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Front cover photography: Common lands, like the pastures around Čadrg, reflect socio-economic change in the landscape. Their conservation and successful management are crucial for preserving local culture and biodiversity and supporting sustainable development (photograph: Jure Tičar).
Fotografija na naslovnici: Skupna zemljišča, kot so pašniki v okolici Čadrga, so odsev družbeno-gospodarskih sprememb v pokrajini. Njihovo vzdrževanje in uspešno upravljanje sta nujni za ohranjanje lokalne kulture ter biotske raznovrstnosti in zagotavljanje trajnostnega razvoja (fotografija: Jure Tičar).

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MOTIVATION, ROBUSTNESS AND BENEFITS OF WATER COMMONS: INSIGHTS FROM SMALL DRINKING WATER SUPPLY SYSTEMS

Primož Pipan, Mateja Šmid Hribar, Mimi Urbanc

MATEJA ŠMID HRIBAR

A spring with a village water trough in Čadrg, The Julian Alps, Slovenia.

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Motivation, robustness and benefits of water commons: Insights from small drinking water supply systems

ABSTRACT: The article addresses the governance of water commons with an emphasis on drinking water. The study applied two conceptual frameworks: Ostrom's Design Principles and the Social-Ecological Systems framework. The empirical part refers to two water commons in Slovenia and is based on qualitative data from semi-structured interviews with locals and professionals. The article follows three objectives: 1) to identify the drivers and motivations for successful local water governance; 2) to assess the robustness of water commons in terms of current and future challenges; 3) to identify the benefits of water commons. The key elements for the functioning of the two local communities under examination are shared interests, as well as a strong commitment to effective management. In addition to the material benefits (i.e. drinking water supply), non-material ones are also important. Community building and identity are particularly noteworthy. The importance of small drinking water supply systems that are well organised and responsibly governed as commons is beneficial not only to a municipality but also to a country.

KEY WORDS: water governance, water cooperatives, community water management, community water cooperatives, Ostrom's Design Principles, local water resources management, Slovenia

Motivacija, prožnost in koristi vodnih zadrug: spoznanja iz majhnih sistemov za oskrbo s pitno vodo

POVZETEK: Članek obravnava delovanje vodovodnih zadrug, natančneje tistih, ki upravljajo s pitno vodo. Raziskava temelji na dveh konceptualnih okvirih: načelih oblikovanja Elinor Ostrom in socio-ekoloških sistemih (SES). Empirični del izhaja iz preučevanja dveh vodovodnih zadrug v Sloveniji in sloni na kvalitativnih podatkih iz polstrukturiranih intervjujev z domačini in strokovnjaki. Članek ima tri cilje: 1) identificirati dejavnike in motivacijo za uspešno lokalno upravljanje s pitno vodo, 2) oceniti prožnost vodnih zadrug v luči aktualnih in prihodnjih izzivov ter 3) opredeliti koristi vodovodnih zadrug. Ključna elementa za delovanje dveh obravnavanih lokalnih skupnosti sta skupni interesi in močna zavezanost k učinkovitemu upravljanju z vodnimi viri. Poleg materialnih koristi, kot je zagotavljanje pitne vode, so pomembne tudi nematerialne koristi, zlasti oblikovanje skupnosti in identiteta. Sklepna ugotovitev je, da so lokalni sistemi oskrbe s pitno vodo, s katerimi skupnosti preudarno in odgovorno upravljajo, pomembni in prinašajo koristi ne le občini, temveč tudi državi.

KLJUČNE BESEDE: upravljanje z vodo, vodovodne zadruge, skupnostno upravljanje z vodo, skupnostne vodne zadruge, Ostromina načela oblikovanja, upravljanje lokalnih vodnih virov, Slovenija

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1 Introduction

Water, the quintessential resource that sustains life on Earth, has long been regarded as a vital public good. Lately, it has been recognised as a common pool-resource. This shift in perception stems from the difficulty in restricting access to water and the undeniable fact that its availability can be limited by use or mismanagement (Ostrom and Ostrom 1977). Indeed, it is a vulnerable and conflict-prone resource (Amery 2002; Tucker 2014). Pollution and scarcity of drinking water pose pressing problems that compromise the natural environment and deprive people of a decent quality of life. Climate change, in particular, has been blamed for its widespread impact on water scarcity (Brunner et al. 2019; Vrzel et al. 2019; Terzi et al. 2021; Urbanc and Šmid Hribar 2021). Recently, there has been increasing pressure worldwide (Bakker 2007) and in Europe (Staddon 2016) to privatise water, leading to its commodification. Given that water underpins progress, plays a central role in climate change adaptation and is critical to human society (https://www.unwater.org), there are many calls for better and more sustainable water governance (Pahl-Wostl and Kranz 2010; OECD … 2015).

Water governance can take a myriad of forms, practices or principles and can occur at different levels – (supra)national, regional, and local. The local level is becoming increasingly important. Around the globe, there are initiatives to give local communities control over water supply. In the last fifteen years, there has been a trend toward remunicipalisation, with previously privatized water utility companies returning to municipal hands – already implemented in 235 cities in 37 countries, among which the United States and European countries predominate (Kishimoto, Lobina and Petitjean 2015). In addition to the two main governance models – public or state, and private or corporate, there are two others: a hybrid one, i.e. a combination of decentralisation and marketisation (O'Reilly and Dhanju 2012), and a model that is often overlooked: the community or cooperative model (Bakker 2008). Using examples from Bolivia, Wales, and Finland, Bakker (2008) draws parallels between community participation in water governance and democratisation of water supply. A new step toward recognising the community relevance in water supply was taken during the consultation period for the recast of the 2020 European Drinking Water Directive, and as a result, the Alliance of Community-Owned Water Services in Europe was established (Deane and Domhnaill 2021).

Community drinking water governance exists in many countries around the world, mostly in rural and suburban areas (Deller et al. 2009; Takala et al. 2011; Arvonen et al. 2017), including 200 in Canada (Bakker 2007), 1,400 in Finland (Takala et al. 2011), 2,500 in Denmark, 5,000 in Austria (Nikolaou 2014), and 3,300 in the United States (Deller et al. 2009). In the Global South, the phenomenon is often associated with impoverished communities (Hofstetter, van Koppen and Bolding 2021); Bolivia: 15, Chile: 137 (International … 2001), Sri Lanka: 37, and Kenya: 5,000 (Arvonen et al. 2017). The headwater position typically makes it easier to manage water resources and to ensure quality drinking water (Křeček and Haigh 2019), but also brings with it certain responsibilities downstream.

