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UNIVERSAL ACCESS TO DRINKING WATER: FROM NATIONAL RESPONSIBILITY TO INTERNATIONAL SOLIDARITY

Arevik K. Harutyunyan

Institute of Water Problems and Hydro-Engineering

Named After I.V. Yeghiazarov

125/3 Armenakyan St., 0011, Yerevan

e-mail: arevikkamoyevna@gmail.com

ORCID iD: 0009-0006-1554-5267

Republic of Armenia

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Abstract

The Access to drinking water is increasingly recognized as one of the most important global development challenges of the twenty-first century. Although the human right to drinking water has been formally recognized by the international community, significant inequalities in drinking water accessibility continue to exist across countries and regions. Climate change, uneven distribution of freshwater resources, infrastructure limitations, financial constraints, and demographic pressures are further increasing the complexity of this challenge. This study examines the limitations of the traditional national-responsibility model for ensuring universal access to drinking water and explores the need for broader international cooperation mechanisms. Particular attention is given to the South Caucasus region and Armenia as examples of territories where long-term drinking water accessibility may be affected by environmental, infrastructural, and climatic factors. The strategic role of Lake Sevan as a potential long-term freshwater reserve is also discussed. Based on the analysis, the study proposes a new conceptual framework, the Global Drinking Water Accessibility Principle (GDWAP), which seeks to integrate national responsibility with international solidarity. The proposed principle is founded on five core pillars: sustainable water resource development, drinking water conservation and efficiency, technology transfer and knowledge sharing, international financial solidarity, and shared responsibility for universal access to drinking water. The study argues that future water policies should increasingly emphasize cooperation, long-term resource preservation, and coordinated international support mechanisms in order to improve drinking water accessibility and strengthen global water resilience.

Keywords: drinking water accessibility; water security; international solidarity; GDWAP; water governance; Lake Sevan; South Caucasus; sustainable development.

Introduction

Access to safe and sufficient drinking water is increasingly recognized as one of the most fundamental prerequisites for human well-being, public health, and sustainable development. Although water has traditionally been regarded as a natural resource and an economic good, its role extends far beyond purely economic considerations. Access to drinking

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water directly affects human survival, health, food security, education, economic productivity, and social stability [1,2]. The recognition of water as a fundamental human right represents one of the most significant developments in international water policy during the twenty-first century. In 2010, the United Nations General Assembly explicitly recognized the human right to safe and clean drinking water and sanitation, affirming that access to sufficient, safe, acceptable, physically accessible, and affordable water is essential for the full enjoyment of life and all human rights [3]. This position was subsequently reinforced through various international frameworks, including the Sustainable Development Goals (SDGs), particularly Goal 6, which seeks to ensure the availability and sustainable management of water and sanitation for all by 2030 [4].

Despite substantial progress in water infrastructure development, access to drinking water remains highly unequal across the world. According to recent international assessments, billions of people continue to experience periodic or permanent limitations in access to safely managed drinking water services [5]. These disparities are particularly pronounced in low-income countries, arid and semi-arid regions, small island states, and areas affected by conflict, climate change, or weak institutional capacity [6].

The growing gap between water demand and available freshwater resources has transformed drinking water from a local service-delivery issue into a matter of global concern. Climate change, population growth, urbanization, pollution, and increasing competition among water users are intensifying pressures on freshwater systems worldwide [7,8]. Consequently, ensuring universal access to drinking water can no longer be viewed solely as a national responsibility but increasingly requires international cooperation and collective action.

From this perspective, access to drinking water should be considered not only a technical or economic challenge but also an ethical, social, and global development imperative. The principle that every individual should have reliable access to sufficient drinking water regardless of geographical location or economic circumstances provides an important foundation for rethinking existing approaches to water governance and international cooperation.

Global Inequality in Access to Drinking Water

Despite the recognition of access to drinking water as a fundamental human right, the availability of safe and reliable drinking water remains highly uneven across the world. Significant disparities exist not only between developed and developing countries but also among regions within the same country. These inequalities are influenced by climatic conditions, geographical location, economic capacity, institutional effectiveness, infrastructure development, and political stability [9,10].

Sub-Saharan Africa remains one of the regions most affected by inadequate access to drinking water. Millions of people continue to rely on unimproved water sources, while rapid population growth and climate variability further increase pressure on already limited water resources [11]. Similar challenges are observed in parts of the Middle East and North Africa, where extremely low renewable water availability has led to chronic water scarcity and increasing dependence on desalination and water imports [12].

In Central Asia, growing competition among agricultural, industrial, and domestic water users has intensified concerns regarding long-term water availability. Transboundary river systems,

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aging infrastructure, and climate-related reductions in glacier resources are expected to increase future water stress throughout the region [13].

Small island developing states face additional challenges associated with limited freshwater resources, saltwater intrusion, and vulnerability to extreme weather events. Many such countries depend heavily on rainfall harvesting, groundwater abstraction, or costly desalination technologies to satisfy drinking water demand [14].

Recent global assessments indicate that water scarcity is no longer confined to traditionally arid regions. Climate change, population growth, urbanization, pollution, and increasing water demand are contributing to growing water stress in many parts of the world, including regions previously considered relatively water-secure [8,15].

