Community-based river management: Challenging the way we produce, exchange and apply knowledge for improving river health

Gestion communautaire des rivières: Réinventer la production, l'échange et l'application des savoirs pour améliorer la santé des rivières

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RÉSUMÉ

Contexte: L'engagement communautaire est essentiel pour une gestion adaptative des rivières, mais des approches systématiques pour le promouvoir font défaut. Objectifs: Développer un cadre conceptuel de gestion communautaire des rivières et synthétiser les voies favorisant l'engagement. Méthodes: Nous avons mené une revue systématique des études (2000–2021) décrivant le contexte de gouvernance, les valeurs de mobilisation et les voies d'engagement. Une catégorisation itérative a été utilisée pour analyser 51 études éligibles sur 153. Résultats: Trois contextes de gouvernance ont été identifiés: *top-down*, *bottom-up* et hybride. Des valeurs environnementales, économiques, sécuritaires, paysagères, culturelles et sociales ont motivé l'action communautaire, avec une perception fréquente des rivières comme des systèmes éco-sociaux. Sept voies d'engagement ont été identifiées: évaluation des perceptions communautaires, coproduction de connaissances, science participative, construction d'une vision commune, éducation environnementale, groupes communautaires et actions pro-environnementales. Ces éléments ont alimenté un cadre conceptuel reliant valeurs, gouvernance et voies d'engagement. Conclusion: La gestion communautaire des rivières est multifacette et dynamique. Le cadre proposé soutient une implication systématique des communautés à toutes les étapes de la gestion des rivières, du diagnostic à la mise en œuvre.

ABSTRACT

Background: Community engagement is crucial for adaptive river management, yet systematic approaches to promote it are lacking. Objectives: To develop a conceptual framework of community-based river management and synthesize pathways conducive to engagement. Methods: We conducted a systematic review of studies (2000–2021) describing governance context, mobilization values, and engagement pathways. Iterative categorization was used to analyze 51 eligible records from 153. Results: Three governance contexts emerged: top-down, bottom-up, and hybrid. Environmental, economic, safety, scenic, cultural, and social values drove community action, with rivers often seen as eco-social systems. Seven engagement pathways were identified: community perception assessment, knowledge co-production, community science, vision building, environmental education, community groups, and pro-environmental action. These informed a conceptual framework linking values, governance, and pathways. Conclusion: Community-based river management is multi-faceted and dynamic. The proposed framework supports systematically engaging communities across river management stages, from diagnosis to implementation.

1   BACKGROUND

Engaging riparian communities is essential for achieving sustainable river management. Community engagement is necessary at all stages of river management. During diagnosis and monitoring, it can provide a more comprehensive and precise understanding of rivers, leading to better decisions (Pahl-Wostl et al., 2007). In decision-making, it can enhance the legitimacy of decisions and build social capital, facilitating their implementation (Carr, 2015). Additionally, community engagement in daily sustainable practices can be more effective in improving river health than new infrastructure investments (Hanlon, 2020).

Community engagement has gained momentum worldwide within the new framework of collaborative river management, as opposed to the traditional government-led management (Folke et al., 2021). In the traditional framework, decision-making occurs through institutionalized participation, where highly influential actors—technically, economically and politically—are considered the main actors. These typically include large landowners and producers, public administrations, large pro-environmental NGOs and research institutions. The main actors hold the decision-making power, while the contributions of secondary (local) actors —medium-small landowners and producers, local associations, informal citizen-based river groups, educational centres, individual volunteers and the general public— are usually limited to consultation (Behagel and Turnhout, 2011).

The shift towards community-based river management (CBRM) is characterized by stronger communication and cooperation between empowered riparian communities and river governance institutions. However, there is a gap between the intention to engage communities and the translation of this intention into practice, due to a power asymmetry and mistrust between traditional decision-makers and local communities (Perera et al., 2023).

2   OBJECTIVES

Available empirical evidence from lived experiences offers an opportunity to conceptualize CBRM and identify pathways that can help riparian communities to co-produce knowledge, visions and actions with the traditional main actors. This research aims to map riparian community engagement in river management worldwide over the past two decades to provide: 1) a conceptual framework for describing CBRM as a global phenomenon; and 2) a synthesis of empirical evidence on pathways conducive to community engagement at each stage of river management (diagnosis and monitoring, decision-making, implementation). The findings of this study are oriented to establish a foundational knowledge base to foster and sustain meaningful community engagement.

3   METHODS

We developed a systematic review of worldwide empirical evidence on community engagement in river management. Case studies were more frequent in the Global North than in the Global South. More than half were studies located within Anglosphere countries (USA, Canada, UK, Australia, New Zealand), with a particularly high number in the USA. This could be attributed to a strong tradition in collaborative river management through public-private partnerships. Among the Global South countries, significant attention was given to India-Bangladesh, with densely populated riparian areas and powerful citizen-led movements, and China, with strong state programmes aimed at flood mitigation and urban river rehabilitation.

After conducting the systematic review of the empirical evidence, an interpretive process based on iterative categorization was carried out. This served (first) to describe three variables present in all the case studies: values driving mobilization, governance context and pathways to community engagement, and (second) to propose a conceptual framework for describing Community-Based River Management.

