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Review

A Preliminary Review of an Unprecedented Cross-Provincial Water Transfer Plan in Iran: No Clear Vision and Stakeholder Mapping

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Abstract: This review paper investigates unprecedented recent investment and capital spending in cross-provincial water management and transfer infrastructure in Iran. Although numerous cross-provincial water transfer plans have been implemented in the country, the scale, approach, and stakeholders involved in this recent national plan are unprecedented. This notable national plan includes long water transfer pipelines that pass through seven provinces, aiming at transferring desalinated water from the Persian Gulf to the interior. Regarding the scale, there have been a few cases of transferring water at the cross-provincial level, but mostly across two provinces. The approach has also changed in this plan. Long-term efforts to construct dams for electricity or farming with limited geographical impact have been shifted to desalinating water, long-distance pipe-laying, large-scale electric-powered water pumping, and long-distance underground tunnels. Stakeholders have become more diverse, from the council members of a small village to high-level decision makers at the national level. This paper elaborates on these extraordinary alterations by exemplifying a few other contemporary case studies of water transfer plans in Iran. It also examines the fundamental logic, bottlenecks, and future scenarios of this large-scale plan.

Keywords: water transfer; Iran; climate change; cross-provincial; interbasin

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1. Introduction

1.1. Sustainable Development Goals

Water is an essential element for development, with associated complexities in its management, governance, partnership, and institution (e.g., [1–3]). One of the 17 Sustainable Development Goals (SDGs) is 'SDG 6: Clean Water and Sanitation'. The essence of this critical universal goal is to "ensure the availability and sustainable management of water and sanitation for all by 2030" [4]. Such an ambitious vision for water necessitates a holistic management approach, encompassing well-planned schemes, active actors, environmental protection and stewardship, and capital/human investment, notably at the national level. If these general rules are observed, the final goal 'to end extreme poverty and protect the planet' [4] could be achievable.

Nevertheless, past evidence of poorly planned water management strategies, chaotic political situations, unpredictable economic conditions, and dire future scenarios of climate change could make such a global vision by 2030 unrealistic, if not unattainable. On the global scale, progress towards all targets of SDG 6 is off-track [5]. On the other hand, the 'no-plan-at-all' strategy is not advised, as many parts of the world must prepare themselves for growing populations and more scarce water resources [5].

Water conditions are much more complicated and unpredictable at finer scales, from national to basin levels (e.g., [6]). Countries devise their national economic priorities and developmental agendas, but most of these plans are influenced by interactions among capital/human deficiencies, political resistance, and power struggles (e.g., [2,7]). Regarding

water, different beneficiaries and stakeholders at various levels create an intricate decision-making atmosphere that can jeopardise proper and efficient water planning and allocation plans (e.g., [6,8–10]). Due to these complexities, more applied case studies and frameworks must be evaluated to find lasting solutions.

This paper intends to exemplify one of these case studies as the first costly and large-scale national attempt to transfer desalinated water across seven provinces. We will present the probable bottlenecks that can hamper Iran's largest-ever planned cross-provincial water transfer plan. We will also elaborate on the need for a more holistic approach for this unprecedented water transfer plan, which encompasses numerous main basins and sub-basins. We emphasise engaging various stakeholders, actors, and beneficiaries across seven provinces. The paper also reinforces the idea of integrating a set of visionary guidelines and programmes in this plan to improve resiliency to the unpredictable impacts of climate change.

1.2. Problem Statement

Iran has experienced unsustainable pathways regarding overall water consumption for decades. Numerous challenges exist, including degraded lands incapable of water infiltration and storage, unsustainable water usage for inefficient conventional agriculture, high daily per capita water consumption, and so on (e.g., [11,12]).

The country has invested in water management and storing plans such as dam-building projects and water transfer plans, among others, to meet water demands for agriculture, electricity, and urbanisation over the past decades (e.g., [13,14]). However, a notable project has recently begun to desalinate water at Persian Gulf points (in the south) and transfer water toward inner provinces. This research paper will review this costly, environmentally unfriendly, and unusual large-scale cross-provincial water transfer plan, undertaken with unprecedented investment and capital spending in Iran.

