COMMUNITY-BASED MANAGEMENT OF FRESHWATER RESOURCES

A Practitioners' Guide to Applying TNC's Voice, Choice, and Action Framework

Wei Zhang, Hagar ElDidi, Kimberly Swallow, Ruth Meinzen-Dick, Claudia Ringler, Yuta Masuda, and Allison Aldous

The Nature Conservancy
and the
International Food Policy Research Institute

The Nature Conservancy

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

TABLE OF CONTENTS

List of Boxes

List of Figures

ACRONYMS

BVC(s)	Beach Village Committee(s)	NGO(s)	nongovernmental organization(s)
CBC	community-based conservation	NRM	natural resource management
CFO(s)	community fishery organization(s)	PES	payments for environmental services
FWR	freshwater resource(s)	SSA	Sub-Saharan Africa
IFPRI	International Food Policy Research Institute	TNC	The Nature Conservancy
MSP(s)	multistakeholder platform(s)	VCA	Voice, Choice, and Action (framework)

CONTEXT

Despite being one of the most critical resources for all life on Earth, freshwater represents only 3 percent of the planet's water supply, but only 0.5 percent is readily accessible to humans. In addition, the available freshwater resources (FWR) are unequally distributed across the globe, so many areas and populations face issues of water scarcity and quality. FWR are under enormous stress from agricultural systems, climate change, and other factors directly linked to human behavior—including population growth and industrialization. Moreover, the ***institutions*** intended to manage FWR under stress may be ill-equipped to do so, especially in the context of multiple, often competing claims on FWR and the complexity of water flows across time and space. Growing awareness of these challenges has given rise to a sense of urgency to raise attention and catalyze action toward improving the management of FWR, especially at the local level.

This guide aims to advance the understanding of how communities can sustainably manage FWR by applying The Nature Conservancy's Voice, Choice, and Action (VCA) framework.[1] The original framework focused more on terrestrial resources but has been adapted here to address the unique characteristics of FWR (Box 1). These characteristics present significant implications for sustainable resource management and, therefore, need to be taken into account in the design and implementation of community-based conservation (CBC) programs.

The application of the VCA framework to FWR is founded on four interconnected pillars that need to be implemented as a balanced whole so they reinforce each other as they develop over time and achieve the intended outcomes of improved and more sustainable FWR management:

- Secure Rights to Territories and Resources
- Strong Community Leadership and Capacity
- Effective ***Multistakeholder Platforms*** for Decision-Making
- Environmentally Sustainable Economic Development Opportunities

Two additional cross-cutting considerations also need to be fully integrated within and across the pillars, recognizing that they are not only end goals in themselves, but also the key means for achieving CBC objectives:

- Connection to Place
- ***Equity***

In this guide, FWR are defined as any body of water that is fresh (not salty), together with its associated species and ecosystem resources, including aquatic plants and animals such as fish. While the guide focuses on the conservation of FWR, it is important to note that rights to water are often tied to rights to land. As a result, changes in land use and management directly affect FWR, especially for downstream users who do not necessarily have a say in the changes being made. For example, watershed conservation frequently requires upstream land users to adopt practices that affect the timing and quality of FWR for downstream users, both positively and negatively.

*Definitions of terms shown in **bold and italic** are provided in the **Glossary** on page 23. A list of **Further Reading and Resources** is also provided on page 24.*

STRENGTHENING VOICE, CHOICE, AND ACTION

The Nature Conservancy aims to help transform the way land and water decisions are made by strengthening the **Voice**, **Choice**, and **Action** of indigenous peoples and local communities to shape and manage natural territory in ways that improve lives and drive conservation.

A stronger **Voice** leads to the inclusion of traditional knowledge, identity, local priorities, and values in plans and solutions. The ability to exercise and influence **Choice** builds leadership and engagement in decision-making. Greater **Action** provides the opportunities for communities to initiate and participate in the implementation of programs and the management of resources that affect their wellbeing both now and in the future.

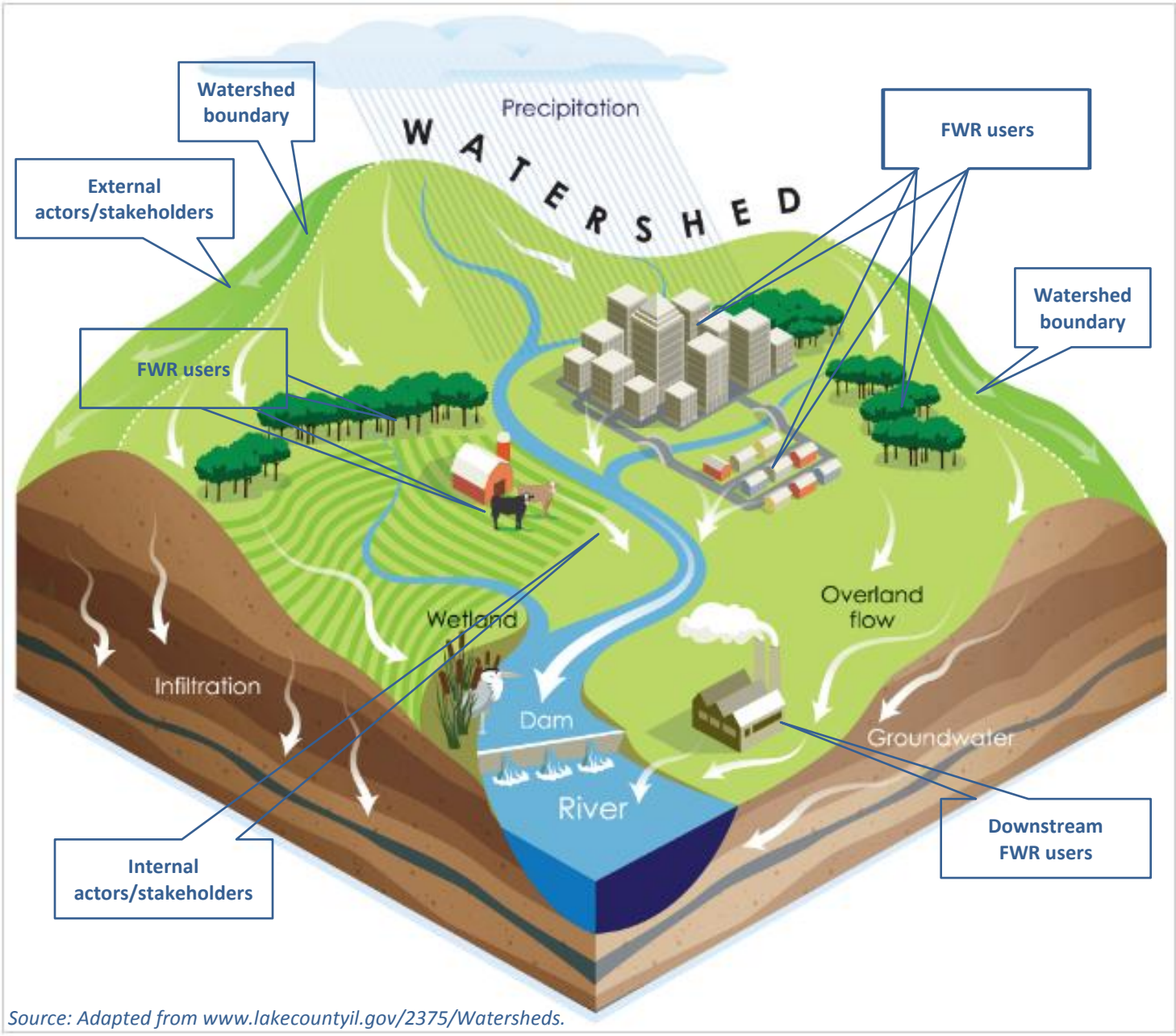
Box 1. The Biophysical and Technical Characteristics of FWR, and their Implications for Sustainable Management

1. *Freshwater is vital for all plant, animal, and human life. There is no substitute. Water is also needed for a variety of economic uses, such as fishing, energy, and manufacturing, and for the environment.*
2. *Water is inherently mobile, creating the potential for high variability in flows and water availability across space and time, hence requiring considerable investment to store it or regulate its flows. FWR management must therefore be adaptable because the availability of FWR changes over time.*
3. *Most water uses involve removing and returning water to a freshwater ecosystem, so impacts on both quantity and quality must be considered. The state of FWR in one location reflects the cumulative effects of all upstream aquatic and terrestrial uses (including agriculture, livestock rearing, manufacturing, electricity generation, and transportation), in addition to climatic and other factors.*
4. *Externalities shape and influence power dynamics among FWR users. Being located upstream provides certain advantages over being located downstream, and power imbalances act to either counter or reinforce these dynamics. This has been an issue in many **transboundary water systems**, where upstream users have developed infrastructure and diverted water resources away from tributaries or rivers, leaving downstream users with reduced water availability and more erratic flows. Such disputes are heightened in times of increased water scarcity, such as from rapid population growth, climate variability, and civil unrest.*
5. *Difficulties in observing FWR—for example, groundwater and fisheries—pose greater challenges to developing an accurate understanding of these resources, and in providing the feedback users require to manage them. This is particularly challenging in the context of climate change.*
6. *Hydrologic connectivity is critical to the viability of freshwater ecosystems, including upstream–downstream, river–floodplain, surface water–groundwater, and connectivity over time. Loss of connectivity significantly impairs freshwater ecosystems and their ability to provide **ecosystem services**. But water is governed along political boundaries, which often differ from natural boundaries.*

These unique attributes make community governance capacity particularly important for the management of FWR, both in terms of knowledge of the resources and on-the-ground management. The number and diversity of FWR stakeholders also increases the importance of a community's capacity to participate effectively in multistakeholder platforms for FWR management. The centrality of FWR for rural lives and livelihoods, and the lack of a substitute for FWR, underscore the importance of links to sustainable livelihood and development opportunities (see Figure 1).

