



Food and Agriculture
Organization of the
United Nations

LAND AND
WATER
DISCUSSION
PAPER

ISSN 1729-0554

10

Exploring the concept of water tenure

A large, multi-arched dam or reservoir structure, possibly the Aswan Dam, is visible in the background, partially obscured by a light, textured overlay. The structure spans across a wide valley, with water visible in the foreground.

Exploring the concept of water tenure

LAND AND
WATER
DISCUSSION
PAPER

10

by
Stephen Hodgson
FAO legal consultant

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISBN 978-92-5-109117-3

© FAO, 2016

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via www.fao.org/contact-us/licence-request or addressed to copyright@fao.org.

FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org.

Table of contents

FOREWORD	VII
ACKNOWLEDGEMENTS	VIII
LIST OF ACRONYMS AND ABBREVIATIONS	IX
GLOSSARY	X
EXECUTIVE SUMMARY	XII
1 INTRODUCTION	1
2 WHAT IS TENURE?	4
2.1 Elements of formal land tenure	5
2.2 Relationships created under customary law	8
2.3 Beyond law and anthropology	10
3 CONCEPTUALIZING WATER TENURE – A PRELIMINARY TYPOLOGY	11
3.1 Tenure relationships defined by formal law	15
3.1.1 ‘Traditional’ formal water rights	15
3.1.2 ‘Modern’ formal water rights	16
3.1.3 Regulatory licensing	18
3.1.4 Agency control	20
3.1.5 Water supply contracts	20
3.1.6 Commonhold water tenure	21
3.1.7 Investment contract rights	23
3.1.8 De minimis (small-scale) free uses	24
3.1.9 Exempt commercial uses	25
3.1.10 Reserves/minimum flows	26
3.2 Tenure relationships that are not defined by formal law	26
3.2.1 Customary water tenure	26
3.2.2 Water tenure under religious law	27
3.2.3 Informal tenure	28
3.2.4 Assumed and impossible rights	28
3.2.5 Unrecognized tenure	29

3.3	So is it really ‘tenure’?	30
3.4	Differences and linkages between land tenure and water tenure	31
4	RELATIONSHIP BETWEEN TYPES OF WATER TENURE AND CATEGORIES OF USE	36
4.1	Domestic water supply	36
4.2	Agriculture	37
4.3	Industry	38
4.4	Hydropower	38
4.5	Environment	38
4.6	Navigation	39
4.7	Inland fisheries and other non-consumptive livelihood activities	39
4.8	Recreation, landscape and tourism	39
4.9	The relationship between categories of use and tenure type	40
5	COMPARING DIFFERENT TYPES OF WATER TENURE	42
5.1	Tenure security	42
5.2	Tenure equity	47
5.3	Tenure sustainability	48
5.4	Tenure efficiency	48
6	WATER TENURE AND GOVERNANCE	50
6.1	Defining water governance	50
6.2	Governance and tenure of water	51
6.3	The broader political economy dimension	52
7	ADVANTAGES AND DISADVANTAGES OF THINKING IN TERMS OF WATER TENURE	55
7.1	Arguments against water tenure	55
7.1.1	“We don’t need a new concept ”	55
7.1.2	“Water tenure is too complex and theoretical”	55
7.1.3	“Water tenure is only of interest to lawyers”	56
7.1.4	“Why start talking about ‘water tenure’ when we have always used the term ‘water rights’?”	56
7.2	Arguments in favour of water tenure	57
7.2.1	Holistic: shows things as they are	57
7.2.2	Non-prescriptive	59
7.2.3	A more sensitive and nuanced approach	60

7.2.4	Policy coherence and the land-water linkage	61
7.2.5	Multidisciplinary	62
7.2.6	Focus on users	63
8	THE FUTURE OF THE WATER TENURE APPROACH	65
9	CONCLUSIONS	68
	REFERENCES	69

Figures

1. Illustration of multiple land tenure claims over a single land plot	7
2. Overlapping water tenure claims on a single river reach	32
3. Nested claims relating to irrigation infrastructure	32
4. The relationship between governance, water governance, water tenure governance and water tenure	54

Tables

1. A preliminary typology of water tenure relationships	13
2. Potential tradability of different types of water tenure	34
3. Linking water tenure to water use	40
4. Relative security of formal tenure arrangements	45
5. Mapping water tenure security against use type	46

Boxes

A. The main legal traditions	5
B. Blackacre: an example of land tenure complexity	9
C. The human right to water	11
D. The prior appropriation doctrine	15
E. Activities subject to a 'modern' formal water rights regime	16
F. Conditions applicable to 'modern' formal water rights	18
G. Water tenure, property rights and quasi-property rights	19
H. Commonhold tenure and water user organizations	22
I. 'Secret' WUOs?	23
J. Hydropower concessions in the Lao People's Democratic Republic	24
K. South Africa – Schedule 1 entitlements	25
L. Planning and use conditions	33
M. Governance from an FAO perspective: The FAO Strategic Framework	51
N. Non-implementation	58

Foreword

Tenure arrangements determine how people, communities and organizations gain access to, and use, natural resources. In recognition of the importance of tenure, the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) were adopted in May 2012 at the 38th Session of the Committee on World Food Security (CFS). When the process of developing the VGGT started, it was initially envisaged that ‘water tenure’, would be part of the VGGT, and that the high-level principles of the VGGT would be further developed in the form of specific technical guidelines on water tenure. In the end, it was decided not to include water tenure in the VGGT. One reason for this decision was that the notion of water tenure itself was not widely known and consequently there was no consensus about its meaning.

At the same time the need to consider water as part of the broader tenure discussion was clear. In 2013, water tenure was discussed at an expert consultation on ‘Water governance and the role of tenure and rights in coping with agricultural water scarcity’ organized by FAO. As a result of that consultation it was decided to further investigate the concept of water tenure, through a series of country case studies, in order to better assess the value and potential of the concept.

In the meantime, the notion and importance of ‘water tenure’ was making its way through a series of important meetings. At its 24th session in September 2014, the Committee on Agriculture of FAO discussed the subject of water governance for agriculture and food security, and encouraged FAO and member countries to pursue efforts towards better integration of the governance dimension in their work towards sustainable agriculture and food security.

In September 2015, the 42nd Session of the CFS approved a set of recommendations in relation to water for food security and nutrition. Issues of governance, rights and tenure were prominent in these recommendations. Of particular prominence was the promotion and implementation of international human rights obligations, closely linking access to water with food security and nutrition. It was recommended that, in line with the VGGT, particular attention be paid to marginalized and vulnerable groups, their use of natural resources, their needs and their tenure rights.

This paper is based on the discussions that have taken place since the 2013 expert consultation, fed by the results of the case studies. Its purpose is to explore the notion of water tenure and to seek to provide answers to a number of basic questions about its meaning, its existence, and the potential use of the concept in the development of future tenure-related policy and practice. It is hoped that the paper will be able to contribute to the broader tenure debate and help FAO and its member countries in designing more effective actions in water in support to governance of tenure.

Acknowledgements

This discussion paper was written by Stephen Hodgson, FAO legal consultant. The author would like to thank Louise Whiting, Jean-Marc Faurès, Pasquale Steduto and Elena Lopez-Gunn for their continued support throughout the preparation of this paper as well as the following people who kindly commented on earlier drafts: Charles Batchelor, Jean Boroto, Stefano Burchi, Jackie Crafford, Frédéric Dévé, Thierry Facon, Valentina Franchi, Karen Frenken, Paolo Groppo, Walter Huppert, A. J. James, Blaise Kuemlangan, Emma Mc Inerney, Lyla Mehta, Ruth Meinzen-Dick, Lucie Pluschke, Julie Trottier, Klaus Urban and Barbara Van Koppen. All errors and omissions remain the responsibility of the author.

Acronyms and abbreviations

FAO	Food and Agriculture Organization of the United Nations
GWP	Global Water Partnership
IWRM	Integrated water resources management
NGO	Non-governmental organization
UNDP	United Nations Development Programme
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security
WUO	water user organization

Glossary

Agency Control: A tenure relationship whereby extensive legal powers are granted to an irrigation/water agency to abstract and use water resources.

Assumed rights and impossible rights: A tenure relationship under which formal water rights are wrongly assumed to exist due to the ‘official’ nature of the use or where lack of legal personality means organizations cannot hold formal water rights.

Commonhold water tenure: A tenure relationship whereby rights to water resources held in common by a distinct community of users such as members of a WUO.

Customary law: The unwritten set of rules that are accepted by a particular community to apply to it.

Customary water tenure: A tenure relationship whereby rights to abstract/and or use water resources are based on customary/local law.

De minimis rights – small-scale: A tenure relationship whereby small quantities of water may be used without any administrative formalities for meeting basic needs such as drinking, bathing, subsistence agriculture, and watering of garden plots.

Exempt commercial uses: A tenure relationship under which specified quantities of water may be used without any administrative formalities in specified areas for specified commercial purposes.

Formal law: The body of legal rules and procedures contained in laws or acts adopted by the legislatures of states as developed/interpreted by the decisions of the formal courts.

Informal water tenure: A use of water that is not legally recognized, or which is illegal but tolerated by the water administration (sometimes for years).

Investment contracts: A tenure relationship whereby rights to use water resources are created on the basis of investment contracts which in the case of foreign investors may be subject to protection under international law.

Irrigation agency: A state agency responsible for the construction, operation and management of one or more publicly funded irrigation systems.

Land tenure: The relationship, whether legally or customarily defined between people, as individuals or groups, with respect to land.

‘Modern’ formal water rights: Permit-based long-term rights (12-30 years or more) to use water resources. Property rights/quasi-property rights, valuable and capable of being asserted against the state and third parties.

Regulatory licence: Short-term (e.g. annual) licence to use water resources based on a ‘command and control’ approach.

Religious law: A tenure relationship relating to the use/protection of water/water resources based on religious teachings.

Reserves/minimum flow requirements: A tenure arrangement that specifies mandatory amounts of water to be left within water bodies.

Tenure assessment: A comprehensive review of existing tenure arrangements in a given region/basin at a given time.

Tenure arrangement: The way by which people gain access to and make use of a resource, and how they relate to each other through a set of (formal or informal) rules and agreements.

‘Traditional’ formal water rights: Usually land based: rights to use water resources derive from land tenure rights. In parts of the Western USA and Canada based on prior use.

Unrecognized water tenure: A range of economic/livelihood activities that relate to the use of water resources, such as inland fisheries and the use of wetland resources, that are not typically regulated by water law.

Water administration: The state agency that is responsible for water resources management within a given jurisdiction.

Water supply contracts: Contracts, usually written, for the bulk supply of water for irrigation, industry or other purposes using water infrastructure.

Water tenure: The relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources.

Executive summary

Tenure arrangements determine how people gain access to and make use of a resource and how they relate to each other through a set of formal or informal rules and agreements. Although the word tenure is used in connection with a range of natural resources it is most commonly used in relation with land. The definition of land tenure promoted by FAO: “the relationship, whether legally or customarily defined between people, as individuals or groups, with respect to land”, provides a useful means of understanding tenure. Key points to note about this definition are the fact that it recognizes that tenure is a social construct, that it recognizes the rights and interests of both individuals and groups, and the fact that it recognizes relationships created under both formal and customary law. Land tenure is concerned with a wide range of formal relationships with land, such as ownership, leases and mortgages, as well as relationships created under customary or local law. The scope of land tenure, however, extends far beyond law and anthropology. It embraces economics, political science, sociology and a range of other disciplines.

In response both to the importance of tenure and the increasing pressure being placed on the world’s natural resources, the Committee on World Food Security adopted the *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* (VGGT) on 11 May 2012. The VGGT set out principles and internationally accepted standards for responsible practices in order to provide a framework that actors can use when developing their own strategies, policies, legislation and programmes. When the process of developing the VGGT started, it was envisaged that water, and thus ‘water tenure’, would also be included in the guidelines. However, for a range of reasons, water was not included in the VGGT. One practical reason for this was the lack of a shared understanding of the term ‘water tenure’ and the potential complexities associated with it.

The purpose of this paper is to examine the notion of tenure in connection with water resources and to explore whether the concept of water tenure has the potential to make a useful contribution towards resolving the world’s water resources challenges. It seeks to provide answers to the following questions: (a) What is water tenure? (b) Does water tenure really exist or is water simply too different from other natural resources? (c) Could the concept of water tenure be useful in terms of the development of natural resources policies and practices?

In conceptualizing water tenure, the following definition is proposed: “the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources”. The reference to ‘water resources’ as opposed to simply ‘water’ is justified by the need to distinguish the discussion on water tenure from the discussion on the human right to water, which focuses specifically on questions related to access to water for domestic purposes.

Applying the definition of tenure to water resources results in a surprisingly wide variety of types of tenure arrangements. This report proposes a typology of tenure arrangements that include those that are defined by formal law (‘traditional’ formal water rights, ‘modern’ formal water rights, regulatory licensing, agency control, water supply contracts, commonhold water tenure, investment contracts, *de minimis* uses,

exempt commercial uses, and reserves/minimum flow requirements) as well as those that are not defined by formal law (customary or local law water tenure, water tenure under religious law, informal tenure, assumed and impossible tenure and unrecognized tenure). This preliminary typology could be further refined and its precise scope broadened. Nevertheless, all the tenure arrangements in the typology represent a type of relationship between people with respect to water resources, and they are all examples of water tenure.

Differences in the physical nature of land and water mean that there are also differences between water tenure and land tenure. These differences include: the nature of overlapping interests; the relatively greater social, economic and political importance of land tenure; the relationship between tenure and management; and different approaches regarding the allocation and reallocation of resources, with markets playing a far greater role in the case of land.

A key point to note is that water tenure itself is largely indifferent to the purpose for which water is used. However, it is possible to associate different types of water tenure with different categories of water use. Equally, it is possible to compare different types of water tenure arrangement by reference to such matters as security, equity, sustainability and efficiency.

What about the relationship between water tenure and water governance? The option proposed in this paper is to see the governance of water tenure, and also water tenure itself, as elements of water governance as a whole. Water tenure and the governance of water tenure are in fact fundamental to the wider question of water governance. It is also clear that water tenure is intimately linked to land tenure. Both have a long, historical relationship with political reforms and with other issues of political economy. Water governance reforms, as well as land governance reforms, that fail to consider the economic and political power that derive from the tenure of land and water will not succeed.

Apart from its potential contribution to the water governance debate, there are other benefits of thinking in terms of water tenure.

- First of all, water tenure provides an opportunity to take an holistic approach to understanding relationships with water resources in order to see things as they actually are rather than as how laws and regulations suggest that they should be. It therefore has the potential to contribute significantly to policy development and *ex ante* evaluations, and shed light on *ex post* evaluations of the actual achievements of reforms.
- Second, because water tenure is not prescriptive, it seems to offer a more nuanced means of recognizing different kinds of relationships among people and water resources; one that can accept that there are fundamental normative and cultural differences at play.
- Third, because it does not assert that one type of tenure system is better than the other, it offers the possibility of negotiation and compromise at the policy level and below. Water tenure also has the potential to facilitate more sensitive and nuanced analyses and discussions of water use and relationships, including transboundary waters. This can be particularly important in dialogues with politicians and other decision makers, but also with water resource users.

- Fourth, examining relationships with water resources under the heading of tenure is coherent with approaches used with other natural resources. Notwithstanding the differences between land tenure and water tenure, they are both systems of tenure. Moreover, the use of one resource can clearly impact and be impacted by the use of other resources. The interface between land and water is an obvious example.
- Fifth, an important potential benefit of the notion of water tenure is the possibility it offers for strengthening multidisciplinary approaches to addressing water resource problems. As can be seen with land tenure, the importance and scope of the issue far exceeds laws and legal questions.
- Last but not least, a key benefit of thinking in terms of water tenure is that it focuses on the most important actors: water users. The relationship between water users is at the heart of water tenure. A water tenure approach is bottom-up and user-focused, as compared to an approach based on water rights, which is top-down and state-led.

Adopting the concept of water tenure is clearly not a panacea for the world's water problems. Nor is it a new technique or methodology that will magically conjure up solutions. The biggest benefit of a water tenure approach seems to be that, in a world of increasing water shortages, it gives a different perspective on water use and claims over water resources. The bottom-up water tenure approach can give insights into the complex system of water use, and, through water tenure analysis, i.e. the analysis of relationships between users and water resources, identify areas and opportunities for improving often chaotic water use (e.g. pointing out areas where formal laws are too rigid or remain unimplemented, or problems related to legal and policy coherence). Water tenure could be useful to a wide range of stakeholders at the national level, including governments, civil society and water users themselves.

What should be done with the concept of water tenure? Probably the first and most important step is to simply recognize that water tenure exists. It should be recognized that, while water has unique properties that distinguish it from other types of resources, water tenure is a legitimate type of tenure that needs to be taken as seriously as land tenure. Specifically, water tenure should be considered more systematically by policy makers and their advisers as well as by researchers, academics and NGOs. It also needs to be taken seriously across the spectrum of professions involved with water resources.

At a practical level, there is need for more reflection, more discussion, more critical analysis and more thought on the issue. Next steps could be to refine the preliminary typology and further review the comparative criteria of security, equity, sustainability and efficiency proposed in this document. From these efforts, a 'water tenure assessment' methodology could emerge that could inform policy reforms, including the development of formal water tenure policies.

Another possibility is to consider the development of a set of voluntary guidelines on water tenure that would set out principles and internationally accepted standards for responsible practices. Such guidelines would be of use for industrialized and developing countries alike. The process of developing these guidelines would in itself create a valuable forum for sharing the experience of different countries and the insights of different disciplines involved with water tenure, and offer a useful connection between management and rights.

A further question is whether such voluntary guidelines should deal only with water tenure or whether they should follow the example of the VGGT and be guidelines on the governance of tenure. While this issue requires further discussion, it is nevertheless suggested that voluntary guidelines on the governance of water tenure would be coherent with the VGGT and would make an important and specific contribution to the global water governance debate. Thereafter, it is possible to imagine a series of implementation projects, as has been done with the VGGT, on various technical aspects of the governance of water tenure.

It is true that up to now 'water tenure' has not been a commonly used term. It is also true that the concept of water tenure in itself does not provide a 'solution' to the world's water challenges. But in a world of ever increasing demand for water resources, the need to ensure that people, as individuals or groups, can benefit from secure, equitable and sustainable water tenure that contributes to more efficient use of water could not be clearer. The question is not, whether we should take water tenure seriously, but rather whether we can afford not to.

1. Introduction

Tenure arrangements determine how people, communities and organizations gain access to, and use, natural resources. They define, among other things, who can use the resource, how much of the resource can be used, for how long, for what purpose and under what conditions (FAO, 2012c). Typically they also specify how decisions are to be made with regard to the allocation and, in some cases, the management of natural resources, the administration of the rights that they create and mechanisms for conflict resolution. Tenure arrangements include rights, but they constitute a much more comprehensive and complex set of formal and informal rules and interactions between users.

Inadequate and insecure tenure arrangements contribute to vulnerability, hunger and poverty. They can also lead to conflict and environmental degradation when competing users fight for the control of resources (FAO, 2012c). Weak tenure arrangements also constrain economic growth, as people are usually reluctant to invest without security of tenure.

In recognition of the importance of tenure and the increasing pressure being placed on the world's natural resources, the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) were adopted on 11 May 2012 at the 38th Special Session of the Committee on World Food Security.

The objective of the VGGT is to set out principles and internationally accepted standards for responsible practices in order to provide a framework that actors can use when developing their own strategies, policies, legislation and programmes. They allow government authorities, the private sector, civil society and citizens to judge whether their proposed actions and the actions of others constitute acceptable practices. At a practical level, the high-level principles set out in the VGGT are in the process of being complemented by a series of 'Governance of Tenure Technical Guides' in which specific aspects of the tenure of land, fisheries and forests are addressed in more detail (FAO, n.d.).

When the process of developing the VGGT started, it was envisaged that water and 'water tenure', would also be included. More specifically it was foreseen that the high-level principles of the VGGT would be further developed in the form of specific technical guidelines on water tenure.

There was some logic in the idea of including water in the VGGT. For a start, around one third of the world's population live in countries that suffer from moderate to high water stress. As water scarcity resulting from increased human demand and competition among water using sectors becomes apparent in a variety of forms, the question of how to allocate and manage water resources becomes more important. As noted in a recent FAO publication, 'business as usual' is not an option. Real changes are needed in the way in which water is governed and used if transient or long-term crises are to be averted (FAO, 2012a). At the same time, using the land often requires water, and land use and land management influence where water will be the available and for how long.

A number of preliminary steps were undertaken to include water in the VGGT, including the preparation of an issues paper and a preliminary set of draft technical guidelines. However, in the end, water was not included¹.

One practical reason for this decision was that although some references to ‘water tenure’ can be found in the literature (e.g. Bruns, 2003; Van Koppen, 2000; Huggins, 2002; Sangkapitux and Neef, 2000), the notion of water tenure, unlike land tenure or forest tenure, is not widely known or used in practice or academia. Discussions about the allocation and reallocation of water resources and equitable delivery of water services tend to be framed in terms of ‘water rights’, which, as will be seen in this paper, are a much narrower concept. It was clear that for many people ‘water tenure’ was something new, and there were concerns about the extent to which tenure of water could be treated in the same way as tenure of land and other natural resources.

Nevertheless, the seed of interest in water tenure had been planted. In 2013, water tenure was subsequently discussed at an expert consultation on ‘Water governance and the role of tenure and rights in coping with agricultural water scarcity’ at FAO headquarters. As a result of that expert consultation and subsequent follow-up meetings it was decided to take a number of additional steps to investigate the concept of water tenure. This involved the preparation of three preliminary case studies from India (James *et al.*, 2014), South Africa (Crafford *et al.*, 2014) and Spain (López-Gunn *et al.*, 2014) and a more conceptual ‘think-piece’, which is this paper.

The purpose of this paper is to explore the notion of water tenure and to seek to provide answers to a number of basic questions. First of all, what is water tenure? Second, does water tenure really exist or is water, with its fluid and fugitive nature, simply too different from other natural resources to render the notion of water tenure irrelevant or simply meaningless? And third, could water tenure help in terms of the development of policy and practice through further work that could include, for example, the possible development of guidelines on water tenure? Put another way, should further effort be spent on water tenure or is the whole idea just a distraction, a fad, a waste of time? Over the years, there has been no shortage of new approaches, remedies or other ‘nirvana concepts’ that have promised solutions to the world’s many and growing water challenges (Molle, 2008).

This paper draws on the findings from the three case studies mentioned above. Of particular importance was the invaluable role the case studies played in shedding light on the concept of water tenure, which radically broadened the conceptual scope of this paper as it was initially envisaged. The paper also builds on the issues paper and preliminary draft technical guidelines produced during the preparation of the VGGT and a review of relevant literature. It also draws on preliminary stakeholder feedback from a presentation on water tenure and the case studies made at the FAO Near East and North Africa Land and Water Days conference held in Amman, Jordan in 2013.

This paper is comprised of nine parts, including this introduction. Part two contains a brief outline of the notion of ‘tenure’, focusing on land tenure, which is perhaps the best-known type of resource tenure. Part three contains a conceptualization of water tenure along with a preliminary typology of water tenure arrangements. In part four, the relationship between different tenure types and different uses of water is examined. Part five sets out possible criteria for evaluating and comparing different types of

¹ Some of the reasons for this decision are described in the report Strategic Evaluation of FAO work on tenure, rights to land and other natural resources – Final evaluation report FAO Office of Evaluation, FAO Rome, 2012.

tenure. Part six examines the relationship between water tenure and water governance. The benefits of water tenure are dealt with in part seven. A number of ideas for taking the concept of water tenure forward are considered in part eight. Some preliminary conclusions are set out in part nine.

