Water, Environment and Justice: Iran

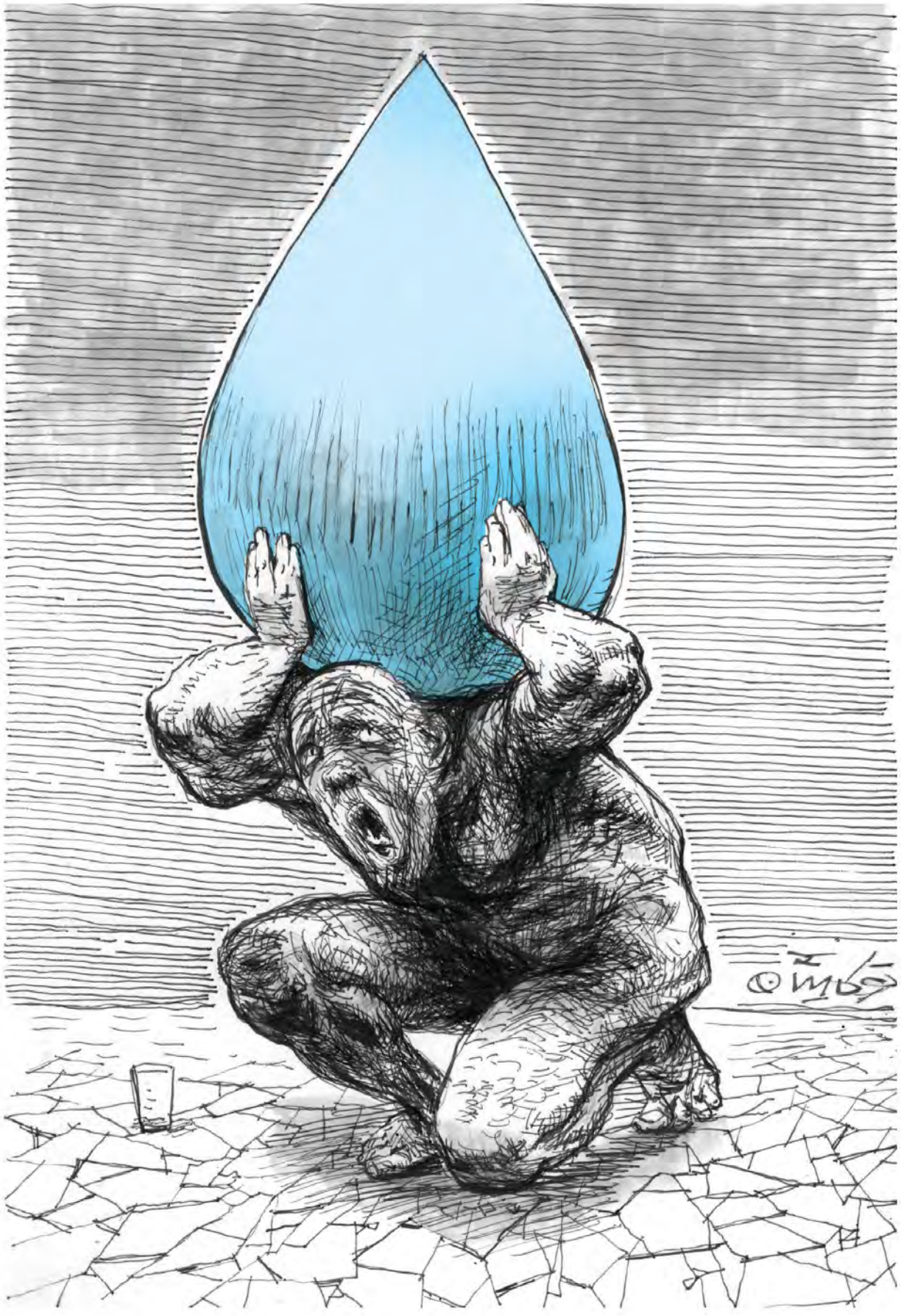

Illustration: Touka Neyestani

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Water, Environment and Justice: Iran

It has not been long since water was recognized as a human right. Over the years, Iranian environmental scientists and activists have worked hard to persuade the government to distribute water without discrimination, and without sacrificing the environment under the pretext of development. The results of many dams and water transfer projects in Iran have been environmental injustice and migration to the city margins and shantytowns.

For the past seven years, Abangan has sought to raise public awareness about water resource management, and in cooperation with the Iran Human Rights organization, it has addressed this issue from the perspective of human rights and environmental justice.

This collection has been prepared as part of a collaboration between Abangan and Iran Human Rights with the help of professors, experts, and environmental activists, and is a step to familiarize international forums and groups with the concerns and goals of leading activists in Iran.

Water: Driver of Peace and Cooperation, or Conflict and Contention?

Nikahang Kowsar

In 2021, Iran experienced water-related protests in multiple cities resulting from decades of mismanagement of water resources and misuse of power, exacerbated by adverse effects of climate change. Instead of managing and reducing water consumption in agricultural and industrial sectors, the Iranian government continued policies and projects destroying groundwater and surface water in the name of food security and self-sufficiency. In his New Year remarks, Ayatollah Ali Khamenei, Iran's supreme leader, emphasized producing more food and reaching food self-sufficiency goals.

Decisions made by the Supreme Water Council, Iran's higher decision-making body on water-related issues, resulted in some provinces feeling unheard and unseen over shared and scarce water resources. Since 2004, provincial governments have been responsible for water resource management instead of regional/basin authorities, thanks to interventions organized by President Khatami's administration. Consequently, some of these provinces did not spare any effort to claim larger shares of common resources. Years of large-scale gray infrastructure projects, such as dams and diversion canals, have created tension among neighboring provinces. The water has been redirected to major cities, especially those with strong bonds with individuals in power.

The existence of water was, at one point, the cause for the formation of a civilization,

Illustration: Assad Binakhahi

but as time passed, poor management of water resources, discriminatory behavior, and depriving others of their water rights became the driver of contention and conflict. The continuation of such behavior can lead to instability and loss of national security, which will only add fuel to a region already under fire.

While the situation is dire, should the Iranian government choose to put the country's long-term interests and its people before the short-term gains of a few individuals, there is still hope to turn the page. The clock, however, is ticking, and the current system will not transform without external triggers. In its latest multi-annual indicative program, the European Union (EU) has planned to re-establish its economic relations with Iran. It would be desirable if the EU or any states recognizing water and a healthy environment as human rights uphold Iran to adhere to its obligation to protect, respect, and fulfill these rights.

Nikahang Kowsar is an award-winning journalist and water issues analyst based in Washington DC.

Environmental Justice: The Overlooked Prerequisite for Transition to a Sustainable and Democratic Future

Kaveh Madani

Until recent decades, natural resources had no major role other than serving as the fuel to run the engine of economic development and growth in the eyes of society, experts, and policymakers. Even in developed societies, extracting and exploiting such resources were seen as a sign of progress and success of economies. Over time, the effects of this mentality and the unrestricted exploitation of natural resources proved that unsustainable development creates serious obstacles to economic growth. The growing global environmental crises and their effects on health (e.g., epidemics, cancers, and lung, skin, and gastrointestinal diseases) as well as their social, political, and security impacts (e.g., mass migration and regional/ethnic conflicts), have left no doubt that the environmental consequences of unsustainable development are not limited to the economic sector.

Yet, the environment still does not play a decisive role in elections, political struggles, and battles, and despite its close relationship with livelihood, health, basic rights, and human survival, political groups and human rights movements and groups, particularly in developing nations, still do not pay enough attention to the issue. After a brief overview of some aspects of the environmental justice concept, this article calls for the efforts and fights to fulfill environmental human rights and justice as an essential step to build and achieve a sustainable and democratic future.

