culturally embedded expectations regarding authority and collective order. As a result, engagement is primarily expressed through trust-based compliance rather than co-production or bottom-up initiatives.

The contrast between European and Chinese engagement patterns highlights how similar different cultural understandings of participation can mediate policy objectives. In European settings, participation is often associated with deliberation, negotiation, and shared decision-making, whereas in China it is more closely linked to coordination, compliance, and reliance on expert authority. These culturally embedded interpretations influence key factors underlying civic engagement, including perceived responsibility, willingness to participate proactively, and expectations regarding policy legitimacy (McEwen et al., 2017; Peng et al., 2020).

From a policy perspective, these differences have important implications for the effectiveness of flood governance. Participatory mechanisms developed in European contexts may not translate directly into settings where participation is culturally framed as secondary to state action. Conversely, governance approaches that rely heavily on administrative control may limit opportunities for learning, local knowledge integration, and long-term preparedness in contexts where more autonomous engagement could enhance resilience (Wolff, 2021; Houser et al., 2022). Recognising these differences is therefore essential for designing flood prevention policies that align with culturally embedded participation factors rather than assuming uniform responses across regions.

Taken together, the comparison between China and Europe supports the central question of this study by demonstrating that factors influencing civic engagement in flood prevention policies are closely related to regional cultural differences. Civic engagement emerges not simply from institutional arrangements, but from culturally mediated interpretations of risk, responsibility, and governance. Understanding these differences provides a foundation for developing more context-sensitive flood governance strategies that enhance participation, policy legitimacy, and public well-being across diverse settings.

8. Discussion

8.1. Flood Response Policy: The Overlooked Role of Culture in Policy Design

This review highlights a persistent limitation in contemporary flood governance: while flood policies increasingly acknowledge the importance of participation and resilience, cultural factors shaping how policies are interpreted and enacted remain insufficiently integrated into policy design. In both Europe and China, culture is frequently recognised as something to be protected—such as cultural heritage sites or valued landscapes—but far less often treated as an active mechanism influencing governance effectiveness (Michael Nones and Pescaroli, 2016).

Existing flood response policies tend to prioritise technical reliability, administrative coordination, and regulatory compliance. Although participatory mechanisms are formally embedded in many European flood governance frameworks, these mechanisms often assume that citizens will engage in similar ways across contexts (Mees et al., 2016; Charalambous et al., 2018). The comparative analysis in this study suggests that such assumptions are problematic. Participation is not a neutral or universally understood concept; instead, it is culturally mediated through shared understandings of responsibility, legitimacy, and appropriate relations between citizens and the state (McEwen et al., 2017; Engel et al., 2014). Where policy designs fail to align with these culturally embedded interpretations, participation may remain symbolic or uneven, limiting policy effectiveness.

In the Chinese context, flood response policies continue to rely heavily on centralised planning and large-scale engineering solutions. While these approaches have delivered significant reductions in flood damage in many regions, they also reinforce expectations that flood prevention is primarily a governmental responsibility (Chen et al., 2012; Kundzewicz et al., 2019). As a result, policies that seek to encourage greater citizen participation may encounter limited uptake if they do not address underlying cultural assumptions regarding authority and responsibility. This does not imply a deficit in governance capacity, but rather a mismatch between policy objectives and culturally embedded participation norms (Christian Wohlfart et al., 2016; Liu et al., 2024).

European flood governance illustrates a different configuration. Policy frameworks increasingly promote shared responsibility and local involvement, drawing on traditions of civic organisation and volunteerism (Mees et al., 2016; McEwen et al., 2018). However, even within Europe, participation outcomes vary considerably across regions, suggesting that formal governance arrangements alone cannot account for engagement patterns. Cultural memory, religious narratives, and place-based identities continue to shape how citizens interpret flood risk and respond to policy interventions, influencing whether participation is perceived as meaningful, necessary, or burdensome (Engel et al., 2014; Hardwick and Stephens, 2020).

Taken together, these findings suggest that flood response policies often underestimate the role of culture as a mediating factor between policy design and societal response. Integrating cultural mechanisms into policy formulation—rather than addressing them only at the implementation stage—could enhance participation, improve legitimacy, and reduce the gap between policy intent and practice (Wolff, 2021).

8.2. *Public Well-Being: The Missing Link Between Culture and Flood Policy*

Beyond governance effectiveness, this review's findings point to an important but underexplored outcome of flood policy design: public well-being. Flood policies are typically evaluated based on physical risk reduction, economic losses avoided, and infrastructure performance. While these indicators are essential, they provide an incomplete picture of policy outcomes if social and psychological dimensions are overlooked (Houser et al., 2022).

Public well-being in flood-prone regions encompasses not only physical safety, but also psychological security, trust in institutions, and social cohesion. Cultural factors play a critical role in shaping these dimensions. Where flood policies align with culturally embedded expectations of responsibility and participation, citizens may experience greater confidence in governance systems, stronger place attachment, and a sense of collective efficacy (McEwen et al., 2018). Conversely, when policies conflict with local cultural values or marginalise meaningful participation, they may generate stress, disengagement, or erosion of trust, even if technical protection levels are high (Wolff, 2021).