2. What is tenure?

Before examining water tenure it is useful first to examine the notion of ‘tenure’ in more detail. As noted in the introduction, tenure arrangements determine how people gain access and make use of different types of natural resources, and how they relate to each other through a set of formal or informal rules and agreements². Fisheries and forests have already been mentioned in connection with the VGGT, but references to tenure can also be found in connection with mineral resources in both national legislation (e.g. the 1996 Mineral Tenure Act of the Canadian province of British Columbia) and international agreements (e.g. Article 153 of United Nations Convention on the Law of the Sea, which explicitly refers to security of tenure in connection with deep sea mining rights in areas beyond national jurisdiction).

It is with regard to land, however, that the term tenure is mostly commonly used, and in trying to understand the concept of tenure it is convenient to use land tenure as a basic model. The issue of who may use land as a resource is usually considered under the heading ‘land tenure’. Although there are many definitions of land tenure, a succinct definition promoted by FAO is:

“..the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to land” (FAO, 2002).

There are a number of points to note about this definition. First of all, it concerns not just the relationship between people and land, but rather the relationship between people and people relating to land. In other words, the definition recognizes that land tenure is a social construct. Second, the definition makes it clear that the rights and interests of both individuals and groups are to be considered. And third, the definition indicates that two types of relationship fall within the overall concept of land tenure: those regulated by formal law and those governed by ‘customary’ or ‘local’ law. The definition explicitly recognizes the notion of legal pluralism (see FAO, 2004).

In contrast to the rules of formal law, which are created on the basis of laws or acts of parliament adopted by the legislature (and in some jurisdictions derive from decisions of the courts), customary law is usually unwritten and stems from the rules of the communities to which it applies. While customary law may be ancient, this is not necessarily always the case. Like any legal system, customary law can change and evolve. That is why anthropologists also use the term ‘local law’, as customary law may in fact be quite recent. Consequently, although the term ‘customary law’ is used in this paper it should be understood in this broad sense and not restricted only to the rules passed down over many generations.

The word ‘tenure’ itself, which derives from Latin via Norman French, means the right to hold or possess rather than the mere fact of holding or possessing it. Tenure implies the fact of holding or possession plus the recognition of this right through formal or customary law (Bruce, 1998).

² It is worth noting that the use of the term tenure is not restricted only to natural resources: judges and academics may also have tenure in the sense that they cannot be removed from office other than in exceptional and specified circumstances.

2.1 ELEMENTS OF FORMAL LAND TENURE

Land tenure rights created under formal law are capable of being asserted against third parties as well as the state. In the case of a dispute, the holder of a formal land tenure right can legitimately expect that right to be upheld by a court, and if necessary, enforced through the machinery and coercive power of the state, including actions by court bailiffs, the imposition of fines and ultimately even imprisonment for failure to comply with court orders. Formal land tenure arrangements are strongly influenced by European conceptions of land as reflected through the two main legal traditions: the civil law tradition and the common law tradition (see Box A).

BOX A

The main legal traditions

The civil law tradition applies in most European countries, including the formerly socialist countries of Central and Eastern Europe, nearly all the countries of Latin America, large parts of Africa, Indonesia and Japan, and the countries of the former Soviet Union.

The common law tradition, which emerged from the law of England, applies also in the Australia, Canada, India, New Zealand, Pakistan, Singapore and the United States and the remaining African countries that are not in the civil law tradition as well as other Commonwealth countries and a number of countries in the Middle East. Although the colonial period explains why European law was 'received' into the legal systems of so many countries, it is not the only reason. A number of countries that were never colonized, such as Japan, looked to European and subsequently North American law in revising or modernizing their own legislation.

A third legal tradition, socialist law, also has European roots. Following recent market-oriented reforms in countries like China and Viet Nam, socialist law tends to more closely resemble civil law. Finally, it is worth noting that the legal systems of some countries, such as South Africa have been influenced by both civil law and common law traditions (FAO, 2004).

As regards land tenure, a key focus of the European legal traditions has long been on private property rights and on the private ownership of land in particular. Land ownership rights confer the fewest obligations on the land owner and the greatest freedom as to how the land in question can be used. In addition to being entitled to choose how to use (or not use) the land, a land owner may make a gift of it, sell it, pledge it, bequeath it or mortgage it free from any interference by the state.

In practice, however, particularly in urban areas, landowners usually do not enjoy total freedom regarding the use of their parcel of land. Land-use planning legislation, as well as public health and environmental laws, may impose restrictions that affect, for example, the purpose for which the land may be used, how this purpose is fulfilled and the extent to which the parcel of land may be subdivided into smaller plots. However, such restrictions arise from other legislative sources and are not inherent to the bundle of rights and obligations that make up, for example, land ownership. This issue is considered in more detail below.

In terms of obligations, the burdens on a land owner that derive from land ownership are few. They typically include the duty to provide physical support to neighbouring land (e.g. no quarrying) and various duties relating to the passage of water (e.g. drainage).

Notwithstanding the important role of private land ownership, all legal systems envisage that some land may be owned by the state (or equivalents, such as the Crown or the Federal Government) and many have special legal rules for such holdings. In civil law jurisdictions, for example, a distinction is commonly made between state-owned land in the public domain and private domain state land. Land under the first category includes the land under roads, rivers, airports and other elements of national infrastructural importance that may not as a matter of principle be sold. On the other hand, state-owned land in the private domain may be sold to a private person and acquire the status of private land.

Not all jurisdictions, however, permit the private ownership of land. For doctrinal reasons, many governments have rejected the notion of private land ownership. On achieving independence, for example, many African nations vested their land resources in the state or in the president. Land was 'nationalized' to assert the power of the state over traditional chiefs and to allow the appropriation of land for development in the belief that the state would be best placed to manage and distribute land in the interests of all (Quan, 2000).

The other principal type of land holding envisaged under the European legal traditions is leasehold tenure, whereby land is leased by a landowner (or 'lessor') to a tenant (or 'lessee') for a specified duration in return for the periodic payment of rent. Leases can typically be granted by private landowners, as well as by the state or other public bodies.

In addition to describing the land that is subject to the lease, lease agreements (which are essentially a form of contract) typically set out a number of conditions as to how the land may be used, including how much rent is to be paid and how it is to be paid. Unlike the case of land ownership, lease agreements typically specify not only the purpose for which land may be used (e.g. home, shop, restaurant) but also how the land is to be used (e.g. prohibitions on playing of loud music in an apartment after a certain time of the day).

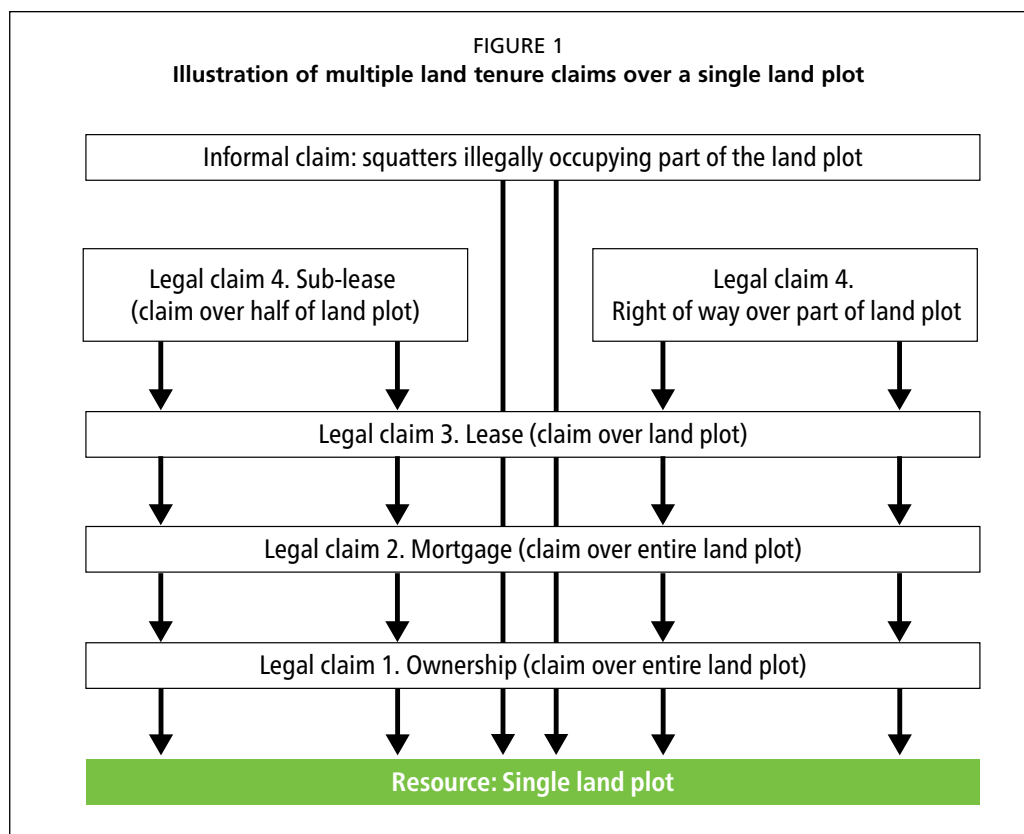
Depending on the purpose for which the land is to be used, the basic freedom of landowner and tenant to agree on the terms of a lease may also be subject to legislation adopted to achieve various socio-economic objectives, such as providing increased security of tenure to residential, commercial or agricultural tenants or specifying formal procedures for determining and/or restricting rent increases.

In countries where all land is held by the state, individuals may be granted long-term leases or long-term use or *usufruct* rights that do not involve the payment of rent. Such rights, like rights created by leases, may be subject to conditions that determine, among other things, how the land in question may be used.

Land ownership rights, lease rights and use rights may be held by an individual or jointly by two or more people. Various legal (and social) mechanisms exist to allow for joint ownership, including trusts and complex 'condominium' arrangements for buildings with multiple ownership. Another option is for individuals to hold shares

in a separate legal entity, such as a company or cooperative or association, that is then registered as the legal owner (or tenant or user) of the land and or building in question.

In terms of their scope, however, land tenure rights created under formal law extend far beyond ownership, lease and use rights. The unique and immovable nature of land means that a single parcel of land may be simultaneously subject to numerous overlying claims and legal rights, such as mortgage rights, rights of way over land, servitudes, lease rights and use rights (see Figure 1).



Land tenure recognizes a range of other relationships with land. For example, the temporary right to enter private land, such as a shop, office or even a house, can be granted by the owner or tenant of that land on the basis of what is known in common law jurisdictions as a licence. Such a licence may be explicitly expressed, in the form of an invitation, or implied, as in the case of a shop with sign on the door with the words ‘open’. The rights created by such a licence are always limited as to duration and purpose (an invitation to dinner is not the same as an invitation to move in) and can usually be revoked with minimum formality (the words “please leave now!” may suffice).

Many jurisdictions have formal rules about the rights that squatters may eventually acquire over land through ‘adverse possession’. However, the issue of squatters goes far beyond the simple issue of the illegal entry and occupation of land. In many countries, large populations live in illegal squatter settlements, often in squalid conditions without the most basic of amenities. How to resettle these people and how to provide the basic services that they need in the meantime, which implicitly recognizes their rights to occupy the land, are major land tenure policy questions.

Further questions may arise as to the relationship between the parcel of land's formal owner, often a man, and other family members. What interests, if any, do women and other members of the owner's family hold in the land? What rights do children and other family members have in the case of a breakdown in relationships?

Other key aspects of land tenure concern how interests in land are created and recorded. This issue has been an important focus of reforms over recent years in terms of strengthening land markets. In short, land tenure raises a number of complex issues (see Box B).

Finally, it is important to note that formal land tenure rights, including land ownership rights, do not have absolute security. In most, if not all jurisdictions, formal land tenure rights may be expropriated by the state on public interest grounds. Expropriation is usually subject to the payment of fair compensation to the holder of the right.

2.2 RELATIONSHIPS CREATED UNDER CUSTOMARY LAW

The recognition of the role of customary law in the definition of land tenure reflects a simple reality: in many parts of the world land tenure continues to be regulated by customary law. There are various reasons for this, and most relate in one way or another to colonial history.

In some, but not all, jurisdictions where indigenous populations now form a minority (in absolute or economic terms), the customary laws of the indigenous population, including those relating to land tenure, are recognized by formal law on the basis of treaties with the original settlers or the legislation (and case-law) of the modern state. Sometimes such rights may be recognized in the state constitution (Boelens *et al.*, 2012).

Elsewhere, particularly in Africa, decisions taken during the colonial era recognizing that customary land tenure law should continue to apply in settled rural areas, or in rural areas where there was no systematic settlement, have not been changed since independence. The result is that formal land tenure law applies in urban areas and customary law continues to apply in rural areas (Malawi Law Commission, 2006).

As noted above, customary law is a rather broad notion. Customary law may derive from ancient times, but equally it can change and adapt just like formal law. Customary or 'local' law may emerge from local practices resulting from the non-implementation or inappropriate adaptation of formal law. Given that customary law tends to be based on local reality, it can be better adapted to community needs than formal law adopted in a distant capital. However, it would be a mistake to romanticize customary law, which may have its own shortcomings in terms of equity, particularly regarding gender and social discrimination.

In contrast to formal law, with its focus on individual property rights, a feature of customary land tenure systems is the preponderance of community or group rights. Such rights may relate to fixed uses of land and the rights of nomadic people. Customary land tenure, like formal land tenure, also recognizes the presence of multiple claims over land.

The focus on individuals or groups is one of a number of tensions between customary law and formal law. The relationship between customary and formal water tenure regimes is usually not a particularly easy one. The basic question is one of legitimacy. The tenure regime that is perceived as more legitimate is more likely to be effective in a

specific local context. Questions of legitimacy may arise in a number of ways, ranging from the political (e.g. an ideological rejection of formal law and all that it stands for) to the practical (e.g. the state's failure to implement its formal law, leaving customary law to fill the land tenure vacuum).

BOX B

Blackacre: an example of land tenure complexity

Mr and Mrs Green decide to buy a parcel of privately owned land called 'Blackacre'. The Greens do not have quite enough money to complete the purchase, so they borrow from their bank. In order to safeguard its loan, the bank takes a mortgage or charge over the land plot at the time of the purchase. If the Greens fail to keep up their mortgage payments, the bank can seek an order that the land be sold so that it can recover its money together with interests and costs.

There are three houses on Blackacre. Mr and Mrs Green move into one house. The second house is rented to a family with small children on the basis of a six-month lease. Mr and Mrs Green agree that Mr Green's brother can move into the third house, which is rather dilapidated, on the basis that he will fix it up, after which he will be able to live there rent-free. Blackacre also includes some agricultural land. The Greens rent out one field to a local farmer. There is an old track across part of the land, which seems to be unused. There are many fruit trees on the land, which produce much fruit.

Then a number of land tenure issues arise. A group of people ('squatters'), without permission, move on to one of the fields and set up a camp. The Greens are advised that they must seek a court order to remove them, failing which the squatters may, after a certain number of years, acquire legal rights to remain on the land. The Greens have an argument with their farmer tenant over the time it is taking to remove the squatters and decide to end his lease. They are told that they may not do this, due to specific land tenure legislation that confers legal security on agricultural tenants. A neighbouring landowner begins to drive his car along the old track across the land each morning and evening. He claims that he is entitled to do so on the basis that he has an easement (or servitude¹) in the form of a 'right of way'. A local man starts to graze his sheep on part of Blackacre and to harvest the fruit trees. He claims he has ancient grazing rights and a right to harvest the fruit (*a profit à prendre*).

Mr Green's brother does considerable work on the house he lives in. One day, there is a huge argument between the brothers, and the Greens tell the brother to leave. He counters that he is entitled to remain in the house on the basis of the earlier agreement. The Greens decide to increase the level of rent payable by the family, and when the family refuses, tell them to leave. The family reply that they are entitled to benefit from social housing legislation, meaning that the rent is frozen, and that in any event, the lease is automatically extended indefinitely under the same legislation as long as the family wish to live there. Increasing financial pressures take a toll on the Green's relationship and they discuss divorce. Mr Green suggests that they sell Blackacre and divide the proceeds evenly. Mrs Green points out that she in fact put up most of the money and that their shares should be determined accordingly. Even if Blackacre is sold, the sale will be subject to the rights of the farmer, the family, the brother, the neighbour and the fruit harvester, not to mention the bank, which will have the first claim over the sale proceeds in order to recover its loan.

¹ These terms are largely synonymous. The former is used in the common law tradition and the latter in the civil law tradition.

In practice, the relationship between customary law and formal land tenure law is not always clear-cut. Customary systems are often shaped by contact with formal law (Cotula, 2011). At the same time, attempts to accommodate and codify local law may make things worse, creating power imbalances and injustice through elite capture (Krishnan and George, 2009). In addition, individuals and communities may 'play' the system, seeking recourse to formal or customary law depending on which one best serves their interests.

2.3 BEYOND LAW AND ANTHROPOLOGY

While land tenure arrangements are underpinned by the rules of formal and customary law, it is obvious that the scope of land tenure goes far beyond questions of law, whether it be formal law, as studied by lawyers, or customary law as studied by anthropologists.

Land is a primary production factor, a source of employment and a repository of personal wealth, and as such it performs an economic function of paramount importance. It follows that land tenure is an issue of immense interest to economists and policy makers. Following the end of the cold war, current orthodoxies, as reflected in the policies of governments and donor agencies, emphasised an increased role for private land rights, private property and the liberalization of market transactions in the land sector (e.g. De Soto, 2001).

In many societies, both social status and power depended, and continue to depend, on the size and structure of land holdings (Vogelsang, 1998). It also follows that land tenure is an inherently political topic, and issues relating to land tenure continue to resonate at the heart of political debate in many countries around the world. It is not uncommon for new governments to be formed (through the ballot box or otherwise) on the basis of land tenure reform agendas.

Questions of land tenure have always been linked to questions of power, both economic and political. Although the nature of land tenure issues varies from country to country, in terms of political priority, many similar questions continue to dominate the agenda, including: How to ensure the availability of affordable housing? How to simplify land transactions and make markets more efficient? How to regularize informal land use and squatting? How to provide land to the landless? How to bring customary tenure into the formal legal system? These issues in turn lead to land tenure reform programmes that may have quite distinct objectives, such as social equity or strengthened markets.

Governments adopt formal land tenure policies often as a precursor to legislative reform, even if distinct aspects of land tenure are addressed in separate laws. A range of professional disciplines (e.g. surveyors, economists, lawyers, sociologists, gender experts) constitutes a cadre of land tenure professionals. Every year thousands of pages are published on the subject of land tenure in journals and textbooks. Specialist land tenure centres exist to study and provide advice on land tenure and land reform.

The scope of tenure, when discussed in connection with land, goes far beyond the narrow question of the rules of formal and customary law that regulate rights over land. The next question, then, is how does the notion of tenure apply to water?

3. Conceptualizing water tenure – a preliminary typology

In conceptualizing water tenure, a logical place to start is the definition of land tenure mentioned at the beginning of part two. A modified version of that definition would be: “the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water”. This definition would, like the land tenure definition, recognize the role of both formal and customary law, as well as the fact that the rights and interests of both individuals and groups are to be considered.

However this immediately gives rise to a question: is water tenure really about the relationship between people with respect to water or to water resources? This question concerns two separate issues but arises from a single obvious fact: everyone needs drinking water to live.

The first issue involves the emerging ‘human right to water’ (see Box C). A legal right, the human right to water is a relationship with water in the abstract, rather than a relationship with water as a resource. In other words, the human right to water does not articulate a claim over particular water resources, i.e. over water contained for example in a specific river or stream. The nature of a human right is that everyone enjoys that right simply by being human. Although, as will be seen, water tenure has the potential to play an important role in ensuring the realization of the human right to water, the human right to water is of a different nature to the types of water right that can be included under the heading of water tenure.

The second issue concerns the manner in which the human right to water is (or should be) usually implemented, i.e., through the delivery of water supply services. The delivery of water supply services involves numerous elements including the abstraction of ‘raw’ water, the treatment of that water, the storage of water in reservoirs and/or a series of water tanks, the conveyance of the treated water under pressure through a

BOX C

The human right to water

The emerging human right to water (or more accurately the emerging human right to safe drinking water and sanitation), which is seen as an important mechanism for securing the supply of safe drinking water and the achievement of the Millennium Development Goals, received a significant boost on 28 July 2010, when pursuant to Resolution 64/292, the United Nations General Assembly voted to recognize the right to safe drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights. On 24 September 2010, the Human Rights Council affirmed that the human right to safe drinking water and sanitation is derived from the right to an adequate standard of living and inextricably related to the right to the highest attainable standard of physical and mental health, as well as the right to life and human dignity. Debate continues as to how the human right to water is best to be actualized in practice.

piped reticulation system to individual dwellings or a public stand pipe, together with the maintenance of the system, as well as the financial and administrative measures necessary to recover the costs of operation, maintenance and, in some cases, capital costs.

Water supply services are generally provided by private or public water utilities that are under a formal or statutory duty to supply clean water to consumers within a specified area and that are often, but not always, responsible for the removal and treatment of waste water. A person who holds property located within the service area of a utility typically has a right to a connection to the reticulation system and to the water supply services provided by that utility. This too is a kind of relationship with water. It is, however, a right to a service and not a right to a share of a specific water resource. A person who opens a tap is, by and large, indifferent to the provenance of the water. In addition, the volumes of water needed to satisfy personal domestic needs are relatively small compared with other needs (e.g. irrigation). It is hard to characterize such a relationship as a relationship of tenure. However, the bulk amount of water required to satisfy a city's demand for drinking water may be large, in which case the city itself, or its water provider, will necessarily become a stakeholder in the water tenure discussion.

In creating a working definition of 'water tenure', it would seem more appropriate to specify that the definition should be concerned with relationships relating to water resources. A modified working definition of water tenure might then be:

“the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources.”

Just as land tenure is concerned with claims relating to specific land plots (land tenure rights also do not exist in the abstract), water tenure is concerned with claims over specific water resources. It deals with claims relating to water in the natural environment, such as the water in streams, rivers, lakes and groundwater sources³. Just as each land tenure relationship relates to a specific plot of land, each water tenure relationship is concerned with a relationship with water contained in a specific source.

This distinction does not seem unreasonable, given that humans are land-based creatures and need land to survive. However, people do not enjoy a tenure relationship with all of the land encountered during the day (e.g. the land of the pavement, of the road, of the station, office or shop). It is true that legal rules may regulate access to such land and our behaviour, but we do not as individuals have a tenure claim over such land.

It does not mean that water tenure is irrelevant as regards to the water supply sector or the human right to water. As will be seen below, water tenure arrangements, in one form or another, regulate the abstraction of water from natural water sources for drinking water purposes. Without effective water tenure arrangements, it is hard to see how states can discharge their responsibilities regarding the human right to water. This applies as much to formal water rights, in the case of piped water conveyance networks, as to the protection of 'traditional' water sources. (COHRE *et al.*, 2007).

³ The precise scope of the boundaries of 'water resources' in connection with water tenure is an issue for further discussion. However there is no reason in principle why rainfall cannot be included just that in most jurisdictions the use of rainwater is entirely unregulated. Indeed in many countries the civil code explicitly recognizes the right of land owners to make use of the rain and surface water flow on their land. Only in a few countries are restrictions placed on rainwater use and harvesting.