Environmental justice

"Environmental justice" is still a dynamic and developing concept that does not yet have a set and unified definition. But its roots can be traced back to a social movement in the 1980s that

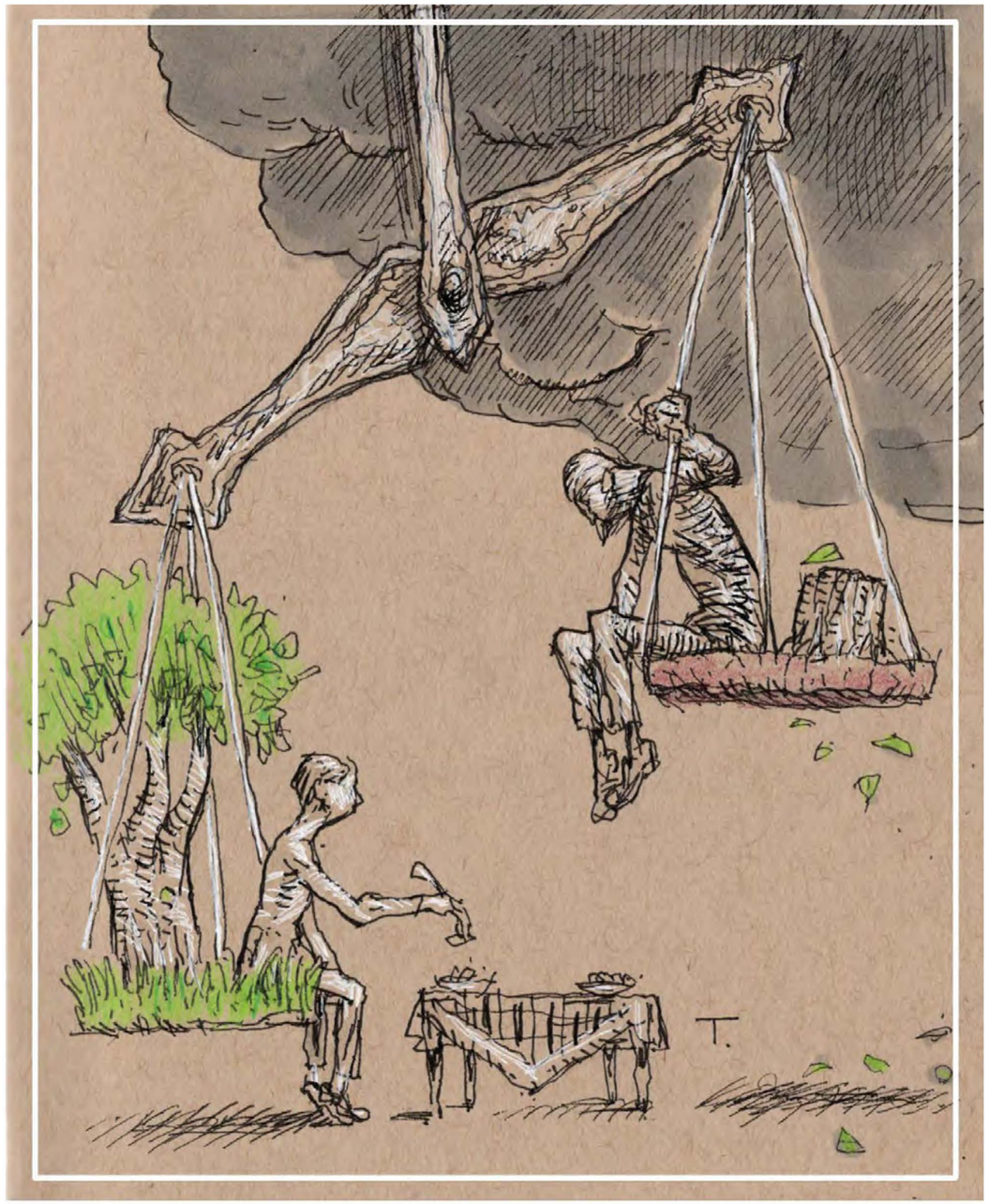

Illustration: Touka Neyestani

was heavily influenced by the American civil rights movement. While this movement initially focused more on the environmental harms of economic development on marginalized racial groups in developed countries, environmental justice eventually became an international concept that encompassed various aspects (beyond just racial).

The "equitable distribution of environmental risks and benefits" is perhaps the simplest and most tangible definition of environmental justice. In a world free of inequality and injustice, both environmental benefits (e.g. clean water, clean air, and a healthy environment) and environmental hazards (e.g., polluted air/soil) are distributed equally among citizens, regardless of their race, ethnicity, language, color, gender, social status, wealth, political power, and other social, economic and political attributes.

Efforts to establish social justice are necessary as generally, the deprived, politically weaker, more vulnerable, and less economically developed have a more limited capacity to deal with and adapt to the environmental impacts and risks that they often not played a part in creating. In contrast, the more privileged, politically powerful, and economically developed groups are more resilient and less harmed by environmental threats. This difference is important as the latter group has historically had a greater capacity to exploit natural resources and essentially, played a bigger role in creating environmental problems. In other words, not only did the more impoverished and disadvantaged groups not have a share of the economic and welfare benefits of extracting and exploiting natural resources but have been left to deal with the adverse conditions created by the environmental crises that they played no role in creating.

Focus on the impact dimension

The COVID-19 pandemic serves as a reminder of the importance of fighting inequality, as it continues to illustrate the implications of the unequal capability to mitigate and adapt to risks and disasters for the more vulnerable groups in society. Although the COVID-19 virus was insensitive to the social and economic background of humans once it reached their bodies, more economically privileged groups and societies had better access to medical care, thus less impacted by the virus before and after contracting it. Additionally, more affluent and developed nations had both faster and wider access to vaccines, but also the possibility to "stay home" without their economies collapsing, significantly increasing their capacity to deal with the damage caused by COVID-19. In contrast, less privileged communities and nations were more vulnerable to the pandemic, due to a lack of adequate medical facilities and infrastructure as well as more limited economical means to provide the vaccine and withstand the economic pressure of the pandemic.

Concerns about the disproportionate impacts of the evolving environmental harms and crises and the greater vulnerability of the weaker groups are the main driving force for social justice activists, experts, organizations and politicians around the world. These concerns, reminiscent of the Persian proverb "the cripple will always find a stone to kick", are mainly focusing on the "impact" of environmental injustice. But in practice, this focus does not necessarily lead to meaningful changes in the real world as less privileged societies that are already victims of the existing global economic and political conditions and structures, do not normally have the means to create the necessary changes that lead to social justice. To

achieve such changes, privileged groups and societies must take responsibility and be more willing to disrupt the conventional political, economic, and social structures.

While the required changes seem logical and fair, disrupting the power, economic and political structures would limit many interest groups who vehemently resist them, as well as other essential changes to address global environmental issues such as global warming. Such resistance does not mean that the global environmental justice movement is pointless and ineffective, but that it is necessary to also focus on the "cause" of environmental crises, like climate change, in addition to their "impact" to achieve and implement practical and effective changes. For example, the dream of achieving climate justice only comes true when, in addition to expressing concern about the vulnerability of poor countries to climate change due to their limited capacity to mitigate and adapt, we seriously ask the rich and developed countries, who have played a major role in causing this global damage since the Industrial Revolution, to take responsibility, provide the necessary resources, and meaningfully change their development models.

The "trans-temporal" and "trans-spatial" dimensions

In addition to the "impact" and "cause" dimensions, the "time" and "space" dimensions are also of fundamental importance. Most environmental harms are not immediately visible. Thus, the environmental issues we are currently dealing with are the products of decisions that may have been made decades or centuries ago. Many environmental impacts of management plans and construction projects only emerge when their designers and executors are no longer in charge. This greatly reduces the quality of environmental monitoring, accounting, accountability, and compensation. For example, it is nearly impossible to hold those who built Los Angeles in a dry part of California accountable. Neither one can take those who caused the air pollution problems in this city by constructing many highways and unsustainably expanding its non-public transportation system to the court. Were it even possible, it would be impossible to make up for and reverse the damage caused by those decisions to restore the city to its previous state. Another example to illustrate the trans-temporal nature of environmental problems is the well-known climate change problems caused by greenhouse gas emissions. Climate change, considered a human-made issue by the scientific community, is the product of the cumulative impacts of the various decisions made by governments, planners, industry owners, and other stakeholders since the Industrial Revolution. Is it now possible to summon and prosecute the policymakers and inventors who are long dead to make up for the enormous damage that currently threatens human survival on earth? If it were even possible to prosecute them, would it be conceivable to quickly solve this problem and reduce the greenhouse gases in the atmosphere to previous levels? The negative answers to these questions remind us of the great significance of the concept of environmental justice being trans-generational. In other words, just as we are the victims of wrong decisions made by previous generations, our decisions today will affect future generations without any opportunity for us to make up for our mistakes. Fulfilling environmental justice is therefore a trans-generational mission and an ethical duty. Even in the absence of representatives of future generations to hold us accountable, monitor