The case of large-scale flood control projects in China illustrates this tension. Projects such as major dams and river regulation schemes have significantly enhanced hydraulic control, yet they have also involved relocation, landscape transformation, and disruption of culturally significant sites (Li et al., 2020). While such interventions may be justified on safety grounds, their impacts on social cohesion and cultural continuity can have long-term implications for well-being. These effects are rarely incorporated into policy evaluation frameworks, despite their relevance for community resilience and recovery (Houser et al., 2022).

In European contexts, efforts to integrate nature-based solutions and participatory planning have increasingly recognised the importance of social acceptance and local identity (Rijke et al., 2012). However, even here, public well-being is often treated as a secondary benefit rather than as a central policy objective. Participation processes may be implemented to improve legitimacy without fully considering how cultural meanings and historical experiences shape emotional responses to flood risk and policy change (McEwen et al., 2017).

This review suggests that public well-being represents a critical link between culture and flood policy outcomes. By shaping how citizens experience risk, interpret policy interventions, and engage with governance processes, culture influences not only participation levels but also the broader social consequences of flood management strategies. Recognising public well-being as a policy-relevant outcome therefore requires moving beyond purely technical or economic assessments toward more holistic evaluation frameworks that incorporate cultural and social dimensions (Houser et al., 2022).

8.3. *Implications for Flood Governance Research and Policy*

By conceptualising culture as an implicit determinant of civic participation, this study contributes to flood governance research in two key ways. First, it helps explain why similar flood-prevention policies yield divergent participation patterns across regions, even under comparable risk

conditions (Mees et al., 2016; Kundzewicz et al., 2019). Second, it highlights how these participation patterns influence broader outcomes, including policy legitimacy and public well-being (Wolff, 2021; Houser et al., 2022).

For policymakers, the findings suggest that effective flood governance requires greater sensitivity to cultural contexts when designing participatory mechanisms and response strategies. Rather than assuming uniform engagement models, policies should be adapted to culturally embedded expectations regarding responsibility, authority, and collective action. For researchers, the results underscore the need for further empirical work examining how cultural mechanisms interact with institutional design to shape participation and well-being outcomes over time (McEwen et al., 2017).

9. Conclusions

This literature review examined whether factors influencing citizen participation in flood prevention policies are related to cultural differences across regions. By synthesising interdisciplinary research on flood governance, civic engagement, and cultural mechanisms in Europe and China, the study demonstrates that participation outcomes cannot be explained by technical capacity or institutional design alone. Instead, culturally embedded interpretations of risk, responsibility, and legitimacy shape how flood policies are received and enacted in practice (Mees et al., 2016; McEwen et al., 2017).

The comparative analysis between Central Europe and China highlights that civic engagement is not a uniform policy outcome, but a socially mediated process. In European contexts, traditions of local self-organisation, volunteerism, and participatory governance tend to frame engagement as a legitimate and necessary component of flood prevention (McEwen et al., 2018; Charalambous et al., 2018). In contrast, in China, long-standing state-centred flood management traditions and reliance on large-scale engineering solutions have reinforced expectations of governmental responsibility, shaping participation primarily through compliance and coordination rather than deliberative involvement (Chen et al., 2012; Kundzewicz et al., 2019). These differences illustrate how similar policy objectives can lead to divergent participation patterns when mediated through distinct cultural frameworks.

By conceptualising culture as an implicit determinant of civic participation, this study contributes to flood governance research in two important ways. First, it provides a mechanism-based explanation for persistent regional variation in participation, complementing existing institutional and technical accounts. Second, it highlights public well-being as a critical yet underexplored outcome of flood policy design. Where policies align with culturally embedded expectations and participation norms, they are more likely to enhance trust, social cohesion, and psychological security. Conversely, culturally insensitive policies risk undermining engagement and eroding well-being, even when physical risk reduction objectives are achieved (Wolff, 2021; Houser et al., 2022).

From a policy perspective, the findings underscore the need for greater cultural sensitivity in flood governance. Participatory mechanisms and response strategies should not be assumed to function uniformly across regions, but instead be adapted to locally embedded understandings of authority, responsibility, and collective action. Integrating cultural considerations into policy formulation—rather than addressing them only during implementation—can help bridge the gap between policy intent and societal response, improving both governance effectiveness and public well-being (Michael Nones and Pescaroli, 2016).

Finally, this study points to several directions for future research. Empirical work combining qualitative and quantitative approaches could further investigate how cultural mechanisms interact with institutional design to shape participation over time. Longitudinal and place-based studies would be particularly valuable for examining how flood experience, memory, and policy change influence civic engagement and well-being across different governance contexts. Advancing such

research is essential for developing flood prevention policies that are not only technically robust, but also socially legitimate and culturally grounded.

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