What kinds of legal or customary relationship can be included under the heading of water tenure? As already noted, the debate over the allocation of water is typically couched in terms of water ‘rights’. But on closer examination there turns out to be a surprisingly large number of quite distinct types of water rights, just as there is a wide range of relationships that fall under the heading of land tenure.

Following the suggested definition of water tenure, it is useful to distinguish between those types of tenure relationships that are defined by formal law, i.e. the body of rules that are created on the basis of laws or acts of parliament adopted by the legislature (and in some jurisdictions derive from decisions of the courts) and are capable of being asserted before the courts and implemented through the power of the state, and those that are not.

In this respect, it is important to bear in mind that the practical relevance of law in connection with water tenure, whether formal or customary, will tend to increase with water scarcity and increased competition for water. In a situation of water abundance, formal legal rules may appear less important, especially for those who use water for *de minimis* needs and require little assistance or regulatory or technical intervention from the government. Water tenure arrangements are always context-specific. Equally, the presence or absence of different types of water tenure arrangements varies from country to country. A preliminary typology of such arrangements, using broad headings, is proposed over the course of the following paragraphs and summarized in Table 1.

TABLE 1
A preliminary typology of water tenure relationships

Type	Summary description	Strengths	Weaknesses
Tenure arrangements defined by formal law			
‘Traditional’ formal water rights	Usually land tenure based: rights to use water resources derive from land tenure rights. In parts of the Western USA and Canada they are based on prior use.	Arise automatically by operation of law (also depending on use in the Western USA and Canada).	May be out-dated in terms of hydrology/technology. Often difficult to quantify and enforce.
‘Modern’ formal water rights	Permit-based long-term rights (12-30 years or more) do not depend on land tenure rights. Property rights/quasi-property rights, valuable and capable of being asserted against the state and third parties.	Sophisticated, legally robust, potential to confer the highest level of tenure security. Rights holders have an interest in asserting them. Possibility of trading.	Depend on monitoring and measurement. May be costly to implement.
Regulatory licences	Short term (e.g. annual) licences to use water based on a command and control approach.	Relatively easy to legislate for and to implement on paper.	Very difficult to enforce. Rights are personal. Holders have very little incentive to comply.
Agency control	Extensive legal powers are granted to an irrigation/ water agency to abstract and use water resources.	Streamlined decision-making enables rapid infrastructure investment.	Risk of elite/political capture. Little room for water users to participate in decision making.
Water supply contracts	Contracts, usually written, for the bulk supply of water for irrigation, industry or other purposes using water infrastructure.	If of sufficiently long duration can create strong rights to water delivery.	Annual contracts provide little water security.

Commonhold water tenure	Rights to water held in common by a distinct community of users such as members of a WUO.	Enable large numbers of users to benefit from common infrastructure	Highly dependent on effective governance within, say, the relevant WUO
Investment contracts	Rights to use water resources are created on the basis of investment contracts. Arbitration awards in the case of foreign investors enforceable under international law through seizure of host state assets	Can be rapidly concluded. In theory confer the highest level of legal security for foreign investors.	Typically confidential. Do not automatically bind other water users and so difficult to enforce except through arbitration.
<i>De minimis</i> rights – small scale	Right to abstract and use small quantities of water without administrative formalities for non commercial uses such as drinking and meeting basic needs, bathing etc.	Arise automatically. No need to obtain a licence or permit.	Rights to water cannot be asserted. No independent security.
Exempt commercial uses	Right to use specified quantities of water in specified areas for specified commercial purposes	Relevant users are exempted from obtaining a permit/licence.	Difficult to actively assert.
Reserves/minimum flow requirements	Specify mandatory amounts of water to be left within water bodies.	Ensure that sufficient water is provided for environmental services and small-scale and inland fisheries/non-consumptive livelihood uses	Cannot be asserted by water users. Reliant on water administration action.
Tenure relationships not defined by formal law			
Customary water tenure	Rights to abstract/and or use water resources based on customary/local law	May be robust/enforceable at the local level	Difficult, often impossible, against formal water tenure arrangements.
Religious law	Rights with regard to the use/protection of water/ water resources based on religious teachings.	Sophisticated, legally robust, potential to confer the highest level of tenure security. Rights holders have an interest in asserting them. Possibility of trading.	May be long established and widely supported by the relevant faith.
Informal water tenure	Use of water that is not legally recognized.	No administrative burden for users.	No formal security.
	Illegal uses that are tolerated by the water administration sometimes for years	Some degree of <i>de facto</i> security.	Can be withdrawn at any time. Possible risks of sanctions under administrative/criminal law.
Assumed rights and impossible rights	Formal water rights are wrongly assumed to exist due to the 'official' nature of the use.	None	No legal security.
	Lack of legal personality means organizations cannot hold formal water rights	None	No legal security.
Unrecognized water tenure	A range of economic/ livelihood activities that relate to the use of water resources such as inland fisheries, use of wetland resources etc., that are not typically regulated by water law.	May be protected under customary law	Typically invisible to water law/water law administrations and thus no security.

3.1 TENURE RELATIONSHIPS DEFINED BY FORMAL LAW

3.1.1 'Traditional' formal water rights

With the exception of the prior appropriation doctrine (see Box D), in both of the main legal traditions, formal water rights traditionally derive from land tenure rights. It is necessary to hold a formal land tenure right in order to hold a formal water right over adjacent or subadjacent water resources.

Many jurisdictions in the civil law tradition distinguish between the 'public waters' of major rivers and the 'private waters' of other water sources, such as smaller rivers and streams and groundwater. While an administrative permission was necessary for the use of public waters, this was not necessary in the case of private waters. The right to use private waters, both surface and underground, derived from land ownership, which recognized the right of owners to use at their pleasure the water existing upon their land without any limitation.

In contrast, the 'riparian' doctrine of the common law tradition, which was developed by the courts in England and North America in the nineteenth century, recognized the specific rights of riparian land owners to make reasonable use of the water in a water course for various purposes. This was subject to the caveat that uses not considered 'ordinary' were only permitted if they did not interfere with the rights of other riparian land owners both upstream and downstream. With regard to groundwater, the common law doctrine of 'capture' provides that there is no property in groundwater until it is abstracted. This creates an open access regime under which a landowner can pump water irrespective of the impacts on neighbouring wells or boreholes.

The main advantage of 'traditional' formal water rights, other than those created under the prior appropriation doctrine, is that they are somewhat self-contained, given that the existence of such rights derives as a matter of law from existing land tenure rights. Because they are tied to land tenure rights, a formal mechanism, with associated bureaucracy, for their creation is not necessary. As long as a person has a land tenure right, in an appropriate situation, that person also has a water right. Similarly each landholder is responsible for asserting his or her water rights against third persons. Again, there is no need for enforcement by water administration.

However, within these advantages also lie some of the main defects of 'traditional' water rights. The legal rules can be easily stated, but what do they actually mean? Water is a single resource, so how is it possible to establish a logical distinction between

BOX D

The prior appropriation doctrine

The prior appropriation doctrine developed to serve the practical demands of nineteenth century water users in the western United States and Canada. Water rights are acquired where a person intentionally applies a particular quantity of water to a particular beneficial use and continue as long as the beneficial use is maintained. The date of the appropriation determines the user's priority to use water, with the earliest user having a superior right in times of low flow (see FAO, 2006).

‘public’ and ‘private’ waters? What constitutes the ‘ordinary’ use of water in terms of a riparian water right? And while the doctrine of capture may have been perfectly reasonable one hundred years ago, now the increasing demand for water and the availability of technologies (e.g. cheap highly efficient vacuum pumps) means not only that rivers and aquifers can be rapidly depleted⁴ but that pumping ‘wars’ eliminate all semblance of security. This leads to the key point: ‘traditional’ formal water rights are increasingly unable to effectively regulate access to water resources. This is why many countries have moved from ‘traditional’ formal water rights to ‘modern’ formal water rights (discussed in the next section) that are distinct from land tenure rights.

However, ‘traditional’ formal water rights are still relevant in many situations and cannot be ignored. The doctrine of prior appropriation still applies in many western states of the United States and in some Canadian provinces. In general, ‘traditional’ formal water rights are still relevant in countries that have not yet introduced ‘modern’ formal water rights. As the Indian case study shows, the common law doctrine of capture, as reinforced by the 1883 Indian Easements Act, still applies to groundwater abstraction. Even in countries where ‘modern’ formal water rights have been introduced, ‘traditional’ formal water rights may continue to play a residual role. This is the case, for example, in Spain where some water users continue to rely on ‘traditional’ formal rights to groundwater, which is based on the notion of private waters (López-Gunn *et al.*, 2014).

3.1.2 ‘Modern’ formal water rights

Key features of ‘modern’ formal water rights (FAO, 2006) are that: (a) they are created on the basis of a legal instrument, described in this paper as a ‘permit’, and; (b) they do not arise automatically from land tenure rights. They authorize the abstraction and/or impoundment and use of water in a natural watercourse either as a share of the available flow or, in the case of a regulated river, as a specific volume (see Box E).

An important point to note is that, as modern water rights are generally introduced to replace or update existing traditional water rights, they are usually designed to provide an equivalent degree of security in order to prevent claims of expropriation by those whose ‘traditional’ formal water rights are replaced. Although formal water rights are

BOX E

Activities subject to a ‘modern’ formal water rights regime

Apart from the use of water, a number of other activities must be regulated within or in coordination with a modern water rights regime due to their impact on water flows and water quality, as well as on formal water rights and other types of water tenure arrangement. These include: the diversion/restriction/alteration of the flow of a water course; the alteration of bed/banks/characteristics of water courses; the extraction of gravel and other minerals from water courses; the reuse of water; navigation; and the discharge of wastes or pollutants to water courses.

⁴ Aquifers are never, or very rarely emptied (e.g. pumping of fossil groundwater), because water is a renewable resource that is constantly being replenished.

rights of use and not ownership rights, they nevertheless create a form of property right or quasi-property right⁵. Consequently, just like formal land tenure rights, formal water rights (both traditional and modern) are capable of being asserted against third parties and the state.

Also, as is usually the case with land tenure rights, they may not be expropriated by the state without the payment of compensation. In introducing a system of ‘modern’ formal water rights, the intention has generally been to replace one kind of property right, i.e. a ‘traditional’ formal water right, with another, i.e. a ‘modern’ formal water right. Primary legislation is necessary for the introduction of ‘modern’ formal water rights (FAO, 2006).

‘Modern’ formal water rights tend to be time limited. Often a distinction is made between ordinary uses where permits may last between 8-15 years, and large-scale uses involving major investments (e.g. hydropower dams) where permits may last between 25-70 years. The time-limiting nature of ‘modern’ formal water rights means that the water subject to these rights can be re-allocated as needed at the end of the term of these rights without the need to pay compensation. The ability to re-allocate water resources in this manner in order to respond to variations in water demand and/or environmental needs is beneficial in terms of water resources management.

‘Modern’ formal water rights are typically subject to conditions that regulate how water is used and prevent or mitigate negative third party or environmental impacts, and are typically also subject to the payment of an annual use fee (see Box F). Water legislation typically also provides for the temporary suspension or modification of ‘modern’ formal rights in times of low flow and drought (without the payment of compensation).

‘Modern’ formal water rights are relatively robust and legally sophisticated instruments. They enable the state to rationally and clearly allocate water among different users and water use sectors while conferring sufficient legal security upon rights holders to enable investment.

The downside of ‘modern’ formal water rights is their cost both in terms of introducing a ‘modern’ formal water rights system and implementing it. In contrast for example to land tenure rights created through land tenure reforms, which, once completed, require little in terms of management, modern water rights are subject to active management by the state agency responsible for water resources (hereafter referred to as the ‘water administration’) in terms of determining seasonal allocations by reference to water flow (or the state of a relevant aquifer), planning, monitoring and enforcement, and safeguarding water quality.

This is not to suggest that ‘modern’ formal water rights are entirely dependent on state enforcement. Just as it is up to each land holder to ensure the enforcement of his or her land tenure rights, water rights holders have an obvious interest in taking active steps to ensure that their rights are enforced against the state and other water users because ‘modern’ formal water rights are of value to them. Nevertheless, it is much more complicated to ensure enforcement of water rights than of land rights. The fact remains that the implementation of ‘modern’ formal water rights regimes does imply certain routine expenditure and this may explain why, generally speaking, ‘modern’

⁵ There is no legal reason why property rights cannot be created on the basis of legislation through a legal procedure such as the issue of a permit: intellectual property rights such as patents are created in this way.

BOX F

Conditions applicable to 'modern' formal water rights

General conditions typically require:

- that use be made of the water that is subject to the water right, failing which the right will lapse. This is to prevent speculation and hoarding;
- water to be used only for the purpose for which it was allocated (e.g. agriculture, industry);
- water protection measures to be undertaken;
- the treatment of any waste water prior to its discharge;
- the return of any unused water to the water course from which it was abstracted; and
- the payment of any applicable water fees or charges.

Specific conditions are, as their name suggests, specific to each individual water right and enable a water administration to impose additional controls on how water is used to minimize specific third party and environmental impacts relating to individual uses. Common examples of specific conditions regulate the point at which water may be abstracted, how water is to be abstracted, the place where it may be used, the specific purpose for which it may be used, how water is to be used, the time or periods during which water may be used and precisely how wastewater is to be treated on the basis of a range of different types of standard, including discharge standards and process standards.

formal water rights regimes have tended to be effectively introduced in industrialized countries. In countries where the state and its water administration are weak, it may be more difficult to implement a 'modern' formal water rights regime.

3.1.3 Regulatory licensing

Regulatory licensing, while sharing some similarities with 'modern' formal rights, is a distinct form of water tenure. Under this approach, short-term licences⁶ are issued to control and regulate various activities pertaining to the use of water resources, including the abstraction of water from surface and groundwater sources, and the discharge of wastewater (see Box G).

The main similarity that regulatory licensing shares with 'modern' formal water rights is the use of a legal instrument, which in this paper is referred to as a licence. Like modern water rights, regulatory licences may contain conditions that specify how a given activity is to be undertaken. The undertaking of such an activity without the necessary licence, or in ways that are not in accordance with the conditions of the licence, may be punished as an offence.

⁶ Confusingly the words 'permit', 'licence', 'consent', 'authorization' are generally not terms of art, in the sense that they do not have a uniform legal meaning. Unless legislation in a particular jurisdiction seeks to give such words a particular legal meaning they tend to be used interchangeably. In the context of the present discussion, in some jurisdictions 'modern' formal water rights may be created on the basis of legal instruments called 'licences', while shorter-term rights to use water resources, which are described in this paper as 'regulatory licences', may be created on the basis of legal instruments that are described as 'permits' (or 'consents' or 'authorizations').

BOX G

Water tenure, property rights and quasi-property rights

As noted formal water rights are a kind of property right or quasi-property right. While a full discussion of the term ‘property’ is beyond the scope of this paper, it is useful to consider this point in more detail in terms of regulatory licences, which do not by their nature create property rights.

While often used as a kind of shorthand for ownership, the word property (like the word tenure) derives from Norman French and means something that belongs to someone (originally something that was ‘proper’ to that person). Property rights include, but go beyond, ownership rights. For example, a patent is an intellectual property right.

Different disciplines have their own conceptions of property, with legal analysis tending to use the notion of the bundle of rights and duties that arise from property. However, a common element of the idea of property is the right to exclude others either from a physical space, as in the case of land, or from the right to use the substance of the property right (e.g. patent holders can exclude others from using their invention). The holder of a ‘modern’ formal water right can exclude others from interfering with the flow of water to which that right relates.

In common law, a licence, such as an implied licence to enter into a shop or an administrative document like a driving licence, does not confer any property on the licence holder and does not provide any basis for excluding others (e.g. to enter into the shop or from driving the car). Such a limited licence may render conduct that would otherwise be illegal legal, but no more than that. One of the common tests for property rights is the right to sell or dispose. Not all ‘modern’ formal water rights permit this, and that is why the term quasi-property right is also used in this paper.

However the main difference between regulatory licensing, sometimes called ‘command and control’ regulation (e.g. Lankford and Hepworth, 2010), and ‘modern’ formal water rights, is that the former do not create property rights or quasi-property rights over water resources. They are of short-term duration (e.g. one year), even in the case of water abstraction. They may be renewable (and they may in practice be renewed). However, their short duration and personal nature makes them quite different in substance and nature to a ‘modern’ formal water right in terms of the extent to which such rights are capable in practice of being enforced against third parties and the state.

In cases where a water law indicates the length of such licences, the legislator’s intention to create a regulatory licensing regime is clear from the legislation itself. In cases where the law does not itself specify the duration of the licences and leaves all of the detail to subordinate legislation, the intention of the legislator is less easy to define.

The key point to note about short-term regulatory licences is that, apart from the risk of being caught and punished, which may in practice be negligible, they otherwise offer no obvious incentive for encouraging compliance.

While a licence may confer a narrow kind of legal right to use water (but only in the sense that such use is therefore no longer illegal), the security it provides is so precarious that it does not constitute a sound basis for an investment. In terms of security, such 'rights' are clearly less than property rights or quasi-property rights. This in turn implies costly and burdensome enforcement activities by the state.

3.1.4 Agency control

Another approach to water tenure is to vest extensive wide ranging or even unlimited powers over water resources on a government agency, such as an irrigation agency or a regional development authority. Under this approach the state, acting through agencies, is deemed to know best, rather like the case of state-owned land. In India, for example, the legislation typically confers extremely broad powers upon irrigation departments to take and use water as necessary to fulfil its development mandate. The Northern India Canal and Drainage Act of 1873 introduced the legal assertion of the 'right of the government' (i.e. the state) to "use and control for public purpose the water of all rivers and streams flowing in natural channels, and of all lakes". Similarly in Mali, the widely studied Office du Niger enjoys extremely broad powers to allocate water within its area of responsibility in contrast to small-scale farmers who enjoy little if any water tenure (or land tenure) security.

The main advantage of this kind of approach, which in this paper is described as 'agency control', is that it facilitates rapid development. A disadvantage, however, of conferring excessive powers on such 'hydraulic bureaucracies' (Molle *et al.*, 2009) is the fact that this can lead to unbalanced development, particularly if irrigation agencies are placed under political pressure to construct new infrastructure rather than managing existing irrigation systems. The situation is particularly acute where there are unhealthily close links between hydraulic construction companies, politicians and irrigation agencies.

In such circumstances, individual water users and farmers may effectively find themselves at the mercy of irrigation agencies that enjoy almost complete control over the allocation of water. This situation can in turn lead to rent-seeking behaviour by agency staff in terms of water delivery.

In places where there are severe water shortages, agency control may be easy to justify at the political level, but in practice it may also result in insecure water tenure for individual water users.

3.1.5 Water supply contracts

The need for irrigation leads to another type of water tenure. Many water users and most irrigators around the world do not have direct access to a water source, particular for surface irrigation. Instead, water is delivered to such users by an irrigation agency on the basis of a water supply contract. In some countries irrigation agencies also supply water to industrial users and to urban areas for domestic water supply purposes. Given the role of irrigation in meeting food security need, this is an important type of water tenure.

In such cases, the person supplied with water has the right not only to a quantity of water but also to the service supplying the water. The Indian case study provides a number of examples of such types of contract under which water may be supplied for irrigation or other uses, such as industry.

Such contracts may be concluded with the final user of the water, such as a factory or an individual farmer, or to an intermediary, such as a water user organization (WUO), which is turn responsible for delivering water to individual farmers. This is described in the section on commonhold tenure that follows.

This situation shares some similarities with urban water supply. The water user has no direct access to the water source and what is provided is the service of water delivery. Nevertheless, there is still a clear relationship to the resource, in that the actual quantity of water delivered will depend on the availability of water in a particular source, such as a river or reservoir. In the case of irrigation, a farmer will typically demand the supply of a specific quantity of water (or a specific number of irrigations) in advance, whereas few urban consumers calculate their water needs based on the number of annual baths they wish to take. Also, urban water supply entities provide water on the basis of a statutory duty rather than on the basis of a contractual right.

In practice, there can be significant differences from jurisdiction to jurisdiction as to the content of water supply contracts in terms of their duration and the overall legal security they provide. In some jurisdictions, water supply contracts are concluded annually. Elsewhere, as in the case of France and the United States (for contracts concluded with the Federal Bureau of Reclamation) they are of indefinite or long-term duration (e.g. 30 years). In such cases, the long-term framework contract is typically supplemented by annual water delivery agreements that can take account of both fluctuations in the available supply of water and variations in water demand, which may change depending on, for example, the types of crop to be grown.

3.1.6 Commonhold water tenure

Particularly in the irrigation sector, the rights of individual farmers to receive water derive from a common or shared right to water held on their behalf by a WUO. Such a right may be in the form of a 'modern' formal water right held by the WUO or a bulk water supply contract to which the WUO is party. These collective rights are held in common by all of the beneficiaries, hence their description in this paper as 'commonhold tenure' (see Box H).

The Spanish case study clearly explains how this form of water tenure functions. 'Modern' formal water rights are held by WUOs, each of which is in turn responsible for distributing irrigation water within a defined area.

The right of individual farmers is a right against the WUO to a share of the water that it abstracts or receives, as well as the service of delivering that water on time to their field. The farmers also have rights against the WUO in terms of its governance, such as the right to vote in elections or to stand for office, and the duty to comply with the rules of the WUO.

The relationship goes beyond that of a purely contractual arrangement, i.e. the rights to a quantity of water and the service of delivering that water, to include rights against the

BOX H

Commonhold tenure and water user organizations

Over recent years, many developing countries devolved a range of water management tasks from state agencies to participatory, autonomous and financially self-supporting WUOs. A similar process has taken place in many transition countries as a result of land and agrarian reforms. At the same time, while the long established WUOs in many countries in Europe and the Americas operate on the basis of specific legislation, in a number of developing countries, they operate on the basis of customary law as they have done for centuries. Many WUOs are responsible for the operation and maintenance of irrigation systems and for supplying their participants with irrigation water. Although they have different names, vary greatly in size (being responsible for systems that irrigate only a few hectares to those that cover several thousand hectares) and operate in quite distinct socio-economic contexts (from large commercial farms in California to the tiny landholdings of farmers in Ethiopia) WUOs share a common basic approach. They are governed through elected bodies by their participants: the farmers and land holders whom they serve. The participants are also responsible for paying for the operations of the WUO and determine the level of service they are willing to pay for. Each participant is subject to the rules of the relevant WUO but also benefits from a series of rights against the WUO, including the right to a share of the water that the WUO receives and rights relating to the governance of the WUO, including the right to participate in elections and inspect the WUOs accounts and records.

While WUOs are premised on the idea that their participants have a common interest in working together, some participants may well be in competition with each other for land and water resources. There is an inherent risk of conflict within WUOs, which requires particularly robust governance arrangements. Experience suggests that while it is usually possible to legally establish WUOs on the basis of existing legislation using existing legal forms, such non-governmental organizations (NGOs), cooperatives or even companies, this approach is not sustainable due to a number of inevitable legal problems. Instead, in countries with a long WUO tradition, WUOs are invariably established as a special legal form on the basis of specific legislation that clearly set out the rights and duties of WUO members and ensure that each WUO has appropriate internal governance structures to promote effective performance and minimize the risk of conflict. The net result is that the effective realization of the right of each WUO participant to irrigation water for example, is entirely dependent on the performance of the WUO (see FAO, 2009). A particular challenging situation is created when WUOs are established in a top-down manner, often with donor support, and lack the necessary legitimacy among water users to ensure their relevance and effectiveness.

