

# Implications and Symptoms: Role of the Water Governance Components in Iran on the Existing Water Bankruptcy

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## Abstract

Iran is suffering from a state of water bankruptcy. Several factors have contributed to the current water resources bankruptcy, ranging from anthropogenic impacts, such as an inefficient agricultural sector and aggressive withdrawal of groundwater, to climatological impacts. This presentation suggests that water resources mismanagement in Iran should be evaluated beyond the policy-makers decisions, as it recognizes that the bankruptcy has been intensified due to the structural and institutional form of the political system in Iran. This study discusses the roots of the water bankruptcy and identifies four major shortcomings caused by the political system: (1) the absence of public engagement due to the lack of a democratic and decentralized structure; (2) adopting ideological policies in domestic and foreign affairs; (3) conflicts of interest and the multiplicity of governmental policy-makers and sectors; and (4) a state-controlled, resource-dependent economy. Through the development of a generic causal model, this study recommends a systematic transition towards a democratic, decentralized, non-ideological, and economically diverse political governance as the necessary—but not necessarily sufficient—adaptive and sustainable solution for mitigating the impacts of water resources bankruptcy in Iran. The insights highlighted in this presentation could be employed to inform water resources decision-makers and political actors in other non-democratic and ideological political structures struggling with a water resources crisis or bankruptcy.

# Implications and Symptoms: Role of the Water Governance Components in Iran on the Existing Water Bankruptcy

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**Purpose of the Study**  
Few studies have evaluated the extent of the existing water bankruptcy and its consequences and attempted to propose technical and fundamental solutions to combat the water bankruptcy and anthropogenic desalination problems in Iran. Despite the

**Importance of Public Involvement and Decentralization**  
Although there are variations in the levels of environmental sustainability and improvement based on a developing country's level of democracy, democracy has been observed to be conducive to the improvement and protection of environmental quality and water resources

**Conflicts of Interest Between Several Governmental Sectors**  
The multiplicity of governmental sectors and parallel decision-makers (DOE, MOE, MAJ, military organizations, parliament representatives, etc.) have intensified the inescapable competition and conflicts of interest between governmental sectors regarding proper decision-making on water management.

**Characterizing the Relationship Between the Political System and Water Resources Management in Ir...**  
The relationships and common characteristics between different types of political structure involved in water resources management in conjunction with the concept adopted from the 'Agency-Importance Matrix of Eisenberg, Note 1: The "agency" component

Iran has experienced a series of significant events in its modern history of water resources management during the last 60 years (Figure 1). These include launching a country-wide land reform around the "White Revolution" in 1963 and beginning the conversion of many pastures to agricultural and irrigated lands, before the first state in the Middle

Figure 1. Simplified conceptual schematic of (a) an efficient or democratic, centralized decision-making approach for the allocation and management of water resources, and (b) the existing decentralized approach for the management of water resources in Iran. Note: The schematic design was inspired by Anderson and Doherty (2003) and Anderson et al. (2014).

Figure 2. Central Logic Diagram of the government for policy regulations. (a) The structure under-based water policy of hierarchy of governmental sectors decision-making for policy regulations, with an significant conflict of interests between the sectors. (b) Diagram of the existing condition governmental sector on water regulation in Iran, which intensifies conflicts of interest between the sectors. DOE: Ministry of Agriculture and Jihad; MOE: Ministry of Energy; DCE: Department of Environment.

