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ABSTRACT

Throughout history, water has been a crucial resource for the survival and development of civilisations worldwide. The legal framework for water regulation has been shaped by a complex system of formal and informal norms, rules, and regulations that have evolved over time in response to changing social, political, economic, and religious contexts. Groundwater resources have become increasingly important globally, and it is necessary to study how access to this resource has been determined in this context. Iran provides a valuable case study for understanding the evolution of the legal framework governing groundwater rights due to its long history and dependence on groundwater through the Kariz system. This paper examines the role played by changes in Iran's religious and socio-political context in articulating groundwater rights, particularly the right to access groundwater, from the Sassanid Empire (224 CE) to the 1906 Iranian Constitution, covering a period of approximately 1700 years. Schlager & Ostrom's framework for common pool resources is used to analyse this evolution in groundwater rights. Our analysis shows that though groundwater rights have primarily been treated as private rights, the changing socio-political and religious context through the centuries has helped with its regulation and management as a common pool resource. The study does not explore the process of management and the actors responsible for it which needs further elaboration to understand groundwater regulation.

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INTRODUCTION

Water has been critical for survival of civilisations around the world over the centuries. Its management has been shaped by legal frameworks made of formal and informal norms, rules, and regulations.¹ Study of traditional knowledge and historical practices related to water issues is pertinent to analyse the historical patterns in water management.²

Groundwater has become increasingly important in fulfilling water demands but the unsustainable use has led to the water crisis.³ Iran makes an important case study for understanding the groundwater legal framework because of the time period Iranian civilisation has survived and the dependence on groundwater through the Kariz system for successive millennia.⁴

It is important to define groundwater rights today because of the increasing importance of groundwater resources and its unsustainable use which threatens the water and food security of different regions.⁵ Hence, studying the traditional knowledge and historical practices that shaped the Iranian groundwater legal framework, to a large extent, could help us in defining groundwater rights presently. For understanding the legal aspects of traditional patterns corresponding to the groundwater resources, we use analytical framework formulated by Schlager and Ostrom for arraying property rights regime for common property resources.⁶ The time

period of analysis in this paper is from the Sasanids empire in 224 CE to the acceptance of the modern Constitution in 1906. The period of analysis is indicative of the evolution of groundwater legal tradition for approximately 1700 years encompassing the pre-modern era.

The starts with an explanation of the framework used and circumscribe the scope of the article. Second, we discuss why the Iranian traditional legal framework for groundwater resources is important. Third, we discuss the legal facets of the Iranian traditional legal framework for groundwater resources. Finally, we present a conclusion of our investigations in the trajectory of this research.

FRAMEWORK AND SCOPE OF STUDY

A thorough examination of the historical legal framework pertaining to the regulation and management of groundwater resources has been conducted for the period between Sasanid rule and the adoption of Iranian Constitution in 1906.

According to our investigation, the written historical records of the Sassanid rule are the first to show evidence of groundwater resources use.⁷ The historical records analysed for this paper are Persian or English translations of Arabic or Pahlavi texts of the Sasanian era and later. Some of these texts are 'The Letter of Tansar to Gashnasb',⁸ 'Avesta',⁹ 'Mādayān ī hazār dādestān',¹⁰ 'Dēnkart',¹¹ 'The History of Persian

¹ Robert G Varady and others, 'Modes and Approaches of Groundwater Governance: A Survey of Lessons Learned from Selected Cases Across the Globe' (2016) 8(10) Water 417

² Christa Brelsford and others, 'Developing a Sustainability Science Approach for Water Systems' (2020) 25(2) Ecology and Society 1

³ Groundwater Overview: Making the Invisible Visible (International Groundwater Resources Assessment Center 2018) 1

⁴ Tony J Wilkinson and others, 'From Human Niche Construction to Imperial Power: Long-term Trends in Ancient Iranian Water Systems' (2012) 4 Water History 155

⁵ 'Global Framework for Action - To Achieve the Vision on Groundwater Governance' (FAO 2016) <<https://www.un-igrac.org/resource/global-groundwater-framework-action-groundwater-governance>>

⁶ Edella Schlager and Elinor Ostrom, 'Property-Rights Regimes and Natural Resources: A Conceptual Analysis' (1992) 68(3) Land Economics 249

⁷ Anahit Perikhanian, *The Book of a Thousand Judgements: A Sasanian Law-book / Introduction, Transcription and Translation of the Pahlavi text, notes, glossary and indexes* (Nina Garsoïan tr, Mazda 1997)

⁸ H Tansar, In Mojtaba Minavi (ed), *Letter of Tansar* (in Persian, 2nd edn, Tehran, Kharazmi, 1976)

⁹ Jalil Dostkhah, *Avesta: The Ancient Iranian Hymns & Texts* (in Persian, Morvarid 1997).

¹⁰ Perikhanian (n 7)

¹¹ DĒNKARD or 'Acts of the religion', written in Pahlavi language, is a summary of 10th-century knowledge of the Mazdean religion, Vol. 3-8 <<http://www.avesta.org/denkard/denkard.htm>>

*Literature*¹² and '*Tāriḳ-e adabiyāt-e Irān-e piš az Eslām*'.¹³

The adoption of the Constitution in 1906 marks a significant transformation in Iran's governance system that fundamentally changed the legal framework for groundwater regulation and management.¹⁴ While the traditional governance system based on custom (Urf) and religion (Sharia), the Constitution was founded on the principles of public law and the right to determine one's destiny, allowing anyone to participate in sociopolitical issues under the rule of law, regardless of their background.¹⁵ The consequent changes in the legal and political context led to a behavioural shift towards water resources, and inclusion of water laws within the public rights framework.¹⁶ Though these changes had been shaped by the historical precedent, the influence of principles of public law and other values after the adoption of Constitution in 1906 requires a different set of assumptions to analyse the post-1906 legal framework for groundwater regulation and management.