WUO itself. The right of an individual farmer to water depends entirely on the correct functioning of the WUO. If a WUO does not operate effectively, or if farmers are not even aware that they are members of a WUO (see Box I), then the relationship between farmers and water resources is adversely affected and this has a direct and immediate impact on the tenure of individual farmers.

3.1.7 Investment contract rights

A more recent type of water tenure derives from rights that are created on the basis of an investment contract. Under such contracts an investor, typically a foreign investor, enters into an investment contract with a host government, or a ministry or agency of

BOX I

'Secret' WUOs?

During the field work in preparation for the Indian case study, none of the villagers interviewed were aware of a WUO in one study area village, even though irrigation department officials confirmed that there are WUOs on all minor and subminor canals in the command area fed through the canal. These WUOs submitted their written estimates of seasonal water requirements, without which canal water could not be supplied to the village. Informally, however, a subengineer with the irrigation department said that the WUOs do not really function, although members are listed and someone from the village submits the seasonal request on behalf of all farmers in the village (James *et al.*, 2014).

the host government, to use an area of land and other natural resources for commercial activities.

Recent years have seen significant investor interest in the agriculture/agribusiness sector in a number of countries, particularly in Africa, on the basis of long-term concession agreements for the use of state land. As abundant water and fertile land are exactly what private investors need, these agreements often also confer rights over water (Cotula, 2011). This type of approach is also used for hydropower and industrial investments, which may specify the volume of water that may be impounded or used.

In countries that do not have an effective 'modern' formal water rights regime in place, this type of approach may be the only way in practice that a host government can use to attract investments in activities that require substantial volumes of water. Without such a regime, investors and their lenders will seek to include the water-related aspects of an investment, including the creation of some form of 'water rights', in the investment agreement itself. This creates a specific type of water tenure, one that may benefit from additional legal protection on the basis of international investment treaties and agreements.

More specifically, under an investment contract, disputes are typically resolved through independent international arbitration rather than through the courts of the host country. Leaving aside the fact that international arbitration is often costly and that many developing countries may struggle to arrange adequate representation, the key point to note is that the enforcement of arbitral awards is specifically regulated by global treaties, such as the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards. The New York Convention requires state parties to recognize awards as binding and to enforce them within their jurisdiction. If a host state does not comply with an award, the investor may seek to enforce the ruling in the national courts of a third country where the host state holds interests. Provided that the third state is party to the New York Convention, enforcement could be done for example by seizing goods or freezing bank accounts (Cotula, 2010)⁷.

Because these are commercial agreements they are very often subject to strict confidentiality requirements. Consequently not only are such contracts negotiated in conditions of secrecy, but in some jurisdictions only the investor and the government of the host state are privy to their content (see Box J).

⁷ Also noteworthy is the International Center for the Settlement of Investment Disputes (ICSID) hosted by the World Bank. The 1965 ICSID Convention, which is the legal basis for the creation of ICSID, has similar rules as regards the enforcement of arbitral awards issued by ICSID.

BOX J

Hydropower concessions in the Lao People's Democratic Republic

In the Lao People's Democratic Republic, in accordance with article 13 of the Law on Water and Water Resources, the use of water for hydropower generation is regulated on the basis of specific legislation: the Law on Electricity 2008, as amended. The Law on Electricity in turn provides for hydropower investments to be undertaken on the basis of 'concession agreements' between the Government and foreign investors, most of whom are foreign. More than 15 of such concession agreements, which are understood to confer 'water rights' on the investors, have been concluded to date. Unfortunately no one, apart from the relevant government officials and the investors themselves, know what these agreements actually say, as they are commercially confidential.

3.1.8 *De minimis* (small-scale) free uses

Due mainly to considerations of cost and administrative convenience, in most jurisdictions, small-scale or *de minimis* uses of water are exempted from formal water rights regimes or from the need obtain a regulatory licence.

The main rationale for exempting small-scale *de minimis* uses of water, sometimes called *de minimis* rights, from a modern water rights regime is essentially practical. It is simply too difficult and too costly to bring small-scale users within a permitting regime. Consequently, small-scale water users are spared the trouble of obtaining and periodically renewing permits, and water administrations are spared costs of administering hundreds or thousands of small claims over water resources.

De minimis uses that are recognized under this heading typically include the use of water resources for drinking and meeting basic household needs, the watering of livestock, domestic animals and poultry, recreational uses, such as swimming and bathing, the watering of garden plots and firefighting (see Box K). Sometimes the distinguishing characteristic of a *de minimis* use is the absence of any form of permanent structure to divert and use water.

Another approach is to describe *de minimis* uses by reference to the volume of water used and/or the area on which may be used (e.g. for irrigation). However, in practice this can be difficult to monitor.

Another type of *de minimis* use relates to water abstracted from wells. A range of approaches are possible with respect to such groundwater abstractions that affect a number of key issues, including the volume used, the area on which water is to be used and for what purpose. In some countries, all abstractions from wells are still regulated on the basis of land-based water rights and do not need a permit even if they are qualified by a requirement for 'reasonable' or 'beneficial' use.

De minimis uses are often of particular importance in developing countries where people rely on access to water in natural sources to meet their basic and livelihood needs (e.g drinking water gathered from streams and rivers). As such, *de minimis* use provisions can reflect customary and religious law regarding moral rights to use water for drinking. Women who are responsible for gathering water in many cultures may be particularly reliant on this category of water tenure.

BOX K

South Africa – Schedule 1 entitlements

As described in the case study, in South Africa, a person may use small quantities of water for use for domestic purposes, limited to single household use. This is defined as ‘Schedule 1’ water use. Schedule 1 entitlements include the use water in or from a water resource for reasonable domestic use (e.g. non-commercial domestic gardening, animal watering, water harvesting and firefighting) and recreational use. The water may be abstracted directly from any water resource to which that person has lawful access. The water may also only be used on land owned or occupied by that person.

One issue that arises from the concept of *de minimis* use right is that, while individual uses may be limited, in very densely populated areas, the combined volume of individual rights may become significantly important in relation to available resources. If *de minimis* use is not correctly accounted for in the overall assessment of supply and demand, it can have unexpected consequences on the overall sustainability of water use. This is particularly the case with private wells in groundwater aquifers.

3.1.9 Exempt commercial uses

While *de minimis* uses are typically not only small-scale but also non-commercial, in some jurisdictions provision is made for larger-scale ‘free uses’ of water resources. In these case, users do not require a formal water right or licence for commercial activities that are done on a relatively small scale.

In South Africa, in accordance with the Water Act, the water administration can authorize large numbers of people to use water resources without the need for a permit. General authorizations are intended specifically to make it easier for the rural poor to abstract water, including include resource-poor farmers who would not need to be ready to apply for a permit and other uses of smaller amounts of water by many people (Department of Water and Sanitation of the Republic of South Africa, n.d). As with *de minimis* uses, a permit or licence is not necessary but the scope of such uses is defined or regulated (Crafford *et al.*, 2014).

Sometimes, this type of tenure arrangement may apply to an entire sector. In Belize, for example, the new water act (Section 27 (1) of the 2010 National Integrated Water Resources Act, No. 19 of 2010) provides for a regulatory licensing scheme for the use of water resources but exempts irrigation, apart from flood irrigation, from its ambit. In Ethiopia, a distinction is made in the water law (Article 12(1)(b) of the 2000 Water Resources Management Proclamation No. 197) between traditional irrigation, using farmer constructed earth canals, which may be undertaken without a permit or licences, and irrigation using concrete canals or structures which may not.

3.1.10 Reserves/minimum flows

Just as water laws can be used to specify the amounts of water that may be abstracted from rivers and other water bodies, they can also be used to specify the amounts that should remain there. This can be done in a number of ways. One way is to specify minimum or ‘environmental’ flows for rivers as described in the Spanish case study. Another approach, which is described in the South African case study, is to specify a ‘Reserve’. In accordance with the South African Water Act, the Reserve consists of two parts, the reserve for basic human needs and the ecological reserve. The ecological reserve deals with water required to protect aquatic ecosystems. The Reserve considers both the quantity and quality attributes of water. This water therefore indirectly secures the delivery of aquatic ecosystem services (Crafford *et al.*, 2014).

These kinds of provision always have a public interest objective (e.g. maintaining healthy river ecologies, ensuring sufficient water for navigation or ensuring that enough water to meet *de minimis* or regulated free uses).

3.2 TENURE RELATIONSHIPS THAT ARE NOT DEFINED BY FORMAL LAW

3.2.1 Customary water tenure

In many places, customary or local law remains the dominant legal paradigm for water tenure. A failure to recognize this fact may not only have severely negative impacts on the lives and livelihoods of rights holders under customary law, but will also hinder or even subvert attempts to introduce broader sectoral reforms.

In some countries in Africa, for example, customary water tenure may form part of a broader legal framework that applies to the use of other resources, such as land and forests. This is similar to what formal law traditionally did in terms of land and water rights. Elsewhere, local law may emerge to create informal but effective rules that apply within and among groups of water users.

There can also be significant variations in terms of the principal actors under customary water tenure. For example, customary law often emphasises the role and rights of groups or communities rather than individuals. Rights to water resources are therefore often a kind of group right. At the same time customary law, including rules relating to the use of water resources, may from certain cultural perspectives be perceived as unfair or even discriminatory, particularly as far as women and non-dominant religious or ethnic groups are concerned. Customary rights to water resources typically form part of a complex framework that regulates access to other natural resources. Depending on ethnicity or livelihood, multiple user groups may enjoy rights within a customary framework.

The resilience of customary law usually depends on historical factors, particularly colonial settlement and the ‘reception’ or introduction of colonial legal systems from Europe. In some Latin American countries, for instance, local laws that regulate the use of water resources by indigenous people have been largely by-passed by formal tenure rules. At the same time, attempts to introduce unpopular water sector reforms

in these countries have been derailed by indigenous communities, partly because of the perceived negative impact of the reforms on customary water tenure (Boelens *et al.*, 2013).

Elsewhere, customary law applies because formal law has not been applied in particular areas, or it has failed to keep up with developments at the local level. In Africa, for instance, customary water tenure rules may apply within a specified area that is recognized by formal law as subject to customary land law. In other places, the formal law and the tenure regimes that it provides for may be perceived as the law of the ‘outsider’, the other, the colonial invader, and there may be no formal recognition of customary law at all. The position may be further complicated by the existence of different customary law regimes. Sometimes, customary law rules regarding water tenure apply only within particular societies. Elsewhere they may regulate the access that different societies, tribes or user groups, (e.g. pastoralists and farmers) have to the same resource.

Increasingly, customary and local law rules relating to the use of water resources are under pressure, not only as a result of an increased overall water demand but also as a result of investments concluded on the basis of investment contracts, particularly investments from abroad backed up by foreign investment treaties (as described above). At the stroke of a pen, these contracts can disenfranchise entire communities of water users.

Some protection may be afforded to indigenous peoples by international law, but primarily with reference to their land resources. For example, pursuant to article 8(2) b) of the 2007 United Nations Declaration on the Rights of Indigenous Peoples, states are required to provide effective mechanisms for the prevention of, and redress for, any action that has the aim or effect of dispossessing indigenous peoples of their lands, territories or resources. Article 10 goes on to provide that indigenous peoples are guaranteed the right not be forcibly removed from their lands or territories, and that no relocation shall take place without their free, prior and informed consent and after reaching an agreement on just and fair compensation and, where possible, the option of return. It is not clear how these provisions would protect an indigenous community that is deprived of its water resources but not its land.

As with land tenure, the relationship between customary water tenure and formal law is not always clear-cut. While in some jurisdictions customary water tenure receives formal recognition in treaties, constitutional provisions or even in water legislation, it can in practice be difficult to reconcile conflicts between quite separate normative regimes (See Burchi, 2005).

3.2.2 Water tenure under religious law

Another category of water tenure derives from religious law and may or may not form part of customary law. Islamic rules regarding water tenure continue to play a particularly important role in establishing relationships with water resources, allocating these resources and in shaping peoples’ attitudes to water and its tenure (Caponera and Nanni, 2007). Other traditions may also have specific codes for how particular areas of religious significance, such as sacred groves, are to be protected and/or used.

3.2.3 Informal tenure

Relationships with water resources may also be based on informal arrangements that are not legally recognized. Sometimes these uses may be tolerated by the water administration because the law is ill-adapted or because it convenient to do so. In many jurisdictions in India, for example, ‘out of command’ irrigation, where water is pumped from irrigation canals is strictly illegal and yet widespread. Other examples of irrigation engineers turning a blind eye to illegal uses of water are detailed in the Indian case study.

In 2013, at the FAO’s Near East and North Africa Land and Water Days event, an example was given of illegal groundwater use for date growing in southern Tunisia that has long been tolerated by the water administration even though the administration is at pains to stress that no rights are created over the water resources in question. The comparison with land tenure and squatters rights is interesting in this respect.

The other type of ‘informal’ use is just a euphemism for illegal water use. While everyone knows that illegal water use takes place all around the world, the water sector seems to lack the appropriate vocabulary to discuss this matter as anything other than as a regulatory, or law and order, issue.

The contrast with land tenure in this respect is striking. In the land tenure sector, the issue of informal settlements is openly discussed in the literature and in practice, along with the associated challenges that arise in terms of mitigating the residents’ hardships, some of which relate to water (e.g. UNECE, 2009). For example, the construction of much needed water supply infrastructure in an informal settlement can save lives, but at the same can be seen as condoning illegality.

3.2.4 Assumed and impossible rights

Two further types of water tenure are ‘assumed water rights’ and ‘impossible water rights’. Assumed water rights can arise when governments or state agencies construct infrastructure for purposes such as irrigation or water supply. Because these structures are built by the state, it seems, in some cases, to be assumed that the state does not need to obtain a water right, or that such a right is implicit in the fact that construction has been authorized, or that such construction is a *de facto* recognition of a water right. In other words, because it is a ‘government’ activity, it must be ‘official’. The effect is that everyone believes that the abstraction and use of water in a given situation is subject to a water right when in fact it is not. The result is that such uses do not in fact benefit from the legal protection afforded to water rights.

This kind of situation may not be that uncommon. One surprising finding of the Spanish case study was the number of domestic water supply systems that are not subject to formal water rights. In India too, while the legislation does seek to provide some protection for the drinking water sector, ‘government’ boreholes for village water supply do not enjoy the protection of any kind of formal water rights. This means that while government officials and engineers no doubt seek to protect drinking water sources, this can only be done indirectly with the result that wells and networks for the provision of drinking water services can and do run dry. A similar situation can arise with regard to irrigation. Because an irrigation system has been constructed, ‘obviously’ a portion of the available water in the related source must have been

formally allocated to that infrastructure for use by those farmers who should benefit from it, even if in reality it has not.

And what of the situation where it is actually formally impossible for water rights to be held? In the case of small-scale water supply systems, it is often the case that villages and settlements enjoy legal personality under relevant local government legislation and are not able as a matter of law to hold a formal water right.

Similar situations can arise with regard to informal water and sanitation committees and WUOs organized on the basis of customary law. As they do not have legal personality under formal law, it follows that they cannot enter into legal relationships, which makes it impossible for them to hold formal water rights or to own the infrastructure that they are notionally responsible for.

3.2.5 Unrecognized tenure

Particularly in developing countries, large numbers of people who depend on water resources to secure their livelihoods do not engage in activities that involve the impoundment and/or abstraction of water. Wetlands and floodplains can provide an important source of food, firewood, livestock fodder and materials for thatching, mat-making and medicinal use. Inland fisheries are often a vital source of protein for rural and urban areas. These and other activities (e.g. harvesting aquatic and wetland plants, the operation of local ferry boats) may or not may not be recognized in formal law. For example, inland fisheries may well be regulated in fisheries law, but the harvesting of aquatic plants may not.

The key point to recognize in terms of water tenure is that such relationships are generally not recognized by formal water laws precisely because they do not involve the abstraction and/or impoundment of water. For this reason, they may not be subject to provisions on *de minimis* free uses or subject to any requirement to obtain a 'modern' formal water right or regulatory licence. From the perspective of water law, these uses may be effectively invisible. However, these activities are totally dependent on the ecosystem services provided by water resources. They are also vulnerable to competition from other activities that depend on water resources and that are covered by other types of water tenure. This holds true for natural watercourses and irrigation schemes. Even if legislation or local custom envisages the participation, for example, of fishermen in WUOs, in practice, irrigation schemes tend to be run for the benefit of farmers and not fishermen who may depend equally on the water stored in a reservoir.

As the South African case study noted, many communities in South Africa are strongly reliant on benefits provided by ecosystem services. The rivers are used for a wide variety of purposes, including spiritual and cultural activities, recreation, fishing, tourism, grazing and cattle watering. However, the South African water act does not explicitly recognize non-water aquatic ecosystem services (Crafford *et al.*, 2014).

It can be difficult for a water administration and others involved in the implementation of water law to 'see' inland fisheries activities. Nevertheless, changes in water quantity, in terms of flow, and water quality can clearly have an impact on these activities and the livelihoods of some of the poorest members of society.

3.3 SO IS IT REALLY 'TENURE'?

This preliminary typology of water tenure is just that: preliminary. The categories are deliberately broad and cannot by their nature reflect every water tenure scenario. There may well be forms of hybrid or cross tenure. It is certainly not proposed as being definitive. Not everyone may agree with all of the tenure categories suggested and the list is not necessarily exhaustive. For example, another type of water tenure arises from the adoption of specific legislation. By the late nineteenth century in England due to the limitations of the riparian doctrine, in practice most large infrastructure projects were subject to their own individual acts of parliament, which created the water rights necessary for them to succeed. In New Zealand, a more radical approach was recently taken when agreement was reached between the Crown (the state) and a representative of the indigenous Maori people living along the Whanganui River that the river will become an legal entity and have a legal voice (Shuttleworth, 2012).

Some may argue that the categories of assumed and impossible rights are too speculative or theoretical. These arguments may have merit. However, the reality is that in many countries these types of tenure arrangement do exist with all the potential problems that they entail.

The tenure categories could be further broken down and subdivided for greater accuracy. For example, under the heading 'traditional' formal land rights' it might be logical to distinguish between rights that are based on land tenure and rights that are not, such as those rights that are established on the basis of prior appropriation. In terms of customary water rights, a case can be made for distinguishing between a) customary water tenure in countries where customary water law is the law of the majority; and b) indigenous water tenure in jurisdictions where indigenous rights are specifically recognized (or not) in the laws of the dominant settler population. There is clearly a range of possible overlaps and combinations of different types of tenure in a particular scenario. For example, some types of *de minimis* free uses under formal law may also be regulated under customary law. In irrigated areas, agency control may be combined with water supply contracts (e.g. where an irrigation agency relies on agency control to abstract water which it then distributes on the basis of water supply contracts). There are also some grey areas that raise questions that merit further investigation. For example, at what point do the rules of a formal WUO become local law rules among WUO participants? Ultimately, though, what this exercise shows is that there are many different types or categories of water tenure, some of which are defined by formal law and some of which are not.

Are these really examples of water tenure? The short answer is yes. Using the definition suggested at the beginning of this part, these are all relationships between people and how they relate to water resources. As with land tenure, many of these examples are established under formal law, but many other types of tenure relationship are not recognized by formal law at all. While many of the different types of water tenure described in this typology involve 'water rights', such as 'traditional' formal water rights, 'modern' formal water rights, and investment contract rights, it is equally clear that there are significant differences between these rights, and that some water tenure relationships cannot be accurately described in terms of rights at all.

3.4 DIFFERENCES AND LINKAGES BETWEEN LAND TENURE AND WATER TENURE

In practice, there are clear differences between water tenure and other types of tenure, such as land tenure. These differences are inevitable given the particular nature of water as a natural resource.

Water is a fluid and fugitive resource in contrast to land, which is fixed and immobile. This fluid and fugitive nature largely precludes the idea that water resources can be subject to private ownership. It means it is not possible to occupy water resources in the same way that land can be occupied or to physically exclude others from that occupied area. But is this a relevant issue? Not all types of land tenure relationship require physical occupation (e.g. a mortgage or a right of way). Also fisheries resources are just as fluid and fugitive. Water is at least a tangible resource. Property rights regimes are not confined to physical resources as the example of intellectual property, which is concerned with such matters as patents, copyright and database rights, shows. There is also a complex relationship between water users living in a river basin. Upstream users enjoy a *de facto* advantage over downstream users in that, in absence of any agreement or rules, they can divert and use the water before it flows downstream.

The nature of overlapping claims to water resources may be more linear than is the case of land, as different claims follow each other along a water course. Contrast, for example, the diagram of overlapping claims based on different types of tenure arrangement on a plot of land in Figure 1 with the diagram of water tenure claims over the same water resource in a river in Figure 2. The picture becomes much more complex when considering ‘return flow’, the volumes of water that enter the river after use, or the interactions between river and groundwater aquifers and the interdependency among users that these situations create.

However, when water tenure claims are based around physical infrastructure the relationship between claims starts to look much more like that in Figure 1 (see Figure 3).

It could be argued that the interconnectedness of water uses and water tenure arrangements is such that the relationship aspect of water tenure is in some ways more important than it is for land tenure. At the very least, a landholder can mark out and guard his or her land against encroachment. Individuals holding a water tenure right cannot mark out, fence off and guard their ‘plot’ of water. Consequently, they are much more dependent on relationships, both formal and informal, with other users when it comes to safeguarding their rights. For example, it may be relatively easy to physically cut off the supply to a ‘tail ender’ on an irrigation canal. For that person to enjoy water tenure security, the relationship with people further up the canal is all the more important. Figure 2 also raises the key question of how to coordinate overlapping claims between different types of tenure relationships.

This difference in the nature of overlapping claims is not that important. A key challenge for water tenure, as for land tenure, is how to reconcile the existence of formal tenure relationships with those that are not defined under formal law. Natural fluctuations in the availability of water resources mean that they require active measurement and management. This has an impact on water tenure arrangements in terms of planning (see Box L) and the conditions to which certain types of water tenure arrangement are typically subject (see Box F).

