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Water Resource Management in Liberia: Current Issues and Development Priorities

T.A. Kamaljanova*, B.B. Byulegenova, A.B. Dauylbayev

L.N. Gumilyov Eurasian National University, Astana, Kazakhstan

(E-mail: Takhira.Kamaljanova@mail.ru, byulegenova_bb@enu.kz, green-day-1994@gmail.com)

Abstract. The study analyzes the problems of water resources management in Liberia with an emphasis on the sustainable development of the water sector. Despite the presence of significant water resources, the country faces serious challenges such as drinking water shortages, water pollution, and insufficient water supply and sanitation infrastructure. These problems are aggravated by political, economic, and social factors, as well as the consequences of the civil war.

The research methodology includes an analysis of existing sources, legislation, and reports of international organizations. Content analysis of strategic documents, as well as statistical data on water resources and sanitation conditions, were used. The paper offers recommendations for improving the situation, including modernization of water supply and sanitation systems, improved water quality monitoring, and raising public awareness.

The main results of the study are the identification of key problems in the water sector, such as a lack of infrastructure and weak legislative regulation. To address these problems, measures are proposed aimed at developing infrastructure, attracting foreign investment, and strengthening international cooperation. The practical significance of the work lies in proposing concrete steps to improve water management in Liberia, which can contribute to increasing access to drinking water and improving sanitation. The results obtained can be used in planning and implementing activities in the field of sustainable water use, which is especially relevant for countries facing similar challenges.

Keywords: Water resources management, water, sanitation and hygiene (WASH), institutional capacity, legal and policy frameworks, integrated water resources management (IWRM), infrastructure development, sustainable development goals (SDGs)

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Introduction

Water resources are one of the most important natural resources that determine the sustainable development of society, its economic and social stability. For many developing countries, including Liberia, water resources management is a complex and multifaceted task that includes not only providing the population with quality drinking water but also the effective management of aquatic ecosystems in the face of climate change and economic difficulties. Liberia, despite the presence of extensive water resources, faces several serious problems in the water sector. Among them are insufficient water supply and sanitation infrastructure, poor sanitation, pollution of water bodies, and uneven distribution of water resources. These problems, aggravated by the consequences of civil war and political instability, require the development of effective strategies and solutions aimed at sustainable water resources management. Liberia's water resources are among the most extensive in the West African region. On average, one inhabitant of the country has more than 71,000 m^3 of renewable water per year [1, p. 3]. Water plays a critical role in maintaining the ecological balance and sustainable socio-economic development of the country. However, despite the apparent abundance, water resources are under threat of degradation and pollution by both natural and anthropogenic factors.

The purpose of this study is to analyze the problems of water resources management in Liberia to identify key factors affecting the efficiency of their use and further development of solutions to improve water resources management in the country. To do this, it is necessary to identify key problems in water resources management, analyze the existing water supply and sanitation infrastructure, assess the effectiveness of current strategies, and propose measures to improve the water sector. Particular attention is paid to issues of legislative regulation, attracting foreign investment, and strengthening international cooperation in the field of water resources.

Materials and research methods

The study used an integrated approach that allowed for a comprehensive analysis of the current state of water resources in Liberia, identified existing problems in their management, and determined potential areas for sustainable development of the sector. The theoretical basis is the concept of sustainable natural resource management and the principles of integrated water management, which involve considering both environmental and socio-economic factors. The analysis is based on a wide array of statistical and analytical data, including reports from international organizations (FAO, Worldometers, Aquastat) and expert studies, which made it possible to form an objective and substantiated picture. The work uses content analysis aimed at extracting key quantitative and qualitative characteristics of water use in the country, as well as a comparative analytical method that makes it possible to compare water intake by economic sectors and analyze the dynamics of changes in different periods. Particular attention is paid to the assessment of water supply infrastructure, the impact of the consequences of the civil war, demographic changes, and urbanization. The use of structural and functional analysis made it possible to consider the institutional mechanisms of water resources management and the needs of the population. The case study method was used as an illustrative tool, demonstrating

specific manifestations of water scarcity in vulnerable areas such as West Point. The conducted research is based on a sufficient information base, allowing for the formation of a holistic view of the problem, but also indicates the need for further in-depth scientific research aimed at developing effective water management strategies in the context of sustainable development.

Results and discussions

Brief Description of Liberia. Liberia is one of the sixteen countries located in West Africa and holds a distinctive place in both the historical and economic landscape of the African continent [2]. The country occupies a territory of 111,370 km^2. Geographically, Liberia shares borders with Sierra Leone to the northwest, Guinea to the north, and Côte d'Ivoire to the northeast and east. Its southern and southwestern boundaries are formed by the Atlantic Ocean. The north-south extent of the country measures approximately 465 kilometers, while its coastline stretches for about 520 kilometers [1].

Research indicates that Liberia possesses substantial natural potential. Its natural endowment includes economically valuable timber species suitable for industrial processing, diverse ecosystems with rich biodiversity, and a variety of mineral resources such as iron ore, gold, and diamonds [3]. In addition, the country is home to various energy resources, including biomass, hydropower, petroleum, and other renewable energy sources.

Beyond its mineral wealth – which includes high-grade iron ore, manganese, diamonds, gold, kyanite, and barite – one of Liberia's most significant natural assets is its forest cover. The country maintains a substantial portion of the tropical forests of West Africa, comprising approximately 43% of the forests in the Upper Guinea region. However, it is important to note that this region also experiences one of the world's highest rates of deforestation [4].