While the traditional legal framework for water resources was originally developed with a focus on surface water resources in the Sawad region, which served as the epicentre of ancient Iran,¹⁷ it nevertheless played a significant role in shaping the regulation and management of groundwater resources in the central plateau of Iran. The present study, however, restricts its focus solely to the legal frameworks pertaining to groundwater resources.

Moreover, we use the conceptual framework formulated by Schlager & Ostrom¹⁸ for common-pool resources to analyse Iranian traditional legal framework for groundwater regulation and management. According to this framework, there would be four kinds of legal rights attached to groundwater resources: first, the right to access and appropriation of water; second, right to exclusion; third, right to alienation for the purpose of transferring rights to others either temporarily or permanently; and fourth, right to manage. In this article, we limit ourselves to understanding the significance of Iranian traditional legal framework in determining the first three rights (right to appropriation, right to exclusion, and right to alienation) and do not explore the right to manage due to the complexities in technical, social and political conditions of the respective time periods which determined groundwater management.

IMPORTANCE OF THE IRANIAN TRADITIONAL LEGAL FRAMEWORK FOR GROUND-WATER

The Iranian Plateau, situated between the Caspian Sea and the Persian Gulf, has a predominantly arid and semi-arid climate with limited precipitation.¹⁹ As a result of these geographical and climatic factors, access to groundwater has been crucial for the survival and development of civilisations throughout history. The Kariz (Qanāt) system, which relies on groundwater resources, has been the primary water supply system in Iran. This traditional system consists of underground channels that run along mountain slopes and transport groundwater to the plains through gravitational force. The length of Kariz varies depending on the mother-well depth and the natural slope of the path wherein the greater the depth of the mother-well and the lower the slope, the longer the length of Kariz.

¹² Ronald E Emmerick, Maria Macuch and Ehsan Yarshater (eds), *The Literature of Pre-Islamic Iran: Companion Volume I: A History of Persian Literature* (Vol XVII, I.B. Tauris, 2008)

¹³ Aḥmad Tafazzoli, *Tāriḳ-e adabiyāt-e Irān-e piš az Eslām* (The History of Persian Literature in Pre-Islamic Period), Edited by: Ž. Amuzgār (in Persian, Tehran: Sokhan 1997)

¹⁴ Ehsan Nabavi, '(Ground)Water Governance and Legal Development in Iran, 1906-2016' (2017) 9(1) Middle East Law and Governance 43

¹⁵ Davood Feirahi, *The Modern State and Law Crisis: the Challenge of Sharia and Law in Modern Iran* (in Persian, Tehran: Nashr-e, Ney Ltd 2021) 61 & 231

¹⁶ Nabavi (n 14)

¹⁷ Mohammad Mohammadi Malayeri, *Iranian Culture and History during the Period of Transition between the Sassanid and Islamic Eras* (in Persian, vol 6, Tus Publication Ltd 2000) 126

¹⁸ Schlager and Ostrom (n 6)

¹⁹ Peter William Avery, Janet Afary and Khosrow Mostofi, 'Iran' Encyclopedia Britannica (29 April 2023) <<https://www.britannica.com/place/Iran>>

Usually, the length of Kariz is more than 30 km.²⁰ There are well-like vertical shafts connected by the gently-sloping underground channels to help in delivering the groundwater to the surface. Once the groundwater from the Kariz flows onto the surface, it is used for irrigation and household supply. The rate of water withdrawal from the Kariz has been found to range between 1 to 100 litres per second.²¹

Since the introduction of pump technology in the early 1950s, there has been a shift from the use of Kariz systems to the high-speed turbine technology and installation of groundwater pumps. This has led to a decline of the use of Kariz systems for groundwater withdrawal to only 11 percent of the total in the early 20th century.²² The socio-economic and technical factors responsible for this shift are the operation and maintenance (O&M) costs, availability and access to other water resources and climate change impact.²³ The increased exploitation of groundwater resources due to better access by deep and medium tubewells has led²⁴ drying up of many Kariz systems and the consequent socio-economic marginalisation.²⁵

While the Kariz system allowed availability of groundwater from distant aquifers, the Iranian traditional legal framework determined and regulated groundwater access to people. The following section discusses how groundwater rights are important in determining this access and the role Iranian traditional legal groundwa-

ter framework played in determining who had access.

The Importance of Groundwater Rights

Prior to the twentieth century, groundwater extraction was constrained by technological and energy limitations. However, the advent of electricity and high-speed turbines removed these barriers, allowing for unrestricted groundwater extraction. This marked a pivotal moment in which groundwater became the primary source of water supply, supplanting its previous role as a supplementary buffer source.²⁶ Despite this shift, inadequate regulation and management mechanisms have resulted in unsustainable usage of groundwater.²⁷

Globally, 69 percent of the groundwater withdrawn is used for agriculture, representing 38 percent of the consumptive irrigation water use. To fulfil such demands, there is extensive groundwater extraction leading to emergence of several water hotspots globally.²⁸ Despite the water crisis and increasing water scarcity, groundwater rights of the user and the role of different stakeholders in its regulation and management has not been defined.²⁹ There are several studies by FAO, UN & World Bank which have discussed the importance of groundwater in sustaining food systems and ensuring water security.³⁰ They have also discussed policy instruments that could help with groundwater regulation and management.³¹ The problem is the absence of accountability and the lack of

²⁰ Peter Beaumont and others, *Qanat, Kariz and Khattara: Traditional Water Systems in the Middle East and North Africa* (The Middle East Centre, School of Oriental & African Studies, University of London 1989)

²¹ Ann Katharine Swynford Lambton, *Landlord and Peasant in Persia: A Study of Land Tenure and Land Revenue Administration* (Oxford University Press 1953) 217

²² Hormoz Pazwash, 'Iran's Mode of Modernization: Greening the Desert, Deserting the Greenery' (1983) 53(3) *Civil Engineering—ASCE* 48

²³ Fuzhan Nasiri and Mohammad Saleh Mafakheri, 'Qanat Water Supply Systems: A Revisit of Sustainability Perspectives' (2015) 4 *Environmental Systems Research* 13

