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Article

Improved Water Services Cooperation through Clarification of Rules and Roles

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Abstract: Water services face global challenges, many of which are institutional by nature. While technical solutions may suit several situations, institutional frameworks are likely to vary more. On the basis of constructive research approach and new institutional economics we analyze and illustrate water services and the roles of various water sector actors in Finnish water utility setting using the “soccer analogy” by the Nobel Laureate D.C. North: Institutions are the “formal and informal rules of the game” while organizations are the “players”. Additionally, we assess the Finnish water governance system and discuss issues of scale and fragmentation and distinguish terms water provision and production. Finally, we elaborate the limitations of the soccer analogy to water services through ownership of the systems. According to the soccer analogy, inclusive institutional development requires skillful players (competent staff), team play (collaboration), proper coaching (education), supporters (citizens, media), managers (policymakers), and referees (authorities). We argue that institutional diversity and player/stakeholder collaboration are the foundation for enhancing good multi-level water governance, and that water management, although fragmented, should be seen as a connector of different sectors. For successful outcomes, scientific results should be communicated to public in more common language.

Keywords: institutions; soccer analogy; good governance; institutional diversity; stakeholder collaboration; rules and roles

1. Introduction

Water management is a complex issue where solutions largely depend on local conditions. Many challenges are related to institutions, policies and/or management. While technical solutions may suit several situations, institutional frameworks are likely to vary more. Here we discuss governance paradigms for water services (inclusive community water supply and wastewater) in Finland with reflections from other countries. More specifically, this paper aims at exploring governance principles for various institutions and organizations through the rules and roles of various stakeholders. It questions two arguments: firstly, that sector fragmentation is a major problem in water services governance and, secondly, that the major challenges of water services, such as aging infrastructure, vulnerability, and staff competence, can be solved merely by increasing utility size.

We chose Finland as our case country because it—as well as the other Nordic countries—ranks well in global comparisons dealing with water and water services. In 2016, Finland was the first out of 180 countries in the Environmental Performance Index (EPI) with 25 indicators, water being a key component [1]. More related to governance, Transparency International’s Corruption Perceptions Index ranked Finland the least corrupt country in 2006–2007, with Finland remaining in the top three ever since [2].

A distinctive feature of Finland affecting its water services management is the sparse population density, 18 inhabitants per square kilometer on average. However, since almost 86% of the 5.5 million Finns live in the southern urban areas, the population density in the most northern part, Lapland, is less than 2 inhabitants per square kilometer [3]. Thus, the population is also unevenly distributed.

Most of Finland's water networks were built in the 1960s and 1980s, though in the oldest cities, networks are more than 100 years old. Approximately 90% of Finnish households receive their water from water utilities and approximately 85% of the population is covered by sewerage and centralized wastewater treatment. Water management of properties outside of water supply facilities is arranged either on a per property basis or through water cooperatives. In total, there are currently approximately 1500 water supply companies in Finland, of which approximately 1100 are user-established cooperatives or other types of associations and the rest are municipally owned institutions or companies [4].

To clarify the rules and roles of different water sector actors for improved water services management, we first compare institutions and organizations to a soccer analogy. This type of analogy was first illustrated by Harri Mattila in his doctoral dissertation in 2005 to analyze appropriate management of on-site sanitation [5]. However, to our knowledge the analogy has not been applied to other water supply and wastewater services.

In general, soccer, being an internationally popular sport, is often used as a metaphor in teaching different aspects of collaboration and integration such as leadership, team play [6–9], and systems thinking [10], but also in fields like quantum computing [11]. Using soccer allows us to illustrate various stakeholder roles and the concept of institutions in a clear manner that is easy to understand even for people outside the water sector. This is important to increase the general awareness and understanding of water services management.

Second, we present the assessment of the Finnish water services governance system, including the issues of scale and argued fragmentation. In addition, a distinction between water service provision and production is made based on a sustained institutional framework, as articulated by Ostrom [12] and Oakerson [13]. Despite the distinction is a major concern in most of the countries, professional literature seldom recognizes this fundamental difference in the roles of players [14].

Additionally, the limitations of the soccer analogy to water services are elaborated through ownership of the systems, followed by the main findings. In a practical and illustrative manner, this paper contributes to the debate on how to manage community water services in the most sustainable and resilient ways.

2. Methodology and Conceptual Framework

The methodology of this paper is constructive research approach. We consider the approach appropriate as it produces “innovative constructions, intended to solve problems faced in the real world and, thereby, to make a contribution to the theory of the discipline within which it is applied” [15]. Here, the produced innovative construction is the application of the “soccer analogy” to the Finnish water utility field.