A systematic transition towards a democratic, decentralized, diversified and non-state-controlled political structure is recommended to sustainably mitigate the water resources issues in Iran. A transition to such a structure is not a

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## PURPOSE OF THE STUDY

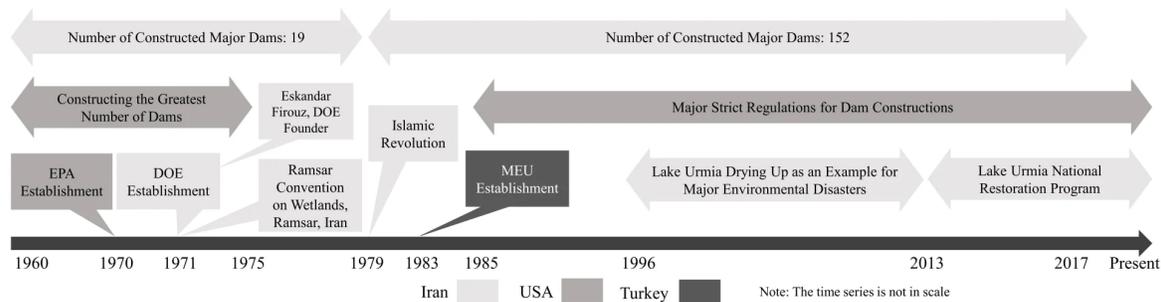
Few studies have evaluated the extent of the existing water bankruptcy and its consequences and attempted to propose technical and fundamental solutions to combat the water bankruptcy and anthropogenic desertification problems in Iran. Despite the importance of the political power structure, no study has assessed the role of political system components in Iran (on a macro-level) regarding the existing water bankruptcy. The current study elaborates implications and symptoms of the fundamental socio-hydrological and hydro-political causes of water bankruptcy given the structure of the political system in Iran and provides a wealth of insights into the consequences of the existing water resources managerial system.

This study has been recently published in the Journal of Sustainability, which can be found Here (<https://www.mdpi.com/2071-1050/13/24/13657>).

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# WATER RESOURCES AND CLIMATOLOGICAL POTENTIALS AND CHALLENGES IN IRAN

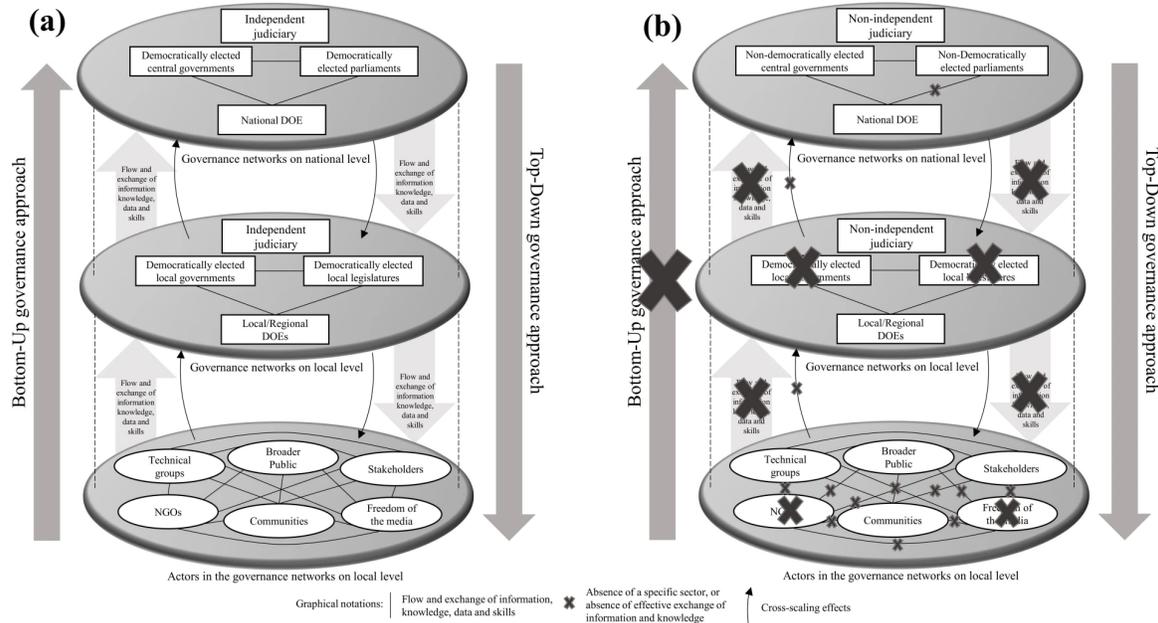
Iran has experienced a series of significant events in its modern history of water resources management during the last 60 years (Figure 1). These include launching a country-wide land reform named the “White Revolution” in 1963 and beginning the conversion of many pastures to agricultural and irrigated lands, being the first state in the Middle East to form a Department of Environment (DOE) in 1971 (prior to the Islamic Revolution in 1979), holding the intergovernmental convention in Ramsar, Iran, on Wetlands in 1971, and having several considerable environmental hazards and disasters due to a series of systematic problems.