²⁴ Reza Ardakanian, 'Overview of Water Management in Iran' in *Water Conservation, Reuse, and Recycling: Proceedings of an Iranian-American Workshop* (The National Academies Press 2005)

²⁵ Amin Alizadeh and Abbas Keshavarz, 'Status of Agricultural Water Use in Iran' in *Water Conservation, Reuse, and Recycling: Proceedings of an Iranian-American Workshop* (The National Academies Press 2005)

²⁶ Tushaar Shah, *Taming the Anarchy: Groundwater Governance in South Asia* (Routledge 2009)

²⁷ Jay S Famiglietti, 'The Global Groundwater Crisis' (2014) 4 *Nature Climate Change* 945

²⁸ United Nations, 'The United Nations World Water Development Report 2022. Groundwater: Making the Invisible Visible' (UNESCO 2022) <<https://unesdoc.unesco.org/ark:/48223/pf0000380721>>

²⁹ Stephen Hodgson, *Modern Water Rights: Theory and Practice* (FAO 2006) 16

³⁰ World Bank, *Deep Wells and Prudence: Towards Pragmatic Action for Addressing Groundwater Overexploitation in India* (World Bank 2010) <<http://hdl.handle.net/10986/2835>>. United Nations (n 28)

³¹ FAO (n 5)

sense of ownership to groundwater resources that impedes its regulation and management. Despite the complexities attributed to groundwater as a resource due to its invisibility given the subsurface existence, uncertainty of the exact quantum and the delayed visibility of groundwater overexploitation impact; it is much needed that groundwater rights are defined and legally affirmed facilitating interventions for its conservation.³² Absence of sense of ownership had been one of the critical factors attributed to the mismanagement of common property resources such as groundwater resources.³³

Iran and the Traditional Legal Framework for Groundwater

For Iran, the role of groundwater in fulfilling Iran's water demands has been increasing in the past few decades.³⁴ The consequent overexploitation has led to a decline of 20 percent - 2600 percent with a spatial variability across the country in the last decade. Moreover, the regions categorised as overexploited are inhabited by 71 percent of the total Iran's population and is responsible for 70 percent of the total water demand.³⁵ While the consequence of such overexploitation has become apparent with groundwater depletion, drying up of surface water bodies such as rivers and natural resources.³⁶

While throughout history, access to surface water and groundwater resources has been de-

termined by their unique hydro-geographical and socio-economic characteristics.³⁷ However, with a growing number of users and stakeholders, conflicts over the use and management of these resources have increased. Researchers have focused on understanding local traditional water management systems to promote sustainable water resource management and resolve conflicts.³⁸ While surface water rights were historically prioritised in countries such as the USA and England due to their reliance on perennial rivers, there is now increasing recognition of groundwater rights.³⁹ This shift is attributed to technological advancements allowing for mechanisation of groundwater withdrawal and its subsequent use as a primary source of water supply.⁴⁰

Understanding the traditional water management systems in Iran will be an important contribution to the formulation of an adaptive legal framework for groundwater rights in the present scenario wherein the resource has become critical in ensuring water security. Iranian civilisation has been considered as one of the ancient civilisations dating back to approximately fifty century (50 CE).⁴¹ For more than 3000 years,⁴² the traditional knowledge pertaining to groundwater has helped in its identification, extraction, and management of groundwater.⁴³ This traditional knowledge has helped with the availability of groundwater resources while the traditional legal rules and norms have determined the access to it.

³² Gabriela Cuadrado-Quesad and Rosemary Rayfuse, 'Towards Sustainability in Groundwater Use: An Exploration of Key Drivers Motivating the Adoption and Implementation of Policy and Regulation' (2020) 32(1) *Journal of Environmental Law* 111

³³ Elinor Ostrom and others (eds), *The Drama of the Commons* (National Academy Press 2002) <<https://psycnet.apa.org/record/2004-15858-000>>

³⁴ Roohollah Noori and others, 'Anthropogenic Depletion of Iran's Aquifers' (2021) 118(25) *Proceedings of the National Academy of Sciences (PNAS)* e2024221118

³⁵ Samaneh Ashraf, Ali Nazemi and Amir AghaKouchak, 'Anthropogenic Drought Dominates Groundwater Depletion in Iran' (2021) 11 *Scientific Reports* 9135

³⁶ Kaveh Madani, Amir AghaKouchak and Ali Mirchi, 'Iran's Socio-economic Drought: Challenges of a Water-Bankrupt Nation' (2016) 49(6) *Iranian Studies* 997. Ameneh Mianabadi and others, 'Toward the Development of a Conceptual Framework for the Complex Interaction between Environmental Changes and Rural-urban Migration' (2023) 5 *Frontiers in Water* 1

³⁷ Joseph W Dellapenna and Joyeeta Gupta, 'The Evolution of Global Water Law' in Joseph W Dellapenna and Joyeeta Gupta (eds), *The Evolution of the Law and Politics of Water* (Springer 2009) 10

³⁸ Brelsford and others (n 2)

³⁹ Sadia A Jame and Laura C Bowling, 'Groundwater Doctrine and Water Withdrawals in the United States' (2020) 34 *Water Resources Management* 4037

⁴⁰ Joseph W Dellapenna, 'A Primer on Groundwater Law' (2013) 49 *Idaho Law Review* 265. Nowadays the presumption about the distinctions between surface waters and groundwater in terms of hydrogeology science has been refuted based on the modern scientific findings

⁴¹ Mohammad Mohammadi Malayeri, *Iranian Civilization and Culture before Islam and its Traces and Impacts on Islamic Civilization and Arab Literature* (in Persian, 3rd edn, Tus Publication Ltd 1995) 18

⁴² *ibid* 18

⁴³ Abigail E Schade, 'Hidden Waters: Groundwater Histories of Iran and the Mediterranean' (PhD Theses, Columbia University 2011)