4   RESULTS

Community-Based Rive Management is shaped by the interplay of the three key variables (governance context, mobilization values, engagement pathways). The typical CBRM is a result of communities defending multiple river values, and operates within top-down or hybrid governance contexts. Both aspects influence the deployment of intentional pathways to support community engagement. The pathways of community engagement involve the collection, transmission and application of local knowledge at the different stages of river management (diagnosis and monitoring, decision-making and implementation). CBRM is an ongoing

process that requires successive planning cycles to systematically enhance the knowledge, intercommunication and capacity to act of riparian communities, and to build trust with main actors.

4.1   Values that mobilize communities.

Communities are mobilized when they perceive their values to be threatened, and this mobilization is the starting point for CBRM. Various types of values drive mobilization, including environmental, economic, safety, scenic, cultural and social values. Rather than being mobilized by a single type of value, most riparian communities are mobilized by two or more types. The communities' mobilization is mostly driven by the simultaneous defence of environmental, economic and social values.

4.2   Governance context.

The second key variable determining the participation of communities in river management is the governance context in which the community interacts with the traditional main actors. The bottom-up context is characterized by a mobilization of the community which is independent of main actors. This was observed in social movements aimed at improving living conditions. The top-down context is associated with traditional centralized governance that is led by water management authorities in collaboration with research institutions. The hybrid context is related to decentralized governance and diffuse public-private partnerships where local communities, government agencies and other stakeholders share knowledge and leadership with the aim of reaching consensus in decision-making, collaborative funding and community support. With the exception of very few bottom-up cases, institutional frameworks both support community participation and determine the relevance of a community's role in river management. This depends on local participatory culture: the community's role is more genuine in hybrid contexts where communities relate horizontally with main actors through deliberative consensus and collective decision-making; it is less genuine in top-down contexts where non-certified experts and those not in a position of power are excluded from decision-making and management processes.

4.3   Pathways to community engagement.

The third key variable in determining community participation is the pathway by which communities become engaged. We identified seven of these pathways, which we grouped into three types based on the relationship between community and knowledge: knowing (focused on knowledge provision), communicating (focused on knowledge communication) and acting (focused on translating knowledge into action). These three types of pathways correspond to the three stages of river management (diagnosis-monitoring, decision-making and implementation).

4.3.1   Knowing

Knowing, which offers a better understanding of riparian eco-social behaviour, was found to be the most frequent type and includes three pathways where communities acted as knowledge providers: community perception assessment (i.e. understanding of a community's perceptions of a river to allow decision-makers enhance social acceptability of river transformations), knowledge co-production (i.e. combination of conventional scientific knowledge with experiential knowledge from community members), and community science (i.e. engaging the community in data collection to track river health and the effectiveness of rehabilitation programmes).

4.3.2   Communicating

Communicating, which enhances riparian communities' buy-in to river rehabilitation decisions, includes two pathways where communities participated in knowledge exchange: common vision-building (to provide a coherent set of shared objectives and actions to enhance river health); and environmental education (paramount for community awareness and engagement with river rehabilitation).

4.3.3   Acting

Acting, which increases on-the-ground local capacity to act, was found to be the least frequent. These include two pathways where communities put their knowledge into action: community-based group formation (i.e. creation of stable groups to engage with community-led river rehabilitation) and pro-environmental action through voluntary work and sustainable daily practices.

5   RIVER MANAGEMENT IMPLICATIONS

These results can serve as a foundation for creating a CBRM toolkit for systematic community engagement. The CBRM toolkit can support the transition towards genuine CBRM by means of two different approaches: 1) an incremental approach, characterized by small, local actions independently promoted by various actors, and 2) a government-led mission-oriented approach to CBRM, defined by structured, government-led actions. These two approaches are complementary and can occur simultaneously with varying degrees of intensity.

5.1   Incremental approach.

Many scholars propose power-sharing based on trust-building as a solution to power asymmetry. Trust-building makes the parties involved more competent at collaborating, paving the way for future power sharing (Ran and Qi, 2019). Trust can be cultivated, and the seven pathways to community engagement identified by this study should also be seen as opportunities for interpersonal networking and mutual learning to build trust between communities and main actors.

5.2   Mission-oriented approach.

Small actions aimed at incremental trust-building are not enough to drive a large-scale transformation towards CBRM. Only governments have the capacity to facilitate this kind of transformation. To fully address the challenge of CBRM, the stability of cooperation platforms is paramount (Mazzucato, 2021). Aligning planning cycles with trust-building actions, repeated over time by means of structured (institutionalized and funded) platforms, serves to gradually increase the number of local actors engaged and facilitates the transition from vertical to horizontal relationship with the main actors.

6   CONCLUSION

CBRM should no longer be seen as wishful thinking or a spontaneous by-product of goodwill on the part of some actors. Instead, CBRM should become a discipline with a theoretical corpus to be systematically learned and applied to prevent the marginalization of local voices and the perpetuation of inequitable decision-making.

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