In summary, Liberia is endowed with a wide range of natural resources, including extensive forests, mineral wealth, and considerable energy potential. Nevertheless, the country continues to face major challenges related to environmental degradation, depletion of natural resources, and weaknesses in governance and management systems. One of the most acute and strategically significant issues in this context is the situation with water resources. With abundant rainfall and access to surface and groundwater, Liberia's water sector remains vulnerable to climatic, social and institutional factors, which requires close scientific analysis and the development of effective management strategies.

Water Resources and Their Utilization. Liberia's water resources can be categorized into two main types of river systems:

Major river basins, which cover approximately 97% of the country's territory and generally flow from the east to the southwest. The principal rivers – Mano, Lofa, St. Paul, St. John, Cestos, and Cavalla – originate in Sierra Leone, Guinea, or Côte d'Ivoire and collectively drain about 65.5% of Liberia's land area.

Smaller coastal streams, which account for drainage over the remaining 3% of the country's territory.

The volume of internal renewable surface water is estimated at 200 km^3 per year, while renewable groundwater reserves are approximately 60 km^3 per year; all of the latter are believed

to be discharged into surface streams. Thus, Liberia's total internal renewable water resources are 200 km^3/year, supplemented by an additional 32 km^3/year flowing in from Guinea and Côte d'Ivoire. This brings the total renewable water resources to 232 km^3 annually [1, p.3].

Historically, Liberia possessed an abundant water supply. However, population growth and escalating environmental pollution have significantly reduced the availability of clean water, leading to a growing scarcity.

As human activity expands, water-related issues are increasingly environmental in nature. What initially manifested as the pollution of freshwater and marine bodies has evolved into a broader ecological threat – characterized by the shallowing of rivers and the disappearance of some lakes.

The situation deteriorated notably following the 14-year civil conflict (1989-2003), during which critical infrastructure, including the hydroelectric power station that supplied water to the capital, Monrovia, was destroyed. According to Seagbeh (2016), only around 25% of Liberia's 4 million residents had access to safe drinking water in the post-war period, and the situation has continued to decline [5].

Water scarcity has been particularly acute in Monrovia and surrounding districts, especially in West Point, the largest slum area. In the absence of a centralized water supply and amid periodic droughts, residents are compelled to purchase water daily placing a significant financial burden on already vulnerable populations.

Across much of Africa, women and children must travel long distances to collect water from unprotected sources, which are often contaminated with pathogenic organisms. As a result, there is a heightened risk of contracting infectious and parasitic diseases, including bacterial diarrhea, typhoid, hepatitis A, yellow and hemorrhagic fevers, malaria, and schistosomiasis. The acute shortage of clean drinking water frequently results in outbreaks of gastrointestinal illnesses [4]. It is estimated that roughly half of Africa's population suffers from water-related diseases, with contaminated drinking water accounting for approximately 25% of child mortality worldwide.

The lack of access to safe water is a major factor perpetuating poverty across the continent. It hampers the production of safe food and undermines public health, particularly in densely populated urban areas, where rapid urbanization drives up demand and intensifies water scarcity.

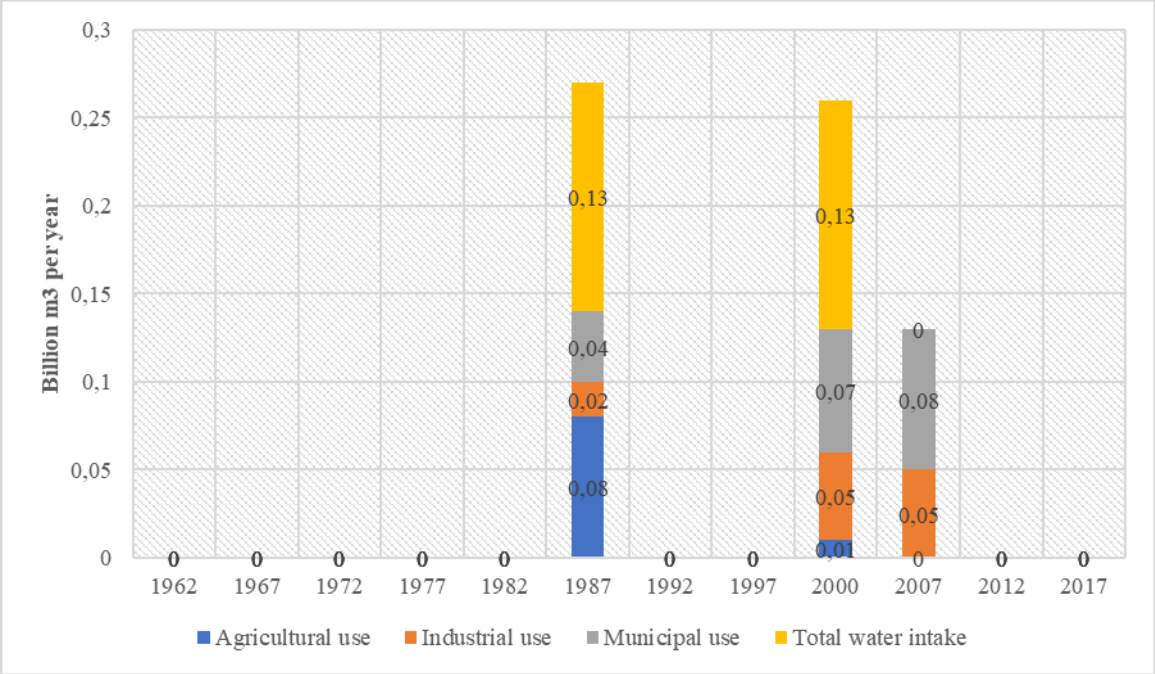
According to Worldometers, Liberia's per capita water availability decreased dramatically from 198,291 m^3 in 1962 to 49,028 m^3 in 2017 – a decline of 149,263 m^3.