Lack of community participation is identified as a major impediment to effective water governance, for example in South Africa (Tyhotyholo and Ncube 2023). It is important to acknowledge the significant potential of community water governance on both political and implementation levels (Marston 2015; Rana and Piracha 2018; Katusiime and Schütt 2020). Despite the fact that water commons exist around the world, few studies have been conducted that address their characteristics, role, relevance, and development. The first gap is based on a comparative analysis of Finland and Kenya where Arvonen et al. (2017) suggest that future research on water cooperatives could address an in-depth study of the factors responsible for their successes and failures in different settings. The second gap is related to the lack of awareness in Slovenia that water can be governed by water cooperatives in the same way as common land is managed by agrarian communities. Water commons have been insufficiently studied; the authors of this paper are aware of only two studies that briefly mention water commons in Slovenia (Šmid Hribar et al. 2023; Šmid Hribar, Urbanc and Zorn 2023), unlike agrarian communities, which have attracted much scholarly attention (Vilfan 1996; Petek and Urbanc 2007; Bogataj 2012; Rodela 2012; Premrl et al. 2015; Šmid Hribar, Bole and Urbanc 2015; Šmid Hribar et al. 2018).

The aim of this article is to present and evaluate water commons governance in two local communities in Slovenia – Čadrg and Goriče – based on the Social-Ecological Systems framework (SES) (Ostrom 2009; McGinnis and Ostrom 2014) and Ostrom's Design Principles (DPs) (Ostrom 1990; 2005). Both cases provide interesting insights into water commons that independently govern their own water resources to ensure the supply of sufficient and safe drinking water for their residents. Other uses, such as pumping,

irrigation, and process water, are beyond the scope of this article. This article discusses the material, non-material, regulatory and social benefits of water commons understood as Nature's Contribution to People (NCP) (Díaz et al. 2015; Díaz et al. 2018). The NCP builds upon the concept of ecosystem services, which recognises that ecosystems provide a wide range of goods and services that are essential for human well-being. The NCP goes beyond the traditional focus on the direct provisioning of goods such as food, water, and timber, and also considers the various non-material benefits that nature provides. It highlights the multiple ways in which nature contributes to human life, culture, health, and overall quality of life.

The research study addresses three main research questions. Firstly, it examines the motivations that drive local communities to govern their own water resources. Secondly, it assesses the robustness of water cooperatives in facing present and future challenges. Finally, it examines the diverse benefits associated with water commons, including material, non-material, regulatory and social benefits, and identifies the various beneficiaries of these benefits.

2 Methods

2.1 The territorial context: Slovenia

Within Europe, Slovenia stands out for its low population density and dispersed settling, whereby half of the population is rural and half urban. The country is rich in water resources due to above-average rainfall compared to both Europe and the rest of the world, diverse rock composition, altitude, and topography (Hrvatin, Komac and Zorn 2020). Institutionalised water supply has a long tradition, e.g. in Celje (Rihter 2008). Three facts are vital for a modern water supply: 1) drinking water is regulated by national legal provisions (Eman, Kuhar and Meško 2020); 2) water supply is the responsibility of individual municipalities; 3) according to the Slovenian legislation, water supply systems are divided into public and private. A private system is only possible in cases where the drinking water supply serves less than 50 inhabitants. Public water systems are organised as municipal utility companies and provide a public service (Uredba … 2012). In 2002, almost 91% of Slovenian population had access to public water supply systems operated by 102 public service providers (Čuček 2011). The rest, 196,400 inhabitants, use drinking water from small drinking water supply systems (Kozelj and Drev 2017), which are mostly fed from small springs or boreholes. They require a water permit to operate and a total of 20,013 permits have been issued (Meljo, Krajčič and Smolar Žvanut 2017).

The dispersed water supply is related to dispersed settling. Many small water supply systems are the result of local initiatives, self-organisation of village communities and so-called self-imposed financial and in-kind contributions dating back to the 1960s. This pattern of the drinking water supply system continues into the present day. Most often, small water systems – if they are unable to comply with the Decree on Drinking Water Supply (Uredba … 2012) and Water Framework Directive (2000) – are transferred to the management of larger public water utility companies due to financial and human constraints (Rejec Brancelj et al. 2011; WRc 2017).

Between 2010 and 2015, the ownership of some Slovenian food and beverage companies, which own 17 of the country's 29 water boreholes, was transferred to multinationals, for example, Heineken (Golubović 2016). This spurred a heated debate about water as a public good. Indeed, water is widely perceived as a public good available to all (Loen and Gloppen 2021). This led to constitutionalisation of the right to drinking water in 2016. Article 70a of the Constitution of the Republic of Slovenia stipulates that water resources are primarily intended for supplying the population (household needs) with drinking water and they do not constitute a market good. Water is a public good administered by the state and therefore cannot be disposed of. Despite the best intentions, the constitutional provision on water raises new dilemmas. It transfers the responsibility for water governance from municipalities to the state, which is to govern water directly and non-profitably through self-governing local communities.

One form of self-governing local communities in the water supply sector are water commons with different levels of formal arrangements. There are currently eleven (Uredba o spremembah … 2013) or twelve (Avsec and Štromajer 2015) water commons with a set formal status that are legally organised as water cooperatives. Data on informal water cooperatives are non-existent (Pipan, Šmid Hribar and Urbanc 2018).

2.2 Case studies: Goriče Water Cooperative and Čadrg Water Committee

To study the importance of water commons, the authors of this study selected two examples, an informal Water Committee – Čadrg, and a fully registered one – Goriče. The Čadrg Water Committee is a decade-old form of local self-governance. Conversely, the Goriče Water Cooperative is seven decades old, but its legal form has been changing to conform to national and EU legislation.

The community of Goriče is situated in the foothills of the Kamnik and Savinja Alps, ten kilometres north of Kranj, the fourth-largest town in Slovenia and the capital of north-western Slovenia. Kranj is the seat of the municipality with 58,527 inhabitants. Golnik Hospital, which specialises in lung diseases, has been located in the neighbourhood since the 1920s. Its development had an economic, social and cultural influence on the wider area. In 2022, the Cooperative supplied water to 248 stakeholders or households (each with one share) and provides water to 690 inhabitants in four settlements: Goriče (471 m above sea level), Srednja vas (495 m), Zalog (530 m), Letenice (440 m). This is roughly one tenth more than when the water system was built. The system supplies 18 large consumers, 17 dairy farms and one primary school.

Čadrg (685 m) is an isolated mountain village in the Julian Alps in western Slovenia near the border with Italy. It is part of the sparsely populated municipality of Tolmin with 11,281 inhabitants and is characterised by its border location, remoteness, demographic deprivation and peripheral location. The Water Cooperative (the so-called Čadrg Water Committee) supplies water to 46 inhabitants, whose number has been increasing since its establishment. Čadrg stands out in the municipality due to its high proportion of young inhabitants. The village dairy is the only large consumer.