The sections that follow provide detailed descriptions of each of the four pillars and the two cross-cutting considerations, including relevant examples illustrating the points made, and three longer case studies on Malawi's Lake Chilwa Basin (Box 2), Brazil's Pantanal Wetlands (Box 3), and Cambodia's Tonle Sap Lake and Floodplains (Box 4). The guide concludes with brief discussions of the implications for ***governance***, the implications for CBC initiatives, and additional considerations to be taken into account, along with the glossary of terms and list of further reading and resources previously mentioned.

Figure 1. The Interconnectedness of FWR Users: An Example of a Watershed



Source: Adapted from www.lakecountyil.gov/2375/Watersheds.

A ***watershed*** is an area of land that separates waters flowing to different rivers, basins, or seas. Because water runoff ultimately drains into other bodies of water, it is important to consider the downstream impacts of upstream uses, whether from internal or external users and communities. Any community is both a generator and a recipient of ***externalities*** affecting the watershed.

SECURE RIGHTS TO TERRITORIES AND RESOURCES

This pillar relates to the confidence community members have that their claims to FWR uses will be respected by others, and that negative externalities arising from others' use of FWR will be distributed fairly. These aspects are a product of governance processes at community and State levels.

Many factors cause degradation of FWR and ecosystem services, but governance and ***market failure*** to address externalities are one such cause. How rights to resources, such as water, are defined—and then understood, claimed, and enforced—can raise or lower an FWR users' risk of experiencing positive or negative externalities. By definition, externalities tend to be "invisible," meaning they are not taken into account by the party generating them. By making externalities visible and giving fair consideration to their impacts, communities and decision-makers can begin to address the root causes of the complex and interlinked challenges of managing FWR at the community level.

In economics, positive or negative externalities are the associated costs or benefits to parties who did not choose to incur those costs or benefits. Externalities are inherently linked to how rights are defined and enforced, and hence how costs and benefits are allocated. For example, under the "polluters pay" principle, water users have the right to clean water, so "polluters" bear the cost of either changing their behavior (for example, by adopting less polluting technology) or compensating "victims" (for example, by paying for water-treatment technology).

Secure Rights

Property rights can be defined as the legitimate (that is, recognized) right to use or control resources and to have those rights protected through a variety of statutory and customary systems. Because of their fluid nature, FWR are less likely to be "owned" like land or buildings. Rather, it is important to look at who holds different (and often overlapping) "bundles of rights," including use rights (access and withdrawal) and control rights (management, exclusion, and alienation or transfer).

National law is one source of rights, but customary, religious, and international law can also be important, especially for water rights. This phenomenon of multiple legal systems operating across a single jurisdiction (area or population) is known as ***legal pluralism***. ***Customary rights*** are often widely recognized and enforced in rural areas, whereas statutory rights may be more limited because the State's reach is weaker. Also, what is perceived to be "legal" changes over time, both in terms of the authorities involved and the powers they are invested with. It is therefore important to recognize the multiplicity of property rights regimes, along with their underlying political and economic influence.

While legal pluralism applies to all types of property rights, and who has claim to those rights, additional complexities arise with FWR due to the variable and mobile nature of water, its irreplaceability as a resource, the numerous users and uses, and the challenge of attaching property rights to water. Establishing clear water rights may reduce conflicts and uncertainty, increase economic efficiency, and allow situations that could avoid environmental

Bundles of Rights

Access rights. *The right to enter freshwater bodies or piece of land from which FWR can be accessed*

Withdrawal rights. *The right to remove water, fish, or other FWR*

Management rights. *The right to make decisions about FWR, such as flow regulation, aquaculture, or fishery management*

Exclusion rights. *The right to prevent others from using the FWR*

Alienation or transfer rights. *The right to redistribute, sell, rent, gift, or bequeath rights over FWR*

degradation and wastage. Yet establishing water rights is far from straightforward—or in some cases not possible if all water has been allocated—and the process itself can create conflict, particularly when statutory rights are inconsistent with customary or religious rights that consider water a basic human right.

The costs and challenges of registering water rights are often prohibitive—particularly for small-scale users—and they may lead to unintended consequences. Rather than starting from the assumption of a formal water rights system, especially one akin to land ownership, it is more useful to begin with the perspective that multiple people may claim different and overlapping rights to the same resources based on different bundles of rights and on legal pluralism.

Water rights can be State-granted, historic (belonging to those living on the land), transfer-based (through sale, donation, or inheritance), forceful (through coercion), or user-investment based (for example, through the construction of irrigation facilities). Rights can also be obtained through negotiation, as when communities discuss water-sharing rules during times of scarcity. Many local and indigenous communities developed cultural norms of cooperation and reciprocity that foster water sharing, often based on moral ideologies, intricate social relations, and religious practices. These norms promote social cohesion and act as a form of social insurance, especially for vulnerable community members in the case of water scarcity.

Property rights shape people's incentives and authority to manage natural resources. For example, a group of irrigators with secure rights to the water in their system is more likely to be able to create and enforce rules for equitable sharing of the water than a group that does not have recognized water rights. In practice, rights to FWR are often linked to associated land or physical ***capital*** (such as irrigation infrastructure or pumps) because it is often not possible to use or manage water without control over the land or infrastructure. On the other hand, the right to fish or harvest aquatic plants is often tied to water rights. Further, the unique aspects of water—such as its mobility and necessity for all life—can make it difficult to exclude others from accessing and using it. These features make water rights different from land rights, and challenging to enforce.

The larger the investment in a particular type of FWR use, the more important secure ***tenure*** becomes (Figure 2). For example, engaging in ditch and ridge tillage on farmland may pay off within a few seasons and thus would require less secure property rights compared with the construction of a fishpond with higher investment costs. Thus, tenant farmers with short-term rights might be able to install ditches and ridges but would not invest in more durable fish ponds. At the same time, owners of land might not allow tenant farmers to construct a permanent groundwater well, for example, because such structures could contribute to later claims over the associated land.[2] Similarly, the construction of a major reservoir has a decades-long payoff period and hence requires secure rights to the underlying land and associated water flows.

The General Components of Tenure Security

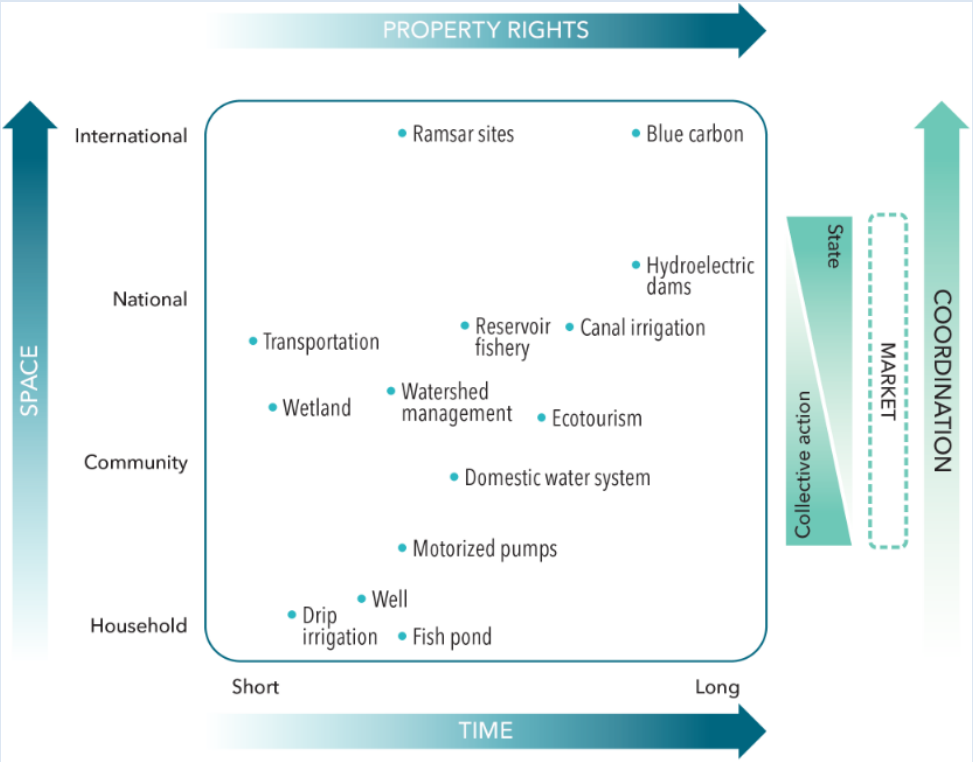
Completeness of the bundle of rights. *Whether the various rights are held by one person or distributed among different stakeholders*

Duration. *Whether the rights are short- or long-term; in the case of water, this could include whether rights change by season or between regular and drought years*

Robustness. *Whether rights are known by the holders, are accepted by the community, and are enforceable in the face of challenges.*

Property rights do not guarantee the ability to use or benefit from FWR. Many water bodies have been over-allocated, so rights exceed the available water, especially in drought years. Similarly, many water bodies are contaminated, making the available water unusable for some purposes. For this, it is important to take ***power dynamics*** between water users into account because imbalances prevent certain groups from asserting their rights. For example, the need to maintain socioeconomic and political ties with other households and community members may prevent poor people and households from defending their water rights due to fear of potential consequences. So it is not only the rights held, but also ***tenure security***—the ability to control and manage a resource over time and make transactions, such as transfers, with it—that shapes how people use and invest in FWR. Importantly, holding rights to FWR can affect access to financial and social capital (sources of power in one-to-one exchanges and socioeconomic networking), as well as political capital (a source of power in collective decision-making).