A critical contributing factor to Liberia's water resource issues is the uneven distribution of water across economic sectors. Data from FAO Aquastat (2005) indicate that in 2000, the total annual water withdrawal in Liberia was 106.8 million m^3, of which 57% (60 million m^3) was used in agriculture, 28% (30.4 million m^3) for domestic consumption, and 15% (16.4 million m^3) by industry [1]; [6, p. 21].

Liberia's agricultural sector, predominantly subsistence-based, contributes between 10% and 50% of GDP and provides employment for about 70% of the population. The potential area for irrigation is estimated at 600,000 hectares, primarily comprising freshwater swamps [6, p. 21]. However, there is a lack of up-to-date data on the actual extent of irrigated land, despite the sector's substantial share of national water consumption.

Alternative sources, including Worldometers, provide comparable data on water use in agriculture and industry, but also highlight the municipal sector, which, according to these estimates, consumes the largest volume of water, ahead of even agriculture (see figure 1) [7].

Figure 1. Total water withdrawals in Liberia in 1987, 2000 and 2007 and their use



Additional causes of water scarcity in Liberia include increased urban migration, fragmented water sector governance, and inadequate public investment. To overcome the current crisis, greater public support is needed, as water supply requires financial investment, while sanitation requires institutional commitment [5].

“Water requires investment,” notes a water expert, “and sanitation requires commitment, so to address the water crisis that Liberians are experiencing, public investment in the sector must be increased” [5].

The Liberian government is currently implementing a targeted policy to attract foreign investment in the resource sector, while seeking to ensure that investors provide public goods. In accordance with bilateral agreements, Liberia provides concessions for the development of natural resources – iron ore, gold, timber, rubber, palm oil, etc. - in exchange for investors' commitments to build and maintain infrastructure in the areas of their operations. These obligations typically include the construction of roads, bridges, ports, railways, and power generation facilities [8, p. 5]. This strategy aims to create new “development corridors” and stimulate economic agglomeration through the synergy of private and public investment.

Legislative Framework and Institutional Mechanisms for Water Management. Effective water resources management in Liberia is a critical component of sustainable development and plays a fundamental role in ensuring basic living standards for the population. Legislative initiatives in this domain have evolved progressively since the mid-20th century, reflecting the state’s growing commitment to environmental protection and improved sanitation.

One of the earliest legal instruments addressing water pollution in Liberia was the Public Health Act of 1956, which was revised in 1975 and incorporated into Section 33 of the Code – entitled An Act Establishing a New Public Health Act of Liberia, Chapter 24. This legislation marked the first formal attempt to regulate water quality, with Chapter 24 specifically aimed at protecting the country's water resources [6].

A significant milestone was the adoption of the Environmental Protection Act in November 2002, which identified the sustainable management of natural resources as a priority objective of national policy [6, p. 3]. Within this framework, the Government of Liberia initiated several reforms to enhance water resource management, particularly through the implementation of WASH (Water, Sanitation, and Hygiene) programs aimed at strengthening access to safe water, sanitation, and hygiene services.

Despite these efforts, Liberia remains among the African countries with the lowest coverage of WASH services [9]. According to the World Health Organization [10], the Second African Conference on Sanitation and Hygiene (AfricaSan), held in Durban in 2008, resulted in a regional commitment to increase public investment in WASH. This culminated in the adoption of the eThekwini Declaration, signed by ministers from 30 African countries, which pledged to allocate at least 0.5% of GDP to improving WASH infrastructure and services.

Following this commitment, Liberia, alongside other Sub-Saharan African nations, achieved approximately 20% progress toward the stated targets, reaching 94% of interim performance indicators. However, when compared globally – particularly with regions such as North Africa, Latin America, and South and Southeast Asia – these results remained among the lowest.

Table 1. Fulfilment of political commitments: progress towards achieving sanitation and drinking-water targets (% of countries reporting achievement of core sanitation and drinking-water targets in urban/rural areas) [10, p. 12].

Region	Target indicators are in place	Policy adopted	Adequate funding (own assessment)	Adequate results
Latin America and the Caribbean	100%	52%	30%	32%
Sub-Saharan Africa	94%	73%	9%	20%
North Africa, East, Central, and West Asia, and the Caucasus	97%	88%	44%	49%
South and Southeast Asia and Oceania	86%	63%	32%	36%
Total	93%	70%	22%	30%

Thus, Liberia still faces the urgent task of reassessing its approach to WASH and prioritizing comprehensive improvements in this sector. In response to the persistent challenges, the Government of Liberia developed a five-year Strategic Plan (2012-2017), aligned with the

Sustainable Development Goal (SDG) 6, which calls for universal, sustainable, and equitable access to safe drinking water, sanitation, and hygiene by 2030.