The theoretical base of the paper lies on new institutional economics (NIE). As a framework of institutional development, we analyze the roles of various stakeholders in water services by using the soccer analogy of D.C. North, a Nobel Laureate from 1993. According to him, institutions are the “formal and informal rules of the game” while organizations are the “players” [16].

According to Lukka [15], in a constructive study the researcher's empirical intervention is explicit and strong. Contrary to typical objective oriented research with minimal empirical obtrusion, having an impact is part of the constructive research method itself. The innovative construction and concept of using the soccer analogy are based on long-term experiences and knowledge accumulation of the Capacity Development of Water and Environmental Services (CADWES) research team since 1998, currently at Tampere University, Finland. The mission of the team is “to produce usable knowledge and education, based on multi- and interdisciplinary research, on the evolution and development of

sustainable use of water services and water resources in a wider institutional context: Organizations, governance, management, economics, legislation, policy, rules, and practices”.

3. Results

3.1. “Water Soccer”

According to the “soccer analogy” by D.C. North, institutions are the “formal and informal rules of the game” while organizations are the “players.” As in good soccer, we need skillful players (competent staff), good team play (good governance), proper training and coaching (education, capacity building), active supporters (citizens, media), managers (policy-makers), referees (permit authorities), rules and sidelines on the field (legislation), and a playground (infrastructure). Additionally, supporting services such as physiotherapy for recovery (operation and maintenance) are needed. Very good players as well as water sector professionals have the ability to change their roles, that is, making changes in career and widening their views and competence. Additionally, they have a good eye for the game and capacity to react accordingly. In other words, they are agile and resilient. However, even a world-class team should not rely too much on one player, but on smooth collaboration and team play.

Similar to water services management, we may play good soccer using various tactics. Choosing the right tactic depends on various Political, Economic, Social, Technological, Ecological, Legislative and Ethical (PESTELE) circumstances. For example, in the center we need a player to structure and build the game. In water services management in Finland we consider this active role for the water utilities and the Finnish Water Utilities Association (FIWA).

To visualize the roles of specific water sector actors, we used the soccer analogy to analyze “a game” of Finnish municipal water utilities against Team Chaos. The players of Finnish water utilities are presented in Figure 1. The goalkeeper of Finnish utilities needs to ensure the provision of water services in all situations and is therefore the Water Services Pool, set by the National Emergency Supply Agency. The defense includes various ministries, as well as national and regional organizations. The midfield, on the other hand, is taken care of by the foundations and financiers, education and research institutions, and the national water utilities association. Finally, forwards include the water utilities in the center, and private enterprises and citizens. Team Chaos players, on the other hand, will include players and supporters such as bad governance, corruption, inequality, unprofessional and uneducated staff, leaking pipes, polluted water sources, inefficient treatment facilities, and insufficient finance. If they score, the water services are in crisis.

For this paper, we have applied the analogy in the Finnish water utility setting. However, the analogy can be applied in various situations. Depending on the teams, the players and their roles change accordingly. For example, in Harri Mattila’s soccer analogy for on-site sanitation the goalkeeper is the house owner, keeping a water body from getting polluted. In additional contrast to our utility-based example, Mattila has placed legislation, regulation, and authorities in forward field highlighting their active role in on-site sanitation [5].

3.2. Assessment of Finnish Water Governance System

On a national level, multiple ministries are responsible for the governance of water resources and water services. The responsibility for overall development of water services as well as use and maintenance of water resources lies within the Ministry of Agriculture and Forestry. The Ministry also guides the Environmental Institute (SYKE) and the Centers for Economic Development, Transport and Environment (ELY). The Environmental Institute is responsible on national level information management, reporting, warning systems, and several citizen services, whereas the ELY-centers are independent actors with central responsibility in regional and strategical development in water services. Their responsibilities also include coordinating water services and land use planning, water resources use monitoring and development, and the legal monitoring of water services and groundwater.

According to the Water Services Act (2001/119, amended 681/2014), our example of “water soccer” is played, that is, water services are provided by the local governments (municipalities), and produced at four interconnected scales: on-site systems, cooperatives (water user associations), municipal utilities and various inter- and supra-municipal arrangements (Figure 2).