These findings demonstrate that access to drinking water is influenced not only by natural resource availability but also by economic, technological, and institutional capacities. Consequently, the persistence of large disparities in drinking water access raises important questions regarding the adequacy of existing governance mechanisms and the distribution of responsibilities for ensuring universal access to drinking water.

Limitations of the National Responsibility Model

The prevailing approach to drinking water governance is largely based on the principle of national responsibility. Under this model, individual states are expected to develop, finance, operate, and maintain the infrastructure necessary to provide their populations with adequate drinking water services. While this approach has achieved significant successes in many countries, it also exhibits important limitations when applied to regions facing severe water scarcity, limited financial resources, or unfavorable geographical conditions [16,17].

The distribution of freshwater resources across the world is highly uneven. Some countries possess abundant renewable water resources that significantly exceed domestic demand, whereas others face chronic water deficits resulting from climatic, hydrological, and geographical constraints [18]. Consequently, the ability of governments to ensure universal access to drinking water is often influenced not only by political commitment and institutional effectiveness but also by factors beyond their direct control.

Economic disparities further complicate the situation. The construction of reservoirs, water-transfer systems, desalination facilities, treatment plants, and distribution networks often requires substantial capital investments that exceed the financial capacities of many low-income countries [19]. As a result, populations living in water-deficient regions may experience persistent limitations in access to drinking water despite the existence of internationally recognized human rights obligations.

Climate change introduces an additional layer of uncertainty. Increasing drought frequency, declining snow and glacier resources, changing precipitation patterns, and growing competition among water users are expected to intensify water stress in many regions during the coming decades [20]. Under such conditions, reliance exclusively on national resources and national financing mechanisms may prove insufficient for ensuring universal access to drinking water.

These considerations suggest that the traditional national-responsibility model, while necessary, may no longer be sufficient as the sole framework for ensuring universal access to drinking water. As water scarcity increasingly becomes a global challenge, greater international

cooperation and shared responsibility mechanisms may be required to complement national efforts.

From National Responsibility to International Solidarity

The recognition of access to drinking water as a fundamental human right raises an important question regarding the distribution of responsibilities for ensuring that right. While national governments remain the primary actors responsible for providing drinking water services to their populations, the growing scale and complexity of global water challenges suggest that exclusive reliance on national efforts may no longer be sufficient in all circumstances [21,22].

The availability of drinking water is influenced by factors that frequently extend beyond national boundaries. Climate change, transboundary river systems, regional droughts, migration, economic inequalities, and technological disparities increasingly shape the capacity of countries to secure reliable water supplies for their populations [23]. Consequently, access to drinking water should not be viewed solely as a domestic policy issue but also as a matter of international concern.

The concept of international solidarity has already been applied in various fields of global development, including public health, food security, disaster response, and climate adaptation [24]. Similar principles may be relevant for addressing growing inequalities in access to drinking water. Under such an approach, countries possessing greater financial, technological, and institutional capacities could contribute to improving drinking water access in water-deficient regions through investment, technology transfer, capacity building, and infrastructure support.

Importantly, international solidarity does not imply replacing national responsibility. Rather, it represents a complementary mechanism designed to assist countries facing structural constraints that cannot be overcome solely through domestic efforts. In this context, the objective is not the redistribution of water resources themselves, but the strengthening of global capacities to ensure universal access to drinking water.

Based on the above considerations, this study proposes a new conceptual framework, termed the **Global Drinking Water Accessibility Principle (GDWAP)**, aimed at strengthening universal access to drinking water through the integration of national responsibility and international solidarity mechanisms.

Conflict Setting

Despite the international recognition of access to drinking water as a fundamental human right, hundreds of millions of people continue to experience inadequate or unreliable access to drinking water. At the same time, the natural distribution of freshwater resources, financial capacities, technological capabilities, and institutional effectiveness remain highly uneven across countries and regions. As a result, the ability to ensure universal access to drinking water is often determined not only by national efforts but also by factors beyond the control of individual states.

This situation creates a fundamental contradiction between the universal nature of the right to drinking water and the predominantly national mechanisms currently responsible for its implementation. The present study addresses this contradiction by exploring whether the traditional national-responsibility model remains sufficient under conditions of increasing

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global water stress and by proposing a conceptual framework based on international solidarity and shared responsibility for improving universal access to drinking water.

Research Results

Drinking Water Accessibility Challenges in the South Caucasus

The South Caucasus is characterized by significant geographical, climatic, and hydrological diversity. Although the region possesses considerable freshwater resources compared with many arid parts of the world, access to reliable drinking water remains uneven across countries and communities. The growing impacts of climate change, demographic pressures, and infrastructure limitations increasingly challenge the long-term sustainability of drinking water supply systems throughout the region.

Mountainous regions generally receive higher levels of precipitation and generate most of the surface runoff, while many lowland and densely populated areas depend on complex water-supply systems and long-distance water transfers. Consequently, the physical presence of water resources does not always guarantee reliable access to drinking water for local populations, particularly during dry periods and years characterized by hydrological extremes.