2.3 Conceptual framework

This study employed two conceptual frameworks for understanding and analysing the governance of water commons. Firstly, DPs (see Table 1) provide a set of guidelines to assess the robustness of both water commons in self-organising for governing and managing their water resources. Secondly, the SES recognises that social systems and ecological systems are interconnected and mutually influencing. It emphasizes the need to consider the interactions between human behaviour, institutions, and the natural environment in order to understand the dynamics of resource governance.

Furthermore, in order to capture the broader benefits of community water governance, the authors of this study applied the principles from the concept of NCP (Díaz et al. 2015; Díaz et al. 2018). In addition, they also considered the social contribution that commons can provide to people as an essential form of social capital: social networks, trust and norms, similar to those assessed in Šmid Hribar et al. (2023).

2.4 Data collection

The empirical part is based on two water commons: The Čadrg Water Committee and the Goriče Water Cooperative. The primary data is based on fieldwork, which included a workshop in Čadrg (December 2015, 8 participants from different sectors) and seven semi-structured in-depth interviews with stakeholders (March 2016), followed by a series of interviews with the Committee's president. In Goriče, a series of interviews with three stakeholders took place between June 2016 and May 2017. To complement the data, the authors interviewed four professionals from the municipalities of Tolmin and Kranj and the public utility company Komunala Kranj (August 2016). The final stage of data collection was carried out in September and October 2022. Interviews were carried out by phone with representatives of both water commons, with a focus on the benefits of water commons. Additional data on benefits were collected as part of the study on commons related to Slovenian cultural landscapes (for the detailed set of variables see Šmid Hribar, Urbanc and Zorn 2023). Secondary data is based on available literature and legal documents concerning drinking water.

Figure 1: Map of the Čadrg and Goriče water commons. ► p. 90

Goriče Water Cooperative
Zalog
Srednja vas
Goriče
Letenice
Kranj
0 2 4 6 8 10 km
Legend
Capital city
Municipality center
Settlement
Municipality border
Water commons area
Content by: Primož Pipan, Mateja Šmid Hribar, Mimi Urbanc
Map by: Domen Turk
Source: GIAM 2022; GURS 2022
© ZRC SAZU, Anton Melik Geographical Institute
HUNGARY
AUSTRIA
CROATIA
SLOVENIA
ITALY
Ljubljana
Adriatic Sea
0 10 20 30 40 50 km
Čadrg Water Committee
Čadrg
Tolmin
0 2 4 6 8 10 km

3 Results

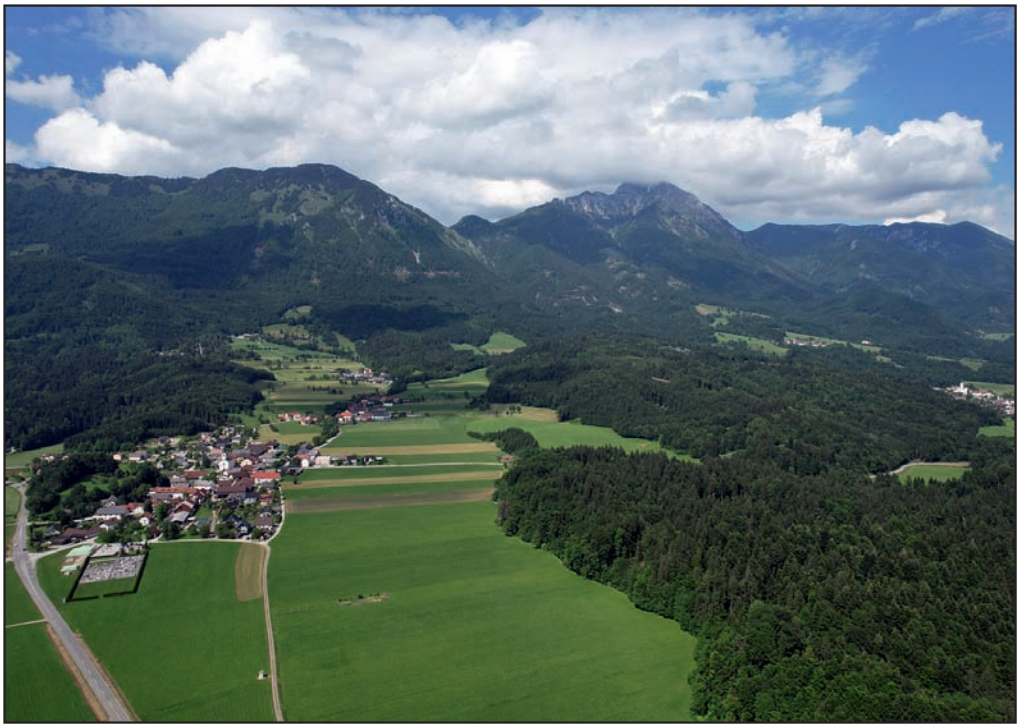
3.1 What drives local communities to govern their water resources

While both the Goriče Water Cooperative and the Čadrg Water Committee aim to ensure access to safe drinking water, their drivers differ in terms of initial motivation, ownership structure, and governance practices. The Goriče Water Cooperative was established to supply healthy food to a nearby hospital and retains control over the water system, while the Čadrg Water Committee emerged from the need for safe drinking water for the village dairy and operates as a recognised private water system governed by a community board.

3.1.1 Goriče Water Cooperative

The need to produce healthy food, especially milk, for the nearby Golnik Hospital generated the idea of building a water supply system in Goriče and the neighbouring settlements as early as 1937. The Goriče Water Cooperative was founded in 1938. The Second World War brought preparations to a standstill, but by 1946 and 1947, inhabitants – members and non-members – had already moved 7,000 m^3 of earth by hand and built the water pipeline (Zadružna … 1995; Košir 2011). When the Goriče Local Community was established – the 1974 Constitution of the Socialist Republic of Slovenia introduced local communities as the lowest administrative units (Fink-Hafner and Kropivnik 2006) – the water supply system passed into its hands.

In 1994, when the Local Self-Government Act came into force, the powers of local communities were relinquished to municipalities. The residents of Goriče decided not to hand over their water system to the Municipality of Kranj or to its operator – the public utility company Komunala Kranj. Based on the Cooperatives



MATEJ LIPAR

Figure 2: The area of the Goriče Water Cooperative on the alluvial fan below the Kamnik and Savinja Alps.