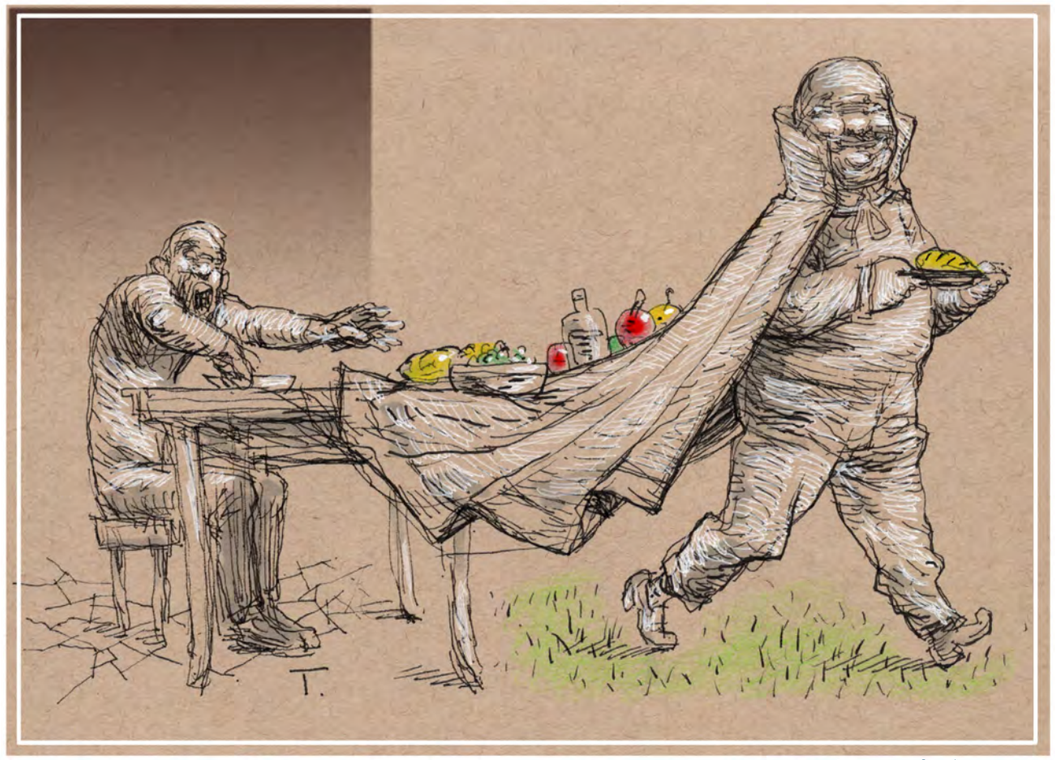

Illustration: Touka Neyestani

our performance, and punish us for bad decisions, we must strive for a fair distribution of environmental benefits and risks between different generations.

The environmental impacts of management decisions and development plans are not only limited to the "time" dimension. The impacts are also hard to be bound in the "space" dimension, meaning that the decisions in one part of the world may impact other parts as well. For example, the geographical area affected by China's decision to continue burning fossil fuels and coal is not limited to its own geographical borders and covers the entire globe. In contrast, the electric vehicle industry in Europe and Northern America may help reduce air pollution in those regions but the resulting increase in lithium mining in countries like Bolivia will cause environmental destruction and irrecoverable health damages in lithium supplying countries. Another good example is the growing dust problem in the Middle East. The poor and unsustainable management of water resources in most Middle Eastern countries has led to desertification and drying of rivers and wetlands. As a result, they have exacerbated the dust storms, a problem that transcends geographical and political boundaries and affects humans and nature miles away from the dust sources and hotspots. A wetland drying up in Egypt and turning into a dust hotspot could cause respiratory problems in the Asian countries of the Middle East or a water body drying in Syria due to the construction of a dam in Turkey could lower productivity in Iraqi farms. Although the "space" dimension

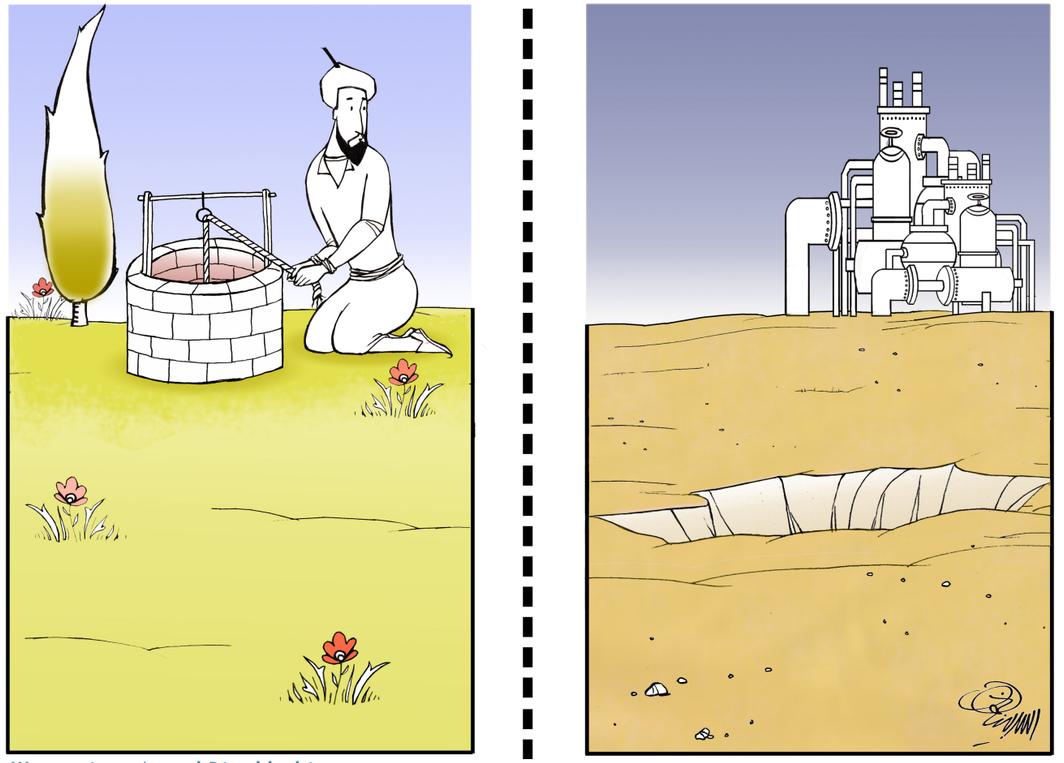

Illustration: Assad Binakhahi

of environmental management seems more obvious and tangible than the "time" dimension, the complicated and complex aspects of environmental phenomena limit our understanding of their spatial dimension and our ability to manage their trans-spatial effects. Given these constraints, and in the absence of appropriate legal mechanisms to manage the transboundary dimensions of environmental decisions, fulfilling trans-spatial environmental justice is currently more of a logical and ethical necessity than a legal mandate.

Environmental human rights

An unhealthy environment threatens human life and health. Those citizens who suffer health problems and do not have access to a clean and healthy environment cannot benefit from their legal and human rights. On the other hand, those governments that frequently violate human rights are normally unsuccessful in sustainable management of the environment. Despite the correlation and interlinkage of human rights and the environment, the attention of human rights activists and organizations to environmental matters and their relevant actions have been very limited.

One can claim that the 1972 United Nations Conference on the Human Environment marked a turning point in creating a stronger linkage between the environment and human rights, significantly strengthening efforts in this space. While the right to a healthy environment is recognized and protected by the constitutions of more than 100 states, so far, no binding

international law has been adopted to reclaim, enforce, and develop an appropriate legal mechanism to punish the violators of environmental human rights. But in the most important recent development and as the result of efforts by environmental activists and human rights defenders along with some member states, in October 2021, the United Nations Human Rights Council adopted a resolution that recognizes access to a clean, healthy, and sustainable environment as an important human right. Though not legally binding, this historic and promising achievement paves the way for the necessary developments in the future to elevate the environment's position in human rights events, movements, and laws.

Democracy, good governance, and the environment

When it comes to environmental human rights, what usually comes to mind is limited to the right to a healthy living environment, clean water, and clean air. However, it should be noted that in addition to these substantive rights (such as the rights to a healthy living environment, clean water, and clean air), environmental rights include procedural rights (inclusive and equal participation in determining the future of the environment). Thus, to uphold environmental rights, not only are governments obligated to ensure their citizens have access to a sustainable environment, but they must provide equal opportunities to the public and different stakeholders to participate in the planning, managing, and determining the fate of the environment and natural resources. Some key questions are necessary to ask in this regard:

- Can one be hopeful that societies and governments that violate different human rights will uphold environmental human rights?

- Can an undemocratic regime or government be expected to provide effective mechanisms for fulfilling social justice and inclusive and equal participation in environmental management?

- Is it possible for a country that does not adhere to the basic principles of sustainable development to manage the environmental sector sustainably?

- Will leaders whose incompetence is evident in the economic, social, political, health, education, construction, etc. sectors be able to establish good and effective governance in the environment sector?

To answer these questions, one must consider the environment's interrelationships with other sectors affected by economic, social, and political institutions. In an interconnected and complex system, due to the nexus between different components, the variations in the status of one component can change the status of other components. In such a system, the unsustainable development of a component makes the whole system unsustainable, or the violation of basic principles of democracy in managing one component makes the whole system undemocratic. Thus, the answer to the questions posed is negative and the status, changes, and fate of the environmental sector are not independent of the status, changes, and fate of other sectors and ultimately depend on the governance system's structure and performance. Consequently, it is impossible to find a country in the world that: is suffering from an unsustainable development model but has sustainable natural resources; is a known human rights violator but fulfills the environmental human rights; or has succeeded in establishing environmental justice but has an unjust executive and judicial system.