Water resource management in Iran is based on political borders (provinces) rather than hydrological basins [15]. As a rare case study, this paper describes a water transfer plan that involves seven provinces. The novelty of this paper lies within its interdisciplinary study aspects, as described here. First, unlike other water-related studies, this paper develops its foundational assertations surrounding the critical roles of stakeholders, varying from top decision makers to the household level. It will explain each group's level of engagement and influences (stakeholder analysis). Second, the paper highlights the power of governmental decisions in investing in water mega-projects in developing countries (especially in the Middle East) without proper investigation of future local and regional water demands (short-term political gains). Finally, the paper uniquely addresses the differences between cross-provincial versus interbasin water transfer plans by exemplifying a real-world project.

Here, we distinguish between two water transfer approaches: 'cross-provincial' (used in this paper) and 'interbasin' (used in the literature). By 'cross-provincial', we mean that water is transferred across several geographical borders (provinces) without potentially extracting/using water resources (surface or underground) from any of them. In this approach, water is hydrologically sourced outside the source point (province). Whilst in the 'interbasin' approach, water is conveyed hydrologically 'from one river basin to another using non-natural means, such as pipelines, aqueducts, or canals' [16]. This latter approach necessitates the extraction or usage of water from one of the involved hydrological basins.

To relate the debate within a global water framework, 'Indicator 6.5.1' is elaborated upon. Accordingly, 'the degree of integrated water resources management (IWRM) implementation [is tracked], by assessing the four key components of IWRM: enabling environment, institutions and participation, management instruments, financing' [4]. Therefore, the paper reviews the following aspects: Will this hastily planned water transfer plan be efficient in a country dominated by arid and semi-arid climate conditions and a growing population? (enabling environment); Who will be the potential beneficiaries at various levels of decision making in this cross-provincial water plan? (institutions and participation);

Who will preside over such a massive cross-provincial project during the development, maintenance, and utilisation stages? (management instruments); What is the logic behind a plan funded and implemented in an uncommon timeframe for a country hammered by continuing international sanctions, high inflation rates, unemployment, and so on? (financing).

The following sections provide background on water management and planning in Iran. The debate will be explained by a brief history of water management in Iran to highlight the changing trends of water management over the past century. The subsequent sections exemplify two extreme case studies of cross-provincial water transfer plans, while focusing on four socio-technical elements of the newly developed water transfer plan that covers seven provinces. The final sections elaborate on the existing bottlenecks and probable future challenges affecting this plan.

2. Water Availability, Management, and Planning in Iran

Despite being a dryland country, Iran has enjoyed a long relationship with water as one of the pioneers in the Middle East region [17,18]. Water management and storage projects have been vital elements in the country. Iran's water history is renowned for its unique underground water canals, qanats (e.g., [17,19,20]). The settlers of arid and semi-arid central parts of the country devised an ingenious plan to expand underground water canals that provide all-season water flows for drinking and irrigation. Nevertheless, such small-scale water systems have gradually become non-usable due to extensive land use changes and unprecedented population growth in Iran, especially since the mid-twentieth century (e.g., [21]).

Vast deserts occupy the inner parts of the country's plains: 35.5% hyper-arid, 29.2% arid, and 20.1% semi-arid [11]. These natural ecosystems survived for millennia before human settlements. Their unique features include sparse vegetation, low precipitation, and particular sediments, among others. Wetlands and permanent rivers have formed scenery landscapes, hosting various animal and plant species. Areas of the interior and southern parts of Iran encompass natural geological features, such as salt domes, which can affect the quality of water rivers and streams. It is estimated that about 6.7 km^3 of brackish water flows annually through 12 major rivers, among which 70% flow into the Persian Gulf and Sea of Oman Basins [22].

Vast mountainous areas surround the country's plains. Two major mountainous areas along the western and northern borders, Zagros and Alborz, respectively, have created unique conditions for water resources. The Zagros mountains have retained water resources through karstic or other geological features [23]. Also, this western mountainous area benefits from a regional atmospheric flow, receives relatively ample precipitation [24], and hosts major permanent rivers. These could be the reasons why large-scale dams (e.g., Karkheh dam) have been developed in this rough terrain area.

The Alborz mountain chain supports pristine Hyrcanian forests engulfed with large amounts of precipitation, creating beautiful natural sceneries. This mountain chain acts as a natural barrier preventing rainy clouds from penetrating the interior plains. Numerous dams originate from the Alborz mountain chain and provide water resources for several provinces, including Tehran.

Over the past century, the hydrological aspect of Iran has undergone unprecedented changes due to two critical factors, anthropogenic drivers and climate change, as outlined below.