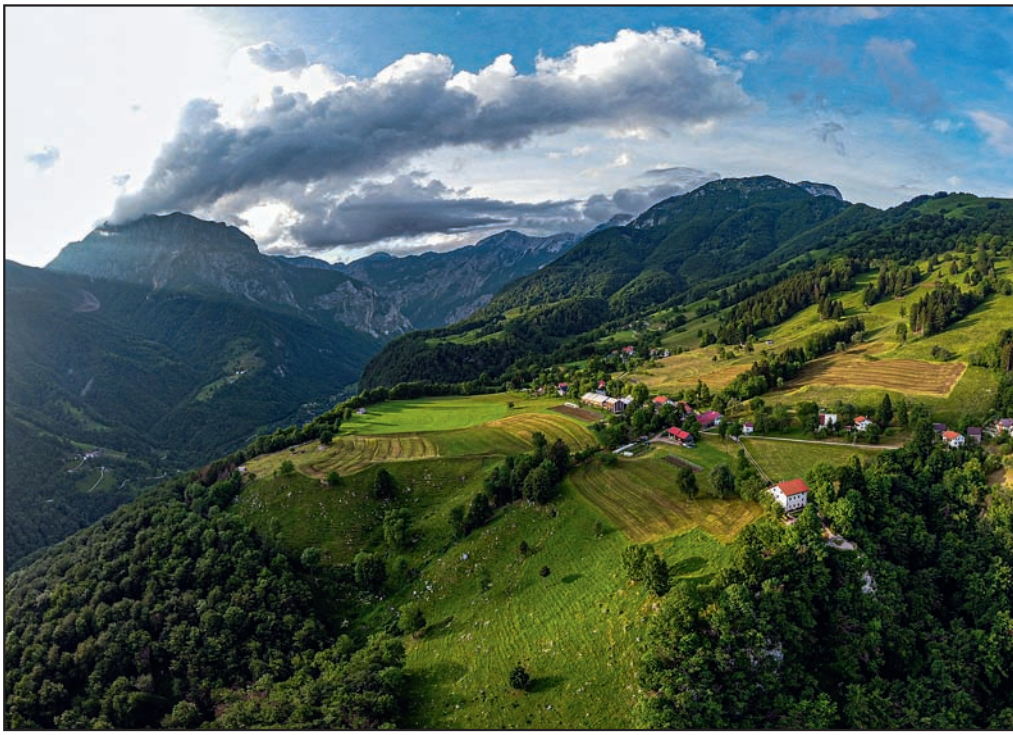
Act (Zakon … 1992), the majority of the households of the Goriče local community re-established the Goriče Water Cooperative in 1995. It pursues its original purpose, i.e. to supply sufficient quantities of safe drinking water at an affordable price to its stakeholders. To achieve this, the water supply network was renovated in line with modern standards, including ultraviolet water treatment. All revenues are used exclusively for the operation of the system.

The water is supplied from three wells: two are located on the Water Cooperative's land and one is on the land of a member of the cooperative. The land on which the water reservoirs are located is owned by the members of the cooperative and the cooperative itself. Despite the ever more challenging precipitation pattern, the Water Cooperative expects to be able to continue fulfilling its ambition, especially because a big increase in the number of inhabitants is not foreseen.

The initial establishment of the Water Cooperative was incredibly progressive. It reflected forward-thinking, self-initiative and social cohesiveness. Two factors were important: the Golnik Hospital and existing examples of water systems in the region. The last reorganisation, which was a *de jure* reestablishment, was an act of civil disobedience towards the municipality, again based on self-initiative and social cohesiveness.

3.1.2 Čadrg Water Committee

The village of Čadrg has extensive experience in community-based initiatives. The villagers themselves built the road to the village between 1972 and 1990 by hand. In 1998, they made the empty building of the former school available to the Don Pierino Community for the treatment of drug addicts (Pipan 2004). Governance of the water supply was another of the community practices, albeit unprofessionally and informally. In 2010, the location of the old water reservoir was found to be problematic in terms of health standards, as it was located in a pasture area. The village dairy, which produces organic Tolminc cheese in particular, was dependent on safe drinking water, therefore an immediate solution to the problem was needed.



JURE TIČAR

Figure 3: The area of the Čadrg Water Committee in the Julian Alps in Triglav National Park.

There were two options: 1) governance of the water system could be handed over to the public utility company Komunala Tolmin; 2) villagers' water rights could be transferred to the Municipality of Tolmin, which should provide safe water via Komunala Tolmin. Both options foresaw the chlorination of water. The only way to keep the water unchlorinated was to retain the governance locally. This option was voted through a full majority at a community meeting. The villagers formed a Water Committee to build a new well and a new reservoir on a forested land away from the old one. The new water system, equipped with ultraviolet treatment, became operational in November 2011.

In view of the Decree on Drinking Water Supply (Uredba … 2012), which defines water systems in settlements with less than 50 inhabitants as private, the Čadrg residents themselves applied for a water permit, which was issued in 2012. As a result of this act, the community water system officially became a private water system with joint ownership governed by a seven-member board.

The Water Committee is considered to be a newly established commons whose governance practices were inspired by centuries-old practices of land commons, i.e. agrarian communities (Premrl et al. 2015). In Čadrg, the Agrarian Community has survived political, economic and social turbulence in the last hundred years.

The main external threat is water shortage due to climate change. The greatest internal weakness is an irresponsible attitude due to the failure to thoroughly check and report leak on a regular basis. The establishment of the Committee was progressive, especially because commons in Slovenia and globally have been in decline (Brown 2006; Premrl et al. 2015). It reflected environmental awareness, self-initiative, social cohesiveness and mutual trust.

3.2 Robustness of water commons

The authors of this study examined the applicability of Ostrom's (1990; 2010) eight DPs to analyse the robustness of two Slovenian water commons with a clear bottom-up self-governance. Despite the nationally favourable attitude to commons in general; for example, tradition (Avsec and Štromajer 2015), and specifically for water commons, the challenges in water governance and strict sanitation requirements are leading to pressure to transfer the governance of water resources to a municipal utility company, for example, in Goriče.

3.3 Benefits of water commons

The water resources governed by both rural local communities bring regulatory, material and non-material benefits. In addition to accessibility to drinking water, the ability to regulate the drinking water quality is important to local people (Table 2). The option of chlorinating the water or instead using ultraviolet lamp treatment is their choice and responsibility. Among the non-material benefits, the locals of Čadrg identified learning, inspiration and strong support for the local identity. They are proud to drink their own water. In Goriče, the non-material benefits included strengthening the community and identity, as well as the ability to use the water resource to preserve the potential for future generations.

Water governance brings social benefits to both local communities. In Čadrg, members build trust and share common norms and values through the water commons. In Goriče, there is a perceived outward integration of the water cooperative with other networks. The Volunteer Firefighters Association and the Agrarian Community manage and maintain the landscape of the water catchment area.

The interviews revealed that locals also recognise the importance of headwater managing. This brings additional, mainly regulating benefits. Erosion prevention and landslide control measures are being implemented to maintain the balance and regulate the water source in Goriče. There is an awareness that surface water needs to be monitored and managed, otherwise it could endanger ground water or cause turbidity in drinking water. Through regular checks, they ensure that there are no carcasses of dead wild animals in the water catchment area and that new forest tracks do not interfere with waterways. In Čadrg, no special regulatory measures targeted at the water source have been taken, but by the time of their self-organisation, environmentalism had already taken over the media and social discourse. Having had experience with the unsuitable location of the former water reservoir, they have thoughtfully located the new reservoir to eliminate potential problems.