Final word: the environment's missing space in political movements

The growing environmental crises around the world have better exposed the environment's nexus with other sectors (e.g., health, sanitation, economy, agriculture, and energy). The impacts of these crises and degrading natural resources have, over time, inevitably engaged more governments and politicians in environmental issues. In some countries, environmental issues have been pushed into election debates and political races. Nevertheless, the environment still does not play a prominent role in political activism, movements, and competitions, and usually does not play a decisive role in the outcome of elections even in the most developed countries. On the other hand, reforming laws and implementing effective policies to protect the environment and fulfill environmental justice usually have no tangible and visible impacts in the short run other than increased costs for the society and stakeholders (such as a hike in water and electricity prices, pollution fines, taxes, and environmental fees). This limits the incentives for political leaders to enter this space as the political and economic costs of implementing environmental policies are significant.

The pivotal role of the environment in sustainable development inherently links the environment to politics. The destruction of a country›s natural resources and environmental degradation are often irreversible, perpetuate human rights violations and injustice, resulting in unemployment and forced migration, escalate tensions, ethnic and regional disputes, civil war, and security problems, and ultimately lead to the destruction of a country. Under such circumstances, even the reform, change, and collapse of the ruling political system will not necessarily resolve the issues, as the lasting impacts of land destruction will not vanish with the replacement of the ruling political system. A country that has lost its most vital resources, faces serious obstacles in meeting the basic needs of its citizens. A society composed of citizens with unsatisfied basic needs will have a very limited chance and bandwidth to establish a democratic system, fulfill justice, and protect human rights. Thus, social activism and political fights to stop human rights violations, reform or replace the ruling political system, and achieve democracy will remain fruitless and unsuccessful if they dismiss the environmental sector. Nonetheless, over time, as environmental issues intensify and their impacts emerge in other sectors, entering the environmental space will become an inevitable necessity, even for those politicians and political activists who are reluctant to address environmental issues. Ultimately, the rising cost of society's indifference to the important issue of environmental justice must be borne by future generations of citizens and politicians.

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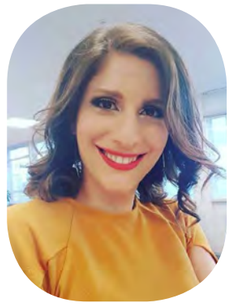
This article is the translation of the article that had been originally written by the author in Persian. The translation has been permitted and approved by the author.

Illustration: Shahrokh Heidari

On Climate Justice



Shooka Bidarian

The world is beset by problems: extreme poverty, conflict, pandemics, environmental destruction, and of course climate change. We are now observing these pre-existing conditions of inequality are being exacerbated by the impacts of climate change, particularly on marginalized communities. We have seen this pattern recurring in all parts of the world. The countries that have contributed very little to the climate crisis, primarily those in the developing world, are now suffering the most from the impacts of climate change. This impact is the result of climate change being a threat multiplier and accentuating existing stressors in disadvantaged groups. It deepens the struggle of those who are already dealing with issues, such as poverty, food security, insecure housing and conflict.

Climate justice is a concept that aims to bridge social justice and climate change, showing how the most vulnerable and poorest communities around the world have been disproportionately and adversely affected by climate change. Climate justice is an intersectional, social, racial, economic, and environmental struggle. This concept highlights the importance of focusing on solutions that improve the lives of the most vulnerable people in each country.

The term climate justice evolved from environmental justice and gained popularity in the 1990s with the first official appearance in a 1999 court watch report. Climate justice is a human-centered approach to climate politics and, of course, climate activism. It recognizes that the climate movement is linked to other worldwide movements such as racial justice, gender equality, and indigenous sovereignty. In climate justice, the climate crisis is seen as a moral

call to action that addresses issues of equality, human rights, and historical responsibility. Climate change and social inequality are two of the biggest global challenges currently facing the international community, and as a result, there has been growing awareness and concern about the issue of climate justice in recent years.

The cruel reality is that the countries that have benefited most from fossil fuel extraction are the least vulnerable to climate change. Meanwhile, poorer countries are much more susceptible to the impacts of climate change and have the least adequate resources to adapt to them. Therefore, countries that have in effect caused climate change and benefited the most from the global fossil fuel economy should have the heaviest responsibility to deal with the climate crisis. This is one of the reasons why the concept of "historic emissions and responsibility" has become the core part of climate debates for the past thirty years.

Since the beginning of the Industrial Revolution, humans have put around 2,500bn tonnes of CO2 into the atmosphere, leaving less than 500Gt CO2 of the remaining carbon budget to stay below the recommended limit of 1.5 C of warming. When it comes to climate justice debates, the party responsible for using up this historic carbon budget and causing the current warming of 1.2 C to become a central issue. Analysis of historic emissions shows that the United States (US) has created the most at %20 of the world's emissions, followed by China (%11), Russia (%7), Brazil (%5), Indonesia (%4), Germany (%4), India (%4) and then the UK (%3). Contrast this to current emissions which are dominated by China (%28) and the US (%15). However, a closer observation of the emissions shows that the US, with a population that is a quarter of China's, has released almost twice as much carbon. When we look at this proportionately, we can see that the average US citizen has benefited from 5½ times their share while the average Chinese citizen has benefited from less than ⅔ of their share and those on the subcontinent have only benefited from %10. Over the past 200 years, industrialized nations have taken advantage of fossil fuel developments to transform the quality of life for their citizens, and now countries like China, India, and those in the Global South claim the right to access similar standards. To achieve the justice needed while cutting global greenhouse gas (GHG) emissions, it is crucial to acknowledge the historic legacy of countries that have been polluting the atmosphere for hundreds of years. Countries like Canada, America, Russia, Australia, and the United Kingdom (the five largest polluters per capita) must take responsibility for their historic emissions and do their part to influence decarbonization in developing countries whose major economic source is the burning of fossil fuels. These efforts would require a commensurate investment that enables growing economies to transition to green energy infrastructure.

In 2009, at the 15th Conference of the Parties (COP15), wealthy countries promised to provide 100$ billion annually in climate funding by 2020 to address the effects of climate change. This funding was intended to provide direct aid to the poorest and least developed countries to move away from fossil fuels and use renewable energy. While this was ratified in 2010, the money was never delivered. Despite the fact that developing nations demanded support for loss and damage at the 26th climate negotiations in Glasgow (COP26), the request was refused by developed countries led by the US and EU, and now the new report suggests that $100 billion may not even be delivered by 2003.

Illustration: Touka Neyestani

The argument on climate finance has been going on for years and it is apparent that adequate financial aid to support poor countries is necessary to make progress toward meeting net-zero targets and building a more just and equitable world. However, as the climate crisis is facing multiple injustices created by our current economic and political systems, the remake of such systems will require a diverse and inclusive coalition that is made up of all groups most affected by this emergency.

We need to recognize structural imbalances and inequalities and tackle the climate crisis by demolishing the evil notion that some lives are more important than others. We cannot win the fight against the climate crisis if we do not address these imbalances and inequalities, and we cannot solve these issues without making fundamental changes in our current political and economic systems. A system change is only possible if individuals engage in civic engagement to keep politicians accountable for promises they make and ensure further demand for more action. It is our collective action that can tilt the power and enact the changes we need.

Shooka Bidarian is Manoto TV's Environment Correspondent and TV Presenter - Climate Reality Leader and Mentor.

The Story of the Sinking Capitals

Nikahang Kowsar

Old Persia was once the land of hydrogeologists who were able to drain a limited amount of groundwater without depleting the aquifers. Many consider the Persian civilization, the Kariz Civilization. Qanat or Kariz is a system for transferring water from an aquifer to the surface through a gently sloped tunnel. Qanat is known to be one of the most sustainable means of transporting water in arid zones, as it limits evaporation.

After World War II and the commencement of Truman's Point 4 Plan, many Iranians were introduced to deep well drilling machines and powerful diesel and electric water pumps. In 1963, the late Shah's land reforms gave many peasants a chance to own land, and through the loans provided by the banks, these new landowners were able to dig wells and purchase water pumps. "The access to various types of water pumps has enabled the farmers to extract groundwater individually. Having access to the pumps, each farmer extracts as much water as he wishes" (Seyed Akbar Mirikhoozani, 1993). Lack of supervision and failure to enforce laws and regulations gradually dried up aquifers in several farming regions.

Before the 1979 Islamic Revolution, there were almost 80,000 wells dug, mostly in farmlands and near cities. Aquifers have been the main source of water for farming, industry, and towns. Though the Shah was enamored with building mega-dams after admiring the Hoover Dam and the Tennessee Valley Authority's achievements, he was also curious about Israeli technologies used to save as much water as possible and avoid wasteful policies and plans. Obtaining digging permits was getting harder for farmers and many Qanats were still active

Efesenko, Adobe Stock

and providing water for everyone.

After 1979 and the rule of the Islamists, Ayatollah Khomeini and his pupils encouraged farmers to produce grains without any regard for the water consumed in the process. Many farmers dug wells and exploited the groundwater resources beyond the equilibrium yield of the aquifer.(film)

Before the mid1980s, there was a balance between drafting and recharge in many plains of the country but since then, over-drafting has killed numerous aquifers and many farmlands and adjacent cities are subsiding.