To implement its commitments under the WASH Compact, the government introduced a Sector Strategic Plan (2012–2017), which encompassed the following key objectives:

a) build and strengthen institutional capacity to effectively manage, scale up, and support WASH services across the country;

b) expand equitable access to safe and sustainable water and sanitation services and promote large-scale hygiene behavior change;

c) establish robust information management systems and enhance mechanisms for monitoring, data collection, communication, and stakeholder engagement; and

d) improve sectoral financing and establish sustainable funding mechanisms.

These objectives were also reflected in the Ebola Virus Disease (EVD) Economic Stabilization and Recovery Plan, which reaffirmed Liberia's alignment with SDG 6. The overarching goal of these efforts was to ensure inclusive and sustainable access to water and sanitation services for all citizens, thereby contributing to Liberia's long-term vision of becoming a middle-income country with adequate WASH infrastructure.

In addition, a Country Plan – developed with the support of Liberia's largest bilateral donor in the WASH sector – outlined the necessity of sustained and future investments to advance the country's strategic goals in water resource management [9].

As a result of these combined efforts, the latest WHO/UNICEF Joint Monitoring Programme (JMP) indicated that Liberia had made partial progress toward achieving its WASH-related Millennium Development Goals. Specifically, the country came within 1.5 percentage points of its target to halve the proportion of the population without access to safe drinking water, reducing it from 57% in 1995 to 76% by 2015. However, progress in sanitation remained limited, with only 17% of the population having access to improved sanitation facilities by the end of 2015, significantly below the target of 57%. (Table 2) [9, p. 2].

Table 2. Short- and medium-term targets of the Government of Liberia as outlined in the WASH Sector Strategic Plan

Sector	Subsector	Coverage		Target Year	
		2015 %	2017 (% Target)	2022 (% Target)	2030 (SDG % Goal
Water supply	Monrovia	76	93	96	100
	Other Urban		93	96	100
	Rural		67	80	100
Sanitation	Monrovia	17	61	80	100
	Other Urban		61	57	100
	Rural		52	70	100

As part of the "Sanitation and Water for All" initiative, Liberia committed to prioritizing the provision of basic services in the poorest rural areas – those with the highest levels of malnutrition – as well as in informal urban settlements (Figure 2-4) [11].

Figure 2. Proportion of population using safely managed drinking water services in Liberia, progress over time

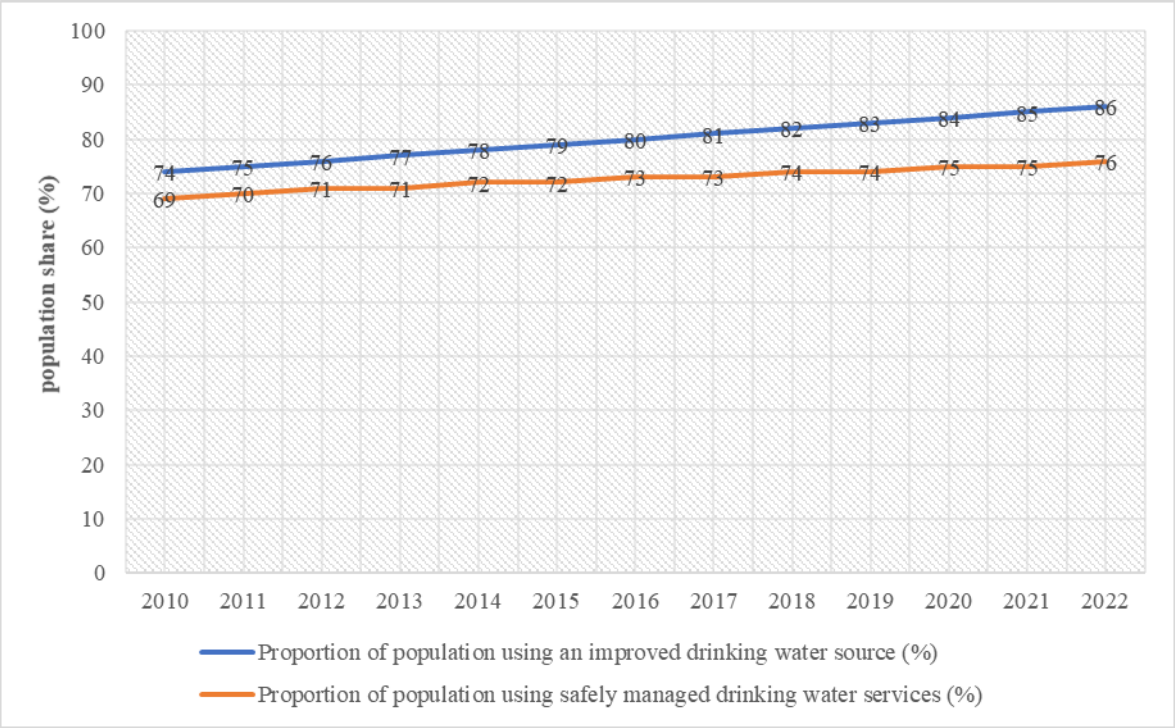


Figure 3. Proportion of population using safely managed drinking water services in Liberia, by level of service and location (2022)