Since water-related legal tradition of each country primarily reflects the region's geographical, political, social, and cultural context, the examination of these aspects can help in devising innovative improvisations in water-related legal framework. This is reflected in the recent emphasis on historical research to understand the legal traditions for regulating water resources. Some of these writings have discussed the traditional knowledge and historical practices of water management around the world. They emphasise on the importance of water for survival of civilisations and the variations in practices of regulation and management. Caponera and Nanni thoroughly examined the water laws in different regions of the world under different traditions such as the Roman law, the common law and the civil law.⁴⁴ Hodgson discusses the conceptual and practical challenges faced by lawmakers for formulation and implementation of water right, briefly discussing them with respect to common and civil law traditions.⁴⁵ Haworth and Getzler comprehensively explained the development of water laws under the common law principles.⁴⁶ Meyer discussed the traditional Hispanic water laws during the medieval time period.⁴⁷ Nordtveit explored the traditional legal framework in three Scandinavian countries, namely Denmark, Norway, and Sweden for regulation and management of water from 1000 years ago to the twentieth century.⁴⁸ Naff and Laster explored the traditional water laws under the Islamic and Jewish reli-

gions.⁴⁹ Kornfeld studied the water laws practiced under the Mesopotamian traditional legal framework and Siddiqui explained the workings and evolution of water laws in pre-colonial India.⁵⁰

One of the key aspects of the traditional legal framework for water resources is the discussion around the different kinds of water rights such as the riparian rights, prior appropriation of water resources, resource use rights (usufructuary right).⁵¹ Though there are rules and norms which have defined water rights, groundwater rights in particular have been difficult to define and accord. We discuss how the different rules and norms of Iranian society determined groundwater rights.

Role of Iranian Society in the Traditional Legal Framework

The traditional legal framework in Iran for water resources has been shaped by four important aspects of Iranian society; namely religion, Iranian theology, interaction between monarchy and religion, and ethical rules and norms.

First, religion (*Shāriā*) has played a critical role in determining the acceptability of behaviours in Iranian society and politics throughout history, leading to a marked impact on the formulation and implementation of Iranian legal principles and rules according to the religious science

⁴⁴ Dante A Caponera, *Principles of Water Law and Administration: National and International* (2nd edn, rev. and updated by Marcella Nanni, Taylor and Francis 2007). To more study regarding water rights under Roman Law tradition refer to: Cynthia Jordan Bannon, *Gardens and Neighbors: Private Water Rights in Roman Italy* (University of Michigan Press 2010); Dylan Kelby Rogers, 'Water Culture in Roman Society' (2018) 1(1) Brill Research Perspectives in Ancient History 1

⁴⁵ Hodgson (n 29) 16

⁴⁶ William Howarth, 'The History of Water Law in the Common Law Tradition' in Terje Tvedt, Owen McIntyre and Tadesse Kassa Woldetsadik (eds), *A History of Water Series III: Sovereignty and International Water Law* (IB Tauris 2015) 66; Joshua Getzler, *A History of Water Rights at Common Law* (Oxford University Press 2004)

⁴⁷ Michael C Meyer, *Water in the Hispanic Southwest: A Social and Legal History (1550-1850)* (University of Arizona Press 1996). In this regard see Michael C Meyer, 'The Living Legacy of Hispanic Groundwater Law in the Contemporary Southwest' (1989) 3(31) *Journal of the Southwest* 287

⁴⁸ Ernst Nordtveit, 'History of Water Law in Scandinavia' in Tvedt, McIntyre and Woldetsadik (eds) (n 46) 105

⁴⁹ Thomas Naff, 'Islamic Law and the Politics of Water' in Dellapenna and Gupta (eds) (n 37) 37; Thomas Naff and Joseph Dellapenna, 'Can There be Confluence? A Comparative Consideration of Western and Islamic Fresh Water Law' (2002) 4(6) *Water Policy* 465; Richard Laster, Rabbi David Aronovsky and Dan Livney, 'Water in the Jewish Legal Tradition' in Dellapenna and Gupta (eds) (n 37) 53

⁵⁰ Itzhak E Kornfeld, 'Mesopotamia: A History of Water and Law' in Dellapenna and Gupta (eds) (n 37) 21. Iqbal Ahmed Siddiqui, 'History of Water Laws in India' in Chhatrapati Singh (ed), *Water Law in India* (Indian Law Institute 1992) 289

⁵¹ In this respect refer to these remarkable sources: Dellapenna (n 40); Hodgson (n 29); Theodore E Lauer, *Common Law Background of the Riparian Doctrine* (1963) 28(1) *Missouri Law Review* 60; Thomas V Cech, 'Water Allocation Law' in Thomas V Cech, *Principles of Water Resources: History, Development, Management and Policy* (3rd edn, John Wiley & Sons 2009) 228; Flavia Rocha Loures, 'History and Status of the Community-of-Interests Doctrine' in Tvedt, McIntyre and Woldetsadik (eds) (n 46) 212; William Goldfarb, *Water Law* (2nd edn, Lewis Publishers 1988). Joseph W Dellapenna, 'The Rise and the Demise of the Absolute Dominion Doctrine for Groundwater' (2013) 35(2) *University of Arkansas at Little Rock Law Review* 291

(*Fiqh*).⁵² One of the most important texts that shows the role of religion on legal frameworks and governance is 'A *Thousand Judgements*' book of the Sassanian Empire on civil rules.⁵³ Second, Iranian theology was founded on the traditional belief that there is 'an inherent inequality between human beings'.⁵⁴ This belief had shaped the social structure of caste system in Iran and always changed during pre-modern era in Iran under distinctive formulations.⁵⁵ Third, the interaction between religion and monarchy which formed two pillars of the traditional governance in Iran. While the religious jurists held the responsibility of formulating the legal framework by articulating its practical rules and norms; the monarchy was responsible for implementation wherein there was an obligation to follow the religious customary rules and norms.⁵⁶ There is written historical evidence of such religion and monarchy interactions from the Sassanids time period to the start of the twentieth century.⁵⁷ Fourth, ethical rules and norms based on Iranian theology which formed the foundation of Iranian law in the pre-modern era and guaranteed that the law was upheld in the society.⁵⁸ It is important to note that throughout Iranian pre-modern history, these ethics have shaped the main legal-ethical principle of the Iranian traditional governance system to be the 'faithfulness to the covenant'.⁵⁹