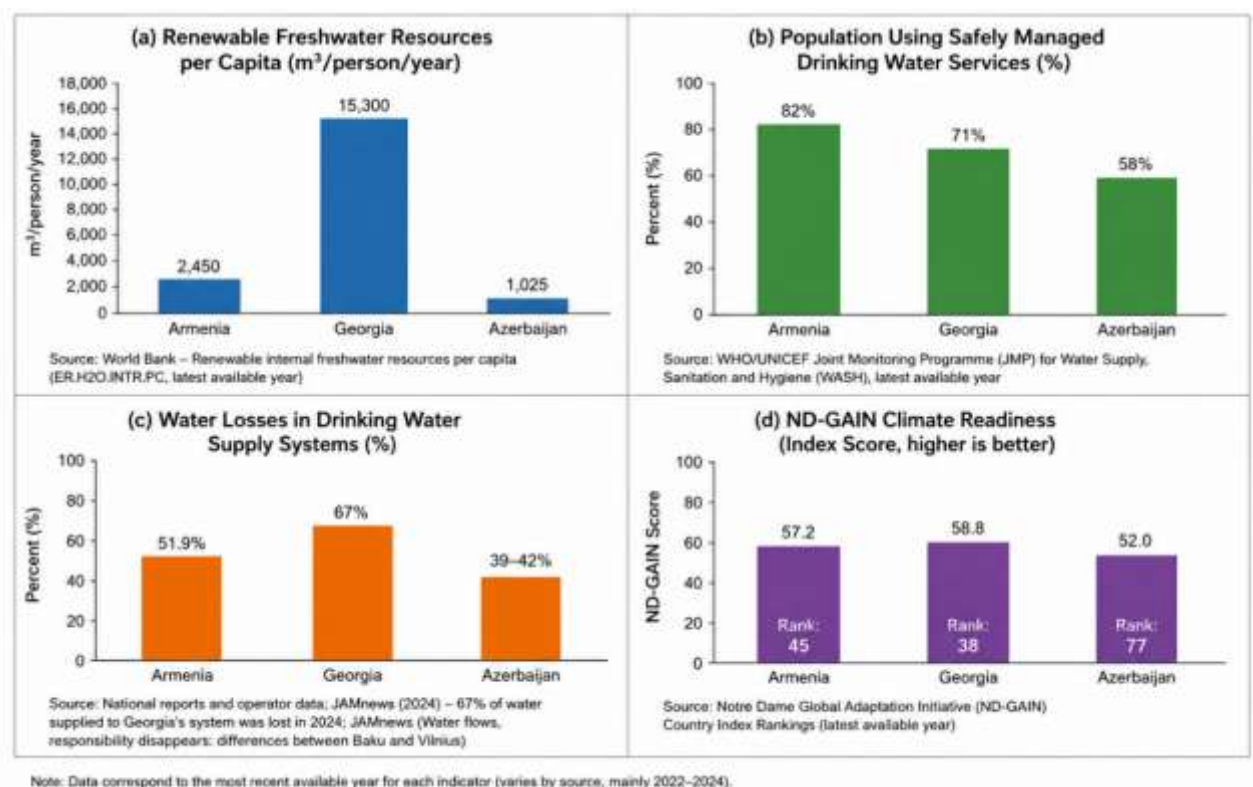


Fig 1. Comparative Indicators of Drinking Water Accessibility in the South Caucasus

Climate change is expected to become one of the most significant drivers of future drinking water challenges in the South Caucasus. Rising temperatures, changing precipitation patterns, increasing drought frequency, and the gradual reduction of snow and glacier resources may alter the hydrological regimes of many river basins. These processes are likely to increase seasonal variability in water availability and reduce the reliability of traditional drinking water sources in several parts of the region.

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In addition to natural and climatic factors, the region faces significant infrastructure-related challenges. Many water-supply systems were constructed decades ago and now operate with varying degrees of physical deterioration. Water losses, insufficient investment in maintenance and modernization, and limited financial resources in certain areas reduce the overall efficiency of drinking water supply systems and increase vulnerability to future water shortages.

Another important challenge arises from the transboundary nature of many water resources within the South Caucasus. Major rivers and watersheds frequently cross national borders, creating interdependencies among countries and increasing the importance of regional cooperation in water-resource management. Under conditions of growing water demand and climate uncertainty, effective coordination among neighboring countries may become increasingly important for maintaining long-term drinking water accessibility and regional water stability.

Taken together, these factors demonstrate that future drinking water accessibility in the South Caucasus cannot be evaluated solely on the basis of available water volumes. Equal attention must be given to climate resilience, infrastructure reliability, water-management efficiency, and long-term strategic planning. Consequently, the region provides an important example of how drinking water accessibility is increasingly becoming a multidimensional challenge that requires integrated solutions extending beyond traditional water-resource assessments.

The Fig. 1 illustrates substantial differences in renewable freshwater resource availability among the South Caucasus countries. Georgia possesses significantly higher per-capita freshwater resources than Armenia and Azerbaijan, highlighting the unequal natural distribution of water resources within the region.

The comparison reveals that water availability alone does not determine drinking water accessibility. Georgia possesses the highest renewable freshwater resources per capita in the region, yet experiences the highest water losses and does not demonstrate the highest level of safely managed drinking water services. Conversely, Armenia achieves the highest drinking water accessibility despite significantly lower per-capita water resources. These findings indicate that infrastructure performance and management efficiency play a critical role in determining actual drinking water accessibility.