Table 1: Conformity of both water commons with DPs.

DPs	Čadrg Water Committee	Goriče Water Cooperative
1 Clearly defined boundaries of resource and users	YES. A resource boundary overlaps with the natural catchment area of the reservoir and is not signposted. Use rights are connected to the local residence address. The owners of the water supply system are all land (residential) owners in the village of Čadrg. The owner of the land in the catchment area is the Agrarian Community (joint ownership).	YES. A resource boundary overlaps with the natural catchment area of the reservoirs and is not signposted. Use rights are connected to the local residence address; no one is to be excluded. The owner of the water supply system is the Goriče Water Cooperative, which is based on voluntary membership (90% of the users are members). The land in the catchment area is owned by the Cooperative's members and the Agrarian Community (joint ownership).
2 Proportional equivalence between benefits and costs	YES. Once yearly, users pay according to the distribution key, which follows the water consumption regulations of the Municipality of Tolmin. The payment also covers monitoring and operation. The quantity ceiling per household is not stipulated. In case of water shortage, users are asked in advance to reduce water consumption as a precautionary measure to avoid complete interruptions. The responsibility of users is to use water sparingly when inflow is low, to report immediately when a leak is noticed and to pay for the service.	YES. Twice yearly, users pay according to the quantity of water consumed. The payment also covers monitoring and operation. A flat-rate for the network charge is added. There is no difference in benefits and costs between members and non-members. The quantity ceiling per user is not stipulated. In case of water shortages, there are graduated mitigation measures (from restrictions on certain activities, e.g. car washing, to temporary general reductions in supply). The responsibility of users is to use water sparingly when inflow is low and to pay for the services.
3 Collective-choice arrangements (participation in the decision-making process)	YES. The Committee has tailored its operation to the local geographical (quantity of water, location of water sources) and (supra)national legal environment. There are no rules of operation or statutes. Representatives (one per household) meet once a year, usually in December, to set the unit price. If necessary, they may hold additional meetings.	YES. The operation has been tailored to the local geographical (quantity of water, location of water sources) and (supra)national legal environment. General rules of cooperatives apply. There are three levels of governance: the president, the board of directors and the general assembly (called once a year). The board of directors fixes the unit price. A group of members can call an extraordinary general assembly and propose changes. Non-members cannot participate in modifying rules. Since its establishment, the operational rules have only been amended to comply with legislation.
4 Monitoring of resource and users	YES and NO. National regulations lay down water quality parameters. Water quality monitoring is imposed from above. The resource quantity monitoring is self-imposed. There is only one common water meter. Peer pressure becomes relevant in case of shortages, as the Committee is not in a position to monitor excessive water consumption.	YES and NO. National regulations lay down water quality parameters. Water quality monitoring is imposed from above. The resource quantity monitoring is self-imposed. Each user has a water meter. Peer pressure becomes relevant in case of shortages, as the Cooperative is not in a position to monitor excessive water consumption. They keep a close watch on the water catchment area.
5 Graduated sanctions (proportionate sanctions)	YES. There is a little leeway for rule violations. Misconduct takes the form of irresponsible behaviour (failure to comply with austerity measures in a dry season or failure to report a leak in the system).	YES. There is a little leeway for rule violation. Misconduct takes the form of irresponsible behaviour (failure to comply with austerity measures in a dry season).
6 Conflict-resolution mechanisms	YES. Conflicts arise only when members do not perform their duties properly, e.g. they do not thoroughly check where the leak is. Disputes are resolved on an ongoing basis. The stages are: 1) negotiations, 2) a personal warning is issued to the offenders, 3) a meeting of all users where a specific problem is on the agenda.	YES. There are occasional conflicts connected with rights of usufruct as routes of the water network, which run through private land, are sometimes disputed. Small problems are solved by negotiation, while bigger ones by applying the Cooperative's rules and at a general assembly.
7 Minimal recognition of rights to organize	YES and NO. The Committee is an informal organisation without statutes. It operates within the framework of the Čadrg village council, which in itself is also an informal entity, however, the water permit entitles it to provide water.	YES. The Cooperative is a legal entity organised under the Cooperatives Act (Zakon . . . 1992). It is listed in the Slovenian Business Register.

DPs	Čadrg Water Committee	Goriče Water Cooperative
8 Nested enterprises	YES and NO. Functioning must comply with legislation (municipal, national, EU-wide). The Water Committee is not vertically integrated into the Municipality and does not have a legal subjectivity of its own. However, they do cooperate exemplarily. It is integrated horizontally with the Agrarian Community, which owns the land in the catchment area.	YES and NO. Functioning must comply with legislation (municipal, national, EU-wide). The Cooperative is not vertically integrated into the Municipality. Mutual mistrust between the Municipality and the Cooperative is always present. Pressure from the Municipality is fierce. The Cooperative is integrated horizontally with the Agrarian Community and the local Volunteer Firefighters Association.

Table 2: Benefits of community governance with water resources in Čadrg and Goriče.

Selected cases			Čadrg	Goriče
Type of commons		Traditional		x
		Transforming		
		New	x	
Geographical area		Rural	x	x
		Urban		
Nature's contribution to people (NCP)	Regulating	Habitat creation and maintenance		
		Pollination and dispersal of seeds and other propagules		
		Regulation of air quality		
		Regulation of climate		
		Regulation of ocean acidification		
		Regulation of freshwater quantity, location and timing		
		Regulation of freshwater and coastal water quality	x	x
		Formation, protection and decontamination of soils and sediments		
		Regulation of hazards and extreme events		
		Regulation of detrimental organisms and biological processes		
	Material	Energy		
		Food and feed	x	x
		Materials, companionship and labour		
		Medicinal, biochemical and genetic resources		
	Non-material	Learning and inspiration	x	
		Physical and psychological experiences		
		Supporting identities	x	x
		Maintenance of options		x
Social contribution		Social networks		x
		Trust and reciprocity	x	
		Shared norms and values	x	
Additional measures to maintain regulation of NCP		Yes		x
		No	x	

4 Discussion

The answer to the question of why some local communities have succeeded in retaining successful water governance until today is complex and structured. There are several decisive factors related to the local-specific and the general, i.e. national, context.

The general attitude in Slovenia towards water as a public good available to all (Loen and Gloppen 2021) and global initiatives for local communities to control water supply (Kishimoto, Lobina and Petitjean 2015) support the endeavours of both water commons. The cases examined in this study have shown that community water governance can be an alternative to mainstream governance models – public and private, which is congruent with evidence in published literature (Bakker 2008).