⁵² Ahmad Pakatchi, 'Introduction to Iran' in Kazem Musavi Bojnurdi (ed), *The Great Islamic Encyclopedia* (in Persian, vol 10, Great Islamic Encyclopedia Foundation 1988) 622

⁵³ Maria Macuch, 'Sasanian Legal System' in *Judicial and Legal Systems* (Encyclopædia Iranica, Vol. 15, 2009) 181-96 <<https://www.iranicaonline.org/articles/judicial-and-legal-systems-iii-sasanian-legal-system>>

⁵⁴ Davood Feirahi, *The Concept of Law in Contemporary Iran* (in Persian, Tehran: Nashr-e Ney, 2020) 19

⁵⁵ Pakatchi (n 52) 622; Davood Feirahi, *The Concept of Law in Contemporary Iran* (in Persian, Tehran, Nashr-e Ney 2020) 35

⁵⁶ *ibid* 23

⁵⁷ Mohammad J J Langroudi, *History of Law in Iran from the Fall of Sassanids to the Beginning of the Constitutionalism* (in Persian, Tehran: Nāšir M'arifa 1982) 76

⁵⁸ *ibid* 34

⁵⁹ Pakatchi (n 52) 620

LEGAL FACETS OF THE IRANIAN TRADITIONAL LEGAL FRAMEWORK FOR GROUND-WATER RESOURCES

This section discusses the fundamentals of traditional groundwater legal framework. In the first sub-section, we discuss how the groundwater rights were determined by the interplay of the positive and natural law doctrine due to society's ambiguity and complexity over the period of 224 CE to 1906. In the second sub-section, we discuss how during this period the groundwater rights has been de-facto linked with land ownership though in certain conditions groundwater rights have been considered separate from land titles. In the third sub-section, we discuss how the groundwater rights and its de-facto attachment to land title allowed land owners' the authority to define the conditions for groundwater access under the '*Hārīm principle*'.

The Appropriative Right to Groundwater

From the legal perspective, the Iranian traditional legal framework for groundwater has been drawn from both the *Natural law* doctrine and the *Positive law* doctrine. In the natural law doctrine, which is based on the human-nature interaction and the assumption that there are certain values intrinsic to human nature, the laws and rules are applied independently of the laws and regulations of society or the state.⁶⁰ These laws and rules are considered universal, fundamental, inalienable and inclusive to everyone, and conferred by God, nature or reason rather than humans.⁶¹ In reference to groundwater resources, the natural law doctrine has conferred the right to capture and utilise

⁶⁰ Finnis John, 'Natural Law Theories' in Edward N Zalta (ed), *The Stanford Encyclopedia of Philosophy* (2020) <<https://plato.stanford.edu/archives/sum2020/entries/natural-law-theories/>>

⁶¹ Hans Kelsen, *General Theory of Law and State* (Lawbook Exchange 2007) 8 & 392

groundwater for the purpose of domestic or livestock consumption.⁶² While the positive law doctrine is characterised as the law formulated and implemented by the judicial authority of the society.⁶³ In reference to the groundwater resources, the positive law doctrine formulates its allocation rights for use in production and defines the responsibilities, powers, and privileges under specific sovereignty.⁶⁴ Though groundwater rights were formulated, determined and recognised under specific doctrine in different periods, the ambiguity and complexity pertaining to the society and the resource led to an interplay of the natural and positive law doctrine in determining groundwater rights as discussed in the following section.

Sassanid Empire Epoch (224-651 CE): Recognising the Appropriative Right to (Ground)water Under Positive Law Doctrine

During the Sassanid rule, Iranian society had been divided on the basis of caste system with the upper caste people appropriating most of the opportunities and wealth. One particular exclusionary feature of the caste system is recorded in the manuscript 'The Letter of Tansar'.⁶⁵ In the manuscript it is described how during the Sassanian rule, the possessions belonging to the upper caste and class families were recorded in a particular file with the rule that the lower caste and class families being prohibited to purchase them.⁶⁶ Thus, there is some historical evidence that private property ownership rights existed during the Sassian time period and the scope of this right was defined by the

society's norms, including religious belief.⁶⁷ Since the Sassanian rule, class, caste and religion have been decisive of different rights in Iranian society. One of these rights is the right to appropriation of groundwater which was determined by the natural law doctrine but was recognised under the private property ownership rights.

The right of appropriation was properly recognised under the positive law doctrine, particularly, after the sequence of events following Mazdak's death. Mazdak was a Zoroastrian priest (Mobad), an Iranian prophet and religious reformer who became influential during the reign of Sasanian emperor Kavadh I. He claimed to be a prophet of Ahura Mazda and worked towards the social welfare programs.⁶⁸ According to Mazdak's philosophy, God had initially provided the people with equal means of sustenance on earth but the strong coerced the weak and sought domination which led to inequality in the society. Mazdak's philosophy was based on Zoroastrianism which was based on the idea that everyone has equal access to common property resources such as water irrespective of their social status determined by caste and class. Given that this philosophy was disadvantageous to the upper-class people as it harmed their interests, King Kavadh I consequently ordered the killing of Mazdak and his followers.⁶⁹ This is one recorded historical instance wherein despite the prevailing natural law doctrine during the Sasanian Empire for access to common property resources such as water, the positive law doctrine became decisive in their access leading to an inequality in access to common property resources skewed in favour of the upper class. Thus, it is possible to imagine that the appropriative right to water has been recognised and appropriated under the positive law doctrine.