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Armenia as a Case of Emerging Drinking Water Accessibility Challenges

Armenia is often regarded as a country relatively rich in freshwater resources due to its extensive river network, numerous springs, groundwater reserves, and the presence of Lake Sevan, one of the largest high-mountain freshwater lakes in the world. Nevertheless, the availability of water resources at the national scale does not automatically guarantee equal and reliable access to drinking water across all regions of the country. Significant differences in

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geographical conditions, settlement patterns, infrastructure quality, and local water availability continue to influence drinking water accessibility in many communities.

At the same time, Armenia faces a number of challenges that may affect the long-term sustainability of drinking water supply. Population decline in some rural areas, continued migration toward urban centers, aging infrastructure, and increasing climate variability create new pressures on existing water-management systems. In addition, the unequal spatial distribution of water resources means that certain communities experience periodic difficulties in securing reliable drinking water supplies despite the country's overall water-resource potential.

Water losses within drinking water supply systems remain another important concern. Although considerable improvements have been achieved in recent decades, physical losses, leakage from aging networks, and operational inefficiencies continue to reduce the effective availability of drinking water in certain areas. Consequently, improving infrastructure performance may in some cases provide benefits comparable to the development of new water sources, while requiring significantly lower environmental impacts and financial investments.

Climate change introduces an additional dimension of uncertainty for the future of drinking water accessibility in Armenia. Rising temperatures, changes in precipitation patterns, increasing evaporation rates, and potential reductions in snow accumulation may alter the seasonal distribution of water resources. Under such conditions, ensuring long-term drinking water accessibility will increasingly depend not only on the availability of water resources but also on the capacity to store, manage, and utilize those resources efficiently and sustainably.

These circumstances highlight the importance of adopting a long-term strategic perspective toward drinking water security in Armenia. Rather than focusing exclusively on current water demand, future planning should consider the potential impacts of climate change, demographic shifts, infrastructure aging, and increasing variability in water availability. In this context, the protection and sustainable management of strategic water reserves become increasingly important components of national water policy.

Lake Sevan as a Strategic Drinking Water Reserve for the Future

Lake Sevan occupies a unique position within the water-resource system of Armenia and the South Caucasus. As one of the largest high-mountain freshwater lakes in the world, it represents not only an important ecological and economic asset but also a strategic reserve of freshwater with potential significance for future drinking water security. In the context of increasing climate uncertainty and growing pressure on water resources, the long-term value of Lake Sevan is likely to increase substantially.

Historically, Lake Sevan has played a critical role in Armenia's water management, supporting hydropower generation, irrigation, fisheries, recreation, and ecosystem services. However, future water challenges may require a broader strategic perspective. As climate change increases the frequency of droughts and intensifies pressure on conventional water sources, the role of large freshwater storage systems is expected to become increasingly important for ensuring reliable drinking water accessibility.

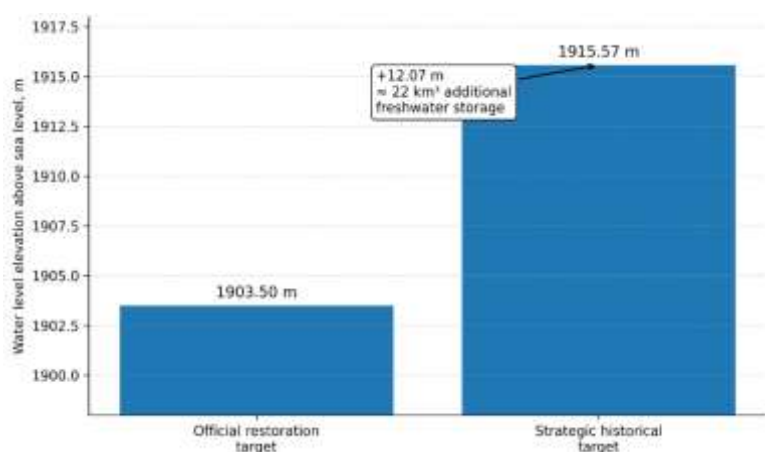
From a long-term perspective, Lake Sevan may be viewed not only as a national water resource but also as a strategic freshwater reserve whose significance could extend beyond present-day economic functions. The preservation of its water quantity and quality should therefore be regarded as an investment in future water security. Water resources that are

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available today may become substantially more valuable under future climatic and demographic conditions, particularly in regions where alternative drinking water sources are limited or increasingly vulnerable.

Historically, the long-term restoration target for Lake Sevan has been established at 1903.5 m above sea level. However, previous scientific studies have suggested that the historical lake level of 1915.57 m above sea level should be considered as a long-term strategic objective [26].



According to these assessments, achieving this level could create approximately 22 km³ of additional freshwater storage. Such a reserve would substantially strengthen Armenia's long-term drinking-water security and significantly increase the strategic value of Lake Sevan

within the South Caucasus region.

Fig. 2 Existing and Proposed Strategic Water Levels of Lake Sevan and Additional Freshwater Storage Potential

The comparison presented in Figure 2 demonstrates that the strategic importance of Lake Sevan extends beyond its current ecological and economic functions. The potential increase of approximately 22 km³ in freshwater storage highlights the considerable reserve capacity that could be available under a long-term water-security perspective. In an era characterized by increasing climate uncertainty, growing water demand, and rising pressure on conventional water sources, such large-scale freshwater reserves may acquire exceptional strategic significance. Consequently, the future management of Lake Sevan should be evaluated not only from the perspective of present-day water use but also in terms of its potential contribution to long-term drinking water accessibility and regional water resilience.