FIGURE 2
Overlapping water tenure claims on a single river reach

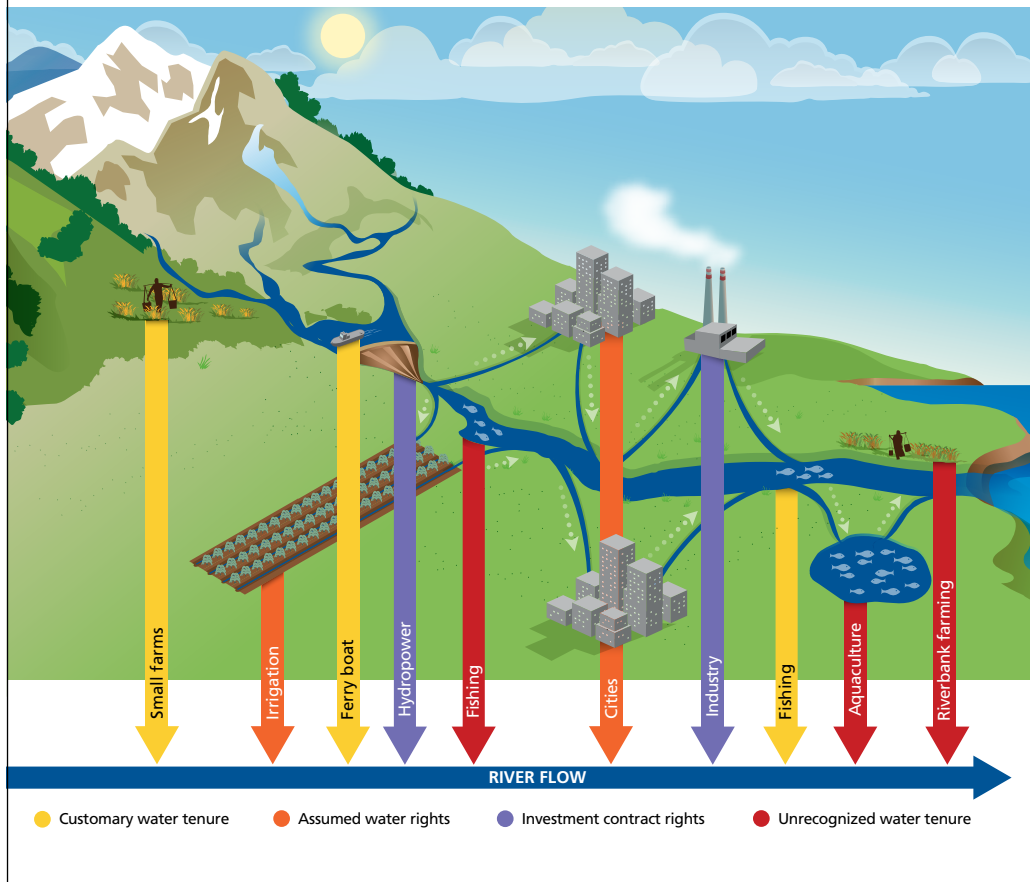
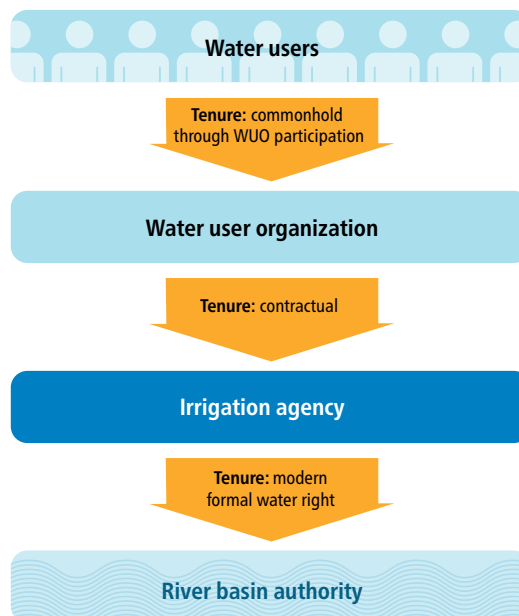


FIGURE 3
Nested claims relating to irrigation infrastructure



BOX L

Planning and use conditions

River basin management planning is a key tool of water resources management. In setting out a common vision for the management of water resources within a given basin, these plans typically identify current and projected demand, set out priorities for water use, identify measures to protect the aquatic environment and specify how fluctuations in resource availability, seasonal or otherwise, are to be addressed. The plans directly affect the allocation of water tenure rights and the conditions to which they are subject.

In the case of formal land tenure, as noted in part two, land tenure rights can be distinguished from land-use planning restrictions. This is particularly clear in the case of land ownership: a land owner is essentially completely free, as a matter of land tenure, to choose how to use his or her land. Other types of land tenure arrangements, such as leases typically specify the purpose for which the leased land may be used, and in the case of easements/servitudes the purpose is implicit in the right itself. Land use planning law is separate to land tenure law, but the net result is the broadly the same: both water tenure and land tenure rights are subject to conditions as to how the resource can be used. The main difference is that, in the case of land ownership rights, the layer of conditions derive from land-use planning law and are not incidental to land tenure itself.

An interesting issue that has rarely been resolved satisfactorily concerns the relationship between land-use planning, management and land tenure, and river basin planning, integrated water resources management and water tenure.

There are also differences in the manner whereby water tenure rights and land tenure rights are allocated and re-allocated. The market and market transactions play a far greater role in land tenure. In the water resources sector, ‘new’ water resources have traditionally been made available through the construction of hydraulic infrastructure in the form of dams and canals. As demand, and thus competition, for water increases, these kinds of ‘supply side’ engineering solutions become more difficult to construct as more and more river basins become ‘closed’ in terms of available supply. As a result, the question of how to allocate and re-allocate water resources among different water users and water use sectors is becoming increasingly important around the world. In cases where there are sufficient water resources, ‘modern’ formal water rights regimes typically contain relatively sophisticated mechanisms for the allocation of water rights on the basis of priorities for water use, river basin management plans, and a formal application procedure that includes an opportunity for third party comment and a final determination. But what happens in the case of closed basins?

The idea of markets for water rights is appealing for many, particularly economists and international financial institutions. Water rights markets have the potential to enable the transfer of water resources from lower value to higher value uses and permit more innovative arrangements, such as the ‘banking’ of water rights. The need to ensure that third party and environmental impacts are taken into account means that water rights trading may be subject to significant transaction costs and a degree of regulatory control. The key point to note is that by their very nature only a few distinct types of water tenure arrangement have the potential to be traded in the manner in which land tenure rights are so freely bought and sold. Furthermore, transaction costs will

necessarily arise due to the need to take third party and environmental impacts into account (see Table 2).

The differences between water tenure and land tenure are not sufficient in themselves to negate the concept of water tenure. It bears repeating: water tenure exists. This preliminary analysis also suggests that water tenure is not something new. Relationships under customary or formal law regarding water resources that define who has access to these resources have always existed, even if the term water tenure has not been widely used.

TABLE 2
Potential tradability of different types of water tenure

Type of water tenure relationship	Potential for water rights trading	Comment
'Traditional' formal water rights	Limited	Because they are tied to the land, 'traditional' formal water rights can only be 'sold' if the relevant plot is also sold. The only exception arises in parts of the Western USA and Canada in jurisdictions where the prior appropriation doctrine applies and where there is an active market in water rights. This is in effect the only way to re-allocate water short of expropriation which would be both controversial and expensive. However this is a unique and non-replicable situation. It does show that water rights can be traded in that particular context. However it is rather unlikely that any other jurisdiction would seek to introduce the prior appropriation doctrine, which emerged from case law, into its legislation due to the very limited possibilities for reallocation that perpetual rights offer.
'Modern' formal water rights	Yes	It is however important to note that 'modern' formal water rights cannot be traded in all jurisdictions and therefore that the benefits of a modern water rights regime do not depend solely on tradability.
Regulatory licensing	No	Such rights may be personal to the holder and even if they are not then the transaction costs will outweigh the benefits.
Agency control	No	By definition because broad rights are conferred on an agency by law.
Water supply contract	Yes	Depending on the wording of the contract in question rights/entitlements may be sold or leased. In fact, the literature suggests that most water rights trades relate to contractual water rights within irrigation schemes.
Commonhold tenure	No	Because the rights arise by reason of participation in the body that holds the water tenure rights in common.
Investment contract	Limited	As with 'traditional' formal water rights the only way to transfer the benefits would be to transfer the benefit of the entire contract.
<i>De minimis</i> use	No	Because there are no substantive rights to transfer.
Regulated free use	No	Again there are no substantive rights to transfer – a person either qualifies for this kind of tenure or does not.
Reserve/minimum flow	No	The nature of this type of tenure is such that it is not suitable for trade/transfer.
Customary water tenure	Yes	Some examples do exist of the sale and lease of water rights under customary tenure in accordance with local law. However such transactions will invariably be confined within the community subject to that law.

Religious law	No	The nature of this type of tenure is such that it is not suitable for trade/transfer.
Informal tenure	No	Formal transactions are precluded by the very nature of the tenure.
Assumed or impossible tenure	No	There are no rights that can be transferred.
Unrecognized tenure	No	Again there are no rights that can be transferred.

The types of water tenure that exist in a given jurisdiction will vary from country to country, depending on its level of socio-economic development and hydrology. Some types of water tenure may co-exist quite easily, while others may be mutually antagonistic. It is, for example, hard to see how a system of ‘modern’ formal water rights could harmoniously co-exist with agency control. Similarly, depending on its scope, a regulatory licensing regime may conflict with customary tenure arrangements. In each case, the types of water tenure to be found in any country will depend also on the purposes for which water is used.

4. Relationship between types of water tenure and categories of use

From its source to its terminus, a typical river is subject to numerous and competing claims from different sectors and from individual water users. In discussing different categories of water use (or more accurately the different purposes for which water is used) it is useful to distinguish between withdrawals of water from a source, such as a river (e.g. abstractions for irrigation or industry) and *in situ* uses (sometimes described as non-consumptive uses), where water is used within the source (e.g. the impoundment and release of water for hydropower generation).

By reducing the volume (and often the flow) of water in a given water source, withdrawals clearly have an impact on other uses of water. *In situ* uses, such as hydropower generation, can have impacts that are just as significant in terms of water quality and can modify the flow regimes and patterns that determine when and where water can be accessed.

However, just as a river may be subject to different types of use, involving withdrawals or otherwise, it may also be subject to different types of water tenure. In general terms, tenure arrangements themselves will tend to be indifferent to the purpose for which water is used. Water can be used on the basis of informal tenure, for example, for a wide range of different purposes. However, in practice, certain categories of water use will tend to rely more or less on certain types of tenure.

The purpose of this part of the paper is to try and link water tenure with use. The relevance of this exercise will become clearer later, when the different types of water tenure are compared, particularly with regard to tenure security.

4.1 DOMESTIC WATER SUPPLY

Where domestic water is supplied through a piped water conveyance network, these networks typically also supply important municipal users and uses (e.g. schools, hospitals, civic office or meeting halls, parks and a range of business activities, including offices, restaurants, shops, workshops and light industry). In theory, wastewater resulting from these uses is treated in wastewater treatment plants and discharged to rivers and other surface water bodies. In many countries, however, treatment plants do not exist, or have inadequate capacity and/or poor maintenance.

From a policy perspective, the water supply sector constitutes a use of water that demands the utmost tenure security. Where a 'modern' formal water rights system has been introduced, the abstraction of water for a water supply network will invariably take place on the basis of a 'modern' formal water right. Sometimes water may be supplied in bulk to an urban area from the operator of a dam (e.g. a state irrigation agency) on the basis of a bulk water supply contract. If a private investor is involved in the provision of drinking water services, then it is quite possible that the abstraction of water will be subject to an investment contract.

If these types of tenure arrangement are not available in a given jurisdiction, what type of tenure arrangement governs the abstraction of water for distribution through a piped conveyance network? It seems unlikely that 'traditional' formal water rights would be of much use in this context, or that such a use would be subject to regulatory licensing. However, some form of agency control may be relevant. This type of water use could certainly not be classified as a *de minimis* use or a regulated free use. It is also hard to see how it could be subject to customary or informal water tenure. This kind of use is recognized in water laws, so it cannot be categorized as unrecognized tenure. What's more, by its nature this kind of use depends on the abstraction of water, so it cannot fall under the heading 'minimum flow/reserve'. The only other alternative type of tenure arrangement that could apply is assumed tenure. However, in the case of small-scale village networks, boreholes and stand pumps, it is also possible that these uses are subject to impossible tenure.

Where water is taken for drinking and household purposes directly from water sources (a practice that is sadly still too widespread), this kind of tenure arrangement is subject to *de minimis* use rules and may also, at the local level, be subject to customary or local law. How governments can guarantee the human right to water in such circumstances poses an interesting question. As noted by the United Nations Committee on Economic, Social and Cultural Rights in its General Comment 15, the obligation to respect the right to water includes "refraining from engaging in any practice or activity that denies or limits equal access to adequate water; arbitrarily interfering with customary or traditional arrangements for water allocation; unlawfully diminishing or polluting water...". States are also under a duty to prevent third parties, including individuals, groups, corporations and other entities, from interfering in any way with the enjoyment of the right to water. Among other things, this duty includes the adoption of necessary and effective legislative and other measures to restrain "third parties from denying equal access to adequate water; and polluting and inequitably extracting from water resources, including natural sources, wells and other water distribution systems".

4.2 AGRICULTURE

Agriculture, for stock water purposes and in particular irrigation, accounts for 70 percent of global freshwater withdrawals and more than 90 percent of consumptive use (FAO, 2102a). Irrigation is most frequently used for arable crops, but also for orchards and forests. Excess irrigation water ('return flows') is drained back to surface (and sometimes groundwater) sources. The quality of return flows varies. Sometimes they are contaminated with pesticides and fertilizers and may have high levels of salinity. Although surface irrigation is often characterized as wasteful and inefficient, particularly when unlined earth canals are used, in fact the 'lost' water may play a major role in recharging groundwater sources and/or provide a source of water for maintaining environmental flows.

In terms of agricultural water use, it is clear that most types of tenure are relevant. Farmers in industrialized countries typically may rely on 'traditional' formal water rights (as land owners), modern water rights or bulk water supply contracts, either as individuals or on the basis of commonhold tenure through WUOs.

In developing countries, farmers may be less likely to hold 'modern' formal water rights but may, particularly in the case of groundwater, rely on 'traditional' formal water rights. India is a good example in this respect.

Where reforms have been introduced, farmers may in theory, if not in practice, be subject to regulatory licensing. In many developing countries, irrigation water is provided to farmers either directly by irrigation agencies that in turn rely on agency control over water resources, or indirectly through WUOs. Other types of water tenure that may be relevant include *de minimis* free uses, regulated free uses, customary tenure and informal tenure.

On the other hand, large private investors, including foreign investors, in developing countries may seek to rely on land investment contracts that implicitly or explicitly also grant rights to use water resources.

4.3 INDUSTRY

Larger industrial operations, factories and large plants, frequently require large quantities of water that they abstract directly from surface and/or groundwater sources. Used water, which may be heavily contaminated, is discharged to surface water bodies. Legislation usually requires these discharges to be pre-treated to remove dangerous levels of contamination. This legislation is not always correctly implemented or enforced. Thermal power stations use vast quantities of water for cooling purposes. This water is not contaminated as such but is usually discharged at a high temperature, which may have detrimental effects on the ecosystem.

In industrialized countries, abstractions for industry may take place on the basis of 'modern' formal water rights or water supply contracts. In developing countries, industry may rely on water supply contracts but also on informal tenure. Again, a private investor will need water security and so may rely on an investment contract.

4.4 HYDROPOWER

When water is impounded behind a dam and channelled through turbines to generate electricity, this is generally described as a non-consumptive use, even if some water stored in reservoirs may be lost through evaporation. Dams and other hydraulic structures have a major impact on the flow and morphology of rivers. Because of the enormous sums of money involved, investments in hydropower infrastructure demand particularly secure water tenure. Without it, the backers of such projects (e.g. banks and other financial institutions) will not lend their money.

In countries that have 'modern' formal water rights regimes in place, an investor in the construction of a hydropower dam will rely on this kind of water tenure. This is illustrated in the Spanish case study.

But what happens in countries that do not have modern water rights regimes in place? In such countries investments in hydropower may typically take place on the basis of agency control (in the case of a state actor) and in developing countries in particular, on the basis of investment contracts (see Box J).

4.5 ENVIRONMENT

The natural environment provides and uses ecosystem services. For that reason, the environment can be considered as a type of use of water resources. In practice, this kind of use means ensuring that sufficient environmental flows are maintained within water bodies so that environmental functions can be supported.

This can be done through a range of measures, including the setting of a reserve or minimum flow requirements and the acquisition of formal water rights by a NGO, a trust (King, 2004) or even the state. These types of ‘in-stream rights’ are used to maintain flow regimes that support functioning aquatic ecosystems.

It is important to note, however, that not all countries have provisions in their legislation that enable the establishment of minimum flow requirements.

4.6 NAVIGATION

Navigation is another *in situ* use of water resources. Water legislation has traditionally distinguished between navigable and non-navigable watercourses. Given the historic importance of navigation to trade, an importance still present in many parts of the world, water legislation usually seeks to protect navigation interests. This is usually done through the use of minimum flow requirements and the setting of a reserve for navigation. However, it is also necessary to coordinate applications for ‘modern’ formal water rights with relevant navigational requirements.

Water legislation does not typically require those who use water resources for navigational purposes to hold water rights. Inland navigation is commonly regulated on the basis of a regulatory regime requiring the use of regulatory licences that has been created through legislation relating to navigation. Such legislation is also typically the basis for the adoption of a range of standards regarding vessel safety, minimum qualifications and other standards relating to the manning of vessels and the discharge of effluents.

4.7 INLAND FISHERIES AND OTHER NON-CONSUMPTIVE LIVELIHOOD ACTIVITIES

While aquaculture may be subject to modern water rights or regulatory licensing, due in no small part to the harmful effects this activity may have on water quality, inland fisheries and other livelihood activities relating to water resources are often simply unrecognized by formal water law. Fishers who depend on reservoirs and canals of irrigation schemes for their catch are sometimes recognized as potential WUO members. In these cases, the water security of fishers is much weaker than that of irrigators in practice.

On the other hand, customary tenure is more likely to recognize and protect these kinds of use.

4.8 RECREATION, LANDSCAPE AND TOURISM

Recreational, landscape and tourism uses of water resources are generally also *in situ* uses. The economic value of these activities should not be underestimated⁸. Tourism in particular is a global growth industry. However, increased visitor numbers in a particular location may strain local capacities to abstract enough water for drinking purposes and discharge waste.

In some jurisdictions, recreational uses of water are recognized as *de minimis* free uses.

⁸ In 2001 the U.S. Fish and Wildlife Service survey gave the following monetary values for recreational activities in Nebraska involving water resources: fishing: US\$307 million; wildlife-watching: US\$211 million; hunting: US\$306 million (Zellmer, 2008).

All categories of this type of use may benefit from the setting of a reserve/minimum flows. In some jurisdictions, formal water rights may be acquired for recreational purposes.

4.9 THE RELATIONSHIP BETWEEN CATEGORIES OF USE AND TENURE TYPE

As noted at the beginning of this chapter, there is no fixed linkage between different types of water tenure and different water uses. Nevertheless, it is also clear that certain categories of water use will tend, by their nature, to be undertaken on the basis of certain types of tenure arrangement. For example, it is unlikely that anyone would invest in a hydropower dam on the basis of customary tenure. The situation is summarized in Table 3.

TABLE 3
Linking water tenure to water use

Type of water tenure relationship	Water supply (network)	Agriculture	Industry	Hydro power	Environment	Navigation	Inland fisheries/livelihoods	Recreation/landscape
Tenure relationships defined by formal law								
'Traditional' formal water rights	✗	✓	Unlikely		✓	✗	Unlikely	
'Modern' formal water rights	✓	✓	✓	✓	✗	✗	✗	✗
Regulatory licensing	Unlikely	✓	Unlikely		✓	✓	✗	✓
Agency control	✓	✓	✓	✓	✗	✗	✗	✗
Water supply contract	✓	✓	✓	✗	✗	✗	✗	✗
Commonhold tenure	✗	✓	✗	✗	✗	✗	✗	✗
Investment contract	✓	✓	✓	✓	✗	✗	✗	✗
<i>De minimis</i> use	✗		✗	✗	✗	✗	✗	✗
Regulated free use	✗	✓	✗	✗	✗	✓	✗	✗
Reserve/minimum flow	✗	✗	✗		✓	✓		✓
Tenure relationships defined by formal law								
Customary water tenure	✗		✗	✗	✓	✓	✓	✓
Religious law	✗	✓	✗	✗	✓	✗	✗	✓
Informal tenure	✗	✓	✓	✗	✗	✗	✓	✗
Assumed or impossible tenure	✓	✓	✗	✗	✗	✗	✗	✗
Unrecognized tenure	✗	✗	✗	✗	✗	✓	✓	✓

However, the reality of the situation in a given context, when un-picked by economic power/wealth, gender and ethnicity is likely to be much more complicated at the level of individual water users. Put another way, power/wealth, gender and ethnicity may typically explain why certain people use water resources on the basis of one type of tenure arrangement and others on another. In other words there is often a relative disparity of bargaining power among water users even within the same use sector. This matters enormously because, as will already be clear, there are significant differences between water tenure relationships.

5. Comparing different types of water tenure

All of the water tenure arrangements described above are quite different from each other. They each have their own specific features, strengths and weaknesses. The most obvious difference is between water tenure relationships that are defined by formal law and those that are not. Beyond that distinction, there are significant differences between water tenure arrangements. These differences allow for comparisons on the basis of objective criteria, such as security, equity, sustainability and efficiency.

To be effective all comparisons of water tenure arrangements will need to be context specific. However, by comparing different types of water tenure with categories of water use it should be possible to better understand the impact different tenure arrangements have on different social groups, including small-scale farmers, women and the poor. It would be useful to field test a comparison of these criteria in a real life situation through further case studies. This comparison has the potential to bring about not only to be a better understanding of existing water relationships but also better designs for water sector reforms.

5.1 TENURE SECURITY

The notion of tenure security is a complex one and there is no universal operational definition (See Laska and Mikawy, 2009). For a person who uses natural resources, or who intends to invest in activities that involve the use of these resources, security of tenure is perhaps the most important issue. A person with insecure land tenure is unlikely to invest in improving or developing that land. Similarly, who would invest in water resources without tenure security?

Tenure security is much more important than simply creating an appropriate investment climate. Peoples' livelihoods depend on secure access to water resources, and therefore on water tenure security. Communities that rely on water resources to meet their drinking water requirements need water tenure security. Water tenure security is not the same as the concept of 'water security' but the two concepts are linked. One widely cited definition of 'water security' is "the reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water risks" (Grey and Sadoff, 2007). At a practical level, without security of water tenure how can water security be guaranteed?

At the outset, it is important to note that in the case of water resources, tenure security will generally be relative, as it depends on the availability of a fluctuating resource. Secure water tenure arrangements will therefore typically relate to a share of the available resource (e.g. river or aquifer). This implies the need for water measurement, which in turn raises the following questions: who measures water resource availability and determines the quantity of water available? how is this data disseminated among water users? and how long before a final determination is made?

In many countries, poor water quality has become, or is becoming, a serious problem due to pollution from the discharge of effluent from industry and sewerage networks.

In India the official 2009 *State of the Environment Report* noted that almost 70 percent of the country's surface water resources and a growing percentage of its groundwater reserves were contaminated by biological, toxic, organic and inorganic pollutants. The resulting pollution levels render water sources unsafe for human consumption and for other activities, such as irrigation and industry (Government of India, 2009). For many uses of water resources, the quality of the water is as important as water quantity. The apparent security of water tenure may be negated if the quality of water is so poor that it cannot be used. Poor water quality may also be a significant threat to water tenure security. Both of these issues emphasise the importance of water resources management to water tenure, as discussed in part four.

How can security be assessed? How can different types of water tenure be compared? While a wide range of definitions have been suggested for the term 'security of tenure' in different contexts the basic questions that arise are: (a) can I count on being able to use the water resources I need over a sufficiently long period (which may vary depending on the context)? and (b) do I have any means of preventing other people from interfering in my use of water resources?

In assessing the security of different types of water tenure arrangements, the initial distinction is between those that may be asserted and defended under formal law and those that may not. From a purely legal perspective, 'modern' formal water rights and investment contracts appear to confer the highest level of formal legal security on water users. Of long-term duration, they confer clear legal rights upon users to use the specified water resources in question.

Similarly, water supply contracts and commonhold tenure should enjoy relatively high levels of legal security, but only if the contracts are sufficiently long and relevant WUOs or equivalent organizations are effectively operated. Everything depends on the context and the specific details of the water tenure arrangement. In practice, in many developing countries, water supply contracts between irrigation agencies and WUOs last for only one year, and WUOs are established largely on paper (as seen in the Indian case study). In such circumstances, water users have little tenure security.