⁶² Hodgson (n 29) 12; Dellapenna (n 40) 267 & 271

⁶³ Henry Campbell Black, 'Positive Law' in Henry Campbell Black, *Black's Law Dictionary* (5th edn, West Publishing Co 1979)

⁶⁴ Joyeeta Gupta and Joseph W Dellapenna, 'Water Law and Rights' in Janos J Bogardi and others (eds), *Handbook of Water Resources Management: Discourses, Concepts and Examples* (Springer 2021) 125

⁶⁵ Tansar (n 8)

⁶⁶ Tansar (n 8) 65

⁶⁷ Arthur Voobus, *History of Asceticism in the Syrian Orient: A Contribution to the History of Culture in the Near East Vol. 1: The Origin of Asceticism Early Monasticism in Persia* (Louvain 1958) 223

⁶⁸ Ehsan Yarshater (ed), *The Cambridge History of Iran: The Seleucid, Parthian and Sasanian Periods*, vol 2 (Cambridge University Press 1983) 995

⁶⁹ Mansour Shaki, 'The Social Doctrine of Mazdak in the Light of Middle Persian Evidence' (1978) 46 (4) *Archiv Orientalní* 289

Islamic Law Tradition (700-1906 CE): Recognising Appropriative Right to (Ground)water Under Natural Law Doctrine

After the fall of the Sasanian Empire, the caste system in Iranian society declined. The historians have provided two explanations for this process. First, after the fall of the Sasanian Empire, its territory was split into several regions with different governments followed by the changes in their polity and economy.⁷⁰ The second is the spread of Islamic teachings which has been cited as relatively more important than political and economic changes because these teachings at the time were considered novel across Southwest Asia given the prevailing inequality and injustice.⁷¹

These religious, social, political and economic changes had an impact on the legal system of Iranian society. As the Islamic religion and traditions expanded in Southwest Asia, it led to the emergence of two sects in Iranian society who practiced Islam, the Shiites (Shia Muslims) and Sunnites (Sunni Muslims). Though these two sects had different foundational judicial doctrines, they had a consensus regarding the formulation and implementation of 'appropriative right to groundwater'. According to the declaration of Mohammad (the Prophet of Islam), water resources belong equally to everyone in the society with equal rights for access and appropriation of groundwater resources irrespective of class, colour, descent, caste, or other societal differences. Based on this declaration, the Islamic jurists interpreted that everyone should be able to appropriate groundwater for domestic and agricultural purposes without any permission or limitation.⁷² This interpretation led to codifying a new principle entitled Mubāh in the Islamic law tradition according to which the Islamic jurists consider water beyond private ownership until unless there is full possession such as the water contained in a private dug well or a jar. The principle is based on the belief

that origin of water is associated with God and so, the water belongs to the community.⁷³ Thus, it could be said that with the changes in Iranian society under the Islamic religion, the jurists recognised the right to appropriate groundwater under the Natural Law doctrine and henceforth, this right was protected under it.

Though there was the recognition of the right to appropriate groundwater under the natural law doctrine, there were problems with the acceptance of these rights in Iranian society particularly during the initial years of Islamic religion expansion. Two of the most pertinent problems were: first, there were severe disputes regarding the Kariz system and its technology in the Sunnites sect of Islamic religion that occupied the central plateau of Iran;⁷⁴ second, despite the recognition of groundwater rights under the Natural Law doctrine during the pre-modern era there was a continuous contemplation regarding the ownership of groundwater resources wherein the central government abolished or granted usufructuary rights to groundwater resources on their own rationale.⁷⁵ This ambiguity persisted in the right to appropriation of groundwater resources till the late nineteenth century. It was Naser al-Din Shah Qajar in the late nineteenth century who abolished the Iqtā system⁷⁶ and recognised the right to groundwater resources under the private ownership rights and as an absolute right within the purview of modern property rights.⁷⁷

Right to Alienation: Association of Groundwater Rights and the Land Title

The Iranian groundwater law has been linked with land ownership since the Sasanian Empire

⁷⁰ Parvaneh Pourshariati, *Decline and Fall of the Sasanian Empire: The Sasanian-Parthian Confederacy and the Arab Conquest of Iran* (IB Tauris 2017)

⁷¹ Pakatchi (n 52) 622

⁷² Caponera (n 44) 62-63

⁷³ Naff and Dellapenna (n 49) 465

⁷⁴ Lambton (n 21) 217

⁷⁵ Hamid Bahrami Ahmadi, *Law History: Iran Before the Rise of Islam* (in Persian, vol 2, Emam Sadiq University 2015) 284

⁷⁶ Lambton (n 21) 53 - Iqtā system: the system is for granting rights for the ownership in the pre-modern era

⁷⁷ Hadi Enayat, *Law, State and Society in Modern Iran: Constitutionalism, Autocracy and Legal Reform, 1906-1941* (Springer 2013) 23

rule to the modern era in a de-facto manner. There are two primary legal approaches which define the scope of Iranian traditional legal framework in determining the right to alienation from groundwater resources from the Sassanid rule (224 CE) to the adoption of the constitution (1906).

The Incorporation of Groundwater Rights into the Land Title

Initially, the groundwater rights were recognised as part of the land ownership title and groundwater was legally considered attached to land. According to the book of a Thousand Judgements:

*'If anyone pledges a plot of land and subsequently a spring gushes forth on it, then this spring is to be considered as part of the pledge'*⁷⁸

so if anyone declares:

*'.....I conveyed to you this dastkart (land) together with everything it contains'*⁷⁹

It would be interpreted as: '... the person is the rightful owner of the land, the Kariz (the canal) dug in this land and also the other plots which are irrigated by this particular Kariz'.⁸⁰

With the de-facto approach, the groundwater rights are attached to land title. This de-facto approach has been used to determine groundwater rights in certain regions of the Iranian central plateau where the conventional feudal systems existed.⁸¹ Despite the social, political, economic, and religious changes after the Sasanian Empire, this legal principle continued to determine the groundwater rights in these cer-

tain regions of Iran.⁸² Moreover, both the Shiites and Sunni sect of Islamic religion continued to incorporate this legal approach for groundwater rights in their legal framework. While the Sunnis completely recognised that groundwater rights are attached to land ownership; the Shiites defined specific circumstances where this legal principle for groundwater rights would be applicable.⁸³ This approach had been taken into consideration under entitling 'Dependent Karizes' system even during Modern legislation.⁸⁴