Figure 2. The Relationship between FWR Governance and Property Rights



The longer the duration of a particular type of FWR use, the more important it is to have secure tenure. The exact location in the figure of a particular type of FWR use depends on the time required for the investment to "pay off." In general, technologies or management practices with a shorter payoff period are shown toward the left, and those requiring decades or even generations before the benefits payoff are shown on the right. The larger the spatial scale, the greater need for coordination, whether by the State, through collective action, or by the market.

Source: Meinzen-Dick, R., "Property Rights and Sustainable Irrigation: A Developing Country Perspective," Agricultural Water Management (145/2014): 23–31.

Fair Consideration of Externalities

Most water users both withdraw water and other FWR, and add waste or contribute to runoff into water resources, which affects other resource users, especially those downstream. As a result, users are both generators and recipients of externalities. But externalities are difficult to determine based on the complexity of measuring how much water is available (in good and bad years), the source and extent of pollution, and the consequences of pollution for different types of water uses. Despite a rich tradition of ecological knowledge of FWR (including indigenous sources), integrating this type of knowledge with scientific and other external sources of knowledge is challenging, particularly for MSPs seeking to foster stakeholder dialogue and build consensus.

As hard as it is to define rights to the varying quantities of water, defining rights to water quality is even more difficult. The externalities that water users impose on each other, combined with the vital nature of reliable and clean FWR, make equity a particularly important concern. Moreover, the challenges associated with monitoring and enforcing laws and regulations related to FWR mean that both State and local intervention is required to remedy any unfair distribution of negative externalities.

Box 2. Case Study: Malawi's Lake Chilwa Basin

*Malawi's Lake Chilwa Basin, a protected **Ramsar** site, spans the Malawi–Mozambique border and consists of a shallow lake surrounded by a reed belt and seasonal flood plain. The lake is a closed-drainage lake with no outlet. The water level is determined by the amount of rainfall during the rainy season and the amount of water that evaporates, plus upstream withdrawals for agriculture and other uses. The lake's shallowness makes it prone to loss of wetland areas and drying out. Lake Chilwa itself is host to one of Africa's most productive lake fisheries, and its plain provides fertile land for lowland rice. Sustainability of the lake's fishery is being threatened by climate change, the expansion of cropland into marginal areas (such as marshes), and pollution from the run-off of upland agriculture and urban waste.*

Although the governance of the basin has changed continuously since colonial times, it has always comprised a combination of customary and statutory systems: on the one hand, chiefdom-based governance of a fishing calendar enforced through cultural taboos and myths, and on the other, national governance, based on the centralized authority of the Department of Fisheries until 1995, and thereafter on co-management by Beach Village Committees (BVCs). In response to reports that leaders of customary chiefdoms and BVCs had come into conflict over their authority to set and enforce rules, participatory monitoring was introduced to increase the accountability of all three governance bodies. Fishers had been able to use data on catch, sales, and incomes, collected through logbooks, to more proactively request that government authorities adjust their management approaches.

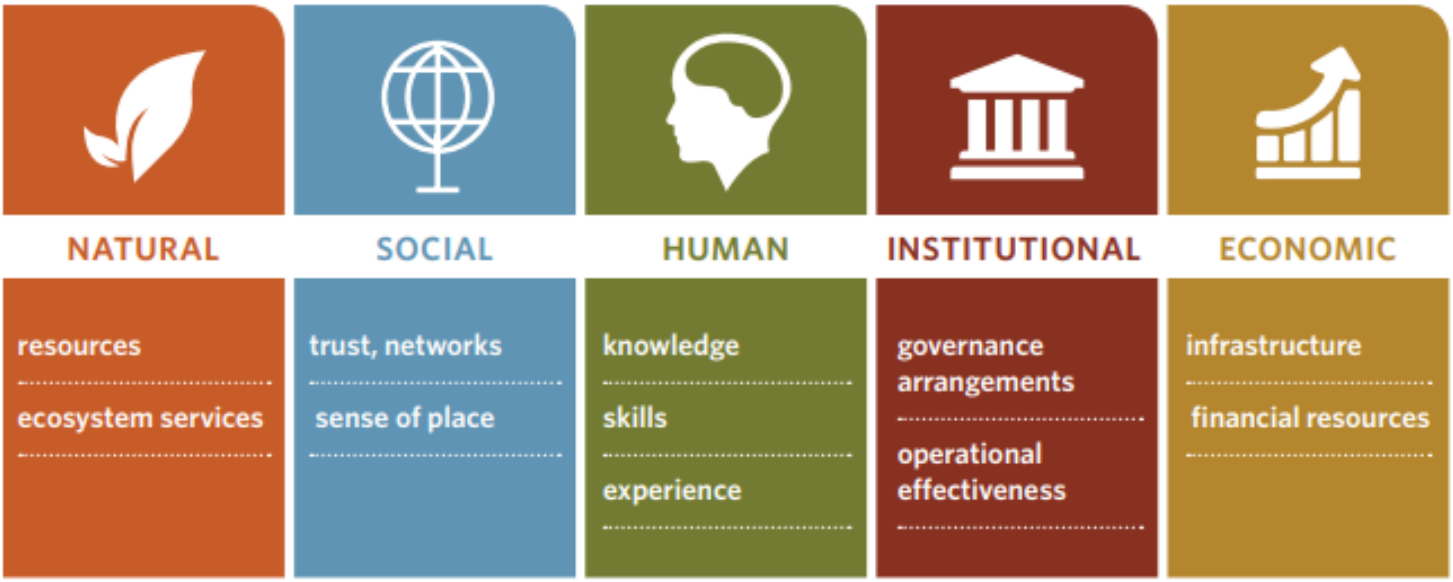
So far, few institutions have been developed to manage the growing competition and tradeoffs across sectors and nations that are causing continual shifts in livelihood opportunities. This leaves users to seek their own coping and adaptation strategies, which is particularly difficult for poorer users. Government agricultural authorities have helped farmers expand cropping along the lakeshore and riverbanks, inadvertently competing with efforts to protect critical aquatic habitats. In addition, no crossborder arrangements are in place to coordinate regulations or mitigate or resolve conflicts between the fishery authorities and fishers of Malawi and Mozambique. For example, because Mozambique's fishing restrictions are less developed than Malawi's, Malawian fishers migrate to the Mozambican side of the lake once Malawi's season closes, which disrupts Mozambique's fishers' use of the basin. These findings may be generalizable to other shallow, closed-drainage lake systems.

Source: Ratner, B., K. Mam, and G. Halpern, "Collaborating for Resilience: Conflict, Collective Action, and Transformation on Cambodia's Tonle Sap Lake," Ecology and Society, 19 (3), 2014.

STRONG COMMUNITY LEADERSHIP AND CAPACITY

Community capacity refers to how effectively a community can govern its FWR to support livelihoods, conservation, and sustainable development. This includes the ability to mobilize resources and to resolve conflicts. Community capacity is also essential for effectively engaging in ***co-management***, and ensuring a stronger voice in multistakeholder processes—especially where economic and political power dynamics impede ***collective action***. In communities that are dependent on FWR, strong governance is vital. Building community capacity means strengthening all types of community resources, including natural, social, human, institutional, and economic capital. Political capital is also an important factor to consider in terms of power dynamics within groups.

At larger scales (that is, beyond the household or farm levels), coordination of communities and community members becomes important for governing FWR. In many pastoral systems, for example, watering points serve multiple households and communities. Coordination is therefore required to build and maintain physical structures, to allocate water among users, and to provide appropriate incentives for sustainable usage. At smaller scales, collective action is likely to be more robust than ***statutory governance*** because local users are more able to monitor what is occurring, and community-level norms and rules governing the use of FWR are often in place. Where social norms and rules are respected, communities have legitimacy to enforce the rules. Finally, strong leadership plays a key role in improving social learning and collaboration, in turn increasing community capacity to govern FWR effectively.



Governance

Because of interconnections among the multiple users of FWR, cooperation and compromises are required to ensure equitable distribution of resources and externalities. Historically, a diverse range of community-based FWR institutions have developed, monitored, and enforced their own rules for extracting, managing, and developing FWR. Local communities are capable of governing their own resources and should be recognized as such—within the limits of larger upstream–downstream interlinkages—even if customary rights are not recognized by the State. This should include the community's role in conservation (since its members are dependent on FWR for their livelihoods) and incorporate different views within a community (such as those of poor and marginalized members), to promote equity.

Knowledge

Knowledge is a key contributing element for raising local communities' capacity to govern FWR and meaningfully participate in co-management. Different types of knowledge—including legal, scientific, legislative, technical, indigenous and local knowledge—are all important. Knowledge and information are also resources that equip local communities to influence action. Thus, groups without technical and legislative knowledge may be unable to effectively negotiate, influence decisions, and demand their water rights. In co-management arrangements with the State, knowledge, and hence power, can be imbalanced. Combining different kinds of knowledge and exchanging knowledge and information among stakeholders can be highly beneficial. It is also extremely important to seek and incorporate indigenous and traditional ecological knowledge; ignoring its contribution can lead to failure in development and sustainability. For instance, technical knowledge of hydrology is important in designing dams and irrigation canals, but indigenous knowledge of water flows is also invaluable (such as developing understanding of the migratory patterns of target fish species). Low levels of education and weak bargaining power in some communities can hinder members' ability to communicate effectively and have their voices heard. Indigenous communities often have a strong interest in participating in decision-making processes, and seek to learn about and benefit from western approaches to water management. Yet, indigenous and local communities also expect, and deserve, reciprocation of resources and knowledge, where government partners and other stakeholders also learn from their knowledge and science.