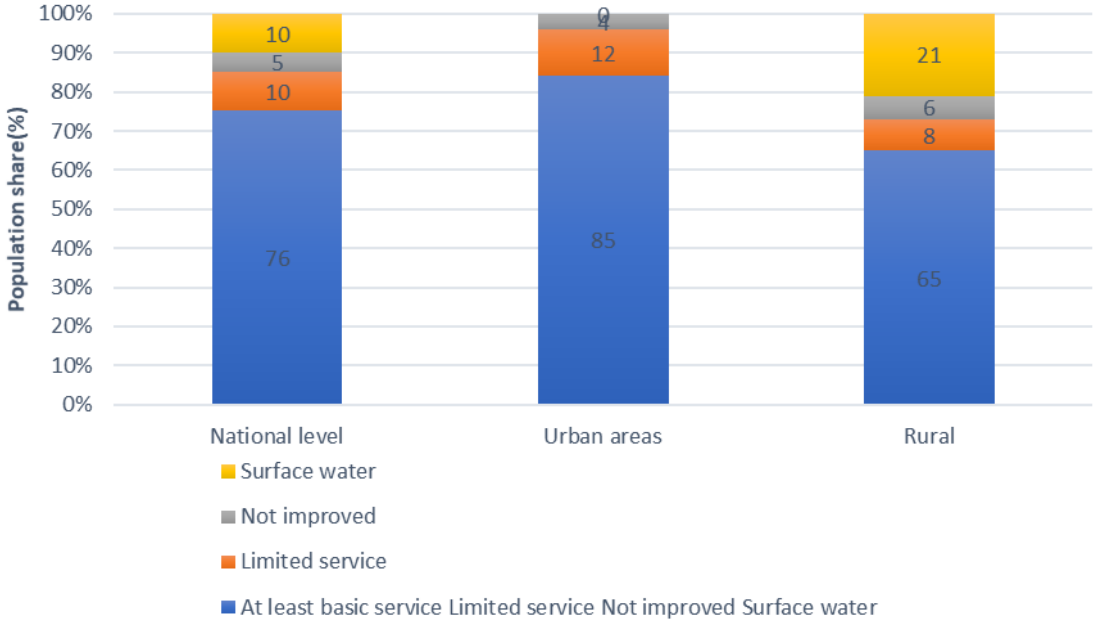
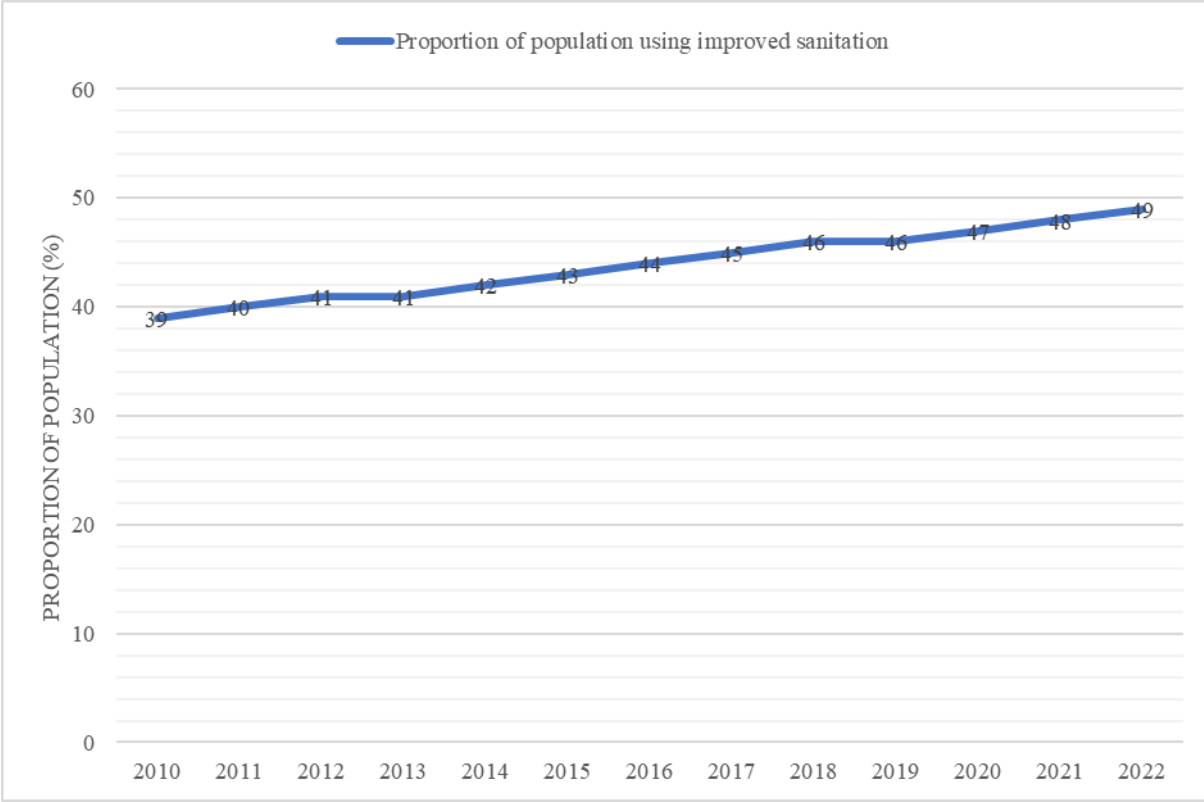


Figure 4. Proportion of population using safely managed sanitation services in Liberia, progress over time



Despite notable progress in expanding access to safe drinking water, Liberia continues to face significant challenges in improving health indicators related to water, sanitation, and hygiene (WASH), as well as food security. According to the Ministry of Lands, Mines and Energy of Liberia, the primary obstacles to effective water resource management include: (1) a weak legal and regulatory framework; (2) destruction of critical physical infrastructure; (3) limited institutional capacity to provide services and monitor resources; and (4) severe financial constraints. Another often overlooked issue is the insufficient recognition of the vital ecosystem services provided by freshwater wetlands [6].