In spring 2001, I wrote two op-eds criticizing the government for its water policies and for building too many dams without understanding the consequences. The president summoned me to his office three days after his re-election to provide me the opportunity to explain my points. I told him that his administration's concerted efforts toward dam building and water transfer blatantly disrespected Iran's aquifers and ignored the warning signs that will have a very negative impact on the country in the next few decades. Rather than listen to my points, the only thing his government took seriously from my talking points was censoring me.

Isfahan: A city and its heritage are sinking

In 1998, a major and long-lasting drought started and because of overconsumption and also decreasing rain and snow, rivers such as Zayandeh-Rud shrunk. Zayandeh Rud, which originates from Zard Kuh (Yellow mountain)

in the Zagros mountain range, is the most important and strategic river in the central Iranian plateau (Gohari et al, 2013). People settled near this river and the city of Isfahan was born thousands of years ago during the Bronze age because of its proximity to the Zayanedh Rud.

In the past, the usual flow was over 1.4 billion cubic meters (BCM), and out of that 1.4 million cubic meters (MCUM), 650 MCUM was from tributaries and groundwater and the rest was and has been transferred from the Karun basin. The Zayandeh Rud river ends in the Gav Khuni marshes.

There are some facts to consider:

- During the last 2 decades, we have faced both a decrease in rainfall and a decrease in snowfall.

- The average inflow of water to Zayandeh-Rud Dam has decreased by %25 in the last 12 years. Zayandeh Rud has had an average of about 1.100 billion cubic meters of water in the last 10 years.

- In the last 50 years, the area under cultivation in the Zayandeh-Rud catchment has tripled in size, from 66,000 hectares to 208,000 hectares.

- Consumption of drinking water and sanitation has increased from 60 MCUM to 400 million cubic meters (including Isfahan and other cities and townships including Yazd and Kashan).

- Industries draw about 70 MCUM of water from the river and use the rest from wastewater treatment.

- The defined consumption for the Zayandeh River is about 1.5 BCM, while the river has an average of only 1.100 BCM of water.

Isfahan, once the capital of Persia, is now a sinking city. This jewel of central Iran has experienced many droughts through history, but its water managers prior to the last century used its resources wisely and sustainably through the ages to save it for the very generations that are witnessing its destruction.

After World War II, the government's water managers decided to transfer water from one of the Karun river basin's tributaries, the Kuhrang river, to Zayandeh Rud, and later in the 1960s, built a major dam to store water and regulate the river. This excessive amount of water was seen as a sign of wealth at the time. The area primarily used for agriculture in the Zayandeh Rud basin expanded, resulting in many farmers beginning to cultivate rice and wheat. The government inaugurated Iran's first steel plant in the arid central Iranian plateau, only relying on the flow of Zayandeh Rud that was receiving a constant doping shot from Karun.

After the 1979 Islamic Revolution, a second steel plant that was initially supposed to be built near the Persian Gulf was established near Isfahan, stealing more water from the basin.

After the drought struck in the late 1990s, farmers who did not want to change the routine began digging more wells and extracting greater amounts of water, creating an imbalance between the aquifer and the river and resulting in signs of land subsidence.

Farmers in Isfahan have withdrawn almost half of the initial 7 BCM of water from the aquifer through 3,600 active wells in the town itself and 5,421 wells in the Isfahan-Borkhar plain. It is believed that under today's regime of over-extraction, the aquifer will die in 15-9 years.

Reza Eslami, the head of Iran's Geologic Survey in the Isfahan province says that the continuation of this situation and the exploitation of groundwater will damage more than 6,000 historical structures, including old mosques and bridges in the city of Isfahan.

In the last decade, residents of several housing projects and new towns have been forced to leave their homes, due to safety concerns after major cracks appeared in the buildings and the land subsided beneath them. Many fissures have appeared around the city and even reached the tarmac of the airport.(photo-film)

The North-South railway crosses over some of these fissures and experts have warned the local and national officials of the risks. The bedrock beneath the Isfahan aquifer is not very deep. Subsidence varies from a few millimeters near the mountains to 18 centimeters per year in the middle of the Isfahan-Borkhar plain. If at one time the limited rain and Zayandeh Rud could make up for the aquifer's shortcomings, the drying of the river for most of the year would not give any hope of feeding the dying aquifer.

Tehran is sinking

In 2019, Mahdi Motagh and Mahmud Haghshenas published a paper indicating that using Interferometric Synthetic Aperture Radar (InSAR) time series analysis of Tehran using different SAR data between 2003 and 2017 there were three distinct subsidence features in Tehran with rates exceeding 25 centimeters per year (cm/yr) in the western Tehran Plain, approximately 5 cm/yr in the immediate vicinity of Tehran International Airport, and 22 cm/yr in the Varamin Plain to the southeast of Tehran. Tehran is a megacity located south of the Tochal mountains with inadequate infrastructure built over a major alluvial fan. For thousands of years, smaller towns and villages, including Rey, relied on a number of streams and Qanats. When the Qajar dynasty chose this part of the country as the capital in the 1800s, many moved to the new center of the Persian civilization.

The radical development of the city started after the downfall of the Qajars, and the new king had high hopes to turn Tehran into a modern capital. Between the 1960s and 1980s, various land developers and housebuilders began building settlements and suburbs without considering the soil resistance of alluvial fans and qanats. After the Iran-Iraq war, many skyscrapers appeared all around the city, after warnings made to the municipal government by a few people regarding the city's vulnerability to major faults. Seismologists are now awaiting the return of a large earthquake, and according to estimates, the death toll from this earthquake may exceed 100,000 people.

Although civil engineers were concerned about the buildings› resistance to sudden shocks of earthquakes, they paid no attention to land subsidence, which has now turned into a silent earthquake. Cracks have appeared in many townhouses and condominiums in southern parts of Iran as well as the suburbs of Tehran, and sinkholes have emerged in various parts of the country. Parts of Tehran are sinking with a record of 25 cm/yr, close to what we have seen in Corcoran, California. To add insult to injury, cracked buildings and weakened structures caused by subsidence will have very little resistance to the large-scale earthquake that awaits them, and this will significantly increase Tehran›s risk of destruction.

Gary Sick, one of the members of the national security council under Presidents Ford, Carter, and Reagan and an expert on Iran's politics, once told me that the effect of a major earthquake is beyond a coup d› tat against the Islamic Republic. I believe his statement to be true, especially because the regime has not treated water, the planet's most precious gift, with care.

This article was presented as a video to the Rosenberg International Forum on Water Policy.

The Budding Collaborative Communal, Civil Society, and Academic Water Governance Networks in Iran

Water Governance, Environmental Justice, and Sustainability in Iran

Shahram Kholdi

The end of the Iran-Iraq war, shortly ensued by the death of the Islamic Republic's leader and founder, Ayatollah Khomeini, ushered in an era that was dubbed "Sazandegi," or reconstruction. The new Islamic Republic leader, ex-President Ayatollah Khamenei, who had spent the last years of his presidency largely on the war front, ostensibly left the critical matter of post-War reconstruction to the ex-Parliament Speaker and new president Rafsanjani. His vision of reconstruction did nonetheless ensure that the Supreme Leader Khamenei's most trusted and favorite armed force in Iran, namely, the Islamic Revolutionary Guards Corps (IRGC), received the lion's share of state "reconstruction" project contracts, i.e. dam-building projects. The1990-2010 period saw IRGC engineering corporations become Iran's chief contractor in dam building peppering the geological and hydrological topography of the Iranian plateau with dams of various mantle sizes and reservoir volumes. By the early 2010s, the dams proved to be the primary source of a nationwide water shortage as well as the overall state of environmental injustice in Iran. In short, the dams became yet another symbol of a state maligned by widespread kleptocracy and corruption under whose dry spell millions of Iranian farmers suffered from mass salinization of downstream lands and a great many others became drought-induced displaced persons who were thrust into the ever-expanding shanty-towns and impoverished suburbs of major urban centers. Beyond being a symbol of greed and corruption, the dams also became a symbol of the state establishment's outrageous disregard for the science of water management in the country in the academic community. Military-clerical centralism and an outdated dominant perception of development

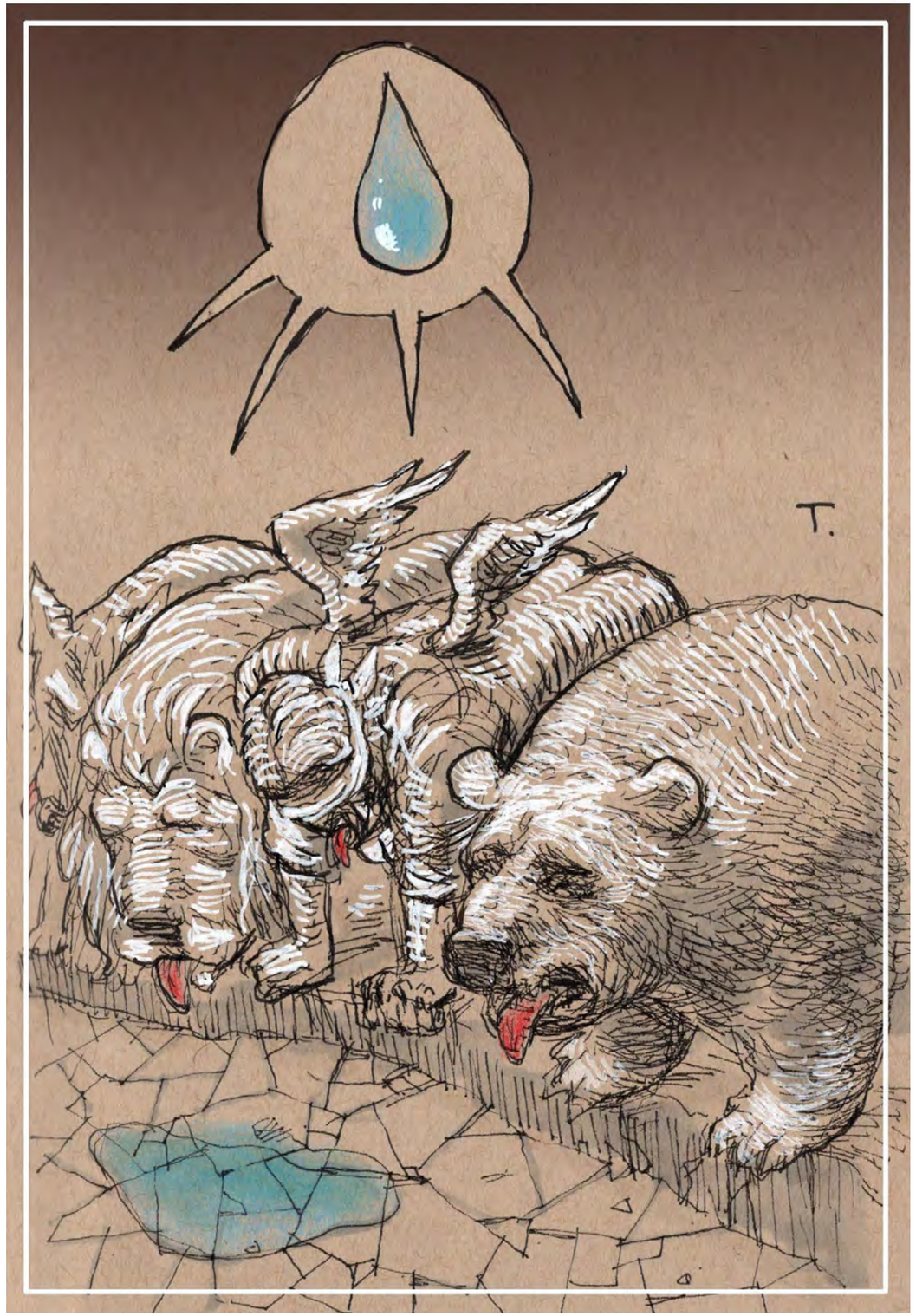


Illustration: Touka Neyestani

Illustration: Assad Binakhahi

were at the core of the administration of this grave environmental injustice. By casting aside scientifically supportable traditions of local water governance, the state is now facing chronic farmers' riots caused by the construction of Gotvand Dam and Koohrang water canal in Khuzestan and Isfahan province.

Against the backdrop of a drought largely induced by the dam-building racket, quite a few communities that were hardest hit are now the various nexuses of the resurgence of communal water governance models, including the historically tried and tested models that were long disrupted by "reconstruction era development models". The resurgence is nonetheless a hybrid by-product of many collaborative joint civil society and academic ventures that are countering the unholy alliance of the state's military-security patrons and the aggressive state dam-building rackets in a David-versus-Goliath struggle. Over the past fifteen years, a new firebrand environmental journalist community in Iran has emerged that has provided a voice to all affected communities by disseminating the expert testimony of geologists, water engineers, publicly available archival data, and peer-reviewed scientific sources. The Iranian civil society's response is certainly comparable to similar endeavors in the developing world from South Asia and Africa to Latin America.

Though one cannot be overly optimistic about the emerging water governance models, collaboration between university academics and water management engineers and local civil society/grassroots can go beyond the herculean task of building sustainable water governance; an effort that seeks to arrive at innovative solutions to lessen the damage done by the aggressive dam building. The emergent water governance networks in Iran have now become multifaceted heuristic networks that not only offer solutions and innovations that are communally viable and locally sustainable but seek to use the available, albeit highly unreliable, legal advocacy methods to halt further dam building and build up new environmentally just and scientifically sustainable and renewable infrastructure.

Shahram Kholdi is a Historian and a Sessional Lecturer at the University of Waterloo, Canada.

Information Exchange and Distribution of Stakeholder's Influence in National Water Governance Policy Networks: A Case Study of Iran's Water Governance System

Behshad Mohajer

The exchange of information and resources implements water policies through a network of actors and institutional rules. Due to the rapid change in physical systems, such as hydrological system processes or socio-economic and political settings, the structures and distribution of authority may also deviate from an ideal state. Characterization of this network is of great importance for identifying influential actors and their adaptation to change induced by external drivers. This understanding will contribute to the design of sustainable and resilient water policy networks. This study investigates the main stakeholders and social processes controlling a water policy network.

Characterizing the system's structure, agents, roles, and connections is crucial to understanding the social dynamics of complex human-water systems. Categorization of stakeholders provides valuable insights into infrastructure operation and resource allocation when dealing with complex socio-hydrological systems. We propose a multi-method approach to first synthesize the available frameworks of national water governance of Iran and then adapt the framework plus social network analysis to characterize influential stakeholders and their dynamic feedback system conceptually. Data from multiple sources will be utilized to map stylized governance systems. The proposed quantitative and qualitative analyses aim to investigate the main stakeholders and social processes controlling the performance of a water policy network at a national level. We will apply our proposed approach to Iran›s water governance network.

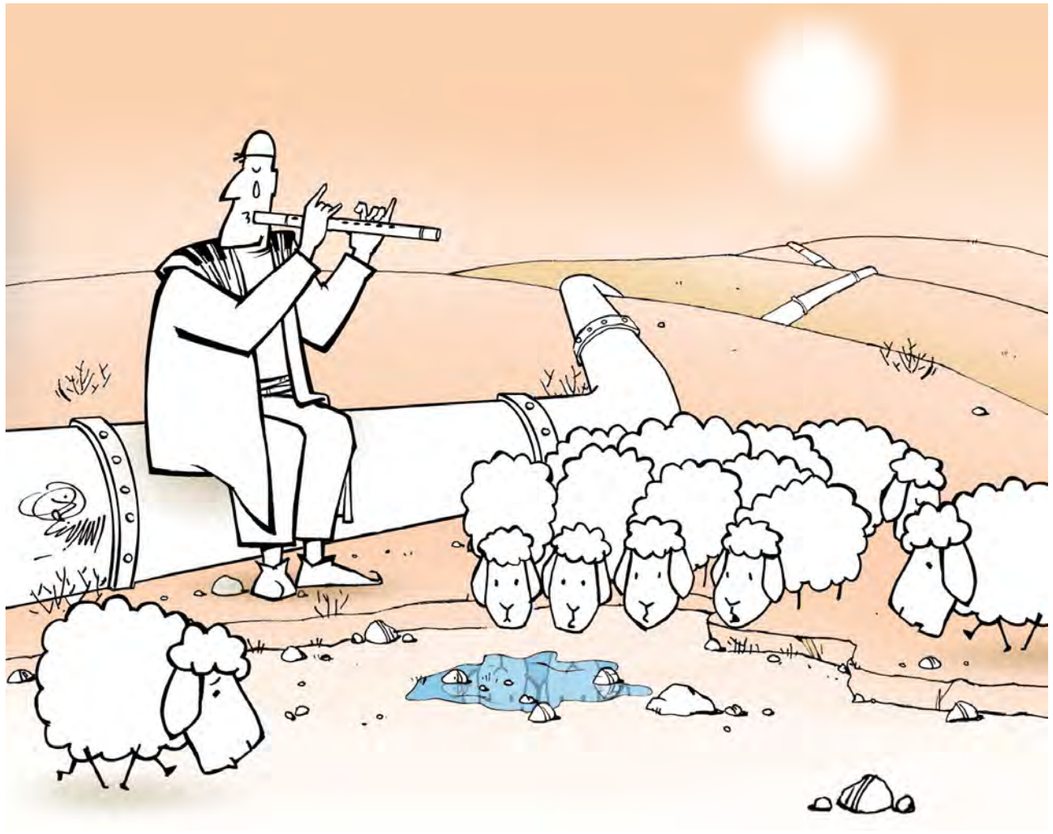


Illustration: Assad Binakhahi

We anticipate that the proposed analysis highlights the crucial barriers and constraints in implementing sustainable water policies and can be used in developing collaborative human-water models to investigate system adaptation to water scarcity. The learnings from the proposed stylized model are also beneficial to characterizing the dynamic feedback system of stakeholders at the national levels. This process will contribute to cross-case comparison in studying the political economy of water in various climatic and socio-economic settings.

Behshad Mohajer is a Water Systems Policy and Analysis Researcher in Arizona, USA.

Illustration: Nikahang Kowsar

Water Resources and Environmental Justice in Developing Countries, Iran

Ehsan Danshvar

The words justice, environment, and water resources are individually popular in Iran, but if we combine them to create environmental justice for water resources, do we still get the same attention? Is this combination of everyday words used by researchers and professors in the fields of environment and water resources?

The majority of Iran is classified as arid and semiarid climates, and along with other Middle Eastern countries, the most water shortage problem is seen in this region. The Middle East is home to %3.6 of the world›s population but has access to only %1.4of the world›s renewable freshwater. This means droughts reduce access to safe water and increase food insecurity, growing poverty, and the loss of inhabitants. An increase of salinity in water resources is the direct effect of drought where corrupted countries with insufficient infrastructures and poor management of water and agriculture ultimately experience environmental inequality.

Two groundwater studies on the Karun and Karkheh catchments found that the salinity of groundwater in all the plains within these two catchments after the construction of the main dams has increased over time. The main reason is the reduction of water flow in the Karun and Karkheh rivers downstream of dams. Now, if we are in a period of drought due to lack of rainfall, water flow upstream of dams will be greatly reduced and the possibility of storing water behind the dam and releasing downstream streams will be increasingly disrupted.

The construction of large dams and lack of proper management of water resources destroys the water quality of groundwater and surface waters. This has, in turn, brought damage to urban and rural residents who are

living in the region and their agriculture and livestock. At the same time, residents of other parts of the country, without paying direct costs, benefit from the development plans of these dams and the irrigation and electricity networks. This example also applies to the presence of steel, petrochemical, and refinery industries and oil and gas transport lines, as people living close to these plants experience greater pollution levels in soil, air, and water than those living farther away. Therefore, these residents are more susceptible to various pollution-related diseases, while individuals living farther away benefit from the presence of these plants without being directly exposed to environmental damage to the water sources they use. To gain an understanding of the impact of pollution on communities of lower socioeconomic status, the United Nations and several academic institutions have conducted research on children in the suburbs of developing countries. The results revealed that the rate of lack of learning and academic failure in children aged 12-7 years, and growth disorders in children aged 7-3 years are directly related to increased salinity of drinking water.

Water tensions continue to increase, impacting poverty rates and social inequality which will result in more severe discrimination in access to water resources. These water tensions are a consequence of mismanagement, lack of effective planning on sustainable development, lack of planning to increase resilience, and adaptation of communities to mitigate the risks of climate change impact, especially in the eastern, southern, and southwestern regions of the country. There is a clear link between poor management in environmental activities with unrest and ethnic tensions in communities that do not have adequate water.

Ehsan Daneshvar is the director of Future GeoScience and a senior lecturer at the University of Marine Science and Technology.

Illustration: Assad Binakhahi

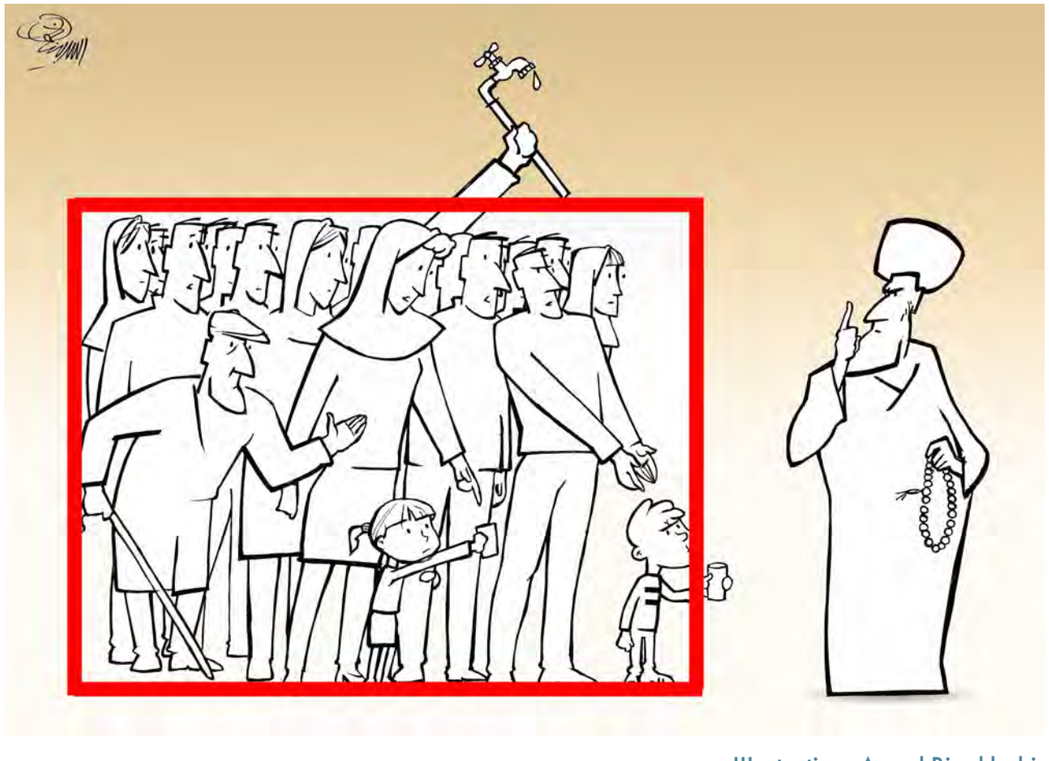
Water Crisis in Urban Iran: Critical Geography Meets Critical Pedagogy

Behrang Foroughi

In Iran, the water crisis is alarming. In the last 10 years, drought and mismanagement of water resources exacerbated by adverse effects of climate have been feeding dissatisfaction with Iran's government, sparking deadly protests throughout the country. There is a mounting disillusionment with the national government and its political efficacy to address the water crisis.

There is a significant divide between communities and local government where most immediate water demands are met. It is a crisis of legitimacy, a lack of responsiveness and trust in the institutions that govern water resources and distribution as it affects people's livelihoods. Top-down interventions and decision-making have proven not just wrong but destructive.

It is time to bring water decision-making closer to the everyday life of people, where they can participate in the deliberations over how water resources should be managed and water crises should be governed. Achieving inclusive local participation for responsive water governance demands a Community Development (CD) framework. CD, a dynamic concept with an expanded toolbox and international stories, can guide practitioners to engage with local communities and enable multistakeholder participation effectively. CD fosters a sense of collective agency– a shared expectation and organizational capacity for social action –within groups of people invited to or claiming a social space, making transparent decisions regarding the water resources affecting their livelihoods.



IIlustration: Assad Binakhahi

Critical to this is the right of every stakeholder to voice their concerns and interests, but more importantly, to participate in the deliberations, the decision-making, and the monitoring and evaluation of would be proposed actions. Also critical is the awareness that participation is a spatial practice. Hence, we should be mindful of the visible, hidden, and invisible forms of power governing such spaces. Taking water decisions closer to where people live and having them participate in those decisions make the process both transparent and effective while also developing aware and engaged conscious citizens.

Drawing from Iran's own historical experiences of community-based water management along with the lessons learned from best practices of water management in global contemporary cities, the proposed framework will generate a repertoire of community-based approaches, tools, training materials, and case studies to inform the planning, monitoring, and evaluation of inclusive and locally responsive water management in urban Iran. Should the Iranian government choose to put the long-term interests of the nation as their main priority there is still hope to turn the page and open spaces of deliberation and collaboration to improve water governance in both rural and urban areas.

Behrang Foroughi is a Learning and Development Consultant, based in Toronto, Canada.

Unstable Agriculture does not Result in Stability

Mansour Sohrabi

Unbalanced agricultural development in Iran has led to wastage of water resources, groundwater depletion, land subsidence, soil erosion, rangelands use change, wetlands drying up, desertification, and rural migration. Continuation of this process will create many problems for Iran's environment and natural resources.

For years, Iran's development plans based on food security in Iran were misinterpreted as self-sufficiency in agriculture. Improper agricultural development policies in Iran led to an increase in the area under cultivation and a change in the use of rangeland lands. This change of land use from rangeland to rainfed and from rainfed to irrigated has resulted in irreparable damage to water resources. Continuation of this process will create many problems for the environment and natural resources of Jran. The purpose of this article is to investiaate the effects of conventional agriculture in Iran on soil and water resources.

Despite of this, a few questions should be answered:

1 - What are the factors causing the crisis in Iranian agriculture?

2 - Is the policy of self-sufficiency in Iranian agriculture the right policy?

3 - Is there a way out of this crisis?

4 - Is there a possibility of sustainable agriculture in Iran?

According to the Ministry of Energy, the agricultural sector has harvested more than %90 of the country's water consumption, almost 86BCM per year with a water use efficiency of %38. Most agricultural products in Iran result from uncontrolled harvesting of water resources and remain unstable.

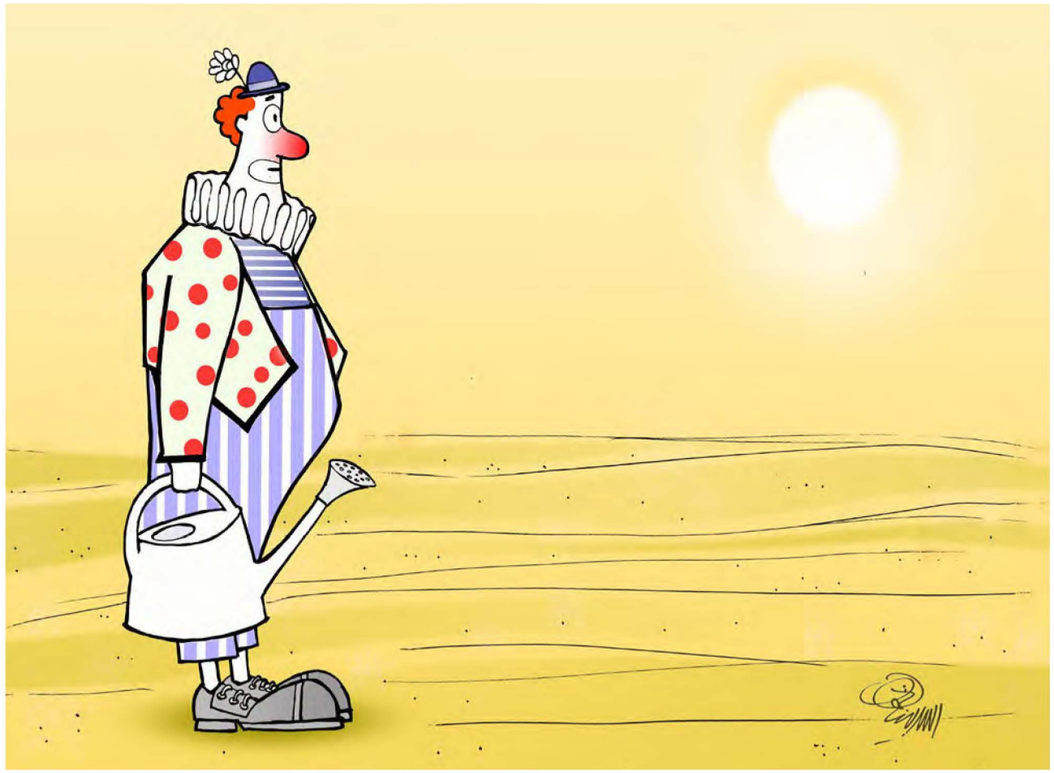


Illustration: Assad Binakhahi

Iran annually produces about 110 million tons of crops and horticulture, of which more than %30 is wasted. More than %90 of Iran's agricultural production is obtained through irrigated agriculture while the global average is about %20.

Irregular water abstraction in the agricultural sector has led to significant food insecurity. It has also caused many environmental problems, including groundwater depletion, landslides, land subsidence, soil erosion, Rangelands use change, wetlands drying up, desertification, and rural migration. Continuation of this process will create many problems for the environment and natural resources of Iran. There is even the possibility of conflict between different provinces, cities, and villages in the future. Given that different ethnicities live in Iran, this can widen the gap between ethnicities.

Studies show that Iran's water and soil resources are facing a new threat and there is a possibility of desertification in most parts of Iran. If Iran's agricultural policies and programs do not change, there is a possibility of widespread migration from most parts of Iran.

Mansour Sohrabi is an Agroecologist and researcher based in Kiel, Germany.

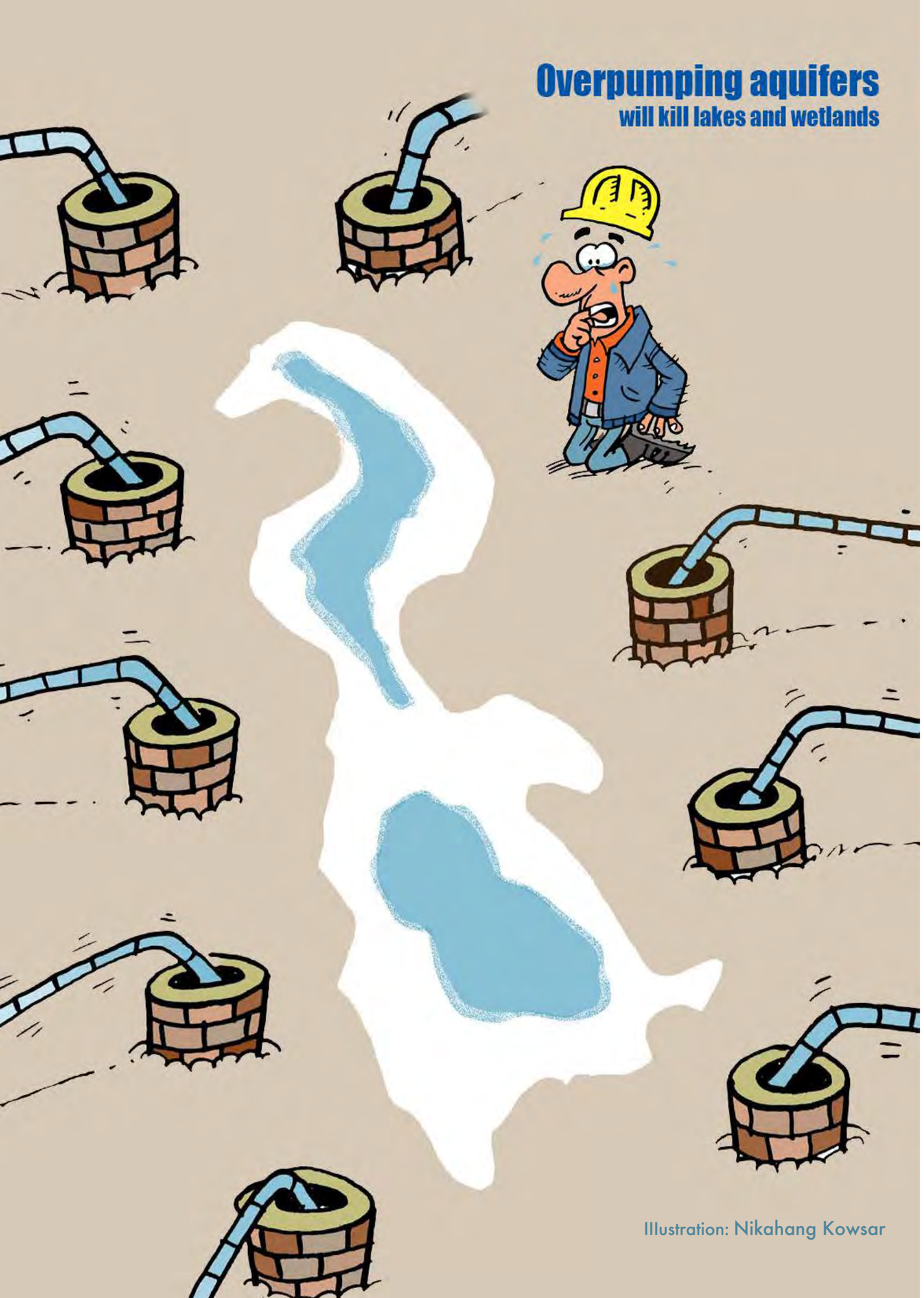


Illustration: Nikahang Kowsar

Illustration: Assad Binakhahi

Illustration: Assad Binakhahi

Sayyed Ahang Kowsar: “Iran is facing a serious water crisis, and after that, we would face a food crisis. The reason for this dire situation is the shortage of water all around. Iran is in a very dry zone of the earth and we receive about one-third of the average world precipitation, therefore we have to be concerned with the amount and timing of the water we receive, as about 60% of our water needs aresupplied from underground, we have to manage our aquifers very carefully.

Aquifer management is the art and science of managing aquifers from the furthest part of watersheds to where they terminate in a lake, a lagoon, a playa, or the sea. We have a lot of floods that cause damage on the way to these terminal areas, therefore we have to do something to manage our floodwater. The easiest way which brings us multi-benefits is to recharge our aquifers.

In Iran, we have more than 14 million hectares of very good land for aquifer management and we have enough floodwater on average years to supply some 42 cubic kilometers of water to these aquifers. In the past 60 to 70 years, we have overexploited our aquifers to the tune of on average 7-8 cubic kilometers per year, therefore we need to replenish this water.

If we continue using this much groundwater, we are going to end up with dry aquifers and mass death of our people because even now, we have water shortage in hundreds of villages. In the old days, they used to be supplied by Qanat, but most of them have been dried out, due to the overexploitation by powerful pumps.”

Professor Sayyed Ahang Kowsar is a Senior Research Scientist at the Fars Research Center for Agriculture and Natural Resources, Shiraz, Iran