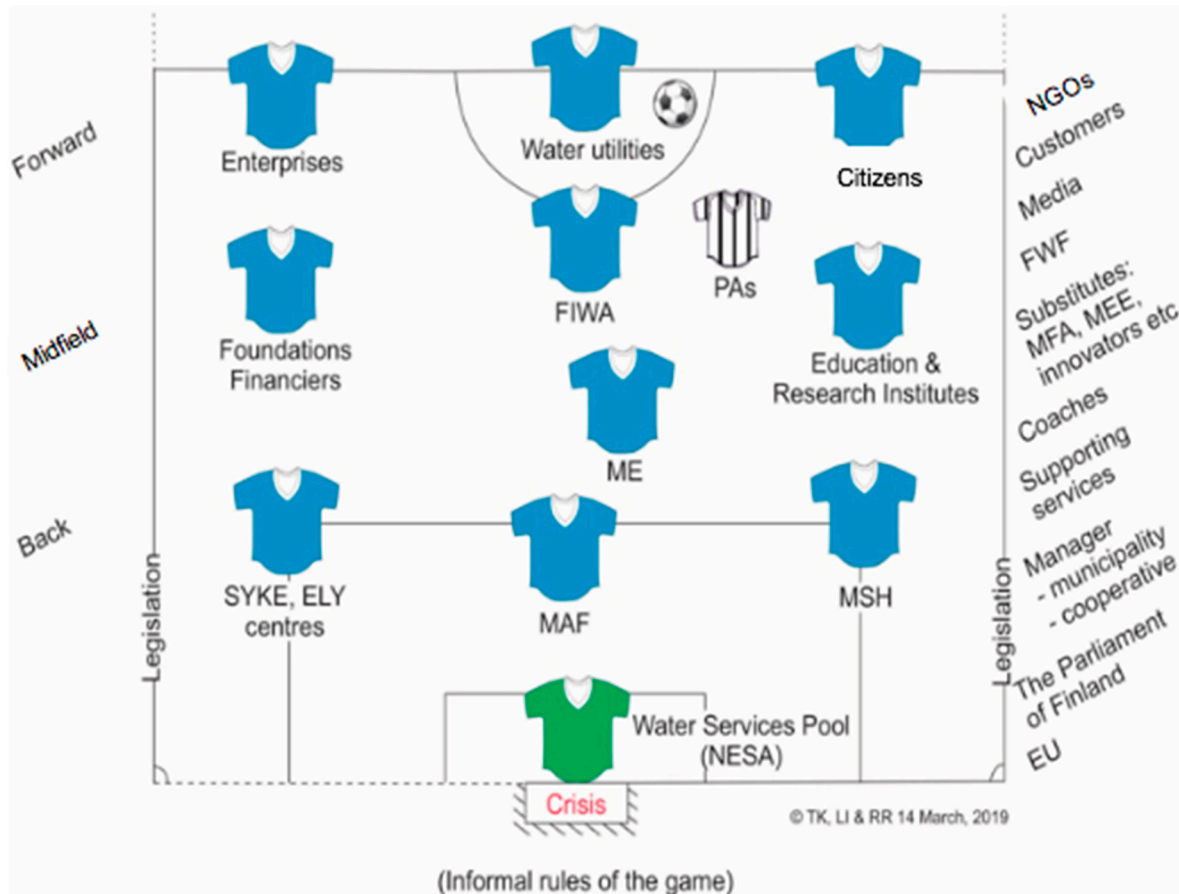


Figure 1. Finnish “water soccer”: Finnish utility-based water services against Team Chaos. Acronyms and abbreviations on the field: FIWA = Finnish Water Utilities Association; PAs = permit authorities; ME = Ministry of Environment; SYKE = Finnish Environment Institute; ELY = Centre for Economic Development, Transport and the Environment; MAF = Ministry of Agriculture and Forestry; MSH = Ministry of Social Affairs and Health; NESAs = National Emergency Supply Agency. In the supporting team: NGOs = non-governmental organizations; FWF = Finnish Water Forum; MFA = Ministry of Foreign Affairs; MEE = Ministry of Employment and the Economy.