There is a relatively clear link between the duration of rights created under particular tenure arrangements and the relative level of security of these rights. Generally speaking, from the perspective of the right holder, 'the longer the better'. A ten-year right will *prima facie* confer greater security than a one-year right. This means that a 'modern' formal water right will provide greater security than a regulatory licence. However, the duration of a right is not always conclusive. An indefinite right that is incapable of effective delineation (e.g. a traditional water right based on the notion of private water in the civil law tradition) or that cannot exclude others from the resource (e.g. rights to groundwater based on the common law doctrine of capture) will not provide very much security.

De minimis free uses of water, on one hand, may free individual users from the trouble of obtaining 'modern' formal water rights for example, but in practice, they offer little in the way of legal security because they do not confer any rights that can be enforced. The rights to use water are clearly not property rights, as they do not imply the ability to prevent others from using the same water resources.

The setting of a reserve or minimum flow requirements on rivers may, as a deliberate or indirect effect, ensure that sufficient water is available for those who benefit from free uses, customary tenure and recognized tenure. But what if such reserves or flow

requirements are not set or periodically reviewed by the water administration? What rights do such users have to challenge inaction in the courts or otherwise to ensure reserves/flow requirements are set and enforced to ensure, in an indirect way, their water tenure security?

Moreover, the security provided by formal tenure arrangements may, in a given context, prove to be illusory. The water rights created by an investment contract that is potentially capable of being enforced against the host state following an international arbitration would seem to confer the most solid security legally possible. However, such agreements apply only between the investor and the host state. They are typically confidential and their contents will often be unknown to other state agencies, let alone water users. What happens if third parties start to take water for agriculture, legally or otherwise? Can the private rights of the investment contract be enforced other than through the 'nuclear' option of a claim for *de facto* expropriation, which would likely end the mutually beneficial money-making relationship with the host government?

On paper at least, 'modern' formal water rights provide the most secure and sophisticated form of water tenure. But this is true only to the extent that the relevant legislation is actually implemented and, if necessary, enforced. The ostensible security provided by formal water tenure arrangements is always subject to a caveat, as seen in Table 4. Rights that exist only on paper and not in practice are not secure. In such circumstances, customary law or local law can, at the local level, offer greater tenure security. Formal tenure relationships are not necessarily more secure than those that are not defined by formal law.

What of tenure arrangements that are not defined by formal law? Whether or not customary water tenure is recognized by formal law will depend on the jurisdiction. In some countries, as already mentioned, customary water tenure arrangements are recognized in constitutions, treaties and even water laws. In seeking to assess the level of legal security that formal law can confer on customary tenure, a more fundamental issue is the extent to which it provides genuine legal mechanisms that can enable water users who rely on customary tenure to actually assert their claims rather than simply offer statements of principle.

Informal tenure, assumed and impossible tenure and unrecognized tenure enjoy the lowest degree of formal legal security simply because they are not recognized by formal law.

For customary water tenure, a key issue is its relationship with formal law and water uses regulated by formal law that exceed the remit of local customary law. Customary land tenure usually applies in a particular area or region (or reserve). It can exist quite happily alongside formal land tenure arrangements in adjacent land areas. This is the case, for example, in rural areas where customary land tenure exists next to urban centres where formal land tenure laws apply. On the other hand, customary water tenure may apply on rivers and other water bodies where activities that are not subject to customary tenure also take place. For example, the construction upstream of hydropower dams under formal laws may have the effect of destroying customary tenure arrangements. See figure 2 above.

The relative security of different types of tenure arrangements will always be context-specific. As outlined above, certain types of water tenure may benefit from greater formal legal security, but in practice everything will depend on implementation and the facts on the ground. But it can often be the case that data may be missing or absent with

TABLE 4
Relative security of formal tenure arrangements

Degree of formal security (decreasing)	Type of water tenure relationship	Degree of formal security	Caveat
↓	Investment contract	In the case of a foreign investment potentially the most secure type of water rights as may be protected under international investment law	If the contract is confidential it may be difficult to enforce with resorting to arbitration.
	'Modern' formal water rights	The most legally secure type of water tenure available under national law.	Can be costly to introduce and implement.
	Agency control	For the agency concerned very high level of security.	
	Water supply contract	If of sufficiently long duration should provide a relatively high degree of security.	Little security provided if short term. Depends on performance of irrigation agency.
	'Traditional' formal water rights	Legally secure as a property right of indefinite duration.	Difficult to quantify.
	Commonhold tenure	Provided the WUO or equivalent holds secure tenure and operates effectively can provide very secure water tenure.	
	Regulated free use	Provided necessary measures taken by water administration can ensure provision of sufficient water.	Not directly enforceable by beneficiaries as depends on administrative action. No individual 'right' that can be used as security. No possibility to exclude new users.
	<i>De minimis</i> use	Legally 'secure' in the sense that such types of tenure are typically specified in law	Do not confer rights that can be enforced - depend on action by the water administration. No possibility to exclude other users.
	Reserve/minimum flow		Because the rights arise by reason of participation in the body that holds the water tenure rights in common.

regard to various types of water tenure, which raises major questions regarding tenure security. For example, people who rely on free uses of water do not need to interact with the state through a registration of permitting procedure, and consequently their water use may not even be known to the water administration.

In exploring the issue of water tenure security, it should also be possible to map different types of water against specific water uses. Take, for example, the hypothetical, but not so unusual, case of a make-believe country called 'Tenuristan'. With no system of 'modern' formal water rights, Tenuristan has a largely unimplemented regulatory licensing regime. Irrigation infrastructure is operated and maintained by an irrigation agency that relies on its rights of agency control to build irrigation systems and abstract water resources. The agency in turn supplies water on the basis of annual contracts to WUOs, the creation of which was promoted by a major donor agency. In practice these WUOs are weak dysfunctional entities established on the basis NGO legislation and exist mainly on paper. The irrigation agency also supplies water to industry and large farms, but in these cases on the basis of long-term contracts. The water law does not make provision for the setting of minimum flow requirements, which makes it easier for the government to conclude long-term investment contracts with foreign investors

TABLE 5
Mapping water tenure security against use type

	Water supply (traditional)	Water supply (network)	Agriculture (small-/medium-scale)	Agriculture (Large-scale)	Industry	Hydropower	Environment	Navigation	Inland fisheries/livelihoods	Recreation/landscape
Tenure relationships defined by formal law										
'Traditional' formal water rights			Weak		Weak					
Regulatory licensing			Weak	Weak	Weak			Weak		Weak
Agency control			Weak	Strong	Strong	Strong				
Water supply contract			Weak	Strong	Strong					
Commonhold tenure			Weak							
Investment contract		Strong		Strong	Strong	Strong				
<i>De minimis</i> use	Weak			Weak						
Regulated free use			Weak	Weak						
Tenure relationships not defined by formal law										
Customary water tenure	Weak		Weak	Weak			None	None	None	None
Religious law	Weak			Weak			None			None
Informal tenure			None	Weak	Weak				None	
Assumed or impossible tenure	None	None	None	None						
Unrecognized tenure	None							None	None	None

who require the use of water resources for hydropower, industry and agriculture as well as to attract investments for water supply in the main cities.

As can be seen from Table 5, many water uses, including water supply for small towns from traditional sources, have little tenure security. In terms of agriculture, small-scale farmers have little, if any, security, but foreign agribusiness investors can rely on the security provided by investment contracts. This scenario suggests that those with the lowest water tenure security are likely to be small- and medium-sized farmers who rely on water supply networks in rural areas and people who depend on watercourses for inland fisheries and other *in situ* activities for their livelihoods.

5.2 TENURE EQUITY

The issue of equity can also be explored from a number of angles. Equity is almost certainly more difficult to evaluate than security. Questions of equity, of fairness, arise not only in terms of the nature of different types of water tenure, particularly given the fact that different types of water use tend to be associated with particular types of water tenure, but also in connection with how decisions relating to different types of water tenure are made.

If, for example, certain types of water tenure are ignored systemically (e.g. unrecognized tenure) or intermittently (e.g. when decisions relating to water allocation are made without taking into account customary tenure), it is hard to characterize the relationship between different types of water tenure as fair. The issue concerns not only negative impacts, but the impossibility of any form of legal redress.

Issues of equity are closely linked to issues of security. Is it fair that some types of tenure are more secure than others? Again, the issue of tenure type will often relate to specific categories of use. Is it, for example, fair that releases from hydropower dams destroy fish traps and fish farms, or bankside gardens? Is it fair that irrigation reservoirs are drained for convenience of farmers without regard for the interests of people who depend on the fish that live there?

Certain types of water tenure may be more likely to result in unfair outcomes simply because of the manner in which they are transacted. In particular, confidential investment contracts that are not, and cannot be, subject to civil society comment and scrutiny are by their nature more likely to lead to unfair outcomes, if only because those who may be negatively affected have no opportunity to point that out. It also clear that certain categories of water use and water user are more likely to enjoy secure water tenure. Foreign investors negotiating an investment contract may demand water security as a precondition for an investment. But their need for security is no less than that of a poor farmer who is not in a position to make demands of the government. It follows that different types of tenure arrangement, and the manner in which they are implemented, may contain built-in socio-economic biases.

Issues of equity can also arise in connection with customary tenure arrangements, particularly in cases where formal law seeks to recognize customary rules without reflecting the subtleties of customary tenure arrangements. Undertaking legislative reforms with a vision of creating greater 'equity' may not lead to equitable results, if the reforms are not fully implemented. A veneer of equity may exist on paper but not in the reality of water tenure.

A key aspect of equity in terms of water tenure concerns the manner in which decisions are made and the scale at which they are made. Inequities are easily missed or masked by, for example, planning water services delivery at just one scale. If they are to be effective, decisions must be perceived as fair by different water users and different water use sectors, and by those who use water on the basis of different types of water tenure arrangement. For example, holders of water rights under customary tenure regimes may reject involvement in formal tenure arrangements if these are perceived as unfair because they are biased against them and in favour of other water users. Similarly, there may be little point in engaging in the voluntary re-allocation of water use rights to maintain environmental flows unless the dependants of those rights find the arguments for reallocation acceptable. The notion of the mutual acceptability or fairness is important.

Not only must outcomes be perceived to be fair but they must also derive from fair governance mechanisms, an issue that is discussed in part six.

5.3 TENURE SUSTAINABILITY

Is it possible to compare different types of water tenure in terms of sustainability? By their nature, are certain types of water tenure more or less likely to ensure that sufficient water is made available throughout river basins and that it safeguards the environment in ways that can be sustained for future generations? In practice, this means ensuring that sufficient water is left within water bodies to provide environmental services.

This can best be achieved by including in legislation provisions on mandatory reserves/minimum flow requirements and correctly implementing these provisions. In this regard, there are a number of questions that must be addressed, including: What are the consequences if the agreed upon reserve/flow requirements are not established? What redress is there for citizens, civil society groups and other water users who depend on these environmental services if these services are compromised due to a failure to meet requirements?

Certain types of water tenure would seem to have the potential to lead to less sustainable outcomes. For example, tenure arrangements that permit the unregulated extraction of water (e.g. those based on the common law doctrine of capture in respect of groundwater), would appear to fall within that category. Similarly agency control may lead to unsustainable infrastructure development unless an appropriate focus is given to environmental considerations and the operation and maintenance of existing infrastructure.

Sustainability issues may also arise in terms of the duration of water rights created on the basis of different types of water tenure. If they are indefinite or excessively long it may make it more difficult to allocate additional water for the environment.

Again, assessments of sustainability will always be context specific. It is not possible to say that a given type of tenure arrangement is not sustainable or that it is less sustainable than another type. It is necessary to examine the elements of different types of water tenure and their relation with other water uses and the environment.

A number of questions need to be asked about water tenure and future environmental conditions. How 'climate change-ready' are existing water tenure arrangements? How easily can water tenure arrangements be suspended or modified in times of drought to ensure the satisfaction of priority needs? If water rights are tradable is there, for example, provision for 'water banking'? (see Bruch and Troell, 2011)

5.4 TENURE EFFICIENCY

As with equity, efficiency is an issue that can be addressed from a number of angles. The issue of security is closely linked to economic efficiency. How can investments be made efficiently in the water sector in the absence of water security? Again, this matter is context-specific. For example, governments spend large sums on land reforms promote land tenure security in rural areas without ensuring that farmers hold adequate water security. How can that be considered an efficient use of resources? Similarly time and money is spent on building irrigation schemes and setting up WUOs (which often exist only on paper) without ensuring that the beneficiaries of these schemes enjoy security of water tenure. Again, how can this be seen as an efficient use of resources?

Inland fisheries and other non-consumptive livelihood activities may contribute significantly to socio-economic well-being in rural areas. In the case of inland fisheries, governments spend large sums on extension services, infrastructure investments and so forth. But again, how can these investments be deemed efficient in areas where the water tenure of fishers is unrecognized?

In terms of the water productivity, types of water tenure that permit the trading of water rights may have a potentially important role to play if the costs of addressing third party and environment concerns are taken into account. However, most types of water tenure do not permit this (see Table 2).

Tariffs and charges for water resources use are often seen as another means of promoting water use efficiency and raising revenue. The extent to which such objectives can be met will depend on the type of the water tenure arrangement in question. For example, very often discussions about managing demand by setting user tariffs and fees ignore the issue of water tenure and the security of that tenure (e.g. Zeitoun *et al.*, 2011). The amount paid by the water user is only part of the story. The value of the water to user depends on the water tenure arrangement.

In this respect, it is important to note that one of the main reasons why governments have historically been interested in maintaining up to date land cadastres and land registers is to facilitate the recovery of land taxes. But in practice, these taxes can only be recovered to the extent that tenure security is provided.

6. Water tenure and governance

Over recent years, the issue of water governance has moved to the forefront of public and academic debate. The water crisis has been described as a ‘crisis of governance’ (UNESCO-WWAP, 2003). But what is water governance? And more importantly, what is its relationship with water tenure?

6.1 DEFINING WATER GOVERNANCE

Over the years, numerous definitions of governance have been proposed and promoted by different organizations. Many of them are rather general and can only be applied at an abstract level. The United Nations Development Programme (UNDP) defines governance as “the exercise of political, economic and administrative authority in the management of a country’s affairs at all levels. Governance comprises the complex mechanisms, processes, and institutions through which citizens and groups articulate their interests, mediate their differences, and exercise their legal rights and obligations” (UNDP, 1997). For the World Bank, governance is “the manner in which power is exercised in the management of a country’s economic and social resources for development.” (World Bank, 1992) FAO has recently defined its position in this connection (see Box M).

How can the concept of governance be applied to water? The Global Water Partnership (GWP) proposes to define water governance as the “range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society” (GWP, 2002). The definition supported by UNDP focuses more exclusively on water resources: “water governance encompasses the political, economic and social processes by which governments, civil society and the private sector make decisions about how best to use, management and develop water resources” (UNDP, 2004).

Water governance is the manner by which society organizes itself with respect to water resources. It is a range of social relationships that relate to, and affect water resources in terms of use, development and management. From an FAO perspective, it can be proposed that:

“Governance of water resources embraces the formal and informal rules, organizations, and processes through which public and private actors articulate their interests; frame and prioritize issues; and make, implement, monitor, and enforce decisions in relation to water resources.”

Governance is concerned with how the available water resources are divided and shared in a given context. Water governance is concerned not only with the decisions made regarding the use and protection of water resources, but also with how those decisions are made and implemented.

It is possible to narrow down the notion of water governance to a particular subsector, such as agricultural water. The governance of agricultural water can be considered as the governance of the total water resources that are being abstracted for agricultural use. Restricting the question of governance to a single subsector like agriculture may

BOX M

Governance from an FAO perspective: The FAO Strategic Framework

‘The concept of governance embraces the formal and informal rules, organizations, and processes through which public and private actors articulate their interests; frame and prioritize issues; and make, implement, monitor, and enforce decisions. Its scope includes the special constitutive processes through which these rules, organizations and policy processes are formed, adapted, revised and dismantled. Essential governance activities include agenda-setting, prioritizing, norm-, rule- and policy-making, measurement, monitoring, enforcement and adjustment.

Governance is not simply “what governments do.” Governance issues arise, and governance takes place, in many different settings, both public and private, from local communities, farms and cooperatives, to business organizations and large-scale enterprises, and in a wide variety of local, regional, national and international contexts. A robust concept of governance takes a whole-of-society perspective, recognizing that improving governance involves strengthening and empowering non-state as well as state actors.

To improve the governance capacities of societies and of social actors is to enable effective and efficient collective problem-solving in ways that are regarded as legitimate by the stakeholders who are involved.

The term “governance”, or “good governance”, is sometimes used in ways that imply a uniform set of criteria to be applied universally as a precondition to policy success. The FAO approach is not premised on such assumptions, but seeks to incorporate in its framework sensitivity to widely shared principles that can be incorporated in different ways within and across societies to enhance legitimacy and effectiveness, and to make governance, among other things, a widely shared, mutual learning process. These key principles for enhancing effective governance include: participation, transparency, accountability, legitimacy, equality and fairness, efficiency and effectiveness, and rule of law.’ (FAO, 2013)

be useful to help addressing governance issues concretely. However, by isolating the subsector from the broader water governance context, it offers only a partial understanding of issues at stake in relation with the governance of water.

6.2 GOVERNANCE AND TENURE OF WATER

How does water tenure fit into the water governance debate? A good option is to view the governance of water tenure, and water tenure itself, as fundamental constituents of water governance.

Under this approach, the true subject matter of water governance is the relationship, whether legally or customarily defined between people, as individuals or groups, with respect to water resources. To rephrase a sentence at the beginning of this paper, water governance is concerned with how decisions are to be made with regard to the allocation (and, in some cases, the management) of natural resources, the administration of the rights that they create and mechanisms for conflict resolution. Governance is concerned with how to divide up and share out the notional ‘cake’, i.e. the available

water resources in a given context. Water governance is concerned not only with the decisions made about the use and protection of water resources, but also how those decisions are made.

The distinction between management and governance is important. Broadly speaking, water management is concerned with the actions necessary to implement decisions that derive from the process of governance. However, the relationship between governance and tenure is dynamic rather than static. Water tenure is not simply subject to water governance. In fact, the opposite also holds true: water governance depends on water tenure. The reasons for this are sketched out in the following paragraphs.

In discussions about water governance, the point is often made that inadequate water governance, however defined, is traced back to inadequate political and legal governance at the national level. Inadequate budgets for water resources management, a lack of transparency, rent-seeking behaviour and so on are linked to broader societal ills, such as censorship, inefficient courts, widespread graft and a corrupt and self-serving political class.

6.3 THE BROADER POLITICAL ECONOMY DIMENSION

At this point, the discussion of water governance moves on to broader questions of political economy. What is interesting, here, is the long relationship between tenure, particularly land tenure, and political economy and above all, with political reforms.

As already mentioned, in every country, land tenure has always been, at one time or another, a key political issue. In many countries, the development of political or state-level governance structures has mirrored land tenure reforms. In feudal Europe, for example, power was held⁹ by the sovereign and the great lords who held their vast estates at the favour of the sovereign. Over the centuries, the gradual dismantling of these estates and the growth of private ownership was accompanied with the progressive extension of the voting rights leading to universal suffrage. What is particularly striking is the relationship between land tenure and the steady expansion of the franchise. In many countries, this was done on the basis of land tenure criteria, with the right to vote accorded to (male) landowners. This brief aside on the history of mass voting is intended to show that land tenure is, and always has been, a key factor in power relationships in societies around the world.

In this respect, water tenure has a key role to explain the power dynamics in water governance. Issues around water tenure are clearly of profound political importance in arid and wealthy jurisdictions (e.g. Western United States and Australia). “Water flows uphill to money and is sucked uphill to politics”, as the saying goes in the American West. But elsewhere, it is clear that water tenure is also often intimately linked to issues of water governance in general. No analysis of water governance can take place in a vacuum.

When it comes to water sector reforms, it is a major mistake to ignore questions of water tenure and the economic and political power that derive from water tenure. Reforms based on integrated water resources management (IWRM) or any other policy ‘solutions’ that fail to take account of water tenure and the power relationships that derive from water tenure are doomed to failure. This is because all water sector reforms are about change, and these reforms inevitably create winners and losers. Many may benefit from an absence of reform or a failed or flawed reform.

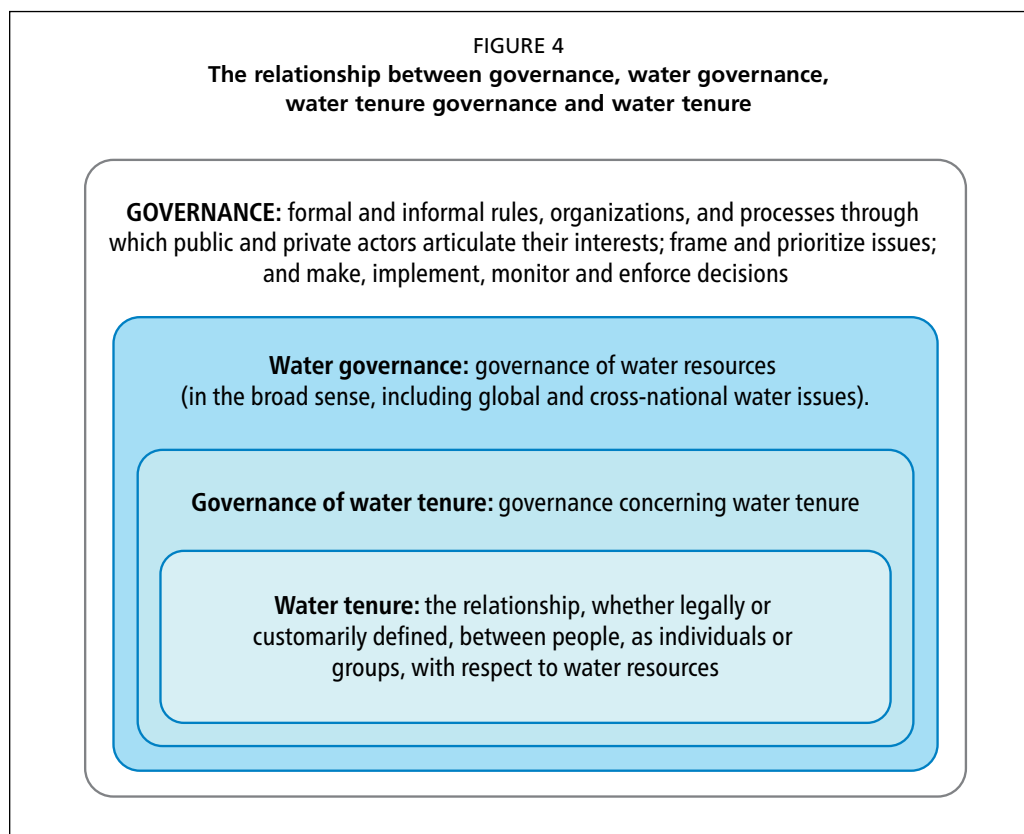
⁹ ‘Holding’ is synonymous with ‘tenure’ as noted in part two.

For example, why would the managers of an irrigation agency want to give up any of their power to the of benefit farmers, especially when they can co-opt politicians keen to secure ‘development’ through new infrastructure investment by sharing secret and illegal payments from corrupt contractors paid with government funds? The Indian case study clearly raises two questions about the irrigation engineers employed by relevant irrigation agencies: do irrigation engineers have political power? and are they another interest group? A basic problem for lending agencies and their international advisers is that irrigation agencies and water administrations are their principal interlocutors. Water experts are all generally found in the water bureaucracy. While these water administrations may agree to go through the motions of setting up the inevitable river basin committees and stakeholder consultation mechanisms, from their perspective surrendering any power that derives from the particular water tenure arrangement is of little interest.