Wetlands, comprising rivers, lakes, groundwater basins, and swamps, serve as key sources of renewable freshwater. Globally, an estimated 1.5 to 3 billion people rely on groundwater for drinking, which is typically recharged through wetland systems [12]. These ecosystems play an essential role in the hydrological cycle and are fundamental to water supply. Human activities have significantly altered hydrological processes and river regimes, with experts estimating that reservoirs worldwide now retain approximately 6,000 to 7,000 km^3 of water [13].

Wetlands – particularly swamps – also perform crucial water purification and detoxification functions. Research has shown that certain wetlands can reduce nitrate concentrations by over 80% [14, p. 6]; [15]. Therefore, neglecting their role in water resource management is a critical oversight. In Liberia, as in many other countries (nearly 90% globally), water supply

responsibilities are decentralized. Moreover, in around 40% of surveyed countries, fiscal decentralization further constrains the ability of local authorities to plan and deliver water-related services [10, p. 14].

Additionally, international organizations emphasize the lack of comprehensive studies on freshwater resources and water use in Liberia. Limited data availability, particularly on water rights and the legal framework, exacerbates existing management challenges.

Nevertheless, Liberia has established three primary agencies directly involved in water resource governance: (1) the Liberian Hydrological Service under the Ministry of Lands, Mines and Energy, which conducts hydrometric measurements and provides technical expertise on hydraulic infrastructure and hydropower; (2) the National Fisheries Bureau under the Ministry of Agriculture, responsible for aquatic resource conservation; and (3) the Environmental and Occupational Health Division within the Ministry of Health and Social Welfare, which monitors water pollution and its environmental impacts.

Additional key institutions include the Liberia Water and Sewerage Corporation, which oversees urban water supply and wastewater management, and the Environmental Protection Agency (established in 2006), tasked with maintaining environmental quality and coordinating activities related to environmental protection and sustainable natural resource use. At the local level, municipalities are responsible for wastewater collection and disposal within their jurisdictions [16, p. 11].

Experts argue that addressing water scarcity requires a shift from traditional water management toward integrated water resources management (IWRM). In her study, A Framework for Institutional Analysis for Water Resources Management in a River Basin Context, Christina Bandaragoda [2000] emphasizes the relevance of IWRM and its alignment with principles established at the 1992 Dublin Conference on Water and the Environment and Agenda 21 of the Rio Earth Summit. These principles affirm that "water is a finite, vulnerable, and essential resource that must be managed in an integrated manner," and that such management should follow a participatory approach involving all stakeholders [17, p. 10].

As water reuse becomes increasingly common, river basins are widely considered the most appropriate unit for managing water resources, particularly in agriculture where water scarcity directly impacts productivity. Growing competition for limited water resources – particularly from the dominant consumer, irrigated agriculture – necessitates a reassessment of sectoral water demands.

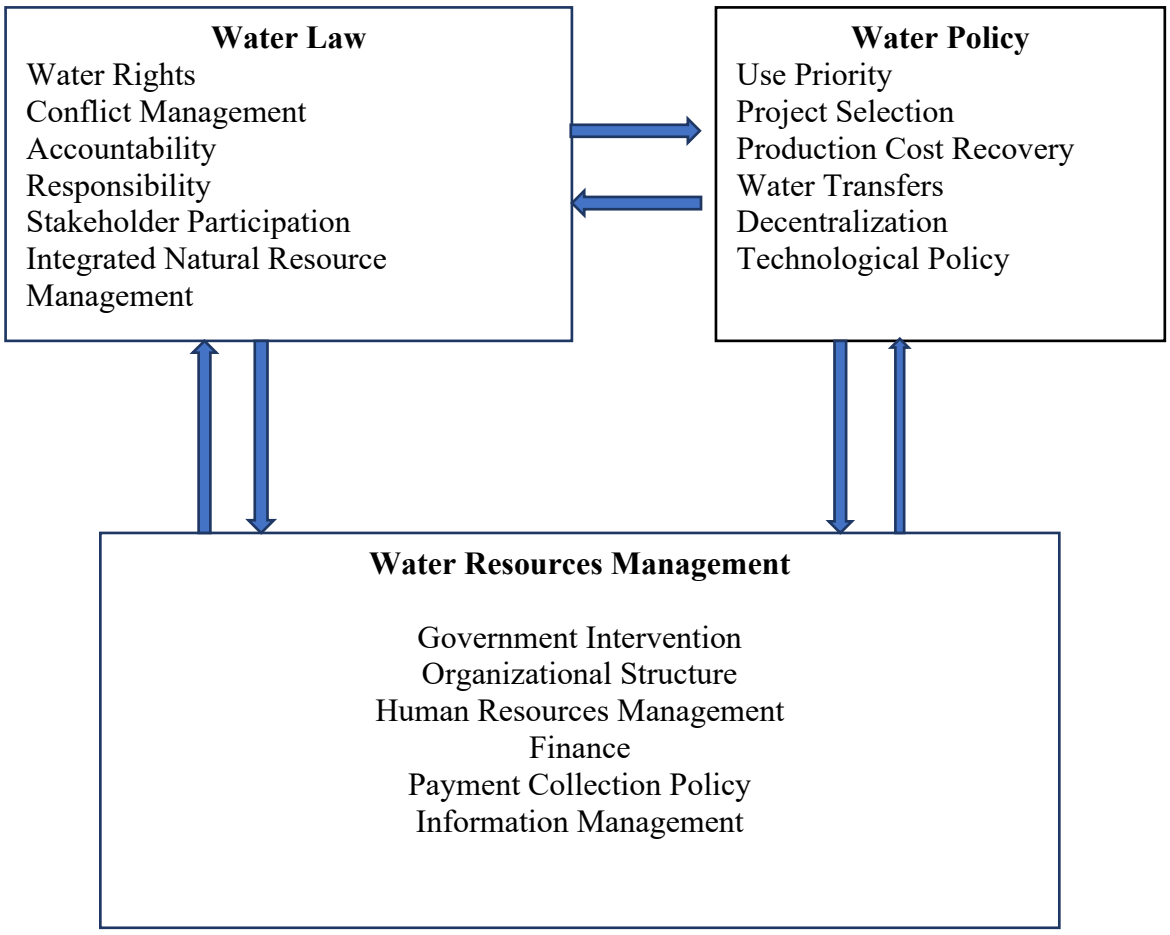
Institutional and policy-related barriers at supra-farm and irrigation system levels often hinder the effective implementation of water reforms. Consequently, the role of basin-level institutions becomes increasingly critical. Basin-based management distinguishes two complementary dimensions: (1) macro-level resource governance, and (2) system-level service delivery management. Coordinated institutional action is essential to harmonize both dimensions.