The Separation of Water Property Rights from Land Title

The second legal approach of the Iranian legal framework which determined and recognised the groundwater rights to be separate from the land ownership title in the Iranian pre-modern era finds mention from 224 CE to 1906 CE. There are two circumstances where the right to groundwater could be dissociated from the land ownership right. First, in accordance with *The Thousand Judgments* book, during Sasanian era, permission would be provided to pass a Kariz from lands owned by other people in specific circumstances where the Kariz owner and the landowner are different people.⁸⁵ Second, during the Islamic law tradition, the groundwater rights were also recognised as servitude (usufructuary) rights allowing their transfer from one person to another. In accordance with this legal principle, the ownership rights to groundwater and the ownership rights to agricultural land have been recognised and implemented as separate in regions such as Yazd and Khorasan.⁸⁶ This traditional legal principle has been a remarkable provision to assure groundwater rights separation from land rights. It has also been included in the modern legal system under the 'Independent Karizes' category.⁸⁷

⁸² Caponera (n 44) 64.

⁸³ Mahdi Agah and Maryam Hassani, *Water Law in the Central Plateau of Iran* (in Persian, Iranian Water Policy Research Institute 2015) 22

⁸⁴ *ibid* 49

⁸⁵ Perikhanian (n 7) 201

⁸⁶ Pakatchi (n 52) 624

⁸⁷ Agah and Hassani (n 83) 49

⁷⁸ Perikhanian (n 7) 111

⁷⁹ It is essential to point out that based on the manuscript translated from Pahlavi to Persian by Rostam Shahzadi (1950, Tehran), the phrase 'Canal' refers to 'Kariz'

⁸⁰ Perikhanian (n 7) 63

⁸¹ Lambton (n 21) 219

Differences in socio-political and economic factors of regions with similar geographical characteristics and technological advancements were responsible for the existence of these two distinct legal approaches determining the right to groundwater resources. With the emergence of Islam, Iranian socio-political aspects became increasingly determined by religious principles. The jurists (*Mujtahids*) in different regions of Iran recognised and implemented the legal framework for groundwater resources shaped by these two approaches.⁸⁸ The religious principles (so-called *Fatāwi*) were codified in the legal framework of these regions and they also became part of the cultural norms in these regions (*Resāle-e Amālie-e*).⁸⁹ Thus, the differences in the socio-political, cultural and economic attributes of a particular region determined the interpretation of the legal framework for groundwater rights based on these two approaches by the religious jurists.

Hārîm Principle (Forbidden Area Rule): The Central Argument of Iranian Groundwater Law Tradition

According to the conceptual framework of Schlager & Ostrom, the 'right to exclusion' provides the individuals who hold this right the authority to define the conditions for access to the resource.⁹⁰ In the Iranian legal framework for groundwater resources, the 'right to exclusion' is recognised as 'Hārîm principle' (Forbidden area). However, there is evidence of 'Hārîm principle' being recognised in the Sasanian rule,⁹¹ the most of historical evidence is found in Iran's judicial manuscripts from the medieval period (Islamic era). According to Islamic manuscripts, the 'Hārîm principle' was recognised under two ap-

proaches:⁹² the 'Structural Hārîm' and 'Water Hārîm'⁹³ or 'Qanât Hārîm'.⁹⁴

The first approach, 'Structural Hārîm' referred to a specific area around a well or Kariz (<10 Square meters) with the purpose of its maintenance. The second approach, 'Water Hārîm' or 'Qanât Hārîm', referred to an area, where digging a well or Kariz around another groundwater withdrawal system dug earlier was absolutely forbidden because of reducing the amount of water belonged to the earlier system.⁹⁵

'Structural Hārîm' Approach

Within the '*Hārîm principle*' of the Iranian legal framework, the '*Tāslîl principle*' is the fundamental reason to articulating '*Structural Hārîm*'⁹⁶ and is used to expand the absolute ownership of groundwater resources beyond the well or Kariz. The '*Tāslîl principle*' could be interpreted as an absolute ownership doctrine in the Islamic legal framework, particularly in the Sunni school of Islam. According to this principle, a person has complete appropriation and utilisation rights to groundwater in their land when they access it through a well or Kariz. The jurists recognised this principle and decreed that an area of less than 10 square meters would be specified and any other well or Kariz could not be constructed in this delineated area.⁹⁷ This allowed extraction of groundwater resources without any consideration to any other user of the same aquifer but different well or Kariz at the same time. The lack of consistency of the Kariz system and legal acceptance of '*Tāslîl principle*' allowed people to extract groundwater as a private resource attached to land rights, which led to water disputes between users.⁹⁸

⁸⁸ Langroudi (n 57) 31. Majid Labbaf Khaneiki, 'Hydro-Political Organization in Iranian History' (2020) 12 *Water History* 403

⁸⁹ Langroudi (n 57) 36

⁹⁰ Schlager and Ostrom (n 6)

⁹¹ Perikhanian (n 7) 201

⁹² Abdollah Shafaei, Rethinking Regarding Hārîm Institution (in Persian) (2004) 42 *Islamic Sciences and Culture Academy, Fiqh Journal* 107

⁹³ Agah and Hassani (n 83) 39

⁹⁴ Ali Asghar Yazdi and Majid Labbaf Khaneiki, *Qanat Knowledge: Construction and Maintenance* (Springer 2016) 139

⁹⁵ Caponera (n 44) 63

⁹⁶ Agah and Hassani (n 83) 39

⁹⁷ Caponera (n 44) 63. Shafaei (n 92)

⁹⁸ Lambton (n 21) 217

‘Water Hārîm’ Approach

Within the ‘*Hārîm principle*’ of the Iranian legal framework, the ‘*Water Hārîm*’ or ‘*Qanât Hārîm*’, is used to restrict the absolute ownership of groundwater resources beyond the well or Kariz. ‘*Water Hārîm*’ or ‘*Qanât Hārîm*’, was articulated initially by Ibn Jonayd Eskafi,⁹⁹ a Shi’a jurist during the tenth century, and was later improvised by Allamah Al-Hilli,¹⁰⁰ a Persian Shi’a jurist during the fourteenth century on the basis of the ethical norm of ‘no harm to others’.¹⁰¹