**Figure 1.** Time series of major events related to the modern history of water resources management in Iran and a comparison with similar events in the USA and a country in the region, Turkey; EPA: Environmental Protection Agency, DOE: Department of Environment, MEU: Ministry of Environment and Urbanization.

# IMPORTANCE OF PUBLIC INVOLVEMENT AND DECENTRALIZATION

Although there are variations in the levels of environmental sustainability and improvement based on a developing country's level of democracy, democracy has been observed to be conducive to the improvement and protection of environmental quality and water resources



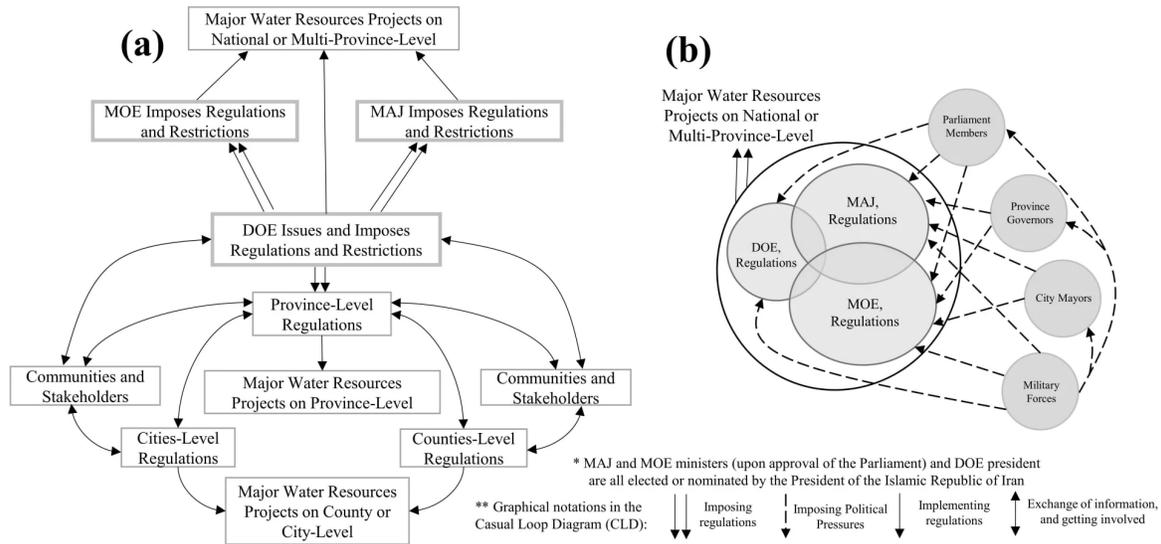
**Figure 2.** Simplified conceptual schematic of (a) an effective democratic, multilateral decision-making approach for the allocation and management of water resources, and (b) the existing decision-making approach for the management of water resources in Iran. Note: The schematic design was inspired by Andersson and Ostrom (2008) and Meerow et al. (2016).