The case of local "fishing accords" in the Juruá river in Brazil provides a grounded example of sustainable outcomes based on local communities' management of FWR and fisheries in Amazonia. The community of subsistence fishers agreed with large commercial fishers to establish rules and grounds for the protection of a species driven to near extinction. The community designated open access lakes that allowed anyone to fish, subsistence-use-only lakes for the local community, and protected lakes maintained as recovery areas for fish stocks. The community collectively surveilled and guarded the lake and fish stocks, which resulted in strong conservation outcomes even outside the boundaries of areas that were protected. This case illustrates the value of involving local communities in conservation planning and implementation.[3]

Social Capital

Communities are more able to achieve common goals when they act collectively. Social capital includes social norms, trust, networks, solidarity, and reciprocity. Collective action enables FWR-dependent communities to combine forces, thereby increasing their leverage and ***agency*** in decision-making arenas. Evidence from Ghana shows that information exchange and being embedded in advice networks significantly affects community members' level of influence in river management boards.[4] Building social networks has been shown to increase community influence in decision-making and resilience in response to extreme events.[5] One study suggests that informal social networks could even be more important than formal institutions, and that making explicit efforts to have groups learn together though social networks, rather than setting up inflexible institutions, can lead to more sustainable water management solutions.[6]

Fostering opportunities for collaboration and shared learning have also proven to be effective, such as forums for different user associations to share their experience and knowledge of managing FWR. Social and advice networks also provide opportunities for social learning, which is important because it builds capacity to resolve conflicts, deal with and absorb different perspectives, act collectively, and learn from previous experience. This, in turn, facilitates the development of trust among local communities and with other stakeholders.

Factors like the uncertain impacts of climate change and changing socioeconomic boundaries require FWR governance to be adaptive. Social learning is key to adaptive co-management of social-ecological systems. It greatly facilitates a community's capacity to cope with change and uncertainty, to take advantage of different types of knowledge, to enhance opportunities for the community to self-organize, and to cultivate community resilience.

Adaptive co-management practices within fisheries have been found to lead to more positive social/ecological outcomes and to help prevent conflict.[7] Social networks are, therefore, a key link in building local capacity to adapt.

Leadership

A leader can be a person or a group, provided they have a vision and are trusted by other stakeholders. To be effective and sustainable, leadership should include multiple individuals across diverse groups. In the Tanzanian Mkindo catchment, mapping of social networks showed that village leadership increased the connectivity of multiple actors in the network, as well as solving local disputes related to water resources in the catchment.[8] For example, village leadership created institutional mechanisms to mitigate recurring conflicts between farming and pastoralist communities arising from damage to farmers' crops in the dry season (when one of the joint streams dries up and pastoralists are forced to use the other stream for their livestock).

It has been argued that this leadership needs to be collaborative, capable of eliciting trust, able to foster open debate and to mobilize collective energies in a clear direction. Leadership that is accepted and trusted by all members is also a key factor for effective ***capacity building***. For example, in Tanzanian water-user associations, lack of community capacity (including leadership and skills) hindered local participation and operational management of FWR. Dynamic leadership is needed to enforce rules, instigate regular opportunities for discussion and feedback, and avoid pitfalls like favoritism.[9] A charismatic leader or facilitator can motivate meaningful discussion, assist in the development of capacity and the generation of knowledge, and facilitate effective decision-making and consensus-building. It should be noted, however, that developing capacity is a slow process that must be actively fostered.

EFFECTIVE MULTISTAKEHOLDER PLATFORMS FOR DECISION-MAKING

MSPs are formal and informal governance structures intended to bring different sectors and actors together to address specific issues. MSPs are particularly relevant in the context of FWR systems because, in recognition of State limitations, there is greater movement toward decentralized management that favors inclusive and participatory decision-making approaches. MSPs can create the necessary "space" for the development of community capacity, the creation of social networks, and the exchange of knowledge and information, all of which have the potential to promote equity and diversity—especially in the management of FWR, given its large and highly diverse base of stakeholders.

A key challenge in managing FWR is the sheer scale of the resources involved, both across space and over time. This has a significant impact on the types of roles stakeholders play in the management system. MSPs themselves vary across space and over time depending on the context in which they function. Some are permanent to address ongoing co-management of resources, whereas others are temporary—for example, to deal with conflict resolution. Spatially, MSPs can function at local, national, regional, or international levels. Several factors need to be considered to ensure the effective facilitation of MSPs (Figure 3). It is possible to have many overlapping MSPs that address issues at different spatial scales.

MSPs focused at the river-basin level or wider catchment areas tend to encompass a wider spectrum of FWR-related issues, such as land use, fisheries, livelihoods, health, rights, and so on. Such MSPs usually also deal with multiple resources because they are embedded in a wider geographic area. A catchment area, for instance, usually cuts through forest patches or agricultural lands. As a result, multisector and multistakeholder collaboration and planning are needed.

Determining the Scale of Governance

While no one scale is appropriate for an MSP, in the context of FWR, tradeoffs have to be considered between small-scale, village-level platforms for management, and large national, international, or basin-level MSPs. One school of thought argues that scaling MSPs to transboundary levels will likely be problematic because, although watersheds represent a natural hydrological scale, this level is impractical for human/social interaction. Working at this higher scale creates distance between the communities involved and those making decisions, which could discourage local groups from participating. The appropriate scale of FWR governance will often depend on the particular water use or challenge to be addressed. A recent study suggests that improving governance requires a multi-scale approach, not necessarily based on the landscape or watershed. Nesting village-level watershed projects into larger scale platforms has been found to be more effective in bridging sectoral and institutional boundaries, such that local communities can operate at their own scale, embedded within the broader framework of the watershed, State, nation, or initiative.

Factors Affecting Outcomes

The key factors affecting the dynamics and outcomes of MSPs are as follows:

1. The external and ***enabling environment***
2. Existing power dynamics
3. Member capacity

It is important to take these factors into account when designing and establishing MSPs in order to avoid inequitable and less-inclusive outcomes that fail to empower local communities or achieve social justice. In the context of Brazil's Pantanal Wetlands (Box 3), for example, lack of effective fisher participation in the MSP led to lack of understanding of management requirements, fishers' distrust of the MSP's urban-based scientists, and noncompliance with MSP rules.

Government support and involvement in decentralizing MSPs and ensuring the inclusion of multiple stakeholders is another important enabling factor (although it is not necessarily a defining factor for success). In some cases,

governments may not relinquish their decision-making authority and, instead, maneuver to retain hierarchy through institutional reforms that are promoted as participatory but have no actual power. In a review of 91 fisheries across 37 countries, co-management of fisheries was more likely to develop in countries with well-defined rules and good national legislation, yet some co-management regimes addressing overfishing evolved in countries without sufficient rules of operation or a supportive legal framework.

There is no guarantee that stakeholders will be motivated to participate simply because a platform is available. Forming and participating in an MSP has associated costs of their time, travel, and other contributions. If insufficient gains are perceived, members may lose interest in participating. That is why it may be difficult to motivate private actors like agribusinesses with private wells to join a discussion on solving water scarcity in irrigation canals, because they will not be as affected as other stakeholders. Stakeholders may also be discouraged from participating in MSPs when trust is lacking, outcomes and power structures are predetermined

Figure 3. Seven Key Principles for Effective Facilitation of Multistakeholder Platforms

Source: Brouwer, H., and J. Woodhill with M. Hemmati, K. Verhoosel, and S. van Vugt, The MSP Guide: How to Design and Facilitate Multi-stakeholder Partnerships (Wageningen: Wageningen University and Research, CDI, 2016).

***Inclusion** is an important factor in designing MSPs for FWR management, both in terms of who is involved and how they are engaged. In large lakes in Cambodia, Uganda, and Zambia, national governments transitioned the governance of fisheries to local communities, but conflict arose due to the exclusion of small fishers. Better management outcomes and compliance resulted in MSPs that ensured the representation of all stakeholders, including community members.*[10]

Large differentials in power dynamics, associated with authority, ethnicity, caste, socioeconomic status, and so on, can make it difficult to ensure participation of all groups. In India, for example, unchallenged upper caste members often take over decision-making processes in resource management, making it challenging to form watershed groups, even if the value of collaboration is clear to all. Even if stakeholders have representation in a seemingly participatory MSP, they can still be discouraged from actively participating. For example, in cases where some groups have the power to disrupt negotiations or control the discussion or implementation, weaker participants may agree to decisions due to lack of negotiation skills, undue pressure, or fear of retaliation.

Stakeholders' characteristics, assets, and resources greatly shape participation in MSPs and the outcomes they generate. Knowledge and information, such as technical, scientific, and legal knowledge, help participants to influence opinions, negotiate decisions, and eventually affect outcomes. These issues are strongly linked to community capacity. Social capital and social networks are also key assets because they facilitate collective action and increase leverage. All these factors make it important for MSPs to establish rules that promote equitable participation and build capacity among the members of weaker groups to ensure their meaningful participation.

Determining different types of decision-making is another important factor. Decisions can be based on different types of voting, be negotiated, or require a majority or a consensus. In India, for instance, majority-rule decision-making for a watershed-related MSP allowed elite groups to dominate. One MSP set rules to eliminate domination or coercion by rotating leadership, by requiring members to include the reason for their vote, and by only passing decisions when 90 percent of the members were in attendance.

Box 3. Case Study: Brazil's Pantanal Wetlands

Brazil's Pantanal wetland, a geological depression within the Paraguay River Basin, is the largest wetland in the world, at over 140,000 km^2. It has more biodiversity than the Amazon rainforest, is a UNESCO World Heritage Site, and contains two ***Ramsar*** *wetland sites. The Pantanal has important fishing grounds, but fish populations are highly mobile, which causes frequent, unpredictable changes in the accessibility of fishing grounds. Having adapted to this variability, customary governance focuses on varying fishers' mobility levels and ensuring that information on fishing-ground activity is shared. Fishing communities both cooperate and compete, and governance is implemented using* ***normative incentives/disincentives:*** *fishers' reputations, reciprocity, punishment, and ostracism.*

Conservation and government interventions have attempted to assure sustainability by imposing rules and regulations, such as restrictions on the use of certain fishing gear, the implementation of fishing licenses with quotas, prohibitions on the extraction of endangered species, open and closed seasons or fishing grounds, and strict protected areas. This has been done through a superficial co-management approach based around a regulating commission comprising legislators, scientists, and enforcers. But stakeholders' rights of participation in making decisions on rules have not been realized. High levels of distrust of scientists' understanding of the Pantanal's sustainable-use requirements have led to noncompliance by customary fishers.

Failing to take into account the character of the specific resource, its sustainable harvesting requirements, and the existing customary governance system—for example, by too strictly limiting users' mobility and hindering their ability to track the distribution of resources—could actually undermine sustainability and livelihoods. A better approach might be to apply an equitable process to negotiate flexible, protected areas for sustainable use. Findings may be generalizable to other systems with moderate competition with extensive and unpredictable distribution of resources.

Sources: Chiaravalloti, R., and M. Dyble, "Limited Open Access in Socio-Ecological Systems: How Do Communities Deal with Environmental Unpredictability?" Conservation Letters (October 2019): 1–7; Shirley, E., and M. Gore, "Trust in scientists and rates of noncompliance with a fisheries rule in the Brazilian Pantanal," PloS one 14 (3), 2019.

(that is, deemed unfair), or benefits of participation are unclear. In Bolivia, for example, an MSP was established to discuss a major drinking water and sanitation project. Water-user associations were invited to participate but declined to do so because outcomes had already been determined. The MSP had been established after construction had begun and contracts between the municipality and construction company had been finalized.

The participation of external actors, such as nonprofit organizations like TNC, are important in cases where facilitation is necessary to establish MSPs, link various actors, facilitate mutual learning, and support conflict resolution. In the Ecuadorian Andes, for example, while social capital aided collective action within communities, nongovernment organizations (NGOs) helped to establish overarching water-user associations among the different neighboring communities by building trust, facilitating the establishment of rules of operation, and forming relations with external agents.

Finally, adaptive learning and management play a strong role in improving MSP outcomes. Studies show that a learning-by-doing approach to the co-management of FWR encourages positive social and ecological outcomes, while also serving to reduce the potential for conflict. Another important factor for consideration is the history of dialogue, cooperation, and outcomes among the various stakeholders, which can affect their future willingness to participate in platforms, as well as future outcomes. For example, where trust among stakeholders has been eroded, participants may be less willing to participate.

Examples of the Impact of Multistakeholder Platforms

In the case of Malawi's Lake Chilwa Basin (Box 2), after an NGO's participatory monitoring program was introduced to improve the accountability of the three stakeholding bodies, conflict was reduced, and fishers became more proactive and effective in calling for government reform, which ultimately increased governance capacity.

Box 4. Case Study: Cambodia's Tonle Sap Lake and Floodplains

Cambodia's Tonle Sap Lake is a large, seasonally inundated lake bordering five Cambodian provinces and draining into the lower Mekong River system. Intense conflict has arisen in response to upstream–downstream competition, both nationally and internationally. Local arenas of resource competition are both intra- and inter-sectoral, the latter involving conflicts among fishing and dry-season irrigated rice production. Expansion of the rice production is often backed by powerful investors from outside of local communities, creating private irrigation areas that displace customary community use.

In an attempt to address fishing-sector conflict, the Cambodian government changed its national fishery policy from centralized control of large-scale commercial fishing lots to a form of decentralized co-management based on community fishery organizations (CFOs). The newness of the CFOs meant that their legitimacy, leadership, and governance capacity were low, so local competition over fishing resources initially rose as users maneuvered to secure rights under the new system or take advantage of enforcement gaps, which led to widespread illegal fishing.

To increase their governance capacity, CFOs used a participatory multistakeholder process to restructure management and improve enforcement. The CFOs also increased their capacity to resolve interprovincial and intersectoral disputes. In the case of the dry-season rice farmer associations, a verbal agreement was made in the presence of provincial agriculture and fisheries departments, which was later formalized by the Fisheries Administration. The CFOs also increased their capacity to petition for government support to change or allow exemptions from current regulations. This resulted in a pilot project to establish a commercial fishery under community management, with safeguards to ensure adequate resource protection and benefit sharing. The CFOs also engaged in networking among the communities surrounding the lake (through a series of marketplace knowledge events) and with a national grassroots network representing fishing communities.

The success of the participatory multistakeholder process was so great that a national grassroots network representing fishing communities modified its internal governance and increased collaboration with national government authorities and the formal nongovernmental sector. The Fisheries Administration also proposed incorporating the process in the implementation of ongoing fisheries reforms. These results may be generalizable to other large, open-drainage systems of international significance, such as Lake Victoria (bordered by Kenya, Tanzania, and Uganda) and Lake Kariba (bordered by Zambia and Zimbabwe).

Source: Ratner, B., C. Burnley, S. Mugisha, E. Madzudzo, I. Oeur, K. Mam, and L. Rüttinger, et al., "Investing in Multi-Stakeholder Dialogue to Address Natural Resource Competition and Conflict." Development in Practice 28 (6/2018): 799–812.

In the context of Cambodia's Tonle Sap Lake and floodplains (Box 4), the MSP was able to increase the community's capacity to collaborate and negotiate with government authorities, which allowed it to secure a formal transfer of access rights to fishing communities, eventually resolving interprovincial access disputes. This increased security of access rights and subsequent expectations of control of returns to long-term investments. In turn, this freed communities to promote their values around sustainability, and encouraged fishers to increase their investment in environmentally sustainable livelihood and economic-development opportunities. Collaboration with government authorities equalized power imbalances that were preventing the resolution of access disputes. After the Cambodian government provided safeguards to ensure adequate benefit sharing, community fishery organizations were able to participate in pilot co-management of a commercial fishery, as well as engage in networking among the communities surrounding the lake and with a national grassroots network representing fishing communities.

Outcomes have not always been positive, however. In several cases in West Africa, attempts by MSPs to impose alternatives to traditional systems actually threatened the customary tenure security of resource use.[11]

ENVIRONMENTALLY SUSTAINABLE ECONOMIC DEVELOPMENT OPPORTUNITIES

Environmentally sustainable economic development opportunities are essential within FWR-dependent communities, and are important for creating incentives for sustainable usage. Communities' own livelihood and development opportunities are often founded on natural resource use, creating incentives both for managing resources sustainably and investing in a collective future. This promotes a "win–win situation" whereby a community's development interests align with broader conservation goals. In addition, conservation interests can generate sustainable livelihood and development opportunities by enhancing the users' access to sustainable resources and capitalizing on the positive influence communities may generate for themselves and others. Ecotourism in national parks is a good example of how conservation can create local employment and business opportunities. Tremendous potential exists to improve communities' livelihood and development opportunities through sustainable use and management of FWR. Irrigation in Africa, for example, has the potential to boost agricultural productivity by at least 50 percent, representing a key step in reducing poverty in the region. It is vital, however, that a long-term perspective be taken that includes multidimensional (that is, economic, health, social equity, resilience, and education) development outcomes.

Improving the sustainable use of common-pool resources requires management at both the supply and demand sides of natural resources, and interventions must address socioeconomic, institutional, and behavioral factors, along with biophysical (hydrological) and technical (engineering) factors. For example, in the absence of strong collective governance by local communities to sustainably govern the shared FWR, individual farmers may lack monetary incentives to save water or use it efficiently. In the case of groundwater management in India, the government subsidizes the cost of electricity to pump groundwater, thereby encouraging greater agricultural productivity. This has encouraged farmers to pump more, which lowers the water table, and requires farmers to continue to drill deeper at greater cost.

Increasing sustainable livelihood and development opportunities tends to open avenues for strengthening community governance capacity and effective participation in MSPs. Resource users can be strong advocates for the sustainable use of the FWR on which they depend. Poor and food-insecure users, for example, are often forced to focus on short-term goals, such that survival needs take precedence over conservation goals. Participation in community and MSP governance processes can also have a positive impact on participation in FWR-related production and marketing activities and socioeconomic networking, ultimately increasing levels of engagement and empowerment. Numerous studies, for example, have found that women's access to water is limited by implicit and explicit exclusion from management decisions, and the allocation of irrigated land.[12]

Finally, in an increasingly connected world, a holistic, systems-thinking approach is needed to build understanding for how livelihood and development opportunities within a community are linked to other communities and sectors, and how (positive and negative) externalities can be addressed to ensure equity, economic efficiency, and environmental integrity across communities and sectors. This necessitates mapping the actors involved, along with their relationships within a given FWR system.

Incentives/Disincentives

The incentives (and disincentives) associated with sustainable resource use are numerous and varied. They include regulatory incentives, market-based (that is, economic) incentives, and ***normative incentives***, which involve pro-social preference, cultural values and beliefs, identity, and social norms. Of these three types of incentives, which are discussed further below, regulatory and economic incentives are most widely used to promote conservation of natural resources.

Regulatory Incentives/Disincentives

Regulatory incentives/disincentives have taken the form of policies, taxes, rules, fines, and subsidies. Government entities can affect freshwater systems through policies relating to energy, agriculture, housing, and so on. Government has a role to play, for example, in instituting strategic planning to shape the mix of energy sources used in the future, which has important ecosystem implications. Legal approaches can be powerful.[13] For example, in 2017, the Whanganui River in New Zealand was recognized by the government as a legal "person," enshrining rights to the connected functioning of its watershed and Indigenous people's links to the river.

Market-Based Incentives

Market-based economic incentives can play an important role in supporting innovations and technology development, which can contribute to sustainable FWR use either by reducing the reliance on natural resources or by reducing the negative environmental and social impacts of use. The provision of alternative livelihood options has the potential to shape sustainable development pathways. For example, promoting the transformation of local economies from activities that depend on natural resources to those that have a service orientation can assist in reducing pressure on FWR. Migration and the subsequent remittances sent back to families that rely heavily on FWR have also been shown to help curb local pressure on natural resources. In addition to reducing human pressure on FWR, diversifying livelihood options can also contribute to risk management.

Payments for Environmental Services (PES) have been used by governments, donors, NGOs, and the private sector to encourage the provision of environmental and watershed services by upstream communities. Evidence of the outcomes of PES programs has been mixed. Some studies find that PES programs have had moderately positive overall impacts in developing countries, correlating high payments, a high degree of volunteerism, and high opportunities for alternative income sources with improved livelihood outcomes. Other studies show livelihood outcomes associated with PES to be mixed and sometimes conflicting, and a recent review of PES studies suggests that no firm conclusion can yet be drawn. What is clear is that the specifics of the design and implementation of programs is significant in their ultimate effectiveness. In the context of FWR, PES has the potential to create incentives for sustainable resource use. In Kenya, for example, the Lake Naivasha Water Resource Users Association (representing its downstream members, most notably a public–private electricity generator and international commercial floriculture and horticulture corporations), pays small-scale land owners in the upper catchment area to adopt sustainable agricultural management practices.[14] It should be noted, however, that this PES program is only possible because the downstream demand is high enough to make the payments economically viable. The associated need for heavy (technical and financial) facilitation and support by external organizations would be a major barrier for scaling up such programs, but further exploration is warranted.

Normative Incentives

Although normative incentives have received less attention than regulatory or economic incentives, an increasing body of evidence indicates that they can be a powerful means of encouraging conservation behaviors. Preliminary findings indicate the potential superiority of normative incentives over economic incentives in promoting sustainable resource use in developing countries. For example, in a Mexican project that offered payments for watershed services and stressed the cultural, provisioning, and regulating services of forest, the economic incentives had little impact on household income or assets, but local residents cited their appreciation of environmental values as their reasons for participating, despite the lack of significant economic benefits.[15] Social assessments that focus solely on economic values may not sufficiently reflect participants' experiences, motivations, and perceived benefits. Relational values—defined as preferences, principles, and virtues—have been articulated in the ecosystem services literature as a way to broaden understanding of people's motivations to care for the natural world. Relational values are associated with meaningful, reciprocal, relationships reflecting human nature.

Community-Driven Approaches

While external initiatives and support (for example, technical assistance and PES) can play a considerable role in increasing sustainable livelihood and development opportunities around FWR, a community-driven (or at a minimum, community-responsive) approach is critical for achieving culturally appropriate, equitable, and sustainable use of FWR. For example, numerous Japanese rural communities have initiated ecotourism, and a forest-management community in Nepal has built a swimming pool to attract nearby urban dwellers on day trips. These ideas emerged from the community.

Addressing conflicting interests is critical for positioning a community to navigate the sustainable use of their FWR. The *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* suggests that the decision-making and implementation of land governance should be vested at the level at which they can best be performed. The advantages of community-driven initiatives are numerous:

1. They tend to have greater potential for acceptance by community members.
2. They are more likely to be culturally aligned and to address local differences and knowledge, social context, and historical experience, all of which are critical for successfully addressing unique challenges of managing FWR.
3. They are more likely to be self-sustaining due to their greater local ownership.
4. They tend to be more focused on capacity building than technological change, and on building community resilience through increased capacity to adapt, rather than targeting a single technological solution.

Community-driven approaches do have potential disadvantages, however. For instance, it is possible for existing inequitable power dynamics to prevent communities from forming new coalitions to capitalize on sustainable livelihood and development opportunities. Increasingly, the consensus in the development community is that these dynamics (that is, the cross-cutting considerations described in more detail below) should be taken into account in developing a program.

CROSS-CUTTING CONSIDERATIONS

Connection to Place

Culture comprises shared knowledge, beliefs, values, experiences, and conventions contributing to the identity of a community or organization. Because FWR and its related ecosystem services are vital for the full range of human needs—including physical, economic, social, ecological, cultural, and spiritual needs—in many societies strong cultural values are associated with FWR. The association between water and life brings sacred and religious significance to shape normative incentives for sustainable use and CBC of FWR.

Researchers who study the valuation and protection of ecosystem services rate cultural services among the most compelling reasons for conserving ecosystems. The strength of cultural appreciation of FWR is also affected by the capacity of the collectives in which the culture is embedded to guide stakeholder behavior. Cultural values and connections tend to be either reinforced or undermined by the degree to which behavior and stated values align.

In Cambodia's Tonle Sap Lake and floodplains (Box 4), the yearly "Water and Moon Festival" represents rebirth. The festival marks the yearly reversal of the Tonle Sap river and the opening of the fishing season. Canoes are refurbished, and victory in canoe races brings good fortune to the entire village in the coming fishing season.

Cultural values also influence the mechanisms and cost of governing FWR management, especially information gathering, decision-making, and enforcement. For example, the values of open information sharing can reduce the costs of information gathering; the values of cooperation, turn-taking, and inclusion (acceptance of diverse opinions) can lower decision-making costs; and the values of respect, trust, cooperation, and compliance with rules can greatly reduce the costs of monitoring and enforcement.

Identifying and building on local FWR customs and intergenerational ecological knowledge-sharing provides a firm foundation for the innovation of legitimate practices in support of FWR biodiversity and sustainability. Local FWR customs and knowledge can also provide new avenues for collaboration in FWR-related MSPs because they can be used as a community's human and social capital contribution to a MSP. It is important to recognize, however, that issues of culture are neither static nor one dimensional.

Across the globe, a high correlation exists between spiritually important and strategic conservation sites. For example, nearly one-third of species-specific taboos held by indigenous peoples worldwide correspond with the threatened species Red List of the International Union for the Conservation of Nature. Similarly, many national parks incorporate sacred sites. Across Africa, customary protection of mountain burial sites and ancestral settlements is common and has beneficial outcomes for biodiversity and FWR sustainability. Building a common database of knowledge of FWR-dependent sacred sites would be beneficial for the rehabilitation of degraded landscapes near these sites.

Cultural values are formed from the intermixing of different opinions and approaches, as well as different levels of comfort with the pace and means of change. Although a high level of cultural stability and connection to FWR can contribute to strong FWR governance capacity, it will not necessarily result in the equitable outcomes that are important for sustainable development, particularly if cultural values and beliefs related to FWR do not support equity, diversity, and sustainability. For example, in certain locations in India and Nepal, members of low castes are prohibited from directly accessing water based on the belief that in doing so they would pollute it.

Equity

Equity is ***equality*** of "opportunities for individuals to pursue a life of their choosing, independent of circumstances beyond their control. . .. The 'acceptable' level of inequality in outcomes is a decision that is up to each society."[16] The concept includes ***distributive equity***, which is equality of responsibilities, inputs, and outcomes, and ***procedural equity***, which is equality in having an effective voice in governance processes.[17] Distributive and procedural equity are likely to be mutually reinforcing. Power is the ability to affect change against opposition.

Equity is specific to a culture, context, and time specific. In many irrigation systems, equity is defined in terms of giving equal amounts of water per unit of land, which favors larger landowners. In many Indonesian and Nepalese farmer-managed irrigation systems, equity is defined in terms of shares of water proportional to initial investments and ongoing contributions for irrigation-system construction, operation, and maintenance. This again favors those with greater holdings of capital, although in this case the type of capital is financial rather than natural.

Tolerance of distributive or procedural inequity is different for different cultures. Cultures also differ in their tolerance for inconsistencies between equity values and equity realities in their communities. Many cultures are unaccepting of extreme inequity, whereby basic needs—in this case for water or subsistence-level FWR—are not met. Equity, however, is subjective and can be highly contested, as seen in protests over privatization of water services. This is more often the case with the allocation of FWR (such as water for drinking, sanitation, and hygiene) than it is for the allocation of terrestrial resources because FWR are essential for human survival and hence are difficult to privatize. Equity issues are further complicated where large wealth and power differences are involved. For example, an attempt to apply the polluter pays principle to capital-poor upstream polluters of capital-rich downstream users would further increase inequality.

IMPLICATIONS FOR GOVERNANCE

FWR are characterized by high and diverse levels of externalities, high costs of gathering information on the status and use of resources, and high costs of monitoring and enforcing the instruments of governance. Managing FWR sustainably therefore requires progress across all four of the VCA framework pillars and the two cross-cutting considerations.

Key implications for governance include the following:

1. Equitable participation in governance processes is important for shaping governance outcomes. If those who bear the costs of FWR-related governance choices have less input into decision-making processes than those who benefit, those who bear the costs may have insufficient incentive to comply with the decisions made.
2. Although users may value sustainability, poverty can prevent them from accessing sustainable livelihood opportunities, and undermine their incentive to participate in collective governance.
3. Trust in the leadership of the group that is granting use rights—based on strong cultural connections both to FWR and among and between members and nonmembers—increases FWR-user expectations of long-term tenure security, compliance, and willingness to bear the costs of participation in governance.
4. Secure tenure of use rights (that is, access to and withdrawal of FWR) can promote secure tenure of membership in the group granting the rights, ultimately increasing users' commitment to uphold the group's cultural values and norms.
5. Although the potential exists for MSPs to reduce inequities among FWR stakeholders, this rarely occurs. MSPs could offer a space for building the capacity for weaker groups, especially in their role of creating networks and fostering trust among stakeholders. The tendency, however—unless explicitly countered—is for inequity to undermine the effectiveness of highly diverse MSPs. If, for example, MSPs make decisions without the knowledge of all stakeholders, the livelihoods of those excluded could be affected without their knowledge, ultimately creating conflict. MSPs should therefore be viewed as valuable, but inherently political, mechanisms.

IMPLICATIONS FOR THE DESIGN AND IMPLEMENTATION OF COMMUNITY-BASED CONSERVATION INITIATIVES

The linkages of issues across the four pillars and two cross-cutting considerations have a number of implications for the design and implementation of community-based initiatives intended to facilitate FWR conservation:

1. Support to CBC institutions should match the biophysical/technical need for support, in terms of resource users' rights, exposure to externalities, access to information, ***transaction costs*** (related to information gathering, contracting, and enforcement,) and ***transition costs*** (such as advocating for necessary changes in rights).

2. The development of the VCA framework's pillars should be coordinated and simultaneous to ensure that each pillar remains strong enough to be mutually reinforcing of the others.

3. Culture usually changes slowly, and customary governance—deeply embedded in long-standing cultural norms—is usually slower to respond to change than more formalized systems. Some advocate working within current customary frameworks in the short- and medium-term, while promoting incremental change over time that preserves cultural integrity and diversity.

4. Governance arrangements that establish clear expectations reduce transaction costs associated with information gathering, negotiation, and monitoring and enforcement. FWR-related governance systems from the community or State that are newly established or facing rapid change may be weaker. How transaction costs are distributed among different actors can have significant efficiency and equity implications. For example, in Malawi's Lake Chilwa Basin (Box 2), although diversification into fish marketing was a potential livelihood risk-reduction strategy, female-headed households were not able to take advantage of this opportunity, in part due to their inability to get the information and negotiate to obtain the necessary credit.

5. In designing and implementing FWR-related initiatives, tradeoffs among efficiency, equity, and ecological outcomes need to be carefully considered. For example, establishing equitable governance arrangements with local buy-in takes time, so it may seem more efficient to work through local elites or external State enforcement, or to rely on external experts' guidance on sustainable practices. Although, at times, FWR sustainability goals have been achieved through efficiency at the expense of equity, changing contexts and a growing body of evidence increasingly suggest that equity considerations should be integrated into the planning and implementation of programs. Addressing poverty in the context of natural resource–based livelihoods not only means rebuilding collapsed stocks, but also rebuilding entire social/ecological systems.

6. Given the increased variability and uncertainty surrounding FWR, a key goal should be building resilience through the capacity to adapt, rather than focusing on individual technological or governance solutions.

ADDITIONAL CONSIDERATIONS

In addition to the points already discussed, the following factors should also be considered:

1. The scope and diversity of FWR mean that the management of these resources should be tailored to the size, scope, and time horizons of the specific FWR, as well as the FWR users and use. The high level of mobility, high spatial interconnectivity, long timeframe for rehabilitation, and high temporal variability of FWR makes determining and establishing relationships among stakeholder groups extremely important. This scope and diversity of FWR has implications across all four pillars of the VCA framework.

2. The unique biophysical/technical characteristics of FWR—specifically, the high resource dependence across sectors, the complexity of stakeholders' involvement in specific resources, and the high level of simultaneous use of resources—imply the need to carefully identify and differentiate stakeholders' roles, and determine an operating structure (such as an MSP) to promote optimal interaction and cooperation. These factors most directly affect the pillars *Secure Rights to Territories and Resources* and *Effective Multistakeholder Platforms for Decision-Making*.

3. The high potential for externalities and large number of stakeholders involved point to the need to mobilize capacity both within and beyond the community. This consideration most directly involves the pillar *Strong Community Leadership and Capacity*.

ENDNOTES

1. The Nature Conservancy. 2017. *Strong Voices, Active Choices: TNC's Practitioner Framework to Strengthen Outcomes for People and Nature.* Arlington, VA, USA. www.nature.org/content/dam/tnc/nature/en/documents/Strong_Voices_Active_Choices_FINAL.pdf
2. Personal communication, Emmanuel Obuobie, Ghana.
3. Campos-Silva, J., and C. Peres. 2016. "Community-Based Management Induces Rapid Recovery of a High-Value Tropical Freshwater Fishery. *Scientific Reports.* 6. https://www.nature.com/articles/srep34745
4. Schiffer, E., F. Hartwich, and M. Mario. 2010. *Who Has Influence in Multistakeholder Governance Systems? Using the Net-Map Method to Analyze Social Networking in Watershed Management in Northern Ghana.* IFPRI Discussion Paper 964. www.ifpri.org/publication/who-has-influence-multistakeholder-governance-systems
5. Pahl-Wostl, C., M. Craps, A. Dewulf, E. Mostert, D. Tabara, and T. Taillieu. 2007. "Social Learning and Water Resources Management." *Ecology and Society* 12 (2): 5. www.ecologyandsociety.org/vol12/iss2/art5/
6. Stein, C., H. Ernstson, and J. Barron. 2011. "A Social Network Approach to Analyzing Water Governance: The Case of the Mkindo Catchment, Tanzania." *Physics and Chemistry of the Earth*, Parts A/B/C. 36,1085–1092. DOI: 10.1016/j.pce.2011.07.083
7. d'Armengol, L., M. Prieto Castillo, I.Ruiz-Mallén, and E. Corbera. 2018. "A Systematic Review of Co-Managed Small-Scale Fisheries: Social Diversity and Adaptive Management Improve Outcomes." *Global Environmental Change* 52 (May): 212–25. https://doi.org/10.1016/j.gloenvcha.2018.07.009
8. Stein, Ernstson, and Barron. "A Social Network Approach to Analyzing Water Governance."
9. Kabogo, J., E. Anderson, P. Hyera, and G. Kajanja. 2017. "Facilitating Public Participation in Water Resources Management: Reflections from Tanzania." *Ecology and Society* 22 (4): 26. https://doi.org/10.5751/ES-09739-220426
10. Ratner, B., C. Burnley, S. Mugisha, E. Madzudzo, I. Oeur, K. Mam, L. Rüttinger, et al. 2018. "Investing in Multi-Stakeholder Dialogue to Address Natural Resource Competition and Conflict." *Development in Practice* 28 (6): 799–812. https://doi.org/10.1080/09614524.2018.1478950
11. Brautigam, D. 1992. "Governance, Economy, and Foreign Aid." *Studies in Comparative International Development* 27 (3): 3–25.
12. Theis, S., N. Lefore, E. Bryan, C. Ringler, and R. Meinzen-Dick. 2017. *Integrating Gender into Small-Scale irrigation.* Feed the Future Innovation Lab for Small Scale Irrigation (FTF-ILSSI) Project Notes 2. http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/131549
13. Schmitt, R., N. Kittner, G. Kondolf, and D. Kammen. 2019. "Deploy Diverse Renewables to Save Tropical Rivers." *Nature* 569: 331–332.
14. Nyongesa, J., H. Bett, J. Lagat, and O. Ayuya. 2016. "Estimating Farmers' Stated Willingness to Accept Pay for Ecosystem Services: Case of Lake Naivasha Watershed Payment for Ecosystem Services Scheme-Kenya." *Ecological Processes* 5 (15). http://doi.org/10.1186/s13717-016-0059-z
15. Arriagada, R., A. Villaseñor, E. Rubiano, D. Cotacachi, and J. Morrison. 2018. "Analysing the Impacts of PES Programmes beyond Economic Rationale: Perceptions of Ecosystem Services Provision Associated to the Mexican Case." *Ecosystem Services* 29: 116–127.
16. World Bank. 2017. *World Development Report 2017: Governance and the Law.* Washington, DC. p.168. www.worldbank.org/en/publication/wdr2017
17. World Bank. *World Development Report 2017.*

Recommended citation for this guide:

Zhang, W., H. ElDidi, K. Swallow, R. Meinzen-Dick, C. Ringler, Y. Masuda, and A. Aldous. 2020. *Community-Based Management of Freshwater Resources: A Practitioners' Guide to Applying TNC's Voice, Choice, and Action Framework.* Arlington, VA, USA: The Nature Conservancy.

GLOSSARY

Agency. Purposeful action, implying that actors have the freedom to create, change, and influence events

Bargaining power. The capacity of one party to dominate another based on its influence, wealth, size, or status, or via threat of social, economic, political, or physical harm. When bargaining power in a negotiation is equal, the process—and hence the outcome—is more likely to be equitable.

Capacity building. The development of an individual's or organization's core skills and abilities, such as leadership; organizational, financial, and human resource management; planning and negotiating; and developing, implementing, and evaluating programs. The process of assisting an individual or group in identifying and addressing issues and gaining the necessary insights, knowledge, and experience to solve problems and implement change. Facilitated through the provision of technical support, such as coaching, training, and so on

Capital. Valuable/tangible assets—including natural, physical, financial, human, social, and political capital—that can be used to generate more value

Collective action. Coordinated behavior by a group in pursuit of members' perceived shared interests or purpose

Co-management. A partnership in which responsibility and authority for decisionmaking are shared among stakeholders—for example, a statutory government, a community or group of resource users, of external agents (nongovernmental, academic, and research organizations). Often refers to programs that seek to increase users' direct involvement in natural resource management in conjunction with some role for the State, especially regarding backstopping of enforcement

Community capacity. Determines how effectively a community can self-govern its FWR to support livelihoods, conservation, and development. This includes the ability to mobilize resources, to resolve conflicts, to engage in co-management effectively, and have a strong voice in multistakeholder processes

Culture. A set of shared knowledge, beliefs, values, and conventions that define expectations of behavior. Characterizes the identity of a community or organization, and depends on the capacity for transmission to new members

Customary rights. Rules and practices that are part of accepted and expected behavior established within a specific social setting, group, or population

Distributive equity. Refers to equity among groups of individuals relating to choice, affordability, quality of life, education, and so on

Ecosystem services. Refers to benefits stemming from the natural environment and from healthy ecosystems—for example, clean drinking water stemming from freshwater resources

Enabling environment. In the context of governance, refers to supportive legal, policy, and regulatory frameworks; institutional strengthening, including clear coordination, roles, and responsibilities; and capacity strengthening, including participatory approaches and social networking to encourage stakeholder engagement

Equality. The condition or quality of being equal; treating all the same; may be applied to rights, opportunities, or outcomes

Equity. The state or ideal of being just, impartial, and fair; a standard of fairness or justice in the context of diversity, especially when preserving diversity is a goal

Externalities. An economic term referring to the costs or benefits caused by the behavior of one party and affecting another party who did not choose to incur those costs or benefits

Governance. The process by which communities, institutions, resources, and so on are governed (See also enabling environment)

Groundwater. Subsurface water that occurs beneath the water table in soils and geologic formations, and that often flows to rivers and other aquatic ecosystems

Hydrological cycle. The sequence of conditions through which water passes from vapor in the atmosphere to precipitation, flows through aquatic ecosystems, and ultimately back to the atmosphere through evaporation and transpiration

Inclusion. The concept that all people have the right to be included, respected, and appreciated as valuable members of their communities

Institutions. An organization founded for a specific purpose, or an established law, practice, or custom

Legal pluralism. The existence of multiple legal systems within a single population or geographic area, such as statutory legal systems operating alongside customary law

Market failure. The inefficient distribution of goods and services in the free market, such that individual incentives for rational behavior do not lead to rational outcomes for the group

Multistakeholder Platforms. Formal and informal governance structures intended to bring different sector/actors together on specific issues

Normative incentives/disincentives. Incentives/disincentives involving issues of preference, cultural values/beliefs, identity, and social norms

Power dynamics. The way people, groups, and institutions interact based on differences in their ability to participate and to influence or control behavior and outcomes (*see also* bargaining power)

Procedural equity. Refers to fairness in respect to procedures and processes, for example, in allocating resources and resolving disputes

Property rights. The legitimate (that is, recognized) right to use or control resources and to have those rights protected through a variety of statutory and customary systems

Ramsar Convention. Treaty for the conservation and sustainable use of wetlands (named for the Iranian city where it was signed in 1971)

Statutory governance. Governance based on a traditional statutory, legal, or other regulatory framework, such as a State government or governmental authority/body

Tenure. The rules that govern how, when, and where people and communities access and use natural resources like land and water

Tenure security. The certainty that a person's or group's rights to resources will be recognized and protected in cases of specific challenges

Transaction costs. Costs associated with economic activity, such as gathering information, negotiating contracts, and monitoring and enforcement

Transboundary water systems. Water systems, such as river basins or aquifers that cross international boundaries

Transition costs. Costs associated with effecting change, such as advocating for necessary changes in rights

Watershed. A surface area from which runoff resulting from rainfall is collected and drained through a common point

FURTHER READING AND RESOURCES

Multistakeholder Platforms

For information on facilitating multistakeholder partnerships: J. Brouwer and J. Brouwers, The MSP Tool Guide: Sixty Tools to Facilitate Multi-Stakeholder Partnerships: Companion to The MSP Guide, 2017). www.mspguide.org/sites/default/files/case/msp_tool_guide.pdf

For information on how to conduct a situation and stakeholder analysis: Amazon Conservation Team, Methodology of Collaborative Cultural Mapping, 2008. www.amazonteam.org/wp-content/uploads/2019/05/ACT-Brazil_MappingMethodology_2008_ENGLISH.pdf

For information on how to combine indigenous and scientific perspectives: S. Cairney, T. Abbott, S. Quinn, J. Yamaguchi, B. Wilson, and J. Wakerman, "Interplay Wellbeing Framework: A Collaborative Methodology 'Bringing together Stories and Numbers' to Quantify Aboriginal Cultural Values in Remote Australia," *International Journal for Equity in Health*, 16 (1/2017): 68. DOI: 10.1186/s12939-017-0563-5

Connection to Place

For information on how to conduct a situation and stakeholder analysis: See Amazon Conservation Team 2008 (under Multistakeholder Platforms).

For information on how to adapt the Open Standards conservation planning process for use with indigenous peoples and local communities: (a) *Healthy Country Planning: Using Open Standards with Indigenous Communities* (TNC Australia 2016) https://tnc.app.box.com/s/zp43topt8bt5zbghih1unevsv4qrufuv; (b) *Healthy Country Planning Summary Reference Cards* (TNC Australia 2012) https://tnc.app.box.com/s/d5ix2i1yo2ketj29lhi4r2p039r18511; and (c) *Healthy Country Planning Tools to Support the Process* (TNC Australia 2012) https://tnc.app.box.com/s/ch8ehkk3smafc7qvu0jqk3zh38zbfggg.

For information on how to assess cultural ecosystem services as experienced by indigenous peoples: (a) Tipa, G., and L. Teirney, A Cultural Health Index for Streams and Waterways: A Tool for Nationwide Use, 2006. www.mfe.govt.nz/sites/default/files/cultural-health-index-for-streams-and-waterways-tech-report-apr06.pdf; (b) Pascua, P., H. McMillen, T. Ticktin, M. Vaughan, and K. Winter, "Beyond Services: A Process and Framework to Incorporate Cultural, Genealogical, Place-Based, and Indigenous Relationships in Ecosystem Service Assessments," *Ecosystem Services* 26 (2017): 465-475. https://doi.org/10.1016/j.ecoser.2017.03.012; and (c) Satterfield, T., R. Gregory, S. Klain, M. Roberts, and K. Chan, "Culture, Intangibles and Metrics in Environmental Management," *Journal of Environmental Management* 117 (2013): 103–114. https://doi.org/10.1016/j.jenvman.2012.11.033

For information on how to combine indigenous and scientific perspectives: See Cairney et al. 2017 (under Multistakeholder Platforms)

Equity

For general information:

The Indigenous Governance Toolkit. http://toolkit.aigi.com.au/

Graham, C., and M. Naím. "The Political Economy of Institutional Reform in Latin America," Ch 12 in *Beyond Tradeoffs: Market Reform and Equitable Growth in Latin America*, C. Graham, R. Sabot, and N. Birdsall, ed., 1997. https://publications.iadb.org/en/beyond-tradeoffs-market-reform-and-equitable-growth-latin-america

For gender-related information:

Theis, S., R. Deribe Bekele, N. Lefore, R. Meinzen-Dick, and C. Ringler, *Considering Gender when Promoting Small-Scale Irrigation Technologies: Guidance for Inclusive Irrigation Interventions*, IFPRI-REACH Project Note, 2018. https://reachwater.org.uk/wp-content/uploads/2018/12/Gender-Toolkit-IFPRI.pdf

Theis, S., N. Lefore, E. Bryan, C. Ringler, and R. Meinzen-Dick. *Integrating Gender into Small-Scale Irrigation*, Feed the Future Innovation Lab for Small Scale Irrigation, Project Notes 2, 2017. http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/131549

Baker, T., B. Cullen, L. Debevec, and Y. Abebe, "A Socio-Hydrological Approach for Incorporating Gender into Biophysical Models and Implications for Water Resources Research," *Applied Geograph*y 62 (2015): 325–338. https://doi.org/10.1016/j.apgeog.2015.05.008

World Bank, *United Nations Gender in Agriculture Sourcebook, 2009.* http://siteresources.worldbank.org/INTGENAGRLIVSOUBOOK/Resources/CompleteBook.pdf

Food and Agriculture Organization of the United Nations, Gender and Social Analysis E-Learning Courses. https://elearning.fao.org/course/index.php?categoryid=9

CARE Gender Toolkit. http://gendertoolkit.care.org/

CGIAR Research Program on Climate Change, Agriculture and Food Security: Flagship Tools on Gender and Social Inclusion. https://ccafs.cgiar.org/flagships/gender-and-social-inclusion

CGIAR Research Program on Water, Land, and Ecosystems (WLE): (a) Lefore, N., E. Weight, and N. Mukhamedova, *Improving Gender Equity in Irrigation: Application of a Tool to Promote Learning and Performance in Malawi and Uzbekistan*, 2017 www.iwmi.cgiar.org/Publications/wle/r4d/wle_research_for_development-learning_series-6.pdf (b) WLE, Upper River Basin Watersheds: Sustainable, Equitable and Profitable Interventions, 2018. https://hdl.handle.net/10568/97649

CGIAR Gennovate Tools. https://gennovate.org/gender-tools-and-resources/

TNC WORLDWIDE OFFICE
The Nature Conservancy
4245 North Fairfax Drive, Suite 100
Arlington, VA 22203-1606 USA
Phone: +1 703-841-5300
www.nature.org

IFPRI HEADQUARTERS
International Food Policy Research Institute
1201 Eye St, NW
Washington, DC 20005-3915 USA
Phone +1 202-862-5600
www.ifpri.org

Wei Zhang *and* ***Ruth Meinzen-Dick*** *are senior research fellows in the Environment and Production Technology Division (EPTD) of the International Food Policy Institute (IFPRI);* ***Hagar ElDidi*** *is a research analyst within EPTD at IFPRI; and* ***Claudia Ringler*** *is Deputy Director of EPTD at IFPRI.* ***Kimberly Swallow*** *is an independent consultant working in the field of development.* ***Yuta Masuda*** *is Senior Sustainable Development and Behavioral Scientist at The Nature Conservancy (TNC) and* ***Allison Aldous*** *is Director of Freshwater Community-Based Conservation at TNC.*

For further information about this practitioners' guide, contact Yuta Masuda at ymasuda@tnc.org.