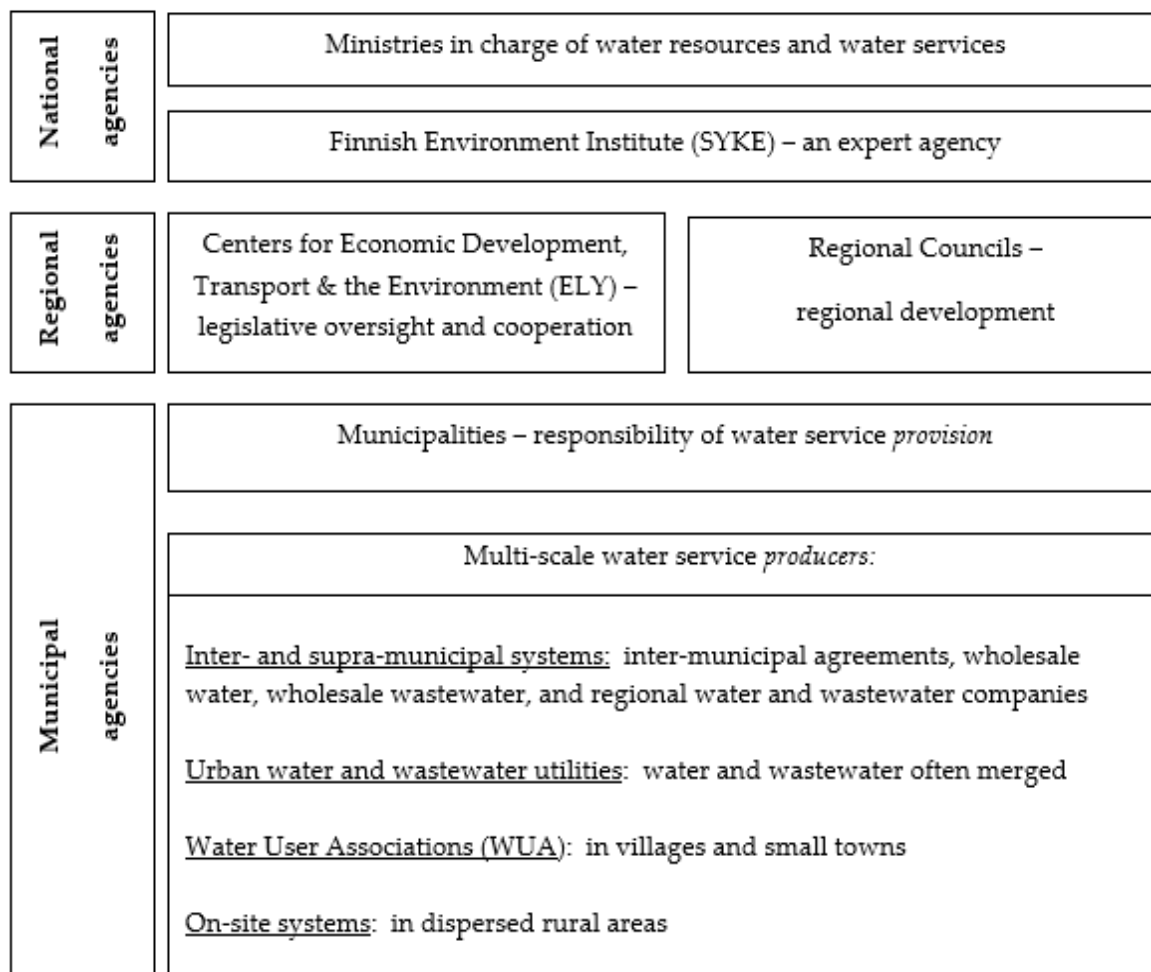


Figure 2. Schematic presentation of water services governance in Finland (authors’ modification from [17]).

The largest water service producers are the inter-municipal systems based on a bilateral agreement, and supra-municipal systems based on regional whole-sale agreement. These often produce water services in both water supply and sewerage. The next largest producers include some three hundred urban water and wastewater utilities serving approximately half of Finland’s population in towns, cities, and population centres forming a single municipality. Small rural systems serving a village or a slightly larger area, on the other hand, are commonly managed by Water User Associations (formally called cooperatives) and have recently become increasingly involved also in sewerage. The smallest water producers are the on-site water and sanitation systems, typically serving one or a few households not connected to networked systems.

In international comparison Finnish water and sewage utilities are quite small. The clear majority of public water utilities are owned by municipalities and their water and/or wastewater companies that serve about 87% of the population. About 90% of the population is covered by public water supply systems, and nearly 80% by public sewerage systems. However, due to long distances and the abundance of water, the coverage of public water services in the country’s sparsely populated areas is quite low compared to many other European countries. Yet, the share of citizens served by public water services has continuously increased in Finland—the coverage of public water services in densely populated areas being currently close to 100% [18]. The level of service of on-site systems is also at a high level.