Water commons need strong motivation from the outset through to the mature stage of operation. The key motivation is connected with agriculture, which functions as a backbone activity in both cases. In dairy farming, the need for sufficient and safe water became evident. In Čadrg, the need for chlorine-free water for the production of organic cheese was the immediate motive for the setting up of a water common. In Goriče, the motives were broader and related to the economic and social development of the area half a century earlier. The persistence is also attributable to milk production, which requires large quantities of water. For this reason, the farmers, who are also landowners, are the driving force behind the actions – either directly or indirectly through the Agrarian Community. Greater momentum for actions is observed if the communities consist of younger members. The results confirm widely established findings (e.g. Ostrom 1990; Ostrom 2005; Bravo and Marelli 2008; Gatto and Bogataj 2015) that communities are capable of governing their resources through cooperation and dialogue, provided they have a common interest.

Both water commons have been able to emerge and survive because of the strong commitment of proactive individuals, backed by a strong and cohesive local community. Water commons act as a link between communities and provide a great example of community building. Hence, this study has advanced the current literature by stating that it is not only about water supply or service to residents, but also about social capital, identity, and coherent vanguard community. This is in line with the findings of Heinmiller (2009) who claims that in governing many common-pool resources, institutional legacies may be just as important as the knowledge, preferences, and mutual trust of current stakeholders.

Both water commons must also be understood in the context of marginality. Both communities are located in a headwater on the edge of the municipality. Čadrg's marginality is even more pronounced, not only because of its position on the western periphery of Slovenia but also because of its mountainous location and altitude. The feeling of being ignored and left to one's own devices is strong in both areas, and the commons are a form of a local initiative and resistance to municipal centralisation. This feeling is particularly strong in Goriče, where the pressure from the municipality to take over their local water resource is ever-present. The governance of water carries an element of mistrust towards the municipality and, as a consequence, of rebellion and civil-society activism.

Of Ostrom's eight DPs, DPs 7 and 8 refer to the importance of the state's role. In this case, the state sets a general legal framework and requires registration of the water source use, but it does not otherwise interfere with governing. The commons' stakeholders can develop self-organising institutions to self-govern their own water resources. Although the Goriče Water Cooperative was found to be more compliant with the DPs and is therefore more robust than the Čadrg Water Committee, neither of them meets all the DPs. Monitoring (DP 4) and Nested enterprise structures (DP 8) – both horizontal, appear to cover some spectrum in both cases. In the case of the Čadrg Water Committee, Minimal recognition of rights to organise (DP 7) is informal. It has a right to organise, but the degree of formality is very low.

Robustness is equated with long duration, lasting from centuries to a millennium, through many ups and downs, and many adaptive changes to disturbances (Anderies, Janssen and Ostrom 2004). However, none of the commons studied has such a long tradition, with the Goriče Water Cooperative having a longer tradition than the Čadrg Water Committee. Therefore, and due to better developed DPs, the Goriče Water Cooperative is more robust than the Čadrg Water Committee.

Both cases show that water commons bring various benefits (nature contribution) to people. In addition to the material benefit, i.e. drinking water, a myriad of non-material benefits can be singled out. Supporting the identity and providing opportunities for learning and generating inspiration are experiential. Among social benefits, networking with other entities, building trust and reciprocity, and sharing common norms and values were identified.

Both water commons demonstrate a high degree of responsibility towards the local community, the water source, and ultimately the landscape. This level of responsibility – supported by knowledge, awareness and economic stability – enables water commons to provide sufficient and safe drinking water.

Both water commons have prior positive experiences with self-governance from agrarian communities and are therefore aware of the benefits of governing their own natural resources. Previous experiences have empowered them in self-recognition of their know-how and capabilities. This leads to a notion that was not explicitly mentioned but was sensed throughout the interviews, namely path dependency. Water commons' representatives seem to be aware of the complex physical and social environment in which they function, but when it comes to approaches to achieving goals and missions, they constantly refer to earlier experiences and decisions. Water commons are not perceived as an achievement, but rather as a natural deed for the benefit of the community. In terms of path dependency, governing one's own water resources is not a goal, but a long-term tool to sustain the local community's independence in water provision. In this way, they can set their own water price, which is much lower and more affordable than that of the municipal utility companies. There are no elements of game-playing or tactics, but minimal adjustability to the legal framework.

The elements that make common governing in both cases possible are: strong motivation, a voluntary aspect, and democratic decision-making, which are in agreement with published literature (Arvonen et al. 2017). The elements that make selected cases different are: size, degree of formality, motivation, longevity of tradition, and benefits that water caters to local inhabitants, which is consistent with the established literature (Takala et al. 2011).

The results are consistent with other literature showing that water commons are a suitable form of governing common-pool resources (Deller et al. 2009; Takala et al. 2011; Arvonen et al. 2017), provided they are able to overcome social dilemmas and recognize a common interest in preserving their resources (e.g. Ostrom 1990; Ostrom 2005; Bravo and Marelli 2008; Gatto and Bogataj 2015).

The findings of this article can have implications for governance and policy. Raising awareness of each individual and small communities through a policy of small steps is of paramount importance. Each individual influences and changes the common good through their behaviour, whether unwittingly or willingly. Communities with natural resources should build on informed and empowered local communities that pose and are aware of the value of natural resources and what they can do for them. Rather than putting pressure on water commons, municipalities should strive to achieve interdependencies between the local and municipal levels. This would help water commons build greater robustness and municipalities to capitalise on them to achieve a higher level of municipality coherence and identity.

5 Conclusions

This study focused on identifying the factors of successful water commons, their robustness and the benefits they bring to a local community. To address the issue of local governance of water resources, case studies of two contrasting water commons in Slovenia were used.

The conceptual lens consists of the SES and DPs to gain insight into the resources and their users within the local context. The underlying factors that enable both water commons to function are strong economic/material interest, passionate commitment, understanding of the commons as a tool to mitigate marginality and soft resistance towards municipality centralisation. In terms of robustness, none of the commons fulfils all the DPs. The weak points are monitoring, vertical positioning, and in the case of Čadrg, additionally lack of formality. The benefits are directly linked to the drivers and motivation. There are material and non-material benefits. Among the latter, community building and identity stand out. The concepts that bind all these aspects together are self-initiative, social cohesiveness and path-dependency.

For this reason, a policy implication would be to deploy local collective actions as a tool to achieve greater coherence within a municipality. It is important to achieve mutual interdependencies between the local and municipal levels. The practical implications of the study confirm Ostrom's findings that communities are capable of governing their resources through cooperation and dialogue, provided they have a common interest. The importance of local small water systems that are well organised and responsibly governed should be seen as a benefit, not only to a municipality but also to a country. As examples of shared

water governance, they are good role models for educating the public about the importance and value of common-pool resources governing.

If local communities want to maintain control over their own small drinking water supply systems and govern and manage them independently, they should not turn them over to public utility companies, as this is an irreversible decision. By assuming responsibility for their own governance and management, communities benefit both financially and in terms of the potential advantages of accessing unchlorinated water.