2.1. Anthropogenic Drivers

A combination of factors has influenced Iran's overall hydrological cycle regime over the past century. Oil exploration, started in 1908, has been continued on an industrial scale since then. Following unprecedented population growth between the 1950s and 1990s, the top national priority was redirected toward supplying food and electricity [13,14]. Also, industrialisation and urbanisation have been accelerated nationwide, and water resources

have profoundly diminished. Urbanisation has increased at an alarming rate, necessitating further adjustments in water distribution and supply for cities. Huge petrodollar reserves have gradually helped the subsequent governments expand large-scale developmental plans (e.g., generating electricity) and intensive agriculture [13,14]. Cities, villages, and industries expect more water resources. Central decisions have also included the ill-advised establishment of mega-industries (e.g., steel industries) with high water demands in central dryland regions that already suffered from drinking and farming water shortages.

Those earlier underground water canals, qanats, excavated for sustained water flows over the past millennia, have gradually faded through a series of human interventions. Deep wells have been excavated, while wastewater management was begun only recently. These factors have exerted pressure on water resources over the past century (Table 1). Exacerbated by frequent droughts [11], water resources have become scarcer and more unreliable. According to the Iranian Red Crescent Society, 4.8 million people are at medi-um-to-high risk of drought-related impacts, mostly in remote and rural areas of the provinces [25].

Table 1. Pivotal human drivers affecting the quality and quantity of water resources in Iran over the past century.

Drivers	Description/Evidence	First Probable Interventions	Source(s)
Deep water wells	Long-term extraction of underground water resources for intensive low-yielding cultivation	Early 20th century	[13]
Developmental activities	Housing and tourism development	1950s	[26]
Heavy industries	Establishing large-scale water-consuming industries in central dryland regions	1950s	
Transboundary water resources	The controversial Iran–Afghanistan transboundary river	1970s	[27,28]
Wastewater	Pollution of waterbodies due to untreated wastewater		[21]
Poor planning of water storage and distribution	Construction of large-scale dams	1950s	[14]

Land use planning is an ignored element in national planning in Iran. Over the past 40 years, subsequent governments have pledged to conform all developmental activities with land use plans, although more needs to be done.

2.2. Climate Change

Recent studies show that the current tragedy in Iran's water resources is primarily caused by unsustainable hydro-environmental resource management combined with decadal climate change (e.g., [15]). Unlike other parameters, the impact of climate change on any ecosystem services and function heavily relies on scenarios with different outputs, high variabilities, and uncertainties. Scenarios as tools for generating desirable and plausible futures cannot forecast or predict; instead, with a logical plot, they can narrate how events will unfold in the future while considering the causal flow of events [29]. Existing Iranian climate change model calibrations and scenarios suggest changing trends in precipitation, temperature, and water storage in major basins (e.g., [30–33]). The inclination toward less water availability due to decreasing precipitation trends in some basins, while increasing in others, within the next decades indicate conformity with global models.

Precipitation (rainfall and snowfall) has declined in many parts of the country. Frequent droughts and low precipitation, storing natural river water upstream using large-scale dams, and pumping water flows for agricultural purposes have prevented water flows

from enriching natural terrestrial and aquatic ecosystems. Almost all Iranian wetlands are experiencing water stress and pollution. Such impacts degrade wetlands and their associated ecosystem services (e.g., [34]). Globally, it is estimated that "between 32% and 53% of the monetary value of inland wetlands comes from co-benefits such as food, erosion regulation, tourism, and recreation" ([5], p. 51).

2.3. Extreme Water Transferring Schemes in the Past

Whether originating from qanats or rivers, local water allocation systems have benefitted rural areas on a smaller scale by sharing irrigation water among farmers based on traditional documents and records. Nevertheless, such local water allocation rules have disappeared.

The diminished significance of underground water canals (qanats) and associated traditional allocation rules has coincided with a gradual growth of socio-economic factors, notably population growth, since the mid-twentieth century. Agricultural lands have become segregated and divided due to developmental plans. All of these challenges have affected the integrity of natural oases and water management structures.