The application of ‘*Water Hārîm*’ or ‘*Qanât Hārîm*’ was largely to the construction of wells or Kariz in unutilised lands where the groundwater rights and land rights were separate from each other. In these cases, if a new user wanted to construct a well or Kariz, they would have to ensure that their appropriation of groundwater would not cause any harm to the existing users. In other words, the existing users had priority over appropriation of groundwater resources over any new user. This prioritisation of existing appropriation has mostly been done in the central plateau of Iran where the groundwater rights were separate from land rights.¹⁰² Thus, even though the Iranian legal framework recognised groundwater rights to everyone, the ‘right to alienation’ was systematically linked to the ‘right to exclusion’. Moreover, Islamic jurists recognised the right to groundwater to everyone under ‘*Water Hārîm*’ or ‘*Qanât Hārîm*’ principle only when unutilised lands were considered. This was done with the rationale that groundwater rights are prescriptive rights attached to utilised lands and these prescriptive rights have precedence over the right to appropriate groundwater.¹⁰³

Thus, legally the *Tāslîf* principle (the Absolute ownership doctrine) was favoured by the Iranian

Jurists over any other principle that determined groundwater rights to be exclusive and attached to land rights irrespective of any resultant inequity in Iranian society.¹⁰⁴

CONCLUSION

Access to groundwater resources has been inequitable, contested and competed for since the Old Testament age in regions of West Asia.¹⁰⁵ The inequitable distribution of groundwater resources in Iran has been self-reinforcing, a fact that becomes clear with the above analysis of different rights to groundwater resources and the approaches to them.

Historically, the access to groundwater resources has been recognised to be associated with land rights. This recognition was particularly important in the central plateau region of Iran where there has been greater dependence on groundwater resources for meeting anthropogenic demands. This understanding is reflected in the construction of *Karizes systems* around the plateau and the utilisation of groundwater resources. Moreover, the association of groundwater resources with land title is determined by two approaches within the Iranian traditional legal framework: a) the incorporation of groundwater rights into the land title, and b) the separation of groundwater property rights from the land title. It is the second approach which becomes increasingly important when groundwater resources are recognised and considered as ‘public resources’. In relevance to this ‘public resource’ categorisation of groundwater rights is the *Water hārîm* approach, discussed as part of the right to exclusion. While this approach argues that water resources are to be considered as ‘public resources’, it also places one very important condition on the use of groundwater as a public resource. To elaborate, though accessible to everyone, the ‘first come - first serve (access)’ rule has determined groundwater appropriation when it is recognised as a public resource. This

⁹⁹ Ahmad Pakatchi, ‘Ibn Jonayd Eskafi’ in Kazem Musavi Bojnurdi (ed), *The Great Islamic Encyclopedia* (in Persian, vol 3, Great Islamic Encyclopedia Foundation 1995) 258

¹⁰⁰ Richard C Martin and others, *Encyclopedia of Islam & the Muslim World* (Macmillan Reference USA 2003) 301

¹⁰¹ Shafaei (n 92)

¹⁰² *ibid*

¹⁰³ Mohammad H Emamverdy, ‘The Nature of the Right to Border in the Legal System of Iran’ (in Persian) (2017) 14 *Private Law* 347

¹⁰⁴ Abdollah Shafaei, ‘Rethinking Regarding Hārîm Institution (2)’ (2005) 12 *Islamic Sciences and culture Academy, Fiqh Journal* 107

¹⁰⁵ Cech (n 51) 283

has accordingly allowed inequity in access to groundwater resources given the capital investments needed for groundwater use.

Another aspect of the *Water hārīm* approach focuses on the 'no harm to others' also reinforces the inequity. To elaborate, if the use of groundwater by a 'junior' (more recent) appropriator (user) damages the interests of a 'senior' (previous) appropriator, then the former would be legally bound to compensate the latter for their loss in entirety and might also have to cede their groundwater rights to them.

Despite the inequity in access to groundwater resources and the inbuilt mechanisms in Iranian traditional legal framework to reinforce this skewness, the framework has been evolving throughout pre-modern history (considering the time period of our analysis: from the Sassanid rule to the Constitution in 1906). One key feature of this evolution is the increasing recognition of the right of appropriation to groundwater resources from under the Positive law doctrine to the Natural law doctrine.

In this context, this study provides an overview of the legal groundwater framework in pre-modern Iran. This traditional legal framework determined the use of groundwater from the approximately 3,000-year-old Kariz system. As the groundwater legal framework changed with adoption of the Constitution in 1906, the features of the traditional legal framework were mostly not incorporated into these modern laws during the process of their codification and implementation. Though the modern laws regarding groundwater are aimed at protecting water rights, they made these more individualistic despite recognition of groundwater as a common pool resource. This is important because it aggravated the inequity in groundwater access when the technical restraints on groundwater extraction were removed with the emergence and development of the high-speed turbine technology. The high-speed turbine technology spread extensively allowing the land owners to extract groundwater without any restraint and absence of state regulation which has led to severe groundwater overexploitation. Given the dependence on groundwater resources for food and water security, the groundwater depletion

increasingly threatens the food and water security.

The changes in the principles that determined groundwater rights and consequently access to groundwater resources prior to the adoption of the Constitution in 1906 is important to understand that even though there has been a fundamental change in defining groundwater resources as a public resource, its access and allocation has continued to be determined in accordance to the century-old principles. These principles have largely had incremental changes rather than radical changes aggravating inequity in access and groundwater overexploitation. Thus, an understanding of these incremental changes is critical for groundwater regulation. Furthermore, we need to study the role of different stakeholders that helped with these incremental changes for a comprehensive understanding of the groundwater overexploitation problem and the barriers to its conservation.

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