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6 References

Amery, H. A. 2002: Water wars in the Middle East: A looming threat. The Geographical Journal 168-4. DOI: https://doi.org/10.1111/j.0016-7398.2002.00058.x

Anderies, J. M., Janssen, M. A., Ostrom, E. A. 2004: A framework to analyze the robustness of social-ecological systems from an institutional perspective. Ecology and Society 9-1. DOI: https://doi.org/10.5751/es-00610-090118

Arvonen, V., Kibocha, S. N., Katko, T. S., Pietilä, P. 2017: Features of water cooperatives: A comparative study of Finland and Kenya. Public Works Management and Policy 22-4. DOI: https://doi.org/10.1177/1087724X17715267

Avsec, F., Štromajer, J. 2015: Development and socioeconomic environment of cooperatives in Slovenia. Journal of Co-operative Organization and Management 3-1. DOI: https://doi.org/10.1016/j.jcom.2015.02.004

Bakker, K. 2007: The »commons« versus the »commodity«: Alter-globalization, anti-privatization and the human right to water in the Global South. Antipode 39-3. DOI: https://doi.org/10.1111/j.1467-8330.2007.00534.x

Bakker, K. 2008: The ambiguity of community: Debating alternatives to private-sector provision of urban water supply. Water Alternatives 1-2.

Bogataj, N. 2012: Model delovanja slovenskih agrarnih skupnosti. Soupravljanje naravnih virov: vaške skupnosti in sorodne oblike skupne lastnine in skupnega upravljanja. Wageningen.

Bravo, G., Marelli, B. 2008: Irrigation systems as common-pool resources. Journal of Alpine Research/Revue de Géographie Alpine 96-3. DOI: https://doi.org/10.4000/rga.536

Brown, K. M. 2006: New challenges for old commons: The role of historical common land in contemporary rural spaces. Scottish Geographical Journal 122-2. DOI: https://doi.org/10.1080/00369220600917412

Brunner, M. I., Björnsen Gurung, A., Zappa, M., Zekollari, H., Farinotti, D., Stähli, M. 2019: Present and future water scarcity in Switzerland: Potential for alleviation through reservoirs and lakes. Science of the Total Environment 666. DOI: https://doi.org/10.1016/j.scitotenv.2019.02.169

Čuček, S. 2011: Water supply, wastewater treatment and irrigation in Slovenia compared to the EU. Water management in Slovenia. Celje.

Deane, B., Domhnaill, B. M. 2021: The alliance of community-owned water services in Europe: Opportunities and challenges based on the Irish perspective. Water 13-22. DOI: https://doi.org/10.3390/w13223181

Deller, S., Hoyt, A., Hueth, B., Sundaram-Stukel, R. 2009: Research on the economic impact of cooperatives. Internet: http://reic.uwcc.wisc.edu/water/ (30. 11. 2022).

Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., Larigauderie, A., et al. 2015: The IPBES Conceptual Framework – connecting nature and people. Current Opinion in Environmental Sustainability 14. DOI: https://doi.org/10.1016/j.cosust.2014.11.002

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R.T., Molnár, Z., Hill, R. 2018: Assessing nature's contributions to people. Science 359-6373. DOI: https://doi.org/10.1126/science.aap8826

Eman, K., Kuhar, S., Meško, G. 2020: Access to safe and affordable drinking water as a fundamental human right: The case of the Republic of Slovenia. The Emerald Handbook of Crime, Justice and Sustainable Development. Bingley.

Fink-Hafner, D., Kropivnik, S. 2006: Politična udeležba v posocializmu: med deformirano modernostjo, novo modernizacijo in postmodernostjo. Družboslovne razprave 22-51.
Gatto, P., Bogataj, N. 2015: Disturbances, robustness and adaptation in forest commons: Comparative insights from two cases in the Southeastern Alps. Forest Policy and Economics 58. DOI: https://doi.org/10.1016/j.forpol.2015.03.011
Golubović, B. 2016: Predlogi na osnutek ustavnega zakona – pravica do pitne vode. Internet: http://voda.svoboda.si/sprememba-ustave/predlogi-na-osnutek-ustavnega-zakonapravica-do-pitne-vode/Informacijski sistem javnih služb (28. 12. 2022).
Heinmiller, T. 2009: Path dependency and collective action in common pool governance. International Journal of the Commons 3-1. DOI: https://doi.org/10.18352/ijc.79
Hofstetter, M., van Koppen, B., Bolding, A. 2021: The emergence of collectively owned self-supply water supply systems in rural South Africa – what can we learn from the Tshakhuma case in Limpopo? Water SA 47-2. DOI: https://doi.org/10.17159/wsa/2021.v47.i2.10921
Hrvatin, M., Komac, B., Zorn, M. 2020: Water resources in Slovenia. Water resources management in Balkan countries. Cham. DOI: https://doi.org/10.1007/978-3-030-22468-4_3
International Labour Office, 2001. Promotion of cooperatives. International Labour Conference, 89th Session. Geneva. Internet: https://www.ilo.org/public/english/standards/relm/ilc/ilc89/pdf/rep-v-1.pdf (22. 12. 2022).
Katusiime, J., Schütt, B. 2020: Integrated water resources management approaches to improve water resources governance. Water 12-12. DOI: https://doi.org/10.3390/w12123424
Kishimoto, S., Lobina, E., Petitjean, O. (eds.) 2015: Our public water future. The global experience with remunicipalisation. Amsterdam, London, Paris, Cape Town, Brussels.
Košir, M. 2011: Moja pot skozi čas. Ljubljana.
Kozelj, D., Drev, D. 2017: Možnost kontaminacije pitne vode in varnostni ukrepi. Drugi slovenski kongres o vodah. Ljubljana.
Křeček, J., Haigh, M. 2019: Land use policy in headwater catchments. Land Use Policy 80. DOI: https://doi.org/10.1016/j.landusepol.2018.03.043
Loen, M., Gloppen, S. 2021: Constitutionalising the right to water in Kenya and Slovenia: Domestic drivers, opportunity structures, and transnational norm entrepreneurs. Water 13-24. DOI: https://doi.org/10.3390/w13243548
Marston, A. 2015: Autonomy in a post-neoliberal era: Community water governance in Cochabamba, Bolivia. Geoforum 64. DOI: https://doi.org/10.1016/j.geoforum.2013.08.013
McGinnis, M. D., Ostrom, E. 2014: Social-ecological system framework: initial changes and continuing challenges. Ecology and Society 19-2. DOI: https://doi.org/10.5751/ES-06387-190230
Meljo, J., Krajčič, J., Smolar Žvanut, N. 2017: Raba voda v Sloveniji. Drugi slovenski kongres o vodah. Ljubljana.
Nikolaou, K. 2014: Another world exists: Thousands of water co-operatives on the planet. Aigua és Vida. Internet: https://www.aiguaesvida.org/another-world-exists-thousands-of-water-cooperatives-on-the-planet/ (10. 11. 2022).
OECD Principles on Water Governance 2015. Internet: https://www.oecd.org/cfe/regionaldevelopment/OECD-Principles-on-Water-Governance.pdf (24. 12. 2022).
O'Reilly, K., Dhanju, R. 2012: Hybrid drinking water governance: Community participation and ongoing neoliberal reforms in rural Rajasthan, India. Geoforum 43-3. DOI: https://doi.org/10.1016/J.GEOFORUM.2011.12.001
Ostrom, E. 1990: Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge.
Ostrom, E. 2005: Understanding institutional diversity. Princeton.
Ostrom, E. 2009: A general framework for analysing sustainability of social-ecological systems. Science 325-5939. DOI: https://doi.org/10.1126/science.1172133
Ostrom, E. 2010: Beyond markets and states: Polycentric governance of complex economic systems. The American Economic Review 100-3. DOI: https://doi.org/10.1257/aer.100.3.641
Ostrom, V., Ostrom, E. 1977: Public goods and public choices. Alternatives for Delivering Public Services. New York.
Pahl-Wostl, C., Kranz, N. 2010: Water governance in times of change. Environmental Science and Policy 13-7. DOI: https://doi.org/10.1016/j.envsci.2010.09.004
Petek, F., Urbanc, M. 2007: Skupna zemljišča v Sloveniji. Geografski vestnik 79-2.