The necessity of establishing a polycentric and decentralized administrative structure—with no major conflicts of interest between governmental institutions and agencies—is one of the necessary (and not sufficient) requirements for the proper management of water resources. In such a structure, major water resources decisions are made solely by local governmental and public stakeholders, local communities, professionals, and those impacted by the resources, under the extensive supervision and imposed regulations/compliances of a country-wide organization, such as the DOE. Therefore, through the payment of costs by affected local public and stakeholders (e.g., through transparent taxation systems and water pricing), stakeholders can become more conscious and sensitive to the supply of water resources and may comply with water-related regulations, resulting in improved management of water resources. In the governing political structure in Iran, most major decisions regarding water resources are made by the center/capital.

Decentralization based on a participatory approach with no conflicts of interest between governmental agencies, extensive supervision by the DOE, and as a major policy implication, is recommended in Iran to improve the sustainability of water resources management

# CONFLICTS OF INTEREST BETWEEN GOVERNMENTAL SECTORS AND THE IMPACTS OF IDEOLOGICAL POLICIES IN DOMESTIC AND FOREIGN AFFAIRS

The multiplicity of governmental sectors and parallel decision-makers (DOE, MOE, MAJ, military organizations, parliament representatives, etc.) have intensified the inexorable competition and conflicts of interest between governmental sectors regarding proper decision-making on water management.



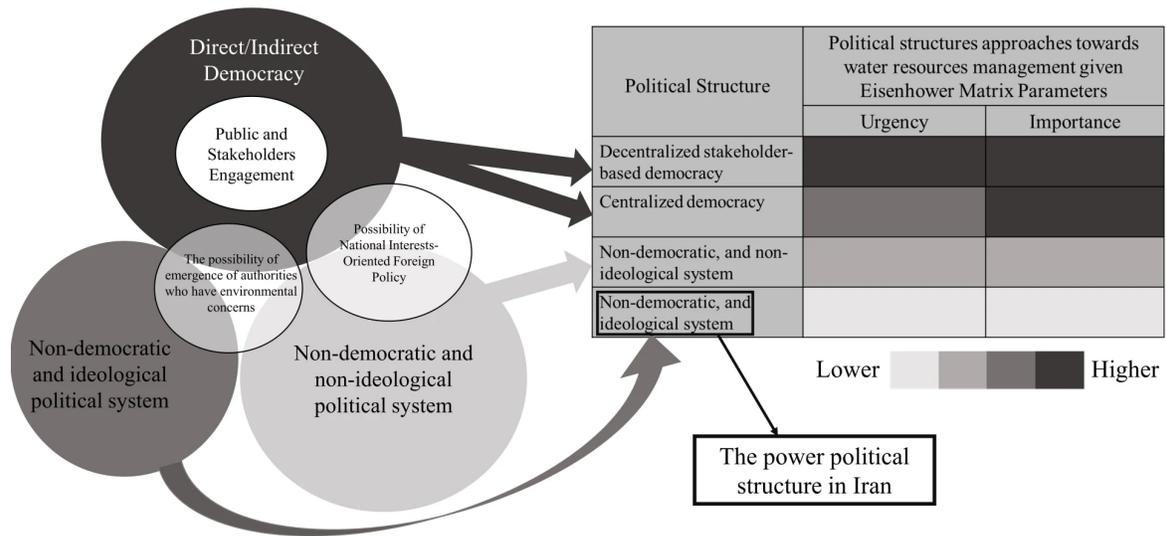
**Figure 3.** Causal Loop Diagram of the processes for setting regulations; **(a)** An effective value-based socio-political hierarchy of governmental sectors decision-making for setting regulations, with no significant conflicts of interests between the sectors; **(b)** diagram of the existing condition of governmental sectors decision-making in Iran, which reinforces conflicts of interest between the sectors. MAJ: Ministry of Agricultural Jihad; MOE: Ministry of Energy; DOE: Department of Environment.