Based on a sustained institutional framework, such as our example from D.C. North on institutions, a distinction between service provision and production should be made, as articulated by Ostrom [12]

and Oakerson [13]. This distinction is a major concern in most of the countries, such as Finland, where legislation requires municipalities to provide or arrange the services which are produced and delivered by utilities or cooperatives. Once institutional arrangements and provision responsibilities are clear, water services infrastructure is required for the water utilities to produce the actual water services for customers and citizens (Figure 3).

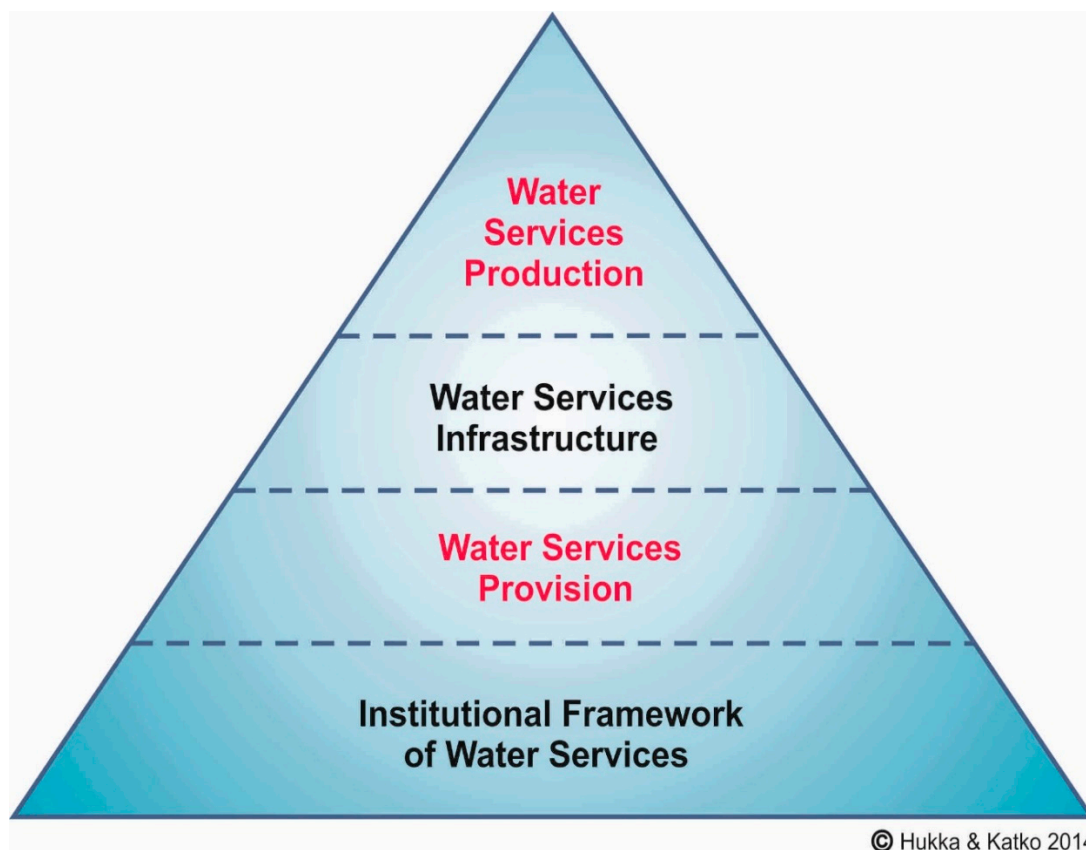


Figure 3. Proposed hierarchical framework for sustained water services institutions, provision, infrastructure, and services production [14].

4. Discussion

Good soccer is never a single player game. Instead, it is a smooth cooperation of various players, whether on the field or supporting on the sidelines. Same is true for sustainable water services. We argue, that cooperation can be enhanced by clarifying roles and rules while being flexible to change according to circumstances. Katko and Hukka state that “to provide and produce sustained water services, we also need proper institutional arrangements and social innovations in addition to “conventional” technological and economic solutions. Technology development should be considered in the wider context of ensuring sustained water services in the futures. That is also an area in need of further research” [14].

However, it is important to remember, that the strategies and arrangement we choose for our games are hardly permanent due to changing environments. In Finland, many smaller water cooperatives in rural areas are in distress due to migration to urban areas and lack of new volunteers and champions to run the cooperatives. Acknowledging the challenges, the responsible ministry, Ministry of Agriculture and Forestry in collaboration with other water sector stakeholders, proposed a water sector reform that would combine smaller cooperatives and utilities into larger units. This proposal, however, was dismissed in wider discussions. Currently the renewed water sector reform or renewal concentrates

on asset management, organization and leadership, bio and circular economy, mitigation, economy, capacity building, operation and maintenance, and investments.