Hydrologically, Iran is classified into six main water (hydrological) basins and 30 sub-basins, receiving various precipitation rates (less than 50 mm to more than 1600 mm) [11]. Precipitation and demographic features among these basins vary dramatically. The hydrological and topographical advantages of certain basins have enticed massive dam-building movements [14] and affected the overall functions of basins in the long term. Interbasin water transfer plans have always been advised as potential scenarios for enriching other sub-basins. Domestic research identified 19 interbasin water transfers via tunnels, pipelines, or canals in the country until 2013 [35]. A recent paper also examined interbasin water transfer from the headwaters of the Karoon River to the central plateau, confirming a drop in the aquifer volume and level of the original basin in the long term [36].

Here, we briefly review two of the latest national water transfers cases in Iran:

Water transfer from the Caspian Sea. For almost two decades, one extreme water transfer plan has sought to transfer desalinated water from the Caspian Sea (in the north) to interior provinces in the country. Debates led by the public media portrayed the Caspian Sea "as a potential free water resource that could be transferred physically to the central deserts [provinces] for irrigation and drinking water purposes" ([37], p. 9). Nevertheless, this plan is no longer suitable due to financial costs and environmental impacts. Also, the recent decline in the Caspian Sea water level could be evidence of such an unattractive proposition (see [38]).

Enriching Urmia Lake (wetland). Another extreme water transfer plan is related to enriching of one of the wetlands in Iran, which has undergone unprecedented changes over the past decade. Located in northwest Iran, Urmia Lake is one of the international wetlands registered by the Ramsar Convention. It is home to the largest natural habitat of *Artemia* species of brine shrimp [39] and a location with associated ecotourism potential [40]. The wetland has shrunk and lost much of its area over the past decade. Many studies emphasise intensive agriculture and declining rainfall as influencing factors in the basin where the wetland is located (e.g., [34]). As a national, regional, and international iconic lake, a plan was devised in the early 2010s when the then-President set up a special task force to devise solutions for its revival [37]. One of the key components of this plan is to transfer water from various sources to this lake. The interbasin water transfer project seeks to convey water from the Zab River to this lake [41]. Based on climatic and hydrological data analysis, it was found that the project could be challenging to implement, inefficient, and may not be a plausible eco-friendly solution [41].

The above-mentioned water transfer plans encompassed two or three provinces, but we examine a recent national extreme plan entailing seven provinces.

3. Persian Gulf Water Transfer (PGWaT) Plan: A Cross-Provincial Undertaking

3.1. Enabling Environment

In response to the high demand for water resources in several southern and central provinces, the country has initiated a mega-scale water transfer plan to desalinate water from the Persian Gulf, store, and redistribute it across several southern and central provinces (Table 2).

Table 2. Features of the cross-provincial Persian Gulf Water Transfer (PGWaT) Plan.

Features	Description
Approval date	2010
Start date	2021
Provinces	Seven provinces (Hormozgan, Kerman, South Khorasan, Razavi Khorasan, Yazd, Isfahan, Sistan-Baluchestan)
Pipe-laying	3700 km
Water source	Desalinated water originating from the Persian Gulf
Water allocation	Yazd (250 mm^3); Sistan-Baluchestan (220 mm^3); Razavi Khorasan (120 mm^3); Southern Khorasan (60 mm^3); Kerman (30 mm^3)

Note(s): Based on various sources written in Persian; mm^3, million cubic meter.

The PGWaT Plan is the most ambitious, expensive, and extended water transfer plan ever designed and implemented in Iran. By the end of the plan's timetable, the PGWaT Plan is expected to supply water for seven provinces (Table 2). Except Hormozgan (coastal province in the south), others are considered as inland provinces. These provinces suffer from growing populations, urbanisation, and intensive agriculture. Their ecological conditions are regarded as dominant arid and semi-arid climatic zones with minimal precipitation and frequent droughts. Despite ecological and hydrological limitations, these provinces have hosted mega-scale industries such as mining and steel/copper production. It is estimated that these industries will need to be supplied with over 950 million m^3 of water for their processing procedures in the future [42].

The PGWaT Plan necessitates a series of complex and interlinked technical procedures in the retrieval, desalination, storage, and distribution of seawater sources. In the first technical stage, water is collated from the open sea (Persian Gulf), stored, desalinated, and finally distributed by pumping systems. The water will be stored in large ponds and redistributed via pipe systems. Each stage will encompass technological advancements and progression for accomplishment. Landscapes include rough and uneven terrains, so stages need accurate water engineering calculations and management skills to be accomplished. No details were found about these stages, as they remain in the custody of public institutes, field-based engineers, and contractors.

3.2. Institutions and Participation

Stakeholders are "individuals and organizations that are actively involved in the project or whose interest may be affected as a result of project execution or project completion" (cited by [43], p. 166). For proper water governance, "relevant stakeholders should be involved and that their interests, concerns and values should be sufficiently balanced and considered" ([6], p. 616).

As a cross-sectoral issue, water management is influenced by different types and levels of stakeholders [8]. In this plan, spanning seven provinces, various stakeholders and actors are expected to get involved: from decision makers at the national level (e.g., ministers), to local/provincial government/governors, middle-level managers, and local technical staff (e.g., engineering staff), to the final exploiters (e.g., farmers, households, industries).

The complexities of the functioning and distribution strategies established among all stakeholders for the PGWaT Plan could be numerous. Nevertheless, the roles of small

local user groups and NGOs in the future management and governance of this plan are not apparent.

3.3. Management Instruments

The overarching management responsibility of the PGWaT Plan remains under the auspices of the Iran Ministry of Energy (MoE). As one of the existing ministries, it administers water (drinking and irrigation), electricity (including hydroelectricity), and rivers in the country. Together with the Ministry of Agriculture, MoE manages irrigation water systems via artificial canals and pipes.

3.4. Financing

Regarding financing for the water resource infrastructure, matters such as investment, cost-recovery, allocation of public funds, innovative financing mechanisms, and financial buffers/insurance schemes are considered [9]. The financial details of the PGWaT Plan's costs and operations (e.g., cost–benefit analysis) have not been published (at least none were found at the time of writing this paper), but one can imagine a massive investment is needed for such a mega-scale public plan.

It is assumed that farmers and households will receive their shares as end-users of water consumption, although the exact water allocation shares and prices are unclear (e.g., whether households will pay an extra payment in addition to what is already being paid via their monthly bills to compensate for the project costs). The issue is also relevant to the industries and manufacturers established in these provinces.

4. Discussion

4.1. 'Direct vs. Indirect Use'

"Policy frameworks across most countries in the Middle East and North Africa (MENA) have directed sector financial flows toward supply-side interventions to maximize agricultural production and provide water for cities" ([44], p. 95). This is valid for Iran as well.

The food–energy–water nexus has been established in Iran, especially over the past century, to embed diverse services such as drinking water, irrigation water, and electricity [13,14]. The country has invested in the technical and human aspects of these three pivotal elements. By investing in water management, distribution, and storage, the country has become self-sufficient in several strategic foodstuffs while generating electricity that is exported even to neighbouring countries [14]. Nevertheless, the economic and ecological costs of these national self-sufficiencies cannot be overlooked.

Two terms are considered for water consumption: 'direct use' and 'indirect use' [45]. 'Direct' use relates to the 'direct use of water resources for consumptive uses, such as input to agriculture', while 'indirect' use relates to the indirect environmental services provided by water, such as habitat and biodiversity protection (cited by [45]).

For Iran, in general, the former term (direct use) has predominantly been the case, as the country's priorities in providing food and electricity have prevented water flows downstream for enriching wetlands (indirect use). Moreover, over the past decades, pollutants, lack of adequate water flow, and desiccation have influenced most permanent rivers, wetlands, and other aquatic ecosystems (e.g., [15]). There are numerous examples where insufficient water entries due to the over-exploitation of water resources or digging deep water wells to expand upstream agriculture have caused wetlands and rivers to become dry. Also, human interventions have deteriorated the quality of urban water resources, increasing flooding, land subsidence, farming failures, and aquifer depletion (e.g., [11,12,46,47]). A comprehensive investigation of six major wetlands in Iran revealed that human land use changes in croplands and urban areas were the most critical drivers of wetland decline, followed by climate change (temperature and precipitation) [48].

4.2. PGWaT Plan: Concerns

Desalination is one of the pivotal stages of this plan. As defined, desalination is "a process of separating the dissolved salts from an aqueous solution (from brackish water up to brine) to obtain freshwater" [49]. In the Middle East, heavy investments in desalination occurred in the 1980s, were paused in the 1990s, and then ramped up from 2000 onward [44]. Iran has also invested in desalination projects. As of August 2022, the country had installed 75 desalination plants, most located in southern provinces [25].

The scant data and information have impeded our efforts for further investigation and conclusions, as the first stage of the PGWaT Plan has only been completed. However, there are some concerns about this plan, as outlined below (Figure 1).

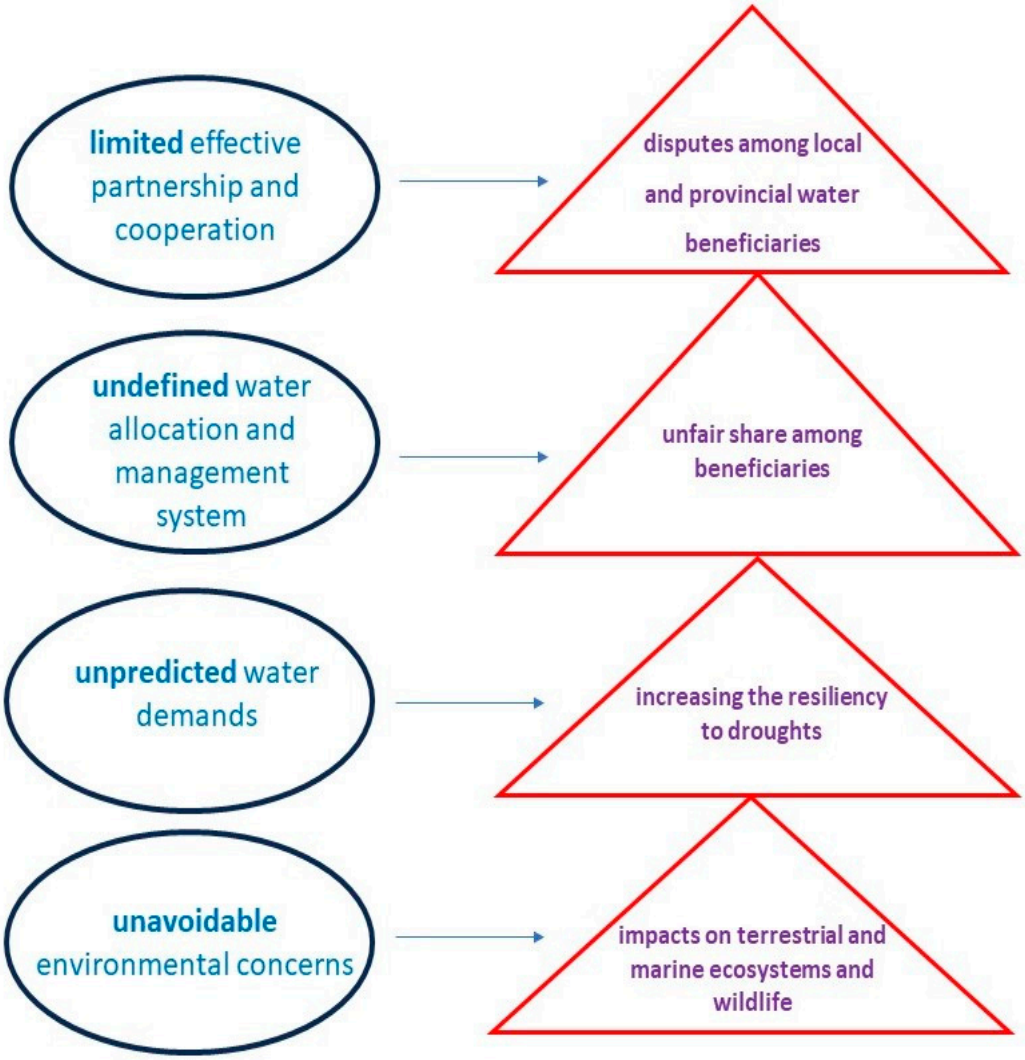


Figure 1. Shortcomings (**left**) and potential impacts (**right**) of the PGWaT Plan (Author).

"Partnerships and cooperation can develop naturally among parties, or need enabling and promoting, but few are without difficulties. Each party comes with its own knowledge, perceptions, interests, positions and objectives, such that disagreements on priorities and strategies are commonplace" ([5], p. 30). For the PGWaT Plan, effective partnership and cooperation exists only among some parties involved at horizontal and vertical levels. Such plans are regarded as 'national priorities' in Iran, so no further consultations with local or provincial authorities or communities occur. It seems that the PGWaT Plan developers need to negotiate details with the related parties for initiating and developing future activities. It is likely that disputes will gradually occur between local and provincial water beneficiaries.

Social unrest and road blockage incidents have occurred in many provinces over the past years, including when local farmers disputed cross-provincial water transfer from the Zayandehrood River in Isfahan to another inland province (Yazd) [35]. Failure to correctly identify stakeholders involved in community-based projects in rural Iran has been shown to effectively curb their progress (e.g., [50,51]).

More importantly, water allocation among these beneficiaries is obscure. Will the share of water allocated to a large manufacturing company be the same as that to other water consumers (e.g., farmers)? Who will coordinate or monitor these water allocation arrangements across seven provinces and/or within one province? What kind of economic frameworks or models of water allocation systems will be used? Already, the Governor General of Hormozgan, a key stakeholder managing the source province for the desalination process for this plan, has asked for the fair buying price of the produced water and generated sludge [52].

Also, how much water would be required to meet the unpredicted demands in these southern provinces is unclear. How have decision makers stipulated the future populations or industries in these seven provinces? The population increase will affect the overall water consumption and demands (or per capita usage) in the future. Also, contingency plans must include probable land use changes in the destinations. For instance, new housing development demands in these provinces must have been predicted.

Models suggest that southern parts of Iran will experience more extended periods of extreme maximum temperatures in 2025–2049 [32]. As such, many of the established facilities and equipment used in the PGWaT Plan could be underestimated or useless. No comprehensive prediction for climate change has been proposed for this plan. It has no vision or programmes for improving resiliency to droughts. Frequent droughts have affected these seven provinces over the past decades, so adaptive resiliency programmes are necessary.

Regarding environmental impacts, the PGWaT Plan has already had a massive impact on the natural landscape, and concerns could be escalated in the future. Large-scale soil extraction, vehicle traffic, littering (including toxic chemical materials), and other footprints during the installation of desalination plant water pipes/pumps have endangered natural habitats and corridors across seven provinces. The Persian Gulf has a fragile and unique marine ecosystem, including Nayband National Marine Park (e.g., [53]). There have been concerns among Iranian pundits about the impact of water retrieval from the Persian Gulf (for desalination) and its associated impact on terrestrial and marine ecosystems and wildlife (e.g., [54,55]). The local benefits of the desalination process are usually marred by the environmental impact of discharging toxic materials into the sea (e.g., [49]). Fisheries is one of the key employment sectors in southern parts of Iran that may be affected by the PGWaT Plan. Research shows that local fishing activity will be affected if proper mitigation measures are not adopted for desalination [49].

For the PGWaT Plan, there is no chance for foreign direct investment or support from other viable international financial credit systems. Moreover, investment in water plans is long-term with no returns expected to be seen within the private sector. Therefore, the question remains about how operational and maintenance costs could be covered and shared fairly among beneficiaries and end users.

As one of the countries in the Middle East and North Africa region (MENA), Iran faces difficulties in supplying reliable water resources that need huge investments. This Iranian plan can be regarded as one of the hundreds of expensive water plans in the Middle East region, though on a global scale, the investment in water infrastructure is still minuscule (0.37 to 1.1%) [5]. Focusing on this region, a recent report points to the need for an additional 25 billion m^3 annually by 2050, which equates to building another 65 desalination plants the size of the Ras Al Khair plant in Saudi Arabia—currently the largest in the world [44].

5. Conclusions

Water has been a contentious and challenging political topic in Iran for decades. Under such scarce water circumstances, the only option available for top decision makers has been to use unconventional water resources (desalinated water, treated sewage water, deep fossil water sources, and so on). Nevertheless, most water resources are wasted through conventional agricultural, industrial, or household uses. There is no comprehensive plan to reduce demand. While water governance is a pivotal 'element of change', it can quickly become a 'victim of change' due to improper decisions made at horizontal, vertical, sectoral, and cross-sectoral levels (e.g., [3]).

Unfortunately, the importance of the ecological aspect of water has been diminished or severely faded due to poorly planned developmental plans. Here, we describe one of the latest improper cross-provincial plans that intends to transfer massive water flows from one external source point across seven provinces. Apparently no environmental impact assessment plans have been considered for such a large-scale undertaking, while the financial aspects (costs/benefits) are unclear. Stakeholders and beneficiaries have not been mapped, and no clear conflict resolution plans have been put forward. The plan is in the early stage, and the future will tell us more about its negative impacts.

Globally, environmental issues have always been hostages of political and economic rhetoric, handed over from one government to another. Unless the top national decision makers have serious intentions, no environmental SDG targets can be met by 2030.

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