Pipan, P. 2004: Čadrg: primer don Pierinove skupnosti kot dodatne priložnosti za razvoj podeželja. Geografski obzornik 51-4.

Pipan, P., Šmid Hribar, M., Urbanc, M. 2018: The role of local community in governing water as a common-pool resource. Alpine water – common good or source of conflicts. Breitenwang.

Premrl, T., Udovč A., Bogataj, N., Krč, J. 2015: From restitution to revival: A case of commons re-establishment and restitution in Slovenia. Forest Policy and Economics 59. DOI: https://doi.org/10.1016/j.forpol.2015.05.004

Rana, M., Piracha, A. 2018: Supplying water to the urban poor: Processes and challenges of community-based water governance in Dhaka city. Management of Environmental Quality 29-4. DOI: https://doi.org/10.1108/MEQ-11-2017-0127

Rejec Brancelj, I., Jerič, M., Zupan, F., Nagode, P. 2011: Medresorska odgovornost pri izvajanju Načrta upravljanja voda 2009–2015 in učinkovitejše poti za doseganje dobrega stanja voda. Upravljanje voda v Sloveniji. Celje.

Rihter, A. 2008: 100 let vodovoda v Celju. Celje.

Rodela, R. 2012: Uvod v skupno lastnino in skupno upravljanje naravnih virov. Soupravljanje naravnih virov: vaške skupnosti in sorodne oblike skupne lastnine in skupnega upravljanja. Wageningen. Internet: https://edepot.wur.nl/205876 (10. 10. 2022).

Staddon, C. 2016: Managing Europe´s Water Resources. New York.

Šmid Hribar, M., Bole, D., Urbanc, M. 2015: Public and common goods in the cultural landscape. Geografski vestnik 87-2. DOI: https://doi.org/10.3986/gv87203

Šmid Hribar, M., Kozina, J., Bole, D., Urbanc, M. 2018: Public goods, common-pool resources, and the commons: The influence of historical legacy on modern perceptions in Slovenia as a transitional society. Urbani izziv 29-1. DOI: https://doi.org/10.5379/urbani-izziv-en-2018-29-01-004

Šmid Hribar, M., Hori, K., Urbanc, M., Saito, O., Zorn, M. 2023: Evolution and new potentials of landscape commons: Insights from Japan and Slovenia. Ecosystem services 59. DOI: https://doi.org/10.1016/j.ecoser.2022.101499

Šmid Hribar, M., Urbanc, M., Zorn, M. 2023: Commons and their contribution to sustaining Slovenian cultural landscapes. Acta geographica Slovenica 63-3. DOI: https://doi.org/10.3986/AGS.11591

Takala, A. J., Arvonen, V., Katko, T. P., Pietilä, P. E., Åkerman, M. W. 2011: The evolving role of water co-operatives in Finland. International Journal of Co-operative Management 5-2.

Terzi, S., Sušnik, J., Schneiderbauer, S., Torresan, S., Critto, A. 2021: Stochastic system dynamics modelling for climate change water scarcity assessment of a reservoir in the Italian Alps. Natural Hazards and Earth System Sciences 21-11. DOI: https://doi.org/10.5194/nhess-21-3519-2021

Tucker, C. M. 2014: Creating equitable water institutions on disputed land: a Honduran case study. Water International 39-2. DOI: https://doi.org/10.1080/02508060.2014.888986

Tyhotyholo, T., Ncube, B. 2023: The rhetoric of community participation in urban South African water governance. Utilities Policy 82. DOI: https://doi.org/10.1016/j.jup.2023.101573

Urbanc, M., Šmid Hribar, M. 2021: Livek: a mountainous border area's transformation from a ski paradise to a resilient community. Culture and climate resilience: Perspective from Europe. Cham. DOI: https://doi.org/10.1007/978-3-030-58403-0_4

Uredba o oskrbi s pitno vodo, 2012. Uradni list Republike Slovenije 88/12. Ljubljana.

Uredba o spremembah Uredbe o seznamih naročnikov, področni zakonodaji skupnosti, seznamih gradenj in storitev, obveznih informacijah v objavah, opisih tehničnih specifikacij in zahtevah, ki jih mora izpolnjevati oprema za elektronsko naročanje. Priloga 3 – Seznam naročnikov v sektorju proizvodnje, transporta ali distribucije pitne vode. Uradni list Republike Slovenije 12/2013. Ljubljana.

Vilfan, S. 1996: Zgodovinska pravotvornost in Slovenci. Ljubljana.

Vrzel, J., Ludwig, R., Gampe, D., Ogrinc, N. 2019: Hydrological system behaviour of an alluvial aquifer under climate change. Science of the Total Environment 649. DOI: https://doi.org/10.1016/j.scitotenv.2018.08.396

Water Framework Directive, 2000. EUR LEX, Directive 2000/60/EC. Brussels.

WRc 2017: European Level Report: Evaluation of the Contribution of Operational Programmes to the Implementation of EU Water Policy. Brussels. Internet: http://ec.europa.eu/environment/water/pdf/EU_overview_report_%20operational_programmes%20.pdf (22. 12. 2022).

Zadružna pravila vodovodne zadruge Goriče z omejeno odgovornostjo, 1995. Goriče.

Zakon o zadrugah, 1992. Uradni list Republike Slovenije 13/92. Ljubljana.