Reforms implemented within a basin management context help achieve a functional balance between centralized oversight and decentralized service delivery responsibilities [17, p. 12]. Effective water governance relies on a robust knowledge base encompassing social, environmental, institutional, economic, and physical data. Stakeholder engagement within river

basins must be grounded in mutual understanding of resource limitations and needs imposed by environmental factors.

Practically, implementing a basin approach – particularly in the agricultural sector—requires extensive information, including water resource inventories, user demographics, usage patterns, legal entitlements, and system efficiencies [17, p. 15-16]. This model fosters the integration of water, land, and environmental management, ensuring coherence across legal and policy frameworks. According to Bandaragoda [2000], the effectiveness of water management institutions is determined by five main factors: (1) economic policy, (2) political system, (3) socio-economic conditions, (4) natural resource base, and (5) legal framework. Institutions governing water resources comprise three interrelated components: legislation, policy, and administration, which collectively structure the core institutional architecture (see Fig. 5) [17, p. 35].

Figure 5. Relationships between institutional components



The figure shows that some institutional aspects belong to more than one category. This is because there is a close relationship between these components. For example, water legislation usually enables the implementation of water policy, and water policy, in turn, can initiate the

adoption of a new water law. These two components enrich each other. They determine the way water management works. It should be noted that close cooperation between the various institutions dealing with water resources can contribute to more efficient management of this resource and thus help to solve the problem of its shortage in the future.

Conclusion

The analysis of Liberia's water resources shows that despite the presence of vast water reserves, their effective management and distribution remain a serious problem. Liberia's water resources, which were abundant in the past, are now facing the threat of depletion and pollution, which is caused not only by natural factors but also by human activity. The situation is aggravated by the lack of effective water supply and sanitation infrastructure, as well as insufficient protection of aquatic ecosystems. In-depth research into water resources is essential to address this problem, which will allow a more accurate assessment of existing reserves and the possibilities for their sustainable use. Today, there is a lack of information that is necessary for a full understanding of the state of water resources and the development of effective solutions. It is important not only to conduct research on aquatic ecosystems and hydrological processes, but also to create a sufficient information base for the development of long-term water management strategies. There is a need to develop clear legal mechanisms that will ensure equitable access to water resources and their rational use. It is important to consider the historical, geopolitical, and social characteristics of the regions to ensure a fair distribution of water resources and prevent conflicts arising from water scarcity. In this regard, it is necessary to develop and implement effective water management strategies, including the construction of infrastructure to protect areas with limited access and the creation of conditions for sustainable water use. Thus, solving the water resource problem requires an integrated approach, including in-depth research, strengthening the institutional framework and active cooperation with international partners. Only by taking these aspects into account can we achieve sustainable water management and ensure their availability for future generations.

Author Contributions.

Kamaljanova T.A. – Corresponding author, work with literature, collect and translate materials, write a research article using research materials and methods, and format the article according to the requirements.

Byulegenova B. – determine the concept and topic of the article, collect materials, and provide guidance and direction.

Dauylbayev A.B. – write a research article using research materials and methods, and format the article according to the requirements.

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Т.А. Камалджанова, Б.Б. Бюлегенова, А.Б. Дауылбаев
Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Астана, Қазақстан

Либериядағы су ресурстарын басқару: ағымдағы мәселелер және даму басымдықтары

Аңдатпа. Зерттеу су секторының тұрақты дамуына баса назар аудара отырып, Либериядағы су ресурстарын басқару мәселелерін талдайды. Елеулі су ресурстарына қарамастан, ел ауыз су тапшылығы, судың ластануы және сумен жабдықтау және канализация инфрақұрылымының жеткіліксіздігі сияқты күрделі мәселелермен бетпе-бет келіп отыр. Бұл проблемалар саяси, экономикалық және әлеуметтік факторлармен, сондай-ақ азаматтық соғыстың салдарымен шиеленісіп отыр.