Adopting ideological governmental policies at external and internal levels can shift the policy priorities from sustainable and adaptive development to idealism and ideological goals. These policies, for example, emphasizing high population growth, emphasizing self-sufficiency in agricultural production, and increasing conflicts with neighboring countries have been a few of the main reasons for inadequate water distribution, a decline in water per capita, and a lack of constructive regional cooperation with countries in the region regarding transboundary water resources in recent decades. The foreign policy of the current political system has intensified regional and trans-regional tensions. This has acted as a driving factor for the intensification of international sanctions on the state since the 1979 Islamic revolution, negatively impacting the sustainability of the environment in Iran, particularly water resources, and reinforcing the government’s idealism about self-reliance for food and agricultural production.

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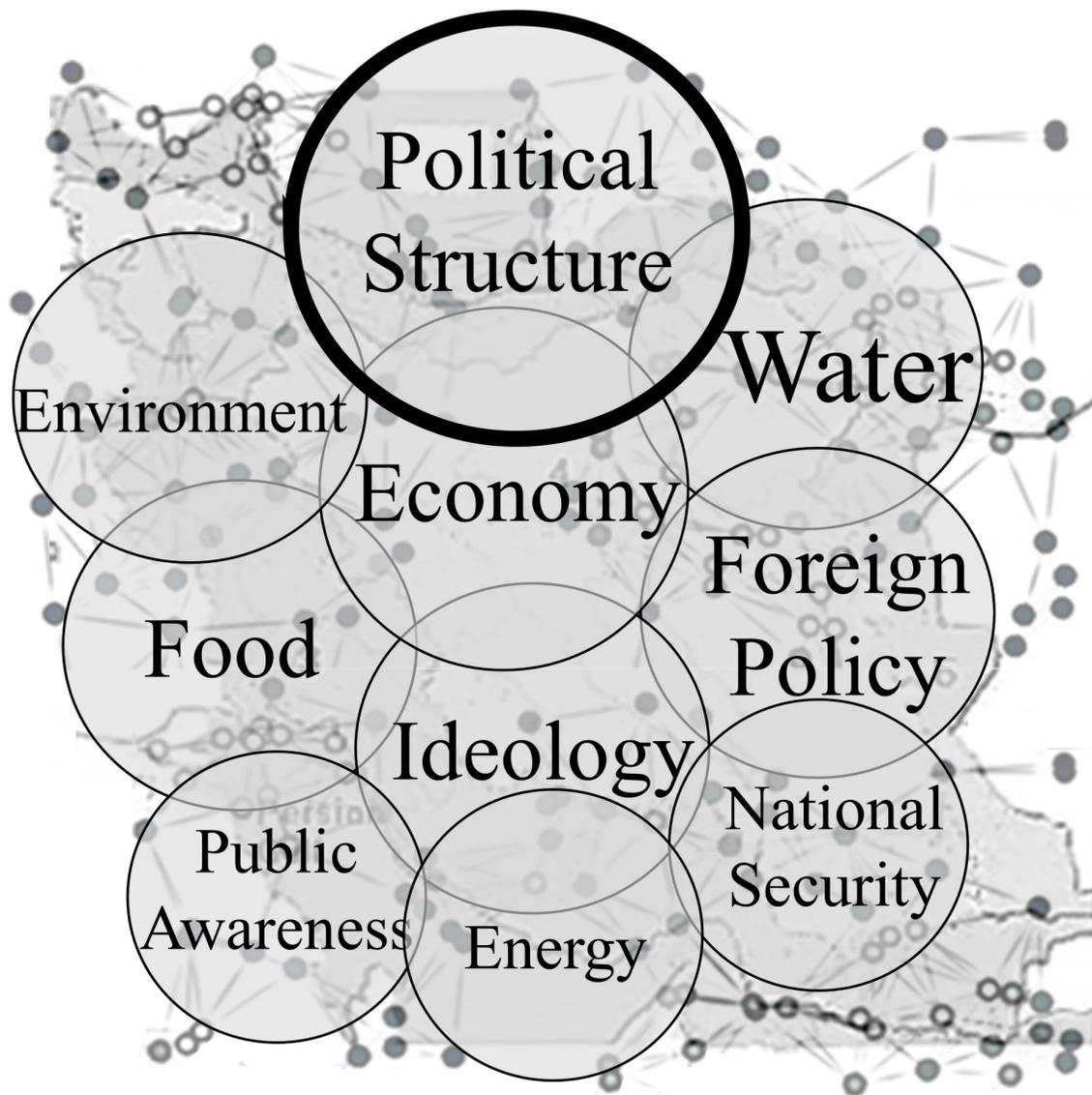
# CHARACTERIZING THE RELATIONSHIP BETWEEN THE POLITICAL SYSTEM AND WATER RESOURCES MANAGEMENT IN IRAN USING THE MATRIX OF EISENHOWER