An equally important consideration is that the strategic value of Lake Sevan is determined not only by the volume of stored water but also by the possibility of preserving that resource for future generations. In a world where access to reliable drinking water is becoming increasingly uncertain, the protection of major freshwater reserves should be viewed as a long-term public investment rather than solely as a matter of current resource utilization. This perspective emphasizes the importance of balancing present-day water demands with the responsibility to maintain strategic reserves capable of supporting future societal needs.

The case of Lake Sevan illustrates a broader principle that may become increasingly relevant in the twenty-first century: water resources should be evaluated not only according to their current economic use but also according to their potential contribution to future drinking water accessibility. As uncertainty regarding future water availability increases, the strategic preservation of major freshwater reserves may become an essential component of long-term water-security planning. This perspective provides an important link between national water-

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management policies and the broader concept of international responsibility for ensuring universal access to drinking water. Beyond its national importance, Lake Sevan may also be considered within a broader regional context. The South Caucasus is expected to experience increasing pressure on water resources as a result of climate change, economic development, and demographic transformations. Under such conditions, large freshwater reserves acquire strategic significance that extends beyond administrative and sectoral boundaries. Consequently, the long-term protection and sustainable management of Lake Sevan should be regarded not only as a national priority but also as a contribution to regional water resilience and future drinking water accessibility.

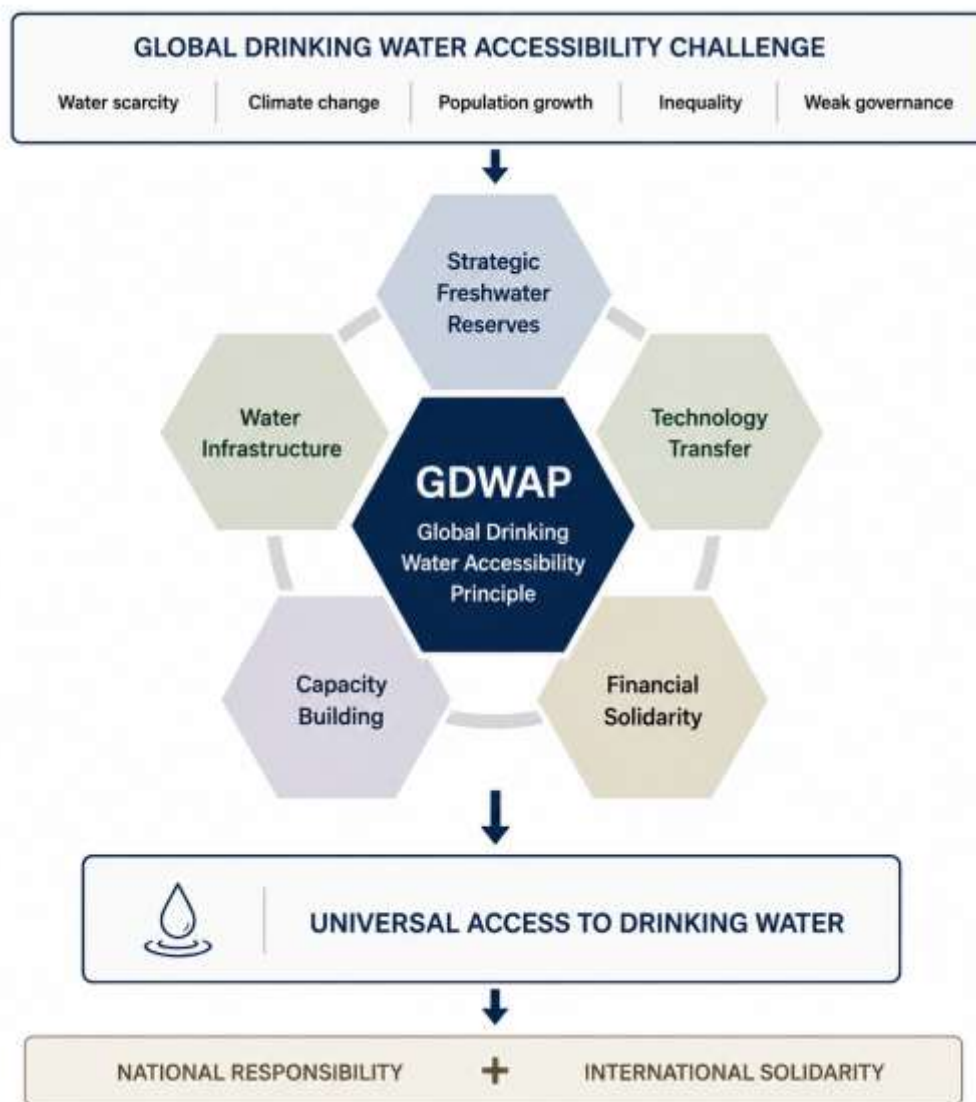


Fig. 3 Conceptual Framework of the Global Drinking Water Accessibility Principle (GDWAP)

The case of Lake Sevan illustrates a broader principle that may become increasingly relevant in the twenty-first century: water resources should be evaluated not only according to their current economic use but also according to their potential contribution to future drinking water accessibility. As uncertainty regarding future water availability increases, the strategic preservation of major freshwater reserves may become an essential component of long-term

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water-security planning. This perspective provides an important link between national water-management policies and the broader concept of international responsibility for ensuring universal access to drinking water. The analysis conducted in this study indicates that the growing disparity between the universal recognition of the human right to drinking water and the unequal capacity of countries to ensure that right requires a new conceptual approach. Existing governance mechanisms remain predominantly based on national responsibility, whereas many of the factors influencing drinking water availability, affordability, and reliability increasingly operate at regional and global scales.

Based on the findings presented above, this study proposes the Global Drinking Water Accessibility Principle (GDWAP) as a conceptual framework intended to complement existing national approaches. The proposed principle is founded on the premise that universal access to drinking water should be regarded not only as a national obligation but also as a shared international responsibility. Under this approach, countries retain primary responsibility for managing and developing their own water resources, while the international community contributes through cooperation, financing, technology transfer, capacity building, and support for sustainable water infrastructure development.

The proposed principle seeks to establish a balance between national sovereignty over water resources and international solidarity in ensuring universal access to drinking water. Rather than promoting the redistribution of water resources themselves, GDWAP emphasizes the redistribution of opportunities, knowledge, technologies, and financial capacities necessary to improve drinking water accessibility in water-deficient regions.

Relationship Between GDWAP and Existing International Frameworks.

The proposed Global Drinking Water Accessibility Principle (GDWAP) is intended to complement rather than replace existing international water and development frameworks. The principle is fully consistent with the human right to drinking water recognized by the United Nations, Sustainable Development Goal 6 (Clean Water and Sanitation), and ongoing international efforts aimed at improving water security and sustainable water management. GDWAP expands these existing approaches by emphasizing the role of international solidarity in addressing persistent inequalities in drinking water accessibility. While current frameworks primarily define objectives and responsibilities, GDWAP highlights the need for enhanced cooperation, technology transfer, financial support, and capacity-building mechanisms to help achieve universal access to drinking water.

Consequently, the proposed principle should be viewed as a complementary framework that strengthens and supports existing international initiatives rather than creating a parallel governance structure.

Core Pillars of the Global Drinking Water Accessibility Principle (GDWAP)

The proposed Global Drinking Water Accessibility Principle (GDWAP) is based on five interconnected pillars intended to strengthen universal access to drinking water through cooperation between national governments, international organizations, development institutions, and the private sector.

Pillar 1 – Sustainable Water Resource Development.

Countries should promote the sustainable development of available drinking water resources, including groundwater, springs, rivers, reservoirs, rainwater harvesting systems, desalination technologies, and water reuse where appropriate.

Pillar 2 – Drinking Water Conservation and Efficiency.

Reducing physical water losses, improving operational efficiency, promoting water-saving technologies, and encouraging responsible water consumption are essential components of long-term accessibility.

Pillar 3 – Technology Transfer and Knowledge Sharing.

Access to modern water-treatment technologies, monitoring systems, digital management tools, and engineering expertise should be expanded through international cooperation mechanisms.

Pillar 4 – International Financial Solidarity.

Water-deficient regions frequently face financial constraints that limit infrastructure development. International financing mechanisms, development assistance programs, and public-private partnerships can contribute to improving drinking water accessibility.

Pillar 5 – Shared Responsibility for Universal Access.

While national governments retain primary responsibility for drinking water provision, the international community shares a collective responsibility to support efforts aimed at ensuring universal access to drinking water, particularly in regions facing structural water scarcity and limited development capacity.

Together, these pillars establish a framework that integrates local action with international cooperation and provides a foundation for improving global drinking water accessibility in a sustainable and equitable manner.

Implementation Mechanisms of GDWAP

The effectiveness of the proposed Global Drinking Water Accessibility Principle (GDWAP) depends on the establishment of practical implementation mechanisms capable of translating international solidarity into measurable improvements in drinking water accessibility. The principle is intended to complement existing national water-management systems rather than replace them. Accordingly, implementation should occur through coordinated actions at local, national, regional, and international levels.

One of the primary implementation mechanisms involves the development of sustainable water-storage infrastructure. In regions experiencing seasonal water availability, the construction of reservoirs, rainwater harvesting systems, managed aquifer recharge projects, and other storage facilities can significantly improve long-term drinking water accessibility. Water that is available during wet periods should be conserved and strategically managed to support populations during periods of scarcity.

A second mechanism concerns the reduction of water losses and the improvement of water-use efficiency. In many countries, substantial volumes of treated drinking water are lost through aging distribution systems, leakage, and inadequate management practices. Investments in modern monitoring technologies, digital water-management systems, leakage control programs, and infrastructure rehabilitation can substantially increase effective water availability without requiring the development of additional water sources.

Technology transfer represents another important implementation pathway. Advanced treatment technologies, desalination systems, smart monitoring tools, water-quality

management systems, and engineering expertise are often concentrated in a relatively small number of countries. International cooperation can facilitate the transfer of such technologies and knowledge to regions facing water scarcity and limited technical capacity.

Financial cooperation constitutes a further essential component of GDWAP implementation. International financial institutions, development banks, donor organizations, climate-finance mechanisms, and public-private partnerships can support the construction of critical drinking water infrastructure in regions where national resources are insufficient. Such investments should be viewed not only as development assistance but also as contributions to global stability, public health, and sustainable development.

Finally, the implementation of GDWAP requires strengthened international cooperation and governance. Existing global initiatives related to water, climate adaptation, sustainable development, and disaster-risk reduction provide a foundation upon which more coordinated efforts to improve universal access to drinking water can be developed. In this context, international solidarity becomes a practical instrument for addressing one of the most important challenges of the twenty-first century.

Potential Benefits and Challenges of GDWAP

The proposed Global Drinking Water Accessibility Principle (GDWAP) offers several potential advantages for improving universal access to drinking water. First, it expands the traditional understanding of responsibility for drinking water provision by recognizing that global water challenges increasingly require cooperative solutions. Second, it creates opportunities for strengthening international partnerships aimed at improving water infrastructure, technological capacity, and institutional development in water-deficient regions. Third, it encourages a more efficient use of global financial and technological resources by directing support toward areas where drinking water accessibility remains critically limited.

Another important benefit of the proposed principle is its compatibility with existing international development frameworks. The objectives of GDWAP are consistent with the Sustainable Development Goals, climate adaptation strategies, public-health initiatives, and international efforts to reduce poverty and inequality. Consequently, the principle can complement rather than compete with existing global development agendas.

At the same time, several challenges should be acknowledged. Differences in national priorities, financial capacities, political interests, and governance systems may complicate the implementation of international solidarity mechanisms. In addition, questions may arise regarding the allocation of financial responsibilities, the measurement of effectiveness, and the coordination of international support programs.

Another challenge concerns the balance between national sovereignty and international cooperation. While countries retain sovereign rights over their water resources, effective implementation of GDWAP requires the recognition that universal access to drinking water represents a broader humanitarian and developmental objective extending beyond national boundaries.

Despite these challenges, the increasing global importance of drinking water accessibility suggests that the development of cooperative mechanisms may become an essential component of future water governance. In this context, GDWAP should be viewed as a conceptual framework intended to stimulate discussion and encourage the development of practical approaches for improving universal access to drinking water.

Conclusions

1. Access to drinking water has evolved from a purely technical and infrastructure-related issue into a global development challenge closely linked to public health, social stability, economic growth, and human well-being.
2. Despite the international recognition of access to drinking water as a fundamental human right, significant inequalities in drinking water accessibility persist across countries and regions due to differences in natural water availability, economic capacity, technological development, and institutional effectiveness.
3. The analysis indicates that the traditional national-responsibility model remains necessary but is increasingly insufficient as the sole mechanism for ensuring universal access to drinking water under conditions of growing water scarcity, climate change, and global interdependence.
4. The study demonstrates that many factors influencing drinking water accessibility, including climate variability, transboundary water systems, technological disparities, and financial constraints, extend beyond national boundaries and require cooperative responses.
5. To address these challenges, this study proposes the Global Drinking Water Accessibility Principle (GDWAP), a conceptual framework that combines national responsibility with international solidarity in support of universal access to drinking water.
6. The proposed principle is based on five core pillars: sustainable water resource development, drinking water conservation and efficiency, technology transfer and knowledge sharing, international financial solidarity, and shared responsibility for universal access to drinking water.
7. Future international water policies should increasingly emphasize cooperation, capacity building, sustainable infrastructure development, and coordinated financing mechanisms in order to improve drinking water accessibility and support long-term global water resilience.
8. The proposed Global Drinking Water Accessibility Principle (GDWAP) should be viewed as an initial conceptual step toward a broader framework of international water solidarity. Future research should focus on developing the theoretical foundations of water solidarity, capacity-based international responsibility, governance mechanisms, and implementation pathways capable of strengthening universal access to drinking water at the global level.

Recommendations

1. Promote recognition of universal access to drinking water as a shared international responsibility in addition to a national obligation.
2. Strengthen international financing mechanisms for drinking water infrastructure development in water-deficient regions.
3. Expand technology-transfer programs and professional capacity-building initiatives in the water sector.
4. Encourage investments in water-storage infrastructure, water-loss reduction, and efficient water-use technologies.
5. Support further research aimed at developing quantitative indicators, assessment methodologies, financing models, and practical implementation tools for the Global Drinking Water Accessibility Principle (GDWAP).

6. Promote comparative studies evaluating the role of strategic freshwater reserves, including major lakes and reservoirs, in strengthening long-term drinking water accessibility under climate-change conditions.

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ԽՄԵԼՈՒ ԶՐԻ ՀԱՄԸՆԴՀԱՆՈՒՐ ՀԱՍԱՆԵԼԻՈՒԹՅՈՒՆ. ԱԶԳԱՅԻՆ ՊԱՏԱՍԽԱՆԱՏՎՈՒԹՅՈՒՆՆԻՑ ԴԵՊԻ ՄԻՋԱԶԳԱՅԻՆ ՀԱՄԵՐԱՇԽՈՒԹՅՈՒՆ

Ա.Կ. Հարությունյան

Ակադեմիկոս Ի.Վ. Եղիազարովի անվան ջրային հիմնահարցերի և հիդրոպեխնիկայի ինստիտուտ

Խմելու ջրի հասանելիությունը 21-րդ դարի կարևորագույն համաշխարհային զարգացման մարտահրավերներից մեկն է: Չնայած խմելու ջրի իրավունքը միջազգային մակարդակով ճանաչվել է որպես մարդու հիմնարար իրավունք, աշխարհի տարբեր երկրներում և տարածաշրջաններում շարունակում են պահպանվել խմելու ջրի հասանելիության զգալի անհավասարություններ: Կլիմայական փոփոխությունները, քաղցրահամ ջրային ռեսուրսների անհավասար բաշխվածությունը, ենթակառուցվածքային սահմանափակումները, ֆինանսական դժվարությունները և ժողովրդագրական ճնշումները լրացուցիչ բարդացնում են իրավիճակը: Սույն

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հետազոտությունը վերլուծում է խմելու ջրի համընդհանուր հասանելիության ապահովման ազգային պատասխանատվության ավանդական մոդելի սահմանափակումները և ուսումնասիրում ավելի լայն միջազգային համագործակցության անհրաժեշտությունը: Առանձնահատուկ ուշադրություն է դարձվում Հարավային Կովկասին և Հայաստանին՝ որպես այնպիսի տարածաշրջանների օրինակների, որտեղ խմելու ջրի երկարաժամկետ հասանելիությունը կարող է ազդվել բնապահպանական, ենթակառուցվածքային և կլիմայական գործոններից: Քննարկվում է նաև Սևանա լճի ռազմավարական դերը որպես ապագայի քաղցրահամ ջրի կարևոր պաշար: Վերլուծության հիման վրա առաջարկվում է նոր հայեցակարգային մոտեցում՝ խմելու ջրի համաշխարհային հասանելիության սկզբունքը (Global Drinking Water Accessibility Principle – GDWAP), որը նպատակ ունի համադրել ազգային պատասխանատվությունն ու միջազգային համերաշխությունը:

Առաջարկվող սկզբունքը հիմնված է հինգ հիմնական հենասյուների վրա՝ ջրային ռեսուրսների կայուն զարգացում, խմելու ջրի խնայող և արդյունավետ օգտագործում, տեխնոլոգիաների և գիտելիքների փոխանցում, միջազգային ֆինանսական համերաշխություն և խմելու ջրի համընդհանուր հասանելիության ապահովման համատեղ պատասխանատվություն:

Հետազոտությամբ հիմնավորում է, որ ապագա ջրային քաղաքականությունները պետք է առավել մեծ ուշադրություն դարձնեն համագործակցությանը, ռազմավարական ջրային պաշարների պահպանությանը և համակարգված միջազգային աջակցության մեխանիզմներին՝ խմելու ջրի հասանելիության բարելավման և համաշխարհային ջրային կայունության ամրապնդման նպատակով:

Բանալի բառեր՝ խմելու ջրի հասանելիություն, ջրային անվտանգություն, միջազգային համերաշխություն, GDWAP, ջրային կառավարում, Սևանա լիճ, Հարավային Կովկաս, կայուն զարգացում:

ВСЕОБЩАЯ ДОСТУПНОСТЬ ПИТЬЕВОЙ ВОДЫ: ОТ НАЦИОНАЛЬНОЙ ОТВЕТСТВЕННОСТИ К МЕЖДУНАРОДНОЙ СОЛИДАРНОСТИ

А.К. Арутюнян

Институт водных проблем и гидротехники им. акад. И.В.Егизарова

Доступ к питьевой воде всё чаще рассматривается как один из важнейших глобальных вызовов развития XXI века. Несмотря на то, что право человека на питьевую воду официально признано международным сообществом, существенные различия в доступности питьевой воды по-прежнему сохраняются между странами и регионами. Изменение климата, неравномерное распределение пресноводных ресурсов, ограничения инфраструктуры, финансовые трудности и демографическое давление дополнительно усложняют решение данной проблемы.

В настоящем исследовании рассматриваются ограничения традиционной модели национальной ответственности за обеспечение всеобщего доступа к питьевой воде и обосновывается необходимость более широких механизмов международного сотрудничества. Особое внимание уделяется региону Южного Кавказа и Армении как примерам территорий, где долгосрочная доступность питьевой воды может оказаться

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под воздействием экологических, инфраструктурных и климатических факторов. Также анализируется стратегическая роль озера Севан как потенциального долгосрочного резерва пресной воды.

На основе проведённого анализа предлагается новая концептуальная модель — Принцип глобальной доступности питьевой воды (Global Drinking Water Accessibility Principle, GDWAP), направленная на интеграцию национальной ответственности и международной солидарности. Предлагаемый принцип основывается на пяти ключевых направлениях: устойчивое развитие водных ресурсов, сохранение и эффективное использование питьевой воды, передача технологий и обмен знаниями, международная финансовая солидарность, а также совместная ответственность за обеспечение всеобщего доступа к питьевой воде.

В исследовании утверждается, что будущая водная политика должна в большей степени ориентироваться на сотрудничество, долгосрочное сохранение водных ресурсов и координированные механизмы международной поддержки, направленные на повышение доступности питьевой воды и укрепление глобальной водной устойчивости.

Ключевые слова: доступность питьевой воды; водная безопасность; международная солидарность; GDWAP; управление водными ресурсами; озеро Севан; Южный Кавказ; устойчивое развитие.

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