Even in cases where reforms are undertaken in good faith, it is clear that those with weak water tenure will struggle to make their voices heard; they will struggle to stand up to those who are more powerful. How can water users confront the water administration if their livelihood depends on a one-year regulatory licence, an annual water contract, or simply the hope that the rivers will be filled by rainfall? And why should water users with weak water tenure have a real interest in participating in governance mechanisms ostensibly set up for their benefit?

There is a socio-political dimension to this as well. Not everyone suffers when water governance (or as suggested the governance of water tenure) is poor and inadequate. The rich, with their connections, money and power can usually manage to resolve governance ‘challenges’ by paying (higher) bribes to ensure a more secure water supply. Foreign investors can side-step existing national legal frameworks entirely by

FIGURE 4
The relationship between governance, water governance,
water tenure governance and water tenure



concluding a confidential investment agreement with the government. In this sense, water tenure provides an important prism for examining and understanding rent-seeking behaviours, which, although they are convenient for those who profit from them, are objectively bad for society as a whole.

In conclusion, this paper suggests that the relationship between water tenure, governance of water tenure and the wider issue of water governance is both fundamental and dynamic. It is a social and historical construct (see Figure 4) in which the governance of water is often considered as the equivalent to water tenure. However, in reality, tenure tends to focus on access to, and use of the resource, whereas governance of tenure embraces all the wider social and economic processes and forces that determine the status of tenure itself. It is in this context, that water tenure has an influence on water governance and simultaneously is influenced by water governance. Until and unless there is a clear and objective understanding of water tenure arrangements in a given context, attempts at water governance reforms will fail. This is why it is necessary to focus on the governance of water tenure. This paper suggests that examining the governance of water tenure has the potential to make a significant contribution to the water governance debate by shedding light on how and why different water users act and by referring to the legal or customary arrangements on which they rely.

7. The advantages and disadvantages of thinking in terms of water tenure

This part of the paper examines the advantages and disadvantages of talking and thinking in terms of water tenure.

7.1 ARGUMENTS AGAINST WATER TENURE

Listed below, in no particular order, are some of the main arguments that have so far been advanced or identified against water tenure.

7.1.1 “We don’t need a new concept at this time”

Although there are some references to water tenure in the literature, it is true that for many people water tenure is a new concept. However, on closer analysis it also becomes clear that water tenure is not really new at all. It has existed as long as people, as individuals or communities, have had relationships with water resources. Many of the types of water tenure described in this paper can be traced far back into history.

If water tenure can make a useful contribution to the water debate, the fact that it may be a new concept for many people is not relevant. Discounting the idea as a novelty is not a valid reason to disregard the potential of water tenure.

There is a concern that introducing the topic of water tenure into an already complex, and in some cases fraught, debate about the water sector will hinder, for example, attempts to resolve on-going discussions about other issues, such as water governance. Some may claim that the discourse that characterizes much of the debate on IWRM and water governance is already fuzzy enough.

Introducing the concept of water tenure does add another layer to a complex situation. However if this layer provides a useful perspective, then why not include it? It is not as if any of the existing approaches for improving the water sector have been all that effective. The debate over water governance shows no sign of easy resolution.

7.1.2 “Water tenure is too complex and theoretical”

Water tenure is a definitely a complex issue. It was only with the conclusion of the case studies that the real complexity of water tenure became apparent, particularly in contrast to the initial draft of the technical guidelines for this think piece. The preliminary typology set out in part three is long, even though several types of water tenure have been grouped together.

If water tenure turns out to be a complex issue, then so be it: life is complex. Based on the discussion of water governance in part six, it can be strongly argued that the failure to understand the complexity of water tenure is one of the reasons why so many water sector reforms fail. An obvious example comes from the western United States. Tradable water rights work very well in that part of the world, but this does not mean that this system can be simply transferred to a regulatory licensing scheme.

Water tenure may be complex, but it is not theoretical. On the contrary, although the concept of water tenure is affected by many theoretical solutions to the water crisis, water tenure itself is far from theoretical. It shapes how real people relate with real water resources.

7.1.3 “Water tenure is only of interest to lawyers”

It is true that the typology of water tenure in part three is written from a legal perspective. However, is this really so problematic in a modern world in which nearly every aspect of life is subject to laws or regulations of one form or another? Legal rules underpin, or fail to underpin, different types of water tenure for a reason, whether good or bad.

It must be understood that these legal underpinnings are really just that. They underpin a vast and complex web of social, economic and political relationships. As noted above, although land tenure is based on rules of formal or customary law, no profession enjoys a monopoly on the subject of land tenure, certainly not lawyers.

7.1.4 “Why start talking about ‘water tenure’ when we have always used the term ‘water rights’?”

This question can be answered on a number of separate yet often interlinked levels. It is certainly true that ‘water rights’ are a much more familiar concept than ‘water tenure’. But what exactly is meant by water rights?

There is no internationally agreed definition of water rights. While some countries define ‘water rights’ in their laws, many do not. Complications can arise when people confuse the human right to water with water rights. As discussed in part three, significant differences exist between the various types of water rights. The meaning of the term water rights is not necessarily clear, neither among lawyers nor non-lawyers. In discussing water rights, therefore, there is a significant risk that people will have a conception of water rights that is based on the practice in their own country, which may be quite different to experiences elsewhere.

The fact that water rights may formally be provided for in law does not necessarily mean they exist in practice. This provides another reason to talk in terms of water tenure rather than just water rights. By providing a basis for analysing actual relationships between people and water resources in all their complexity, rather than simply the relationships prescribed by law, the scope of water tenure goes far beyond formal water rights.

7.2 ARGUMENTS IN FAVOUR OF WATER TENURE

7.2.1 Holistic: shows things as they are

Without forgetting the potential contribution of water tenure to addressing water governance, it is appropriate to sketch out some of the potential benefits of water tenure and water tenure discourse. The first key benefit of thinking in terms of water tenure is that it provides an opportunity to take a holistic approach to understanding relationships with water resources in order to see things as they actually are.

A neutral term, water tenure is a means of systematically analysing the nature of all of the relationships between people as they relate to water resources in a given time and place. It cuts across the conceptual boundaries that are created by policy, legislation and institutional arrangements, as well as by professional biases (an issue returned to below).

Even in terms of formal law, provisions on different types of water tenure can often be found scattered among different laws (e.g. water laws, irrigation laws, water supply laws, investment legislation, WUO laws). Moreover certain types of water tenure are not even considered by formal law. Too often the linkages between these different types of water tenure are simply ignored as one or other law is reformed. This is especially true if, as increasingly is the case, water resources law is under the responsibility of an environment and natural resources ministry and irrigation is under the ministry of agriculture. Tenure relationships that are not defined by formal law are all too easily ignored.

More fundamentally, water tenure has far greater potential to shed light on water relationships in terms of what they actually are rather than simply what laws or policies say that they should be. In this respect, the case studies were particularly interesting.

Take, for example, the case of South Africa. The National Water Act of 1998 is widely considered to be an excellent example of a reformed water law (Hendry, 2013). Serving as a model for other countries in Africa and beyond, the Act has clear redistributive objectives and provides for a system of ‘modern’ formal water rights. At the same time, it also seeks to safeguard the interests of small-scale and disadvantaged water users and protect the aquatic environment.

Examining the current situation in South Africa from a water tenure perspective allows for an assessment of the discrepancy between how things should be and the reality on the ground. For example, the system of ‘modern’ formal water rights has yet to be substantively implemented. Nearly 20 years after the act was adopted, many water users continue to rely on a special category of entitlement called an Existing Lawful Use based on ‘traditional’ formal water rights which continue to be recognized and as they are land-based continue to favour the interests of large land-owners. Similarly, provisions in the National Water Act for more inclusive WUOs have largely gone unimplemented. As a result, irrigation systems are largely still managed by traditional white-dominated irrigation boards. Customary law continues to apply in many rural areas, but curiously the act does not even refer to customary water tenure. Although the act is a sophisticated piece of legislation, the manner in which it has been implemented has had less impact, in terms of equity and security than had been hoped. Water tenure in South Africa today does not necessarily align with what the law says it should be. This is likely to be the case everywhere, with different levels of discrepancy depending on the law and the prevailing tenure situation.

Spain also has a sophisticated and modern water law. Again, looking at how the law has been put into practice from a tenure perspective has illustrated not only the implementation challenges, but the fact that such challenges vary from river basin to river basin. A clear finding of the Spanish case study is that examining water use through a water tenure ‘lens’, as opposed to simply focusing on water rights and water institutions, “captures the reality on the ground, an evolving and dynamic relationship between people and water”. As one of the experts in the Spanish case study commented: “water rights are like snapshots, static, water tenure is more like a video, capturing a dynamic and evolving relationship of people with water”. In addition, water tenure could shed light on and render explicit the reasons why water rights are failing in a given context. By providing a clearer understanding of power dynamics on the ground, an analysis of water tenure could enable the identification of gaps or dysfunctions in the current system and the reasons for lack of implementation.

The Indian case also reveals valuable information from a water tenure perspective, not only as to how decisions are made but also in terms of the difficulties in adopting the subordinate legislation necessary to fully implement a number of extremely important water-related laws (see Box N).

Laws and policies are by their very nature normative. They state what should happen and specify the consequences when what should happen doesn’t happen. However, no policy interventions in the water resources sector are ever made in a vacuum. Each policy reform, each implementation step, will always take place against the background of existing water tenure arrangements that have their own strengths and weaknesses, tensions and dynamics. In a world where decision makers are increasingly concerned with assessing policy impacts, water tenure with its holistic bias has the potential to contribute significantly to policy development and the conduct of *ex ante* evaluations. It could also provide insights in *ex post* evaluations on the achievements of reforms.

BOX N

Non-implementation

In India, the Maharashtra State Irrigation Act of 1976 (MIA) is the basis for all other irrigation-related legislation. It provides a detailed framework for different facets of an irrigation law. Since all subsequent legislation refers back to this law, it is the *de facto* template on which all later state laws have been formulated. However, the MIA has not yet been implemented for the simple reason that necessary implementing legislation has not been formulated. The law is a ‘paper tiger’.

Pending the implementation of the MIA, colonial-era rules are still followed, some dating from the nineteenth century, despite completely different contexts and challenges. As a result, water use (diversion and theft) is virtually unregulated. The MIA provided for regulation, monitoring and a set of responsibilities for the officials and the land owners in terms of use of surface water. But due to the non-formulation of rules to implement the MIA, conveyance losses have become serious without anyone being held responsible. Water theft is a rule rather than exception. Irregular water rotation, non-maintenance of canals, arrears of water tariffs and massive diversion of irrigation water to non-irrigation purposes, all of which were meant to be arrested and checked by the MIA, have proliferated and continued with greater intensity even after newer laws were enacted (James *et al.*, 2014).

Just as importantly, water tenure can make a key contribution to showing how things as they are on the ground, and thus provide a better understanding of water resources challenges in connection with water accounting. As noted in a recent FAO publication, any strategy seeking to successfully address the challenge of water scarcity must be based on a thorough understanding of the elements of the water balance, including supply and demand for water and the spatial and temporal dimensions associated with it (FAO, 2012a). To this end, water accounting, which can be understood as the systematic study of the hydrological cycle and the current status and future trends in water supply, demand and use, is increasingly being promoted as a key element of IWRM programmes and for other measures promoting water security.

Beyond the simple accounting of volumes and flows, water accounting is a vital component as a resource baseline for any policies and programmes aimed at tackling water scarcity. This is because water scarcity is a relative concept i.e. an excess in water demand over available water resources in a specified domain. Therefore, water scarcity can only be described, quantified and/or mapped once a good understanding is gained of past, current and projected differences between supply, demand and use, and how this affects different water users. This is exactly the aim of most water accounting procedures.

Water accounting achieves its full potential only when complemented by the identification of the various different types of water tenure relationship on the basis of which water use takes place. Again, a comparison with land tenure is instructive. A land cadaster may show the quality of different land plots and the purposes for which they are used. It is the land register that shows who holds tenure interests in the land plots in question. In the context of water, it is water tenure that will help explain why investments are made, or not made, in the use of water in specific circumstances. Who would invest without tenure security? Why is water being used unsustainably? Water tenure can also show if, and if so how, water can be re-allocated from one use to another. Water tenure has the potential to complete the water accounting picture needed to achieve water security.

7.2.2 Non-prescriptive

Because water tenure is not prescriptive, it seems to offer a more nuanced means of recognizing different kinds of relationships with water resources; one that can accept that there are fundamental normative and cultural differences at play. Because it does not assert that one type of tenure system is better than the other, it offers the possibility of negotiation and compromise at the policy level and below.

This contrasts with the usual practice of examining water relationships from the perspective of water rights. Rights are by their very nature normative. Talking in terms of water rights immediately leads to the question: what type of water rights? A water tenure arrangement that works effectively in one place may not be capable of being effectively replicated elsewhere. An obvious example of this, perhaps, is the doctrine of riparianism, which has informed 'traditional' formal water rights in many common law countries. The doctrine itself was developed by the courts on the basis of cases relating to the competing needs of water mill operators in England's damp and rainy climate. It is not surprising this approach was not effective when transplanted to more arid climates with their long dry seasons and non-perennial rivers.

A modern echo of this is found in India, where much of the debate about water rights reforms seems to be focused on the issue of tradable transferable water rights. Most Indian farmers who irrigate with surface water are supplied through irrigation systems. This does not mean that they do not need secure water tenure, However it does indicate that the Australian experience, for example, in which transferable 'modern' formal water rights are used by large commercial farms to abstract water directly from rivers is probably not of much relevance to farmers who receive water supplied through many kilometres of irrigation canals.

Understanding the situation from a water tenure perspective marks the first step in working out suitable policy solutions. It is only on the basis of a clear understanding of existing water tenure arrangements in a given jurisdiction that appropriate remedies can be found to problems relating to issues such as tenure insecurity, equity, sustainability and efficiency. If, at the policy and legislative level, this means an individual, tailor-made solution, so be it. Talking about water tenure enables policy makers and their advisers to escape from copy-and-paste solutions. As already mentioned, the South African water law has been an inspiration in many countries. There is no doubt that it is an excellent legal text. But the experiences to date of its own implementation show the dangers of relying on a prescriptive approach.

7.2.3 A more sensitive and nuanced approach

Water tenure also has the potential to facilitate a more sensitive and nuanced analysis of water use and relationships. This can be important in terms of dialogue with politicians and other decision makers, but also with water resource users.

A neutral, more or less objective, examination of the current state of water tenure in a given jurisdiction in terms of security, equity, sustainability and efficiency is far more likely to be palatable than a blunt discussion as to why, existing water laws policies are not implemented, do not 'work', or are just wrong. As noted in the Indian case study, an important contribution of the use of the term 'water tenure' is to instantly legitimize the study of 'inconvenient truths' concerning water use, including everyday events, such as the theft or appropriation by force by farmers and the prohibition of lower castes and other socially disadvantaged groups from using certain water sources. The study of actual relationships between people with respect to water resources has also uncovered positive findings, including examples in terms of water sharing, the absence of social discrimination and even cases of positive discrimination.

A dialogue set in terms of water tenure also allows truly sensitive and difficult issues to be broached, such as informal (patently illegal) water use. Recognizing that this is actually a kind of water tenure, a kind of relationship with water, is the first step towards accepting that illegal water use is not merely a law and order problem caused by 'bad people', but that it quite likely has its own internal logic that derives from socio-economic causes.

In this respect a key finding of the Spanish case study was that "(o)ne of the main emergent and most important issues is that the water tenure frame provides space to look into informal/illegal use, normally either neglected or pre-judged from a water rights analysis. Water tenure starts from real use and the possibility to document 'informal/illegal use' in the case study areas". One basic problem is that the water administration has a limited interest in acknowledging the extent of informal water use

and limited resources to explore the reasons behind it. However, by approaching the topic through the more neutral framework of water tenure, the researchers were able to finally access information about informal water use that had hitherto been effectively closed to them. People do not like to talk about illegality. The preliminary evidence from the case study pointed to a myriad of reasons behind informal use, including rigidity in the current legislation and divergent interpretations of that legislation. These reasons will need to be taken into account if the problem of illegal abstractions is to be addressed.

In any dialogue, the vocabulary used can be as important as the substance. In a number of Latin American countries, rules based on customary law regulating the use of water resources by indigenous people have been largely by-passed by formal water tenure rules, which has provoked considerable tension and resentment. Attempts to introduce unpopular water sector reforms in these countries have been largely derailed by indigenous communities in part because of the perceived negative impact of such reforms on customary water tenure. A person talking about formal law or customary law risks immediately being marked out as being for one side or the other. Talking in terms of water tenure in circumstances where positions are entrenched opens the door to debate without prescribing specific remedies.

7.2.4 Policy coherence and the land-water linkage

Another potential benefit of examining relationships with water under the heading of tenure is that such an approach is coherent with approaches used for other natural resources. As mentioned earlier, despite the differences between land tenure, and water tenure they are both system of tenure. The use of one resource can clearly influence and be influenced by the use of others. The land-water interface is an obvious example. Most uses of land require water in one form or another. In the case of agriculture, unless this is water provided by precipitation, access to water or water resources will be need to be obtained if land is to be put to productive use.

Many aspects of land tenure affect and are potentially affected by water and water tenure. Land reforms, for example, may have a number of direct and indirect impacts on water tenure arrangements. For example, how is the issue of water tenure to be addressed in the case of redistributive land reforms? What are the impacts on customary water tenure when customary land is brought into the formal land tenure system? Irrigated agriculture also has obvious linkages between land tenure and water tenure. It may be unrealistic to expect farmers to invest in irrigated land (not to mention participate in the effort to create effective WUOs) if they themselves enjoy only precarious land tenure, which can happen where land is deliberately granted on short leases to ensure that irrigation water fees are paid. Land tenure plays also a direct role in the viability of WUOs in terms of their own land tenure rights regarding the infrastructure that they use. Without clear and secure land tenure, it is difficult to create effective WUOs.

These linkages clearly emerge from the case studies. The Indian case study shows that old and archaic land tenure systems can effectively exclude artisans and non-landowners from access to water. Land tenure reforms can also have the effect of physically preventing access to water sources and thus thwarting water tenure rights. The continued deep link between land and water was also clearly shown in the Spanish case study in connection with allocation of water rights to land owners rather than

those who use the land. In South Africa, the competition between pastoralists and gardeners over riparian land demonstrates the important links between land and water.

There are also links between forests, wetland and fisheries tenure with water tenure. Given the extent to which different professions and different ministries are involved in different types of natural resource management and decision making, the concept of tenure has the potential to provide a common vocabulary, a common bridge. For example, in current debates about the impact of foreign investment in agricultural land, the consideration of water has been peripheral. The result is that headlines about 'land deals' have not automatically led to a discussion of water requirements, even though water scarcity is a major driver of international flows of investment in agricultural land (Woodhouse and Ganho, 2011). Various reasons are posited for this situation, including the fact that water is seen as a distinct 'sector'. A common tenure vocabulary would at the very least facilitate discussion about the impacts of these investments on water resources.

7.2.5 Multidisciplinary

Rather than being only of interest to lawyers, this paper has also suggested that an important potential benefit of water tenure is the possibility it offers for facilitating multidisciplinary approaches to addressing water resources problem. As noted in part two, the importance and scope of land tenure goes far beyond law and the legal aspects of land tenure.

A clearer and systematic recognition of customary tenure in the proposed definition of water tenure, with a wider role for anthropology and sociology in understanding how formal water laws are relevant (or not) in particular situations (and by implication all of the types of water tenure that do not derive from formal law), would be an important step forward in terms of water policy analysis, development and reform. The concept of legal pluralism has made a significant theoretical contribution, but it is not yet clear how far it is being considered in policy and programming decisions (Mason and Newborne, 2013). However, considering water tenure simply as a new way of talking about legal pluralism would limit its potential.

Too often debates about water resources management are directed by individual professions with their specific perspectives and biases. Water tenure has the potential to create the link necessary to facilitate thinking across the boundaries of the natural sciences and the social sciences. Because water tenure focuses on the practical reality of water use, mapping the existing relationships, without a *priori* normative judgements, and analysing water allocation mechanisms and processes, it facilitates (and even forces) close collaboration by professionals from different disciplines, such as sociologists, engineers, lawyers and hydrologists. By preventing any one discipline from dominating discussions, which has resulted in much wasted investment in the past, the concept of water tenure could make it possible to greatly enhance the effectiveness of project and policy interventions.

The key point to emphasise is that project and policy interventions in the water resources sector always take place against the background of existing water tenure arrangements. In the real world, no new policy can be developed and no new infrastructure can be built in a water tenure vacuum. And unlike the laws of physics that govern the principles of engineering, water tenure arrangements vary enormously from jurisdiction to jurisdiction and even within individual river basins.

A better understanding of water tenure has the potential to shed light on why interventions are more, or less, likely to succeed. Sophisticated engineering solutions that work well in developed countries where farmers and other water users have water tenure security may fail to meet their full potential when applied in countries where water tenure arrangements are insecure, unfair or unsustainable. Why should farmers in developing countries have any interest in engineering solutions if they have no security of tenure? Similarly why should farmers participate in the establishment and operation of WUOs that do not have water tenure security and lack any real autonomy? And how can the dispossessed, those with weak water tenure, realistically participate for example in river basin organizations? How can economic solutions based on charging for water or the sale of water rights work unless water tenure is fully factored into the equation?

7.2.6 Focus on users

A key benefit of thinking in terms of water tenure is that it focuses on the most important actors: water users. The relationship between water users and the way they access and use the water is at the heart of water tenure. Because it focuses on users as opposed to laws and policies that are imposed from the top, a water tenure approach is by nature bottom-up.

As already noted, water resources management is a complex technical activity. Probably because of its historical bias towards supply side measures, water resources management has often had a strong engineering and technical bias. But beyond hydraulic engineers, it also involves, hydrologists, modellers, data collection experts, statisticians, modellers, GIS experts, as well as economists and institutional experts of one sort or another. All of this expertise and all of these activities are absolutely necessary, and always will be. However, there seems to be no end to the data and technology that is needed for what is an increasingly technical and science-driven process. At a certain point, it is difficult to avoid the conclusion that the ultimate goal of water resources management is water resources management for its own sake.

Over recent years, IWRM has become the dominant paradigm for water resources management. While a number of different definitions for IWRM have been proposed, one of the most cited is that it is “a process which promotes the coordinated development and management of water land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP, 2010). But where are the water users in this picture? Where are the people who actually depend on water resources?

By focusing on water users, water tenure provides an opportunity to remedy this imbalance. By focusing on people and communities and their relationship with water resources, water tenure provides the possibility to reorient water resources management in a more responsive bottom-up manner.

This is because for water users, water tenure, and water tenure security in particular, are the only things that matter. As a Spanish farmer noted in the case study, without secure water tenure “it is like having nothing at all”. None of the elements of IWRM matter other than the basic question: “will I get my water?”

But more than that, by focusing on real people and their real problems in terms of tenure security, equity, sustainability and efficiency, water tenure offers the possibility to reorient the political debate concerning water.

Just as politicians have supported and used land tenure reform programmes to advance social objectives, focusing the discourse on water tenure may offer similar opportunities for genuine reform. Water tenure and water tenure reform will never have the same global resonance as land tenure and land reform. But in dry and arid countries where the water crisis is, and will continue to be, most keenly felt, water tenure already matters. People are already fighting and dying over water disputes caused by weak and inadequate tenure. The rich and well-connected can usually find a way to protect their interests. But why should the benefits of water tenure security accrue only to the rich with their shady connections or to foreign investors who have their own particular means of gaining water tenure security? Without seeking to claim too much for water tenure, discussions held to date suggest that water tenure might provide a possible path to genuine water sector reform. Politicians have long understood land tenure, why can it not be the same water tenure? Everyone who has a relationship with water resources has a direct interest in secure, equitable, sustainable and efficient water tenure.

8. The future of the water tenure approach

The concept of water tenure is neither a panacea nor the latest solution for the world's water problems. It is not a new technique or methodology that will magically conjure up solutions.

In moving forward, the first and most important step is to recognize that water tenure exists and that it has always existed. While the unique nature of water as a resource means that water tenure has a number of differences with other forms of tenure (e.g. land tenure) it remains nevertheless a type of tenure. It needs to be taken as seriously as land tenure by policy makers and their advisers, and by researchers, academics and NGOs across the entire range of professions involved in the water resources sector.

The biggest benefit of taking a water tenure approach seems to be that it offers a comprehensive perspective on water use and claims over water resources in a world of increasing water shortages. It seems to have the potential to be a useful interdisciplinary umbrella for examining a wide range of relationships between people with respect to water resources.

The water tenure approach can give insights into complex systems of water use, and, through water tenure analysis (i.e. the analysis of relationships between users and water resources) help identify areas and opportunities for improving often chaotic water use (e.g. identifying areas where formal laws are too rigid or remain unimplemented, and problems related to legal and policy coherence). Too often both policy reforms and investment projects are based around models (e.g. water markets, irrigation management transfer, river basin organizations) that are copied from somewhere else (Molle, 2008). The reality is that all development projects and all sector reforms take place against the background of existing water tenure arrangements. If these arrangements are not understood, how can projects and reforms be successful?

At a more practical level, there is a need for more reflection on water tenure, more discussion, more critical analysis and more thought. The three case studies were extremely useful in preparing this paper and in advancing the conceptualization of water tenure. However, one of the outcomes of the process is that the conception of water tenure set out in part three of this paper has already evolved. It would be useful to further refine and develop the preliminary typology, for example by seeing how it can be applied in other contexts, such as the Middle East and in Latin America. This could be done by carrying out additional case studies. The preliminary typology could be further refined using real life examples with a more developed assessment of their strengths and weaknesses.

It would also be interesting to further discuss the comparative criteria set out in part four. Are these the right criteria and do they address the most relevant issues? Are they objective or unnecessarily normative? Could indicators be developed for these criteria? It would particularly useful to explore the notion of efficiency from an economic perspective. There is a mass of equivalent literature for land tenure. It would also be worthwhile to apply the existing four criteria to future case studies and retrospectively apply them to the already completed case studies.

Looking at water tenure arrangements and their relation to attempts by the hydraulic community to better quantify water uses through improved water accounting methods also merits attention. By connecting people and their relationship with water resources to the broader water balance, which provides the necessary basis of sound water resources management, water tenure has the potential to complement FAO's work on water scarcity, and in particular on water accounting. An important question is how to reconcile a water tenure assessment approach with hydrological and economic accounting, which are needed to adequately determine water resources availability and their contribution to the economy.

From such exercises, the foundation of a 'water tenure assessment' methodology could emerge. This has the potential to be useful to countries before and after major policy reforms. In terms of the retrospective evaluation of reforms, the methodology would provide a relatively standard and objective means of comparing outcomes. As regards the prospective evaluation of reforms, a water tenure assessment would have the potential to guide decision makers in identifying the different types of water tenure in a given jurisdiction and the key aspects of water tenure on which to focus. In each case, this will ultimately be a political decision. A water tenure assessment may, for example, show to what extent small farmers and inland fishermen lack secure water tenure. Which tenure arrangements to focus on and which to prioritize will depend on the range of social, economic, cultural and other calculations that guide policy makers.

Related to this, is the question of how the water tenure debate can be used in an effective way to contribute to dialogues on water allocation, which are becoming more and more necessary as the competition for water grows. Can the concept of water tenure be of any use, for instance, in addressing the increasingly complex relationships between users (and polluters) of water in a given hydrological entity? How can it be used in relation with anthropic influences on rainfall, evaporation, water quality, floods and aquifer recharge? How can we integrate water tenure with the necessary regulation and management of water, both in terms of water flows and quality? And, finally, how can water tenure be used in a broader sustainability framework in which current claims for water must be considered in relation with environmental requirements and the claims of future generations?

Given that half of the world's land surface lies within international river basins, water tenure also has the potential to resonate at the international level. While water tenure itself has nothing to say about how the waters in a transboundary water body are to be managed among riparian states, water tenure assessments have the potential to bring relevant evidence in support of efforts to improve cooperation in the management of transboundary waters.

The next question may be how to influence water tenure and what adaptations are needed to improve the governance of water tenure. Again, water tenure does not directly reveal any magic solutions. However, breaking down the different types of water tenure into a common typology along the lines set out in part three but with greater refinement, could provide the opportunity to reduce the chance that inappropriate conclusions will be drawn from different types of water tenure, and help forestall attempts to enact reforms that are doomed to fail. As to what reforms are needed, again water tenure *per se* has no magic solution. However, a clear understanding of the weaknesses and strengths of a given type of water tenure in a particular context should improve the chances of developing appropriate and better-adapted solutions. It may well be that new policy models are needed that are better suited to the specific requirements of a given situation; models that can balance security, equity sustainability and efficiency.

It is not necessarily the case that existing models developed in industrialized countries are suitable for water tenure arrangements elsewhere.

The development of formal policies that address water tenure, something that is not usually done, would be a good first step towards water tenure reforms. This could be done either as a stand-alone document or as a separate chapter in broader water resources policy. To this end, it would be useful to pilot the systematic development of a policy based on a tenure approach in a jurisdiction facing challenges with water demand. Specific water tenure legislation in the form of a 'water tenure law' would seem to be neither necessary nor appropriate. There is no reason why any necessary reforms to water tenure cannot be undertaken within the existing types of water legislation (e.g. water laws and irrigation laws). How to address the relationship between customary tenure arrangements and formal legal frameworks remains, clearly, a question of major importance.

It would seem logical, also, to explore the idea of developing voluntary guidelines on water tenure, or at least to more explicitly incorporate water tenure in existing guidelines. It could be argued that, given the impetus for 'all things tenure' provided by the VGGT and the interest shown by some FAO's member countries in extending the VGGT process or a similar process to the water sector, now is exactly the right time to start working on voluntary guidelines for water tenure and a follow-up series of technical guidelines. The need for this kind of work is very clear. Water tenure, like land tenure, is not subject to any specific rules of international law. As a result, states are broadly free to determine their own water tenure policies. In the face of growing water scarcity, this paper strongly suggests that consideration be given to the development of a set of voluntary guidelines on water tenure that set out principles and internationally accepted standards for responsible practices. Such guidelines would be useful for both industrialized and developing countries.

The process of developing such guidelines would in itself create a valuable forum for sharing the experience of different countries and the insights of different disciplines involved in water tenure.

A further question is whether such voluntary guidelines should be limited to water tenure or whether they should follow the example of the VGGT and also be guidelines on the governance of water tenure. The governance of water tenure would provide a unique and wholly cogent alternative route to furthering the water tenure debate. It can be justified in terms not only of FAO's early work on the VGGT, but also because most water tenure relates to agricultural uses of water. Voluntary guidelines on the governance of water tenure would be coherent with the VGGT and would also make an extremely important and specific contribution to the global debate on water governance.

After these proposed steps have been taken, it is possible to imagine a series of implementation projects. These would be similar to projects undertaken for the VGGT and would deal with various technical aspects of the governance of water tenure, such as identifying mechanisms for strengthening commonhold tenure, bolstering the relationship between customary tenure and formal law, gaining a clearer picture of the gender and social equity aspects of water tenure, and addressing the issue of water measurement from a tenure perspective.

9. Conclusions

At the beginning of this paper, the question was asked ‘what is water tenure?’ In response this short definition was provided: “the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources”. In looking at the many different types of water tenure, the basic distinction was made between tenure arrangements that are defined by formal law and those that are not. Under both of these categories, there is a surprisingly wide range of different types of tenure relationships. In preparing this think piece, water tenure turned out to be more complex than originally anticipated. While a number of the types of water tenure arrangement identified in this paper are expressed in terms of ‘water rights’, it is equally clear that there are significant differences between these rights. Depending on the context, the notion of ‘water rights’ can have quite different meanings. However, the concept of ‘water tenure’, in going beyond the narrow legal rights that may exist in reality or only paper, permits a broader understanding of the relationship between people and water resources in all of its real world complexity.

The response to the second question, ‘does water tenure really exist?’, is surely ‘yes’. There are differences between water tenure and other forms of tenure (e.g. land tenure) that reflect the particular properties of water as a resource. However, this does not preclude the fact that relationships exist between people with respect to water resources. It is also clear that water tenure is not something new. People, as individuals or groups, have always had relationships with water resources and will continue to have such relationships whether or not the term ‘water tenure’ is used.

As regards the third, question ‘could water tenure help in terms of the development of policy and practice through, for example the possible development of guidelines on water tenure?’, this paper again has suggested that the answer is a resounding ‘yes’. At the global level, water tenure will probably never be as important as land tenure. However, in areas where there is increasing water scarcity, water tenure is already as important as land tenure or is rapidly becoming so. This is particularly the case where water, or rather the absence of water (rather than land) is the limiting factor for production or where the delivery of basic human needs in terms of water supply is a major challenge. It is true that ‘water tenure’ is not a term that has been commonly used. It is also true that water tenure in itself does not provide a ‘solution’ to the world’s water challenges. But in a world where the demand for water resources is constantly increasing, the need to ensure that people, as individuals or groups, can benefit from secure and equitable water tenure and at the same time guarantee the sustainability and efficiency of water use could not be more acute. The question is not “should we should take water tenure seriously” but rather “can we can afford not to?”.

References

- Boelens, R., Duarte, B., Mansolvas, R., Mena, P., Rosa Avenado, T. & Vera, J.** 2012. Contested Territories. *The International Indigenous Policy Journal*, 3(3) (available at <http://ir.lib.uwo.ca/iipj/vol3/iss3/5/>).
- Boelens, R., Hoogesteger, J. & Baud, M.** 2015. Water reform governmentality in Ecuador: Neoliberalism, centralization, and the restraining of polycentric authority and community rule-making. *Geoforum*, 64: 281–291 (available at <http://dx.doi.org/10.1016/j.geoforum.2013.07.005>).
- Bruce, J.W.** 1998. *Review of tenure terminology*. Tenure Brief No. 1, Land Tenure Centre, University of Wisconsin, Madison (available at <http://digital.library.wisc.edu/1793/22013>).
- Bruch, C. & Troell, J.** 2011. Legalizing adaptation: water law in a changing climate, *Water International*, 36(7): 828-845.
- Bruns, B.** 2003. Water Tenure Reform: Developing an Extended Ladder of Participation Politics of the Commons. Paper presented at *Articulating Development and Strengthening Local Practices Conference*, Regional Center for Social Science and Sustainable Development (RCSD), Chiang Mai, Thailand (available at <http://www.bryanbruns.com/bruns-ladder.pdf>).
- Burchi, B.** 2005. The interface between customary and statutory water rights – a statutory perspective. Paper presented at *African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa*, International Workshop co-organized by the International Water Management Institute (IWMI), the Natural Resources Institute (NRI) of the University of Greenwich, the Faculty of Law of the University of Dar-es-Salaam, and the South African Department of Water Affairs and Forestry, Johannesburg, South Africa (available at <http://projects.nri.org/waterlaw/AWLworkshop/BURCHI-S.pdf>).
- Caponera, D. & Nanni, M.** 2007. *Principles of Water Law and Administration: National and International* 2nd edition. Taylor & Francis.
- COHRE (Centre on Housing Rights and Evictions, Right to Water Programme), AAAS (American Association for the Advancement of Science), SDC (Swiss Agency for Development and Cooperation) & UN-HABITAT.** 2007. *Manual on the Right to Water and Sanitation* (available at <http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=2536>).
- Cotula, L., ed.** 2006. *Land and water rights in the Sahel Tenure challenges of improving access to water for agriculture*. Issue Paper No. 139. International Institute for Environment and Development (IIED), London (available at <http://pubs.iied.org/pdfs/12526IIED.pdf>).

- Cotula, L.** 2010. Investment contracts and sustainable development: *How to make contracts for fairer and more sustainable natural resource investments*. Natural Resource Issues No. 20. IIED, London (available at <http://pubs.iied.org/pdfs/17507IIED.pdf>).
- Cotula, L.** 2011. *Land Deals in Africa: What is in the Contracts?* IIED, London. (available at <http://pubs.iied.org/pdfs/12568IIED.pdf>)
- Crafford, J., Wilkinson, M., Magagula, T., Danga, L. & Harris, K.** 2014. Investigating water governance, water rights and water tenure in the Olifants River Water Management Area in *South Africa Final Report*.
- De Soto, H.** 2001. *The Mystery of Capital*. Black Swan, London
- Department of Water and Sanitation of the Republic of South Africa.** n.d. Home page (available at <https://www.dwa.gov.za/default.aspx>)
- FAO.** n.d. *Information Resources* (available from <http://www.fao.org/nr/tenure/information-resources/en/>).
- FAO.** 2002. *Land tenure and rural development*. FAO Land Tenure Studies No. 3. Rome (also available at <http://www.fao.org/docrep/005/y4307e/y4307e00.htm>).
- FAO.** 2004. *Land and Water – the Rights Interface*, by S. Hodgson. FAO Legislative Study No. 84. Rome (also available at <http://www.fao.org/docrep/007/y5692e/y5692e00.HTM>).
- FAO.** 2006. *Modern water rights – Theory and practice*, by S. Hodgson. FAO Legislative Study No. 92. Rome. (also available at <ftp://ftp.fao.org/docrep/fao/010/a0864e/a0864e00.pdf>)
- FAO.** 2009. *Creating legal space for water user organizations: transparency, governance and the law*, by S. Hodgson. FAO Legislative Study No. 100. Rome (available at <http://www.fao.org/docrep/012/i1120e/i1120e00.htm>).
- FAO.** 2012a. *Coping with water scarcity – An action framework for agriculture and food security*. FAO Water Report 38. Rome (available at <http://www.fao.org/docrep/016/i3015e/i3015e.pdf>).
- FAO.** 2012b. *Strategic Evaluation of FAO work on tenure, rights to land and other natural resources – Final evaluation report*. Rome (available at <http://www.fao.org/docrep/meeting/025/mC957E.pdf>).
- FAO.** 2102c, *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security*. Rome (available at <http://www.fao.org/nr/tenure/voluntary-guidelines/en/>).
- FAO.** 2013. *The Director-General’s Medium Term Plan 2014–17 and Programme of Work and Budget 2014–15*. Rome (available at <http://www.fao.org/docrep/meeting/027/mf490e.pdf>).

- Government of India.** 2009. *State of the Environment Report 2009*. Ministry of Environment and Forests, New Delhi (available at <http://www.indiaenvironmentportal.org.in/content/283130/state-of-environment-report-india-2009/>).
- Grey, D. & Sadoff, S.** 2007. 'Sink or swim? Water security for growth and development' *Water Policy*, 9(6): 545-571 (available at <http://wp.iwaponline.com/content/9/6/545>).
- GWP.** 2002. *Introducing Effective Water Governance* (mimeo). In P. Rogers & A.W. Hall. 2003. *Effective Water Governance*. TEC Background Paper No. 7. Stockholm.
- GWP.** 2010. *A Water Secure World*. (available at <http://www.gwp.org/en/Press-Room/A-Water-Secure-World>).
- Hendry, S.** 2013. Private Rights and Public Responsibilities: *Recent developments in Scots water law*. Policy Brief, Foundation for Society, Law, Justice and Society (available at <http://www.fljs.org/content/private-rights-and-public-responsibilities-recent-developments-scots-water-law>).
- Huggins, C.** 2002. *Rural Water Tenure in East Africa: a comparative study of legal regimes and community responses to changing tenure patterns in Tanzania and Kenya*. African Centre for Technology Studies, Nairobi.
- James, A.J., Dinesh Kumar, M., Mandavkar, Y., & Suresh, V.** 2014. *India Case Study On Water Tenure Draft Final Report*.
- King, M. A.** 2004. Getting Our Feet Wet: An Introduction To Water Trusts. *Harvard Environmental Law Review*, 28(2): 495-534.
- Krishnan, J. & George, A.** 2009. Ecology and equity in rights to land and water: A study in south-eastern Palakkad in Kerala. *Water Alternatives* 2(1): 1-15 (available at <http://www.water-alternatives.org/index.php/alldoc/articles/vol2/v2issue1/40-a2-1-1>).
- Lankford, B. & Hepworth, N.** 2010. The cathedral and the bazaar: Monocentric and polycentric river basin management. *Water Alternatives* 3(1): 82-101 (available at <http://www.water-alternatives.org/index.php/alldoc/articles/vol3/v3issue1/71-a3-1-5>).
- Laska, K. & El Mikawy, N.** 2009. *Reflections on Land Tenure Security Indicators*. Discussion Paper No. 11. UNDP Oslo Governance Centre.
- López-Gunn, E., Bea, M., Huertas, R., Vay, L. & Zorrilla P.** 2014. *Proof of concept study Water Tenure in Spain Final Report*.
- Malawi Law Commission.** 2006. Report of the Law Commission on the Review of the Land-Related Laws. Lilongwe (available at <http://sdnp.org.mw/lawcom/index.htm?http%3A//sdnp.org.mw/lawcom/land.htm>).

- Mason, N. & Newborne, P.** 2013. Property rights and development briefing: *Water rights and rural household welfare*. Overseas Development Institute, London (available at <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8510.pdf>).
- Molle, F.** 2008. Nirvana concepts, narratives and policy models: Insight from the water sector. *Water Alternatives* 1(1): 131-156 (available at <http://www.water-alternatives.org/index.php/alldoc/articles/vol1/v1issue1/20-a-1-1-8>).
- Molle, F., Mollinga, P.P. & Wester, P.** 2009. Hydraulic bureaucracies and the hydraulic mission: Flows of water, flows of power. *Water Alternatives* 2(3): 328-349 (available at <http://www.water-alternatives.org/index.php/alldoc/articles/vol2/v2issue3/65-a2-3-3>).
- Shuttleworth, K.** 2012. Agreement entitles Whanganui River to legal identity. *New Zealand Herald*, 30 August (available at http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10830586).
- Quan, J.** 2000. Land Tenure, Economic Growth in Sub-Saharan Africa. In C. Toulmin & J. Quan eds. *Evolving land rights, policy and tenure in Africa*. Department for International Development (DFID) / IIED/ NRI, London.
- Sangkapitux, C. & Neef, A.** 2000. Assessing water tenure security and livelihoods of highland people in northern Thailand. *Quarterly Journal of International Agriculture*, 45(4): page 377-396.
- UNDP.** 1997. *Governance for sustainable human development*. New York
- UNDP.** 2004. *Water Governance for Poverty Reduction Key Issues and the UNDP Response to Millennium Development Goals*. New York.
- UNECE (United Nations Economic Commission for Europe).** 2009. *Self Made Cities - In Search of Sustainable Solutions for Informal Settlements in the United Nations Economic Commission for Europe region*. New York and Geneva (available at <http://www.unece.org/fileadmin/DAM/publications/oes/SelfMadeCities.pdf>).
- UNESCO-WWAP (United Nations Educational, Scientific and Cultural Organization - World Water Assessment Programme).** 2003. *Water for People Water for Life, The United Nations World Water Development Report* (available at <http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/wwdr1-2003/downloads/>).
- Van Koppen, B.** 2000. Gendered water and land rights in construction: Rice valley improvement in Burkina Faso. In B. Bruns & R. Meinzen-Dick eds. *Negotiating water rights*. SAGE, New Delhi.
- Vogelsang, F.** 1998. *After land reform, the market?* FAO, Rome.
- Woodhouse, P. & Ganho, S.** 2011. Is Water the Hidden Agenda of Agricultural Land Acquisition in sub-Saharan Africa? Paper presented *International Conference on Global Land Grabbing*. Land Deals Politics Initiative (LDPI), University of Sussex, Brighton (available at <http://www.future-agricultures.org/papers-and-presentations/conference-papers-2/1303-is-water-the-hidden-agenda-of-agricultural-land-acquisition-in-sub-saharan-africa/file>).

- World Bank.** 1992. *Governance and development*. The World Bank, Washington, DC (available at <http://documents.worldbank.org/curated/en/1992/04/440582/governance-development>).
- Zeitoun, M., Allan, T., Al Aulqi, N., Jabarin, A. & Laamrani, H.** 2011. Water demand management in Yemen and Jordan: addressing power and interests. *The Geographical Journal*, 178 (1): 54-66 (available at <http://onlinelibrary.wiley.com/doi/10.1111/j.1475-4959.2011.00420.x/abstract>).
- Zellmer, C.** 2008. Legal Tools for Instream Flow Protection. In A. Locke, C. Stalnalter, S. Zellmer, K. Williams, H. Beecher, T. Richards, C. Robertson, A. Wald, A. Paul & T. Annear *Integrated Approaches to Riverine Resource Stewardship: Case Studies, Science, Law, People, and Policy*. Instream Flow Council, Cheyenne, WY.

FAO TECHNICAL PAPERS

FAO LAND AND WATER DISCUSSION PAPERS

1. A perspective on water control in southern Africa – support to regional investment initiatives, 2003 (E)
2. On-farm composting methods, 2003 (E, F)
3. Payment schemes for environmental services in watersheds / Sistemas de pago por servicios ambientales en cuencas hidrográficas, 2004 (E, S)
4. Drought impact mitigation and prevention in the Limpopo River Basin – a situation analysis, 2004 (E)
5. Water desalination for agricultural applications, 2006 (E)
6. Land evaluation – towards a revised framework, (E) 2007. Only available in PDF format at <http://www.fao/ag/agl/public.stm>
7. Coping with Water Scarcity: What Role for Biotechnologies? 2008 (E)
8. Review of evidence on drylands pastoral systems and climate change (E)
9. Monitoring agricultural water use at country level (E, F)
10. Exploring the concept of water tenure (E)

Availability: July 2011

<i>Ar</i>	–	<i>Arabic</i>	<i>Multil</i>	+ <i>Multilingual</i>
<i>C</i>	–	<i>Chinese</i>	*	<i>Out of print</i>
<i>E</i>	–	<i>English</i>	**	<i>In preparation</i>
<i>F</i>	–	<i>French</i>		
<i>P</i>	–	<i>Portuguese</i>		
<i>S</i>	–	<i>Spanish</i>		

The FAO Technical Papers are available through the authorized FAO Sales Agents or directly from Sales and Marketing Group, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy.

Exploring the concept of water tenure

Tenure arrangements determine how people, communities and organizations gain access to, and use, natural resources, and are gaining increasing attention and recognition as part of efforts towards sustainable, equitable and efficient use of natural resources. Yet, there is little literature available on the concept of water tenure. The purpose of this paper is to examine the notion of tenure in connection with water resources and to explore whether the concept of water tenure has the potential to make a useful contribution towards addressing some of the world's water resources challenges. It seeks to provide answers to the following questions: (a) What is water tenure? (b) Does water tenure really exist? (c) Could the concept of water tenure be useful in terms of the development of natural resources policies and practices?

ISBN 978-92-5-109117-3 ISSN 1729-0554



9 789251 091173

I5435E/1/02.16