The urgency and importance assigned to water resources management issues vary in different political structures based on the level of democracy and the adoption of ideological policies. While in decentralized stakeholder-based democracies, there is a greater chance of perceiving water resources management issues to be relatively urgent and important matters through engaging societies in earning high priorities for water problems, non-democratic and ideological political structures, such as the Islamic Republic of Iran, usually overlook the limited time window for addressing water resources issues; they perceive the environment (including water resourced) as an infinite opportunity to boost the economy and address socio-economic and socio-political problems.



**Figure 4.** The relationships and common characteristics between different types of political structure involved in water resources management in conjunction with the concept adopted from the Urgency-Importance Matrix of Eisenhower. Note 1: The “urgency” component of Matrix of Eisenhower for a centralized democracy is lower than its “importance” primarily due to weakened tightness of feedback loops. Note 2: The terms “higher” and “lower” are relative concepts, as for example, water bankruptcy can be also observed in democratic political systems.

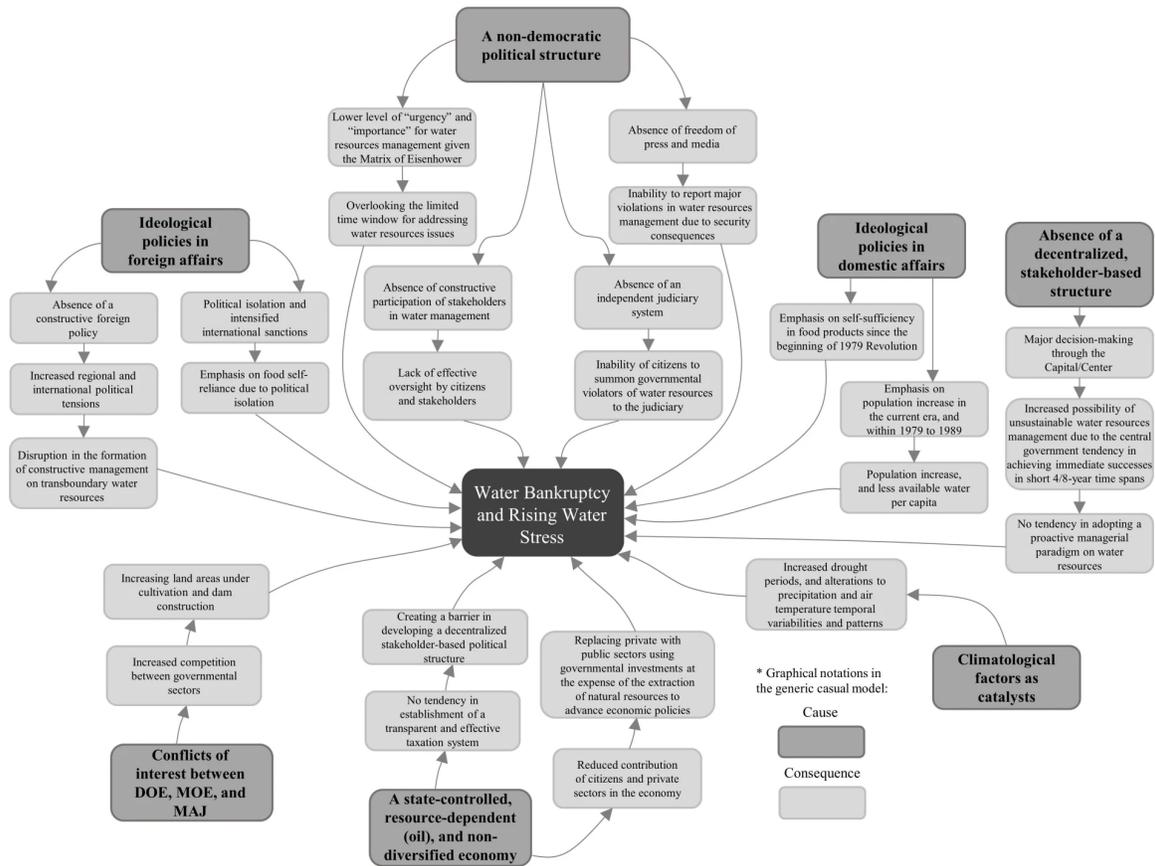
Water, the economy, the environment, foreign policy, etc. are components of a complex policy-natural-human system of systems, and are all managed through the major policies adopted by a political structure (state), reaffirming the state as the central object of hydro-politics.



**Figure 5.** Conceptual positions of different elements within the complex policy-human-natural management system of Iran; the background image is a map of Iran.

# RECOMMENDATION FOR ADAPTATION TO THE WATER BANKRUPTCY PARADIGM

A systematic transition towards a democratic, decentralized, diversified and non-state-controlled economy, and non-ideological political structure is recommended to sustainably mitigate the water resources issues in Iran. A transition to such a structure is not a sufficient, but merely a necessary condition. Such a political structure may not immediately mitigate the impacts of water bankruptcy; however, it does provide the necessary components for sustainable management of water resources and will increase the chance of mitigating the impacts of water resources bankruptcy, and allow for the adaptation of the country's water supply (which is on the verge of territorial destruction) to the existing bankruptcy condition.



**Figure 6.** The generic causal model of the main causes and consequences of the existing water resources bankruptcy problem in Iran.

## AUTHOR INFORMATION

Mehdi Ketabchy is a PhD student in Civil and Environmental Engineering at University of Maryland, College Park, USA. He received his second M.S. degree in Biological System Engineering, Virginia Polytechnic Institute and State University in 2017, received his first M.S. degree in Civil and Environmental Engineering, Sharif University of Technology, Tehran, Iran in 2013, and graduated with his B.Sc. in Civil Engineering, University of Mazandaran, Babol, Iran in 2010.

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## ABSTRACT

Iran is suffering from a state of water bankruptcy. Several factors have contributed to the current water resources bankruptcy, ranging from anthropogenic impacts, such as an inefficient agricultural sector and aggressive withdrawal of groundwater, to climatological impacts. This presentation suggests that water resources mismanagement in Iran should be evaluated beyond the policy-makers decisions, as it recognizes that the bankruptcy has been intensified due to the structural and institutional form of the political system in Iran. This study discusses the roots of the water bankruptcy and identifies four major shortcomings caused by the political system: (1) the absence of public engagement due to the lack of a democratic and decentralized structure; (2) adopting ideological policies in domestic and foreign affairs; (3) conflicts of interest and the multiplicity of governmental policy-makers and sectors; and (4) a state-controlled, resource-dependent economy. Through the development of a generic causal model, this study recommends a systematic transition towards a democratic, decentralized, non-ideological, and economically diverse political governance as the necessary—but not necessarily sufficient—adaptive and sustainable solution for mitigating the impacts of water resources bankruptcy in Iran. The insights highlighted in this presentation could be employed to inform water resources decision-makers and political actors in other non-democratic and ideological political structures struggling with a water resources crisis or bankruptcy.

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