Зерттеу әдістемесі қолданыстағы дереккөздерді, заңнаманы және халықаралық ұйымдардың есептерін талдауды қамтиды. Қолданылған әдістерге стратегиялық құжаттарға контент-талдау жүргізу, сондай-ақ су ресурстары мен санитарлық жағдай туралы статистикалық мәліметтерді пайдалану жатады. Бұл мақалада сумен жабдықтау және су бұру жүйелерін жаңарту, су сапасының мониторингін жақсарту және халықтың хабардарлығын арттыруды қоса алғанда, жағдайды жақсарту бойынша ұсыныстар берілген.

Зерттеудің негізгі нәтижелері су секторындағы инфрақұрылымның жетіспеушілігі және заңнамалық реттеудің әлсіздігі сияқты негізгі проблемаларды анықтау болып табылады. Бұл мәселелерді шешу үшін инфрақұрылымды дамытуға, шетелдік инвестицияларды тартуға және халықаралық ынтымақтастықты нығайтуға бағытталған шаралар ұсынылады.

Жұмыстың практикалық маңыздылығы Либериядағы су ресурстарын басқаруды жақсарту бойынша нақты қадамдарды ұсынуда жатыр, бұл ауыз судың қолжетімділігін арттыруға және санитарияны жақсартуға ықпал ете алады. Алынған нәтижелерді суды тұрақты пайдалану саласындағы шараларды жоспарлау және іске асыру кезінде пайдалануға болады, бұл әсіресе ұқсас қиындықтарға тап болған елдер үшін өзекті.

Түйін сөздер: су ресурстарын басқару, су, санитария және гигиена, институционалдық әлеует, құқықтық және саяси негіздер, су ресурстарын кешенді басқару, инфрақұрылымды дамыту, тұрақты даму мақсаттары.

Т.А. Камалджанова, Б.Б. Бюлегенова, А.Б. Дауылбаев
Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан

Управление водными ресурсами в Либерии: текущие проблемы и приоритеты развития

Аннотация. Исследование посвящено анализу проблем управления водными ресурсами Либерии с акцентом на устойчивое развитие водного сектора. Несмотря на наличие значительных водных ресурсов, страна сталкивается с серьезными вызовами, такими как дефицит питьевой воды, загрязнение водоемов и недостаточная инфраструктура водоснабжения и водоотведения. Эти проблемы усугубляются политическими, экономическими и социальными факторами, а также последствиями гражданской войны.

Методология исследования включает анализ существующих источников, законодательных актов и отчетов международных организаций. Применялись методы контент-анализа стратегических документов, а также статистические данные о водных ресурсах и санитарных условиях. В работе предложены рекомендации для улучшения ситуации, включая модернизацию водоснабжающих и водоотводных систем, улучшение мониторинга качества воды и повышение осведомленности населения.

Основными результатами исследования являются выявление ключевых проблем водного сектора, таких как нехватка инфраструктуры и слабое законодательное регулирование. Для решения этих проблем предлагаются меры, направленные на развитие инфраструктуры, привлечение иностранных инвестиций и усиление международного сотрудничества.

Практическая значимость работы заключается в предложении конкретных шагов для улучшения управления водными ресурсами Либерии, что может способствовать повышению доступности питьевой воды и улучшению санитарных условий. Полученные результаты могут быть использованы при планировании и реализации мероприятий в сфере устойчивого водопользования, что особенно актуально для стран, сталкивающихся с аналогичными вызовами.

Ключевые слова: Управление водными ресурсами, вода, санитария и гигиена, институциональный потенциал, правовые и политические рамки, интегрированное управление водными ресурсами, развитие инфраструктуры, цели устойчивого развития.

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Information about authors:

Kamaljanova T.A. **–** Candidate of Historical Sciences, Associate Professor at the Department of International Relations, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan.

Byulegenova B. **–** Candidate of Political Science, Associate Professor at the Department of Political Science, L.N. Gumilyov Eurasian National University Astana, Kazakhstan.

Dauylbayev A.B. **–** teacher at the Department of International Relations, L.N.Gumilyov Eurasian National University, Astana, Kazakhstan.

Камалджанова Т.А. – тарих ғылымдарының кандидаты, Халықаралық қатынастар кафедрасының доценті, Л.Н. Гумилев атындағы Еуразия ұлттық университететі, Астана, Қазақстан.

Бюлегенова Б.Б. **–** саясаттану ғылымдарының кандидаты, Саясаттану кафедрасының профессоры м.а, Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Астана, Қазақстан.

Дауылбаев А.Б. **–** Халықаралық қатынастар кафедрасының оқытушысы, Л.Н. Гумилев атындағы Еуразия ұлттық университететі, Астана, Қазақстан.

Камалджанова Т.А. – кандидат исторических наук, доцент кафедры международных отношений, Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан.

Бюлегенова Б.Б. – кандидат политических наук, и.о. профессора кафедры политологии, кандидат исторических наук, доцент кафедры международных отношений, Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан.

Дауылбаев А.Б. – преподаватель кафедры международных отношений, Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан.