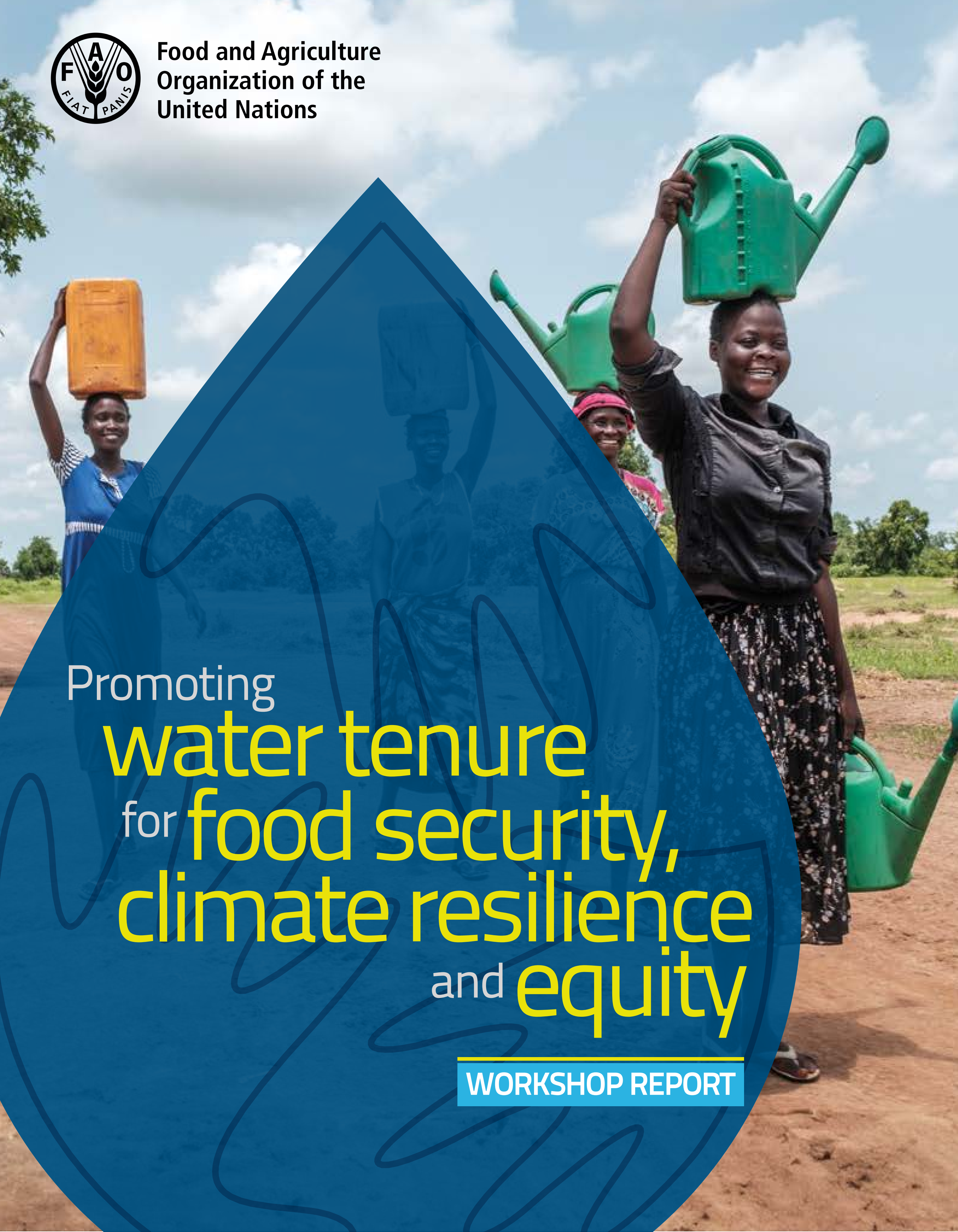
Food and Agriculture Organization of the United Nations



# Promoting water tenure for food security, climate resilience and equity

WORKSHOP REPORT

adelphi

# Promoting water tenure for food security, climate resilience and equity

**WORKSHOP REPORT**

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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# FOREWORD

With more than 733 million people currently living in areas of high or critical water stress, and a projected 30 percent increase in global water demand by 2050, sustainable and equitable water allocation has never been more important. Agriculture is by far the largest sectoral user, accounting for 72 percent of global freshwater withdrawals. At the same time, agriculture faces increasing competition for water from industry, cities, and the environment. Smallholder farmers are particularly vulnerable to changes in water access and availability: a sudden lack of water due to drought can mean lost income and food, threatening their lives and those of their families.

Increasing water demand coupled with the predicted impacts of climate change pose a significant challenge for all countries to allocate water allocation to meet sectoral water needs and achieve food security. In order to manage and use water resources sustainably and equitably, the quantity and quality of water available over timing need to be well understood. To strike a balance between the supply and the needs by multiple sectors at all levels, and to create, when possible, a sufficient degree of flexibility for water re-allocation in a transparent and equitable manner, it can only be achieved through the responsible governance of water tenure.

To address these challenges, FAO and partners have been spearheading work on the governance of water tenure. With support from the Government of Germany, a methodology to assess water tenure and country level was applied in Rwanda, Senegal, and Sri Lanka. In July 2022, the FAO Committee on Agriculture mandated the organization of a Global Dialogue on Water Tenure, in collaboration with relevant UN organizations, and encouraged in the Dialogue. The Global Dialogue is one of eight commitments by FAO to the Global Water Action Agenda during the UN Water Conference in New York in March 2023.

In this vibrant context, FAO, in collaboration with the German Ministry of Food and Agriculture, the German Agency for International Cooperation on behalf of the Ministry of Economic Cooperation and Development, the German Institute of Development and Sustainability, with participation of global partners, organized a two-day workshop to discuss concrete pathways that water tenure can be leveraged to increase concerns of equity, climate resilience and food security in the allocation and governance of water resources.

It is hoped that the deliberations, conclusions and recommendations of this practical workshop presented in this short publication will guide further discussion on the responsible governance of water tenure.

**Lifeng Li**
Director, Land and Water Division

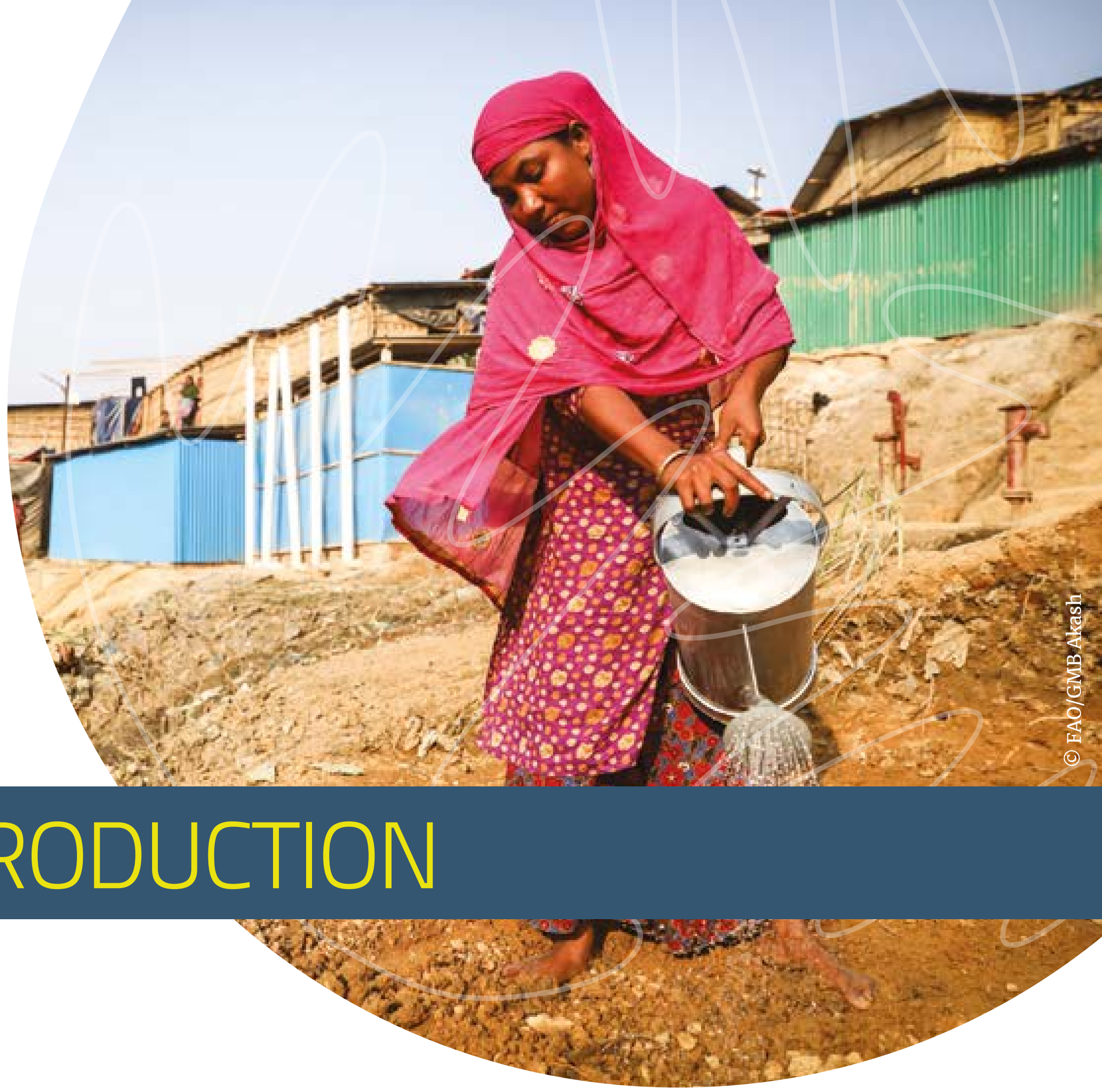
# ACKNOWLEDGEMENTS

The workshop "Promoting water tenure for Food Security, Climate Resilience and Equity" was organized on 28-29 June 2022 at Pfefferberg Berlin by adelphi research GmbH on behalf of FAO by a team coordinated by Sabine Blumstein, with support from Elsa Semmerling, and Karolina Heck. The workshop concept and programme was developed with inputs from Sofia Espinosa, Virginie Gillet, Jippe Hoogeveen, Benjamin Kiersch, Lamine Samake, Joseph Bizima and Thushara Ranasinghe (all from FAO), as well as Svea Wragge (GIZ), Hendrick Acker (BMEL), Srinivasa Srigiri (IDOS) and Jessica Troell (ELI).

The present report was prepared by Karolina Heck and Sabine Blumstein from adelphi, Flannery Johnson from GIZ and Benjamin Kiersch from FAO. The background section was prepared by Blumstein and Heck, along with Jessica Troell (ELI) with inputs by Sofia Espinosa and Benjamin Kiersch (FAO). It was edited by Ruth Raymond and prepared for publication by Sofia Ramirez, Jim Morgan and Paolo Mander.

# ABBREVIATIONS

| | |
|---|---|
| **BMEL** | Federal Ministry of Food and Agriculture |
| **BMZ** | Federal Ministry for Economic Cooperation and Development |
| **CFS** | Committee on World Food Security |
| **ELI** | Environmental Law Institute |
| **FAO** | Food and Agriculture Organization of the United Nations |
| **GIZ** | German Agency for International Cooperation |
| **IDOS** | German Institute of Development and Sustainability |
| **IWRM** | integrated water resources management |
| **KnoWat** | Knowing Water Better |
| **VGGT** | Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests |
| **WBCSD** | World Business Council for Sustainable Development |



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# 1. INTRODUCTION

The workshop "Promoting Water Tenure for Food Security, Climate Resilience, and Equity" was held by the Food and Agriculture Organization of the United Nations (FAO) and adelphi on 28 and 29 June 2022 in Berlin, Germany with support from the Federal Ministry of Food and Agriculture (BMEL), the German Institute of Development and Sustainability (IDOS), and the German Corporation for International Cooperation (GIZ) on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ). **The objectives of the workshop were to increase knowledge and awareness about the role that water tenure plays in managing water resources and its impacts on people's food security and livelihoods.** The workshop focused on three topics: i) water tenure and food security; ii) water tenure and social inclusion; and iii) water tenure to increase climate resilience and mitigate conflicts. 72 participants from governments, civil society organizations, academia and international organizations attended the workshop both on-site in Berlin and on-line. .

Water tenure can be defined as "the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources" (Hodgson, 2016; FAO, 2020). Water tenure considers all types of water uses, including those that are not formally recognized by law. A major challenge to improving sustainable water use and food security for rural populations, particularly in areas affected by water scarcity, is to determine **how customary arrangements for accessing and using water resources can be recognized as legitimate use rights and included in broader water governance frameworks.** Secure water tenure is a prerequisite for investments in the efficient operation of water infrastructure. For these reasons, it is important that water tenure informs political agendas and is recognized as a crucial element of inclusive and sustainable development.

The workshop built on the results of the FAO project **"Knowing Water Better – towards fairer and more sustainable access to natural resources (KnoWat)."** The goal of the KnoWat project is to strengthen water governance processes in Rwanda, Senegal and Sri Lanka by building capacity in water accounting and developing and testing a methodology to assess water tenure. The project aims to contribute to global discourse and to advance the understanding of water tenure in the development sector, with the goal of increasing food security by safeguarding water rights. The workshop concept was developed in discussions with GIZ project teams on the potential uses of the water tenure concept for development.

In 2012, the **Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (VGGT)** were endorsed by the Committee on World Food Security. The VGGT reflect an international consensus on the need to prioritize land tenure rights for the rural poor, who depend heavily on equitable access to resources for their food security and livelihoods (FAO, 2022). Water tenure rights were not included in the VGGT; the issue of water tenure is inherently complicated due to the fluidity of water resources and complications around water rights and governance. Transboundary water governance and the alignment of water tenure approaches are a particular challenge. In addition, there is still no agreed definition of water tenure, leading to challenges in applying the concept widely. In this context, the workshop and the KnoWat project aimed to raise awareness among practitioners and policymakers of the need for secure water tenure for sustainable development, especially for marginalized groups.

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# 2. BACKGROUND

At the opening of the workshop, Benjamin Kiersch, FAO Project Coordinator for KnoWat, welcomed participants to the event and described the journey the project has taken. Introductory remarks by Wolfgang Zornbach of BMEL and Matthias Toll of BMZ stressed the importance of intersectoral work in addressing the challenges of water scarcity, climate resilience and food security, and explained how these challenges are linked to peace, equity and global security. Food and water, they emphasized, needs to be addressed collectively, especially when food shortages loom. Jippe Hoogeveen, Chief Technical Advisor at FAO, described water tenure as a key component of good governance and sustainable access to water, particularly in rural areas. Water tenure assessment and water accounting are mutually reinforcing. An assessment of water tenure security, for instance, requires an accurate knowledge of available water resources.

Ines Dombrowsky from IDOS reiterated the importance of water tenure for food security and other global priorities, as equitable sharing of water resources among sectors will be vital, to achieving Sustainable Development Goal (SDG) 6 (clean water and sanitation for all), as well as SDGs 2, 7, 13, and 15.[1] Dombrowsky emphasized that the relationship between formal and informal water allocation, aggravated by climate change, could impact food security and exacerbate inequality. She expressed the hope that water tenure could contribute to balancing the water needs of different sectors and to achieving the SDGs. Water tenure could also facilitate the integration of formal and informal relationships into integrated water resources management (IWRM) frameworks.

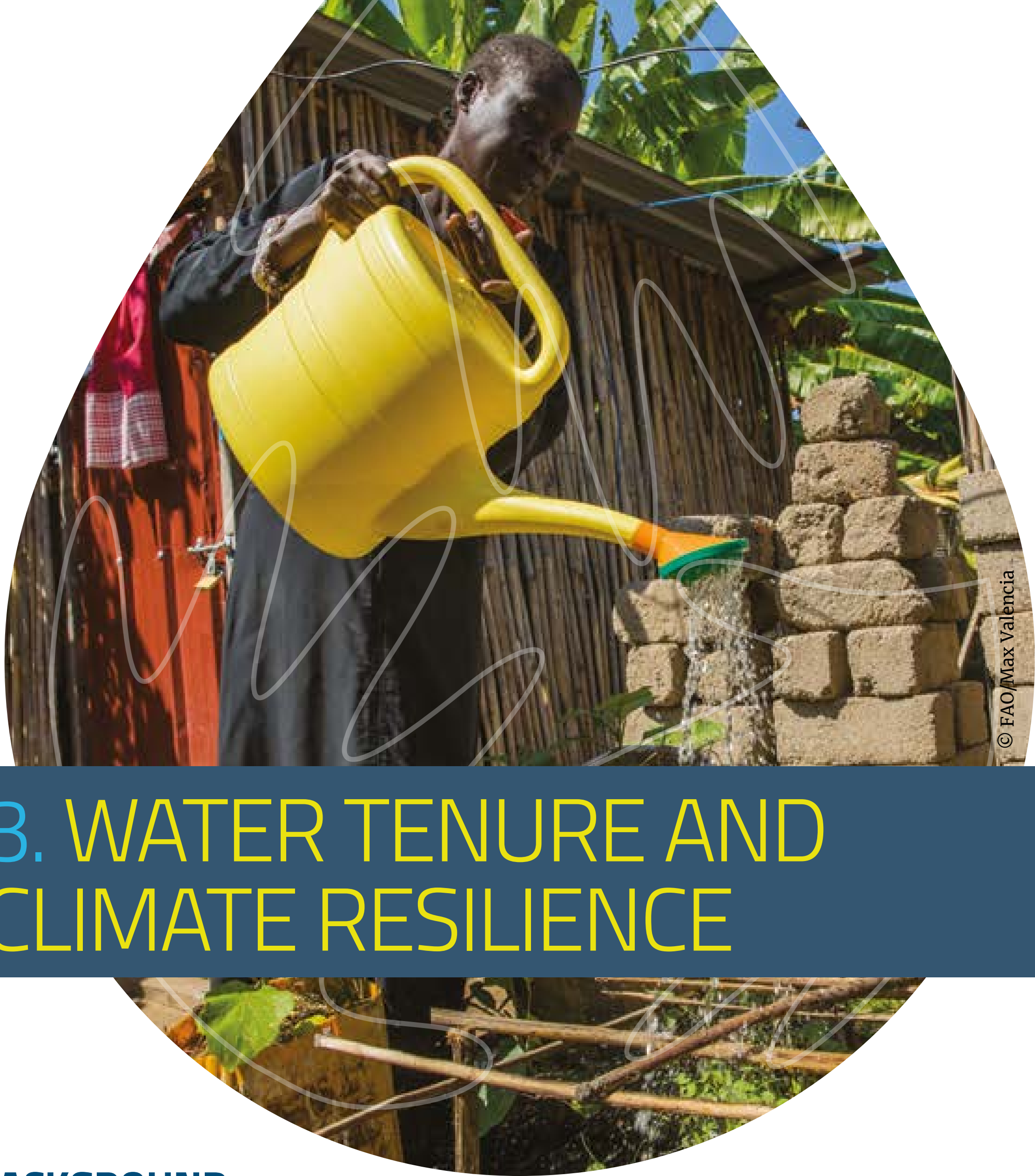
[1] SDG 2 – Zero Hunger, SDG 7 – Affordable and clean energy, SDG 13 – Climate Action, SDG 15 – Life on Land.

Following these remarks, a presentation by Stephen Hodgson, and international environmental lawyer and FAO Senior Legal Consultant, introduced the concept of water tenure. Water tenure arrangements determine who can access and use water resources and to what purpose and describe the relationships between people and water resources. Hodgson sees many benefits in the water tenure approach. Water tenure is **a social and a legal construct** that enables a multidisciplinary, bottom-up approach to water resources. Some water tenure arrangements derive from local laws, customs or traditions. Others stem from religious law, informal measures, assumed water tenure or unrecognized and legally impossible water tenure. It is these arrangements, which are not derived from formal law, that the water tenure concept captures and considers. Hodgson introduced various formal and informal water tenure arrangements. Formal water laws include short term regulatory permits and water law-controlled permits that also provide for security of investments in water-related infrastructure. Informal water tenure arrangements may be illegal but still tolerated by the water administration (for example, in some jurisdictions in India, water users pump from irrigation canals, which is illegal and yet widespread). Water tenure allows us to see the whole picture by considering all types of water uses. A multidisciplinary perspective on water tenure also opens the discussion to related socioecological issues, for example, the rights of access of water resources to informal settlements.

The following presentation by Benjamin Kiersch introduced the KnoWat project in greater detail. Kiersch pointed out that many existing concepts of resource tenure could be applied to water as well. Hence, the KnoWat project builds on tenure concepts for land, forests and fisheries as laid down in the VGGT and combines current research for a comprehensive water resource assessment that combines governance and tenure assessment with water accounting and productivity assessment, based on WaPOR, FAO's portal for monitoring water productivity through remote sensing. Kiersch expressed the hope that FAO's governing bodies will give the organization a mandate to continue to address water tenure in the future, with a view of identifying guiding principles for the responsible governance of water tenure.

In the question and answer session that followed, it emerged that concept of water tenure still needed some clarification. For example, the question was raised as to whether water quality aspects should be included in the concept. While wastewater discharge is not considered a water tenure issue, the **deterioration of water quality** is highly relevant to water tenure. The analysis of environmental flows is important for the evaluation of holistic water use rights. Thus it will be important – as well as just – to involve local communities in the development and implementation of data collection and monitoring systems. However, this will require setting conditions for the **participation of the most vulnerable people**. The hope was expressed that water tenure could be taken up by the Committee on World Food Security (CFS). FAO will need to convince member states of the importance of the topic, although it was noted that some member countries have asked that water tenure be included on the agenda of FAO's Committee on Agriculture (COAG).

The following three chapters summarize the outcomes of the deliberations along the three main workshop topics: Chapter 3 deals with water tenure and climate resilience, chapter 4 with water tenure and social inclusion, and chapter 5 with water tenure and food security. For each topic, a short background paper prepared by the organizing team is presented first, followed by a summary of presentations and discussions, and insights from group work. Chapter 6 is devoted to insights on the link between water tenure and development priorities. Finally Chapter 7 summarizes key points from the workshop, as well as open questions for further research and debate around water tenure.



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# 3. WATER TENURE AND CLIMATE RESILIENCE

## BACKGROUND

### Key messages – water tenure and climate resilience

1. An important challenge in addressing climate change is to find the right balance between secure water tenure rights, which depend on clearly defined rules and regulations, and the assurance of adequate flexibility to respond to changing climatic conditions.

2. Sound water accounting is necessary to ensure secure water rights in conditions of scarcity and to implement flexible water allocation mechanisms. Recognizing all water users can help fill gaps in water balances and thereby improve climate resilience.

3. Secure water tenure rights can have positive effects on water use efficiency since they may provide incentives for investment in new and more efficient water infrastructure.

4. The acknowledgement of different types of water rights can contribute to conflict resolution. Water tenure assessments provide a framework for understanding the relationships between water users, which can help to prevent or resolve potential conflicts.

## Water tenure arrangements under changing climate conditions

**Climate change has major implications for water availability in many parts of the world**. The challenges are enormous. Climate models predict decreases in renewable water resources in mid-latitude and dry subtropical regions and increases in other areas, (mainly high latitude and humid mid-latitude regions). Even where water increases are projected, there may be temporary shortages due to changing streamflow caused by greater variability in rainfall (FAO, 2021). Many countries may need to build more reservoirs for water storage and flood protection. Many water users will need to increase water abstraction for irrigation to accommodate food production in higher temperatures. These adaptive measures will inevitably impact the existing water tenure arrangements of other users. In these circumstances, understanding diverse water tenure rights can help to increase resilience and mitigate water resources conflicts.

A key challenge in addressing climate change is to **find the right balance between secure water tenure rights**, which depend on clearly defined rules and regulations, **and the assurance of adequate flexibility to respond to changing climatic conditions**. On the one hand, it is necessary to ensure that water tenure rights are based on clearly defined rules on how much water can be accessed and when to provide actors with enough planning security to make long-term decisions and adequate investments in water infrastructure. On the other hand, climate change is likely to require significant flexibility in tenure arrangements to allow users to react to changing water availability.

Ensuring climate resilience will thus require a greater emphasis on flexible water tenure mechanisms such as, for example, **water allocation and accessing rights based on percentage shares of available water resources rather than fixed volumes**. Anallocation of rights as a share of available resources leaves more room to mitigate water resource variations than fixed allocations (Dinar *et al.*, 2010) and can also help to reduce grievances among users of the same water sources, particularly in systems with high water variability. .

However, implementing percentage-based water allocation mechanisms (as well as other instruments) will require a thorough and current knowledge of water resources availability. In this regard, it is important to emphasize the need for **sound water accounting to provide reliable information on water resources.**

## Effects of water tenure on water use efficiency

Climate change adaptation requires the efficient use of water resources. However, water use efficiencies are limited in many countries, including those that are most affected by climate change. In these contexts, the recognition of secure water tenure rights, can have **positive impacts on water use efficiency**, in part by motivating **investments in new and more efficient water infrastructures.**

A case study from the KwaZulu-Natal region in South Africa shows the positive relationship between secure water rights and irrigation efficiency on agricultural land. In this case study, local water rights are ensured through a scheme committee, which adheres to typical water user association (WUA) principles. Scheme committees can make decisions without government approval. The committees provide technical and infrastructural support, collect water fees and are directly responsible for the administration of land and water resources. For many years, the South African Government has pushed for the registration of WUAs and scheme committees in smallholder irrigation schemes to better monitor water use, particularly in times of drought, and to improve water use efficiency (Cele and Wale, 2018). Secure and transferable property rights have been shown to be essential to motivating a higher level of investment by farmers as well as improving their credit rating. **Water rights that are secured through highly-functioning scheme committees lead to greater productivity in the use of irrigation water** (Cele and Wale, 2018).

## Water tenure and its impact on local water conflicts

Water tenure arrangements define who can access water resources, as well as how much can be extracted, for how long and to what purpose. They may also indicate the process of water rights allocation and delineate uses should be considered as priority, particularly in times of scarcity. Formal and informal rules and the interactions between users form an intricate "web of interest" (Meinzen-Dick and Mwangi, 2008), which may make the identification of adequate and secure tenure arrangements a complex task. Competing user claims over water resources can be a sign of insecure water tenure rights, which could increase vulnerability, hunger and poverty. As previously noted, a **clear distribution of water rights can contribute to conflict resolution** (Hodgson, 2016). Water tenure regimes **clearly define the relationship between water users, which enables a better understanding of the causes and means to resolving potential conflicts** (FAO, 2020).

**A case study from the Yanze sub-basin in Rwanda shows the potential that recognizing different forms of water tenure arrangements has for conflict resolution.** A large part of the Yanze River is used to supply water to the city of Kigali. The river also serves as an important water source for agricultural activities in the region. In Rwanda, legally-defined water tenure rights do not include traditional or customary water rights. Land law clearly excludes the right to water based solely on land ownership. Hence, farmers have no natural right to extract water on their own property. Farmers who intend to use water for irrigation and whose land is larger than one hectare can apply for a water permit. However, in practice, many water users do not have a permit, even when water is used collectively, such as along a shared irrigation canal. Many users are not aware of the requirement for a permit, or lack the capacity to form a WUA, which has the authority to issue permits. This reality increases the potential for conflicts between users with formal rights to extract water and those that do not have the rights. In this case, however, the Kigali water supply company entered into voluntary contracts with upstream farmers to regulate when and how much water they could use without compromising water supply to urban areas downstream. While not to do so by law, the company saw this as an adequate mechanism to accommodate upstream needs while ensuring water supply downstream – and avoiding conflicts along the line.

This **example illustrates the importance of acknowledging different forms of water tenure arrangements to provide secure and fair water access and prevent conflicts** (FAO KnoWat Rwanda, 2022). The KnoWat project assisted upstream farmers in the Yanze catchment to create a WUA and to establish their formal right to use water resources.

## Water tenure and the availability of data to increase climate resilience

Water stock and supply data is critical to efforts to find innovative and sustainable adaptation strategies to increase the climate resilience of communities. Secure water tenure arrangements can facilitate registration processes that capture all domestic and livelihood uses as well as commercial irrigation uses of water. The **legal recognition of all water users can help to close data gaps** and thus improve climate resilience.

In Tanzania, the lack of recognized local water rights in formal law and the resulting unclear water allocation standards have led to water conflicts and the lack of effective management strategies for agricultural water resources (Mutabazi, 2015). By formally recognizing local laws, the water practices and water balances of smallholders could be monitored more precisely. Different **types of water tenure** (especially local water arrangements) should therefore be added to the water information systems to **present a more realistic accounting of water use and water availability** (Veldwisch *et al.*, 2013).

## Box 1. What is water tenure?

**Water tenure can be defined as "the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources"** (Hodgson, 2016; FAO, 2020). The advantage of this relatively new concept is that it considers all types of water uses, including those that are not formally recognized by law. **At the centre of most water tenure systems is a core group, or bundle, of rights** that constitute the fundamental elements of peoples' relationship with their water resources and with each other in relation to those resources. For example, tenure holders can have rights to access, impound, use, and manage water, as well as "procedural" rights to have access to information and participate in decisions around water resources. The rights that are held by any one individual or group can vary, resulting in different "bundles of rights" that are created and protected by legislative and customary frameworks which may or may not be aligned. The ways in which various rights within the bundle are assigned, who the rightsholders are and how the rights are implemented and enforced shape both the quality and security of water tenure regimes. While the bundle-of-rights approach to tenure was initially developed to apply to terrestrial resources, it can be tailored to the freshwater context.

Water tenure offers a nuanced framework for recognizing the different kinds of formal water tenure relationships as well as relationships derived from customary and local practices. Another key benefit of thinking in terms of water tenure is that it focuses on **water users, the relationships between them and the way they access and use water.** Because water tenure concentrates on users rather than laws and policies, a water tenure approach is by nature bottom-up (Hodgson, 2016).

**One can broadly distinguish two types of tenure: legally defined water tenure and customary tenure. Water tenure defined by formal law** often includes permit-based rights to use surface and groundwater resources. These constitute property rights (or quasi-property rights) that enable the rights-holder to exclude third parties from using these resources. Formal arrangements on water rights are often established between individuals and water user organizations (WUOs). In such cases, rural farmers receive their water from irrigation agencies but the arrangements are handled through the WUOs (Hodgson, 2016). In many countries, some small-scale domestic activities, so called *"de minimis"* uses allow the abstraction of small quantities of water for livestock or drinking water. They are listed under formal law arrangements but do not require a regulatory license.

**Customary and religious water tenure rights** include the right to abstract and use water based on customary practices or religious teaching. In many places, customary or local law remains the dominant legal paradigm for water tenure. Customary water tenure arrangements vary significantly in form and scope. Often, they emphasize the rights of groups and communities rather than of individuals (which is common in formal water tenure) and they are frequently part of complex frameworks that regulate access to other natural resources as well. However, if formal law does not acknowledge or protect customary tenure rights, they will not provide adequate security to water users, making them vulnerable to possible risks of sanctions and sudden prohibitions on use (Hodgson, 2016).

Sources: FAO. 2020. Unpacking water tenure for improved food security and sustainable development. Land and Water Discussion Papers. Rome. https://doi.org/10.4060/cb1230en
Hodgson, S. 2016. Exploring the concept of water tenure. Land and Water Discussion Paper 10. Rome, FAO. https://www.fao.org/3/i5435e/i5435e.pdf

## PRESENTATIONS AND DISCUSSION

Climate change has massive implications for water availability in many parts of the world, causing decreases in renewable water resources in some areas and increases in others. Even in places where increases are projected, there may be temporary shortages due to changing streamflow caused by greater variability in rainfall (FAO, 2021). Many countries may therefore need to build more reservoirs for water storage and flood protection. Other water users will need to increase water abstraction for irrigation to accommodate food production in higher temperatures.

In her introduction to this session of the seminar, Sabine Blumstein from adelphi made the point that adaptive measures to address climate change will inevitably impact existing water tenure arrangements. Understanding diverse water tenure rights can help to increase resilience and mitigate water resource conflicts. According to Blumstein, a key challenge will be to find **the right balance between secure water tenure rights, which are based on clearly defined rules and regulations, and the assurance of adequate flexibility to respond to changing climatic conditions.** More flexible and adaptive water management solutions will require current and reliable data on the availability of water resources and their use. Finally, a clear distribution of water tenure rights is likely to mitigate conflicting user claims over water resources and, as such, might contribute to dispute resolution.

A case study presented by Mohamad Mova Al'Afghani of the Center for Regulation, Policy and Governance on **"Peatlands and water tenure in Indonesia"** described the impacts of water allocation priorities and customary water usage in the country. Water tenure issues in Indonesia stem from the competition between drinking water and agricultural usage, and the depletion of springs due to informal irrigation. The competition has two sources – land use change and the conversion of fields from sugarcane to rice paddies without proper irrigation systems, and a community-based water supply that is both informal and, in some cases, illegal.

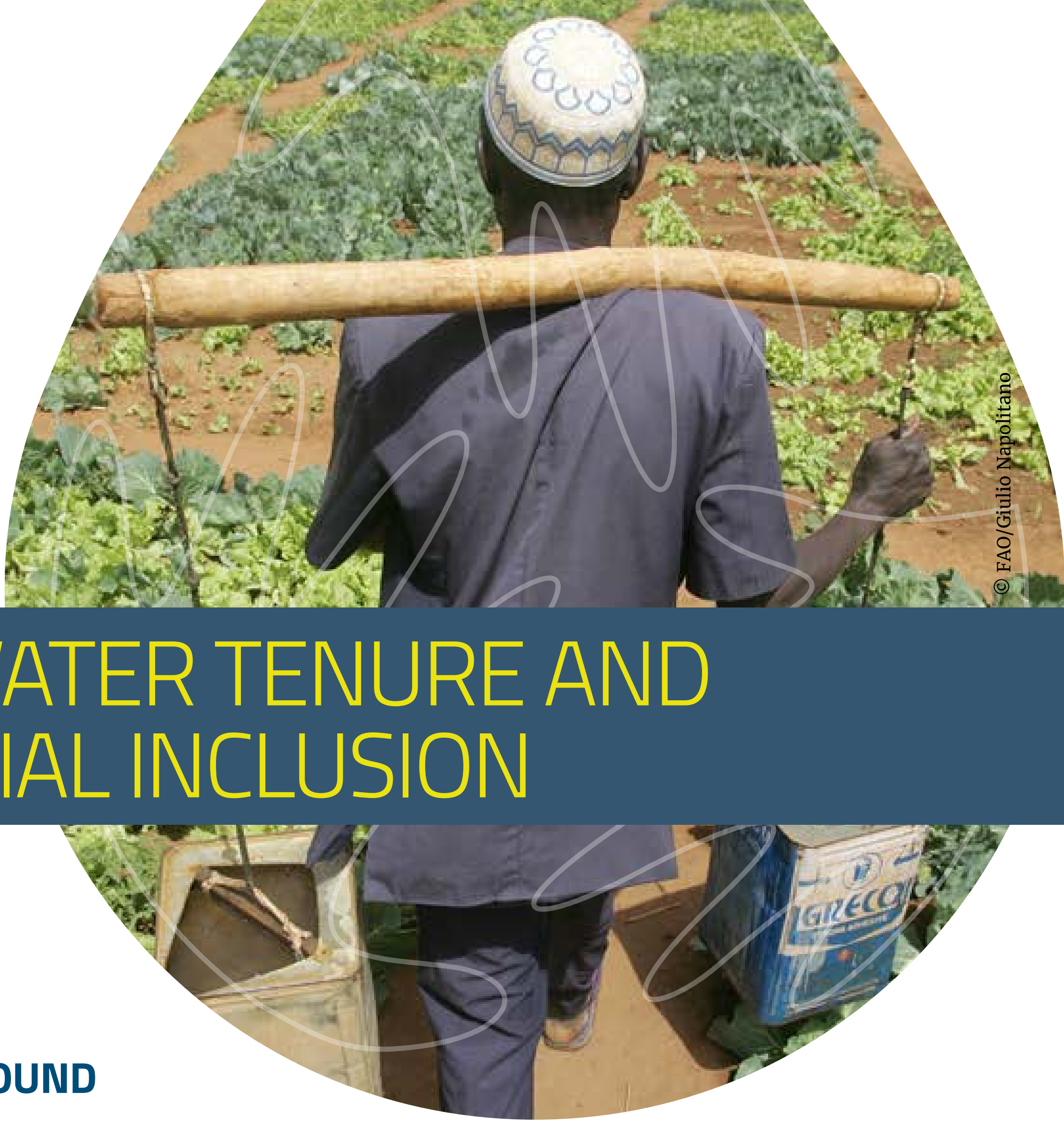
Presented by Julie Trottier, National Center for Scientific Research, another case study focused on Palestine and **"Sacrificing traditional water tenure to favor high-value export-oriented agriculture."** The study presented the potential outcome of unclear water tenure rights, giving the example of the over-abstraction of the El Faraá Valley aquifer, which occurred when water rights were granted over time to users of springs and wells, both of which are replenished by a single water source. The problem was further exacerbated by the production of cash crops such as cucumbers upstream and date palm downstream. While date palms have been promoted as well-adapted to climate change, they require year-round watering. This destroyed the ecological corridors that had long been maintained through traditional water tenure rights to the springs. A potential solution has been proposed: using treated wastewater from the East Nablus Wastewater Treatment plant to recharge the aquifer and restore water availability for users holding traditional water tenure rights.

The discussion that followed highlighted the need to integrate water governance with water accounting and adaptive planning for smallholder farmers, as well as to identify legitimate (and non-legitimate) user claims. This is particularly important within the context of climate change, since water allocation prioritization will have to be adaptive. Water tenure provides a framework for certainty around water rights and, as described in the Indonesian case study, can help to prioritize smallholder farmers or other legitimate users. The determination of legitimacy and its integration into governance continues to be unresolved, as are the effects of governments' climate adaptation strategies, including water storage, on water tenure rights.

## INSIGHTS FROM GROUP WORK AND PANEL DISCUSSION

The relationship between water tenure and climate change was also addressed in working group discussions and a panel discussion. **Knowing how, where and by whom water is used was identified as a key to adapting to climate change** (and avoiding unintended maladaptation). The groups also discussed the likelihood that local disputes around water resources are likely to increase with climate change, especially in fragile contexts. An open question is how water tenure rights can be secured where government structures are unwilling or unable to enforce or protect them.

**PHOTO 1. ONLINE AND ON-SITE WORKSHOP PARTICIPANTS**



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# 4. WATER TENURE AND SOCIAL INCLUSION

## BACKGROUND

### Key messages

1. For the governance of water tenure to be truly inclusive and sustainable, it must account for the diverse, community-based tenure systems employed by indigenous peoples and local communities (IPLCs) around the world.

2. The freshwater tenure of local communities frequently depends on their legally recognized land or forest rights, with the result that legislative harmonization and intersectoral coordination are critical to supporting water tenure security.

3. The security of the land and water tenure rights of communities hinges on the interface between customary rights and government laws, which may or may not recognize customary rights.

4. I nnovative solutions are needed to fill the gaps left by compulsory permitting systems, which are not tailored to the needs and resources available to IPLCs and fail to effectively protect their water tenure security.

5. More explicit legal recognition of community freshwater tenure rights – including those of women – are central to the achievement of water and food security, sustainable livelihoods, and global climate, ecosystem restoration and biodiversity goals.

## Introduction

Water tenure is defined as the relationships, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources. Water tenure determines who has access to water; who can use water for various purposes, how much and for how long: and how those rights interact with those of other tenure holders. Water tenure also derives its meaning and utility from the **bundle of rights** that constitute the fundamental elements of peoples' relationships with each other when it comes to freshwater resources. Rights to use and manage water are governed by both legislative and customary frameworks, which may or may not be aligned with one another. Unpacking the bundle of rights thus helps governments and others to understand the ways in which the specific rights under diverse tenure regimes are formulated, implemented and enforced.

Over the past two decades, there has been increasing international recognition of the ways in which natural resource tenure underpins food security, sustainable livelihoods, and equitable and sustainable development (IFAD, 2017). This has prompted many countries to make tangible progress in the legal recognition and protection of land, forest and fisheries rights. The development and implementation of international principles and tools to guide policy and legal reforms, notably the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (VGGTs), have provided an important basis for building policy consensus on what constitutes responsible governance of land and resource tenure. A key aspect of this consensus has the need to prioritize the rights of the rural poor – particularly rural women– and to support and strengthen local or customary tenure systems that provide resource rights to individuals, groups and communities (RRI and ELI, 2020; FAO, 2020). The vision of inclusive tenure applies to water tenure, which underpins the food security, livelihoods, health, and climate resilience of vulnerable populations worldwide and is interconnected with their land, forest, and other resource tenure rights (RRI and ELI, 2020).

For the governance of water tenure to be truly inclusive and sustainable, it must account for the diverse, community-based tenure systems employed by indigenous peoples and local communities (IPLCs) around the world. These systems regulate access, use and management of natural resources on at least half of the world's land mass. Yet despite the prevalence and importance of these systems, communities are recognized as legal owners of only 10 percent of land globally. The extent of their legal rights to water remains largely unknown (RRI and ELI, 2020). In many cases, the security of community water tenure rights hinges on the interface between customary laws and government-issued laws, which may not recognize customary rights as legally valid (Troell and Keene, 2022).

Concerted advocacy efforts and increased international recognition that secure, community-based tenure underpins a broad cross-section of development goals have driven notable progress in the legal recognition of IPLCs' land and forest rights. However, similar advocacy and policymaking processes around community-based freshwater tenure rights have only recently begun to garner significant attention (RRI and ELI 2020). There is thus a critical need to advance the concept of water tenure, particularly in the context of the world's most vulnerable populations, and to clarify the role that the responsible governance of water tenure can play in achieving national water and development policy goals.

Applied research on water tenure in the context of IPLCs has helped to identify a number of core issues related to the recognition and protection of IPLCs' water tenure rights (including the rights of women) in the larger context of national water governance frameworks. These issues are briefly explored below.

## The "land–water nexus"

In many countries, water tenure –particularly community-based water tenure – depends on legally recognized land or forest rights (RRI and ELI, 2020). This "land–water nexus" can impact the water tenure rights of IPLCs and often persists, even when national water laws delink water rights from land tenure (RRI and ELI, 2020; FAO, 2020). In many countries, however, water laws are lagging behind other sectoral laws in their recognition of community water tenure, including customary water tenure (RRI and ELI, 2020). Where this is the case, the "land–water nexus" can provide a crucial legal foundation for recognizing and protecting IPLCs' freshwater rights.

The recognition of the water tenure rights of IPLCs can pose a threat to those rights when sectoral laws are not effectively aligned or harmonized. In Kenya, for example, land and water rights are inherently different. While customary land rights are recognized by the constitution and include access to water, formal water legislation does not explicitly recognize customary rights and requires that any water use other than for domestic purposes requires water users either to acquire a permit or establish a Water Users Association to legally access to water resources. The Kenyan Government has yet to rule on whether communities require permits or WUAs to assert their water tenure on customary lands.

Inconsistencies, and even contradictions, between water, land, forest, or other laws with respect to water tenure create confusion around sectoral mandates, result in duplicative requirements for realizing communities' water rights, and can undermine existing water rights (FAO, 2020). It is therefore critical for countries to clearly understand the status of existing water tenure systems to enable a more integrated approach that promotes inter-sectoral harmonization of tenure policies, institutional mandates, and legal rights and, ultimately, security of community water tenure.

## The role of customary water tenure

Customary tenure encompasses the relationships between IPLCs and their natural resources (including water), which are governed by a set of rules and norms that communities use to express and order their ownership, possession, management, use and regulation of those resources (Troell and Keene, 2022). The importance of formally recognizing customary tenure rights has increasingly been reflected in international and national laws recognizing, to varying extents, the customary land and forest tenure rights of IPLCs (RRI, 2015; RRI, 2018). The water rights of IPLCs were highlighted in the 2018 UN Declaration on the Rights of Peasants and Other People Working in Rural Areas (HRC, 2018). The Declaration expanded the scope of protection – previously only provided to indigenous peoples – to all communities with resource-based livelihoods and asserted individual and collective rights to access and sustainably use and manage land and waterbodies to achieve an adequate standard of living. It also specifically referenced the right to safe drinking water and "water for personal and domestic use, farming, fishing, livestock keeping and for securing other water-related livelihoods, ensuring the conservation, restoration and sustainable use of water" (Article 17). States were called upon to "respect, protect and ensure access to water, including in customary and community-based water management systems, on a non-discriminatory basis" (Article 21).

At the national level, countries are increasingly recognizing customary laws, particularly customary land (and water) tenure, providing new avenues for ensuring that the water tenure rights of IPLCs are more effectively protected. It is important to note that most customary water rights enjoying legal recognition and protection have their basis in land and other resource-related or environmental laws through the "land–water nexus" described above, so the same concerns regarding intersectoral harmonization apply.

Legal recognition and protection of indigenous and community water tenure rights provide the basis for securing and protecting those rights, particularly where third parties may be threatening them. However, it is important to note that legal recognition of customary water tenure rights also raises difficult questions of legitimacy, power, autonomy and self-determination for communities. Legal recognition is also only one aspect of the challenges IPLCs face in protecting their water tenure rights, which require effective community and national water governance frameworks to ensure meaningful implementation.

## Community-based water tenure for livelihoods and food security

In most countries, water use rights are granted through an administrative permitting or licensing process overseen by the government. Many countries exempt "primary" or "domestic" uses of water from the permitting requirements, usually requiring that these uses be small-scale in nature and/or do not require the use of mechanized abstraction technologies. These exemptions can include certain cultural, religious, and even small-scale agricultural or other livelihoods-based water uses. However, the right to use water for livelihoods purposes are often burdened by permitting or other administrative requirements (such as the need to incorporate as a WUA). Such permitting systems, while providing important benefits for water management agencies, including monitoring and regulating water uses, facilitating more effective resource management and financing water administration and infrastructure, are also rarely tailored to the priorities, needs and capacities of communities and other vulnerable users and often place high administrative and financial, burdens on them. Government offices administering permits are often far from communities and online applications are not commonly available or accessible, thus requiring communities to travel long distances (sometimes multiple times) to apply for permits.

Permitting processes may be intimidating if community members lack the necessary literacy and education levels to easily understand and fulfil the requirements. These requirements also frequently limit the duration of water rights, which contrasts with the unlimited duration of customary water tenure rights in many communities. Even when community livelihoods-based water uses are exempted from permitting requirements, the exempted use rights often do not have the same legal status as permitted rights, leaving them more vulnerable to third party challenges. Moreover, government capacity to implement permitting requirements in rural communities is frequently limited, and the logistical burdens and costs to the state of implementing such systems is much higher than the expected revenue generation (RRI and ELI, 2020; van Koppen and Schreiner, 2018). It is thus critical to explore innovative solutions to the gaps in compulsory permitting systems, which are not often tailored to the needs and resources available to IPLCs and fail to effectively protect their water tenure security. Solutions could include expanding permit exemptions to include livelihoods uses (ensuring their equal legal status to permitted rights) or formally prioritizing a broader range of community use rights to strengthen the legal position of communities when conflicting claims arise or during times of water stress.

## Pastoralism

Approximately 500 million people around the world rely on pastoralism for some or all of their livelihoods (FAO, 2016). Livestock fodder and water are the most important resources for pastoralists. Water tenure rights for pastoralists are therefore critical for determining timing of access to water, physical access to water sources, number of animals, etc. Yet in many countries, overlapping and often competing customary and formal governance systems constrain the effective recognition of resource rights, particularly when pastoral communities cross boundaries (World Bank, 2016). More recently, some countries (including Mali, Burkina Faso, Niger and Mauritania) have passed legislation protecting grazing land and granting herders rights to land and water resources, recognizing existing access and sharing arrangements (FAO, 2022).

## Women's water tenure

Another key issue relates to the specific role of women's water rights within IPLCs. Women's access to and control over land and natural resources is central to their economic and social empowerment, providing a critical basis for their livelihood security, collateral for credit and access to decision-making. Despite the important roles that women play in water management and protection, they are less likely than men to have control over water resources (USAID, 2016). Women's water tenure often depends on their legally recognized land rights, highlighting the need to strengthen land and forest tenure for women (RRI and ELI, 2020).

Where women have secure land tenure rights, they often make investments to improve land, participate in land rental markets, increase their economic empowerment and control over household decisions, and contribute to family food security, children's health and sustainable agricultural productivity (Landesa, 2021; USAID, 2016; FAO 2013). Research demonstrates that secure rights to land enhance the capacity of women to participate and hold positions of authority in community governance institutions, where they can advocate for gender-equitable land and water resource management and governance (Salcedo-La Vina, 2020; Meinzen-Dick *et al.* 2021). Yet, research has also shown that many community-based water tenure systems fail to explicitly protect women's rights to use and make decisions around their water resources (RRI and ELI, 2020). In Senegal, for example, women have great difficulties in accessing or owning land. In line with customary and traditional practices, women rarely inherit or otherwise acquire land rights, even though, according to state law, women and men should have equal access and control over land and other natural resources, including water.

Efforts to formalize women's land and water rights are critical, but women also face several social and cultural barriers that can prevent them from realizing the multiple benefits associated with more secure tenure. Social restrictions can limit women's ability to make productive use of land and water, and tenure insecurity can persist through inequitable marriage and inheritance laws. Thus, reforms around these issues require effective analysis of gender inequities in legal frameworks, as well as a clear understanding of the political economy of land and water resource governance at the local level to facilitate women's equal participation in land and water governance and achieve truly gender-equitable outcomes (Doss and Meinzen-Dick, 2020).

## PRESENTATIONS AND DISCUSSION

The community-based tenure systems employed by indigenous peoples, rural populations and pastoralists worldwide regulate access to natural resources and their use on at least half the world's land mass (RRI, 2015). In many countries, communities use, manage and share water resources based on social, cultural or religious norms. These are not necessarily recognized under formal law, but they still constitute legitimate rights that are vital to supporting rural food and livelihoods security, poverty reduction, conflict management and sustainable development. When the water tenure rights of local communities are not recognized or secure, third-party actions, whether lawful or not, may have significant adverse impacts, particularly on the women in those communities. In her introduction to this session, Jessica Troell from the Environmental Law Institute (ELI) described the disparity in water tenure rights for vulnerable populations and opportunities to create a framework for community-based legal water tenure. Critical considerations include the need to **incorporate women's water tenure** to ensure that governance frameworks are not gender blind, and to recognize the dependence of community-based water tenure on land tenure and land rights. Unfortunately, there are often few synergies between land and water laws and they may even contradict each other. **Legislative harmonization and intersectoral coordination** are thus critical for supporting water tenure security. Innovative solutions are needed to fill the gaps in compulsory **licensing systems, which are not tailored to the needs and resources of many local communities** and fail to protect their water tenure security.

▶ PHOTO 2. WORKSHOP PARTICIPANTS IN BERLIN

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The intrinsic linkage between land and water tenure was further explored in a case study on **"Expansion of large-scale irrigated agriculture and implications for water tenure of pastoralists in the Awash River Basin, Ethiopia."** Waltina Scheumann and Srinivasa Srigiri from IDOS described how land transformation for commercialized, large-scale irrigation schemes has caused the loss of communal grazing and an inability to access water points. In developing the Awash Basin, the Ethiopian Government focused on private investment and economic growth. Irrigation schemes and hydropower plants were considered a national priority. Customary land tenure was excluded from the governments' plans, causing pastoralists and smallholder farmers to lose their land tenure and thus their water tenure rights. The case study emphasized the strong connection between land and water tenure. It raised a critical question: **how to formally recognize customary water law** to overcome exclusion and improve legal security. Water tenure arrangements in the Awash basin are not clear. There are no guidelines on who receives water access and to what purpose. The situation is further exacerbated by **weak monitoring and governance structures.**

A GIZ project in Madagascar was presented by Anni Valkonen of NIRAS, a consulting company and project partner, who raised similar considerations of marginality and equity. In her presentation, entitled **"Addressing water tenure through simplified management plans and local Conventions in Boeny, Madagascar,"** Valkonen detailed a number of challenges in water tenure at the local scale. By focusing on the relationships between people and water resources, both in terms of quantity and quality, water tenure assessments help us to understand the level of water usage, complementing traditional IWRM approaches. In describing the project, Valkonen highlighted **dimensions of justice, including recognition and awareness, participation, and the distribution of benefits**, which are key to ensuring a community perspective on equitable water distribution. In particular, the project aimed to address **challenges related to upstream and downstream water allocation** and water user regulations that are unfavourable to women, leading to insecurities of water use in rural areas.

In the discussion that followed, participants reflected on the links between land and water tenure and, in particular: i) how water tenure rights are considered in land use planning; and ii) the role that water tenure plays on publicly-held lands and lands that have multiple uses, such as irrigation and feeding livestock. Some countries, such as Mali, prioritize pastoralist **water use and water rights.** Issues around **land tenure and property rights**, including communal versus private ownership, were raised several times. Participants emphasized that **water tenure needs to be at the forefront of policy reforms:** making water systems more efficient water has little point if smallholders do not have the right to water.

The group raised questions around the integration of water tenure in land use planning and the sustainability of water tenure in the GIZ/NIRAS project, in particular, relating to the use of participatory approaches. One approach could be to **integrate land use plans into the water authority's planning processes.** A major challenge is that countries often lack adequate financial resources for water management and therefore seek to attract private investment, which leads to private investors controlling water resources.

## INSIGHTS FROM GROUP WORK AND PANEL DISCUSSION

The group work emphasized the difficulty of managing water since volumes are variable and water flows through the landscape, which makes it intrinsically a shared resource. In some countries (for example, Indonesia), the recognition of customary water tenure is more difficult to achieve than customary land tenure, because the water law links water rights to formal land titles. A major challenge is the **lack of awareness among government staff and politicians of the customary laws governing water tenure.** Unless there is clear provision in a country's water policy or law, these customary laws can be struck down overnight, affecting sustainable food production and risking the livelihoods of subsistence farmers.

Participants in the panel insisted that discussions should focus on procedures to mainstream water tenure into water laws and policies. Researchers and practitioners can **learn about customary practices and can integrate customary law into formal law.** However, some participants cautioned **that not all customary tenure should be recognized**, for example, if they conflict with a country's stated policy objectives. Others argued that there must be a legal basis for all water use. The concept of water tenure helps to organize water allocation and water permitting in a more inclusive way, taking small users – who were previously not protected by legally binding water laws – into account. It was noted that holders of water tenure rights should have the right to **complaints, if their right is infringed**.

**Power imbalances** were often mentioned as a key factor contributing to the inequitable recognition of water tenure rights, which are often set in fragile political contexts and are not enforceable. Some participants elaborated on the value of **networking with women's groups, the private sector and the VGGT community.** This could strengthen the notions of equity and justice in discussions on water tenure This task is both challenging and very promising, since a **people-centred approach** makes **bottom-up integration** and the consideration of marginalized groups possible (as compared to IWRM, which takes a more resource-based approach). The results of the online group work can be seen in Annex 2.

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# 5. WATER TENURE AND FOOD SECURITY

## BACKGROUND[2]

### Key messages

1.The water tenure concept recognizes all existing water allocation mechanisms. It not only includes water rights based on legally recognized land and forest rights, but also considers customary rights that are not defined in formal law.

2. Customary tenure arrangements for accessing and using water resources can be recognized as legitimate use rights.

3. Recognizing and protecting water tenure rights under formal law improves food security and empowers communities to participate in decision-making.

4. Secure water tenure is a prerequisite for investments in construction, rehabilitation and efficient water infrastructure for food production.

[2] The background section was prepared by Sabine Blumstein and Karolina Heck (both at adelphi).

## How are water tenure and food security connected?

Water is critical to the livelihoods and food security of all human beings. **Irrigated farming represents about 20 percent of total cultivated land and contributes 40 percent of the total food produced worldwide** (FAO, 2021). Rural communities, in particular, depend on water resources for various purposes, most importantly for subsistence food production, particularly in areas with limited rainfall. Irrigation allows farming communities to increase their resilience to rainfall variability and to diversify the foods they grow.

**Water resources are essential for rearing livestock.** Approximately 10 percent of annual global water flows are used by the livestock sector (Deutsch *et al.*, 2010). The sector accounts for about a quarter of the GDP in Burkina Faso, Mali and Niger (FAO, 2022a), illustrating the crucial importance of reliable access to water resources for pastoralist communities. Livestock also provide important inputs for crop production since many farmers use animal manure to fertilize their crops, which produce food for both humans and livestock. From a food security perspective, livestock provide an important safety net for pastoralists. In times of drought, people can move their livestock to more water-secure areas and still maintain a source of food and income.

Overall, **food security at all levels, from local to global, depends on access to water resources.** However, in many parts of the world, local communities do not have secure access to enough water to sustain food production. Seventy-seven percent of smallholder farms in low- and middle-income countries are in water-scarce regions; less than a third have access to irrigation (FAO, 2021). Similarly, accessing water is an increasing challenge for pastoralists and a source of a growing number of local disputes. Globally, the number of people raising livestock in agropastoral systems exceeds 180 million (Kieta *et al.*, 2016). Around 65 percent of the meat and 70 percent of the milk found in local markets in the Sahel region stem from pastoral systems (FAO, 2011b).

One reason that ensuring secure access to water resources can be challenging is that, in many countries, **access to and use of water resources is governed by customary arrangements, which are often not recognized in formal water governance structures.** In the southern states of India, for example, most local communities manage their resources under customary water tenure arrangements since formal laws do not sufficiently enable the sustainable use of groundwater and surface water by rural communities. In the state of Maharashtra, customary practice enables livestock producers to take water from village ponds that are exclusively used for that purpose. There is no charge for watering or feeding livestock on private land. To irrigate crops, water is shared among family members and people from the same caste. While these customary arrangements support livelihoods and food security for local farmers, they are not recognized by formal state law (James *et al.*, 2014) As a result, the farmers have weak or insecure water rights and are at risk of losing the means to secure food for themselves and their families.

Another case study from South Africa illustrates the links between access to water and livelihoods. In the state of Kwazulu-Natal, local communities on the Pongola River long used water and aquatic resources according to customary practices. The communities depended heavily on the natural flooding of the river and exploited many of its benefits for livelihood purposes, including fishing and livestock grazing. Traditional authorities enforced these customary community rights to use the water on the floodplain and adjacent lands. However, since these customary water uses were not recognized by formal law, the communities were not consulted when a major dam was constructed during the 1960s and 1970s. Since then, flood releases have become sporadic and unpredictable, and the customary use of the aquatic ecosystems downstream for subsistence agriculture has been abandoned (Crafford *et al.*, 2014). As this case illustrates, when laws do not formally recognize the customary water rights of local populations, these rights risk being ignored, putting livelihoods and food security at risk. A major challenge to sustaining and improving water and food security for rural populations, particularly in areas affected by water scarcity, **is to determine how customary arrangements for accessing and using water resources can be recognized as legitimate use rights and included in broader water governance frameworks.**

## How are water tenure rights and land rights connected?

**Water tenure rights are often linked to land and forest rights**. In many countries, formal water use rights have traditionally been granted to property owners, enabling them to freely use surface and groundwater resources on their land. In India's Maharashtra state, for example, access to groundwater resources was once connected to land ownership. Hence, landowners could extract groundwater resources without formal authorization, such as a water permit. This arrangement led to an overexploitation of groundwater resources, often for agricultural irrigation. While the water regulation was revised in 1993, it continued to endorse the right of landowners to extract groundwater on their plots, manifesting the concept of private control of groundwater. A new water act, adopted in 2005, intended to review water projects and to define priorities of water allocation during water scarcity. Nevertheless, many communities in Maharashtra continue to access water for irrigation and other livelihoods purposes based on customary rules (James *et al.*, 2014).

Since **land-based water rights are increasingly considered unsuitable for managing water resources**, most countries have placed water resources in the public domain, providing for the use of such resources through permits that grant use rights that are independent of land tenure rights. In Indonesia, for example, formal water use rights are based on licenses granted by the state. The country's National Water Resource Law distinguishes between two types of water licensing, one for non-commercial and the other for commercial water uses. Water uses for basic daily needs and for agricultural uses are exempt, provided they do not alter the natural condition of water sources and agricultural use takes place within existing irrigation areas. (Al'Afghani, 2022).

Similarly, in Rwanda formal law does not recognize traditional water tenure arrangements. Land and water rights are strictly separated and private land that includes lakes, rivers, springs or wells are considered part of the public domain. Thus, landowners cannot claim a right to the use of water resources on their land, even when access would be granted under customary law (FAO, 2022c).

However, even when a country's water laws do not link water permits to land, it will often require a title to agricultural lands to issue irrigation permits, whether through WUOs in irrigation schemes (commonhold water tenure) or through communities.

## Why is recognizing water tenure rights important for food production?

Given increasing risks due to water scarcity and climate change, secure, equitable and enforceable water tenure rights become increasingly important for food security. Secure water tenure arrangements can contribute to food security in different ways. Most importantly, **securely**

**defined and acknowledged water rights provide important incentives for farmers to invest in water infrastructure**, such as water storage or irrigation systems, since they do not fear losing access to water for the next growing cycle. These investments increase crop yields and the varieties of foods that can be grown. Additionally, irrigation and other infrastructure enhancements can help ensure food production during drought. And with higher crop yields and more reliable access to water, rural communities can spend less time on crop production and more time on activities such as education or other income-generating activities.

Clearly defined and secure water tenure arrangements also play a role in **preventing conflicts over water allocation** between different upstream and downstream users and users in different sectors, such as sedentary farmers and pastoralists.

In many countries, the use of small quantities of water for personal consumption (such as hygiene, cooking, or home gardening), a so-called "*de minimis*" right, is exempted from permitting. Often *de minimis* uses are restricted to manual abstraction, whereas motorized abstraction, e.g. with pumps, requires a permit or license. However, the legal protection and security of *de minimis* rights holders may be limited compared to that enjoyed by holders of water permits.

A case can be made to expand *de minimis* rights to other livelihood uses, such as small-scale irrigation. In Rwanda, for example, the most recent guidelines for water permits – prepared by the Rwanda Water Resources Board – exempt farmers from permits if they irrigate one hectare or less. (FAO, 2022c).

Finally, the recognition and protection of customary water tenure rights under formal law **empowers communities, especially often marginalized community members, to participate in decision-making over water resources** and increases their power vis-à-vis other, often more powerful, actors. Their interests and views are thus more likely to shape political decisions, including those that are relevant to sustainable food production and livelihoods.

## The impacts of water tenure rights on agricultural investments

Secure water tenure is a prerequisite for investments in construction, rehabilitation and the efficient operation of water infrastructure for food production, including irrigation schemes and other water storage and supply facilities. In many countries, foreign investment in large-scale agricultural projects plays an important role in securing food production for a growing world population. Investments in new and more efficient irrigation systems are necessary to secure the availability of groundwater and surface water resources for current and future food production (FAO, 2011a; FAO, 2022c).

For foreign investors, investment contracts can be protected under international law, generating a secure tenure relationship. In recent years, concession agreements with foreign investors have increased, especially in Africa (Cotula, 2011). Those agreements often confer water rights to the investor and specify the volume of water that can be extracted. However, such contracts can easily disenfranchise local water users, particularly when customary water arrangements have no or only weak legal security, as discussed above. While international law provides some protection against the dispossession of local people from their lands, this does not apply to water resources (Hodgson, 2016). Investment contracts are normally not disclosed to the public and can consequently result in water allocation practices that do not consider the rights of local communities. That is the case in the Indian state of Maharashtra, where the federal state has favoured the industrial use of water for mining rather than irrigation for crops and watering livestock. This threatens the use of groundwater for food production by local communities and jeopardizes the sustainability of groundwater resources (James *et al.*, 2014).

In conclusion, considering all legitimate water tenure rights within a country and recognizing these rights – by taking a water tenure perspective – can significantly improve food security and support global development goals.

## PRESENTATIONS AND DISCUSSION

Food security depends heavily on sustainable and secure access to water resources. Rural communities depend on water resources for subsistence food production, particularly in areas of limited rainfall. Irrigated farming represents about 20 percent of the total cultivated land and contributes up to 40 percent of the total food produced worldwide; this is expected to increase as production systems adapt to a changing climate (FAO, 2021). Water resources are essential for pastoralist communities, who depend on livestock for their livelihoods. Ensuring that customary water tenure agreements are formally recognized secures a source of food and income for these communities.

In her introductory remarks, Sofia Espinosa of FAO stressed the **multidimensional nature of water and food security and the constraints on water allocation for both irrigation and livestock**, given an increasingly insecure water supply. Espinosa outlined the various contributions of water tenure to food security, including motivating farmers to invest in water infrastructure and empowering communities to participate in decision-making. The water tenure framework provides an avenue to increase food security by safeguarding water rights.

A case study presented by Manfred Matz of GIZ described the **interrelationship of water tenure and food security in Tunisia**, with a particular focus on green water. Matz cited gaps in the literature and water tenure assessments that do not account for green water tenure, despite the fact that food security in many places is largely based on products from rainfed agriculture. To fill these gaps, Matz recommends **extending the VGGT to include green and/or rainwater, and including rainwater tenure as a component of water tenure**.

Next, Lamine Samaké of FAO described the KnoWat project's work in **identifying the missing links between formal and traditional ways of water management in the Senegal River Delta.** Using a participatory approach, the project found that traditional water tenure and knowledge around water usage in the study area are not incorporated into formal law, which creates challenges in managing water and collecting water charges and causes conflicts among users. The project examined the traditional practices and, with input from stakeholder groups, recommended the best approaches for policy adaptation. **By integrating customary practices into formal law, the water rights of smallholder farmers and their agricultural production can be safeguarded.**

The discussion considered how the concept of green water and customary practices could be integrated into formal systems and what that would mean for water governance at the national level. The concept of green water was of particular interest, with several participants raising the point that definitions of water productivity must be considered in conversations about green water and its role in social equity, biodiversity, nutrition, etc. Green water and rainwater will be increasingly important in conversations around water tenure, particularly in water-scarce contexts where the collection of rainwater or planting of water-intensive crops will negatively impact overall water security. Participants also emphasized the need for governance assessments as part of basin and water tenure assessments prior to drafting water policy or legislation. As reiterated by Samaké, water tenure assessments are vital to determining water policies, as otherwise the codification of water tenure rights could be contrary to the systems currently in place, leaving stakeholders without a legal basis for the water they use. Customary legitimacy and rights-based approaches to water tenure are critical to shifting water governance approaches.

▶ **PHOTO 3. WORKSHOP PARTICIPANTS DURING PLENARY DISCUSSION**

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## INSIGHTS FROM GROUP WORK AND PANEL DISCUSSION

The impact of water tenure on food security was a reoccurring theme in the working group and panel discussions. **Water tenure was identified by the working groups as a vital tool to adapting to climate change while safeguarding the incomes and food security of rural communities.** During the panel discussion, Alsaad Ndayizeye from the Rwanda Water Resources Board raised the point that water tenure offers small stakeholders, who were previously not taken into consideration, legally binding water rights and therefore protects small-scale irrigation users, fish farmers, and pastoralists, and safeguards the water supply. There was resounding agreement, in both the working groups and the panel discussions, that intersectoral cooperation is critical for ensuring sustainable and equitable water use and increasing food security by safeguarding the water rights of smallholder farmers and agropastoralists.

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# 6. THE LINK BETWEEN WATER TENURE AND DEVELOPMENT PRIORITIES

On the second day of the workshop, three speakers presented approaches to integrating water tenure assessments into practice. Tim Brewer from Water Witness, a United Kingdom-based non-governmental organization, described the "Fair Water Footprint" initiative as a tool to encourage sustainable and equitable water use through specific commitments of signatories, including a commitment to "fair water tenure." The declaration outlines regulations and transparency measures and has been signed by numerous corporations and countries. It is hoped that the momentum will be driven by further signatories at upcoming United Nations Climate Change and water conferences.

Barbara Schreiner from the Water Integrity Network (WIN), a think-tank based in Berlin, built on the concept of water allocation as an inherently political issue with examples of extreme water imbalances in basins that favour a small number of high-volume water users rather than many small-volume water users. Schreiner presented a multitool system that allows allocation to be more adaptive by changing approaches to permitting, recognizing customary water law and prioritizing water usage.

Jippe Hoogeveen from FAO stressed the point that water governance on the global scale needs to include water tenure. Inspired by the VGGT, FAO intends to sponsor a global dialogue with the aim to identify principles for the responsible governance of water tenure. The dialogue could build on local assessments and country dialogues could integrate water tenure at the national level. In July 2022, the FAO Committee on Agriculture discussed the proposal of a Global Dialogue on Water Tenure. On the 8-9 November 2022, an expert consultation on water tenure was held at FAO to discuss the roadmap for the global dialogue. The results of the KnoWat project were also presented at World Water Week 2022 in Stockholm. The final KnoWat publications will be launched by the end of the year.

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# 7. KEY MESSAGES, OPEN QUESTIONS AND THE WAY FORWARD

The workshop on water tenure was an international hybrid event. Participants included government staff, project managers and researchers from all over the world. On the first day, participants were introduced to the concept of water tenure and had the chance to discuss the concept with all its potential and challenges. On the second day, the working groups and panel discussion considered many of the key points and lessons learned from presentations on climate resilience, food security and equity. The **need for water accounting and accurate data** – as it relates to water tenure and the creation of water allocation and water permitting priorities – was discussed at length. The issue of **power imbalances** was also a recurring theme, with each group highlighting the **need for a participatory approach to ensure equitable water allocation**. Many groups also mentioned the benefits of **working within existing systems, such as basin authorities or watershed organizations, to strengthen outreach.** Collaboration with water stakeholders has the potential to inform legal reforms. There is a **need to broaden the uptake of the water tenure concept and to promote the integration of water tenure assessments into existing basin assessments and future planning**.

Domitille Vallee, Project Manager at the FAO Regional Office in Cairo, observed that the **communication of water tenure is a critical challenge that needs to be addressed through capacity development.** Barbara Van Koppen from the International Water Research Institute (IWMI) noted that if FAO aims to lead a global dialogue on water tenure, the **VGGT is an excellent starting point** – the process is known, and the underlying principles have been verified. Water tenure is essentially people-centred rather than 'managing for the sake of managing.' Additional key messages from the workshop are summarized in Table 1.

The water tenure concept and the KnoWat assessment method will be presented at different platforms over the next several months with the objective of laying the groundwork for the global dialogue on water tenure, and mainstreaming water tenure into development projects.

## Box 1. Key messages from the workshop

**Benefits of the water tenure concept:**

- a holistic approach that shows a diverse and "real" picture of all water uses and relations, including uses that are not legally recognized;
- integrates the nuanced relationships between people and water resources and not only the aspect of water consumption;
- a bottom-up, people-centred approach that integrates aspects of justice and equity;
- a possible entry-point for achieving more equitable water distribution;
- recognizes that tenure is a social construct, acknowledging the rights and interests of both individuals and groups;
- The multidisciplinary perspective (e.g. economics, political science, sociology, etc.) opens the discussion to other important socioecological issues and introduces diverse areas of expertise.

**Where water tenure could play an influential role:**

- multi-stakeholder platforms;
- revision of legal frameworks;
- water as a tool for equity;
- identifying weaknesses in existing laws;
- documentation of existing solutions to water challenges on the ground and potentially to inform legal reforms.

**Ideas for strengthening the water tenure concept:**

- incorporate meaningful (legal) complaint mechanisms in project design;
- make water tenure more gender inclusive;
- integrate water tenure in the social and environmental safeguards of FAO or in assessment mechanisms;
- align water tenure with other policies (e.g. food policies);
- explore the inclusion of green/rainwater, particularly in water-scarce contexts, as well as the role of water quality;
- raise awareness of the concept outside of academia.

**What platforms and networks could be used to promote and implement the water tenure concept:**

- multistakeholder platforms on land tenure (e.g. VGGT);
- platforms that are indirectly related to water, such as initiatives on forest or inland fisheries;
- faith-based organizations, partnerships with religious leaders;
- indigenous and local community networks around land and forest tenure;
- integrate water tenure into basin analysis (e.g. water tenure assessments and water governance assessments); involve academia, e.g. though working with master and PhD students; many universities have worked on water tenure/rights for decades.

**Questions for further discussion:**

- How can legitimate water tenure rights be defined and who gets to define them?
- How can water tenure help organize water use in an equitable and sustainable way, for example, by prioritizing some use claims?
- What comprises the bundle of rights that are involved?
- How can legitimacy and integration of water tenure in governance be sustainably organized and managed?
- Which effect will government climate adaptation strategies, including water storage, have on water tenure rights?

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# ANNEXES

## ANNEX 1. AGENDA

### Tuesday, 28 June 2022 – Day 1

| Time | Agenda item | Name and Institution |
|---|---|---|
| **9:00–9:10** | **Welcome from the organizers** | Moderators: Raquel Munayer (adelphi) and Benjamin Kiersch (FAO) |
| **9:10–9:40** | **Welcoming remarks** | Wolfgang Zornbach (BMEL)<br>Matthias Toll (BMZ)<br>Ines Dombrowsky (IDOS)<br>Jippe Hoogeveen (FAO) |
| **9:40 – 9:50** | **Introductory presentation of the water tenure concept** | Stephen Hodgson (FAO) |
| **9:50–10:05** | **Introduction to KnoWat project and water tenure assessment guide** | Benjamin Kiersch (FAO) |
| **10:05–10:30** | **Q&A** | Moderator: Raquel Munayer (adelphi) |
| **10:30–11:00** | ***Coffee break*** | |
| **11:00–11:30** | **Introductory remarks** | Sabine Blumstein (adelphi) |
| | **Case study 1: Peatlands and water tenure in Indonesia** | Mohamad Mova Al'Afghani (CRPG Indonesia) |
| | **Case study 2: Sacrificing traditional water tenure to favour high value export-oriented agriculture: a maladaptation to climate change** | Julie Trottier (CNRS) |
| **11:30–12:30** | **Discussion**<br>▪ Brief discussion of case studies<br>▪ Identification of entry points for engagement | Moderator: Raquel Munayer (adelphi) |
| **12:30–13:30** | ***Lunch Break*** | |

| Time | Agenda item | Name and Institution |
|---|---|---|
| 13:30–14:00 | **Introductory remarks** | Jessica Troell (ELI) |
| | **Case study 1: Expansion of large-scale irrigated agriculture and implications for water tenure of pastoralists in the Awash River Basin, Ethiopia** | Waltina Scheumann and Srinivasa Srigiri (IDOS) |
| | **Case study 2: Addressing water tenure through simplified management plans and local conventions in Boeny, Madagascar** | Anni Valkonen (NIRAS) & Juliot Soumar (GIZ) |
| 15:45–16:30 | **Discussion**<br>▪ Brief discussion of case studies<br>▪ Discussion on entry points for engagement | Moderator Raquel Munayer (adelphi) |
| 16:30–16:45 | **WRAP UP AND OUTLOOK FOR DAY 2** | Moderator Raquel Munayer (adelphi) |
| 18:00–22:00 | ***Workshop dinner***<br>*Location: Restaurant Umami P-Berg (Knaackstraße 16-18)* | |

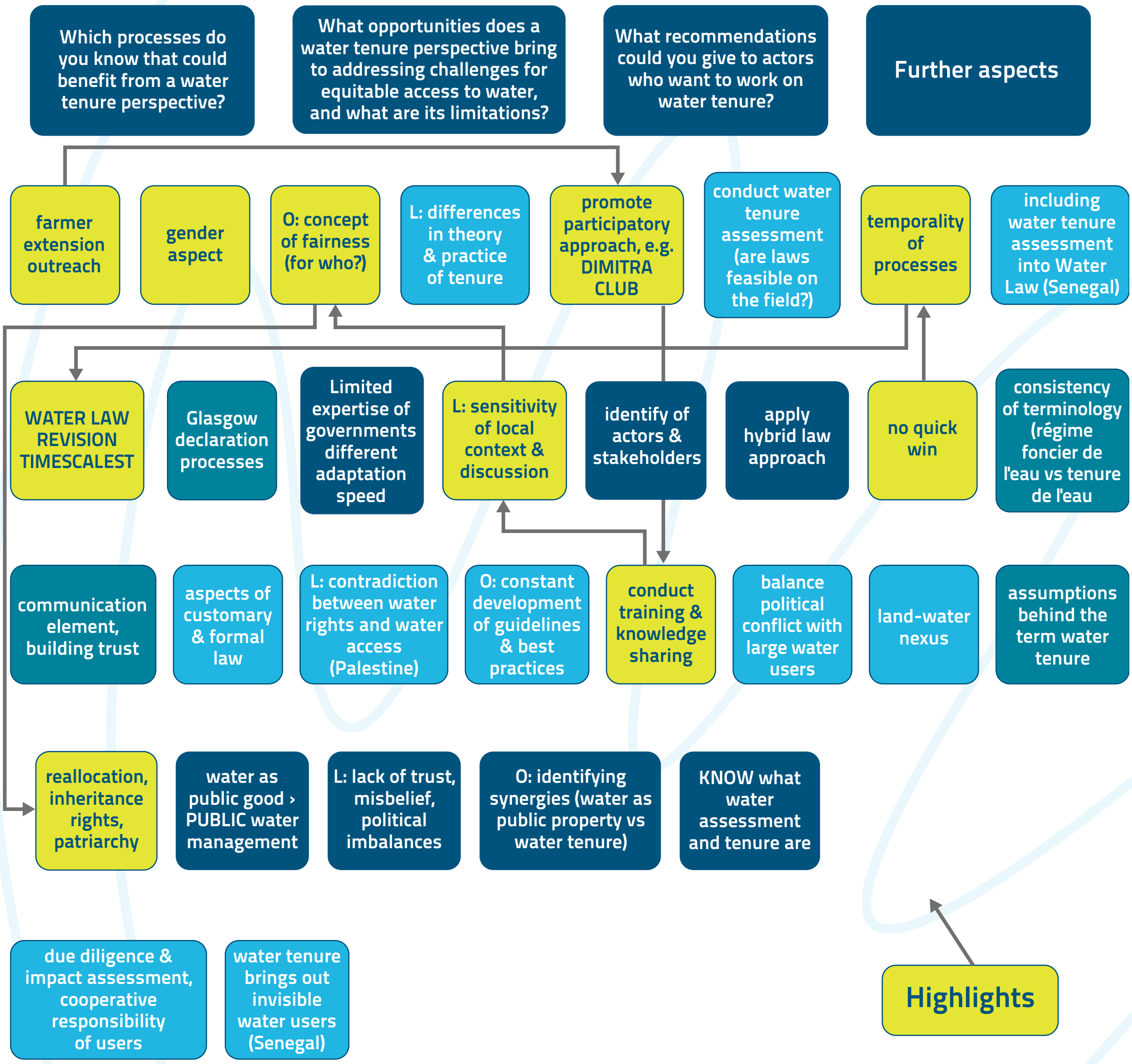
## Wednesday, 29 June 2022 – Day 2

| Time | Agenda item | Name and Institution |
|---|---|---|
| 9:00–9:15 | **Welcome to participants and brief summary of Day 1** | Moderator: Raquel Munayer (adelphi) |
| 9:15–9:45 | **Initiative Sustainable Water Footprint (civil society, private sector engagement)** | Tim Brewer (Water Witness) |
| | **Hybrid water law (national & local governments)** | Barbara Schreiner (WIN) |
| | **Initiative for a global dialogue on water tenure (international community)** | Jippe Hoogeveen (FAO) |
| 9:45–9:50 | **Introduction of working groups** | Moderator Raquel Munayer (adelphi) |
| 9:50–10:45 | Plenary breaks into two groups on site and three groups online<br>Guiding question for group work:<br>**How can international actors (civil society, private sector, government, international community) help to address the challenges identified on Day 1?** | |
| 10:45–11:15 | ***Break*** | |
| 11:15–11:45 | **Brief reports from the working groups** | Rapporteurs of the working groups |

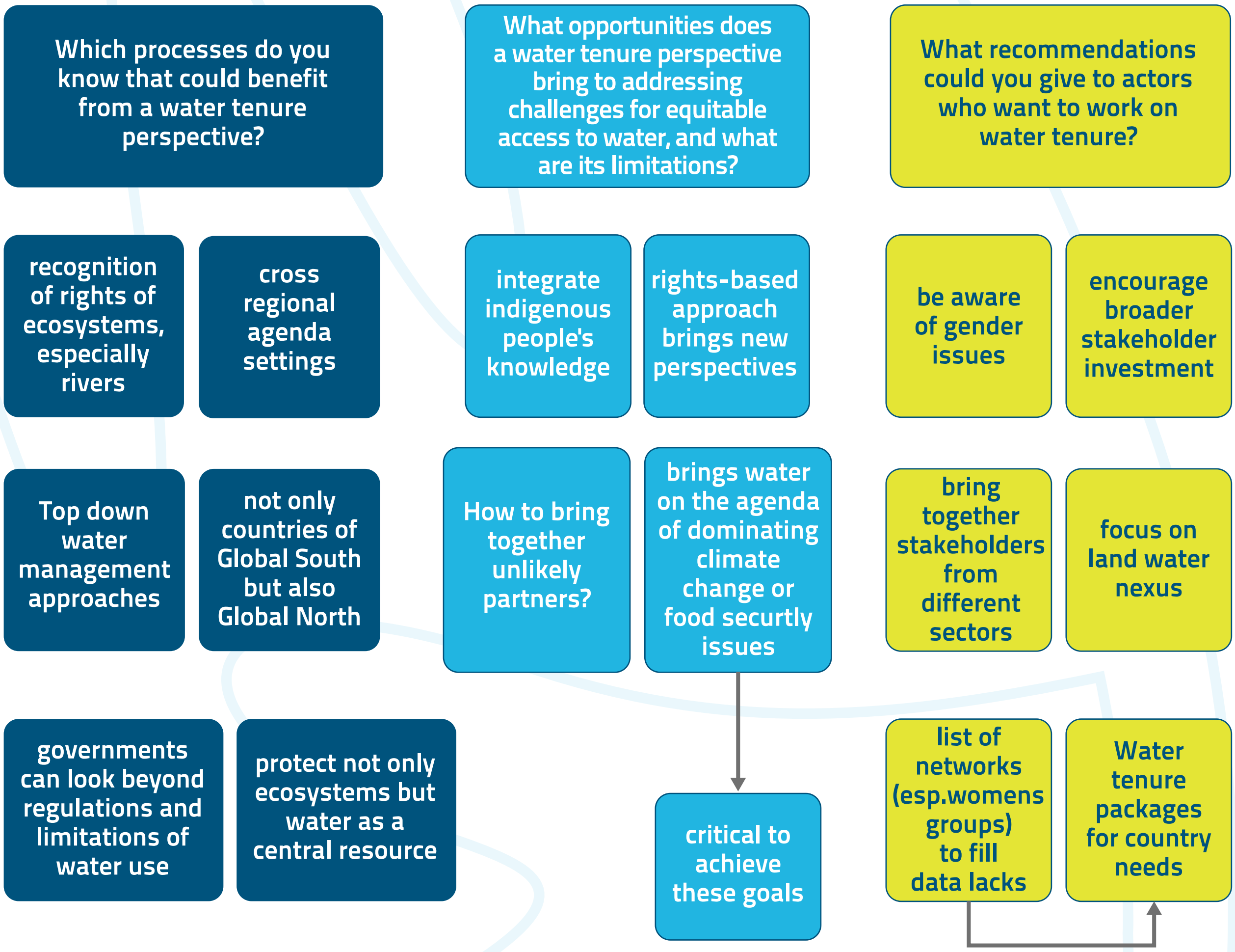
| Time | Agenda item | Name and Institution |
|---|---|---|
| **11:45–12:30** | **Guiding questions**<br>- Which outstanding aspects still need to be addressed to make the water tenure concept tenable for practitioners/policymakers?<br>- How can policymakers/practitioners be engaged?<br>- What could be platforms and avenues for further engagement? | Moderator: Sofia Espinosa (FAO)<br>Panelists:<br>Ingrid Jacobson (Brot für die Welt)<br>Janaki Meegastenna (Irrigation Department Sri Lanka)<br>Lamine Samake (KnoWat Senegal)<br>Mohamad Al'Afghani (CRPG Indonesia)<br>Alsaad Ndizeye (Rwanda Water Resources Board) |
| **12:30–12:40** | Summary of key takeaways from panel discussion | Moderator: Raquel Munayer (adelphi) |
| **12:40–12:50** | **Outlook** | Benjamin Kiersch (FAO) |
| **12:40–12:50** | **Closing statement** | Jippe Hoogeveen (FAO) |
| **13:00–14:00** | ***Lunch*** | |

# ANNEX 2. EXCERPT OF DOCUMENTATION FROM WORKING GROUPS

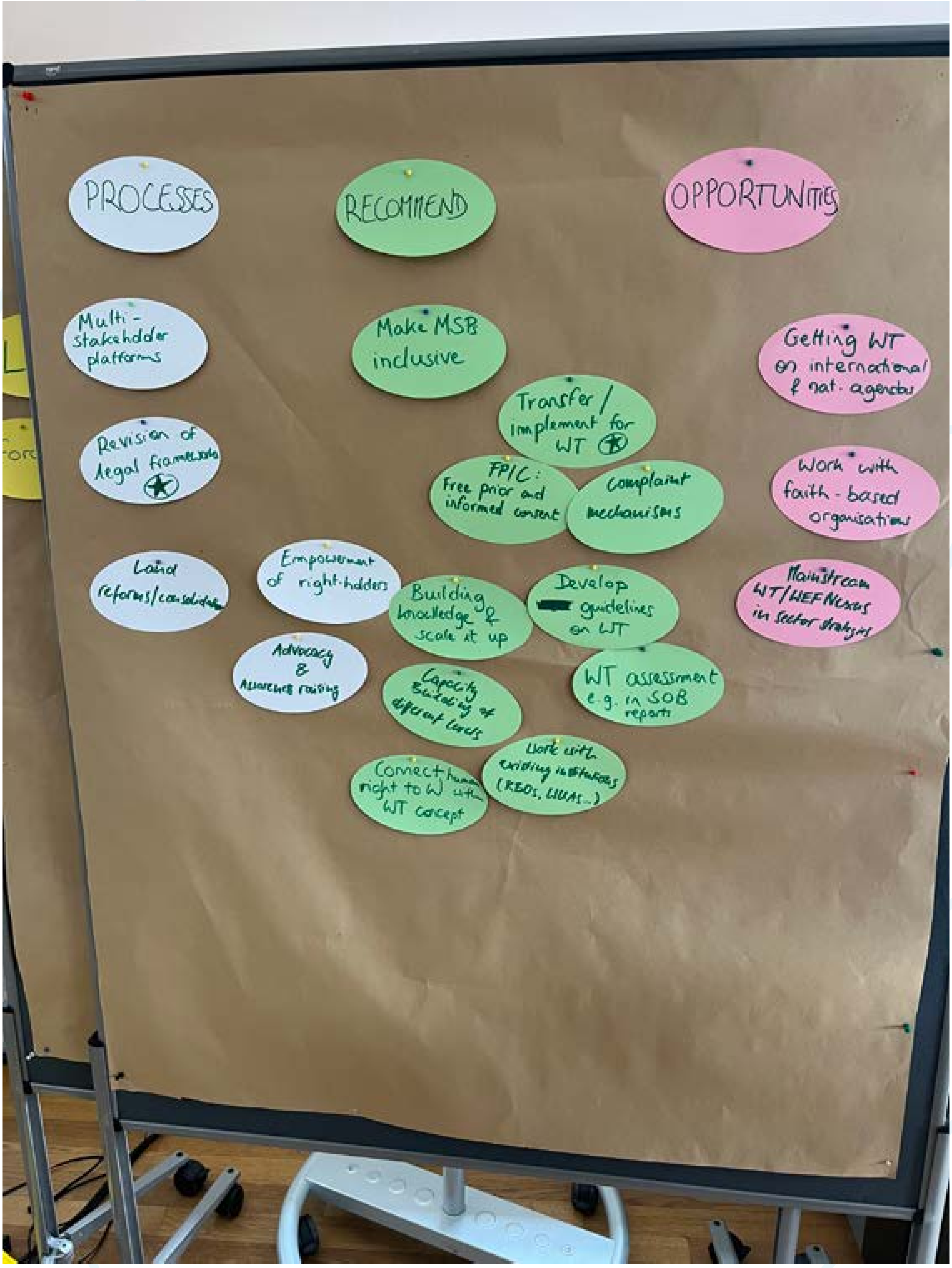
## ▸ FIGURE A2.1. RESULTS FROM WORKING GROUP 2



## FIGURE A2.2. RESULTS FROM WORKING GROUP 3



## ▶ PHOTO A2.4. RESULTS OF ON-SITE GROUP WORK

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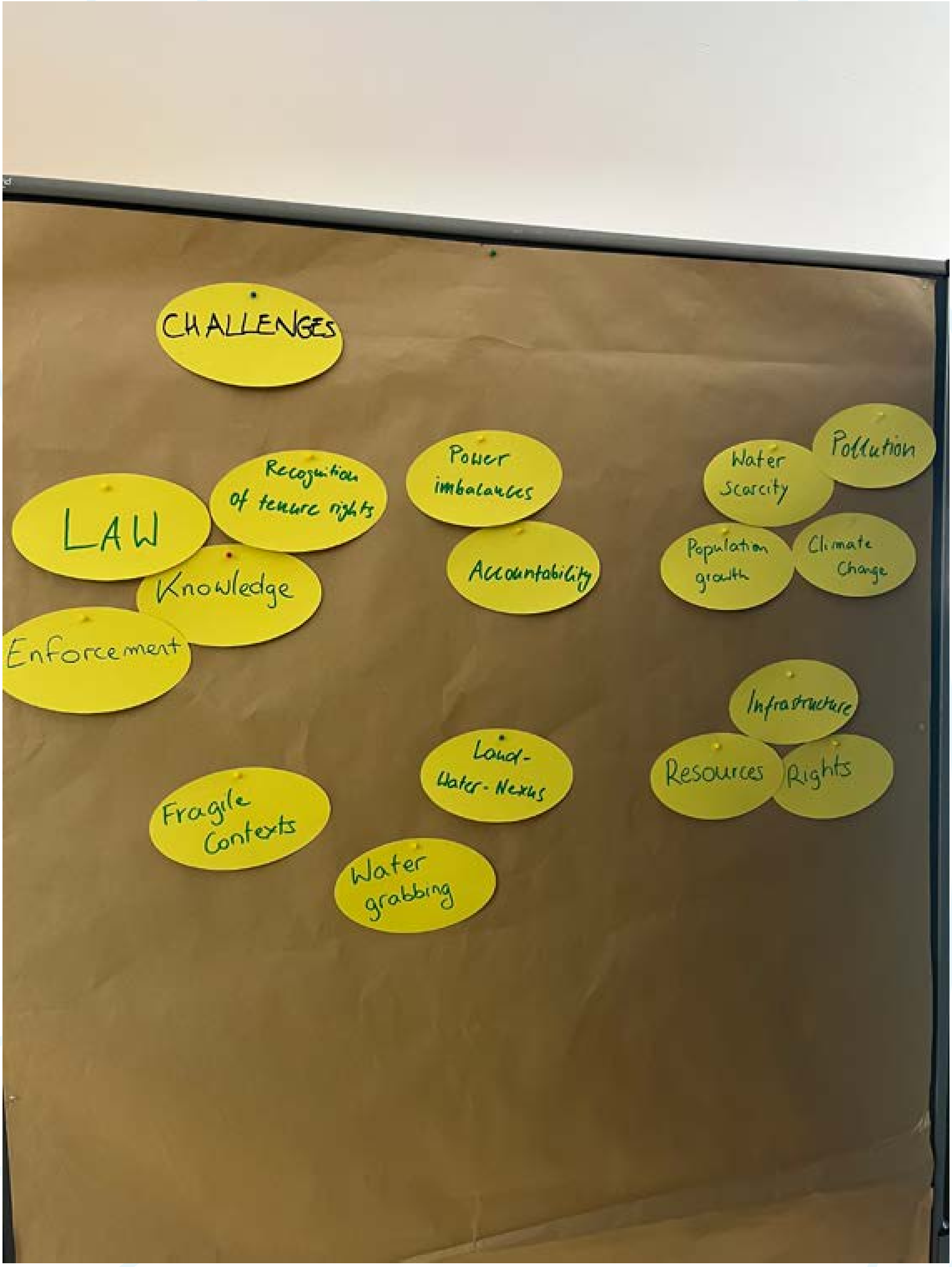
▶ **PHOTO A2.5. RESULTS OF ON-SITE GROUP WORK**

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# ANNEX 3. LIST OF PARTICIPANTS

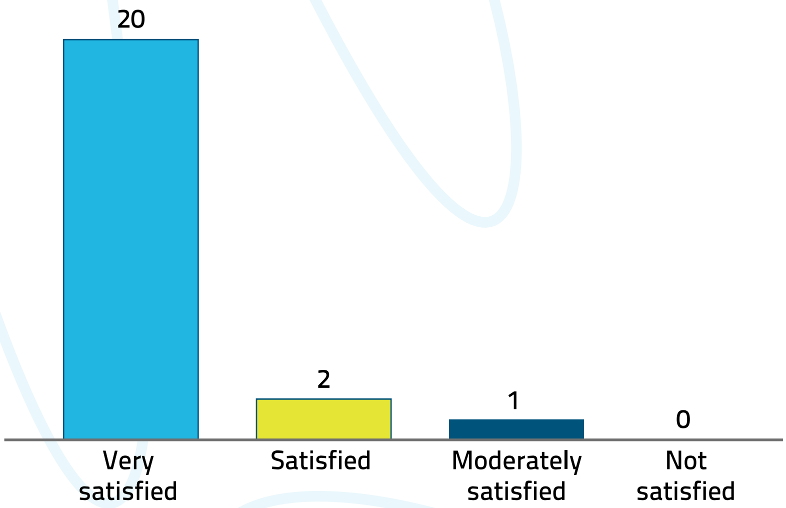
| NO. | SURNAME | NAME | ORGANIZATION |
|---|---|---|---|
| 1. | **Acker** | **Hendrik** | German Federal Ministry of Food and Agriculture (BMEL) |
| 2. | **Al'Afghani** | **Mohamad Mova** | Center for Regulation, Policy and Governance (CRPG) |
| 3. | **Alamirew** | **Tena** | Water and Land Resource Centre (WLRC) |
| 4. | **Aldous** | **Allison** | The Nature Conservancy |
| 5. | **Aurelie** | **Bres** | Food and Agriculture Organization of the United Nations (FAO) |
| 6. | **Basnet** | **Kajol** | Small Earth Nepal |
| 7. | **Bizima** | **Joseph** | FAO Rwanda – KnoWat Coordinator |
| 8. | **Blumstein** | **Sabine** | adelphi |
| 9. | **Bojic** | **Dubravka** | FAO |
| 10. | **Boros** | **Boglarka** | German Corporation for International Cooperation (GIZ) |
| 11. | **Boudreaux** | **Karol** | United States Agency for International Development (USAID) |
| 12. | **Brewer** | **Tim** | Water Witness |
| 13. | **Bruns** | **Bryan** | Independent researcher and consultant |
| 14. | **Dentan** | **Namrata** | World Business Council for Sustainable Development (WBCSD) |
| 15. | **Dombrowsky** | **Ines** | German Development Institute (DIE) |
| 16. | **Doughty** | **Caitlin** | The Nature Conservancy |
| 17. | **Durand** | **Jean-Maurice** | French Technical Cooperation |
| 18. | **Espinosa** | **Sofia** | FAO – KnoWat Water Tenure Coordinator |
| 19. | **Faurès** | **Jean-Marc** | Programme Leader, FAO – Regional Office for Near East and North Africa |
| 20. | **Faye** | **Papa** | FAO Senegal, Water Tenure Expert, Sociologist |
| 21. | **Ferrau** | **Sara** | German Federal Ministry of Food and Agriculture (BMEL) |
| 22. | **Gillet** | **Virginie** | FAO Land and Water Officer |

| NO. | SURNAME | NAME | ORGANIZATION |
|---|---|---|---|
| 23. | Ginsburg | Chloe | Rights and Resources Initiative (RRI) |
| 24. | Heck | Karolina | adelphi |
| 25. | Hertich | Silke | GIZ |
| 26. | Hodgson | Stephen | FAO consultant |
| 27. | Hoogeveen | Jippe | FAO Senior Land and Water Officer |
| 28. | Jacob | Anila | United States Agency for International Development (USAID) |
| 29. | Jacobsen | Ingrid | Brot für die Welt |
| 30. | Jakobs de Pádua | Astrid | Federal Foreign Office (Germany) |
| 31. | Jayakody | Lahiru | InfoTech Ideas |
| 32. | Johnson | Flannery | GIZ |
| 33. | Kavata Katuma | Caroline | UNICEF Kenya |
| 34. | Kiersch | Benjamin | FAO KnoWat Project Coordinator |
| 35. | López Gunn | Elena | ICATALIST |
| 36. | Matz | Manfred | GIZ Tunesia |
| 37. | Maurya | Suray | Government of India |
| 38. | McConnell | Claire | Third Generation Environmentalism |
| 39. | Meegastenna | Janaki | Additional Director General of Irrigation, Irrigation Department, Sri Lanka, |
| 40. | Mosleh | Hannah | SciencePo |
| 41. | Munayer | Raquel | adelphi |
| 42. | Mutuku | Simon | Fresh Del Monte |
| 43. | Narendra | Namrata | Architect and urban practitioner |
| 44. | Ndayizeye | Alsaad | Rwanda Water Board |
| 45. | Novaes | Ricardo | Senior sustainability consultant |
| 46. | Nyatemu | Jérémie Masengo | Nkumba University, Uganda |
| 47. | Petäjä | Jenni | FAO KnoWat Communication |

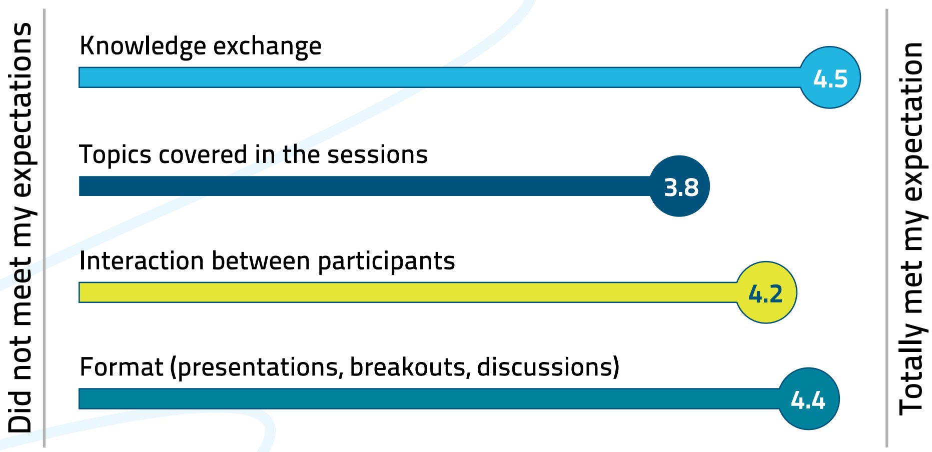
| NO. | SURNAME | NAME | ORGANIZATION |
|---|---|---|---|
| 48. | Ranasinghe | Thushara | FAO Sri Lanka – KnoWat Coordinator |
| 49. | Raya | Stephan | FAO |
| 50. | Romano | Francesca | FAO Rome Coordinator Land Tenure Team |
| 51. | Rondier | Anaïs | FAO Governance consultant |
| 52. | Roth | Anne | BMEL |
| 53. | Samake | Lamine | FAO |
| 54. | Scheumann | Waltina | German Development Institute (DIE) |
| 55. | Schiller | Theresa | World Wide Fund for Nature (WWF) |
| 56. | Schreiner | Barbara | Water Integrity Network (WIN) |
| 57. | Seidler | Jakob | GIZ |
| 58. | Semmling | Elsa | adelphi |
| 59. | Skandrani | Zina | GIZ |
| 60. | Soumar | Juliot | GIZ/ProPFR project |
| 61. | Srigiri | Srinivasa | DIE |
| 62. | Sunah | Dinesh | Ecumenical Global Water Network |
| 63. | Toll | Matthias | Federal Ministry for Economic Cooperation and Development (BMZ) |
| 64. | Troell | Jessica | Environmental Law Institute (ELI) |
| 65. | Trottier | Julie | Centre National de la Recherche Scientifique (CNRS) |
| 66. | Ulloa | Diana | |
| 67. | Valkonen | Anni | GIZ/NIRAS Consulting |
| 68. | Vallee | Domitille | FAO Regional Office for Near East and North Africa |
| 69. | van Koppen | Barbara | International Water Management Institute (IWMI) |
| 70. | Vela Caceres | Estelí Celeste | Protection assistant at United Nations High Commissioner for Refugees (UNHCR) in Lima, Peru |
| 71. | Whiting | Louise | FAO Regional Office for Asia and the Pacific |
| 72. | Wragge | Svea | GIZ |
| 73. | Zornbach | Wolfgang | BMEL |

# ANNEX 4. WORKSHOP EVALUATION BY PARTICIPANTS

## ▶ HOW SATISFIED WERE YOU WITH THE WORKSHOP IN GENERAL?




## ▶ PLEASE INDICATE IF THE WORKSHOP HAS MET YOUR EXPECTATIONS WITH RESPECT TO



# BACKGROUND PAPER ON WATER TENURE AND FOOD SECURITY

## FOR THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO) WORKSHOP ON WATER TENURE 28-29 JUNE 2022 BERLIN, GERMANY

Prepared by Sabine Blumstein and Karolina Heck, adelphi June 2022

### Key messages

1. The water tenure concept recognizes all existing water allocation mechanisms. It not only includes water rights based on legally recognized land and forest rights, but also considers customary rights that are not defined in formal law.
2. Customary tenure arrangements for accessing and using water resources can be recognized as legitimate use rights.
3. Recognizing and protecting water tenure rights under formal law improves food security and empowers communities to participate in decision-making.
4. Secure water tenure is a prerequisite for investments in construction, rehabilitation and efficient water infrastructure for food production.

# WATER TENURE AND FOOD SECURITY

## How are water tenure and food security connected?

Water is critical to the livelihoods and food security of all human beings. **Irrigated farming represents about 20 percent of total cultivated land and contributes 40 percent of the total food produced worldwide** (FAO, 2021). Rural communities, in particular, depend on water resources for various purposes, most importantly for subsistence food production, particularly in areas with limited rainfall. Irrigation allows farming communities to increase their resilience to rainfall variability and to diversify the foods they grow.

**Water resources are essential for rearing livestock.** Approximately 10 percent of annual global water flows are used by the livestock sector (Deutsch *et al.*, 2010). The sector accounts for about a quarter of the GDP in Burkina Faso, Mali and Niger (FAO, 2022a), illustrating the crucial importance of reliable access to water resources for pastoralist communities. Livestock also provide important inputs for crop production since many farmers use animal manure to fertilize their crops, which produce food for both humans and livestock. From a food security perspective, livestock provide an important safety net for pastoralists. In times of drought, people can move their livestock to more water-secure areas and still maintain a source of food and income.

Overall, **food security at all levels, from local to global, depends on access to water resources.** However, in many parts of the world, local communities do not have secure access to enough water to sustain food production. Seventy-seven percent of smallholder farms in low- and middle-income countries are in water-scarce regions; less than a third have access to irrigation (FAO, 2021). Similarly, accessing water is an increasing challenge for pastoralists and a source of a growing number of local disputes. Globally, the number of people raising livestock in agropastoral systems exceeds 180 million (Kieta *et al.*, 2016). Around 65 percent of the meat and 70 percent of the milk found in local markets in the Sahel region stem from pastoral systems (FAO, 2011b).

One reason that ensuring secure access to water resources can be challenging is that, in many countries, **access to and use of water resources is governed by customary arrangements, which are often not recognized in formal water governance structures.** In the southern states of India, for example, most local communities manage their resources under customary water tenure arrangements since formal laws do not sufficiently enable the sustainable use of groundwater and surface water by rural communities. In the state of Maharashtra, customary practice enables livestock producers to take water from village ponds that are exclusively used for that purpose. There is no charge for watering or feeding livestock on private land. To irrigate crops, water is shared among family members and people from the same caste. While these customary arrangements support livelihoods and food security for local farmers, they are not recognized by formal state law (James *et al.*, 2014) As a result, the farmers have weak or insecure water rights and are at risk of losing the means to secure food for themselves and their families.

Another case study from South Africa illustrates the links between access to water and livelihoods. In the state of Kwazulu-Natal, local communities on the Pongola River long used water and aquatic resources according to customary practices. The communities depended heavily on the natural flooding of the river and exploited many of its benefits for livelihood purposes, including fishing and livestock grazing. Traditional authorities enforced these customary community rights to use the water on the floodplain and adjacent lands. However, since these customary water uses were not recognized by formal law, the communities were not consulted when a major dam was constructed during the 1960s and 1970s. Since then, flood releases have become sporadic and unpredictable, and the customary use of the aquatic ecosystems downstream for subsistence agriculture has been abandoned (Crafford *et al.*, 2014). As this case illustrates, when laws do not formally recognize the customary water rights of local populations, these rights risk being ignored, putting livelihoods and food security at risk.

A major challenge to sustaining and improving water and food security for rural populations, particularly in areas affected by water scarcity, **is to determine how customary arrangements for accessing and using water resources can be recognized as legitimate use rights and included in broader water governance frameworks.**

## What is water tenure?

**Water tenure can be defined as "the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources"** (Hodgson, 2016; FAO, 2020). The advantage of this relatively new concept is that it considers all types of water uses, including those that are not formally recognized by law. At the centre of most water tenure systems is a core group, or bundle, of rights that constitute the fundamental elements of peoples' relationship with their water resources and with each other in relation to those resources. For example, tenure holders can have rights to access, impound, use and manage water, as well as "procedural" rights to have access to information and participate in decisions around water resources. The rights that are held by any one individual or group can vary, resulting in different bundles of rights that are created and protected by legislative and customary frameworks, which may or may not be aligned. The ways in which various rights within the bundle are assigned, who the rights holders are and how the rights are implemented and enforced shape both the quality and security of water tenure regimes. While the bundle-of-rights approach to tenure was initially developed to apply to terrestrial resources, it can be tailored to the freshwater context.

Water tenure offers a nuanced framework for recognizing different kinds of formal water tenure relationships as well as relationships derived from customary and local practices. Another key benefit of thinking in terms of water tenure is that it focuses on **water users, the relationships between them and the way they access and use water.** Because water tenure concentrates on users rather than laws and policies, a water tenure approach is by nature bottom-up (Hodgson, 2016). Returning to the example from South Africa, it is evident that the dam was built without any consideration of customary water tenure arrangements. A tenure-based approach could have stimulated a broader understanding of the ecosystem services and connected livelihood benefits provided by the floodplain to downstream communities.

One can broadly distinguish two types of tenure: legally-defined water tenure and customary tenure. **Water tenure defined by formal law** often includes permit-based rights to use surface and groundwater resources. These constitute property rights (or quasi-property rights) that enable the rights holder to exclude third parties from using these resources. Formal arrangements on water rights are often established between individuals and water user organizations (WUOs). In such cases, rural farmers receive their water from irrigation agencies but the arrangements are handled through the WUOs (Hodgson, 2016). In many countries, some small-scale domestic activities, so called *"de minimis"* uses allow the abstraction of small quantities of water for livestock or drinking water. They are listed under formal law arrangements but do not require a regulatory license.

**Customary and religious water tenure rights** include the right to abstract and use water based on customary practices or religious teaching. In many places, customary or local law remains the dominant legal paradigm for water tenure. Customary water tenure arrangements vary significantly in form and scope. Often, they emphasize the rights of groups and communities rather than of individuals (which is common in formal water tenure) and they are frequently part of complex frameworks that regulate access to other natural resources as well. However, if formal law does not acknowledge or protect customary tenure rights, they will not provide adequate security to water users, making them vulnerable to possible risks of sanctions and sudden prohibitions on use (Hodgson, 2016).

## How are water tenure rights and land rights connected?

**Water tenure rights are often linked to land and forest rights.** In many countries, formal water use rights have traditionally been granted to property owners, enabling them to freely use surface and groundwater resources on their land. In India's Maharashtra state, for example, access to groundwater resources was once connected to land ownership. Hence, landowners could extract groundwater resources without formal authorization, such as a water permit. This arrangement led to an overexploitation of groundwater resources, often for agricultural irrigation. While the water regulation was revised in 1993, it continued to endorse the right of landowners to extract groundwater on their plots, manifesting the concept of private control of groundwater. A new water act, adopted in 2005, intended to review water projects and to define priorities of water allocation during water scarcity. Nevertheless, many communities in Maharashtra continue to access water for irrigation and other livelihoods purposes based on customary rules (James *et al.*, 2014).

Since **land-based water rights are increasingly considered unsuitable for managing water resources,** most countries have placed water resources in the public domain, providing for the use of such resources through permits that grant use rights that are independent of land tenure rights. In Indonesia, for example, formal water use rights are based on licenses granted by the state. The country's National Water Resource Law distinguishes between two types of water licensing, one for non-commercial and the other for commercial water uses. Water uses for basic daily needs and for agricultural uses are exempt, provided they do not alter the natural condition of water sources and agricultural use takes place within existing irrigation areas. (Al'Afghani, 2022).

Similarly, in Rwanda formal law does not recognize traditional water tenure arrangements. Land and water rights are strictly separated and private land that includes lakes, rivers, springs or wells are considered part of the public domain. Thus, landowners cannot claim a right to the use of water resources on their land, even when access would be granted under customary law (FAO, 2022c).

However, even when a country's water laws do not link water permits to land, it will often require a title to agricultural lands to issue irrigation permits, whether through WUOs in irrigation schemes

## Why is recognizing water tenure rights important for food production?

Given increasing risks due to water scarcity and climate change, secure, equitable and enforceable water tenure rights become increasingly important for food security. Secure water tenure arrangements can contribute to food security in different ways. Most importantly, **securely defined and acknowledged water rights provide important incentives for farmers to invest in water infrastructure**, such as water storage or irrigation systems, since they do not fear losing access to water for the next growing cycle. These investments increase crop yields and the varieties of foods that can be grown. Additionally, irrigation and other infrastructure enhancements can help ensure food production during drought. And with higher crop yields and more reliable access to water, rural communities can spend less time on crop production and more time on activities such as education or other income-generating activities.

Clearly defined and secure water tenure arrangements also play a role in **preventing conflicts over water allocation** between different upstream and downstream users and users in different sectors, such as sedentary farmers and pastoralists.

In many countries, the use of small quantities of water for personal consumption (such as hygiene, cooking, or home gardening), a so-called "*de minimis*" right, is exempted from permitting. Often *de minimis* uses are restricted to manual abstraction, whereas motorized abstraction, e.g. with pumps, requires a permit or license. However, the legal protection and security of *de minimis* rights holders may be limited compared to that enjoyed by holders of water permits.

A case can be made to expand *de minimis* rights to other livelihood uses, such as small-scale irrigation. In Rwanda, for example, the most recent guidelines for water permits – prepared by the Rwanda Water Resources Board – exempt farmers from permits if they irrigate one hectare or less. (FAO, 2022c).

Finally, the recognition and protection of customary water tenure rights under formal law **empowers communities, especially often marginalized community members, to participate in decision-making over water resources** and increases their power vis-à-vis other, often more powerful, actors. Their interests and views are thus more likely to shape political decisions, including those that are relevant to sustainable food production and livelihoods.

## The impacts of water tenure rights on agricultural investments

Secure water tenure is a prerequisite for investments in construction, rehabilitation and the efficient operation of water infrastructure for food production, including irrigation schemes and other water storage and supply facilities. In many countries, foreign investment in large-scale agricultural projects plays an important role in securing food production for a growing world population. Investments in new and more efficient irrigation systems are necessary to secure the availability of groundwater and surface water resources for current and future food production (FAO, 2011a; FAO, 2022c).

For foreign investors, investment contracts can be protected under international law, generating a secure tenure relationship. In recent years, concession agreements with foreign investors have increased, especially in Africa (Cotula, 2011). Those agreements often confer water rights to the investor and specify the volume of water that can be extracted. However, such contracts can easily disenfranchise local water users, particularly when customary water arrangements have no or only weak legal security, as discussed above. While international law provides some protection against the dispossession of local people from their lands, this does not apply to water resources (Hodgson, 2016). Investment contracts are normally not disclosed to the public and can consequently result in water allocation practices that do not consider the rights of local communities. That is the case in the Indian state of Maharashtra, where the federal state has favoured the industrial use of water for mining rather than irrigation for crops and watering livestock. This threatens the use of groundwater for food production by local communities and jeopardizes the sustainability of groundwater resources (James *et al.*, 2014).

In conclusion, considering all legitimate water tenure rights within a country and recognizing these rights – by taking a water tenure perspective – can significantly improve food security and support global development goals.

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# BACKGROUND PAPER ON WATER TENURE AND SOCIAL INCLUSION

## FOR THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO) WORKSHOP ON WATER TENURE 28-29 JUNE 2022 BERLIN, GERMANY

Prepared by Jessica Troell, Environmental Law Institute June 2022

### Key messages

1. For the governance of water tenure to be truly inclusive and sustainable, it must account for the diverse, community-based tenure systems employed by indigenous peoples and local communities (IPLCs) around the world.
2. The freshwater tenure of local communities frequently depends on their legally recognized land or forest rights, with the result that legislative harmonization and intersectoral coordination are critical to supporting water tenure security.
3. The security of the land and water tenure rights of communities hinges on the interface between customary rights and government laws, which may or may not recognize customary rights.
4. Innovative solutions are needed to fill the gaps left by compulsory permitting systems, which are not tailored to the needs and resources available to IPLCs and fail to effectively protect their water tenure security.
5. More explicit legal recognition of community freshwater tenure rights – including those of women – are central to the achievement of water and food security, sustainable livelihoods, and global climate, ecosystem restoration and biodiversity goals.

# WATER TENURE AND SOCIAL INCLUSION

## Introduction

Water tenure is defined as the relationships, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources. Water tenure determines who has access to water; who can use water for various purposes, how much and for how long: and how those rights interact with those of other tenure holders. Water tenure also derives its meaning and utility from the **bundle of rights** that constitute the fundamental elements of peoples' relationships with each other when it comes to freshwater resources. Rights to use and manage water are governed by both legislative and customary frameworks, which may or may not be aligned with one another. Unpacking the bundle of rights thus helps governments and others to understand the ways in which the specific rights under diverse tenure regimes are formulated, implemented and enforced.

Over the past two decades, there has been increasing international recognition of the ways in which natural resource tenure underpins food security, sustainable livelihoods, and equitable and sustainable development (IFAD, 2017). This has prompted many countries to make tangible progress in the legal recognition and protection of land, forest and fisheries rights. The development and implementation of international principles and tools to guide policy and legal reforms, notably the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (VGGTs), have provided an important basis for building policy consensus on what constitutes responsible governance of land and resource tenure. A key aspect of this consensus has the need to prioritize the rights of the rural poor – particularly rural women– and to support and strengthen local or customary tenure systems that provide resource rights to individuals, groups and communities (RRI and ELI, 2020; FAO, 2020). The vision of inclusive tenure applies to water tenure, which underpins the food security, livelihoods, health, and climate resilience of vulnerable populations worldwide and is interconnected with their land, forest, and other resource tenure rights (RRI and ELI, 2020).

For the governance of water tenure to be truly inclusive and sustainable, it must account for the diverse, community-based tenure systems employed by indigenous peoples and local communities (IPLCs) around the world. These systems regulate access, use and management of natural resources on at least half of the world's land mass. Yet despite the prevalence and importance of these systems, communities are recognized as legal owners of only 10 percent of land globally. The extent of their legal rights to water remains largely unknown (RRI and ELI, 2020). In many cases, the security of community water tenure rights hinges on the interface between customary laws and government-issued laws, which may not recognize customary rights as legally valid (Troell and Keene, 2022).

Concerted advocacy efforts and increased international recognition that secure, community-based tenure underpins a broad cross-section of development goals have driven notable progress in the legal recognition of IPLCs' land and forest rights. However, similar advocacy and policymaking processes around community-based freshwater tenure rights have only recently begun to garner significant attention (RRI and ELI 2020). There is thus a critical need to advance the concept of water tenure, particularly in the context of the world's most vulnerable populations, and to clarify the role that the responsible governance of water tenure can play in achieving national water and development policy goals.

Applied research on water tenure in the context of IPLCs has helped to identify a number of core issues related to the recognition and protection of IPLCs' water tenure rights (including the rights of women) in the larger context of national water governance frameworks. These issues are briefly explored below.

## The "land-water nexus"

In many countries, water tenure –particularly community-based water tenure – depends on legally recognized land or forest rights (RRI and ELI, 2020). This "land-water nexus" can impact the water tenure rights of IPLCs and often persists, even when national water laws delink water rights from land tenure (RRI and ELI, 2020; FAO, 2020). In many countries, however, water laws are lagging behind other sectoral laws in their recognition of community water tenure, including customary water tenure (RRI and ELI, 2020). Where this is the case, the "land-water nexus" can provide a crucial legal foundation for recognizing and protecting IPLCs' freshwater rights.

The recognition of the water tenure rights of IPLCs can pose a threat to those rights when sectoral laws are not effectively aligned or harmonized. In Kenya, for example, land and water rights are inherently different. While customary land rights are recognized by the constitution and include access to water, formal water legislation does not explicitly recognize customary rights and requires that any water use other than for domestic purposes requires water users either to acquire a permit or establish a Water Users Association to legally access to water resources. The Kenyan Government has yet to rule on whether communities require permits or WUAs to assert their water tenure on customary lands.

Inconsistencies, and even contradictions, between water, land, forest, or other laws with respect to water tenure create confusion around sectoral mandates, result in duplicative requirements for realizing communities' water rights, and can undermine existing water rights (FAO, 2020). It is therefore critical for countries to clearly understand the status of existing water tenure systems to enable a more integrated approach that promotes inter-sectoral harmonization of tenure policies, institutional mandates, and legal rights and, ultimately, security of community water tenure.

## The role of customary water tenure

Customary tenure encompasses the relationships between IPLCs and their natural resources (including water), which are governed by a set of rules and norms that communities use to express and order their ownership, possession, management, use and regulation of those resources (Troell and Keene, 2022). The importance of formally recognizing customary tenure rights has increasingly been reflected in international and national laws recognizing, to varying extents, the customary land and forest tenure rights of IPLCs (RRI, 2015; RRI, 2018). The water rights of IPLCs were highlighted in the 2018 UN Declaration on the Rights of Peasants and Other People Working in Rural Areas (HRC, 2018). The Declaration expanded the scope of protection – previously only provided to indigenous peoples – to all communities with resource-based livelihoods and asserted individual and collective rights to access and sustainably use and manage land and waterbodies to achieve an adequate standard of living. It also specifically referenced the right to safe drinking water and "water for personal and domestic use, farming, fishing, livestock keeping and for securing other water-related livelihoods, ensuring the conservation, restoration and sustainable use of water" (Article 17). States were called upon to "respect, protect and ensure access to water, including in customary and community-based water management systems, on a non-discriminatory basis" (Article 21).

At the national level, countries are increasingly recognizing customary laws, particularly customary land (and water) tenure, providing new avenues for ensuring that the water tenure rights of IPLCs are more effectively protected. It is important to note that most customary water rights enjoying legal recognition and protection have their basis in land and other resource-related or environmental laws through the "land-water nexus" described above, so the same concerns regarding intersectoral harmonization apply.

Legal recognition and protection of indigenous and community water tenure rights provide the basis for securing and protecting those rights, particularly where third parties may be threatening them. However, it is important to note that legal recognition of customary water tenure rights also raises difficult questions of legitimacy, power, autonomy and self-determination for communities. Legal recognition is also only one aspect of the challenges IPLCs face in protecting their water tenure rights, which require effective community and national water governance frameworks to ensure meaningful implementation.

## Community-based water tenure for livelihoods and food security

In most countries, water use rights are granted through an administrative permitting or licensing process overseen by the government. Many countries exempt "primary" or "domestic" uses of water from the permitting requirements, usually requiring that these uses be small-scale in nature and/or do not require the use of mechanized abstraction technologies. These exemptions can include certain cultural, religious, and even small-scale agricultural or other livelihoods-based water uses. However, the right to use water for livelihoods purposes are often burdened by permitting or other administrative requirements (such as the need to incorporate as a WUA). Such permitting systems, while providing important benefits for water management agencies, including monitoring and regulating water uses, facilitating more effective resource management and financing water administration and infrastructure, are also rarely tailored to the priorities, needs and capacities of communities and other vulnerable users and often place high administrative and financial, burdens on them. Government offices administering permits are often far from communities and online applications are not commonly available or accessible, thus requiring communities to travel long distances (sometimes multiple times) to apply for permits.

Permitting processes may be intimidating if community members lack the necessary literacy and education levels to easily understand and fulfil the requirements. These requirements also frequently limit the duration of water rights, which contrasts with the unlimited duration of customary water tenure rights in many communities. Even when community livelihoods-based water uses are exempted from permitting requirements, the exempted use rights often do not have the same legal status as permitted rights, leaving them more vulnerable to third party challenges. Moreover, government capacity to implement permitting requirements in rural communities is frequently limited, and the logistical burdens and costs to the state of implementing such systems is much higher than the expected revenue generation (RRI and ELI, 2020; van Koppen and Schreiner, 2018). It is thus critical to explore innovative solutions to the gaps in compulsory permitting systems, which are not often tailored to the needs and resources available to IPLCs and fail to effectively protect their water tenure security. Solutions could include expanding permit exemptions to include livelihoods uses (ensuring their equal legal status to permitted rights) or formally prioritizing a broader range of community use rights to strengthen the legal position of communities when conflicting claims arise or during times of water stress.

### Pastoralism

Approximately 500 million people around the world rely on pastoralism for some or all of their livelihoods (FAO, 2016). Livestock fodder and water are the most important resources for pastoralists. Water tenure rights for pastoralists are therefore critical for determining timing of access to water, physical access to water sources, number of animals, etc. Yet in many countries, overlapping and often competing customary and formal governance systems constrain the effective recognition of resource rights, particularly when pastoral communities cross boundaries (World Bank, 2016). More recently, some countries (including Mali, Burkina Faso, Niger and Mauritania) have passed legislation protecting grazing land and granting herders rights to land and water resources, recognizing existing access and sharing arrangements (FAO, 2022).

## Women's water tenure

Another key issue relates to the specific role of women's water rights within IPLCs. Women's access to and control over land and natural resources is central to their economic and social empowerment, providing a critical basis for their livelihood security, collateral for credit and access to decision-making.

Despite the important roles that women play in water management and protection, they are less likely than men to have control over water resources (USAID, 2016). Women's water tenure often depends on their legally recognized land rights, highlighting the need to strengthen land and forest tenure for women (RRI and ELI, 2020).

Where women have secure land tenure rights, they often make investments to improve land, participate in land rental markets, increase their economic empowerment and control over household decisions, and contribute to family food security, children's health and sustainable agricultural productivity (Landesa, 2021; USAID, 2016; FAO 2013). Research demonstrates that secure rights to land enhance the capacity of women to participate and hold positions of authority in community governance institutions, where they can advocate for gender-equitable land and water resource management and governance (Salcedo-La Vina, 2020; Meinzen-Dick *et al.* 2021). Yet, research has also shown that many community-based water tenure systems fail to explicitly protect women's rights to use and make decisions around their water resources (RRI and ELI, 2020). In Senegal, for example, women have great difficulties in accessing or owning land. In line with customary and traditional practices, women rarely inherit or otherwise acquire land rights, even though, according to state law, women and men should have equal access and control over land and other natural resources, including water.

Efforts to formalize women's land and water rights are critical, but women also face several social and cultural barriers that can prevent them from realizing the multiple benefits associated with more secure tenure. Social restrictions can limit women's ability to make productive use of land and water, and tenure insecurity can persist through inequitable marriage and inheritance laws. Thus, reforms around these issues require effective analysis of gender inequities in legal frameworks, as well as a clear understanding of the political economy of land and water resource governance at the local level to facilitate women's equal participation in land and water governance and achieve truly gender-equitable outcomes (Doss and Meinzen-Dick, 2020).

## What is water tenure?

**Water tenure can be defined as "the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources"** (Hodgson 2016; FAO 2020). The advantage of this relatively new concept is that it considers all types of water uses, including those that are not formally recognized by law. **At the centre of most water tenure systems is a core group, or bundle, of rights** that constitute the fundamental elements of peoples' relationship with their water resources and with each other in relation to such resources. For example, tenure holders can have rights to access, impound, use, and manage water, as well as "procedural" rights to have access to information and participate in decisions around water resources. The rights that are held by any one individual or group can vary, resulting in different "bundles of rights" that are created and protected by legislative and customary frameworks which may or may not be aligned. The ways in which various rights within the bundle are assigned, who the rights holders are and how the rights are implemented and enforced shapes both the quality and security of water tenure regimes. While the bundle-of-rights approach to tenure was initially developed to apply to terrestrial resources, it can be tailored to the freshwater context.

Water tenure offers a nuanced framework for recognizing different kinds of formal water tenure relationships as well as relationships derived from customary and local practices. Another key benefit of thinking in terms of water tenure is that it focuses on **water users, the relationships between them and the way they access and use water.** Because water tenure concentrates on users rather than laws and policies, a water tenure approach is by nature bottom-up (Hodgson, 2016). Looking at the example from South Africa, it is evident that the dam was built upstream without considering customary water tenure arrangements by users downstream. A tenure approach could have encouraged a broader understanding of the ecosystem services and connected livelihood benefits provided by the river's floodplain to downstream communities.

One can broadly distinguish two types of tenure: legally-defined water tenure and customary tenure. **Water tenure defined by formal law** often includes permit-based rights to use surface and groundwater resources. These constitute property rights (or quasi-property rights) that enable the rights holder to exclude third parties from using these resources. Formal arrangements on water rights are often established between individuals and water user organizations (WUOs). In such cases, rural farmers receive their water from irrigation agencies, but the arrangements are handled through the WUOs (Hodgson, 2016). In many countries, some small-scale domestic activities, so called "de minimis" uses allow the abstraction of small quantities of water for livestock or drinking water. They are listed under formal law arrangements but do not require a regulatory license.

**Customary and religious water tenure rights** include the right to abstract and use water based on customary practices or religious teaching. In many places, customary or local law remains the dominant legal paradigm for water tenure. Customary water tenure arrangements vary significantly in form and scope. Often, they emphasize the rights of groups and communities rather than of individuals (which is common in formal water tenure) and they are frequently part of complex frameworks that regulate access to other natural resources as well. However, if formal law does not acknowledge or protect customary tenure rights, they will not provide adequate security to water users, making them vulnerable to possible risks of sanctions and sudden prohibitions on use (Hodgson, 2016).

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# BACKGROUND PAPER ON WATER TENURE AND CLIMATE RESILIENCE

## FOR THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO) WORKSHOP ON WATER TENURE 28-29 JUNE 2022 BERLIN, GERMANY

Prepared by Sabine Blumstein and Karolina Heck, adelphi June 2022

### Key messages

1. An important challenge in addressing climate change is to find the right balance between secure water tenure rights, which depend on clearly defined rules and regulations, and the assurance of adequate flexibility to respond to changing climatic conditions.
2. Sound water accounting is necessary to ensure secure water rights in conditions of scarcity and to implement flexible water allocation mechanisms. Recognizing all water users can help fill gaps in water balances and thereby improve climate resilience.
3. Secure water tenure rights can have positive effects on water use efficiency since they may provide incentives for investment in new and more efficient water infrastructure.
4. The acknowledgement of different types of water rights can contribute to conflict resolution. Water tenure assessments provide a framework for understanding the relationships between water users, which can help to prevent or resolve potential conflicts.

# WATER TENURE AND CLIMATE RESILIENCE

## Water tenure arrangements under changing climate conditions

**Climate change has major implications for water availability in many parts of the world.** The challenges are enormous. Climate models predict decreases in renewable water resources in mid-latitude and dry subtropical regions and increases in other areas, (mainly high latitude and humid mid-latitude regions). Even where water increases are projected, there may be temporary shortages due to changing streamflow caused by greater variability in rainfall (FAO, 2021). Many countries may need to build more reservoirs for water storage and flood protection. Many water users will need to increase water abstraction for irrigation to accommodate food production in higher temperatures. These adaptive measures will inevitably impact the existing water tenure arrangements of other users. In these circumstances, understanding diverse water tenure rights can help to increase resilience and mitigate water resources conflicts.

A key challenge in addressing climate change is to **find the right balance between secure water tenure rights**, which depend on clearly defined rules and regulations, **and the assurance of adequate flexibility to respond to changing climatic conditions**. On the one hand, it is necessary to ensure that water tenure rights are based on clearly defined rules on how much water can be accessed and when to provide actors with enough planning security to make long-term decisions and adequate investments in water infrastructure. On the other hand, climate change is likely to require significant flexibility in tenure arrangements to allow users to react to changing water availability.

Ensuring climate resilience will thus require a greater emphasis on flexible water tenure mechanisms such as, for example, **water allocation and accessing rights based on percentage shares of available water resources rather than fixed volumes.** Anallocation of rights as a share of available resources leaves more room to mitigate water resource variations than fixed allocations (Dinar *et al.*, 2010) and can also help to reduce grievances among users of the same water sources, particularly in systems with high water variability. .

However, implementing percentage-based water allocation mechanisms (as well as other instruments) will require a thorough and current knowledge of water resources availability. In this regard, it is important to emphasize the need for **sound water accounting to provide reliable information on water resources.**

## Effects of water tenure on water use efficiency

Climate change adaptation requires the efficient use of water resources. However, water use efficiencies are limited in many countries, including those that are most affected by climate change. In these contexts, the recognition of secure water tenure rights, **can have positive impacts on water use efficiency**, in part by motivating **investments in new and more efficient water infrastructures.**

A case study from the KwaZulu-Natal region in South Africa shows the positive relationship between secure water rights and irrigation efficiency on agricultural land. In this case study, local water rights are ensured through a scheme committee, which adheres to typical water user association (WUA) principles. Scheme committees can make decisions without government approval. The committees provide technical and infrastructural support, collect water fees and are directly responsible for the administration of land and water resources. For many years, the South African Government has pushed for the registration of WUAs and scheme committees in smallholder irrigation schemes to better monitor water use, particularly in times of drought, and to improve water use efficiency (Cele and Wale, 2018). Secure and transferable property rights have been shown to be essential to motivating a higher level of investment by farmers as well as improving their credit rating. **Water rights that are secured through highly-functioning scheme committees lead to greater productivity in the use of irrigation water** (Cele and Wale, 2018).

## Water tenure and its impact on local water conflicts

Water tenure arrangements define who can access water resources, as well as how much can be extracted, for how long and to what purpose. They may also indicate the process of water rights allocation and delineate uses should be considered as priority, particularly in times of scarcity. Formal and informal rules and the interactions between users form an intricate "web of interest" (Meinzen-Dick and Mwangi, 2008), which may make the identification of adequate and secure tenure arrangements a complex task. Competing user claims over water resources can be a sign of insecure water tenure rights, which could increase vulnerability, hunger and poverty. As previously noted, a **clear distribution of water rights can contribute to conflict resolution** (Hodgson, 2016). Water tenure regimes **clearly define the relationship between water users, which enables a better understanding of the causes and means to resolving potential conflicts** (FAO, 2020).

A **case study from the Yanze sub-basin in Rwanda shows the potential that recognizing different forms of water tenure arrangements has for conflict resolution.** A large part of the Yanze River is used to supply water to the city of Kigali. The river also serves as an important water source for agricultural activities in the region. In Rwanda, legally-defined water tenure rights do not include traditional or customary water rights. Land law clearly excludes the right to water based solely on land ownership. Hence, farmers have no natural right to extract water on their own property. Farmers who intend to use water for irrigation and whose land is larger than one hectare can apply for a water permit. However, in practice, many water users do not have a permit, even when water is used collectively, such as along a shared irrigation canal. Many users are not aware of the requirement for a permit, or lack the capacity to form a WUA, which has the authority to issue permits. This reality increases the potential for conflicts between users with formal rights to extract water and those that do not have the rights. In this case, however, the Kigali water supply company entered into voluntary contracts with upstream farmers to regulate when and how much water they could use without compromising water supply to urban areas downstream. While not to do so by law, the company saw this as an adequate mechanism to accommodate upstream needs while ensuring water supply downstream – and avoiding conflicts along the line.

This **example illustrates the importance of acknowledging different forms of water tenure arrangements to provide secure and fair water access and prevent conflicts** (FAO KnoWat Rwanda, 2022). The KnoWat project assisted upstream farmers in the Yanze catchment to create a WUA and to establish their formal right to use water resources.

## Water tenure and the availability of data to increase climate resilience

Water stock and supply data is critical to efforts to find innovative and sustainable adaptation strategies to increase the climate resilience of communities. Secure water tenure arrangements can facilitate registration processes that capture all domestic and livelihood uses as well as commercial irrigation uses of water. The **legal recognition of all water users can help to close data gaps** and thus improve climate resilience.

In Tanzania, the lack of recognized local water rights in formal law and the resulting unclear water allocation standards have led to water conflicts and the lack of effective management strategies for agricultural water resources (Mutabazi, 2015). By formally recognizing local laws, the water practices and water balances of smallholders could be monitored more precisely. Different **types of water tenure** (especially local water arrangements) should therefore be added to the water information systems to **present a more realistic accounting of water use and water availability** (Veldwisch *et al.*, 2013).

### What is water tenure?

**Water tenure can be defined as "the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources"** (Hodgson, 2016; FAO, 2020). The advantage of this relatively new concept is that it considers all types of water uses, including those that are not formally recognized by law. **At the centre of most water tenure systems is a core group, or bundle, of rights** that constitute the fundamental elements of peoples' relationship with their water resources and with each other in relation to those resources. For example, tenure holders can have rights to access, impound, use, and manage water, as well as "procedural" rights to have access to information and participate in decisions around water resources. The rights that are held by any one individual or group can vary, resulting in different "bundles of rights" that are created and protected by legislative and customary frameworks which may or may not be aligned. The ways in which various rights within the bundle are assigned, who the rightsholders are and how the rights are implemented and enforced shape both the quality and security of water tenure regimes. While the bundle-of-rights approach to tenure was initially developed to apply to terrestrial resources, it can be tailored to the freshwater context.

Water tenure offers a nuanced framework for recognizing the different kinds of formal water tenure relationships as well as relationships derived from customary and local practices. Another key benefit of thinking in terms of water tenure is that it focuses on **water users, the relationships between them and the way they access and use water.** Because water tenure concentrates on users rather than laws and policies, a water tenure approach is by nature bottom-up (Hodgson, 2016).

**One can broadly distinguish two types of tenure: legally defined water tenure and customary tenure. Water tenure defined by formal law** often includes permit-based rights to use surface and groundwater resources. These constitute property rights (or quasi-property rights) that enable the rights-holder to exclude third parties from using these resources. Formal arrangements on water rights are often established between individuals and water user organizations (WUOs). In such cases, rural farmers receive their water from irrigation agencies but the arrangements are handled through the WUOs (Hodgson, 2016). In many countries, some small-scale domestic activities, so called "de minimis uses allow the abstraction of small quantities of water for livestock or drinking water. They are listed under formal law arrangements but do not require a regulatory license.

**Customary and religious water tenure rights** include the right to abstract and use water based on customary practices or religious teaching. In many places, customary or local law remains the dominant legal paradigm for water tenure. Customary water tenure arrangements vary significantly in form and scope. Often, they emphasize the rights of groups and communities rather than of individuals (which is common in formal water tenure) and they are frequently part of complex frameworks that regulate access to other natural resources as well. However, if formal law does not acknowledge or protect customary tenure rights, they will not provide adequate security to water users, making them vulnerable to possible risks of sanctions and sudden prohibitions on use (Hodgson, 2016).

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