While increasing the size of the utilities may sometimes be justified, it is often more feasible to improve collaboration between utilities, municipalities, private sector, and other players. It is vital to include all the stakeholders through cooperative actions and inclusion within the Political, Economic, Social, Technological, Ecological, Legislative and Ethical (PESTELE) framework. Instead of worrying too much about the water sector fragmentation, we should admit that while water is a sector, it is also, and in particular, a connector of many sectors [19]. Thus, proper water management and collaboration are needed for reaching any of the 17 Sustainable Development Goals (SDGs).

Regarding the argument of increasing size as a solution to problems we refer to Romano et al. [20] who explored the issue of economies of scale. While most studies confirmed the presence of economies of scale, several others found diseconomies of scale in various countries. Several studies propose that only small and medium-sized firms improve efficiency through expansion, whereas big firms do not necessarily benefit through expansion and sometimes even face diseconomies [21,22]. In Finland we have found that water utility managers' willingness to contribute to research and development activities has hardly any correlation with the size of the water utility. It seems to be much more an issue of personal awareness, motivation, and willingness. Therefore, we argue that multiple sizes of water producers enhance institutional diversity, flexibility, and thus better resilience for different playgrounds.

Although the soccer analogy seems to fit well in institutional development and governance principles, there are also limitations. For instance, in current international soccer business private ownerships may be justified. As Tony Blair mentioned, "It is not a burning ambition for me to make sure that David Beckham earns less money" [23]. Yet, in water services, which are not merely necessary but invaluable and indispensable, the recent and historical lessons clearly show that mere business rules cannot be applied. According to Andrews [24], in developing economies a major part of institutions is based on informal rules and thus can be described as icebergs of which over 90% is below the surface. In fact, long term experience shows that financial profits should be used to develop water infrastructure and institutions. There are several good arguments in favor of public ownership such as municipalities, or non-profit bodies or associations. In 1989, England fully privatized its water and sewerage systems, with ownership transferred from the state to large regional monopolies. This raised a lot of criticism until in March 2018, Michael Gove, the environment secretary, launched a withering attack on high pay and dividends in the water industry [25]. Furthermore, between March 2000 and the end of 2016, 267 cases of water re-municipalization in 33 countries (excluding renationalization) have been found [26].

Continuing on the formal rules, in international policy discussion we have over the recent years experienced the argument that there should be less regulation. If and when the operational environment is becoming more and more complex, including more and more requirements, we can call this argument into question. Instead, in institutional development—that is, in the rules of the game—it would be much more appropriate to talk about development and renewal of regulation.

An example of the power of institutional development comes from the Finnish water resources conservation sector. Using legislation, monitoring, technological development, financing and capacity building, Finnish water resources were transformed from a tolerable quality level to good level in twenty years. This would hardly have been possible on a voluntary basis.

An alternative analogy to soccer is "bricks and mortar" by ecosystem-based management (EBM) researchers Julia Wondolleck and Steven Yaffee. There, the bricks are legal mandates, regulations, funding sources, data collection, and organizational structures whereas the mortar is the people, without whom the success would not be possible. Despite in the soccer analogy the players are organizations, the organizations are essentially made up of people [27]. Thus, also emphasizing the importance of informal rules in water services management.

Acknowledging the challenge of trying to impact norms, culture, and habits—the informal rules—we want to encourage a wider array in the types of publications. While scientific research

and publications are important, it is equally important to distribute the findings in a more common language and illustrated with examples such as soccer. Increasing awareness and understanding creates an enabling environment also for policy makers, practitioners and sector professionals to improve the sustainability and resilience of water services management.

In future research, the soccer analogy and the different strategies used in the game, that is in the water services management, could be analyzed in more detail through game theory to map out conflicts and/or cooperation incentives between different stakeholders.

5. Conclusions

Water management is a complex issue where solutions depend on local conditions. While technical solutions may suit several situations, institutional frameworks are likely to vary more. We argue that institutional diversity and player/stakeholder collaboration are the foundation for enhancing good multi-level water governance, and that water management, although fragmented, should be seen as a connector of different sectors. Yet, each country should consider the most appropriate tactics of “playing soccer” in managing their water services within their own institutional framework, share their experiences with others, and improve resilience. In the end, everyone wants a good and fair game but without up-to-date knowledge and information one can easily fail, and therefore more research is required.

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