



THE DRAMA OF WATER IN A TIME OF GLOBAL TRANSFORMATION

A TRILATERAL DIALOGUE ADDRESSING
INNOVATIVE WATER DIPLOMACY AND
EFFECTIVE MANAGEMENT OF WATER
RESOURCES IN THE 21ST CENTURY

Geneva - Moscow
2021

ACKNOWLEDGEMENT

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DE GENÈVE

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RUSSIA IS RIGHTFULLY CALLED THE GREAT WATER AND LAKE POWER.

On its territory there are over 2.5 million large and small rivers and more than 3 million lakes, including Lake Baikal, which is on the UNESCO World Natural Heritage List.

In April 2016, Russian President Vladimir Putin, addressing the participants of the All-Russian National Front, noted that “[water resources are the main wealth of our country. It is assumed that in the near, right in the near future, the availability of water resources will be one of the main wealth of the countries that have them, and, on the other hand, may become one of the main problems for some states.](#)”

It is well known that the Russian Federation has a unique water resource potential. The total resources of fresh water in Russia are estimated as accounting for 20% of the world's reserves. Most of Russia's water resources, about 90% of the total, are concentrated in the basins of the rivers of the Arctic and Pacific oceans. The water resources of the Arctic are a strategic reserve of the planet's fresh water. The resource value of pure fresh water will overtake hydrocarbons in the near future. Therefore, it is so important to preserve the purity of unique northern natural reservoirs.

Surprisingly, many people know the names of the great rivers and lakes of Europe and the world, but in relation to the great rivers and lakes of Russia, despite their potential and key role in solving the global water crisis, ignorance often remains.

We hope that the joint initiative of the Geneva Water Hub and the International Association of Lake Regions to publish the study “[The Drama of Water in a Time of Global Transformation](#)” will help to learn more about Russia, its challenges and achievements in innovative water management and will open a new page in the field of water diplomacy.

Rational use of water, water saving and restoration of the quality of water resources are a priority for the activities of the Russian Government. Within the framework of the national project “Ecology”, special attention is paid to water problems and the implementation of federal projects “Clean Water”, “Rehabilitation of the Volga River”, “Preservation of Lake Baikal” and “Preservation of unique water bodies”. The common goal of all these projects is to reduce the technogenic impact to prevent new loads on water bodies.

In achieving the goals set in the national project, an important role is played by ensuring environmental control and environmental audit with the involvement of Russian science, ecologists and the public. On the request of the President, the Government approved on

September 1, 2020, the concept of creating a federal environmental monitoring system.

The digitalization of the country's water resources management is proceeding at a rapid pace. For example, in December 2020, the Government Commission on Digital Development approved the program for digital transformation of the National Agency on Water Resources (Rosvodresursy) until 2023. This program will become a specialized source of data on the state of water resources in the regions. Work is nearing completion on the creation of a state multilingual information resource platform to provide Internet access to digital information in the field of the Lake Baikal protection.

Basin councils play an important role in ensuring the rational use and protection of water bodies. They develop recommendations for the use and protection of water bodies within the boundaries of the basin district.

The Government of the Russian Federation actively supports initiatives to conserve the country's water resources. Among the significant initiatives, one can single out such projects as the “Day of care of water” of the Federal Agency for Water Resources and “Clean Shores of Eurasia” of the International Association of Lake Regions.

The Government pays special attention to the issues of international and transboundary cooperation in the field of water resources use and protection. This is due to the fact that more than 46 thousand kilometres of the border of the Russian Federation passes or crosses the basins of 70 large and medium-sized rivers of the country and neighbouring states. Cooperation in the use and protection of these water bodies is regulated by nine bilateral and one tripartite intergovernmental agreements. A good example of the high level of cooperation achieved in the use of border water systems is Russia's cooperation with Kazakhstan, China, Norway and Finland. Russia's water cooperation is successfully developing with a number of international organizations of the UN system, including the European Economic Commission and UNEP.

Finally, I would like to note that the publication “[The Drama of Water in a Time of Global Transformation](#)” offered to the reader is intended not only for a narrow circle of specialists, but also for politicians, business communities and everyone who is interested and dear to the water resources of Russia and the world.

We are confident that the expert recommendations set out in this publication will help to better understand Russia's contribution to the achievement of the United Nations Sustainable Development Goals in the context of profound changes in today's political and economic realities.



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Freshwater resources are at the heart of human history and development, and fundamental for the sustainable future of humankind.

In the context of the rapid process of global transformation, humanity is faced with numerous challenges, one of the most important being the preservation of fresh water, the world's primary and most priceless resource.

Today, the limited reserve of fresh water is under great pressure from rapidly growing consumption rates. Water stress is further compounded by wasteful and polluting trends in economic development, as well as the effects of climate change.

For several years now, the World Economic Forum (WEF) has positioned the water crisis as one of the major global risks. Water professionals and scientists are signalling that an even more serious water crisis is imminent. Water scarcity is affecting more and more countries, and impairing their development. Water is a source of tensions at the local level, between water users, and between countries. However, water is also a powerful vector of cooperation and an instrument of peace. Many international treaties have been signed to improve transboundary water cooperation and water management.

Against this background, in 2015, Switzerland and fourteen co-convening countries launched the Global High-Level Panel on Water and Peace. The Geneva Water Hub, a then new expert body established in Geneva, was designated as the Panel's Secretariat. In 2017 the Panel produced its report – with a telling title: “A Matter of Survival”. The analysis and recommendations of the Panel's report have been presented and discussed worldwide, including in Russia. In September 2018, the State Duma of the Russian Federation hosted important discussions on water, in partnership with the International Association of Lake Regions.

This partnership continues. In the follow-up to the enriching discussions of 2018, we prepared the present publication: “The Drama of Water in a Time of Global Transformation”. It consists of a trilateral dialogue between Russian experts, the International Association of Lake Regions, as well as the Geneva Water Hub and partner experts. It is intended for use as a reference document by actors in the hydropolitics arena. Thirty-eight prominent experts have made their contributions to this publication, which is organised in eight substantive chapters. Each chapter discusses specific aspects of water today and suggests ideas on innovative water diplomacy and effective management of water resources in the 21st century.

This book contains exciting explorations. It deals with the problems of water from a variety of angles and brings together the views of a wide array of water experts. It includes an extensive discussion highlighting the impressive water expertise in Russia, a vast country with some of the world's largest water reserves and a rich experience in water management and transboundary water cooperation. Furthermore, Russia, like the rest of the world, objectively evaluates global and regional trends in future water resource management and continues to participate in in-depth discussions on water policy.

We hope that this book will provide a useful contribution to the work of water experts, to the deliberations of decision-makers, and to the efforts of non-governmental organisations. It is informed by a vision of equitable and cooperative water resource management and protection, necessary elements for sustainable development and a peaceful future for the world.

Danilo TÜRK

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Alexander TIMCHENKO

SYNOPSIS

This is a book about exciting explorations. It deals with water from a variety of angles and geographies: it concentrates on the experience of Russia, a country that holds the world's largest water reserves. It benefits from a rich experience in water management and transboundary water cooperation yet also faces critical problems of future water governance.

A number of prominent experts have made contributions to this book. These contributions are organised in eight substantive chapters – each one discusses specific aspects of water today and shares insightful ideas for the future.

CHAPTER I: “21ST CENTURY INTERNATIONAL WATER DIPLOMACY: THE DRAMA OF WATER”

This Chapter presents a “broad-brush” picture of discussions, held both in Russia and internationally, about the key problems of water today.

In the opening section, “*The Global Agenda on Water and Peace*”, Danilo Türk and François Münger introduce the themes of the book and present some of the main conclusions of the Global High Level Panel on Water and Peace (2015 - 2017). They argue in favour of a global approach to the issues of water and water cooperation.

This section is followed by a specific focus on the “*Strategy to Preserve the Great Lakes of Eurasia and to Improve the Management of their Resources*”, written by Alexander N. Timchenko. It is paradoxical that the Greater Lakes of Eurasia are still relatively unknown globally, despite representing one of the largest reservoirs of freshwater on earth. The author explains the development potential and current problems of water management in the area, including the transboundary water cooperation. An emphasis is placed on the importance of local and regional actors in water management and problem solving.

In the section “*Impact of Climate Change on Water Resources of the World and Russia*”, Victor I. Danilov-Daniliyan explains that the long existing problems of water use and water management are only exacerbated by the current climate change, not created by it. He argues in favour of a more effective and nationally coordinated approach to water governance, and calls for a more efficient use of existing technologies to deal with the problems of water shortages and water quality.

The next section, by Stanislav I Chernyavsky, “*Water diplomacy of Russia During the Global Water Crisis*” argues in favour of a comprehensive understanding of the concept of diplomacy, one that should

proceed from the “culture of blue peace”, based on the environmental rights of citizens and their comprehensive environmental education. This approach retains the centrality of sovereign state in water diplomacy and, in addition, argues for a strong role of local actors including non-governmental organizations.

In his “*Multilateral Framework on Water Negotiations in the Middle East*”, Andrey G. Baklanov presents a succinct analysis of negotiations on water in the context of the Middle East Peace Process in the 1990s. He explains the dynamic and content of the negotiations as well as the obstacles that prevented those negotiations to succeed.

Anastasia B. Likhacheva discusses the “*Strategic Approaches to Solving Water Problems: Opportunities for Russia*”. She underlines potential solutions for water-intensive processes, and particularly, food production. She also examines technological and financial innovations, including “blue financing” in emergencies.

CHAPTER II: INTERNATIONAL LEGAL FRAMEWORKS

This Chapter relates to peaceful cooperation, to protection of water in armed conflicts and to the prevention of armed conflicts.

In the first section, “*Transboundary Water Resources and International Law: Basic Features of International Law*” Mara Tignino explains the objectives and legal contents of two global UN conventions: the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) and the UN Convention on the Law of the Non-Navigational Uses of International Watercourses (1997). Their application constitutes the basic international legal platform for water cooperation among states.

In the second section Mara Tignino presents the “*Geneva List of Principles on the Protection of Water Infrastructure*”. The “Geneva List” is a systematic code of principles and norms of international humanitarian law, environmental and human rights law applicable in armed conflicts, aiming at protection water resources and installations that are vital for civilians. It is important for all the relevant norms to be understood as a system. This is particularly necessary in contemporary armed conflicts which are often characterized by attacks against water resources and infrastructure.

In the third section Vladimir V. Kochetkov reflects upon “*Water Wars: Water Scarcity as a Cause of International Conflicts*”. He presents a detailed

classification of water conflicts and highlights the main factors that threaten international watercourses as well as the need to look beyond the obvious reasons for conflict. The real water-related reasons are often hidden behind the familiar political explanations. He argues in favour of preventive, diplomatic approach to the problem of water related armed conflicts.

In the fourth section of this chapter [Alexandra V. Kachalova presents the “Specific Features of the Negotiations Process for the Convention on the Legal Status of the Caspian Sea”](#). This convention, concluded in 2018, is a result of two decades of negotiations coupled with an expanded cooperation among the five riparian countries and represents a remarkable success. It evolved from early general commitment to cooperation through a series of partial agreements and understandings to the point of the comprehensive Convention of 2018. That Convention successfully combined the concepts of the international law of the sea and other relevant concepts of international law. It ensured security and cooperation among the State parties as well as better environmental protection of the area.

In the final section, [Dmitry V. Malyshev discusses the “Water Problems in Central Asia and Preventive ways to Solve Them”](#). After the dissolution of the Soviet Union it became necessary to arrange water cooperation among the two upper riparian countries of Central Asia (Kyrgyzstan and Tajikistan) and the three lower riparian countries (Kazakhstan, Uzbekistan and Turkmenistan) in a new manner, taking into account the legitimate interest of all. The first model of cooperation, developed to protect the Aral Sea was moderately successful, although it could not solve the problem. The tension between the needs of the upper riparian countries to generate electricity and of the lower riparian countries to use water from the transboundary watercourses for human consumption and agriculture is continuing. The work of the UN Regional Centre for Preventive Diplomacy and of Russia could lead the facilitation process aiming at a solution.

CHAPTER III: KEY ELEMENTS OF WATER GOVERNANCE: QUALITY AND QUANTITY

In the first section, [François Münger discusses the “Role of Water Data Governance in Peace and Development, and the Need for a Better Understanding of Aquifer Basins”](#). Strengthening the knowledge base and drafting data-driven policies are essential to successful water management. Producing, collecting, treating and modelling data is a key task in this regard. Water knowledge – and particularly the understanding of aquifers – will be of great importance to the pursuit

of UN Sustainable Goal 6 and for international water cooperation. The use of smart technology, digitalization and modelling are critical, and will have to include cybersecurity as an important component.

In the second section [Anton O. Kulbachevsky discusses “Water Resources of the City of Moscow: Modern Challenges and the Ways to Solve Them”](#). As a fast growing metropolis of 12.7 million inhabitants, Moscow is giving high priority to its water management, improving water quality and measuring the available quantities and treatment of wastewater. In this context, the use of chlorine was abandoned, ozone sorption was introduced, and water monitoring was improved. Data on water quality and quantity are now available in real time. The current development is leading to full integration of smart technologies and to making Moscow one of the best smart cities in the world.

In the third section [Yulia V. Babina discusses the “Information and Legal Services for Water Resources Management and the Water Industry”](#). The issues of information and legal support for the use and protection of surface water bodies in the context of land relations are considered on the basis of the concept of “inseparability of water and land.” The practitioners need to manage water and land resources in a coordinated way and pay special attention to water. Examples of legislation and adjudication are discussed in this section. Special attention is paid to the evolving practices of the use of land, the regulation of construction activities and the need to protect water resources.

The fourth section, prepared by [Dmitry O. Sivakov focuses on “Transboundary Groundwater as the Object of Legal Relations”](#). Transboundary groundwater is not at the forefront of legal regulation, whether national or international. However, international soft law contains norms – such as the precautionary principle of the Berlin Rules on Water Resources – that allow further regulation of the use and protection of groundwater. These soft law rules and objectives are reflected in several treaties of Russian Federation with the neighbouring states. This legal approach is important for the reasonable use of groundwater.

The fifth section by [Nikolay I. Koronkevich, Alexander G. Georgiadi and Elena A. Barabanova, deals with the “Transboundary Water Exchange in Russia”](#). The authors discuss the practice in the Russian Federation, a vast country of great geographic diversity. This has led to a rich practice of arrangements both between the entities of the Federation and with the neighbouring states. These arrangements relate to water exchange, including water allocation and compensation as well

as exchange of information on water quality and pollution. Problems of comprehensive monitoring and predictions regarding water quantity and quality are among the main issues to be resolved.

The last section of this chapter discusses the “GCC Unified Water Strategy in Terms of Political Contradiction.” Elmira E. Imamkulieva and Murad Sadygzade analyse the unified strategy in the Arab Gulf countries. These countries are confronted with severe water stress and, at the same time, the requirements of their rapid modernisation, urbanisation and population growth. Political tensions among them create obstacles to the cooperation required by their development. The “GCC Unified Water Strategy” of 2016, valid through 2035, is an important step forward and a complement to the national water strategies of GCC members. However, its implementation will require a better level of political understanding and cooperation among GCC member states.

CHAPTER IV: PEOPLE’S DIPLOMACY

In the first section of this chapter, Denis Lanzaova discusses “Regional and Intersectoral Aspects of Water Resources Management.” Water use by transnational companies often leads to tensions and disputes, particularly at the level of local populations who might be negatively affected by the reduction of water supply, by pollution and other impacts of investments. The relevant international conventions contain rules applicable to states and not to companies. Hence the need arises for additional standards or certification schemes, such as those used by large-scale mining projects. Current discussions facilitated by the Geneva Water Hub aim at the adoption of “high-bar standards” for companies to reduce water-related risks. “Safe space discussions” with investors can help ensure responsible decision-making and reduce the potential for tensions and disputes.

In the second section, Jean Willemin discusses the “Dynamics between the Development of River Basins and Local Development”. Water management at the level of river basins has a strong and direct effect on the local community level. While water management typically requires national or regional decisions, local-level perspectives need to also be involved. In some regions, such as in the Sahel, this constitutes a particularly difficult task. However, the Senegal River Basin Organization (OMVS) sets an excellent example of integrated management involving all four riparian states. It gives heed to the voices of the local communities, and represents a model that can inspire other regions. Finally, he outlines a project under development entitled “Voices of the River: Pathways to Peace”. It will employ the power of art and culture to engage in creative reflections and dialogues between local communities, technical experts, and decision-makers along the River Senegal basin. It will

lead to productions with renowned artists, community discussions, and innovative project proposals. The project will help raise local voices and concerns to the international level, starting with the World Water Forum in Dakar in 2022.

In the final section of this chapter Jeanna A. Balonishnikova addresses “Water Resources of Russian Regions for Sustainable Economic Development and Guaranteed Water Supply to the Population”. She discusses how water consumption data reveals growing demands by both the economy and the people. In Russia this has led to the development of basin management projects in accordance with the Methodological Recommendations for Development of Schemes for the Integrated Use and Protection of Water Bodies (SKIOVO) provided by the Government in 2007. Implementing these projects has highlighted new needs, such as the inclusion of different social groups in water management and planning.

CHAPTER V: THE ROLE OF FINANCIAL SYSTEM AND INNOVATIVE BLENDED FINANCE IN UNLOCKING SUSTAINABLE BLUE INVESTMENTS

The first section of this chapter, by Isabella Pagotto is devoted to “Promoting Shades of Blue in Transformative Sustainable Finance”. Water is a fundamental factor in development and should be approached as such. This should be reflected in the design of water projects and their financing. Therefore, projects should be focused on water basins rather than on purely domestic and sectorial water development. The key is to prepare joint investment plans and blending public and private finance to enable risk reduction. Projects in transboundary water cooperation also represent a means to reduce the potential of tensions and future conflicts. Additional financial instruments such as “Blue Peace Bonds” would help move this investment strategy forward.

The second section is devoted to “Financial Innovation for Water Cooperation”. Sybille Chevalier discusses innovation in the context of sustainable financing that includes issuing green bonds and sustainability-linked loans. This practice has already become a strong trend in the current evolution of development of financing. Investing or paying for watershed services, using a “pay for success” approach as well as blended finance represent other possibilities of financing water projects. The potential use of innovative financial approaches is constrained by limited capacity and lack of autonomy of river basin organizations. These organisations should be supported to develop their capacity to access the existing and innovative financial resources.

In the third section Yulia B. Merzlikina discusses “Financing Solution for Water Problems in Russia: Current Situation, Trends and Perspectives”. Her main focus is on the development of the “user pays” principle in relation to water bodies. In the past decades water development in Russia has been mainly dependent

on public financing either in the form of subsidies or targeted program financing. Payment for water use in Russia has a varied history – from water tax to non-tax payment for water use. The current developments are showing positive results of the payment for water use, while the targeted water project financing (for example for Volga River and Lake Baikal) will require further efforts. Transboundary water cooperation, in several cases subject to international arrangements with the neighbouring countries, will also require innovation in the field of financing.

In the final section of this chapter Ilya A. Stepanov discusses “Prospects for the Development of Green Finance in Russia”. He offers a critical assessment of current developments in the field of green finance and of the rapid expansion of the market of green bonds. The latter is relevant to a variety of water projects. Different sectors of Russia, including companies and banks, are developing their approach to green finance. The early experiences with the development of Russian railways shows that there is considerable potential, particularly in light of the need to reduce greenhouse gas emissions at low cost, to improve the energy infrastructure, and to further develop its hydroelectric capacity. This will require setting ambitious development goals and further developing regulative infrastructure.

CHAPTER VI: GLOBAL ANALYTICS PLATFORM AND A NEW VISION OF WATER DIPLOMACY

In the first section of this chapter, Natasha Carmi discusses “A Global Platform for Cooperation on Water and Peace”. While a number of international institutions are dealing with water issues, there is still a deficit of agency, i.e. the capacity to engage in a transformative process that would make international water action a greater priority. The Global High-Level Panel on Water and Peace has proposed the creation of a Global Observatory on Water and Peace – i.e. a global network of various entities or “nodes” with the purpose of energising international action. The Observatory was launched in 2019 and includes two types of nodes: one focusing on specific needs at the regional-level, and another addressing the societal-level, emphasizing the broader mobilisation of actors to engage with water as an instrument of peace.

In the second section, “Russia in Future Water Diplomacy Structures” Stanislav I. Chernyavsky discusses the experience and vision of Russia regarding international water cooperation at the global level. The UN system is central in this analysis, although individual UN programs, funds or agencies, such as UNEP, cannot do all the work. It is also necessary to balance the international cooperation with the primary responsibility of sovereign States and ensure a higher level of scientific and technical assistance available to developing countries. The UN system should be able

to provide such assistance, including through a well-organised and comprehensive global water database. The author supports the proposal made in the report of the Global High Level Panel on Water and Peace in 2017 to convene a Global Conference on Water Cooperation.

CHAPTER VII: NEW GLOBAL CHALLENGES IN WATER CRISIS

In the first section of this chapter, Vera I. Smorchkova, Valdimir I. Ivanov and Nadezhda K. Kharlampieva discuss “Water Resource of the Russian Arctic: Current Knowledge, Problems of Protection and Perspectives for Cooperation”. The Arctic area is characterised by specific climatic, natural circumstances and socio economic conditions that make research activity more difficult than in other areas. Data about water quantity and quality in the estuaries of rivers emptying into the Arctic Ocean is less researched than other comparable areas. In addition, the legal regulation relating to the Russian Arctic needs to be developed further. The experience of scientific cooperation within the Arctic Council is promising, notwithstanding the difficulties facing researchers in all the Arctic areas.

In the second section, Alexander A. Startsev discusses “The Role of Natural Forests in Overcoming the Global Water Crisis”. This detailed discussion, based on the solid scientific findings regarding the vital role of the world’s forests explains the importance of forests for the global water cycle and the disastrous consequences that may result from the imbalance created by serious degradation of forest space. Pristine forests are a key part of the “biotic pump” that ensures the circulation of moisture in the atmosphere and sustains the world’s ecosystems. There is no substitute for healthy forests. Therefore, every effort should be made, nationally and internationally, to preserve forests, to eliminate their destruction and rationalise development of commercial forests around the world.

The third section by Léna Salamé is devoted to “Universities Partnership for Water Cooperation and Diplomacy”. She focuses on the experience of the Geneva Water Hub and the University of Geneva. Together they have built the Universities’ Partnership for Water Cooperation and Diplomacy (UPWCD), a platform led by knowledge partners and a “one-stop-shop” where experts, diplomats, policy makers and students can share and access information about relevant activities, co-develop research and education, and jointly support professional training in this field. The initiative involves a growing number of partners and visitors, as well as a massive online open course (MOOC) on water cooperation and diplomacy.

The final section of this chapter is devoted to the “Potential of the International Education, Research and Development Centre “Integrated Water Resources Management (IWRM)”: Water Resources management

in Regions of the Middle East and North Africa”. Elena V. Savenkova, Anna I. Kurbatova, Anastasia S. Milutka and Alena N. Basamykina describe the profile and the main goals and objectives of an interesting project at the Peoples’ Friendship University of Russia (RUDN). The project is led by the RUDN’s Faculty of Ecology and combines research with cooperation, involving the scientific and research potential of the Middle East and North Africa. It focuses on the nexus of water, agriculture, food and energy.

CHAPTER VIII: WATER AND PEACE FOR THE FUTURE GENERATIONS ON EARTH

This chapter includes a single yet very important section – devoted to the involvement of young people

in water. Hasmik Barseghyan and Petr Vesnovskii discuss “Youth in Water and Peace” with a particular focus on the European Youth Parliament for Water (EYPW). The EYPW has started to explore the policy orientation of river basins as backbones of regional development. Young participants from various European countries, including Russia, as well as Georgia, Turkey and Armenia show all the understanding, readiness, and ability required to engage with the complex links between water and peace. What they need is to be empowered. There are already grassroots activities involving or initiated by the youth, and in some river basin organisations youth representatives have a consultative status. Young people insist that water, including transboundary water, should be managed on a democratic basis and should enable citizens, especially young people, to take part in the process.



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PARTNERS

The International Association of Lake Regions (MAOR) is the only public organization in Russia addressing environmentally sustainable and innovative development of the lake regions of Russia and Eurasia.

It was established in 2017. Its creation was instigated by the need to combine the efforts of state institutions, public organizations, educational and research centers, business communities and cultural organizations to draw attention to the problems of lake regions and to work together to solve them.

The prime objective of the Association is to mobilize the efforts of a wide range of participants in Russia and Eurasia, as a whole, in the urgent development and implementation of measures for the restoration, reasonable use and protection of lakes and surrounding regions.

The International Association of Lake Regions bases its activities on the national legislation of the Russian Federation, regions and country-members and international agreements on water resources.

The Association is very active and has been recognized by many national and international organizations, including in the UN system. Over the past four years, the Association's cooperation with the Geneva Water Hub, UNEP, WHO, as well as the limnology centers of Switzerland, Italy, Germany, Finland and France has helped strengthen the image of Russia as a water-saving country. It has also increased the level of public diplomacy related to considering and resolving Eurasian water problems. Detailed information on the activities of the Association can be obtained on the website: www.interlaker.org.

The Geneva Water Hub was established in 2014 with the support of the Swiss Agency for Development and Cooperation and the University of Geneva, following the launch of a Blue Peace Movement, within the framework of the strong engagement of Switzerland on Water resources, more specifically on the SDG 6.

The aim of the Geneva Water Hub (GWH) is to foster a better understanding and prevention of water-related tensions at intersectoral and transboundary levels – thereby promoting sound water management as an instrument of peace and cooperation. The GWH works to build bridges between different communities of practices and to leverage resources available in the International community based in Geneva (the so called 'International Geneva') in order to develop a "hydro-politics" agenda. Having the GWH as part of the International Geneva community ensures reflections on water are embedded within the development, humanitarian and peace agendas.

Since 2014, the GWH is a leading actor contributing to overcome the global lack of capacities and expertise to address the gigantic challenges related to the water-peace-security nexus. It builds up the understanding, skills and behavior of academia, practitioners and policy makers and foster synergies between these groups.

Capitalizing on this unique positioning, the GWH acted as Secretariat of the Global High-Level Panel on Water and Peace, an initiative launched in November 2015 in Geneva by 15 co-convening countries with the mandate to develop recommendations aimed at preventing and resolving water-related conflicts, and at making water an instrument of peace.

In September 2017, "A Matter of Survival", the final report of the Panel was launched in Geneva and New York. The GWH now plays a key role in the dissemination of the report and in supporting the implementation of several key recommendations.

The GWH aims to trigger connections and bridges between three major political agendas that consistently remain independent from one to another: (1) the sustainable development agenda, (2) the sustainable peace agenda and (3) the humanitarian agenda.

Influential actor with a transversal approach, the GWH positions water as a vector for peace, an instrument of international cooperation and conflict prevention.



CHAPTER I:

21ST CENTURY INTERNATIONAL WATER DIPLOMACY:
THE DRAMA OF WATER

1.1 THE GLOBAL AGENDA ON WATER AND PEACE: WATER DIPLOMACY AS A PROVEN SOLUTION FOR NEW CHALLENGES



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DEVELOPMENT OF THE WATER-PEACE NEXUS/AGENDA

Competition for limited freshwater resources is rising at an alarming rate due to various factors, including drastic increases in water demand for food, security, and energy consumption, coupled with pollution and inefficient uses of resources. Climate change increases the erratic nature of water availability. This in turn increases the tensions and competitions among the various users of freshwater resources.

Over the past years, there have been increasing warnings about the possibility of water conflicts and water shortage coupled with poverty and societal instability could weaken intra-state cohesion and fuel inter-state conflicts. At the local level, we see the emergence of increasing intersectoral conflicts. The majority of disputes are complex and multifactorial, but can also be expressed as water issues. On the other hand, water is also a tool for cooperation, and is the subject of well-documented agreements and joint commissions, often at the level of basins or regions.

The water-peace discourse exists between the two poles of conflict and cooperation, and is built around two key objectives:

- preventing water-related conflicts
- leveraging water as an instrument of peace.

This discourse is meant to strengthen the linkage between the existing Sustainable Development Goals SDG6 and SDG16. It has been developed through the interactive dynamics through three main initiatives:

- 1. The Blue Peace Movement:** Blue Peace refers to water cooperation across borders, sectors and generations to foster peace, stability and sustainable development. Blue Peace turns competition over limited freshwater resources into collaboration, resulting in more peaceful, cohesive and sustainable societies. The Blue Peace Movement brings a cooperative approach, and uses a variety of diplomatic, political, technical and financial tools, to advocate for creative and innovative thinking on how to use, manage and invest in water resources (Blue Peace, n.d)
- 2. The Geneva Water Hub (GWH):** Focusing on the positive vision of water being a theme for collaboration and an instrument of peace, the GWH was established in 2014 with the support of the Swiss Agency for Development and Cooperation (SDC) and

the University of Geneva. The Hub aims to develop the hydropolitics agenda to help prevent water-related conflicts at intersectoral and transboundary levels at an early stage, and to promote water as an instrument of peace and cooperation, through its three main functions, that of: advocacy, think tank, and research & education (Geneva Water Hub, 2020).

- 3. The Global High-Level Panel on Water and Peace (GHLPPW):** On the 16th of November 2015, the GHLPPW was launched, supported by fifteen co-convening countries, with the Geneva Water Hub as secretariat. The Panel was mandated to develop a set of recommendations aimed at strengthening the global architecture surrounding preventing and resolving water-related conflicts. This was outlined, two years later, in the report “A Matter of Survival” (GHLPPW, 2017), cooperation is a central pillar throughout the report. This is the first time that a reflection of this magnitude has been launched on the issue of water and peace. The report addresses and frames the issue of water and peace through seven major chapters of recommendations.

WATER COOPERATION AND DIPLOMACY

There are many links between water and peace. Water management and trans-boundary water cooperation are important instruments of economic and social development, of friendly relations among nations and of peace. Good practices, both those within sovereign states and the ones requiring cooperation among the riparian countries can inspire and help resolve problems of water governance and trans-boundary water cooperation. They should be studied and applied wherever possible. It is clear that no two water situations are exactly the same. However, experience gained in one situation can be of help to experts and decision makers in others.

Sometimes long-lasting disputes among riparian countries lead to friction and dispute - as currently observed along the River Nile. It should be borne in mind, however, that major international rivers have historically been subject to international legal regulation relating to navigation, fishing, irrigation and energy use and, more recently, protection of environment. International law and water diplomacy offer valuable experience in addressing such situations, as well as for developing adequate, “tailor made” legal arrangements for each international river and for making water cooperation an instrument of peace.

The current era is witnessing a disturbing rise in problems resulting from global warming, which can often lead to threats to peace. Long periods of drought, particularly in parts of Africa and the Middle East have created situations of mass population displacements and fierce struggles over water resources, leading to social instability, political tensions and, in some cases, to armed conflicts. In the armed conflicts of our era water is frequently used as a weapon of war and water resources and installations are often objects of armed attacks. The UN Security Council has been called upon to address a number of such situations. They have proven to be extremely difficult to resolve. The importance of respecting and observing international humanitarian law in contemporary armed conflicts cannot be overemphasized.

Water diplomacy, following the global agenda on water and peace has to include all the aspects mentioned above. Importantly, it must also include the necessary activities at the multilateral and diplomatic levels required to address these water issues. The Sustainable Development Goals (SDGs), adopted at the United Nations in 2015, include SDG 6, aiming to “Ensure availability and sustainable management of water and sanitation for all” (UN, 2015). This goal was intended to be achieved by 2030, but it is clear now that its implementation is seriously off-track. Water diplomacy today must therefore include serious efforts to accelerate international cooperation needed to improve water management and progress towards achievement of the SDG 6. This task goes beyond diplomacy of trans-boundary water cooperation. It is among the core activities of the United Nations.

Water diplomacy today must include all levels of international cooperation: bilateral, regional and global. It must serve the task of generating the political will for improved water management and water cooperation. Furthermore, it must help develop institutional and human capacities for delivery of hydrological products and services as well as a global information platform to help understand water quantity and quality problems across the world. Although these tasks look technical at first glance, they cannot be accomplished without adequate diplomatic support. Climate change is expressed largely through water phenomena, including floods and droughts and it recognises no borders. It has to be addressed globally, through multilateral water diplomacy.

The critical importance and multifaceted role of water is being increasingly supported by the UN, which proclaimed, in 2018, the International Water Action Decade (2018-2028). The UN General Assembly has already decided to convene a mid-term review of the Decade in 2023, through a high-level conference in New York under the auspices of the General Assembly (UN Water, n.d.). This will be an important moment in the evolution of water diplomacy. It will be the first major UN conference on water since the 1977 UN water conference held in Mar del Plata, Argentina (UN,

1977). While the Mar del Plata conference developed the concept of “integrated water management”, helping states devise their domestic policies, the 2023 conference will develop a platform for global action to address the growing global problems of water scarcity, water disasters and water management at a time of increasing global warming effects.

Problems related to water and water diplomacy are also being discussed at the regional level. In Europe and Eurasia, the European Union and the Organization for Security and Cooperation in Europe (OSCE) are increasingly active in water diplomacy. It is expected that the experience gained in the Eurasian space will help addressing the current problems in the region and also serve as an example of successful water management and international cooperation to other parts of the world. Water diplomacy today must draw from the entire range of its rich history and add new urgency to addressing water problems of an increasingly water sensitive and fragile world.

LOCAL WATER CONFLICTS IN THE GLOBAL AGENDA

The last five years have seen greater commitment to the water and peace nexus through initiatives that have included the Geneva Water Hub, the Global High-Level panel on Water and Peace, several international and UN actors, as well as regional and local partners. Essential and vital water resources can be a source of conflict or crisis between nations that share the same basin, or between different usages, such as in mining extraction¹ or the construction of large dams². This in turn affects the use of water by local populations for their livelihood. On the other hand, the management of water resources is a formidable instrument of cooperation and peace. The tensions, conflicts and risks of local conflicts linked to the different uses of water are a particularly sensitive issue, concerning the sovereignty of States.

In a globalized economy, international instruments exist to reduce the risk of occurrence of such local tensions. There are a number of initiatives that engage the social and environmental responsibility of the private sector and in particular of multinationals, such as the UN Global Compact, the CEO water mandate, international non-governmental, independent organizations such as the Alliance for Water Stewardship, or those establishing international standards, such as those being currently developed in the mining sector. The investments and framework of sustainable finance are undoubtedly keys to mitigate the risk of local tensions.

At the local level, multi-stakeholder mechanisms with strong local population involvement and transparent dialogue mechanisms with key partners are needed to reduce risks or respond to existing water conflicts. This is addressed in the recommendations of the Global

¹ Mining affects freshwater basins through the use of water for ore processing and through pollution from discharges of mine effluent. Environmental and social impacts of mining have been well-documented in an ample scientific literature. If progresses have been realized much remains to be done. A new current challenge is certainly the social and environmental responsibility in the extraction of mineral such as lithium that are key for sustainable development

² More than 3,500 hydropower dams are being planned or built around the world, according to a database maintained by Christiane Zarfl (and others) at the University of Tübingen and Global Dam Watch. This could double by 2030.

High-Level Panel on Water and Peace under the title of People's Diplomacy, Inter-Sectoral Water Management and Decision Making (GHLPPW, 2017).

Under the title of local "Blue peace" voices, the Geneva Water Hub and several of its partners stress the importance of including the vision of the local populations in all the major water developments at the regional and basin level. Basin agencies are particularly well-positioned to do this through models such as regional investment plans.

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1.2 CALL FOR A STRATEGY TO PRESERVE THE GREAT LAKES OF EURASIA AND TO IMPROVE THE MANAGEMENT OF THEIR RESOURCES



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“... time will come when people will have to take the responsibility for the development of both man and nature.” –Vladimir I. Vernadsky

LAKES AND THE GLOBAL WATER CRISIS

Every day, media reports bring disturbing news about the shortage of drinking water and its dramatic consequences for the life and health of people, the environment, the economy, international relations, and the internal political situation of many countries. Experts say that this is only the beginning of a universal disaster. According to the Organization for Economic Cooperation and Development, “the projected population of the earth will reach 9.7 billion in 2050; by that time, approximately 3.9 billion, or over 40% of the global population, is projected to be living in river basins under severe water stress” (OECD, 2012).

According to scientists, most fresh water – about 68% of all of the earth’s reserves – is contained in mountain glaciers and in the Arctic and Antarctic ice caps. Furthermore, thirty percent of fresh water is groundwater and only 0.3% is surface fresh water. Of this 0.3 % that is surface water, freshwater lakes constitute 87% of the total volume, and rivers and swamps constitute 2% and 11%, respectively. The fresh water contained in lakes is distributed as follows: about 29% of lake fresh water is contained in the African Great Lakes, 22% in Lake Baikal in Russia, 21% in the North American Great Lakes, and 28% in other lakes (Gleick, 1996). In Russia, lakes Ladoga, Onega, Chudskoe with Pskov, Teletskoe, Khanka, Taimyr, Ilmen, and many others also have large reserves of fresh water (Rumyantsev, Izmailova, & Kryukov, 2018).

Many people know the names of the great rivers of the world, but surprisingly, ignorance remains with regards to the great lakes, despite their potential to help solve the water crisis. For example, here are the names of just a few of the great lakes located in Eurasia: Balkhash and Zaisan in Kazakhstan; Issyk-Kul in Kyrgyzstan; Ubsu-Nur on the border of Russia and Mongolia; Khanka on the border of China and Russia; Naroch in Belarus; Balaton in Hungary; Leman and Neuchatel in Switzerland; Como and Garda in Italy; and Saimaa in Finland.

The theme of the protection of water resources, and in particular lakes, has been repeatedly discussed at representative global and regional conferences. The fundamental documents and milestones on the way to solving the global water problem are the following:

- the International Conference on Water and Environment, Dublin, 1992
- the UN Conference on Environment and Development

(“Earth Summit”), Rio de Janeiro, Brazil, June 1992.

- the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention), 1992
- the “Global Water Outlook” report, developed by the International Water Management Institute, 1999
- the World Summit on Sustainable Development, Johannesburg, 2002
- “World Lake Vision: A Call to Action” by the International Lake Environment Committee Foundation, 2003

Participants of the international roundtable “Great lakes of Eurasia”, held in September 2018 in Moscow, emphasized that “the great lakes of Eurasia play an important role in the economic, ecological, aesthetic, cultural, and educational development of the regions. At the same time, pollution, shallowing, and even the death of a number of lakes cause concern and anxiety. The disappearance of the Aral Sea is a sad example of irreparable loss. Over the past century, thousands of large and small lakes have disappeared from the surface of the Earth. This negative trend continues to this day” (Great Lakes of Eurasia, 2018).

At present, sharply aggravated by climatic changes, the global water crisis and the shortage of drinking water have affected the lake regions of Russia and Eurasia as a whole. Being readily available sources of fresh water, lakes experience a huge anthropogenic impact on their ecosystems, which ultimately leads to their degradation, environmental disasters, and a decrease in quality of life and human health. The lake regions are home to hundreds of millions of people in Eurasia; they are large industrial, economic, recreational, and tourist centers, the prosperity of which will largely depend on the environmentally sustainable development of the lakes. It can be said with confidence that the future of the nations and countries of Eurasia is closely related to the conservation and protection of lakes.

ON THE SIDELINES OF NATIONAL STRATEGIES

The problem of the conservation and restoration of lakes in most countries in Eurasia remains largely ignored by the national ecological and socio-economic policies of the states. Without proper attention and support from governments, lakes and lake regions lose their pristine, fundamental values and their

attractiveness for the population. Unfortunately, today we are seeing an infringement of the harmony in relationships between lakes and society. In most countries and regions, the scale of exploitation of lakes exceeds the permissible norms and limits, creating environmental problems and the threat of lake degradation, as well as decreases in their biological productivity. The following are the growing risks for the Eurasian lakes and their basins:

- lack of long-term policies, programs, and common principles for lake management
- exorbitant withdrawal of water for industrial, urban, and agricultural purposes
- shortage, and in some cases unavailability, of wastewater treatment facilities
- uncontrolled extraction of biological resources and fish stocks
- deforestation in the coastal zone
- low level, or complete absence of, environmental monitoring of lakes and their basins
- low level of competencies of managers and specialists of public institutions and private companies in the field of environmental protection and ecological safety of lakes
- insufficient environmental education and public awareness.

It should be especially noted that two-thirds of the lakes of Eurasia are concentrated in the Arctic regions. Due to the high sensitivity of northern water bodies to anthropogenic impact, the implementation of existing plans for industrial development of the Arctic can lead to catastrophic consequences for aquatic ecosystems (Rumyantsev et al., 2018). This warning from scientists should be highlighted in the sustainable development strategies of businesses operating in the Arctic zone.

A CALL TO ACTION

The International Association of Lake Regions is convinced that the lakes and lake regions of Russia, like other countries of Eurasia, urgently need dynamic political support from the government. This support should be based on a clear and well-defined strategy, supported by specific mechanisms for its implementation.

The experience of a number of foreign countries confirms the effectiveness of their national and regional strategies for sustainable development of lakes and lake regions. One example of success is the Great Lakes Strategy of North America, developed for the five lakes on the border between the United States and Canada. This strategy is aimed at maintenance and long-term protection and restoration of the biological resources of these lakes, as well as the sustainable and innovative development of the regions located on their shores. These strategies apply to all stakeholders and include ministries of countries, regional governments, environmental agencies, pollution control agencies, the US Army Corps of Engineers, universities, foundations,

and the business community. Strategy implementation is carried out at all levels, from state, provincial, tribal (indigenous), and municipal levels, to lake-wide initiatives and projects of local communities, industries, and households. Another example of best practice is the cross-border cooperation between the governments of Switzerland and France for the protection and management of Lake Lemman, which has led to a dramatic cutback of pollution levels, making the lake safe to swim in.

Based on our accumulated experience, our association believes that the strategy for the sustainable development of lakes and lake regions should be based on the transition to a green economy. This approach takes into account the limited resources of lakes, the need to increase the efficiency of their use, and, consequently, the overall efficiency of economic activity and the quality of life in the lake regions. In order to avoid the ecological degradation of lakes, which often leads to an increase in social tension, it is also necessary to increase responsibility for the use of their waters and biological resources. The strategy for the great lakes of Eurasia should be based on the following principles of sustainable development:

1. supremacy of sustainable development over short-term economic interests
2. preventive and precautionary approach to the management of biological resources of lakes
3. science-based approach combined with good practices and best available technologies in decision-making
4. people's diplomacy – the active involvement of citizens and public organizations in solving the problems of the lake regions
5. social and environmental responsibilities of business.

The strategy and programs for its implementation should become an integral part of the national project "Ecology". At the national and regional levels, the strategy could include, among others, the following components:

- legal framework for the protection, restoration, and development of lakes and their regions
- mechanisms for management and rational use of the biological resources of lakes
- technical solutions for efficient use of water for irrigation, industries, and municipalities
- wastewater treatment for lake basins
- social and economic valuation of water resources
- protection of forests and natural landscapes on the territory of the lake basins
- control and prevention of industrial air pollution
- land-use planning in order to preserve the lake basins
- establishment of protected areas in the lake basins
- prevention of risks to human health
- public-private partnerships
- creation of media and information platforms based

on the results of the environmental monitoring of lakes

- strengthening scientific and educational centers for collection, analysis, and dissemination of information on lake resources and management problems
- creation of educational, public awareness, and information programs dedicated to lakes

TRANSBOUNDARY LAKES AS A SOURCE OF PEACE AND COOPERATION

International cooperation plays an important role in the sustainable management of lake resources and lake regions of riparian countries. Russia has agreements regulating the use of transboundary water resources with Azerbaijan, Latvia, Lithuania, China, Kazakhstan, Estonia, and Finland. In 1992 Russia joined the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, which was signed by the country members of the UN Economic Commission for Europe (UNECE) in Helsinki. In 2018 the presidents of the five Caspian states signed the Convention on the Legal Status of the Caspian Sea, the work on which lasted more than 20 years. The Russian Federal Agency for Water Resources has been playing an important role in the field of international transboundary water cooperation. A successful example of resolving transboundary issues is the work of the Intergovernmental Fisheries Commission within the framework of the Russian-Estonian agreement on cooperation in the conservation and use of fish stocks in the Peipsi, Teplom, and Pskov lakes.

Moreover, according to experts from the UN University, “not only nations but provinces and communities will need to align water perspectives to allow for peaceful and effective integrated water resource management and sustainable use. Effective management will mean tackling neglected issues such as water wastage in current systems, which has been estimated to be up to 30%, common institutional dysfunction, unethical practices, poor accountability, and corruption in the water sectors of many countries” (Guppy & Anderson, 2017). The Geneva Water Hub is making an important contribution to developing approaches to water resources management and is helping countries to prevent water-related conflicts at the intersectoral and transboundary levels. Acting as the secretariat of the Global High-Level Panel on Water and Peace, the Geneva Water Hub is actively involved in developing water diplomacy and in promoting the “Blue Peace” concept.

THE ROLE OF PUBLIC DIPLOMACY

In recent years, an awareness of the importance of water resources protection, preservation, and sustainable development has proliferated widely all over the world. With the support of governments, a dialogue between all stakeholders is being strengthened and the involvement of business

communities in cooperation with environmental non-governmental organizations is growing. There are thousands of national and international lake protection associations around the world. The largest numbers of them are found in North America and Europe. They are also active in other regions, including in Africa, which hosts the well-known International Conference on the Great Lakes Region (ICGLR).

The International Association of Lake Regions was established in 2016. It started its activities in the Year of Ecology and received wide international support from the United Nations Environment Program, the United Nations Economic Commission for Europe, the World Health Organization, the UN-Habitat, the International Union for Conservation of Nature, the Government of the Russian Federation, regional environmental organizations in Central Asia, as well as scientific limnology centers and business communities in Russia, Kazakhstan, Kyrgyzstan, Uzbekistan, Belarus, Italy, Mongolia, Finland, France, and Switzerland. The prime objective of the International Association of Lake Regions is to promote and support sustainable and innovative development of the lake regions of Russia and Eurasia as a whole. It brings together the efforts of a wide range of participants for solving the problems of the lake regions. Together with partners from Eurasian countries, the International Association of Lake Regions has developed and implemented projects in the following areas:

- environmental monitoring of water quality and biological resources of lakes and their coastal zone, including such programs as “Clean shores of Eurasia” and “Passports of lake regions”
- promotion of innovative technologies and wastewater treatment systems for the municipal and industrial sectors
- public-private partnership for solving environmental problems of lake regions
- “Eco-Generation” program to strengthen ecological public culture and awareness of the population of lake regions with an emphasis on the younger generation
- ecosystems of lakeside regions and public health
- scientific and educational cooperation between universities, limnology centers, and institutions
- responsible ecotourism.

The International Lake Regions Association considers the need to develop and implement the Strategy for the Great lakes of Eurasia as a solution to breaking out of the vicious circle of lakes degradation and for the beginning of the restoration and conservation of lake resources. Strategy development should be implemented in close cooperation with the government and public organizations, environmental protection experts, and scientists, in order to make it real, understandable, and attractive for citizens inhabiting the lake regions. In the coming decades, the world will face the problem of adaption to the limited resources of our planet and, above all, to the shortage of fresh water. In these conditions, the Eurasian's Great Lakes Conservation Strategy aims to improve the quality of life of the population of lake regions,

enhance lake ecosystem risk management, and lay the foundation for a new Eurasian Lake Vision for the sake of future generations.

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1.3 IMPACT OF CLIMATE CHANGE ON WATER RESOURCES OF THE WORLD AND RUSSIA



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Changes in the global climate have a significant effect on water resources, but reliable forecasting of this impact on specific water bodies is hardly possible, for the near future. At present, only general trends can be described, and they are mostly unfavorable for the economy. However, climate change does not create new problems in connection with water resources and their use, but only exacerbates existing, usually long-known problems. Their solution requires very significant investments and concentration, mainly on intensive ways of development.

The impact of global climate change on water resources can only be assessed by taking into account their territorial distribution. This means that every landscape inhomogeneity should be taken into account, in terms of evaporation, reflectivity (albedo), filtration capacity, height above sea level, etc. Such a study requires a colossal amount of initial information, only a small part of which is contained in the archives of climate monitoring systems or could be reconstructed from indirect data. Still, the main difficulty is the unsolved scientific and methodological problems. It is not certain that some of the issues related to water resources forecasting under conditions of global climate change could, in principle, be scientifically answered in the foreseeable future.

It is only possible to comment on general trends arising from macro analysis (Kattsov & Semyonov, 2014) with a fairly high degree of reliability. However, when trying to extend these trends to specific regions, or to water bodies (and accordingly, resources), the degree of reliability immediately drops to medium or lower. What are these trends? First, the volume of total (global) annual precipitation increases. It is caused by the rise of evaporation from the earth's surface, primarily from the ocean, as a result of global warming. Second, a gap in the distribution of precipitation is growing. In regions of significant moisture, precipitation is likely to increase, and in arid regions, it will decrease. For the economy, such phenomena are undesirable due to the fact that an increase in precipitation will occur where it is not needed, and in low-water areas the climate may become even drier. Third, unfavorable changes in the precipitation regime in a number of regions are observed. This is especially noticed in inland regions, where short periods with very abundant precipitation are replaced by their long absence. Fourth, the already clear trend of an increasing number and severity of water-related natural disasters (e.g., floods, droughts, mudflows, and landslides) will continue. The third trend highlighted above shows the alternation of floods and droughts as a phenomenon,

which even has some regularity for specific regions. However, it does not end there. With the increasing instability of climatic processes, accompanied by weather anomalies of all kinds, flooding can occur where it has almost never happened previously.

Without a detailed analysis, it is clear that from an economic point of view, the situation regarding water resources will worsen more often than it will improve. Due to the first of the noted trends, the water reserves as a whole will undoubtedly increase. However, the second, third, and fourth trends will significantly complicate their use. Uneven precipitation and consequent runoff during the year can cause seasonal water shortages, even where the annual runoff is very significant and obviously covers water needs of the region.

Water consumption by industry and by the housing and communal sectors almost does not change from season to season, while the agricultural sector needs water primarily during the growing season. At the same time, the increase in runoff due to climate change is observed mainly in winter, unaligned with the needs of the agricultural sector. The construction of water reservoirs and sometimes of canals (including for inter-basin redistribution of runoff) could be helpful for balancing uneven precipitation. However, this can be extremely capital-intensive and, as a rule, ecologically not a harmless measure. For this reason, despite the low reliability of forecasts of the hydrological consequences of global climate change, this could serve as at least a preliminary idea for the measures that may turn out to be necessary in the coming two to three decades.

The shortage of fresh water around the world has worsened so much that it has become customary to characterize the current situation as a global water crisis (WWAP, 2019; Danilov-Danilyan, 2008). The economically available fresh water resources in the world are close to depletion. However, water consumption is not decreasing as the world's population continues to grow. Even with a stable population, an emerging economy tends to create additional demand for water. This refers to the use of fresh water by agriculture, industry, housing and communal services, and by other sectors of the economy that take water from surface and underground natural sources around the world in the amount of about four thousand km³ (four trillion m³) per year, and which discharge a huge amount of contaminated drainage.

Throughout the world as a whole, water resources are not used efficiently enough. Opportunities for rationalizing water consumption provided by advanced modern technologies, especially in the agricultural sector, are hardly available in developing countries that do not have the necessary investment resources for this. Russia, with its vast territory and an enviable amount of water resources, demonstrates a variety of both natural and economic conditions, as well as shortcomings, in water management. Russia's per capita water supply (almost 30,000 m³/person/year) is five times higher than the world average. However, the situation regarding the relationships between water supply and the economy and the population cannot be considered favorable. Objective reasons for this state of affairs are the characteristics of water resources, and subjective reasons are determined by the existing water management system. A pronounced unevenness in the geographical distribution of Russian water resources is well known to have negative consequences for the national economy.

In terms of water resources availability, the ratio between the Asian and European parts of the country is approximately 80 to 20, while in terms of population and economic indicators, the ratio is opposite. Seasonal irregularities are also typical characteristics of the country's water resources. For example, about 70% of river runoff occurs during floods in the second quarter of the year. Both geographic and seasonal irregularity should be reduced by the regulation of surface runoff via the construction of reservoirs to create water reserves (also needed for hydropower, river transportation, and recreation) and of channels for water transfer (as well as for shipping).

In the last decade about 60 km³ of water per year has been taken from natural sources in Russia for economic needs, which is about 1.5% of the available resources (State report, 2019). However, in a number of regions, primarily in the Southern Federal District, there is a shortage of fresh water, mainly for irrigated agriculture. In spite of the fact that 13% of the withdrawn water is used in Russia for this purpose (the world average is more than 70%), the above-mentioned district faces a very acute situation during dry time periods, which occur for spans of 3-4 years.

Organized wastewater discharge in Russia reaches 45 km³ annually, of which more than 30% is polluted (State report, 2019). It would seem that an intake of 1.5% of the available water resources is almost negligible! However, as a result of the basic technologies available for using this water, which are at the disposal of enterprises of the Russian housing and communal services, industry, and agriculture, in combination with the methods of wastewater treatment used, even just the use of 1.5% of the available water resources is enough that almost all rivers in economically developed areas are polluted, and often extremely dirty.

An analysis of the situation of water use in Russia reveals a large number of problems that are very urgent and intractable. However, they are not generated by climate change. Long-term forecasts of the development of the Russian economy show the possibility of not only increasing water shortages in those regions where it is already observed, but also the increasing of water stress nearly throughout the

European part of Russia (except for its most northern regions), even under a stationary climate. This very acute water deficit will inevitably arise if one of the forecast scenarios is realized, which assumes extensive economic growth. Unfortunately, we have to admit that such an outcome can by no means be excluded: over the past 50 years, the growth of Russian GDP was primarily due to extensive growth (as well as the external economic environment, for example during periods of world oil price growth). In fact, these forecasts indicate that in the European part of Russia, a further orientation towards the extensive development of water use and economic growth are no longer compatible.

The transformation of the Russian water industry into a resource-supplying industry that meets modern requirements with advanced infrastructure involves significant capital investments (according to various expert estimates, 1-2 trillion rubles are required only for water supply and sewerage). Furthermore, investments can only be effectively utilized if the management of the country's water complex as a whole is improved simultaneously. The development of the water management complex in the post-industrial era should be based on intensification methods, and an extensive approach should be recognized as possible only under conditions of the exhaustion of the intensification potential (Danilov-Danilyan, 2008). An attempt to solve water problems by focusing on expanding the resource base in the face of climate change, neglecting the threats caused by it, can be very expensive for both present and, especially, future generations.

The global nature of water scarcity and the commonality of tasks undertaken to improve water use management for countries with different hydrological conditions dictate the need to develop international cooperation. Meanwhile, among the existing international agreements and treaties related to water relations, there is no document comparable in the scope of the problem and the in depth of its study to the Framework Convention on Climate Change, the Convention on Biological Diversity, and the Vienna Convention for the Protection of the Ozone Layer.

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1.4 WATER DIPLOMACY OF RUSSIA DURING THE GLOBAL WATER CRISIS



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The Soviet Union and its successor, the Russian Federation, have closely cooperated with the world community in the field of environmental protection. Due to the size of its territory and the presence of significant natural resources, the Russian Federation plays a significant role in solving global and regional environmental and water problems, via international organizations and conferences, and at the bilateral level. At present, the Russian Federation has concluded nine agreements on the rational use and protection of waters, including application of the basic principles of cooperation of the Convention, with: Finland, Ukraine, Mongolia, Estonia, the Republic of Belarus, the People's Republic of China, Kazakhstan and Azerbaijan.

The figures describing Russia's water resources are impressive. The total volume of static water resources is estimated to be approximately 88.9 thousand km³ of fresh water, a significant part of which is contained in groundwater, lakes, and glaciers. Excluding glaciers and groundwater, Russia's static fresh water reserves represent about 20% of the global fresh water resources. For many years, water abundance pushed the role and significance of water diplomacy to a low priority in Russia's international relations. The global water crisis, which has exacerbated in recent years, makes us take a fresh look at the place and potential of diplomacy in the implementation of national and international hydro-policy. The joint use of transboundary water bodies for the purpose of environmentally sustainable development requires strengthening and expanding international cooperation and improving diplomatic activities in this area. Taking into account the accumulated problems, the most urgent vectors of Russian hydropolitics and water diplomacy are the conservation and rational use of fresh water.

Modern Russian water diplomacy is a foreign policy activity aimed at strengthening state sovereignty over national water resources and at the fair distribution of transboundary water use within the framework of equal international cooperation (Rossiyskaya Gazeta, 2002). The concept of Russian water diplomacy is based on the recognition of international cooperation in this area as an independent block of foreign policy activities that meets the needs of national development and the fundamental decisions of the UN on sustainable development. In particular, it is built on the inherent principle of human rights to the environment of such a quality that makes it possible to live with dignity and prosperity. The concept reflects current trends in political thinking and contributes to

the implementation of specific aspects of national interests in the framework of international and cross-border interaction.

The main goal of water diplomacy is to achieve an acceptable quality of the environment and the rational use of water resources at the global and regional levels. Its implementation helps to ensure the adoption of foreign policy decisions aimed at observing geopolitical interests and guaranteeing Russia's national security, as well as achieving optimal levels of rational and balanced consumption and protection of water resources in the context of globalization. The framework of Russia's water diplomacy identifies national, regional, and local priorities for cooperation, coordinates them, and includes an international component into the process of managing of the water environment. This all contributes to strengthening the interaction between the state, business, and science, both in determining the priority areas for technological development in the use of water resources, and in the process of their implementation. This creates incentives for technological modernization based on increasing the efficiency of companies, ensuring their investment and business attractiveness.

Water diplomacy has become a part of the everyday life of not only state institutions involved in international relations, but also of the general public. The activities of environmental non-governmental organizations, glasnost, and the websites of context-media networks on water issues are perceived ambiguously both at the regional and federal levels. One example is the serious accident in the Russian city of Norilsk, located in the permafrost zone, which became public thanks to the internet. On May 29, 2020 a large volume (almost 20,000 tons) of diesel fuel leaked there. Fuel flowed out into nearby rivers and lakes, polluting the groundwater deposit and the Kara Sea. It will take decades to restore the ecological balance of the region after this disaster. An equally dangerous situation has developed in the Khimki reservoir (situated very close to Moscow), in which on June 29, 2020 an oil slick with an area of 900 m² formed, composed of waste water mixed with petroleum products. The limit on the concentration of harmful impurities has been exceeded by more than 1,000 times.

The rapidly developing international community of non-governmental organizations and volunteer movements focused on water issues, as well as the growing influence of public opinion on water diplomacy, contribute to its transformation into a

multidisciplinary activity, rationally combining the efforts of governmental and non-governmental organizations working simultaneously, but not necessarily together. Moreover, it is not easy to find a consensus for resolving disputes that contribute to the establishment of a constructive water dialogue. The main forms of implementation of Russia's water diplomacy are its active participation in international organizations and at conferences that consider the problems of the protection and conservation of water resources. However, the existing level of this cooperation does not correspond to the needs of Russia; there is a need to expand the scale of Russian participation in the search for solutions to the global water crisis.

What, in the author's opinion, are Russia's main priorities in this area? Obviously, the basic priority should be the formation of a culture of Blue Peace, as the basis for national and international hydro-policy and water diplomacy. The culture of Blue Peace can include: non-violence, real understanding and perception of water problems and their causes, striving to take measures to prevent water conflicts, resolving problems through negotiations, and seeking consensus. Increasing the effectiveness of participation in the work of international organizations and forums on water issues involves supporting international investment projects in water infrastructure and stimulating the flow of environmentally oriented foreign investments to Russia, including possible participation in the Blue Fund initiated by Switzerland.

Considering multilateral water diplomacy in close connection with traditional bilateral diplomacy, it would be desirable to strengthen the role of Russia as a mediator in the negotiation processes to resolve disputes over transboundary waters. Also, it would be preferable to intensify its participation in monitoring water resources, developing an international system for assessing environmental risks and ensuring effective protection of transboundary water from technogenic pollution, and in the restoration of border rivers. Russia's wider participation in the creation of

a unified information database on water issues in the UN system would be of great importance for the harmonization of international standards for water resources management, including for the creation of a mechanism of mutual responsibility of states for exceeding the permissible levels of technogenic pollution of transboundary waters as well.

Water diplomacy is being implemented in the face of new threats and challenges, including deliberate sabotage of water supply systems through chemical or biological invasion, or infrastructural sabotage in the form of cyber-attacks on water bodies. Taking into account this fact, it is necessary to more effectively use international experience to prevent and eliminate the consequences of "water terrorism".

To sum-up the list of multidisciplinary priorities for cooperation between Russia and international organizations in the framework of water problems, it is important to emphasize the main priority: ensuring the environmental rights of citizens is impossible without universal and comprehensive environmental education of the population, dissemination of knowledge about environmental safety, and information about the state of the environment and limited water resources. In the author's opinion, resolving the listed tasks is possible only within the framework of close international cooperation.

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1.5 A MULTILATERAL FRAMEWORK ON WATER NEGOTIATIONS IN THE MIDDLE EAST



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ABSTRACT

This article analyzes the specific experience of the functioning of the Multilateral Working Group on Water resources from 1992 to 1999, which was established in January, 1992 at an international meeting in Moscow as part of the Madrid Middle East peace process.

The latest developments in the Middle East show that reliable agreements on the distribution and use of water can be achieved only if the interests of all parties related to one or another water resource are taken into account. This is most evident in the discussion of the future of the Nile River basin regime. The previously existing formats for connecting the interests of the parties (i.e., Egypt-Sudan and Egypt-Sudan-Ethiopia) no longer correspond to the new situation. Other countries of the upper Nile River are also vigorously defending their participation in the negotiations. Therefore, it is of great practical interest to learn from the experience of a working group on water resources established for the entire Middle East region and from its functioning in the multilateral negotiation format.

In January, 1992 at a meeting of the participants of the Madrid peace process in Moscow, five multilateral working groups were formed, on regional security, economic cooperation, refugees, the environment, and water resources. Representatives of the United States showed particular interest in the work of the group on water resources. They gradually took on the functions of the lead organizer of the group (initially, representatives of Norway performed these functions).

As a rule, delegations from the following countries took part in the events of the Multilateral Working Group on Water (MWGW), or "the Group": the United States and Russia, as co-sponsors of the Madrid Middle East peace process; a co-organizer delegation from the EU; and representatives of regional countries, including: Algeria, Bahrain, Egypt, Israel, Jordan, Kuwait, Mauritania, Morocco, The Palestinian Authority (PNA), Qatar, Saudi Arabia, UAE, Yemen, and Tunisia. Syria and Lebanon refused to participate in multilateral group meetings due to the "unconstructive behavior" of Israel in the peace process. At the same time, they received official invitations to all of the Group's events. Among the non-regional participants were: Australia, Austria, Belgium, Canada, China, Czech Republic, Denmark, Finland, Germany, Great Britain, Greece, Hungary, India, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Romania, South Korea, Spain, Sweden, Switzerland, Turkey, and Ukraine. As usual, the

meetings were attended by a representative of the UN Secretariat.

Within the period from 1991 to 1998, several consultative meetings of the WGWR took place. In the course of these events, an understanding was reached that Jordan, Israel, and the PNA would form the "working core" of the Group. The "working core" would, in practical terms, carry out pilot projects on the preparation and construction of water infrastructure facilities, while countries such as the USA, Russia, Norway, Japan, Germany, Great Britain, France, Canada, Tunisia, Egypt, as well as the EU and the World Bank would provide advisory and financial assistance for the implementation of these projects. The parties also agreed to move forward with the creation of the "Waternet", a common databank for Jordan, Israel, and the PA on the situation of water resources in the field, including the subsequent connection of other regional countries to this information portal. It is noteworthy that from the very beginning the work in this direction was depoliticized and professional, which made it possible to move forward in developing a program for creating a databank and an information system that would suit all parties. The role of a kind of "headman" of this project was rather successfully performed by the representative of Jordan, who ensured the rapprochement of the positions of the representatives of Israel and the Palestinians. During a meeting of the Group held in May, 1998, the American side announced the allocation of one million US dollars to create a databank and information system, and Canada made a specific proposal to organize specialized seminars in Ramallah for project participants by inviting top-class experts. The technical expertise of the project was carried out by representatives of Norway.

In a separate format, under the auspices of the Federal Republic of Germany, a project has begun to form a regional database on water resource availability and the needs of the Middle Eastern countries. Also, under the aegis of the Group, a pilot project was launched to create a laboratory in the Gaza region to improve the efficiency of water use in agricultural production. An expert group from Luxembourg agreed to lead the project (at the invitation of the EU delegation). During the activity of the Group, in practical terms, the implementation of the project for the establishment of a Seawater Desalination Center in Muscat, Oman advanced the most. The candidate to be the director of the center was selected, and financial contributions were received from Israel, Japan, the Republic of Korea, and Oman, reaching a total of

16 million US dollars. Russia confirmed its readiness to provide expertise in the field of creating waste-free desalination technology.

The Norwegian delegation had developed a draft of the “Declaration of Principles for Cooperation in the Use of Water Resources”. However, “at the suggestion” of the Egyptian representative, this issue was practically removed from the agenda. The Egyptians suggested that first a thorough check of the applicability of such principles should be carried out based on the results of cooperation among Jordan, Israel, and the PNA, and then only after this could the issue of expanding the project to the whole regional level be decided.

Unfortunately, in 1999 the aggravation of the situation within the Palestinian territories and in the region as a whole led to the freezing of these projects. On February 1, 2000 an attempt was made in Moscow to relaunch the functioning of multilateral working groups, including the one on water. This was the first international event with the participation of the newly appointed Acting President of the Russian Federation, Vladimir Putin. In his speech, the Russian President stressed the importance of a multilateral framework

for developing the peace process in the Middle East. It was decided to resume the meetings of the multilateral groups. As a follow-up to this decision, the Russian government, with the United States as co-sponsors and the government of Oman as the organizer, sent invitations to the members of the Group for a meeting of the Multilateral Working Group on Water to be held in Muscat, the capital of Oman. However, it was not possible to breathe new life into the activities of multilateral groups due to the negative development of the situation in the Middle East region in the early 2000s.

Currently, a number of Middle Eastern countries, extremely concerned about the projected worsening of water problems, are exploring the possibility for Moscow’s active involvement in the search for solutions in this area. It seems that if the dynamics in this field of the Middle East peace process is resumed, it would be important to use the experience and best practices of the Multilateral Working Group on Water, which demonstrated the fundamental possibility of resolving the most difficult problems of the region at the negotiation table.

1.6 STRATEGIC APPROACHES TO SOLVING WATER PROBLEMS: OPPORTUNITIES FOR RUSSIA



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WATER PARADOX

The importance of water problems is recognized at the global level, yet for decades the issues of financing water initiatives have remained the most painful and mainly fall in the area of responsibility of states, development institutions, and international initiatives. The financing situation is best in the hydropower sector, but the scale of water projects is still far from being exhausted by this sector. The specifics of investment remain the cornerstone for financing: when implementing water projects, the investor and the beneficiary are often not the same entity. Benefits from “water” investments are received not only by specific water consumers, but also by society as a whole. For example, the state saves on expenses for emergencies, tourism and industry develop, and the efficiency of the healthcare system increases.

It is almost impossible to crystallise these benefits for an individual investor in the form of dividends, which makes it difficult to attract private investment. In addition to the problem of targeted gain of benefits by the investor, the issue of payback from such projects arises when taking into account the assumed restrictions on pricing; often the regulation of water tariffs remains a socially significant topic, which limits the use of traditional investment categories for analysis.

In contrast to the world’s already established green finance agenda, which is primarily aimed at reducing carbon emissions and is based on a network of international agreements and detailed national policies in this area, water finance is still an area in which there is no hurry to invest, although it is recognised as important by many. However, recent changes in this area, such as the introduction into international practice of the terms “blue finance” and “blue bonds”, is an important step towards attracting investments for solving water problems.

WATER INVESTMENT AGENDA

Today, Russia remains one of the countries with the greatest potential to help overcome water challenges both globally and regionally through three instruments:

virtual water, technological solutions, and participation in emergency response. The following text briefly assesses the prospects of each of these instruments in terms of their compatibility with the instruments of “blue financing”.

Although Russia has extensive capabilities to supply virtual water (or water-intensive products, primarily food) to any country (thereby reducing water stress), this area does not require specialized “blue” financial instruments. The situation is different, however, regarding capital-intensive water projects. The possibility to support such initiatives could be facilitated through Russia’s participation in large development institutions (e.g., the Asian Infrastructure Investment Bank and the BRICS New Development Bank) and through its own engineering and industrial capabilities and financial instruments. However, such projects are multifarious, and the demand for “blue finance” within each is significantly different.

Today, states have the most important resource within their own territories: increasing the efficiency of water use. The potential for improvement is more than significant. For example, due to inefficient water systems, especially in developing countries, 60% of water is lost through evaporation or returned to rivers and aquifers. To overcome this, modern technologies are needed, as are projects for their implementation. Conventionally, such technologies can be divided into three categories:

1. Technologies of the first type allow for the production of a larger quantity of goods with a constant volume of water. They aim to increase water use efficiency, water purification, and water saving, and include, for example: drip irrigation, lining irrigation canals with impermeable material, using water pipes instead of open canals, etc. These types of projects are the most developed and business-oriented. Therefore, specialized “blue” investment may be attractive in the event of individual cross-border conflicts, but, in general, the existing tools serve such projects quite well.
2. Technologies of the second type allow for obtaining a larger volume of water from unconventional sources. They include: desalination of water, steam

condensate, transportation of icebergs, development of underground water horizons, etc. These technologies are especially popular in the Middle East, Southeast Asia, and in a number of Mediterranean countries. Such projects are often both more risky and longer-term, or rather large-scale, when it comes to a systematic solution to the problems of water supply for specific cities or regions. Therefore, “blue bonds” in this case are becoming an extremely popular instrument.

3. Technologies of the third type—construction of infrastructure—make it possible to “reshape” the water map of a country or region through the construction of dams, water dikes, and hydraulic structures. Such technologies are especially important for the development of hydropower, nuclear energy, and for the integrated development of certain regions. Today, the anthropogenic impact on the rate of change of geography has reached unprecedented proportions. The flows of more than half of the world’s rivers are controlled by dams, and this area is the most controversial from a political point of view. In this regard, “blue bonds” can rather act as a tool to ensure the accountability of national water projects to international development institutions or donors. In some cases “blue bonds” can help to mitigate political conflicts related to hydro-engineering projects in transboundary basins, primarily in Central and South Asia, as well as for projects on the Nile River in Africa, or for the development of water projects in the Tigris and Euphrates basins.

Finally, it is worth considering the potential of “blue financing” for emergencies. More than a third of all emergencies affect water infrastructures in one way or another, and their protection and recovery remain one of the central elements of emergency warning and response systems. From 1980 to 2004, one third of all natural disasters were caused by floods (29%) and droughts (5%). The increase in the number and intensity of natural disasters, the main driver of which

has been climate change since the second half of the twentieth century, has formed a stable trend of growth in material losses and in the vulnerability of societies due to the increasing impact of natural hazards and man-made accidents. Russia has the service delivery resources to become one of the key global actors in reducing this vulnerability. Moreover, the water aspect of this challenge is extremely important. At the same time, the nature of this challenge leaves little doubt about the need for targeted financial instruments to counter it, and insuring such risks requires the participation of state actors. In this regard, “blue insurance” can be especially promising. Already today it is possible to outline the main geographical priorities for such projects, with the participation of the Russian Federation, which include:

- regions with traditionally strong ties with Russia: Kyrgyzstan, Tajikistan, and other countries of Central Asia
- countries of the Middle East, as an element of the strategy of Russia’s presence in the region
- this issue will be especially acute in Syria when planning any program for restoring the country’s economy and infrastructures
- African countries, as a symbolic element of Russia’s “return” policy to the continent

As a foreign policy activity, water diplomacy, in a broad sense, is considered as an independent direction or as assistance for international development in terms of the current 2008 Concept of Humanitarian Cooperation of Russia, and is undoubtedly among the foreign policy priorities of Russia. However, so far it has not received the appropriate conceptualization nor political instrumentalization. This is partially due to the unresolved issues of financing transboundary water projects and assessing their efficiency and impacts. In this regard, the development of targeted “blue financing” instruments with Russian participation has vast potential.

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CHAPTER II:

AN OUNCE OF PREVENTION – INTERNATIONAL
LEGAL FRAMEWORKS

2.1 TRANSBOUNDARY WATER RESOURCES AND INTERNATIONAL LAW: BASIC FEATURES OF INTERNATIONAL WATER LAW



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Water is an essential resource that constitutes the lifeblood of the human environment. There is no substitute for water and people have relied on it in many different ways throughout the ages. Although water is the most abundant resource on Earth, only a small quantity – around 2.53 per cent – is fresh water that can be used for agriculture, human consumption, and industrial purposes. Moreover, a significant part of this fresh water is locked up in ice or in groundwater resources. Some of the latter, because they are insignificant or have no way of being replenished by surface waters, can become non-renewable resources and risk being exhausted. While the size of the world's population has tripled over the last century, water consumption has increased by a factor of six. With this rate of exploitation, the non-renewable character of water resources (especially fossil aquifers not connected to surface waters) will come into sharp focus in the coming years.

This context highlights some of the challenges that the law applicable to water resources has to deal with. Water scarcity, competing water uses and raising tensions on the management of transboundary water resources between riparian states all prompt a reflection on the role of international water law. This area of law has mainly been concerned with the regulation of international watercourses and lakes.

International norms and institutions, providing a predictable and stable framework, play an essential role in the prevention and settlement of water disputes both at the national and international level. Within the United Nations, efforts towards the design of a multilateral framework on international watercourses and lakes started in the 1970 through the works of the International Law Commission (ILC). The completion of its work, which took almost three decades, led to the adoption by the General Assembly of the [United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses](#) (UN Watercourses Convention) on 21 May 1997 (UNGA, 1997). This Convention entered into force on 17 August 2014. The UN Watercourses Convention codifies many of the customary norms in the field of shared water resources. They include the principle of equitable and reasonable utilization, the obligation not to cause significant

damage, the obligation to cooperate, the protection of the environment and the procedures for dispute settlement and avoidance. These principles are also enshrined in the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (the 1992 Helsinki Convention), adopted under the aegis of the United Nations Economic Commission for Europe (UNECE, 1992). In 2003, the Parties adopted an amendment to the Helsinki Convention which enables states outside the UNECE region to accede to it (UNECE, 2003). It entered into force in 2016, allowing the Helsinki Convention to have a universal scope. As of July 2020, the UN Watercourses Convention counted 37 states parties and the Helsinki Convention counted 44 states parties including the Russian Federation.

The 1997 UN Watercourses Convention and the 1992 Helsinki Convention complement each other with respect to pollution control, reasonable and equitable use and cooperation between riparian states. However, these instruments put emphasis on certain aspects such as the protection of the environment and the obligation of cooperation with a different degree. The protection of water ecosystems is addressed in a more extensive manner by the Helsinki Convention than by the UN Watercourses Convention. This Convention also contains the obligation that riparian Parties must enter into bilateral or multilateral agreements providing for the establishment of joint bodies. These obligations do not find a place in the UN Watercourses Convention. This focus can be attributed to the fact that there were fewer negotiating parties for the Helsinki Convention, and that the issues of water management at stake in the UNECE region concern mainly the protection of water quality and aquatic ecosystems. In contrast, in the UN Watercourses Convention the definition of the principle of equitable and reasonable utilization and the obligation not to cause significant damage to other riparian States, and their relationship, was central to the negotiating process. Access to water was a primary concern for many states in various regions of the world.

Both the UN Watercourses Convention and the Helsinki Convention must be complemented by more precise legal regimes, which take into account the specificity of each water basin. In this context, it is interesting to note that both the UN Watercourses Convention and the works which led to its adoption (i.e. the ILC Draft Articles on the Non-Navigational Uses of International Watercourses of 1994) have been taken into account for formulating international agreements (UNGA, 1994). Examples include the [Revised Protocol on Shared Watercourses in the](#)

Southern African Development Community (SADC) of 7 August 2000 (SADC, 2000), which to a large extent copied parts of the UN Watercourses Convention and the 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (MRC, 1995). The 1992 Helsinki Convention has also led to the adoption of, and acted as a frame of reference for, agreements such as the 1994 Convention on Cooperation for the Protection and Sustainable Use of the Danube River (ICPDR, 1994) and the 1999 Convention on the Protection of the Rhine (IKSR, 1999). The 1997 UN Watercourses Convention and the 1992 Helsinki Convention constitute frameworks that leave space for particularities in the formulation of norms at the basin level.

The law applicable to groundwater resources is now being given increased attention. Groundwater represents 97% of available freshwater. Both the UN Watercourses Convention and the Helsinki Convention cover these resources, the scope of the Helsinki Convention being wider than that of the UN Watercourses Convention. In 2008, the ILC adopted the **Draft Articles on the Law of Transboundary Aquifers** (UNGA, 2008). The UN General Assembly considered the Draft Articles at several occasions and brought the Draft Articles to the attention of states “as guidance for the adoption of regional agreements or arrangements for the proper management of transboundary aquifers” (UNGA, 2008).

Under the framework of the Helsinki Convention, the protection of groundwater resources is also increasingly important. The UNECE **Model Provisions on Groundwater Resources reflect the language of the ILC Draft Articles** (UNECE, 2012). The compatibility of the provisions with the ILC Draft Articles reinforces the law on groundwater resources. A case in point is the **2010 Guaraní Framework Agreement**, which is the first international agreement taking into account the ILC Draft Articles (GAA, 2010).

The Geneva Water Hub and its Platform for International Water Law work actively in the promotion of the principles of international water law included in the UN Watercourses Convention, the Helsinki Convention, as well as basin agreements. It also supports the development of the law on transboundary aquifers. Several activities such as the project on the Senegalo-Mauritanian aquifer basin in West Africa as well as the active involvement in several trainings on international water law around the world illustrate the commitment of the Geneva Water Hub in the respect of the rule of law.

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2.2 THE GENEVA LIST OF PRINCIPLES ON THE PROTECTION OF WATER INFRASTRUCTURE



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This is an updated excerpt from the forthcoming publication: M. Tignino, O. Irmakkesen, *The Geneva List of Principles on the Protection of Water Infrastructure: An Assessment and the Way Forward*, Brill Research Perspectives in International Water Law, vol.5.2, 2020 (forthcoming) (footnotes are omitted).

The targeting of water resources and infrastructure, as well as their utilization as a means of warfare, is not a recent phenomenon. The earliest regulations of warfare include rules on the protection of water, especially on the prohibition of poisoning. This is affirmed by, for example, Alberico Gentili who refers to the prohibition of poisoning as a well-established rule of international law in 1588. Today, more than 400 years later, the protection of water infrastructure is even more relevant; recent examples of not only their frequent targeting, but also ‘weaponization’ demonstrate the importance of the question. For instance, the conflict in Syria, which has been going on for a decade in March 2020, has seen both the weaponization and targeting of water infrastructure.

Armed conflicts invariably adversely affect water infrastructure; they result in, for example, the destruction of and damage to water facilities and power plants providing the necessary energy to water supply networks and the collapse of water and wastewater treatment systems. They may also have negative impacts on the environment and the ecosystem of water resources, among others, due to the targeting of industrial facilities such as chemical and oil plants. These, in turn, have severe consequences on the civilian population. These consequences are more poignant in urban contexts due to the complexity of water infrastructure, its interconnectedness with other infrastructure and the high density of the population depending on it. However, rural contexts bear their own specific difficulties, including due to reliance on water infrastructure for agriculture, sometimes the sole means of subsistence of the civilian population.

In the context of an increased targeting and weaponization of water infrastructure, the Geneva Water Hub (GWH) and its Platform for International Water Law, together with several partners, took the initiative to develop the Geneva List of Principles on the Protection of Water Infrastructure (GLP) (Geneva Water Hub, 2019). The initiative to develop this document emerged during the Think Tank Roundtable on the

‘Protection of Water During and After Armed Conflicts’, held in Geneva in June 2016 (Geneva Water Hub, 2016) and convened by the GWH, which served to feed into the work of the Global High-Level Panel on Water and Peace. A ‘zero draft’ of the Geneva List was presented to a group of experts in December 2018. This draft was discussed during a two-day expert meeting bringing together academics and practitioners in Geneva. The detailed oral and written comments received during the meeting were very valuable and were implemented in a revised first version of the texts of the principles. This first draft was also circulated among the experts for a second round of comments.

The GLP is a reference document prepared for the use of parties to armed conflicts, states, international organizations, policy-makers and practitioners working in the contexts of armed conflicts, including in pre- and post-conflict situations. It is the first text that systematizes the main rules applicable to the protection of water infrastructure during armed conflicts, especially in the conduct of hostilities, as well as in post-conflict situations, and sets forth recommendations that go beyond existing law.

The objective of the GLP is to gather in a single document the rules on the protection of water infrastructure under different branches of international law, namely international humanitarian law, international human rights law, international environmental law and international water law. The aim is not only to restate obligations stemming from different sets of rules and principles of international law, but also to demonstrate their interaction with and significance for one another. The law applicable to the protection of water infrastructure is thus presented in a holistic manner.

The principles both reflect existing binding obligations and set forth recommendations. The rules stemming from both customary and treaty law are included either in the texts of or the commentaries to the principles and are formulated as obligations, using ‘must’. The recommendations are developed in two ways: some are advancements to existing obligations and others are proposals which do not build upon existing obligations. These recommendations are, as far as possible, supported by practice from past and current conflicts and by references to soft law documents such as those of the International Law

Association (ILA). In an era marked by the reluctance of states to develop international law through the traditional means of concluding treaties, one cannot emphasize enough the importance of practice and soft law. The desired improvement in the protection of water infrastructure can also be achieved by drawing attention not only to the international regulatory framework, but also to examples of practices going beyond the law. In the same vein, as reflected in the GLP, it is equally important to highlight instances of compliance with law and not only violations of the law; compliance begets compliance.

It is often the case that damage to or destruction of water infrastructure also has negative impacts on the environment, first and foremost on water resources. Nevertheless, the scope of the GLP is limited to the protection of water infrastructure and installations essential to their functioning. The protection of water resources is dealt with, when necessary, in connection with the protection of infrastructure. This is the case, for example, in dealing with the proportionality of an attack which is expected to cause leakage of wastewater risking the contamination of a nearby water source. Admittedly, the GLP includes one principle entitled 'Protection of the environment'; this principle, however, deals with the indirect protection of water infrastructure by means of rules limiting the means and methods of warfare for the protection of the environment.

The GLP focuses on the protection of water infrastructure during and after armed conflicts. However, due to their nature, some principles are also applicable prior to the onset of an armed conflict. For example, states are encouraged to establish joint commissions or mechanisms with a view to ensuring the protection of water infrastructure located on transboundary water resources during peacetime. However, this temporal scope of application of the rules and recommendations are not reflected in the GLP in a systematic manner. This is a deliberate choice based on two grounds. First, factually, there is often fluidity between armed conflicts and peacetime; it may be difficult to pinpoint the moment where one ends and the other starts, and many situations are marked

by cycles of conflicts. Second, legally, the obligations stemming from the rules governing the protection of water infrastructure do not always entail a strict differentiation between different phases. For certain rules, this is because they are applicable at all times, and even under international humanitarian law, there are rules that are already applicable in peacetime and continue into armed conflict. These include instruction of international humanitarian law to armed forces and dissemination thereof to the civilian population in general, and the marking of works and installations containing dangerous forces, such as dams and dykes with the special sign.

The GLP is addressed both to state- and non-state actors, in particular non-state armed groups. This is particularly important considering that the vast majority of the current armed conflicts are of a non-international character. It is undisputed that non-state armed groups that are parties to armed conflicts are bound by international humanitarian law. The roles of various non-state actors differ under other branches of international law, and it remains controversial whether such actors, in particular non-state armed groups, bear obligations under international human rights law. Accordingly, with a few exceptions, the GLP refers to the obligations of non-state actors stemming from international humanitarian law, duly noting the differences between parallel obligations applicable in international and non-international armed conflicts.

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2.3 “WATER WARS”: WATER SCARCITY AS A CAUSE OF INTERNATIONAL CONFLICTS



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Water, not oil, is the most valuable liquid in our lives. Water is the substance from which life itself was born on Earth and on which it continues to depend. If we run out of oil or other fossil fuels, we can use alternative energy sources. If we do not have clean drinking water, then our days are numbered. Without oil, only our usual way of life will change, but without water, we will die in a few days. Hence, water can be turned into a formidable force. People have used water as a weapon since time immemorial. For example, during the Mongol-Tatar invasion, the defenders poisoned the upstream waters of the Oka River in resistance to the advancing troops of the conquerors, who moved along the frozen river bed due to the lack of roads. Many foreign invaders were then incapacitated.

In the article “Water Wars” by Kochetkov and Pak (2011) we considered the shortage of water resources as a cause and instrument of international conflicts. Ten years have passed since then. During this time, new trends have emerged in international relations. One of these tendencies is related to the fact that so-called “new generation conflicts” have come to replace classic, traditional wars, which differ in their causes and sources. They are conducted not for ideological or religious reasons, as before, but for resources, including water. The participants in conflicts have changed, and today, in most cases at least one of them is a non-state actor. That is why modern water conflicts are difficult to resolve by traditional means of diplomacy. It is difficult to negotiate with non-state actors. Even after reaching an agreement, one cannot be assured of the implementation of the reached agreements, since the question arises about the legitimacy of these actors and their leaders. The differences between domestic and international water conflicts are disappearing, most of which occur at the regional and local levels. These trends force us to consider “water wars” in two dimensions, depending on whether the participants in these conflicts are state or non-state actors.

“WATER WARS” AS “A NEW GENERATION OF CONFLICTS”

Experts from the Pacific Institute for Development, Environment and Security Studies presented a classification of water conflicts according to the involvement of state or non-state actors in water wars (Pacific Institute, n.d.):

- conflicts in which the main goal is control over water resources to meet their own needs (state or non-state actors)
- conflicts in which water resources are used as a military weapon (state actors)
- conflicts in which water resources are used as an instrument of political pressure (state or non-state actors)
- conflicts in which water resources are targets of terrorism (hydro-terrorism; mainly non-state actors)
- conflicts in which water resources are military targets (state actors)
- conflicts in which control over water resources is seized to hinder the development of states or other non-state actors (state and non-state actors)

Scientists from the University of Oregon have found that there are three main factors that threaten international watersheds due to the actions of state actors (Wolfe, Natarius, Danielson, Ward, & Pender, 1999, p. 390):

- “internationalization” of water basins in connection with the emergence of new independent states
- unilaterally adopted development plans (primarily, dam construction projects without prior bilateral legal agreements)
- general tension in the relations between countries, not related to “water” problems

The real reasons for war between states are sometimes disguised under religious or other pretexts, but it is easy to see the real cause of the conflict from the actions taken by the parties. For example, in the case of conflicts between Arabs and Israelis, one can see that the occupation of Palestinian territories was caused by Israel’s desire to control groundwater.

New trends in “water wars” are associated with non-state actors. Most international conflicts are unleashed today by new non-state actors in international relations, such as terrorist organizations and religious and social movements. These actors are not going to adhere to the norms and rules formulated by the UN, since they are not its members. Since there is an obvious tendency for the use of “water as a weapon” mainly by non-state actors, assuming the further development of “water-terrorism” (“hydro-terrorism”) is quite reasonable. Terrorists do not recognize any moral or

legal norms. Their activities are aimed at causing as much damage as possible and at killing as many people as possible at minimal cost. Water weapons are ideal for this purpose.

Today it is rare to name an armed international conflict a “war”. Thanks to the efforts of the UN, the term “war” has become illegitimate, and today such concepts as a counter-terrorist or peacekeeping operation, humanitarian intervention, and an operation to enforce peace are used instead. Just as state structures are not effective enough in the fight against terrorism, international law does not always help in the fight against non-state actors in the field of water resources. Their growing numbers and importance makes one think about reforming the UN. Most non-state actors are organized as net-based structures, without a clearly defined center. Only similarly organized institutional structures can oppose them on equal terms. In this regard, it seems promising to introduce the network principle into the activities of some UN divisions, including those responsible for water security.

Most recently, “hybrid wars” are becoming more widespread, in which both state and non-state actors take part on an equal footing. The tendency to use water resources as a weapon was very clearly observed during several conflicts in and between the post-Soviet states. Sometimes these actions, for example, blocked waterways and canals supplying water, as well as, destroyed water infrastructure facilities.

2017 “A MATTER OF SURVIVAL” REPORT OF THE GLOBAL HIGH-LEVEL PANEL ON WATER AND PEACE: A BREAKTHROUGH IN SOLVING THE PROBLEM OF WATER RESOURCES

The “A Matter of Survival” report of the Global High-Level Panel on Water and Peace is a significant contribution to solving of the problems of water resources. One can agree with its authors, who wrote, “it is widely accepted that water crises may be among the most dangerous developments in the future. In 2015, the World Economic Forum (WEF) concluded that global water crises would be the biggest threat facing the planet in the next decade. In the WEF’s subsequent global risk reports, water crises have consistently figured among the highest risks for the coming fifteen years” (Global High-Level Panel on Water and Peace, 2017, p.11).

The statement of the authors of the report about the importance of the cultural aspects of water as a tool for ensuring peace seems very promising (Global High-Level Panel on Water and Peace, 2017, p.27). For example, in all world religions, water has a sacred meaning. Baptism, as the main sacrament of Christianity is carried out with the use of water. In Islam, water has been used for ablution, considered an exceptional event, comparable to spiritual cleansing. In Hinduism, the sacred waters of the Ganges River are considered the embodiment of supreme power.

Therefore, cultural factors can be successfully applied against religious hydro-terrorism. Along with “water wars” there are “cultural wars”. Culture can prevent the use of water as a weapon (Kochetkov & Maksimov, 2015, p.89).

One should agree with the opinion of the authors of the “A Matter of Survival” report that prevention is the best treatment. Indeed, disease is easier to prevent than to cure. As a preventive measure, the authors proposed to develop the norms of international humanitarian law (IHL) (Global High-Level Panel on Water and Peace, 2017, p.21-24). However, in our opinion, the role of international law should not be overestimated. Of course, IHL needs to be developed. However, there is not a single principle of international law that would not be violated by participants in international relations. Additionally, in the case of states, IHL is far from always being respected, and there is no reason to expect compliance with it by non-state actors at all. At the same time, in the era of the internet and information technology, mobilizing public opinion to appeal to the moral and cultural aspects of the use of water resources can be much more effective.

Water is one of the basic and most fundamental human needs. This can explain the fact that humanity has always fought, is fighting, and will fight for water. Given the growing demographic pressure and depletion of water resources, the tension of water conflicts will only increase. The forms of this struggle will change. To have a chance to win, the international community must carefully monitor the changes in the forms of “water wars” and develop appropriate mechanisms for preventing and resolving water conflicts. Governments, nongovernmental organizations, and local communities must tackle the water problem as the highest priority and most urgently. There are many methods of dealing with this problem, and the economic costs of preventing “water wars” are not so high compared to the consequences, if they should break out.

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2.4 SPECIFIC FEATURES OF THE NEGOTIATION PROCESS ON THE CONVENTION ON THE LEGAL STATUS OF THE CASPIAN SEA



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In 2018, in Kazakhstan's Aktau, the presidents of the five Caspian states signed the Convention on the Legal Status of the Caspian Sea (hereafter "the Convention"). Welcoming this event, UN Secretary General A. Guterres stressed, "this historic document demonstrates the importance of regional cooperation, which is vital for maintaining international peace and security" (Interfax.ru, 2018, August 14). The completion of more than twenty years of negotiations on the Convention, coupled with the signing of intergovernmental agreements on cooperation in the spheres of economy, transportation, prevention of incidents, combating organized crime, and others, opened a new chapter in the history of the development of the regional mechanism of interaction—the "Caspian Five".

IN SEARCH OF THE IDEAL

An analysis of the progress of the negotiations for the Convention allows us to identify three main phases of the process. In the beginning, the Caspian states demonstrated differing approaches to key aspects of the emerging international legal regime for this body of water. Subsequently, they managed to reach consolidated positions, thanks to the gradual realization of the commonality of most of the problems in the Caspian Sea, the need to jointly search for their solutions, as well as the accumulated experience of successful, practical interaction. At the final stage, the parties, having overcome many "phobias", reached a new level of mutual understanding and trust, which made it possible to develop the most viable model of legal regulation (Kachalova, 2019, p.134).

The first phase, which began in the mid-1990s, essentially boiled down to the formulation of national, often purely demanding approaches to the "rules of living" in the Caspian Sea in the geopolitical and economic conditions that changed dramatically after the collapse of the USSR. Within the framework of the Special Working Group (SWG), at the level of Deputy Foreign Ministers of the Caspian states, formed in 1996, the parties began to discuss several alternative drafts of the Convention. In the context of the increased importance of the Caspian oil and gas fields at that time, the resource component was a priority.

Discussions at that stage showed that the chances of a quick, five-sided settlement of the issue of ownership of hydrocarbons were practically zero. Under these conditions, a different path was chosen: the drafts of the Convention were temporarily put aside and work began in bilateral and trilateral formats on narrowly specialized agreements on the delimitation of the Caspian seabed. As a result, in the northern Caspian it was possible to agree on the delimitation of the seabed and sub-seabed into areas (sectors) according to the principle of a modified median line. Russia, Azerbaijan, and Kazakhstan, under the agreements of 1998-2003, reached complete mutual understanding about the ownership of the deposits, the corresponding median lines, and the junction point. At the same time, in the middle and south Caspian, the negotiations were much slower.

During the next stage, from 2002 (the first meeting of the heads of the five states in Ashgabat) until 2014, a system of regular, five-sided meetings at various levels was established, based on a unifying agenda. Agreements were also developed in "non-political" areas, primarily those where urgent joint actions were required, including in: ecology, safety, protection of biological resources, emergency response, and meteorology.

In 2003, the Caspian countries signed the first general agreement, the Framework Convention for the Protection of the Marine Environment of the Caspian Sea, and began to develop protocols for regulating the practical aspects of environmental protection in the Caspian. At the Second Caspian Summit (Tehran, 2007), a detailed Presidential Declaration was adopted, securing at the highest level the principle of resolving all issues in the region by exclusively peaceful means, and the readiness to maintain political dialogue and economic cooperation. As a follow-up to these agreements, in 2008 the Intergovernmental Economic Conference of the Caspian states was held in Astrakhan. In 2010 in Baku, the presidents signed an agreement on cooperation in the field of security in the Caspian Sea, and also adopted a protocol decision, which for the first time outlined the "quantitative" parameters of the future delimitation of the Caspian water area and its regime (Kachalova, 2019, p.138).

OPTIMAL MODEL

The third phase of negotiations, from 2014 to 2018, was characterized by the most positive climate for the dialogue between the five countries, a noticeable intensification of political ties, the development of practical cooperation, and the formation of an extensive network of platforms for interaction. On September 29, 2014, by the initiative of Russia in Astrakhan, the Fourth Caspian Summit was convened, which became the most productive. By this time, the SWG had formed the general structure of the future Convention and identified thematic sections for the consolidated project. At the same time, it was not possible to find an answer to the most controversial question, regarding a universal method for delimiting the bottom and resources and its influence on the delimitation of water spaces.

Based on the results of the discussion at the summit, the presidents adopted a statement on the principles of the activities of coastal countries in the Caspian. In fact, this document became the “framework” of the Convention, later almost literally appearing in its Preamble and in Article 3. Political and military-political imperatives were agreed upon, such as: solutions for all key issues of the Caspian agenda belong to the exclusive competence of five countries; a military presence in the Caspian Sea is allowed only for coastal states; and military construction is carried out within the framework of a stable balance of weapons within the limits of reasonable sufficiency, without prejudice to each other’s security. General approaches to the issues of shipping, transit to the World Ocean, fishing, scientific research, and environmental protection were formulated.

The statement also contained a formula for settling the central problem. The parties agreed on the need to “undock” two delimitations from each other: water spaces and the seabed. Along the water spaces, it was decided to develop a uniform methodology for all for establishing coastal zones under sovereignty, with each state controlling a width of 15 nautical miles from its shore plus a further 10 miles as fishing zones, outside of which was common water space (follow-up of the Baku agreement). Regarding the seabed and sub-seabed, the respective neighboring and opposing states should develop separate agreements based on the norms and principles of international law (Zhiltsov, Zonn, Kostyanov, & Semenov, 2018, p.288). At the same time, it was clearly indicated that the method for water space delimitation would not affect the delimitation of the seabed and would in no way predetermine the outcome of the respective negotiations.

Remarkably, almost immediately after the Astrakhan summit, in December, 2014, a bilateral agreement on the ownership of the seabed and sub-seabed areas between Kazakhstan and Turkmenistan was signed, resulting in the delimitation of half of the Caspian seabed (Zhiltsov, 2020, p. 257-258). Thus, the acceptability of the resource delimitation used in the

north Caspian was confirmed as an optimal model. Also, the undesirability of linking the fate of the five-sided Convention with the outcome of bilateral negotiations on deposits was recognized.

HISTORY OF SUCCESS

Based on the Astrakhan formula, there was a chance to complete the work on the Convention. In December, 2017 in Moscow, at the Meeting of Foreign Ministers of the Caspian states, the project was generally agreed upon. The parties came to an understanding that the Caspian Sea could only receive a special legal status, not typical for other seas or lakes, due to its set of specific, often unique characteristics. It is an inland water body that has no direct connection with the World Ocean, and therefore cannot be considered a sea. However, simultaneously, due to the size, composition of the water, and the characteristics of the bottom, the Caspian Sea cannot be considered a lake either. For this reason, a number of traditional norms of the law of the sea have been adapted to the specific conditions of this water body.

After the Aktau summit, over the past two years significant work was done by the Caspian countries to implement its decisions. The main focus was on the domestic procedures required for the entry into force of the Convention. Turkmenistan was the first to go through all of the formalities, followed by ratification in Kazakhstan and Azerbaijan. On October 1, 2019, the corresponding law was approved by the President of the Russian Federation (President of Russia, 2019). Completion of this process is expected in Iran as well.

Without waiting for the formal entry into force of the Convention, a five-sided High-Level Working Group (Deputy Foreign Ministers and Special Presidents’ Representatives) formed in accordance with the agreements of the Heads of State in the spirit of Article 19, began its work in order to effectively implement the Convention and review cooperation in the Caspian Sea (President of Russia, 2018). Parallel to this, the common legal framework is expanding: agreements on cooperation in search and rescue, in the field of maritime transport, and in a number of others are being developed. On the anniversary of the signing of the Convention on August 12, 2019, Turkmenistan hosted the First Caspian Economic Forum with the participation of the Heads of State and government. Following this the implementation of joint projects in industry, transportation, energy, digital technologies, and tourism were planned (Kachalova, 2020, p.386).

Thus, in the turbulent period of transformation of international relations, the Caspian countries, connected by a common water body, demonstrate solidarity, a disposition to ensure favorable conditions for sustainable development and security in the region, deepen mutually beneficial economic cooperation by settling territorial and resource issues, and eliminate potential disagreements. The mutually respectful

atmosphere characterizing the framework of the “Caspian Five” allows for negotiation to achieve significant concrete results and confirms the thesis about the growing role of associations of states, built in the spirit of true multilateralism and based on the principles of voluntariness, consensus, and equality.

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2.5 WATER PROBLEMS IN CENTRAL ASIA AND PREVENTIVE WAYS TO SOLVE THEM



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The modern man of the world is trying more and more to enjoy the increasing advantages of present-day civilization. In pursuit of these benefits, we very often forget that the true value on earth is in air, food, and especially clean water. As for the latter, for a long time in world practice this resource has been referred to as an inexhaustible one. However, in recent years, more and more often we can hear about the shortage of potable water suitable for meeting the needs of the population, industry, and agriculture. The depletion of water resources, their pollution, and disappearance of sources of fresh water replenishment are global problems. Many regions of the world, especially, for example, South and Southeast Asia, and central and south Africa, have already been faced with the problem of catastrophic drinking water shortages, which they could not completely resolve.

The Central Asia (CA) region is in a much more favorable position, and here one can hardly speak of a water shortage syndrome. Yet, there is such a problem as “water” in the Central Asia region. Its specifics and the main ways of solving it will be discussed in this article. The water problem in the Central Asia region has a long history. It is most acutely connected with the solution for the Aral Sea (Aral) problem, which (albeit unsuccessfully) they tried to solve back in the days of the USSR. In 1992, the President of Kazakhstan, Nursultan Nazarbayev, took the initiative to create a special international structure that would deal with the Aral Sea problem. On March 26, 1993, such a structure was created by the heads of the Central Asian states. It was named the International Fund for Saving the Aral Sea (IFAS or “the Fund”) and Nursultan Nazarbayev became its president. The major task of the IFAS was to finance joint, practical actions, promising programs, and projects to save the Aral Sea. The Fund also paid great attention to the ecological improvement of the Aral Sea area and its river basin in the interests of all states of the CA region (Executive Committee of the International Fund for Saving the Aral Sea, n.d.). At the same time, the problem of the Aral Sea is far from being the only one in this region.

In Central Asia the Amu Darya and Syr Darya rivers are the main water resources. These transboundary rivers originate in the Pamir and Tien Shan mountains. The Syr Darya River flows from Kyrgyzstan through Tajikistan and Uzbekistan, covering the densely populated Fergana Valley, and through Kazakhstan. The Amu Darya River starts in Tajikistan and flows to Uzbekistan and Turkmenistan. The share of fresh water in Kyrgyzstan and Tajikistan accounts for about 80% of fresh water in the region.

The Soviet system of water distribution was based on an integrated approach in the water sector and served the region as a single national economic complex. After the collapse of the Soviet Union, this system was changed. As a result, the upstream countries of Kyrgyzstan and Tajikistan began to provide water to the downstream countries, Kazakhstan, Uzbekistan, and Turkmenistan, and the latter, in turn, supplied energy resources to the upstream countries. When the lower countries, especially Uzbekistan, began to raise electricity prices, the upper countries faced a dilemma: to pay for electricity at world prices or to develop their own hydroelectric facilities. As a result, they made a choice in favor of the second option (Daly, 2010).

This, however, led to a disagreement mainly among Kyrgyzstan, Uzbekistan, and Tajikistan. In particular, Uzbekistan actively opposed the construction of the Rogun Hydroelectric Power Plant (HPP) in Tajikistan and the Kambarata HPP in Kyrgyzstan. The claims of the Uzbekistan officials mainly emphasized the reduction, especially in the summer, of water flow, which made it difficult to carry out agricultural work in the republic. These projects had negative environmental impacts associated with them, among other things, including an even greater shallowing of the Aral Sea. Of particular importance, the problem of the chronic shortage of water received by Uzbekistan needed for the irrigation of cotton, which remains the main national exported product, is still not fully resolved. However, the states of the region, especially the upstream countries, are not going to abandon their plans to develop their own hydropower. At the end of July 2020, a trilateral agreement was signed between Tajikistan, Germany, and Switzerland for the construction of the Sebzor HPP in the Gorno-Badakhshan Autonomous Region (GBAO). Its construction is planned for the Rashtqala region of GBAO (Sputnik News, 2020).

In general, the attention of the countries of Central Asia is focused on the problem of conservation and rational use of water resources. In particular, based on the initiatives of Emomali Rahmon, the President of the Republic of Tadjikistan (RT), the United Nations designated: 2003 as the International Year of Freshwater; 2005-2015 as the International Decade for Action “Water for Life”; 2013 as the Year of International Cooperation in the Field of Water; and 2018-2028 as the International Decade for Action “Water for Sustainable Development” (Kamolova, n.d.). All of these projects and programs are necessary, since according to the most conservative estimates, the conflicts associated with water shortages will only grow. By 2030 the world demand for fresh water will increase by 60% and the

supply of water suitable for drinking will significantly decrease due to the melting of glaciers, the discharge of waste into water bodies, general environmental pollution, and deforestation. Global climate change also plays an important role in these processes. It should be noted that only 1% of the earth's water is drinkable (Mannonov, 2020).

The UN Regional Center for Preventive Diplomacy for Central Asia (UNRCCA), which was opened in Ashgabat in December 2007, plays an important role in solving the problem of water resources use in the region. One of the priorities of the UNRCCA is to promote conflict prevention among the governments of Central Asia in the area of water resources management (UNRCCA, n.d. b). The UNRCCA has been widely encouraging a dialogue between CA countries in the field of transboundary water resources management. In addition, UNRCCA supports any initiatives aimed at solving environmental and other problems affecting the situation in the Aral Sea basin. In this area it closely cooperates with IFAS. The UNRCCA also actively collaborates with the countries of Central Asia in overcoming the negative consequences of melting glaciers and climate change. On a permanent basis it organizes international seminars in the CA countries to analyze these problems, provide recommendations for resolving water disputes, and share experiences of good transboundary water governance (UNRCCA, n.d. a).

The Central Asian states also receive assistance in solving the water problem from other international structures. For example, since 2015 the United States Agency for International Development (USAID) has been implementing the Smart Waters program in the region (USAID, n.d.). So far, the project will last until September 30, 2020. Its immediate goal is to solve the problem of a lack of knowledge in the water sector and to support cooperation with academic institutions in this field (Carec, n.d.). This, to some extent, can contribute to overcoming low awareness of water management, which often hampers resolving water problems.

The situation with regards to water resources in the region continues to be extremely complicated. For instance, at the beginning of June 2020 the government of Kyrgyzstan admitted that a new period of low water had begun in the country, which could lead to insufficient filling of reservoirs and, in particular, of the Toktogul water reservoir, which is the largest one in the country. This, in turn, will have a negative impact on the production of electricity, including possible restrictions on its consumption. To summarize, several general conclusions can be drawn:

In Central Asia there are two entirely opposite approaches to the use of water resources. The first one is shared by Kazakhstan, Uzbekistan, and Turkmenistan. They believe that Kyrgyzstan and Tajikistan should, as before, regulate the water flow in the interests of downstream countries without any compensation. Another approach that Kyrgyzstan has been particularly vigorously pursuing is that water is a commodity and, therefore, downstream countries must pay for all the water supplied to them. The first three countries, on the contrary, assert that water is a "gift of the Gods" and cannot be a commodity (Prokhvatilov, 2020).

Reconciliation between the upstream and downstream countries of the Aral Sea basin can only be achieved via a kind of barter system, as used in the USSR: electricity in exchange for water. However, given the large-scale construction of hydroelectric power plants in the upper countries, this currently seems unlikely.

There is a need for large-scale negotiations on water problems in Central Asia on various platforms with the participation of mediators. Russia and the UNRCCA could lead the facilitation process. These negotiation platforms could contribute to at least the partial resolution of the problems and tensions in this area, which in the future may become sources of new conflicts, and further destabilize the situation in the CA region.

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CHAPTER III:

KEY ELEMENTS OF WATER GOVERNANCE:
QUALITY AND QUANTITY

3.1 ROLE OF WATER GOVERNANCE IN PEACE AND DEVELOPMENT, AND THE NEED TO A BETTER UNDERSTANDING OF AQUIFER BASINS



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Strengthening the data-driven evidence base is key for meeting Sustainable Development Goal (SDG) 6, as well as for the role of water and water-related services in security, peace, and cooperation.

A broad range of worldwide initiatives pertain to the production, collection, treatment, and modeling of data. International Organizations, NGOs, the private sector and researchers have developed a number of datasets aiming at better understanding hydrological systems and water resource uses. However the water domain – in addition to being extremely fragmented – has a lot of gaps in term of water data: including challenges faced by hydrometeorological measuring stations, and the poor knowledge-base on aquifers (constituting over 80% of worldwide water reserves !) and water quality. These challenges are exacerbated by the increasing demand and pollution caused by global human population growth.

THE RELEVANCE OF DATA FOR WATER COOPERATION AND PEACE

Data monitoring, modeling and archiving are key for sustainable and efficient water management as well as for water security. “You can’t manage what you don’t measure!” encapsulates the essential need for comprehensive water data. The Global High-Level Panel on Water and Peace (GHLPPW), the High Level Panel on Water (HLPW), the High-level Experts and Leaders Panel on Water and Disasters (HELP) are three major political endeavors that are committed to putting water issues at the top of the political agenda. All three panels agree on the importance of water data for a sustainable future and the need to fill knowledge gaps due to the fragmentation of the water sector, insufficient investments, low political prioritization, and lack of trust between countries and sectors.

The GHLPPW dedicated a chapter to “knowledge-based decision-making and cooperation on data,” in its flagship report, “A Matter of Survival”, proposing recommendations to strengthen data-based cooperation and to improve the “level of knowledge relating to water quality and quantity issues at all levels” (GHLPPW, 2017). Knowledge on groundwater aquifers, representing more than 90% of unfrozen global freshwater reserves, should be emphasized as a matter of priority.

In March 2018, the HLPW released its own outcome report, “Making Every Drop Count – An Agenda for Water Action (HLPW, 2018). This included another set of key recommendations, one of which emphasizes the need to develop national water data policies and systems using open-data approaches wherever possible, with support from the World Water Data Initiative (Bureau of Meteorology, 2017).

In 2019, HELP published its first global report for both governments and stakeholders (HELP, 2019). The report urges leaders and users to learn from major water-related disasters and to invest in information systems. Water data, asserts the report, is a key factor for disaster-preparedness.

GREATER USE OF HYDRO-POLITICAL DATA

If a better understanding of environmental conditions is key, we postulate that socio-political dimensions and the economy also have to be considered as part of monitoring systems, particularly when considering interlinkages between water, peace and security, and anticipating future transboundary water disputes. A partnership between the Geneva Water Hub / University of Geneva, Oregon State University (USA) and ETH Zurich (Switzerland), is in place to progress on this approach and update a specific database on the subject matter.

The role of international water law in terms of sharing information and promoting the rights to water and sanitation

The 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE, 1992) and its Protocol on Water and Health (UNECE, 1999) as well as the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses (UNGA, 1997) offer an enabling framework for data sharing. With the exception of the Protocol on Water and Health, both the 1992 and 1997 Conventions have a global scope.

At the global level, Parties to the 1992 Convention are obliged to strengthen transboundary water cooperation and create joint bodies. The 1992 Convention includes provisions on monitoring, research, development, consultations, warning and

alarm systems, mutual assistance and access as well as exchange of information. The duty to share data and information is also included in the 1997 Convention. Interestingly, this Convention provides that even in the case of political tensions between States, there is an obligation of cooperation, “including exchange of data and information, notification, communication, consultations and negotiations” (Art.30) (UNGA, 1997).

In addition, sharing and monitoring quantitative and qualitative water data must be supported by financial mechanisms in water treaties to ensure long-term cooperation between riparian countries.

... AND THE SUPPORT OF THE HUMAN RIGHTS

The right of local populations to access drinking- and fresh-water resources is protected by various human rights such as the right to an adequate standard of living, the right to health and the right to food (UNGA, 1966) in addition of the rights to water and sanitation (UNGA, 2010).

More generally, the rights to water and sanitation are indispensable for leading a life with dignity. One of the less explored aspects is the relation between these rights and political and civil rights. In this respect, it should be stressed that individuals and local communities must have access to information and data on water and water services. Moreover, individuals and local communities must also be able to participate in decision-making processes that may have an impact on their rights to water and sanitation. The rights to information and participation in decision-making are therefore enshrined in the rights to water and sanitation.

THE SUPPORT OF SMART TECHNOLOGY, DIGITALIZATION, MODELLING

Whether at the watershed-level, the national-level, or the transboundary-level, easy access to data and information on the evolution of water resources and uses is one of the keys to successful water management. Water resource managers need to obtain reliable, updated and relevant information related to regulation, planning, adaptation to climate change, risk management, and public information. Unfortunately, the data and information needed are generally fragmented and heterogeneous, and accessing them is often difficult to achieve (due to the multiplicity of data producers, inconsistencies in data and information, etc.). As a result, the data generated by various actors is underused, and the information production capacity required for effective water policy implementation is often extremely limited. This can have significant negative economic effects as important planning decisions may be taken based on partial, insufficient, imprecise data and information. Smart technologies including remote sensing and digital transformation are opportunities to improve upon this, yet data management, which is necessarily cross-sectorial and

needs to integrate the local interests of populations, must respond to the fragmentation, dispersions and diversity of actors, institutions and data sources.

Digitization helps integrate these diverse sources and promote a systemic approach that recognizes the interdependence of water among different sectors, between administrative entities, and between cities and rural areas. Database systems need to undoubtedly be polycentric, but political will is key – as well as the support by a respected and legitimate leading institution in order to ensure coherence. Basin agencies have an essential role to play in building such digital platforms, where water is acting as a multi-actor connector and catalyst for development. Basin agencies are therefore a favorable environment for digital transformation. However, they obviously need to include the cybersecurity component; while digital technologies offer almost unlimited possibilities for management and operations, they also go hand-in-hand with information-technology risks that the water sector must be prepared to face. In addition, operators have to be aware of the fragility of digital archives³.

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³ In hydrology historical data are instrumental to efficiently plan the future. In this sense, sustainable archiving requires a special attention and is often very fragile on the long term.

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3.2 WATER RESOURCES OF THE CITY OF MOSCOW: MODERN CHALLENGES AND WAYS TO SOLVE THEM



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THE VALUE OF WATER FOR THE MOSCOW METROPOLIS

Since ancient times, Moscow and its environs have been famous for clean and tasty drinking water and its sources. Respect for water as the basis of life has been and remains the top priority in the work of the Moscow Government. Today the sustainable development of the city is one of the main priorities of Russia's environmental policy. The main goals and measures implemented by the Moscow Government in the field of water relations fully comply with the national priorities, as well as the UN sustainable development goals and objectives. The Mayor of the capital, Sergei Sobyenin, has repeatedly noted, "we continue to work actively to improve the water quality for Muscovites and the reliability of water supply, we are reconstructing the existing [water treatment] stations" ("Sobyenin: The quality of drinking water ...", 2016). In recent years, the city authorities have implemented several major projects to improve water quality. The first one is the rejection of chlorine. The second project that the government of Moscow has begun to implement is ozone sorption. The third project is related to ensuring the installation of water metering devices, and putting things in order in the water supply networks, including their repair and reconstruction. All this allows us to supply additional volumes of water not only to Muscovites, but also to the Moscow region ("Sobyenin and Vorobiev agreed ...", 2018). In recent years, thanks to modernization, the water turbidity has decreased fivefold, and the concentration of aluminum threefold. In terms of key quality indicators, our water is at the level of that in London and Sydney ("Sobyenin compared the quality of drinking water ...", 2018).

Currently, centralized water supply to the Moscow region is mainly derived from surface water sources. These are the Moskvoretsko-Vazuzskaya and Volzhskaya water systems, which include 15 reservoirs and water supply routes—the Moscow River and tributaries and the Moscow Channel. Their total catchment area exceeds 50,000 km². At present, Moscow, with its population of 12.7 million, consumes about 3 million cubic meters of drinking water daily. Tens of thousands of specialists work in the water treatment and water supply sector, and the main structures of the Moscow water supply system include: nine hydraulic units, four water treatment stations, five water intake points, and 13,145 km of water distribution networks.

The key to the quality of tap water is the control system organization. Every day, Moscow water is being

checked all the way from the upper reaches of the water supply sources to the consumer's tap. To this end, water quality is monitored daily at more than 60 points in the catchment area, 253 points at different treatment stages at the water treatment stations, and at 250 control points located on water supply networks throughout the city. About 6,000 analyzes are performed daily, which is more than 2 million analyses per year.

The continuous urban and economic development of the capital has a significant impact on water bodies, as they are integrated into the urban infrastructure. For example, the hydrological regime of rivers is changing, water bodies are provided for use for various purposes, the landscape appearance of coastal areas is being transformed, the banks are lined with embankments and become part of the road transport network, and recreational centers of attraction for the population and guests of the capital are being formed.

The current state of the city's water bodies is characterized by a high degree of anthropogenic load. The largest water body and the most difficult from the point of view of organizing a surface water pollution monitoring network is the Moscow River. The considerable length, as well as the large number of pollution sources, makes it difficult to obtain reliable and sufficiently timely information on pollution levels along the entire length of the river.

Urban water professionals face an unprecedented workload. A booming city is demanding ever higher standards of water and sanitation services, regulators are imposing stricter directives, and shareholders are looking to get more value from large investments in water infrastructure. In addition, environmental pressures are forcing water managers to prioritize adaptation and sustainability in the face of unpredictable water resources. The value of water in terms of its importance for the economic development of the city and the well-being of its inhabitants can be realized only due to the availability of reliable data on its quantity and quality in real time.

SMART CITY = SMART WATER

Water resources are given a high priority in the Smart City Development Strategy of Moscow. The strategy actively supports bringing smart water systems to life as the foundation for the future sustainable water management of the metropolis. Innovative solutions

and intelligent water management systems; advanced technological developments such as smart meters, sensors, supervisory control, and data collection systems; pipeline network management systems; and geographic information systems together provide consumers with a highly efficient water supply system.

The city of Moscow is actively transforming into one of the most advanced smart cities in the world through the integration of technologies that improve the quality of life of all residents. Moscow performed positively in various international ratings. For example, the capital of the Russian Federation ranked fifth in the Best Cities rating, which was compiled by the international consulting company Resonance Consultancy. There are a hundred cities in the ranking, but only London, New York, Paris, and Tokyo were able to bypass Moscow. In the report of the International Institute for Management Development, “2020 Smart City Index”, Moscow has moved from 72nd place in 2019 to 56th in 2020.

The culture of digital innovation is clearly visible in the performance of Moscow’s water sector, where planners, environmentalists, operators, managers, and decision makers are integrating water into broader Smart Strategies. Moscow is increasingly developing and implementing smart tools and methods for water management and water treatment that help improve the environmental health of the city, extend the life of assets, reduce energy and water consumption, and provide better services, which ultimately leads to more strategic asset management and financial savings in the long term.

An effective solution for monitoring water bodies in the city is a network of automated surface water monitoring stations, allowing continuous, automatic measurement of the concentration of the main pollutants. To date, such a solution has been successfully implemented in Moscow. At the city’s exit, there is an automatic station for water pollution monitoring in the Moscow River, which measures the concentration of the main pollutants in a continuous, automatic mode. In addition to this, during the navigation period the Moscow River is patrolled by the Ecopatrol vessel. This motor ship is equipped with a specialized measuring technology, “Aquatoria 2-M”, which allows for the continuous registration of the main physical, chemical, and hydrochemical parameters of water along the entire route. Continuous, express analysis of water quality makes it possible to identify illegal sources of pollutant discharges, breakthroughs and leaks of infrastructures, the dynamics of changes in concentrations and the area of distribution of pollutants downstream of the emergency discharge, as well as areas with the highest levels of pollutants.

The implemented digital solutions are used in the activities of the Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing (to assess the risk of population morbidity from environmental pollution); The Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters (to forecast and assess environmental emergencies); state environmental oversight bodies

(as a basis for conducting unscheduled inspections of industrial enterprises); executive authorities (to justify environmental measures and assess their effectiveness); and scientific and educational organizations. Monitoring data are also published in international and Russian city rankings, and in articles and studies by the World Health Organization and the World Meteorological Organization. The openness and availability of information about the Moscow experience enables domestic and foreign scientific, expert, and public organizations to create their own internet resources and mobile applications about environmental pollution. Data on the state of water bodies are published in full in the annual report on the state of the environment in the city of Moscow.

The introduction of digital technologies and automated processes in the field of collecting data on the state and dynamics of change of water bodies, and identifying the main sources of pollution of water bodies and processes affecting water quality, significantly increases the efficiency of management decisions and environmental protection measures implemented by the city. All water bodies’ monitoring results are transferred to the Unified Environmental Monitoring Database of Moscow. This is also one of the most important implemented automation processes, the use of which can significantly increase the monitoring efficiency. The introduction of digital technologies for monitoring water bodies in the city of Moscow made it possible to:

- create a specialized e-platform for citizens
- provide direct access to monitoring data to control and supervisory bodies and executive authorities
- assess the effectiveness of environmental activities and make informed management decisions
- obtain objective data on the state of the environment and identify sources of pollution
- carry out modeling, forecasting, and visualization of environmental processes

INTERNATIONAL COOPERATION

Today Moscow is being transformed into a unique metropolis that combines culture, education and knowledge, a comfortable climate for living, innovation, and financial opportunities. The Moscow metropolis is dynamically developing and actively participates in the world’s leading urban initiatives in the fields of environmental protection, climate, and sustainable development, including: C40 (network of the world’s megacities committed to addressing climate change), U20 (coalition of mayors of the largest cities), and the OECD (36 states of the world).

Moscow is a platform for the discussion of the environmental and water agenda of the Russian national development goals within the framework of the federal project “Clean Water”. The All-Russian Water Congress is held annually in Moscow and traditionally discusses all aspects of the development of the country’s water sector, including technology, economics, legal regulation, and international cooperation. More than 1,000 specialists from all federal districts of the country, heads of federal and

regional authorities, members of the expert, scientific and business community, as well as foreign experts and companies, take part in the Congress. The Moscow Government and the Department of Environmental Management and Protection are actively involved in international and regional cooperation and offer its further development together with the Association of the Lake Regions in the field of water resources management and water diplomacy in the following areas:

- providing opportunities for dialogue and creating optimal mechanisms of water diplomacy and water resources management
- exchange of best water management practices
- sustainable development and management of water basins
- international educational program “Smart Water of Megacities”
- development of direct ties and involvement of Swiss partners in Smart City projects for the effective management of Moscow’s water resources
- Eco-generation—the formation of an ecological culture of the aquatic world, as the basis for national and international hydro-policy
- “Clean shores of Eurasia”—volunteer movements for

the careful attitude to water resources

- “Moscow Water Forum: Innovative tools for effective water resources management and water diplomacy of the XXI century”—an annual international conference
- the “Blue Fund”—targeted investment in transboundary and multisectoral water cooperation
- Environmental festival: Water World—an annual international folklore festival of water regions

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3.3 INFORMATION AND LEGAL SERVICES FOR WATER RESOURCES MANAGEMENT AND THE WATER INDUSTRY



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The issues of information and legal support for the use and protection of surface water bodies in the context of land relations are considered on the basis of theoretical ideas about the inseparability of water bodies and the lands covered by them, and on the requests of practitioners in the field for coordinated management of water and land resources.

The main instrument of information services for water resources management in Russia is the national water and fishery registers. Information services for the use and protection of surface water bodies in the context of land relations is of utmost importance. The protection of such objects, along with the application of special measures within the framework of water legislation, presupposes the need for certain regulations in the system of land relations. This is due to the fact that surface water bodies are inseparable from the land and are located on lands for which there are many conflicting economic and other interests, including the public interest of preserving and maintaining good conditions of the surface water bodies, which unfortunately is not always a priority.

Based on the understanding of the need to establish a special legal status and a special legal regime for lands covered by water bodies, a category for such land in the Unified State Water Fund (USWF) has been introduced into the Russian legislation. Since 2018, legal norms have been introduced to regulate the use of Water Protection Zones (which were previously included in the lands of the Unified State Water Fund) as areas with special terms of use within the territory. However, there are extremely few water bodies marked as water protection zones on the public cadastral map. In fact, often even the water bodies themselves are not present on cadastral plans. As of the 1st of January, 2019, in the Russian Federation as a whole there were 72.2 million hectares covered by water (excluding swamps), of which only 27.4 million hectares are included in the land of the Unified State Water Fund (State report, 2019). Expansion of the list of land for inclusion into the USWF is not observed for many reasons, including the lack of information services for accounting for water bodies (Hasanov, 2016). There is a lack of interest from individual land users as well as local authorities in transferring lands under surface water bodies into the category of lands of the USWF due to the restrictions imposed by legislation on their use. Therefore, in many cases, water bodies and their water protection zones

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in the system of land relations are practically not protected from arbitrary use with damage to surface waters.

The definition of water bodies as objects of ownership is of independent importance. According to the Water Code of the Russian Federation (federal property), with the exception of ponds and watered quarries located within the boundaries of a land plot owned by a constituent entity of the Russian Federation, a municipality, or by individuals. At the same time, in the current Water Code of the Russian Federation (unlike the previous one) the concept of "pond" is not legally defined. Moreover, the legislation establishes the possibility of including water bodies in an agricultural land classification. According to article 77 of the Land Code of the Russian Federation, such lands consist of lands covered by water bodies (including ponds formed by water retaining structures on watercourses). Additionally, according to article 261 of the Civil Code of the Russian Federation (part one), the ownership of a land plot applies to the water bodies located within the boundaries of this land plot, without any restrictions. In general, according to the legal norms under consideration, the ownership of the land plot is primarily in relation to the water body. Based on this, in the case of private ownership of land plots, civil law excludes many water bodies from federal ownership. This presupposes the transfer of water fund management tools exclusively to the sphere of water relations (to the extent that they are regulated by water legislation and ensured by proper interaction of management institutions in the field of land relations and in the field of water use). Accordingly, the meaning of article 27 of the Land Code on the limitation of the turnover of land plots within which water bodies are located in state ownership is lost.

In this regard, the ruling of the Supreme Court of the Russian Federation No. 306-KG18-16823 of June 12, 2018 is extremely important for preventing privatization and other civil turnover of land under water. It establishes that, "only ponds (consisting of surface waters and lands covered by them within the coastline), which have signs of isolation and stand apart from other surface water bodies and without any hydraulic connection with them, can be owned by the constituent entities of the Russian Federation, municipalities, and individuals. In case the pond is not isolated from other surface

water bodies and has a hydraulic connection with them, it belongs to the property of the Russian Federation, including in the case when the pond is formed on a watercourse (river, stream, canal) that uses a water pumping structure” (Supreme Court of the Russian Federation, 2020). In essence, the Supreme Court of the Russian Federation, by its definition, restores the concept of “isolated water body”, which was previously defined in the now canceled Water Code of 1995 and is absent in the current Water Code of the Russian Federation. At the same time, in scientific publications the existing contradictions regarding the lands of the USWF are often simply ignored (Lupatrin, 2018), or are indirectly justified as insignificant. For example, it is allowed “to ensure the legal unity for water and land, the legislator does not necessarily have to increase the land component in the structure of a water body” (Sivakov, 2016).

Even court decisions related to the use of water bodies and the areas occupied by them turn out to be ambiguous and, as a rule, proceed on the fact of presence or absence of cadastral registration of a land plot as land of the USWF. When reviewing judicial practice, it is noted that, “the main evidence in such cases is the formal classification of the disputed land plot as an agricultural land, even if data on the presence of a water body on it are presented. In such cases, the courts are guided by the information of the State Real Estate Cadaster, which is indisputable for them until proven otherwise. In other disputes based on statements by environmental prosecutors who defend the rights and legitimate interests of an unlimited number of persons to a favorable environment, the courts invalidate transactions on the transfer of agricultural land plots with water bodies located on them to private ownership, as contrary to the norms of the Water and Land Codes of the Russian Federation and violating the rights of the local population to use water bodies” (Pelvitsakaya, 2014). However, an analysis of the actual state and classification of lands shows that the protection of water bodies in the context of land relations is currently extremely limited, and the practice of using (or even direct destruction) of water bodies, especially small rivers and lakes, in the interests of economic activity prevails.

In this regard, special attention should be paid to the fact that while reforming land relations within the framework of the implementation of the State Policy of the Russian Federation on the management of the Land Fund, the USWF lands are not envisaged at all. This reform was approved by the order of the Government of the Russian Federation of March 03, 2012 No. 297-r (as amended) and is aimed, among other things, at the exclusion from the land legislation of the division of lands by special purpose and categories. In 2014, a draft law (No. 465407-6) was developed, “On Amendments to the Land Code of the Russian Federation and Certain Legislative Acts of the Russian Federation regarding the transition from division of land into categories to territorial zoning”. It proposes to abandon the categories of land and establish 14 territorial zones, for which, “according to the developers of the draft law, there are at least two reasons:

- the need to tighten the preservation regime for agricultural land and protect them from construction of new buildings, dwellings or other structures. The current classification of land does not provide this preservation.
- today the division of lands into categories has lost its meaning, since the main determinant for construction activities on certain lands is actually defined by the types of the issued permission” (Anosov, 2018).

The statement about the loss of the meaning of land categories is completely controversial. The land categories undoubtedly protect the intended purpose of land use, although, due to violations of the law, are not always successful in this. The proposed territorial zones initially ignored many existing categories of land. Due to these circumstances, as well as for other reasons, the original draft law was rejected by many groups of society, who see in the bill an attempt to lobby for the removal of any restrictions on the use of land by interested market players (and, above all, by investment companies).

The new draft law “On Amendments to the Land Code of the Russian Federation and Certain Legislative Acts of the Russian Federation regarding the transition from division of land into categories to territorial zoning” includes forest fund zones, nature protection zones, etc., but there are still no water fund zones. Moreover, the new draft proposes an amendment to article 5 of the Water Code of the Russian Federation, according to which rivers and streams of a width not exceeding two meters are an integral part of the land plot along which they flow, and the boundaries of these watercourses could not be determined or established. If this amendment enters into force, unlimited opportunities will open up for any actions in relation to water bodies (including destruction), even if they have a hydraulic connection with water systems. In addition, in the absence of boundaries of water bodies, there will be no water protection zones that are essential for the protection of surface waters, which poses a huge threat to environmental safety and ultimately violates the constitutional right to a healthy environment. The threats and risks created by this bill have not yet allowed it to be adopted, but this does not mean that other similar bills will not be introduced.

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3.4 TRANSBOUNDARY GROUNDWATER AS THE OBJECT OF LEGAL RELATIONS



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Transboundary groundwater is pushed into the background, both in national legislation and in a number of international treaties. To a greater extent, acts of international soft law contain norms that allow for effective regulation of relations between the use and protection of groundwaters.

CURRENT STATE OF THE RUSSIAN LEGISLATURE

The groundwater resources of Russia are placed at the crossroads of the water and mining sectorial legal regimes, which corresponds to their niche in the global ecosystem. By virtue of the provisions of the mining and water legislation, groundwater resources and the rocks covering them are recorded in the national natural resource accounting system. Before considering the features of the legal regime for transboundary groundwater, one should generally characterize the complex legal regime of groundwater. It should be noted that in the current legislation on subsoil the concept of “groundwater” is used, and not “groundwater bodies”. This is because the law treats groundwater as a recoverable resource rather than a natural entity that needs protection. Nevertheless, applying the expression “water body” to groundwater basins and aquifers due to the norms of the Water Code of the Russian Federation (hereinafter the WC RF) is not a mistake. There are two approaches to groundwater in the national legal science. Some authors consider groundwater horizons and their basins, as well as operations with them, subject to subsoil legislation (Zaslavskaya, 1969, p.79). Others, as a rule, insist that any operations with groundwater (discharge, blowout) are subject to the regulation of water legislation (Kolbasov, 1972, p.158-159). These disputes continue to this day. Some aspects of legal regulations in connection with groundwater are covered by mining legislation, while other aspects are covered by water legislation (Sivakov, 2012).

According to Articles 10.1 and 19.1 of the Law on Subsoil, groundwaters extracted for the purpose of centralized drinking and domestic water supply are subject to a license for the extraction of groundwater, while groundwaters for technological needs are extracted as part of a technical project. The technical project for the development of mineral deposits also includes measures to protect groundwater bodies. The plugging of emergency boreholes and those unsuitable for further use, as well as the conservation

of unused boreholes, is carried out by subsoil users in accordance with project documentation for the plug or abandonment of boreholes.

The water legislation formulates requirements for the protection of groundwater bodies. According to Article 59 of the WC RF, individuals and legal entities whose activities have or may have a negative impact on the status of groundwater bodies are required to take measures to prevent pollution, clogging of groundwater bodies, and water depletion, as well as comply with established standards for permissible effects on groundwater bodies. If aquifers are discovered during the use of mineral resources, measures must be taken to protect groundwater bodies, otherwise their severe pollution is possible. Further, during design, placement, construction, reconstruction, commissioning, and operation of water intake facilities associated with the use of groundwater bodies, measures should be taken to prevent the negative impact of such structures on surface water bodies and other ecosystems. The Decree of the Government of the Russian Federation of February 11, 2016 No. 94, “On the Approval of the Rules for the Protection of Groundwater Objects” (hereinafter the Protection Rules) provides measures to prevent pollution, clogging of groundwater bodies, depletion of their reserves, and also to eliminate the consequences of the above-mentioned processes.

The natural and economic features of groundwater basins and horizons have the following differences compared to surface water bodies. Firstly, in cases where harmful and hazardous substances enter groundwater, underground water bodies that are protected by rock strata remain contaminated for centuries. Secondly, within the same vertical section of the earth's subsurface several aquifers can be observed, which are not always connected with each other. Additionally, they should all be covered by state natural capital data accounting, which should be considered an information resource. Thirdly, the boundaries of the groundwater basins and horizons and the reserves of these waters are usually less well known than the boundaries of surface water bodies and their water reserves. There is often a lack of information about extended aquifers, and the so-called fresh water lenses, as the water supply of these is conventionally considered to be only vertical, from top to bottom. Fourthly, groundwater is mainly managed by the government bodies responsible for the subsoil resources. Their competence is manifested,

in particular, by the fact that they issue or refuse petitioners licenses to use groundwater (Khaustov, 2009, p. 567-576). Fifthly, horizons of unusable waters are often used to discharge produced water ("reservoir horizons"). The literature emphasizes the horizons' impermeability, which makes the disposal of liquid waste in them reliable enough (The State Duma of the Federal Assembly of the Russian Federation, 2015).

All these features also apply to transboundary groundwater bodies. Unfortunately, the current Russian legislation (on mining and water) does not explicitly mention transboundary groundwater bodies. In the previous Water Code of the Russian Federation (1995) there was only a brief reference to transboundary water bodies (underground and surface). Currently, underground transboundary water bodies are only partly the subject of concern of international treaties of Russia and a number of neighboring sovereign republics. They are "pushed into the background" by surface water bodies and watercourses. Sovereign states have regulated the use of international lakes since the middle ages, but the underground wealth of water has attracted the attention of the international community only relatively recently. This is due to the fact that the scientific and technical revolution (STR) allowed for the inventory of groundwater only since the 20th and 21st centuries. As rightly mentioned by François Muenger, Director of the Geneva Water Hub, only a small minority of transboundary groundwater basins are used and protected in accordance with international agreements (Münger, 2018).

"SOFT LAW" PROVISIONS

Some useful groundwater provisions are contained in a "soft law" act such as the Berlin Water Rules (hereinafter Rules). The developers of these Rules proceed from the interconnection of surface and groundwaters (Article 37). In accordance with the precautionary principle, states take early measures and develop long-term plans to ensure the sustainable use of groundwater and aquifers in which groundwater is concentrated (Article 38). In addition, the necessity of information and organizational support for monitoring the level, pressure, and quality of groundwater; development of maps of the vulnerability of aquifers; and assessment of the impact of industrial, agricultural, and other activities on groundwaters and aquifers was emphasized (Article 39). The Berlin Rules also contain the important Article 42, entitled "Transboundary Aquifers". At the same time, the neighboring states sharing the aquifer control its use and protection "in its inseparability", that is, based on considerations of its natural unity. The Berlin Water Rules consolidate consultations and exchange of information regarding obligations under these Rules. Neighboring states shall cooperate in such a way as to ensure the equitable use of aquifer waters, with due regard to the obligation not to cause significant harm to each other and the

obligation to protect this natural formation. In this sense, the principle of equitable and reasonable use of water is manifested.

TRANSBOUNDARY GROUNDWATERS OF RUSSIA AND SOME NEIGHBORING STATES

The goals and objectives outlined in the Berlin Rules are also reflected in international treaties of the Russian Federation with neighboring states. For example, in the framework of the Russian-Estonian agreement on the protection and rational use of transboundary water bodies of August 20, 1997, joint commissions function and programs and plans are adopted. In particular, measures are being taken under the program for monitoring transboundary groundwaters in terms of assessing their condition (in quantitative and qualitative indicators) and the ways they are used. In the framework of such an important activity as monitoring, the groundwater reserve is taken into account, the dynamics of its changes are revealed, and natural and technogenic processes that affect the state of transboundary water bodies are identified in a timely manner. Scientists predict these processes and develop measures to protect the named water bodies, including their regeneration (Monitoring of transboundary groundwater bodies in the territory of the Russian Federation [presentation], n.d.).

The reader may have a reasonable question: what are the main types of exploitation of the adjacent groundwater in Russia and Estonia? These may include mine and quarry drainage during the development of solid mineral deposits, as well as the extraction of groundwater for drinking, domestic, and industrial needs. Currently, the appearance of depression funnels of the groundwater horizons is observed. Applied science sets itself the task of studying the impact of mines and quarries (all functional cycles up to conservation) and of rock dumps on the hydrochemical and hydrodynamic state of groundwater. Joint monitoring of the state and use of groundwater in Russia (in the Kaliningrad region) and Lithuania is bringing positive results ("Information report on the Groundwater Monitoring Program...", n.d.).

CONCLUSIONS

Transboundary water cooperation between Russia and neighboring states requires current and forward-looking assessments of the mutual impact of the parties jointly exploiting such an important natural resource as underground water bodies. The interactions between Russia and neighboring sovereign states (in terms of monitoring and accounting, and scientifically substantiated plans for the further development of the water economy) guarantee the rational and inexhaustible use of groundwater.

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3.5 TRANSBOUNDARY WATERS AND RUSSIA



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The state of transboundary water exchange is described for both the internal administrative borders and the state borders of Russia. Attention is mainly paid to river water exchange between the constituent entities of the Russian Federation, its federal districts, and neighboring countries, as well as the impact of transboundary water exchange on water quality. The main problems associated with transboundary water exchange are considered.

INTRODUCTION

Fundamentally, the term “transboundary”, as it relates to water resources, is used to describe water exchange (mainly river flow), between neighboring countries. However, it seems appropriate to apply this term not only to interstate, but also to administrative borders within a country, for example, for the borders of the entities of the Russian Federation, and its federal districts. In this case, it is very important to know not only the actual amount of water exchanged, but also the content of various substances in the transferred water, especially those that pollute the natural environment. Knowledge about transboundary water exchange is relevant both for determining the ownership right of the shared water resources, and for assessing the payment for pollution from water moved to other regions or countries. Both aspects remain insufficiently studied. The initial materials considered for this article were data from hydrological observations and information contained in various statistical reference books, as well as in literary sources (Rybalsky, Omelianenko, & Dumnov, 2018; Hydrometeorological publishing house, 1967; Shiklomanova, 2008; State water cadastre, n.d.; Ministry of Natural Resources of Russia, 2019; Koronkevich, Barabanova, Georgiadi, Dolgov, Zaitseva, & Kashutina, 2019; Koronkevich, 2003; etc.).

WATER EXCHANGE BY RIVER WATERS BETWEEN THE ADMINISTRATIVE REGIONS OF RUSSIA

Out of 85 constituent entities of the Russian Federation, the transit inflow is absent or insignificant in 26 and in three of them (the Sakhalin region and the Altai and Karachay-Cherkessia republics) it is

completely absent (Hydrometeorological publishing house, 1967; State water cadastre, n.d.). A small inflow is observed in 10 regions; the inflow and outflow are balanced in 11 regions; in 16 regions the transit flow reaches 60–80% of the total flow; and in 19 regions it dominates, for example, approaching 100% in the Astrakhan and Volgograd regions. The above measurements can change under the influence of climatic and anthropogenic factors. This remark also applies to federal districts as a whole. Transit water runoff is dominant in the Southern district, where the volume of local runoff is small, and the volume of total runoff is significant due to the inflow mainly along the Volga River. The smallest (less than 10%) share of transit water runoff in total is observed in the Siberian and North Caucasian districts.

It should be noted that due to the transit runoff in many constituent entities of the Russian Federation, water availability is significantly improved, reducing water and environmental stress, especially in the most inhabited regions. In many constituent entities of the Russian Federation, taking into account the large and especially dominant share of transit runoff in general stream flow, the situation with regards to the dilution of wastewater varies dramatically, although the general pattern of little dilution of wastewater in the most inhabited areas remains. At the same time, the issue of the allocation of transboundary water flows and the water quality problems are very acute in regions of Russia with insufficient local water resources and with high water consumption, such as the lower reaches of the Volga River and Don River.

RIVER WATER EXCHANGE BETWEEN RUSSIA AND OTHER COUNTRIES

The inflow to Russia from neighboring states significantly exceeds the outflow to them. According to the data (State water cadastre, n.d.), on average for the period 2006–2015, inflow amounted to 193 km³ per year (4.5% of the total river flow resources in Russia). The outflow to neighboring countries on average over these years was 47 km³ per year (1% of the total river flow resources in Russia). Most of the

outflow (about 99%), on average across multiple years, went to the seas surrounding Russia, according to Hydrometeorological publishing house (1967).

Russia has a border that runs along rivers, lakes and seas, with 13 states, with which river water exchange is carried out as inflow or outflow. The largest inflows, on average per year, come into Russia from Finland (over 25 km³), Kazakhstan (over 31 km³), Mongolia (about 25 km³), and especially from China (over 95 km³). The largest outflows go to Belarus (over 14 km³), Ukraine (over 11 km³), and Kazakhstan (about 11 km³).

The issue of water allocation plays an important role in the relations of the Russian Federation with other countries, where the issues of pollution of rivers and water bodies have become most acute. Based on the water pollution criteria, the following regions (river basins) can be viewed as problem zones. They include: the Upper Dnieper River basin, from which pollutants enter Belarus and Ukraine; the Lower Don River, more precisely the Seversky Donets River, with the reverse direction of pollutants (from the territory of Ukraine); the Urals River Basin, with a predominant outflow of pollutants to Kazakhstan; the south of Western Siberia, receiving pollution from the runoff of the Irtysh and Ishim rivers; the Selenga River Basin, which carries pollution from the territory of Mongolia; and the Amur River Basin, the waters of which are polluted by the tributary of the Sungari River from China. Of particular interest are the cases of mutual water exchange. Thus, according to Klyuev (1994), the inflow of wastewater to Russia from the territory of Ukraine was 1.5 times higher than the outflow to Ukraine. With Kazakhstan, the opposite picture was observed; the inflow of wastewater to Russia was 2.9 times less than the outflow.

THE MAIN PROBLEMS OF TRANSBOUNDARY INTRA-RUSSIAN AND INTERNATIONAL WATER EXCHANGE

First of all, the problems of transboundary and border rivers are associated with water allocation for economic needs. The next, and in many cases the main problem, are the questions of who compensates, and to what extent, for the damage caused by pollution of transboundary and border rivers and water bodies. Different standards of permissible water pollution applied in each country, as well as different natural water qualities, can serve as obstacles to finding solutions. The third problem, largely arising from the first two, is how to ensure acceptable levels for ecological indicators (both in terms of quantity and quality of waters) for transboundary and border rivers and reservoirs. This issue is especially relevant for water bodies that are closed or weakly connected with the World Ocean, water bodies such as the Caspian, Azov, Black, and Baltic seas. The fourth major problem, which has recently received particular urgency, is how to ensure the protection of the populations and economies located on transboundary and border rivers in case of possible natural and anthropogenic

disasters. In the context of modern armed conflicts, water resources and infrastructures are increasingly becoming targets for attacks or are themselves used as a means of warfare (Global High Level Panel on Water and Peace, 2017).

Each of these problems has a range of legal, economic, and technical issues. It must be said that the main fundamental recommendations for solving the problems of transboundary water exchange, including the issues of providing information, have already been basically developed. The following international documents play the most important roles in the regulation of modern transboundary water cooperation:

- the Helsinki Rules on the Uses of the Waters of International Rivers
- the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, developed by the United Nations Economic Commission for Europe
- the Agreement on the basic principles of interaction in the field of rational use and protection of transboundary water bodies of the Commonwealth of Independent States (CIS) member states

People's diplomacy plays an important role in their implementation (Global High Level Panel on Water and Peace, 2017). These agreements proclaim a basin approach to solving transboundary hydrological problems. It is very important that they proceed from the fundamentals of maximum consideration of the interests of countries located in the basins of transboundary rivers. An important part of this is the provision on compensation for damage caused by irrational water use, which is reflected in "the polluter pays principle".

At present, many agreements on international waters are in force all over the world, in which the ideas of the above-mentioned and other international agreements are being implemented. In particular, Russia has such agreements with Finland, Estonia, Ukraine, Kazakhstan, and China. Among the rivers on which agreements have been concluded are the Dnieper, Seversky Donets, and Amur rivers. At the same time, in practice, there are many insufficiently resolved issues that require further research. Among them, the implementation of a truly comprehensive monitoring of the state of water resources not only in the channel network, but also on the territory of catchments, including dispersed (diffuse) runoff. Much remains unclear in the calculation of the current, and especially of the expected, water balance of transboundary river basins; projected anthropogenic impacts on water resources; estimation of the current and expected material balance of transboundary river basins; assessment for a unified methodological basis for assessing the qualitative composition of waters; and the preparation of integrated schemes for the rational use and protection of water resources and associated land and other natural resources. The issues of information exchange remain unresolved.

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3.6 GCC UNIFIED WATER STRATEGY IN TERMS OF POLITICAL CONTRADICTIONS



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The purpose of this article is to analyze the unified water strategy in the Arab countries in the Persian Gulf, which are faced with an acute shortage of water resources, as they are mainly located in arid climatic zones. This quite specific group of Arab states (the countries of The Cooperation Council for the Arab States of the Gulf, hereinafter GCC or the Council) reflect new economic challenges caused by speedy modernization: quick and extreme population growth, urbanization, and ecological problems. On the one hand, the numerous political tensions among the Council members are an insurmountable obstacle to cooperation among the countries. However, on the other hand, due to the growing acute shortage of fresh water in the region, GCC members urgently need to put aside political differences and coordinate their efforts to address the water scarcity issue.

Keywords: GCC, water management, Unified Water Strategy, Sustainable Development, 17 UN SDGs

The Arabian Peninsula is characterized by an arid climate with high evaporation levels (above 3,000 mm/year), average temperatures of 33.3 °C, and low precipitation levels of 70 to 155 mm/year. Annual precipitation in the GCC region does not, on average, exceed 170 million m³; surface water reserves reach 277 million m³; the estimated reserves of groundwater are 26,705 million m³; and the reserves of desalinated and treated water are 5,745 and 907 million m³, respectively. Thus, 54% of the total available freshwater resources are non-renewable sources ("Water statistic Report in GCC countries", 2017). High population growth (natural growth and labour migration), which has increased from 5 million people in 1960 to 56 million people in 2018, aggravates the problem of a shortage of fresh water in the region. Additionally, intensive economic growth, which included development of water-intensive sectors, such as the development of heavy industry and agriculture, has also added to the stress on fresh water resources (Al-Saidi & Saliba, 2019, p.24).

Countries	GDP (B USD)	GDP (PC USD)	Population (M)	Average rainfall (mm)
Bahrain	37.7	24,050	1.569	150 – 170
Qatar	191.4	68,793	2.782	60 – 80
Kuwait	140.6	23,338	4.137	100 – 120
UAE	414.2	43,004	9.631	80 – 100
Oman	79.2	16,415	4.829	80 – 100
Saudi Arabia	786.5	23,338	33.700	70 – 90

Table 1. GCC main indicators (World Bank, 2018).

The accelerated modernization and rapid involvement of the Arab Gulf countries in international economic affairs took place in the 20th century. With the increasing production of hydrocarbons in the Gulf regions, there was an increase in competition for resources, which was accompanied by increased environmental pollution and population growth. This required the search for new sources of fresh water, which were already very scarce in the region. Due to their proximity and access to one water area—the Persian Gulf—it was the members of the GCC that could become the driver of reforms and transformations aimed at preserving or even improving the water situation in the region, as they all face similar problems, and simultaneously have the financial resources (through oil and gas export) to solve them. Resources of the GCC countries, according to experts' estimates, account for 29% of the explored oil reserves and 22.6% of the explored natural gas reserves, the sale of which allows for significant financial inflows to the budgets of the Council member countries (BP Statistical Review of World Energy, 2017).

These countries, meanwhile, are paying considerable attention to the transition to sustainable development, as noted in their government strategies, published between 2015 and 2020, and are trying to diversify sources of government revenue. Governments are

actively involved in the implementation of the 17 UN Sustainable Development Goals (SDGs), among which the climate theme is of particular importance (Pilipiszyn & Hedjazi, 2017).

In addition, there has been repeated interest from the leaders of the Council countries in the possibility of forming a unified water strategy for the GCC region. For example, at the 31st session of the Supreme Council of the GCC in Abu Dhabi in December, 2010, the creation of an expert pool from six Council member countries was initiated to develop a common water strategy (Shaheen, 2010). Moreover, a review of the “GCC Unified Water Strategy (2016-2035)” was published in June, 2017, which aims to bring together the national water strategies of the Council member countries and their water management policies (Zubari, Al-Turbak, Zahid, Al-Ruwis, Al-Tkhais, Al-Mutaz, Abdelwahab, Murad, Al-Harbi, & Al-Sulaymani, 2017). According to the authors, this strategy would enable the GCC to create the highest standards of water security, and ensure the transparent functioning of state and public institutions in the area of increasing environmental responsibility of the Council’s population and business. It should be noted, that it also would create a platform for promoting innovative “green technologies” and expand the role of the GCC in projects of regional and global scale.

The “GCC Unified Water Strategy (2016-2035)” is focused on five main pillars: system stability under normal and crisis conditions; efficient and rational use of water resources; continuous development and improvement of the system; ensuring open and transparent control by state and public institutions; and ensuring financial stability and favorable political and socio-economic conditions for the development of the system. The strategy includes 10 main strategic objectives and 82 key performance indicators, which allow for the structuring and assessment of the effectiveness of the implementation of a unified strategy (see more detailed information at <https://gccuws.org/>). According to the authors’ calculations, if this unified strategy is successfully implemented, by 2035 all countries will be able to achieve the indicator of 250 l/d/cap, reduce the loss of water resources at delivery by 10% or more, increase the efficiency of water use for irrigation purposes in agriculture by 60% of the current level, and increase the volume of recycled water resources.

Among the GCC members, the UAE and Saudi Arabia have their own water security strategies: “The UAE Water Security Strategy 2036” (UAE, 2017) and the “Saudi National Water Strategy 2030” (Ministry of Environment and Water & Agriculture, 2019). The rest of the Gulf countries pay special attention to this problem and recognize its solution as an integral part of their national development strategy. If we briefly characterize the main features of countries’ approaches to achieving water security, we can identify several trends that are the same for all countries. GCC countries focus on seawater desalination technology and consider this method of obtaining fresh water to be the most optimal, combining it with the moderate use of groundwater. In addition, governments are

considering a gradual reduction, and then the complete abolition of subsidies for water use, increasing prices for utilities, and the implementation of environmental education programs for the population and businesses.

Thus, based on the results expected by the authors, the idea of implementing a unified water strategy for the GCC countries can be assessed positively. The accompanying positive achievements will also be economically beneficial for the countries, as they will make it possible to preserve considerable financial savings and achieve a number of goals strategically necessary for the further existence and development of the countries. Additionally, it is necessary to take into account the peculiarities of the geographical location of the countries. In the absence of a single strategy, the active use of ground water by one party will lead to the depletion of this type of resource for the whole peninsula, as the sources are interconnected with each other. For the equitable distribution of resources, coordination of the actions of each country should be ensured.

GCC: BETTER TOGETHER OR SEPARATELY?

Nevertheless, it is the political disunity and crisis within the regional Arab organization itself that is preventing the establishment of common rules of environmental management and conservation for those countries, as members of the Council already face serious threats that must be addressed immediately. Among the main obstacles to the implementation of a common water strategy are political differences among the GCC member countries.

Until 2017, the countries demonstrated their readiness to join their efforts together to solve common problems and their awareness of the need to form a unified water strategy. However, political strife instantly pushed aside the idea of cooperation and only brought the day of crisis even closer. Nevertheless, it is assumed that the 17 UN SDGs, in particular the environmental aspects, can become a “soft power” that will be able to overpower the political differences of the parties and achieve the desired results for all GCC members. The above mentioned, most serious problems in the political landscape of the GCC countries, together with other contradictions, are the most important obstacles to the implementation of any projects common to all of the Council countries.

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CHAPTER IV:

PEOPLE'S DIPLOMACY

4.1 REGIONAL AND INTERSECTORAL ASPECTS OF WATER RESOURCES MANAGEMENT



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The water usage of transnational companies has been a cause of dispute (environmental, economic or related to human rights) in a wide range of sectors including the food & beverage, garment, or mining and metal industries. The extent to which better practices are promoted is often limited and varies across businesses. Relatively-speaking, mining is one of the most socially and environmentally-sensitive industries, yet its companies are also the most challenging to influence.

Water is a critical resource in the mining process (cooling machinery, processing ore, suppressing dust, managing tailings) and mining impacts other water users and the environment throughout all stages of the mining lifecycle (Toledano and Roorda, 2014). Because of this, competition and tensions surrounding access to water resources are increasing: between 2000 and 2017, 58% of mining cases lodged with IFC's Compliance Officer Ombudsman were related to water (Kunz et al., 2017). Conflicts related to environmental and health issues are especially prevalent; metal mining can result in acid mine drainage, cyanide and mercury contamination and other forms of contamination (such as arsenic, iron, manganese, heavy metals, and mud turbidity) of water (IFC, 2014).

A number of conventions cover the hydrological dimensions of mining operations (UNESCO, 1972) (UNGA, 1991) (UNECE, 1998) (UN, 2013). Yet international law imposes obligations on countries, not companies, and regulation efforts occur primarily at the country-level, which is a matter of national sovereignty (Schoderer et al., 2020). The limitation of international and national legislation reinforces the importance of the extractive sector's voluntary engagement in corporate responsibility. However, most water stewardship frameworks place a strong focus on water reporting and disclosure (Hamilton, 2019), and generally, these initiatives have weak compliance mechanisms and are primarily designed to ensure comparability among companies using consistent industry metrics (ICMM, 2017). Similarly, voluntary codes of conduct on water management do not generate general support from civil society which often mistrusts self-implemented and non-binding instruments.

Multiple issue "standards" (or certification schemes) applicable to large-scale mining may play a bigger role in avoiding conflict between water used by mining industries and local uses (IISD, 2018). These originate from multi-stakeholder processes and third-party

verification mechanisms as a guarantee for compliance. However, despite a clear recognition that a new management response to water challenges is needed, the mining sector struggles to define its approach to better practices. A major barrier to change is a lack of understanding by companies of the benefits that could arise from the adoption of responsible standards, which is a costly investment.

In order to break this deadlock, the Geneva Water Hub supports and facilitates discussions with investors and international mining companies. This process aims at facilitating the adoption of high-bar standards, showcasing the creation of financial value from the adoption of such standards. In order to achieve this, the new demands from investors and the insurance sector are used as leverage. These industries are concerned with potential impacts of water-related risk on financial performance, which include physical, regulatory, and reputational water risks (Richards, 2016). More specifically, physical water risk is the exposure to changes in the quantity, quality and accessibility of water resources (Bonnafeux et al., 2017). Reputational water risk is associated with potential conflict with the public due to its perception of the consequences of company's decisions and actions on water resources. Finally, regulatory water risk relates to change in law or regulation, leading to raising costs of operating a business, lower return on investment or modifications in the competitive landscape (Orr et al., 2009).

These risks could materialize with a negative effect on the operational profitability and longevity of mine sites (Columbia Water Center, 2017). While the operations of extractive industries are contingent on water availability and accessibility, an inadequate response to local communities' concerns could damage a mining company's brand image and lead to protests and project delays. The reputation of a mine could be affected to the point where strong local and national opposition can make operations difficult (Franks et al., 2014). For example, the loss of the social license to operate could lead to blockages in permitting, higher hiring costs, eroded investor trust and increased cost of capital, a general difficulty in doing business and even the interruption of operations or project shutdowns. Furthermore, reputational risk is considerably higher for larger listed companies, which are the most scrutinized. For investors, reputational risk not only translates into financial losses but can also be very costly to their brand.

These concerns constitute real incentives for change in water practices. Certification by a credible standard-setting organization becomes a viable quality-assurance mechanism, thus increasing reputational capital (Angel and Rock, 2005) and attracting capital investment. “Safe Space” discussions with investors, standard-setting bodies and mining companies allow for engagement with the private sector towards the sustainable and responsible water management of the mining and extraction industries. In so doing, the barriers to standard adoption can be identified, and the concept of economic profitability from the adoption of responsible water practices can be strengthened. This would in turn push asset managers to factor the water risk into their investment decisions and devote a greater proportion of funds to such certified companies. In this way, a new approach by the mining sector to address shared water challenges may lead to inclusive water governance and access to adequate solutions for affected communities, while driving long-term returns to shareholders.

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4.2 DYNAMICS BETWEEN THE DEVELOPMENT OF BASINS AND LOCAL DEVELOPMENT



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As a vital resource for basic needs and economic activity, water management has strong and direct implications at the local level. As a resource in motion, flowing both at the surface and underground, water constitutes a physical bond that underlines social cohesion in any given geography. Watersheds are often the common denominator behind the cultural identity of riparian communities, remaining a stable landmark while societies evolve. The Integrated Water Resource Management (IWRM) approach has been promoted as an effective way to establish governance systems within coherent hydrographical units. Basin organization models have been implemented in many national and transboundary contexts establishing institutions at sub-basin and local levels with the aim to coordinate decision-making processes at the level of the watershed.

However, in certain contexts, such as in the Sahel region, basin organizations face serious challenges. The impact of climate change, population growth, growing competition over natural resources, the security crisis and most recently, COVID-19, are all destabilizing factors that hamper confidence in political institutions and social cohesion at large. Yet, West Africa is home to some of the most elaborate basin organization structures, such as the Senegal River Development Organization (OMVS). The OMVS model was designed by visionary politicians who were aware of the necessity to consolidate efforts to secure the water needs of the four riparian countries in the wake of the severe regional droughts of the 1970's. Furthermore, the organization demonstrated its capacity to use water as a driver of peace by successfully resolving a dispute between Mauritania and Senegal in 1989 when all other diplomatic channels were suspended by the two countries.

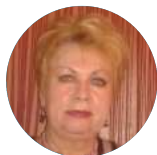
In its latest initiative to tackle the above-mentioned challenges, the OMVS is preparing a project to engage in creative dialogue with its riparian communities. This would help adapt its strategies and visions towards a 21st century model of transboundary basin organization. The results of this creative reflection will be shared at the 9th World Water Forum taking place in Dakar in 2022. The Geneva Water Hub, together with a series of partners will help the OMVS implement this project. The relationship between the different local populations and governing authorities is fraught with challenges, in a context where job opportunities and livelihoods are also under threat. The Global High-Level Panel on Water and Peace has recommended innovative approaches to consider the interests and opinions of local stakeholders. Basin agencies can play a major role

in this context, helping organize a form of “peoples’ diplomacy” on water-related issues, and raising the local “voices of the river” in forums where major water strategies are developed. This can help the economic integration of local interests, regulating water uses, and sustainably maintain resources. Strengthening the role that basin agencies play, as a backbone of development, and a conduit to local voices, can be an essential step to addressing pockets of fragility and addressing the challenge of improving the link between the local- and regional basin economies.

This new project is entitled: “Voices of the river: Pathways to Peace” which will organize a strategic reflection around water-related issues between local populations, OMVS leaders and experts in water management and climate change. In order to support this reflection and facilitate a creative and engaging dialogue on the multiple dimensions of our relationship with water, the project will also bring together personalities, artists and cultural actors in the fields of music, cinema, theater and photography. The works produced in this context will serve to convey the visions and key messages of local populations to the 9th World Water Forum which will be held in Dakar in 2022. They will also serve to enhance the cultural heritage of the river basin by strengthening a common identity woven around the flow of water. The reflection will be organized around a point of confluence along the basin, a natural space for cultural and economic transactions. These spaces of confluence for water and peace will also aim to provide practical solutions through a connection with local water entrepreneurship. This will be achieved through the development of a new criteria grid for future projects, as well as the development and promotion of innovative projects responding to the issues raised during the discussions.

The “Voices of the River: Pathways to peace” project will take place in four phases and will be able to adapt to the COVID-19 pandemic. An initial preparatory phase will see all key project activities being set into place. The second phase will focus on organizing creative community dialogues. The third phase will be a creative and technical gathering / festival to address the key issues emerging from the voice of the riparian countries at a confluence site along the banks of the Senegal river. In the event of a resurgence of the COVID-19 pandemic, exchanges will be organized by audiovisual methods along with mobile mediators. Finally, in the fourth phase, the project will culminate with a presentation of works and projects emerging from the prior phases at the 9th World Water Forum.

4.3 WATER RESOURCES OF RUSSIAN REGIONS FOR SUSTAINABLE ECONOMIC DEVELOPMENT AND GUARANTEED WATER SUPPLY TO THE POPULATION



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ABSTRACT

The current data on water consumption are presented, in accordance with the demands of the economy and water supply for the population in regions with limited water resources. New methods for water resources management are considered, including the involvement of various social groups.

INTRODUCTION

The uneven distribution of water resources, both globally and regionally, necessitates their management. One of the goals of the UN 2030 Agenda for Sustainable Development is the provision of available water resources of appropriate quality for each person. This goal is also laid out in the Ninth Phase of the UNESCO International Hydrological Programme for the period 2022-2029, in which water resources management is defined as the main priority for contributing to the achievement of Goal 6 of the UN 2030 Agenda for Sustainable Development. There are enough water resources in the world. The volume of water total flow in rivers is 42,000 km³ per year, and only 4,000 km³ per year are taken for use. An excess of water resources are found in Siberia and in vast regions of Russia and Canada, whereas the problem of water scarcity is most acute in North Africa and in South, West, and Central Asia (Shklomanov, 2008).

In Russia, despite the fact that it ranks second in the world after Brazil in the absolute value of water resources, many of its regions have very serious regional problems with water supply for economic development and for the population. For example, the Southern and Far Eastern federal districts differ by almost 30 times in terms of the size of their local water resources formed within the administrative unit; and in terms of water supply for their population, they differ by about 100 times. In the European part of Russia, where 80% of the country's population is concentrated, water resources account for 21% of the total volume of water resources, while in its Asian part, the flow of only the four largest rivers (Yenisei, Lena, Ob, and Amur) is equal to 48% of the total volume of river flow in the country.

WATER USE IN THE RUSSIAN FEDERATION FOR ECONOMIC DEVELOPMENT

One of the tasks outlined in the Water Strategy of the Russian Federation is to eliminate the shortage of water resources in certain regions of Russia and

to ensure the socio-economic development of the country (Government of the Russian Federation, 2009). Despite the decrease in the volume of water use in Russia as a whole over the past two decades, from 67 km³ per year in 2000 to 53 km³ per year in 2018 (Rosstat, 2018), at present, high pressure on water resources and their shortage remains a problem in a number of regions of the country. According to estimates made by the State Hydrological Institute, individual water management areas in the Volga, Don, Kuban, Terek, Sunzha, Sura, and Ural river basins face the highest economic pressure on their water resources during average water years (Babkin & Balonishnikova, 2018). Economic pressure on water resources is defined as the ratio of water consumption parameters and quantitative characteristics of a water body, and where water is taken from and where it is discharged after use.

Taking into account the efforts of the Government of the Russian Federation in 2020 to restore and accelerate economic growth in the medium term, especially in industry and agriculture, one should expect an increase in water consumption due to the development of water-intensive industries and irrigation in agriculture. However, according to expert estimates, the increase in water consumption for various needs of the economy will not exceed by volume the level reached in the year 2000 (67 km³ / year), the most favorable period between the two crises of the 1990s and the end of the 2000s. At the same time, it is necessary to focus on the strategies of those industries that will be priorities for the development of the economy, especially in the newly developed regions of the country. This is, first of all, the energy sector, which is responsible for up to 80% of the total volume of industrial water consumption, and the agro-industrial complex, in particular, irrigated agriculture. According to the Energy Strategy of Russia for the period until 2030, electricity production at thermal power plants (TPPs) and nuclear power plants (NPPs) should increase by 70% compared to the current period, while water consumption over this period will increase by 45%, from 29 km³ at present to 42 km³ (Balonishnikova, 2018).

In agriculture, the largest water consumer is irrigated agriculture. According to the Federal Targeted Program on "Development of ameliorated lands and Increase of its Productivity" (Government of the Russian Federation, 2013) the largest increase of irrigation is planned in Siberia and the Far East in the basins of the Ob, Yenisei, and Amur rivers. It is planned to increase the area of irrigated land to 800,000 hectares in the future, or almost 3 times more than at present. A significant

increase in irrigated areas is also planned in the Volga River basin, especially near the Middle and Lower Volga River, as well as in the Kama River basin. In the Don River basin, the area of irrigated land is planned to increase in the Voronezh and Lipetsk regions, as well as in other regions that only partially belong to this basin (including the Belgorod, Kursk, Tambov, Penza, and Volgograd regions). In the south of Russia, in the Kuban, Terek, and Sulak river basins, a significant increase in the area of irrigated land is not expected due to limited water resources, and consequently, this will not change the current volume of water consumption. With such a scheme for expanding irrigated lands in the south of Russia, there are possible risks of water shortages in the regions listed above, which currently have limited water resources, intensive economic activities, and water supply shortages.

WATER SUPPLY FOR THE POPULATION IN THE REGIONS OF RUSSIA

The available estimates of the water supply in the regions of Russia, taking into account the ongoing climatic changes (shown in table 1), give reason to

believe that there is a high probability of a further decrease in water supply in those constituent entities of the Russian Federation in which there are currently water shortage problems.

WATER RESOURCES MANAGEMENT: NEW APPROACHES AND METHODS

The observed situation regarding the distribution of water resources, industry locations, labour forces, and population density, is uneven across the territory of Russia. This undoubtedly requires optimal and rational management of water resources in accordance with the needs of the population and the economy, as well as within the consideration of climatic factors and the more frequent, hazardous hydrological phenomena in recent years. Water management is a long-term activity that requires water master plans and implementation projects based on science, legislation, multiple institutional bodies, and is the responsibility of all stakeholders.

According to the “Water Code of the Russian Federation” (Government of the Russian Federation,

Federal District and regions	Population (M)	Average long-term water resources (km ³ /year)	Water resources during a dry season (km ³ /year)	Water supply, thousand m ³ /year/person	
				average water resources	during dry seasons
Central FD					
Belgorod region	1.53	2.70	1.62	1.76	1.06
Bryansk region	1.28	7.30	5.10	5.70	3.98
Voronezh region	2.34	13.7	6.00	5.85	2.56
Kursk region	1.13	3.80	2.13	3.36	1.88
Lipetsk region	1.17	6.30	3.30	5.38	2.82
Moscow region and Moscow city	18.6	18.0	12.2	0.97	0.66
Orel region	0.79	4.10	2.60	5.19	3.29
Tambov region	1.09	4.10	2.52	3.76	2.31
Tula region	1.55	10.6	7.60	6.84	4.90
Southern FD					
Kalmykia Republic	0.29	1.10	0.25	3.79	0.86
Krasnodar krai	5.23	23.0	17.4	4.40	3.33
(territory)	4.28	26.2	12.7	6.12	2.97
Rostov region					
North Caucasian FD					
Ingushetia Republic	0.41	1.70	0.73	4.15	1.78
Stavropol krai (territory)	2.79	5.50	0.46	1.97	0.16
Volga (Privolzhsky) FD					
Bashkortostan region	4.07	34.2	19.0	8.40	4.67
Mordovia Republic	0.83	4.90	2.54	5.90	3.06
Orenburg region	2.03	12.6	3.5	6.21	1.72
Penza region	1.39	5.60	2.84	4.03	2.04
Ural FD					
Kurgan region	0.91	3.50	0.69	3.85	0.76
Sverdlovsk region	4.30	30.2	15.7	7.02	3.65
Chelyabinsk region	3.48	7.40	3.35	2.13	0.96
Siberian FD					
Omsk region	1.98	41.3	9.5	20.9	4.80

Table 1. Regions of the Russian Federation with low (<5 000 m³/year) and catastrophically low (<1 000 m³/year) water availability.

2009), the major legal documents regulating water use and water resources management are federal schemes in “The Integrated Use and Protection of Water Resources (SKIOVR)”. It should be noted that in the former USSR, water balances for the most important river basins were regularly compiled and the General and Regional schemes for the integrated (rational) use of water resources for a 20-year perspective were used, taking into account the developments in the national economy.

Over the past 30 years, fundamental changes have taken place in Russia, both in terms of the scale and structure of water use in various sectors of the economy, and in the water regime of river basins, due to the processes of global and regional climate change. Basin projects are currently being developed in accordance with the Methodological Recommendations for the Development of Schemes for the Integrated Use and Protection of Water Bodies (SKIOVO; Ministry of Natural Resources of Russia, 2007). At the same time, these schemes have a number of disadvantages associated with the unknown number of all interested water users in the basin, unreliable estimates of water resources in a changing climatic situation, and the lack of a mechanism for the SKIOVO schemes implementation.

One of the advantages of the modern SKIOVO schemes is the public involvement in their discussion, which takes into account views of scientific experts and public organizations. One such example is the 2014 SKIOVO project in the Amur River basin. Initially, the project developer did not include an ecological component in the project. Therefore, by the initiative of the Amur branch of the World Wildlife Fund, a public ecological expertise was implemented into the project, in addition to that of the state. The practice of involving public organizations, the private sector, and various interested social groups is consistent with the international trend in decision-making on water and is reflected in the official documents of leading international organizations in the field of water resources (UNESCO, 2015).

The issues of efficient water resources management are currently of paramount importance and are reflected in many international publications. However, it should be noted that at the national and regional levels, the mechanisms of water management may differ significantly. Each country develops and uses their own mechanisms for managing its water resources, but at the international level, when a water body is transboundary, specific national mechanisms may not work if they infringe on the interests of one or several countries located in a basin. In this case, the ideas of the authors of the report “A Matter of Survival” of the Geneva Water Hub on the need to create effective institutions for the management of water resources of transboundary water bodies in the event of both water-deficit conditions and flood situations, seems to be quite reasonable. Its implementation would allow for the development of basin agreements and water management protocols, including potential risk management for such basins (Global High-Level Panel on Water and Peace, 2017).

The data exchange of quantitative and qualitative characteristics of a water body, and remote and satellite data on the state of the transboundary water body and its catchment area is another effective mechanism for efficient water management (Global High-Level Panel on Water and Peace, 2017; Balonishnikova, Tsytsenko, & Kramareva, 2019). Unfortunately, currently it is difficult to realize this, but in case of its wide introduction, this mechanism could play a decisive role in the efficient management of water resources.

In recent years, the issues of “people’s diplomacy” in making managerial decisions in the water sector have been widely discussed (Global High-Level Panel on Water and Peace, 2017). Undoubtedly, this is an important aspect that takes into account the rights and interests of various public, social, and other groups of the population in the availability of water resources, their rational use, and guaranteed water supply to all interested parties: “this participation will provide a genuine link between water management and human rights” (Global High-Level Panel on Water and Peace, 2017).

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CHAPTER V:

THE ROLE OF THE FINANCIAL SYSTEM AND
INNOVATIVE BLENDED FINANCE IN UNLOCKING
SUSTAINABLE “BLUE INVESTMENTS”

5.1 PROMOTING SHADES OF BLUE IN TRANSFORMATIVE SUSTAINABLE FINANCE TOWARDS SYSTEMIC FINANCING AND INVESTING FOR WATER COOPERATION



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THE CHALLENGE

Water is a fundamental factor for sustainable economic development. Rivers alone provide livelihoods for three billion people worldwide. Water flows as a prerequisite through every one of the United Nations' Sustainable Development Goals (SDGs), especially those on food security, healthy lives, energy, sustainable cities, sustainable consumption and production, as well as marine and terrestrial ecosystems (UN, 2015). Due to climate change, every society with a growing and dynamic population has been or will be confronted with water scarcity and/or water pollution as a major threat to the health of its population, its livelihood assets and economy. This has recently also started being acknowledged by the financial sector⁴. COVID-19 is another wake-up call when it comes to the importance of protecting water as a resource, including access to sufficient clean water as one of the best preventive public health measures.

There is a compelling economic case for greater investment in water. The benefits from strategic investments in water security could exceed hundreds of billions of dollars annually. But this huge potential has not reached the finance community, as yet. Converting the benefits of investments into revenue streams can increase the risk-return profile of investments and attract financiers. The task goes beyond the water community alone: the efforts of urban planners, farmers, energy suppliers, and financiers will founder if they ignore water as a shared resource, a potential hazard (risk) and an investment opportunity. The way public investment plans are defined and the responses of the financial institutions are organized – both geared towards sectorial and administrative approaches – denies any hydrographic reality, which is why investment plans are not analyzed and negotiated from different perspectives and interests. The current investment plans and strategies do not take into account the intrinsic value of water in its cross-sectorial, transboundary nature. Moreover, the standard sectorial approach leads almost inevitably to oversized and overly costly infrastructures, missing synergistic opportunities.

THE PROPOSAL: FINANCING WATER COOPERATION AND SUSTAINABLE INVESTMENT PLANS

In 2015, Switzerland came together with 14 other states to set up the Global High-Level Panel on Water and Peace with the Geneva Water Hub as its Secretariat. With this Panel the Blue Peace initiative has grown to a multi-stakeholder global movement. In 2017, the panel published its final report 'A Matter of Survival' (GHLPPW, 2017) with specific recommendations on how to promote water as instrument for cooperation and peace, including a recommendation on financial innovation for water cooperation. The Blue Peace Financing Initiative, led by Switzerland in partnership with the UN Capital Development Fund and the Geneva Water Hub, is an attempt to implement this recommendation on financial innovation for water cooperation (Wennubst et al, 2019).

The funding and financing of current approaches to water investments is country-based and sectorial, not taking into account a basin-wide approach and is therefore often inefficient. There is an urgent need for a systemic change to move from sectorial and national to systemic and transboundary thinking and investing – a systemic approach to financing water as an entry point, with de-risking effects. Water is the perfect entry point and lever for such a systemic change and to develop new opportunities for impact investments in multiple sectors, contributing to all SDGs and therefore to the sustainable and economic development of many sectors and countries.

Concrete examples of projects based on the use of water, of a shared river are, for example, irrigation projects for agriculture, food security (fishing), sustainable clean energy (hydropower/solar), mobility (navigation), preservation of ecosystems (e.g. for tourism), and responsible use of water for industrial purposes. In addition, the production of clean water and energy (and its associated municipal infrastructure) is the bedrock of service delivery and a pre-condition for a healthy, functioning economy.

Currently, there are efforts under way to analyze challenges and opportunities related to funding and

⁴ See for example the Sustainable Stock Exchange Initiative (SSE, 2020), with nearly 100 stock exchanges worldwide participating; or the Network of Central Banks and Supervisors for Greening the Financial System (NGFS, 2020).

financing water cooperation and basin development⁵, and to identify different funding needs, available sources (public and private) and their specific characteristics and requirements (UNECE, 2018).

Systems analysis and scenario-planning, including bundling together projects based on the reality of a hydro-geographical unit, such as a basin, can unlock a whole chain of economic opportunities, benefitting people and their environment. The question is: how to channel funding towards collaborative projects that can generate cooperation which in turn unleashes new economic opportunities? How to build strategic project portfolios?

Answering these questions requires introducing systems thinking into the discipline of public and private investing which requires re-conceptualizing almost all existing paradigms of capital deployment.⁶ The transformation and evolution of systems can be influenced by constructing strategic portfolios and blending multiple assets to maximize their synergistic potential. As mentioned above, this requires integrated (scenario) planning approaches, embedded in so-called joint investment plans based on the hydro geographic reality. They are attractive to (multilateral) financial institutions due to their properties of risk reduction. If interventions are sequenced correctly, properly communicated, and political and financial wills come together, joint investment plans may become a reality in the near future, and should be given monetary value. This will also be possible due to new technological developments, allowing the collection and analysis of data to define and share future-oriented water availability models. Investment plans can take shape based on these models, and with the support of data and digitalization. This requires investments in infrastructure as well as in institutions and information, data-collection and analysis. Well-designed infrastructures only deliver expected benefits when they are backed by appropriate institutions (for project design, financing, management, accountability), and when they build on the best available knowledge and information.

To make these joint investment plans a reality, there is a need to structure a new way of financing that blends public money (for certain investments and for de-risking) with private capital for development.

The joint investment plans should be viewed by investors as a de-risking mechanism that is funded by public finances. The plan helps to understand the benefits of water across assets and sectors and is anchored in a joint political agreement. This in turn can incentivize the creation of institutional mechanisms managing the joint investment plan.

Strategic blending is particularly effective when private-sector investors forge investment partnerships with public sector actors, and when policy and regulation are adjusted to create enabling conditions for the system to transform itself. Governments can

always make sure their own investment activities as well as those of private-sector actors are coordinated with non-investment-related interventions. Similarly, there is an opportunity for progressive capital—philanthropic funds, impact investors, family offices and the first movers – thereby accelerating the mainstreaming of a system-transformative investment logic. What is needed to bring transformation capital to life is further conceptual work combined with real-world prototyping.

INVESTMENT PATHWAYS: THE EXAMPLE OF BLUE PEACE BONDS

To channel funding towards collaborative systemic approaches, it is suggested to identify pathways to guide investments over the long term. While financiers are typically focused on the availability of a pipeline of “bankable” projects, governments should also situate these pipelines within broader investment strategies that contribute to water security and sustainable economic development pathways over the long term.

This requires long term strategic planning of investment pathways that reduce water risks at least cost and that can be adapted over time in response to developments.

The idea is not to replace existing financial agreements and public resources, but rather to create new, additional and complementary ways to access financial capital, leading to a sustainable circular economy.

The financial instrument required for this new kind of impact investing will blend both public and private investments into one and will be called a «Blue Peace Bond». The public funds will be used for risk-mitigation and to attract public and additional private funds to achieve total financing (blended finance). Investment plans bundling together projects from different sectors using water as an entry point (“Blue Peace Masterplans / joint investment plans”) will be used to raise these bonds. The majority of the bonds will be issued by a municipality or a transboundary (water) organization where necessary, through a Special Purpose Vehicle owned by that non-sovereign entity.

CONCLUSION

Investing in Blue Peace supports the achievement of the SDGs while also transforming water from a potential source of crisis into an instrument of cooperation and peace. This innovative approach will lead to systemic change on two levels:

1. it will change the approach and perception of the financial sector away from looking at water-related projects and water as a sector, and towards looking at water as an entry-point for multisectoral and regional

⁵ This includes institutions, data collection and analysis, infrastructure and possibly other related economic development opportunities and projects using water.

⁶ See also Financing the Low Carbon Economy (SSF, 2020): “Mainstreaming systemic investment principles: systemic investing presents an opportunity to create public goods and private value in a symbiotic relationship. This provides an impetus for government to be at the forefront of incorporating systemic investment considerations when developing public spending or capital raising plans.”

impact investment opportunity. It will do so by adding a non-sovereign pillar (Transboundary Water Organizations and Municipalities) to the current financial ecosystems by providing access to finance and the capital market,

2. it will provide a new financial incentive for countries and sectors to cooperate and come to political agreements for a more sustainable management of shared resources, reducing social, political and economic conflicts and therefore leading to cooperative, peaceful societies. The Blue Peace Financing Initiative therefore comes with a peace dividend by giving a value to peaceful and sustainable agreements among stakeholders.

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5.2 FINANCING SOLUTION FOR WATER PROBLEMS IN RUSSIA: CURRENT SITUATION, TRENDS, AND PERSPECTIVES



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ABSTRACT

This article examines the structure of the economic mechanism of water resources management in Russia, including its problems, features of the development of the economic basis, and basic tools. The main focus is on the financing of the water sector in Russia and the development of the “user pays” principle in relation to water bodies.

Since the 1990s, the Russian water management system has been in a continuous process of transformation. The last key reforms in the water sector can be associated with the adoption of the country's Water Code in 2006. From this moment on, the building of the water management system has taken place in a relatively stable “channel”. In addition to defining the main provisions of the state policy in relation to water bodies, the 2006 Water Code determined property rights, the main jurisdictions of water management institutions, and the key elements of the economic mechanism for water resources management.

The relative stability of the state course in water relations has made it possible to form “reference points” in the economic mechanism of water resources management. All subsequent changes concern the improvement of the existing tools of this mechanism. One of the key elements of the modern economic mechanism for water resources management is state financing of the country's water resources. We can say that it is precisely this that is the “driver” of the revival of the water sector at the state level. The total federal budget expenditures on water management and water protection measures in 2018 remained at a level of 18.7 billion rubles, which is more than double the amount of funds spent in 2006. In 2013, given the dynamics of federal budget expenditures, the expenditures peaked at 24.3 billion rubles. As a matter of fact, the amount of financing was significantly affected by the economic crises that took place in 2008 and 2014. This is why from 2014 to 2017 a decline in funding for this expenditure item continued. A critical minimum is noted in 2015, when funding amounted to only 13.2 billion rubles.

It should be noted that despite the current problems, the general course towards maintaining stable financing of the water sector has remained unchanged. However, the level of financing for water in different years ranges from 0.08% to 0.21% of the overall federal budget expenditures, which is clearly not enough for the country's huge water sector, with its accumulated problems over the last decades. This has been reflected

in an increase of the cost of water in the gross domestic product, in the decrease of the safety levels of hydraulic structures, and in the deterioration of the environment of the most water bodies located in the economically developed regions of the country.

FINANCIAL INSTRUMENTS FOR GOVERNMENT EXPENDITURE

Currently, the financial instruments include the following: (a) subsidies allocated to the budgets of the constituent entities of the Russian Federation for the implementation of their responsibilities in the field of water relations (Government of the Russian Federation, 2019); (b) targeted program financing for the development of the water sector of the Russian Federation in 2012–2020 (Government of the Russian Federation, 2012); and (c) subsidies for several priorities, including:

- subsidies for the fulfillment of the state assignment for the provision of public services (works) by subordinate organizations of the Russian Federal Agency for Water Resources (Federal Agency for Water Resources, 2011);
- subsidies to the budgets of the constituent entities of the Russian Federation for the co-financing of regional priority programs in the field of use and protection of water bodies (Government of the Russian Federation, 2012);
- and subsidies for the reimbursement of part of the cost of paying interest on loans received to finance projects for the construction, reconstruction, and modernization of water supply systems and waste water facilities (Government of the Russian Federation, 2012).

According to expert estimates, the annual need for financing water management and water protection measures equals about 50–60 billion rubles. Analysis of the allocated financing clearly shows that the received payments for water use cover approximately 60–70% of state expenditures and 30% of the cost for the maintenance of the water sector. It is obvious to conclude that this state budget line remains deficit. These shortcomings are covered by other lines of budget expenditures.

The main reason for this situation with the financing of a strategically important sphere of the national economy such as water management was, first of all,

a complete ignorance of inflationary processes for almost a decade. The growth of this problem has led to the fact that now, in order to take into account only the inflationary component, it is necessary to arrange a stage-by-stage indexation of payment rates in order to avoid a sharp increase in tariffs and prices for water. During the period under review, the consumer price index increased more than 2.5 times, and the tariffs for the supply of water to consumers increased more than 6 times, which led to a significant decrease of the burden on economic agents engaged in the use of water bodies. In fact, there was hidden subsidizing, and the current situation objectively did not contribute to the interests of economic entities in rational water use. According to available calculations, the corresponding budget shortfalls ranged from 9 to 21 billion rubles annually.

PAYMENTS FOR THE USE OF WATER RESOURCES AND ENVIRONMENTAL SERVICES

The dynamics of payment for water use in Russia has a significant and varied history. The development of this payment was not always straightforward and unambiguous. A number of problematic and controversial issues continue to persist. The most recent stage in the development of the system of payment for water began with the adoption of the Federal Law of the Russian Federation "On Water Tax" in mid-2004. In 2007, the new Water Code of the Russian Federation was adopted, which provided for significant changes in the system of payments for water use: the water tax was to be gradually replaced by non-tax payments for the use of water bodies.

The 2007 Water Code abolished the licensing for water use that had been in force since 1995. Since 2007, water bodies can be used under an agreement concluded in accordance with the norms of Articles 12-16 of the Water Code (that is, within the framework of contractual civil legal relations), or on the basis of a decision taken by the Government of the Russian Federation, or executive bodies of state authorities or local government. This water use agreement must provide for a non-tax payment for the use of water bodies (Article 20 of the Water Code). Administration of payments for water bodies in federal ownership is entrusted to the Russian Federal Agency for Water Resources (Rosvodresursy). At present, both tax and non-tax payments exist simultaneously, but over time, taking into account the transition of all water users to contractual relations, the water tax on the withdrawal of water from surface sources will gradually disappear.

The main result of the innovations was a complete loss of the targeted nature of spending on water management activities and making the targeted approach an exclusively fiscal one. However, the author asserts that the "targeted approach" in the payment for water use, which existed until 2004, can be considered rather arbitrary. Not all regions had taken advantage of spending these funds on targeted activities in water management. This, in fact, was the reason for the centralization of these funds in the federal budget. Payment for the use of water bodies

can be attributed to progressive methods in water use management, similar to payment for environmental services. The fact is that not only the volume of water intake from surface water bodies is subject to payment. Payment should also be collected for the use of the water area of water bodies and for its use for electricity generation without taking (withdrawing) water resources. The issue of revising and classifying the types of use of water bodies is periodically on the agenda of governing bodies and professional circles.

FROM PROBLEM SOLVING TO DEVELOPMENT OF THE WATER SECTOR

The development of financial instruments and an increase in the efficiency of public spending are two of the most important tasks for improving public policy in the field of water resources management. One of the new tools for planning and achieving goals in the state policy for environmental management are national projects (Krutikova, 2019). Along with the existing programs, the format of national projects includes relevance, goals, and activities to achieve them. A distinctive feature of national projects is the complexity of solutions incorporated in the mechanism for achieving their goals. This should, according to the authors of the reforms, ensure inter-departmental coordination in solving problems of a complex nature. The national project "Ecology" includes the water sector in three federal projects, namely: "Restoration of the Volga River", "Conservation of Lake Baikal", and "Conservation of the unique water bodies". The Project Passports contain significant details describing anticipated results.

However, experts criticize the insufficient elaboration and groundlessness of the ambitious goals of projects, as well as the "haste" of their development and adoption (Zaporozhan, 2019). Not enough time has passed yet to assess the results and to draw conclusions about the effectiveness of this instrument. However, the fact that without inter-departmental coordination it will not be possible to solve most of the problems of the water sector, is beyond question. The advantages and the shortcomings of the functional approach used for solving complex problems in the water sector are clearly manifested for a certain range of project activities (Krutikova, Merzlikina, & Prokhorova, 2012). However, the preparation and implementation of projects is a process that does not tolerate hurriedness and requires a coordinated organizational mechanism to implement such an approach in the area under consideration.

Payment for water use has already established itself as an effective instrument of water policy, which has both a compensatory mechanism and stimulating potential. The amount of payment received for the use of water bodies covers a part of the state expenses, and water users are increasingly interested in protecting their financial interests by reducing the volume of water used. This was especially evident after the start of the process of raising payment rates in 2015 due to the introduction of coefficients that take into account the inflationary component.

One of the significant events in the development of the economic mechanism is the introduction of the principles of economic assessment of the resource potential of water bodies in the sphere of state water management (Merzlikina, Krutikova, Prokhorova, & Morozova, 2017; Merzlikina, Morozova, & Krutikova, 2017; Order of the Ministry of natural Resources of Russia, 2019). Assessment of water reserves is carried out on the basis of the requirements of the System of National Accounts. The value of water reserves is based on information about the state's revenues from the use of surface and groundwater in the reporting year, and also takes into account the fact that the state will receive such revenues in the future, since water resources are classified as renewable resources (Ministry of Natural Resources of Russia, 2020).

ADDRESSING ECONOMIC ISSUES THROUGH COOPERATION ON TRANSBOUNDARY WATER BODIES: THE PATH TO SUSTAINABLE WATER USE IN RIVER BASINS

For Russia, the issues of transboundary cooperation for the use and protection of water resources are extremely topical. The basins of 70 large- and medium-sized rivers of the country are transboundary. Almost 46,500 kilometers of the Russian Federation border passes or crosses water bodies. The relations of the Russian Federation with neighboring countries on the joint use and protection of the 24 largest transboundary water bodies are regulated by nine bilateral and one trilateral intergovernmental agreements. Until now, there have been no significant systemic studies on the economic issues of transboundary water bodies, which would analyze not only the problems of direct regulation of water use, but also other aspects of cooperation. For example, issues of national economic security; inter-departmental coordination linked to the "Water-Food-Energy-Ecosystems" nexus; as well as the financing of joint projects and planning, economic settlement of disputes, and other important issues.

Often, regulatory issues directly affect the solution of economic issues. On the part of the Russian Federation, gaps in legislation seriously affect the building of relations with river-sharing countries on a stable legal and economic basis. So, in the current Water Code of the Russian Federation there are no articles devoted to the regulation of relations on transboundary water bodies, while in neighboring countries, for example, in the Republic of Kazakhstan, a whole section of the Water Code is devoted to these issues. To build water diplomacy it is important that the legal framework is harmonized; only in this case is it possible to discuss economic issues in such a key area as joint water resources management. An awareness of the value of the Russian water resources and, most importantly, the first results received from calculating their estimated cost, causes the emergence of new trends in the water management system aimed at preserving this value and at the effective use of available financial resources for its reproduction and growth.

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5.3 FINANCIAL INNOVATION FOR WATER COOPERATION



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Geneva Water Hub

INTRODUCTION

Sustainable finance⁷ is no longer a niche activity, but a major force across global financial markets. Some of the innovative financial mechanisms or approaches developed in recent years in this field can be tailored to promote water-related investments as a tool to foster peace and cooperation. The main challenge lies in the joint development of environmentally friendly, socially inclusive and “fit to finance” water projects.

SUSTAINABLE FINANCE: A STRONG TREND

The proportion of sustainable investments relative to total managed assets is experiencing rapid growth⁸. Three main factors are driving this strong trend. First, beneficiaries and clients are increasingly asking for greater transparency, sustainability and impact. Second, regulators increasingly consider ESG factors to be part of an investor’s fiduciary duty. The strongest push comes from the EU, which has developed the most complete set of initiatives in the field of sustainable finance⁹. Finally, sustainable finance’s growth is also driven by the increasing recognition that environmental, social and governance (ESG) factors affect the financial performance of investments.

Sustainable finance is also gaining ground in Russia. Recently, and particularly since 2018, Russian private actors have started to use innovative sustainable finance instruments, such as green bonds or sustainability-linked loans¹⁰. In parallel, actors shaping the Russian financial framework, such as the Russian Central Bank or the Moscow Exchange (MOEX) are also turning to sustainability¹¹. At the government level, an action plan for adaptation to climate change (2020 to 2022) was published in December 2019, including recommendations related to the development and use of economic and financial instruments.

WATER AS A RISK AND AN OPPORTUNITY

It is estimated that water-related financial losses reached USD 36 billion in 2018 alone due to water risks (CDP, 2018). However, and even though water issues drive many of climate change’s financial impacts, water garners nowhere near the same level of awareness of its related systemic risks to the financial system as do risks from exposure to fossil fuels (Morgan, 2019).

Water is also a significant opportunity for investors. By way of comparison, the required investments in water are higher than the required investments in telecommunications (USD 9.5 trillion) and comparable to the required investments in energy supply (USD 12.2 trillion) (Granzo and Morgan, 2019). As underlined in the Report of the Global High-Level Panel on Water and Peace, “A Matter of Survival” (GHLPPW, 2017), investments in the sustainable management of water are also an opportunity to foster peace and cooperation between all users of the resource.

FINANCIAL INSTRUMENTS FOR WATER COOPERATION

Some of the instruments or approaches developed in sustainable finance since the 2000s have the potential to attract capital towards water cooperation. Peaceful cooperation between water users and sustainable use of hydric resources could in turn lower the risks of related investments. The most promising tools or approaches are listed below:

- Use-of-proceeds bonds are fixed-income securities (debt) that raise capital for a project with specific environmental and/or social benefits. Best-known are Green Bonds, whereby funds are earmarked to environmental or climate projects, but the issuance of Social Bonds or Sustainable Bonds (a mix of social

⁷ Sustainable finance refers to “any form of financial service integrating environmental, social and governance (ESG) criteria into the business or investment decisions for the lasting benefit of both clients and society at large” (SSF, 2020).

⁸ Assets managed with at least one sustainable investing strategy stood at USD 30.7 trillion (2018) in the five markets of the study – Europe, US, Japan, Canada, Australia & New Zealand increased 34% in two years. The proportion of sustainable investing relative to total managed assets amounts to 48,8% in Europe, 25,7% in the US or 18,3% in Switzerland (2018). GSI Alliance (2018) and SSF (2019).

⁹ European measures have a strong impact beyond EU borders because asset managers, not only in the EU, but also in North America or Switzerland for instance, must adapt to European client demand

¹⁰ The waste management company Resursosberezhenie was the first to issue a green bond on domestic capital markets in December 2018. The company Solar Systems then followed suit in March 2020. Furthermore, Russian Railways was the first Russian company to issue an international green bond in May 2019. The 8-years Green Bond was significantly oversubscribed and priced at 2,2%, the lowest interest rate ever for a Russian Euro-denominated bond of any kind. Equally noteworthy is Russian aluminium producer Rusal’s USD 1.085 billion pre-export finance facility closed in September 2019, whose pricing depends on the sustainability of the company, measured with key performance indicators (sustainability-linked loans).

¹¹ The waste management company Resursosberezhenie was the first to issue a green bond on domestic capital markets in December 2018. The company Solar Systems then followed suit in March 2020. Furthermore, Russian Railways was the first Russian company to issue an international green bond in May 2019. The 8-years Green Bond was significantly oversubscribed and priced at 2,2%, the lowest interest rate ever for a Russian Euro-denominated bond of any kind. Equally noteworthy is Russian aluminium producer Rusal’s USD 1.085 billion pre-export finance facility closed in September 2019, whose pricing depends on the sustainability of the company, measured with key performance indicators (sustainability-linked loans).

and green impact projects, aligned with the SDGs) is growing. Blue Bonds can be issued to finance water infrastructure (including nature-based solutions), sustainable water management, wastewater management and ocean-friendly projects. This instrument could also be used to attract capital towards the financing of jointly-owned water infrastructures.

- Sustainability-linked loans connect the interest rate to the borrower's sustainability performance. As the environmental, social or governance performance of a company improves, the interest rate on its loan decreases. Lenders could create similar financial incentives to promote transboundary water cooperation in a sustained and significant way and reward lower credit risk induced by peaceful cooperation with cheaper debt.
- Investments or Payments for Watershed Services are economic mechanisms whereby the beneficiaries of ecosystem services provide investments or payments to the stewards (or provider) of ecosystem services in return for a guaranteed flow of ecosystem services. This mechanism can be used to implement a shared benefits approach in intersectoral and transboundary water contexts.
- The Pay-for-success (PFS) approach has been used to structure Impact Bonds, such as Social Impact Bonds, Humanitarian Impact Bonds, Development Impact Bonds or Environmental Impact Bonds. With this approach, the outcome payer (often a government or a donor) repays the investors with returns if the project achieves its objectives. This payment is compensated with the savings accrued as a result of the program's success. The PFS approach can be applied to watershed services projects (Wrocklage, 2019), with the main challenge lying in the objective measurement of success and thus of the corresponding payments.
- Blended finance consists in using catalytic development capital (from public and philanthropic sources) to create acceptable risk-return profile, so as to mobilize additional private investment for sustainable development (Convergence, n.d). This structuring approach is privileged by the proponents of Blue Peace Bonds, in order to reduce high - real or perceived - risks of financing sustainable joint investment plans of multiple water users.

There is no "one-size-fits-all" solution. Specific instruments or mechanisms must be selected according to investment opportunities and underlying assets.

IS WATER COOPERATION FIT TO FINANCE?

There is a need for stronger institutions to drive efficient intersectoral, transboundary and territorially inclusive water-induced development from the ground up. Water organizations, from small, local water users' associations, community systems and water utilities to large transboundary agencies – especially river basin organizations (RBOs) – could be such organizations. RBOs have unrealized potential beyond water management, as developers, equalizers, to prevent and adapt to climate change and water-related disasters, as informal diplomats or peacemakers. Unfortunately, with few exceptions, these organizations are undervalued and underperform. Few are truly transboundary or intersectoral and only a handful have a degree of financial autonomy. The long-term vision would thus be for RBOs to become creditworthy. In the shorter term, RBOs should be supported to develop their capacity to access traditional and innovative financial sources.

Another important constraint to the development of "bankable" water cooperation projects, is getting agreements between all stakeholders and the political will to act. There are indeed very few opportunities to bring together all stakeholders, at the early conceptual stage, or during implementation when major corrective action is needed (e.g. treaty, contract renegotiation, political changes, etc.).

CONCLUSION

Various innovative financial mechanisms and approaches developed in the past years can be tailored to support water cooperation, but there is a shortage of "bankable" or "fit to finance" projects, able to attract capital for water cooperation. This is even more the case for transformative water cooperation projects in intersectoral and transboundary contexts. To facilitate the joint development of environmentally friendly, socially inclusive and "fit to finance" water cooperation projects, all stakeholders should be brought together at an early stage. Such informal "safe spaces" will generate innovative ideas, spark and catalyse cooperation, help build bridges and develop confidence between actors. Facilities for such "safe spaces" could be provided by existing water cooperation organizations with the overall facilitation of the Global Observatory for Water and Peace (GHLPPW, 2017).

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5.4 PROSPECTS FOR THE DEVELOPMENT OF GREEN FINANCE IN RUSSIA



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This article is devoted to the analysis of the development processes of the green segment of the world financial markets. In particular, the market of green debt financing is considered, and opportunities for expanding the financing of water projects are described. Finally, the state of green finance in Russia is presented, and the prospects for its further development are assessed.

PREREQUISITES FOR THE DEVELOPMENT OF GREEN FINANCE

There is no universal approach to defining green finance yet. Green finance standards have been set by a number of international initiatives (e.g., International Capital Market Association, Climate Bonds Initiative, etc.) and by government institutions of different countries (including the EU, China, USA, Brazil, etc.). They differ both in financing methods and in the direction of spending. In general, green finance means financing projects aimed at eliminating or compensating for damage from economic activities, or at mitigating and adapting to the effects of global climate change. These can be projects related to waste processing, water purification, the energy efficiency of industrial processes, and many others (International Finance Corporation, 2017).

Green financing is being developed as a response to local and global environmental threats. Every year the green finance response to these challenges is more closely intertwined with various areas of society and becomes more and more in demand and commercially attractive. At the state level, the development of the green segment of financial markets, in addition to environmental goals, pursues the priority goal of the socio-economic development of countries: from promoting specific technologies to solving health problems. Private sector interest in green finance also has several dimensions, including the ability to build a reputation in the market, commercialize new technologies and production methods, and minimize long-term climatic or purely market risks associated with tightening environmental standards.

GREEN BONDS

The most widely used green financial instrument is green bonds. Their fundamental difference from ordinary bonds is the directed use of the attracted capital: the issuer of the bonds must invest it in environmental initiatives. For an issuer, labeling a bond as green provides an opportunity to expand the pool of potential investors to include trust, sovereign, or municipal funds interested in making their portfolio “clean-oriented”. Governments and central banks, predominantly in developed countries, often act as lenders for green projects directly or through interest rate subsidies. Entering the green segment of financial markets, in addition to launching new projects, is often used to refinance existing debt on projects that were not previously labeled as green.

The global green debt capital market is expanding rapidly. In 2019 its volume amounted to USD 259 billion (+ 51% compared to 2018), and the number of issuers increased to 506 (compared to 347 in 2018). The leaders in attracting green debt financing are the United States (105 issuers,

USD 41.3 billion of attracted capital) and China (79 issuers, USD 31.3 billion of attracted capital). Most of the funds are attracted through projects in the energy (31%), construction (30%), and transport (20%) industries. Water resources management projects account for about 9% of green financing (Almeida, 2020).

GREEN FINANCE AND WATER RESOURCES

Water projects that receive green funding cover a wide variety of areas, from water storage and distribution projects to flood protection projects. Their development, however, is constrained by the purely regional nature of most water problems, and the source of funding for projects is mainly regional economic entities. In this regard, the expansion of the segment of green financing for water projects in different countries can be facilitated by their internationalization. The implementation of projects in the field of use and management of water

resources is increasingly intertwined with the tasks of mitigation and adaptation to climate change, which are of a global nature. Thus, the development of water pump technology is closely interconnected with the development of renewable energy sources (Gopal, Mohanrai, Chandramohan, & Chandrasekar, 2013), and the construction of dams and water barriers with the ability to adapt to climate change (Climate Bonds Initiative, 2018). The proper labeling of water projects can significantly increase the interest in them by international financial organizations, as well as by the corporate sector interested in financing climate projects.

Another promising way to stimulate the development of green financing for water projects is to emphasize their transboundary components. Given the transboundary nature of a number of water problems, financing the construction of water infrastructure, including dams and irrigation systems, can be carried out in cooperation with neighboring countries. This can be done by attracting funds from regional development banks or through the creation of funds for transboundary water cooperation. One example of such cooperation can be the currently discussed initiative for the Blue Fund (Global High-Level Panel on Water and Peace, 2017).

GREEN FINANCE IN RUSSIA: STATE AND PROSPECTS

Despite active steps to form the architecture of the green segment of the financial market in recent years, Russia is still at the very beginning of the path (NAKDI, 2020). To date, only six Russian issuers have placed eight issues of green bonds in the amount of 7.55 billion rubles, 250 million Swiss francs, and 500 million euros on the Moscow, Swiss, and Irish stock exchanges, respectively. These projects cover the areas of housing and communal services, energy, transport, and real estate. The largest green borrower in Russia is Russian Railways, which raises funds on the European market to implement projects for the construction and modernization of railway infrastructure (NAKDI, n.d.).

Raising funds for the development of railway transport is a good example of the colossal potential for the development of green finance in Russia. Green bonds and other components of green financial markets (e.g., voluntary carbon markets) are important in terms of global environmental issues and, in particular, global climate change. One of the main difficulties in solving the problem of global climate change is that the most significant sources of financing for low-carbon projects are located in developed countries (e.g., EU and USA) and also partly in China, while the most effective (in terms of cost) projects are in developing countries and economies in transition, including Russia.

Until recently, integration into the green segment of the global financial markets was not viewed by Russia as a potential source of economic benefits

that goes hand in hand with the possibility of solving environmental problems. The development of rail transport is recognized by the international community as an important source of electricity demand, whose growth is driving the development of low-carbon energy technologies aimed at combating climate change. Russian production is highly energy and carbon intensive and a large amount of energy is lost due to outdated infrastructure, making Russia a country with significant potential to reduce greenhouse gas emissions at a low cost. Other promising projects for attracting green financing in Russia lie in the areas of forest management and the development of renewable energy, including hydroelectric energy (Damianova, Guttierrez, Levitanskaya, Minasyan, & Nemova, 2018; McKinsey & Company, 2009). Russia already has experience participating in international green market mechanisms. Russian companies received additional revenues of USD 600 million in the late 2000s to early 2010s through participation in the Joint Implementation Projects carried out under the Kyoto Protocol to the UN Framework Convention on Climate Change.

Kyoto project mechanisms are no longer available to Russia, but the explosive development of green financial markets offers significant opportunities to capitalize on the enormous potential for low-cost emission reductions and environmental projects. Realizing this potential will depend on the following possibilities:

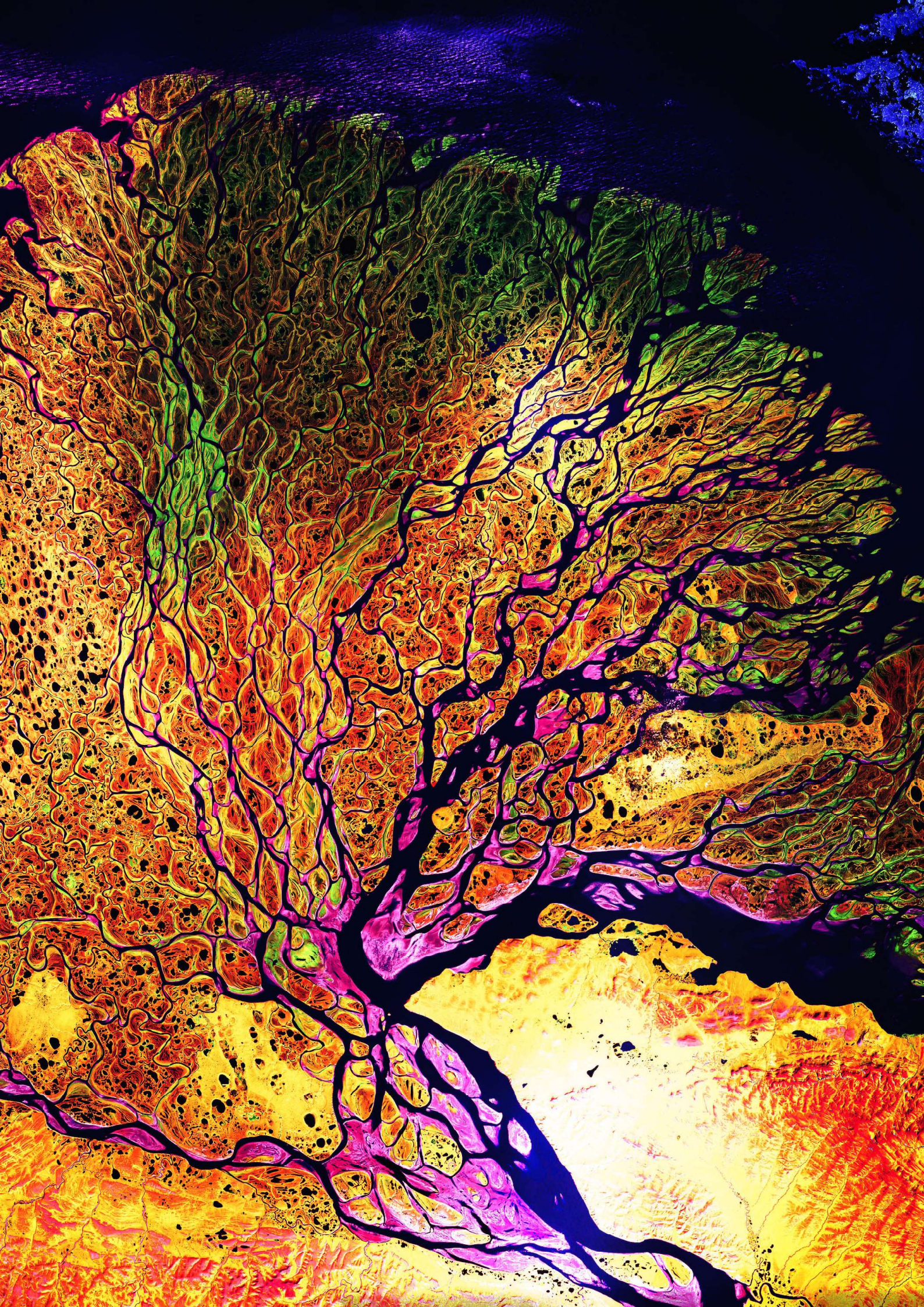
The implementation of more ambitious environmental and climate government policies. Currently, the weak goals to reduce greenhouse gas emissions and to reduce anthropogenic pressure on the environment, formulated at the state level, do not contribute to the creation of long-term incentives for the implementation of environmental and climate projects.

Further work on building a regulatory and legal architecture for green finance, including the development of a system for standardizing green projects in Russia (and its convergence with international systems), developing institutions and mechanisms for project verification, expanding the diversity of green financial instruments, etc.

The synchronization of the efforts of the national business communities around the green agenda. The potential for the implementation of green projects largely depends on the complementary work of government agencies, the Central Bank of the Russian Federation, Vnesheconombank, regional governments, the private sector, and business associations. Among other things, the opportunities for the development of green finance lie in the plane of both the search for new projects and the labeling of a number of existing projects, which will allow international investors to consider them as green.

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CHAPTER VI:

GLOBAL ANALYTICS PLATFORM AND A NEW VISION
FOR WATER DIPLOMACY

6.1 A GLOBAL PLATFORM FOR COOPERATION ON WATER AND PEACE



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In our present time, there are many international institutions dealing with water issues, contributing as significantly as possible to water cooperation at the international-level. These existing organizations and mechanisms are necessary, valuable and impactful. They are doing important work in furthering joint water management as a means of advancing peace.

However, in the global discussions relating to international water cooperation, there is growing urgency for the adoption of new mechanisms of water diplomacy that are capable of answering the challenges of the 21st century. On one hand, it is necessary to recognize the political importance and nature of many water issues that need to be addressed diplomatically, requiring attention beyond the technical dimension of water cooperation. On the other hand, as noted in Adelphi's 2014 report, "The Rise of Hydro-diplomacy" (Pohl et al, 2014), there is a need for more agency¹² as global water problems rise and are likely to contribute to international tensions, disputes, and threats to peace.

In February 2017, and as part of the work of the Global High Level Panel on Water and Peace, a senior expert's two-day roundtable was convened on the topic of Hydro-Diplomacy beyond water management and Financial Incentives for Water, Peace and security. This is where the notion for the establishment of the Global Observatory on Water and Peace (GOWP) was first introduced through a paper that set the stage for expert discussions, based on the argument that new approaches of hydro-diplomacy are required to realize the potential of water as a tool of peace-building and conflict-prevention.

Accordingly, the Panel later recommended, in chapter 7 of its report "A Matter of Survival" (GHLPPW, 2017), the establishment of a new mechanism for facilitating agency, collecting and disseminating existing knowledge, and acting as a neutral arbitrator.

The Global Observatory for Water and Peace (GOWP) was launched during the Arab Water Week held at the Dead Sea, Jordan, under the patronage of HRH Prince El Hassan bin Talal in March 2019. The GOWP is a global platform, based in Geneva, Switzerland, an international hub for peace and diplomacy. It is an inclusive network of existing practitioners, organizations, and nodes of different kinds which reflect analytical and strategic perspectives on water and peace. The GOWP's process

of reflection is carried out through a dynamic, creative exchange, and contributes to creating a discreet "global space" («Safe Space») addressing key themes for their environment, with both generic and global scopes.

The flexibility given by a network means that the partnerships are region- and context-specific; forged with think tanks, research institutes, and others working towards water cooperation. Different parts of the world have different water challenges and entry points to the use of water as a vehicle for peace, leading to rich and diverse partnerships. There are two main types of nodes: (1) regional nodes (2) societal nodes

1. Regional nodes are currently being set up, bringing the issue of water and peace to the global level from its base in Geneva. These nodes will help catalyse and implement the GOWP's network. Nodes are currently being set up in West Africa, Latin America, and the Middle East and, will soon be extended to other regions, particularly Central Asia and the Maghreb.

Each regional node must have two capacities: (i) the analytic capacity and (ii) the capacity and credibility to create neutral spaces for reflection (safe spaces).

2. Societal nodes are varied in their nature, and constitute an analytical and creative capacity (carrying a reflection) in their "society". They include partners that enrich the GOWP's process of thinking and its ability to address the water-peace nexus. They address the projected megatrends of the second half of the 21st century, using water as a vehicle for peace for meeting the challenges of climate change, urbanization, demographics, conflicts, and migrations. These partners include the Panel, the Group of Friends on Water and Peace (the GoF), the voices of local populations, the Water Diplomat media network, the Youth Parliament for Water, and Philosophical expression. (Opinion leaders cover poems, religions, music, etc.)

In the fall of 2020, the GOWP will publish its first annual analytic report, reflecting on the developments and trends in relation to the global water and peace architecture of the 21st century. The report will be compiled by the Geneva node, based on the individual reports of the partners.

¹² "Agency" is referred to as the capacity to act effectively through a setting that connects pivotal actors, reinforces and complements existing frameworks, initiatives and expertise to coordinate and execute political action.

The GOWP is an open platform that welcomes all agencies and entities concerned with the challenges of the water, peace and security nexus, and who bring into action the untapped potential of water in peacebuilding. It is hoped that more partners will join and collectively contribute to a better global water architecture in which no one is left behind.

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6.2 RUSSIA IN FUTURE WATER DIPLOMACY STRUCTURES



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The Russian Federation takes an active part in the activities of the United Nations and its specialized agencies in the field of environmental protection (EP). Within the framework of multilateral cooperation on transboundary waters, the Russian side shows particular interest in the following areas: the rational use of transboundary water bodies, the application of the principles of integrated water resources management, the protection of ecosystems and water quality, and monitoring and adaptation to climate change in transboundary basins.

Without denying the positive role played by United Nations Environment Programme (UNEP) via its coordinating mandate in the field of environmental protection, the author believes that the existing international structures for managing environmental activities are not sufficiently adapted to solving problems in the context of intensified use of natural water bodies for socio-economic development. New global challenges and the resulting aggravation of social contradictions, with which mankind is not yet able to adequately cope, generate mutual distrust in the world community. Mistrust, in turn, leads to the emergence of threats against states allegedly guilty of certain global cataclysms. Recently, this has been especially acute in the struggle for the use of water resources, primarily in countries that have already faced a shortage of fresh water. Based on this, it is important to welcome any initiative aimed at improving international water diplomacy. Initiatives should propose new forms of cooperation in this vital area based on equal and unifying principles. The basic idea of such proposals could be captured by the slogan, “a planet for all, without sanctions and restrictions on environmentally sustainable development”.

Russia is interested in developing new approaches to regulating various aspects of the global water problem. Among them could be, in particular, a single set of international normative legal acts that establish common principles for all subjects of international relations for the use of transboundary water flows and reservoirs, as well as a mechanism for resolving relevant international disputes. The author believes that the water agenda of the UN and its specialized agencies should pay special attention to the relationship between environmental and social human rights, and in this regard, actively promote the idea of the need for lifelong education as a priority direction for harmonizing the relationship between man and nature.

The rationalization of the process of international management in the field of water resources protection presupposes the implementation of reforms aimed at transforming international environmental relations, including through a fundamental change in the existing management mechanism.

The most important direction of the desired reforms is legal support for environmental safety, including water aspects, through overcoming the rivalry between the economy and the environment. Within the framework of this idea, it is necessary to regulate at the international level both the legal responsibility and the legal support for the environmental safety of enterprise activities from the fuel and energy sectors, as well as determine the responsibility of cargo carriers for the operation of vehicles that do not meet environmental safety standards. The same group of issues includes legal regulation for ensuring environmental safety when handling wastewater during production.

While welcoming the expansion of international cooperation, at the same time, the author supports the strengthening of Russia's sovereign rights in the field of ecology. The author also believes that the country's ecological sovereignty should be ensured by guaranteed access to the world's natural resources by allocating appropriate quotas, as well as by revising international treaties that run counter to the country's interests. In addition, the market created for environmental technologies and services that support the exchange of natural resources should be regulated by the states. At the same time, the author is in favor of a reasonable balance between the priorities of ecology and economics, and against “environmental and water extremism”, which puts political pressure on national governments to the detriment of the social rights of the population.

Scientists of the Moscow State Institute of International Relations have repeatedly made specific proposals for the further development of Russian approaches to solving the global water crisis. The expert and analytical report of the Institute of International Studies of MGIMO University, “The problem of fresh water. The global context of Russian policy” (Orlov, Chechevishnikov, Chernyavsky, et al., 2011) formulated the main directions for improving the water policy of the Russian Federation, and also proposed a number of specific measures. These proposals were further developed during the international scientific and

practical conference of the Academy of the Ministry of Emergency Situations (MES) and MGIMO, dedicated to topical issues of law and security in the field of global environmental security (Global environmental security, 2011).

According to the experts from MGIMO, given the impact of the growing, global struggle for water resources on the national security of Russia and the countries bordering it, it is advisable to focus our water diplomacy on proposals for the development of new approaches to regulating various aspects of international hydraulic policy within the UN system. In particular, it is proposed to initiate the adoption of the program for the provision of scientific, technical, economic, political, and legal assistance to developing countries from the most industrialized countries to optimize the use of water resources. Such a program can include, among others, the following assistance: compiling country and regional balances of water resources; scientific, technical and economic support for the optimal use of water resources; assessment of environmental, economic, and social side effects of irrigation and drainage projects; and mediation in the settlement of interstate disputes over the volume of water intake.

It would also be desirable to develop and adopt at the international level a set of measures to protect water resources from terrorist attacks, as well as from encroachments from other political actors. Since the country's water system is one of the critical infrastructures, it is important to have a platform for collecting and processing information using science-

based methods that allows potential threats to be revealed in a timely manner. The likelihood of power scenarios dictating the need to use the potential of the armed forces to protect national interests in this area cannot be ruled out. In view of what is mentioned above, it seems important for us, at the expert level, to support the recommendation of the Global High-Level Panel on Water and Peace (2017) for the convening by the UN General Assembly of a Global Conference on International Water Cooperation in order to develop a strategic framework for global water cooperation and an action program with the definition of specific priorities.

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CHAPTER VII:

NEW GLOBAL CHALLENGES IN WATER CRISIS

7.1 WATER RESOURCE OF THE RUSSIAN ARCTIC: CURRENT KNOWLEDGE, PROBLEMS OF PROTECTION AND PERSPECTIVES FOR COOPERATION



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The state of knowledge of water resources, problems of its protection, and prospects for cooperation in the Russian Arctic are becoming the most important components of the domestic and foreign policies of the Russian Federation (hereinafter referred to as the RF). Due to the long-term and seasonal changes in river runoff and the “dispersed” economic activity, it is difficult to overestimate the socio-economic importance of water resources in the Arctic, including fresh water reserves (Atlas of the Arctic, 1985, p. 97-98).

The emerging Russian environmental policy in the Arctic is the objective of research and improvement of the national legislation and management capacities. This policy is based on the federal laws, decrees of the President of the Russian Federation and the Government, orders of the Ministry of Natural Resources and Ecology, as well as guiding documents of the Russian Federal Service for Hydrometeorology and Environmental Monitoring (RosHydroMet) and the Federal Water Resources Agency (RosVodResours). It is implemented based on the results of monitoring surface water bodies within the established boundaries of the Arctic zone of the Russian Federation (hereinafter AZRF), which includes estuarine areas of rivers, as well as freshwater areas of internal seas (Ivanov & Kharlampieva, 2020, p.8-18). It is well known that in the above-mentioned laws and regulations and other documents arising from them, there are a number of contradictions and shortcomings (at the federal and agencies levels) associated with insufficient specifics in relation to the water resources of the Arctic (Ivanov & Tretyakov, 2015, p.151-160). The key factors influencing the state and development of the national monitoring system of estuarine areas of rivers, as well as inland sea waters, are:

1. the uniqueness of these natural areas due to the following circumstances:
 - extreme natural and climatic conditions, namely, a long duration, up to 8 to 9 months, of snow and ice cover, which determines its influence on the characteristics of the hydrological regime and processes in estuarine areas of rivers and inland sea waters, especially the processes of ice formation and melting
 - a clearly noticeable dependence of the characteristics of the hydrological regime of the estuarine areas of rivers and inland sea waters of the Russian Arctic on the long-term and seasonal variability of river runoff, on the one hand, and the synoptic variability of the dynamics and thermohaline structure of sea waters, on the other hand
2. the socio-economic conditions for organizing a monitoring network:
 - extremely low population density in the Russian Arctic and the infrequent and random (almost point-like) nature of the location of settlements and zones of industrial and economic development within the territories of local catchments of river estuaries; this results in the lack of local, qualified personnel to carry out full-fledged hydrological monitoring and hydro-meteorological services in the network of the regional units of RosHydroMet
 - dependence of the life support of the monitoring units on transport, which determines the high cost of resources such as fuel, food, and essential goods

- closing of territorial departments of RosHydroMet responsible for monitoring in the Russian Arctic zone, and reassigning their operational services to other departments of RosHydroMet located outside the Arctic zone; at present, this has led to a decrease in funding and the liquidation of operational and services divisions of RosHydroMet in the AZRF, especially at hard-to-reach stations and posts in the Siberian and Far Eastern Federal District
- extremely insufficient provision of instruments and equipment, as well as land and water transport suitable for arctic conditions for the observation network; this affected the quality of observations and led to a reduction in the number of monitored parameters

3. imperfection of the legislation and lack of legal status for estuarine areas of rivers and inland sea waters of the Russian Arctic (in terms of legal terms and the sphere of application of legislation and regulatory legal acts) and, as a consequence, the lack of a unified zoning of water resources in estuarine areas of rivers and inland sea waters of the Russian Arctic

4. lacunas in the national land and water resources zoning methodology regarding areas of river estuaries of the AZRF as independent surface water bodies, and as a result, the disappearance of these water bodies on the water resources zoning maps prepared by RosVodResours

In addition, today there is no inventory of AZRF river estuaries and their water resources zoning, which existed in the past and was developed in detail by RosHydroMet since the beginning of the 1930s (Davydov, 1936, p. 7-22).

The most important factors determining the possibilities for the use of water resources are the parameters of water quality, and therefore, identifying the sources of their pollution becomes a priority task. For example, the qualitative composition of water resources in the Ob and Taz rivers estuary area is determined by the influx of chemicals supplied with the runoff of the Ob, Nadym, Pur and Taz rivers and, to an even greater extent, by pollution caused by human activities and their impact on the water of the estuary area (Ivanov & Tretyakov, 2015, p.158). Under the conditions of the exploitation of hydrocarbon deposits in the catchments of the estuarine areas of the AZRF rivers, the improvement of the environmental legislation for the estuarine areas of the AZRF rivers and of the requirements of the national environmental monitoring system contribute to the prevention of degradation of aquatic ecosystems not only in the Russian Federation, but also in other Arctic states.

The activities of Russian experts within the framework of the working group of the Arctic Council on Arctic Environmental Assessment and Monitoring Program (AMAP) and the Sustaining Arctic Observing Networks are closely related to issues of the Arctic management system (Tretyakov & Kharlampieva, 2017, p. 16-18). The agreement on strengthening international Arctic scientific cooperation, signed in 2017 by the Arctic countries and their partners, intends to provide for the intensification of cooperation between scientists and the exchange of best practices for specialized education programs and responsible management. An evaluation of the effectiveness of the implementation of the agreement, carried out by the University of the Arctic jointly with the International Arctic Scientific Committee and the International Arctic Association for Social Sciences, showed the following results:

1. Eight per cent of respondents stated that there are specific problems in conducting international scientific research (including difficulties in accessing some scientific sites and databases, participation in meetings, conferences, as well as bureaucratic problems, etc.).

2. The overwhelming majority of respondents noted the positive experience of organizing and conducting international scientific research in the Arctic (e.g., free movement, close cooperation with local scientific communities, access to all resources that allow for conducting full-fledged research).

This survey focuses on the relevance of Arctic research in the social sciences. At the same time, it is worth noting the potential of the Arctic Council (AC), the Council of the Barents / Euro-Arctic Region, the Northern Forum, and associations of indigenous peoples of the Arctic in the implementation of program and project activities on socio-economic and environmental aspects common to the Arctic countries. It is also worth paying attention to the experience of training local personnel in management of the Russian Arctic territories organized by the Russian Academy of Public Administration under the President of the Russian Federation (Smorchkova, 2003). This master's degree program in "Management development of the Russian North" allows for constant improvement of the trainees' capacities in integrated management of Arctic resources (Sokolova, Smorchkova, & Yusov, 2017; Smorchkova, 2018). In the future, issues of water resources management in the Arctic may become a priority area not only for the development of educational programs in this field, but also for improving the competencies of local personnel according to international standards.

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7.2 THE ROLE OF NATURAL FORESTS IN OVERCOMING THE GLOBAL WATER CRISIS



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The world's scientific achievements and latest technologies amaze the imagination with fantastic prospects for the future world. However, the main blind spot in modern science remains the question of how do ecosystems such as forests, rivers, lakes, swamps, tundra, and oceans that are not yet disturbed by man function? Where does all fresh water come from? How has life in these ecosystems not been interrupted and how has the environment remained livable for hundreds of millions of years? Without answering these questions that are vitally essential for civilization, it is impossible to speak definitely about our future.

Over half a century of intensive scientific research, global satellite and ground-based observing systems have been created and data on the state of the environment that are unprecedented in volume and detail have been obtained. The analysis of these data revealed the complexity and insufficiency of research on the interconnection of biogeophysical processes that determine Earth's climate. There is a large uncertainty related to atmospheric moisture. On the one hand, water vapor and clouds greatly contribute to the greenhouse effect (like carbon dioxide, they redirect heat radiation back to the Earth's surface that results in its heating). On the other hand, clouds reflect solar radiation back into space and cool the Earth's surface. Without a reliable assessment of the role of atmospheric moisture, it is impossible to assess the effect of excess carbon dioxide on the climate. Therefore, during the last two decades the world meteorological community has been focusing on the water phase transitions, such as evaporation and condensation (Schiermeier, 2010).

For centuries, civilization has been destroying the natural vegetation cover, particularly forests. The most rapid deforestation began in the 20th century, particularly due to massive forest cuttings and fires. This process has accelerated the onset of the global water crisis. In the climate agenda, deforestation was initially viewed only as an additional source of carbon dioxide emissions (or its deposition, in the case of reforestation), altering the reflectivity of the planet. However, the accumulated data on the key role of forests in the regulation of atmospheric moisture indicate a possible underestimation of deforestation and the replacement of pristine forests with artificial plantations as factors affecting climate destabilization and fresh water shortage. Long-term observations have shown that on land evaporation is almost completely determined by the vegetation cover, mainly by natural

forests. These revelations promoted further intensive research in this area (Jasechko, Sharp, Gibson, Birks, Yi, & Fawcett, 2013).

For the last quarter of a century, the renowned researchers Dr. V. G. Gorshkov and Dr. A. M. Makarieva (Saint-Petersburg, Russia) formulated and proved two globally significant discoveries, including: (1) the concept of biotic regulation of the environment and climate, with quantitative assessment of the stabilizing effect of natural ecosystems on the environment, climate change, and the state of water resources; and (2) the theory of the biotic pump of atmospheric moisture, providing a quantitative evaluation of pristine forests in the transportation of atmospheric moisture from the ocean and atmospheric condensation on land. In respect of the global water crisis, we will consider the second discovery in more detail. Numerous studies by Russian scientists have shown that condensation of water vapor is the main driving force behind Earth's atmospheric circulation (Gorshkov & Makarieva, 2020). However, the biotic pump theory goes against the traditional paradigm claiming that the kinetic energy of the wind is generated not by water condensation but by the temperature gradient. Many textbooks on meteorology still provide a diagram of the water cycle in nature indicating the ocean evaporation as the main cause of atmospheric moisture condensation in clouds, then precipitated as rain. This traditional scheme completely ignores the role of vegetation and especially of natural forests acting like giant fountains and generating winds.

BIOTIC FORESTS PUMP MECHANISM

The sun energy generates an intensive evaporation (transpiration) from pristine forests, exceeding the evaporation from the same area above the ocean by about an order of magnitude. The transpiration maintains a dense condensation of water vapor over land. Further, water vapor condenses and passes from the gas phase into clouds filled with water droplets, leading to a rarefaction of air in the atmosphere above the forest. These low pressure areas promote ascending air currents over the forest and "pumping" of high-humidity air from the ocean, which rains down (and snows in winter) in northern latitudes. Most (about 2/3) of the precipitated fresh water maintains the balance of water in rivers and wetlands, feeds lakes, provides for the vital activity of flora and fauna, and also evaporates again over land. The rest of the

precipitation in the normal cycle flows down the rivers back into the ocean. All moisture on land drains into the ocean in four years. This mechanism explains why rain does not fall over the desert. There is no moisture in the desert and there is nothing to evaporate. Therefore, such areas have permanently higher pressure compared to the ocean, where evaporation and condensation of moisture only take place in this case. So, the wind in the desert always blows from land to sea, but never in the opposite direction!

This simple, yet far-reaching, physical theory describes how the water vapor exhaled by trees creates winds. Thus, the Russian natural boreal forest, stretching over 7,000 kilometers from Northern Europe to the Far East, is an essential component of the global biotic forest pump. It supplies fresh water to Western Europe, Russia, Central Asia, Mongolia, and China. Thanks to these boreal forests, winds from the Atlantic cross the continent, carrying humid air across Europe and through Siberia to Mongolia and China. These winds carry the rains that feed the lakes and rivers of Eurasia, including the giant rivers of Eastern Siberia. The same winds bring moisture to China's northern plain, the granary of the most populous country on the planet. China receives 80% of its fresh water from the west, and this is mainly Atlantic moisture, which is "pumped in" by the natural taiga forests of Eurasia. Moreover, the path of atmospheric moisture transfer occurs in several stages, involving transpiration cycles with associated rain, and takes six months or more. This phenomenon contradicts the traditional notions taught at school. Paradoxically, China is close to the Pacific Ocean, but most of its rainfall is moisture from land in the far west (Pearce, 2020).

A natural forest is an integrated system of trees of different ages and other biological species, including bacteria, fungi, insects, birds, and small and large animals, all of them participating in the forest life processes. All of this complex activity of the natural forest community for millions of years is aimed mainly at maintaining the stability of the fresh water cycle, without which life is impossible. When coniferous forests are partially destroyed by natural disasters (e.g., hurricanes, lightning strikes, etc.), natural restoration processes (succession or self-healing) last over a hundred years (Gorshkov & Makarieva, 2007).

Purposeful deforestation and burning of forests, negligent fires, and destruction of native forests lead to a serious disruption of soil water evaporation. If the areas of destroyed forests are significant, erosion of low atmospheric pressure zones occurs. This results in abnormally hot springs and rainy, cold summers. The mechanism of the biotic forest pump for transporting atmospheric moisture from the coastal sea zones inland becomes poorly regulated (the biotic pump "sneezes"). These factors also lead to an increase of abnormal weather phenomena. These include either droughts accompanied by fires, or disastrous floods occurring when large masses of moisture abruptly flow onto land and flood settlements, agricultural, land and other territories. This results in an excess of fresh water that is impossible to use and causes catastrophic situations in which flora and fauna die and people have to save themselves.

Anthropogenic destruction of natural forests results in the degradation of their biodiversity and their ecological succession proceeds extremely slowly, taking many tens of years due to the destruction of all the biodiversity of the natural forest. After the tree clearings and fires, deciduous trees do not form soon. They cannot draw moisture from the ocean in the spring months before foliage forms and, accordingly, provide a sufficiently high degree of evaporation. The result is a drought in the interior of the continent and catastrophic floods in the coastal regions, where all moisture that has not penetrated inland will accumulate. A complete destruction of pristine forests blocks the considered biotic pump and turns any river basin into a desert over about several decades. In the last century, dramatic consequences resulting from a sharp shortage of precipitation led to the disappearance of the Aral Sea. The basin of the formerly rich Amu Darya and Syr Darya rivers feeding the sea disastrously shallowed (Startsev, 2016).

WHAT IS THE VALUE OF NATURAL FORESTS?

From 1986 to 1997, an experiment called "Biosphere-2" was carried out in the United States in the state of Arizona. It was the most ambitious biophysical project ever undertaken by the scientific community, costing USD 200 million at the time (more than USD 1 billion at current prices, as estimated by the author). In 1991, eight scientists entered a sealed and glazed research facility with a floor area of 1.3 hectares, where they were to remain isolated from the outside world for two years. Inside the dome, diverse ecosystems, including a rainforest, swamp, agricultural field, savannah, desert, and an ocean with a coral reef were created. In this nature-simulating environment the "biospherians" were accompanied by insects, bees, butterflies, fish, reptiles and mammals, which were carefully selected to support the vital functions of the ecosystems that were supposed to provide air circulation, water, and nutrients in order to (a) maintain an atmospheric composition acceptable for humans, and (b) provide the sources of food for the participating humans.

After 17 months, the experiment had to be stopped ahead of schedule due to the drop in oxygen levels under the dome, where people were already breathing thin air at 5,300 m above sea level. The first and main lesson is: natural components, as in a natural ecosystem, cannot be created by humans for any amount of money. Lesson two is: there is a real possibility of sudden, dramatic changes in ecosystems. The natural environment is a nonlinear system, which tends to maintain dynamic equilibrium under the influence of disturbances, but only up to a certain threshold. Then, even small shifts in equilibrium can cause abrupt changes that transfer the system to a nonequilibrium state with rapid fluctuations that mean passing the point of no return (Startsev, 2012).

The accelerated artificial reforestation that simulates natural forest restoration turned out to be inefficient. Artificial forest plantations do not recover and maintain the natural water cycle. Furthermore, numerous examples, particularly including the failure of planting of greenery in China that was started 25

years ago, show that they are unstable and undergo rapid degradation from drought or pests. All of these facts confirm the vital necessity of the preservation of pristine forests still existing on the planet.

In view of the growing global shortage of drinking water, taking into account the key role of natural forests in a sustainable freshwater cycle, and in order to effectively manage water resources, the following measures are suggested for consideration and implementation at both international and national levels:

- in national forest registers, identify and legally establish a new category of forests: climatic and water regulatory forests (pristine or weakly disturbed forest areas that perform a continental regulatory function for the atmospheric moisture transportation from the ocean and precipitation stability on land)
- development of a new concept for the woodworking industry, taking into account the fundamental difference between climatic and water-regulatory forests, which are exclusively subject to protection and monitoring, and commercial forests (for industrial and consumption purposes)
- climatic and water regulation forests should be completely protected from any industrial and commercial activities, including forest concessions and currently popular ecotourism; in fact, these forests should become a specially protected restricted area, free of even small aircraft flights (probably except for drones with environmentally friendly engines for monitoring purposes)
- creation of commercial forests (forest plantations) via artificial and combined reforestation to provide the maximum economic return from intensive forestry, based on modern scientific developments in accelerated tree growing and “circular economy” principles involving deep processing and the implementation of the most advanced technologies (e.g., waste-free processes and developments of modern biochemistry), contributing to the intensification of consumer forestry
- include a new priority for scientific research: “Forest and water: Physical and biological foundations of the environment and life sustainability” in national and international programs. This research direction should be based on an interdisciplinary approach, involving the integrated participation of specialists from different fields of science (currently working in their own narrow areas without consideration of the complex worldwide situation and problems)
- development of the educational course, “Natural science foundations of forest and water resources sustainability in the biosphere” and its implementation in all universities, as well as performing advanced training courses and workshops for state officials and, industrial and business communities to disseminate knowledge about the “technosphere-biosphere” system as a part of the competence in all levels of management
- in the field of social policy: (1) consider the protection and preservation of natural forests as a priority in international cooperation; (2) provide the conditions for the involvement of the expert and civil societies for addressing the problems of protection and preservation of natural forests, monitoring and controlling their condition, and exchange of experiences between regions and countries; and (3) ensure the availability of the comparative monitoring data for worldwide community
- in the field of nature-like technologies: (1) development of technologies for wood/timber replacement by other materials, particularly in the paper and packaging industries; (2) introduction of blockchain technologies to control timber turnover and exclude illegal forestry exploitation; (3) use the potential of information and communication technologies, digitalization, and aerospace surveillance equipment for continuous monitoring and forecasting of the state of natural forests using artificial intelligence algorithms; and (4) address climate change problems with the assessment of the stabilizing potential of biota and natural forests at the level sufficient for ecosystems to maintain an environment and water balance suitable for life
- in the international dimension, seek recognition of Russia and its mission as an environmental donor and guarantor of climate sustainability in Eurasia and worldwide; Russia is a scientific leader in the field of fundamental research on environmental sustainability, including the invention of the biotic regulation concept for the environment and climate (1995), as well as the global level discovery of a forest biotic pump of atmospheric moisture (2005)
- extension and intensification of international cooperation in the field of protection of the Eurasian boreal forest belt, since the biotic pump is free of state borders and provides fresh water for all Eurasian countries, including Russia
- organization of an international, interdisciplinary research center for boreal forest sustainability, based on the scientific research results of St. Petersburg scientists V. G. Gorshkov and A. M. Makarieva
- explore the potential of the Geneva Water Hub, UN structures, and other international associations for cooperation among the countries to preserve large areas of pristine forests, including Russia, Brazil, Indonesia, Papua New Guinea, Canada, and countries of the Congo River Basin; this cooperation should include measures towards the elimination of exploitation of natural forests and development of commercial forest plantations around the world.

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7.3 THE UNIVERSITIES PARTNERSHIP FOR WATER COOPERATION AND DIPLOMACY



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The mission of the Geneva Water Hub can only be shaped and achieved through quality and relevant knowledge and capacity development in the field of water cooperation and diplomacy. By investing in knowledge and capacity through its academic arm at the University of Geneva, the GWH enhances the skills of its target audiences, prepares them to face the future autonomously, and lends its know-how to help build a more peaceful future to individual societies, countries and the world.

Through the University of Geneva, the Geneva Water Hub established the Universities' Partnership for Water Cooperation and Diplomacy (UPWCD) which serves as a platform led by knowledge partners in the field of water cooperation and diplomacy. It is a "one-stop-shop" where such actors can share and access information about relevant activities, co-develop research and education tools and jointly support professional training in this field.

The main objective of the Partnership is to bring together research and teaching competences from various institutions and disciplines and enhance their respective visibility, impacts and services rendered to key target audiences. Partners include policy and decision makers, senior, mid-level and junior professionals, students, educators, civil society, the media, donors, and intergovernmental institutions. While preserving and respecting its partners' identities, the Partnership encourages and reinforces connections, collaborations and exchanges among them. It, therefore, aims at leveraging existing competences and bolstering institutional strength while striving to achieve common goals.

The Partnership is referred to as a "Universities' Partnership" as a tribute to its history, evolving from a number of universities willing to join efforts. It is however established as a multi-institutional, academic, research and non-academic partnership, whose Partners share common objectives.

The Partnership aims at:

- Enhancing scientific knowledge and capacities in water cooperation and diplomacy
- Contributing to the public debate and discourses on shared waters
- Introducing rigorous science into related dialogues and deliberation processes

Under the lead of the University of Geneva, the

Partnership is catalysing a worldwide network of distinguished players who would otherwise never connect. It is building a potential force that will mobilise academic forces and minds and ultimately impact political agendas in water and peace. So far around 30 institutions working on knowledge and capacity development in the field of water cooperation and diplomacy have joined the partnership. The network attracts a lot of attention and interest. It is leveraging the impact of its constituting partners individually and collectively and, building up to become a network of inevitable actors.

Within a few weeks after its launch, more than 70 resources were posted on the online platform of the UPWCD. The number of visitors is increasing exponentially. It has reached more than 5000 visitors during the month of March 2021. This platform aims to be a "one-stop-shop" on water cooperation and diplomacy. It integrates all relevant information and resources related to the theme. This includes: events, publications, education material and events etc.

The first flagship project of the Partnership is a Massive Online Open Course (MOOC) on Water Cooperation and Diplomacy has been started. It is developed with the lead of the University of Geneva and the IHE institute for Water Education. Other prestigious institutions from the Partnership are heavily involved in this endeavor, in addition to members of the High Level Panel for Water and Peace include: IUCN, IWMI, Oregon State University, Kazakh German University, The University of Zimbabwe, and The University of Arizona. While being developed this course mirrors the basic principles that fuel the partnership i.e. geographical and cultural diversity of players, catalysis of knowledge, and excellence of content development.

While necessary, political will and financial resources are not sufficient elements if individuals, institutions and societies lack the capacity to address the challenges they face. The complexities of our present and future water problems, and the pressure they exert on our lives means that individuals, institutions and societies have to invest differently in developing their knowledge and skills.

Furthermore, global demand for trained professionals has yet to be met. The world was unable to fulfill the 2003 sustainability requirements of the United Nations' Millennium Development Goals (MDGs), which required a 300 percent increase in the number of trained water

professionals in Africa, a 200 percent increase in Asia, and a 50 percent increase in Latin America and the Caribbean (World Water Assessment Programme, 2003).

Knowledge and capacity-building in water diplomacy should not only aim at content development, but also at choosing the right timing, target audiences, and contexts to maximize impact. The UPWCD works towards facilitating the achievement of such complex goals. It nurtures investments in capacity building on the individual, institutional, and societal scale to ensure goals are met while building collaborative outcomes to meet the expectations and need of a wide range of actors (Marshall, Salamé & Wolf, 2017).

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7.4 POTENTIAL OF THE INTERNATIONAL EDUCATION, RESEARCH AND DEVELOPMENT CENTER – “INTEGRATED WATER RESOURCES MANAGEMENT (IWRM): WATER RESOURCES MANAGEMENT IN REGIONS OF THE MIDDLE EAST AND NORTH AFRICA”



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BACKGROUND

Severe water scarcity, in combination with population growth and economic activity, creates unprecedented water demand, often driven by irrigated agriculture, aquatic ecosystems, and poor rural populations. Satisfying excessive water demand has led to depleted water resources and the contamination of surface water and groundwater with household, agricultural, and industrial waste. Biodiversity and ecosystem services are also threatened by large-scale withdrawals and transport of water from lakes, rivers, and groundwater deposits and the blocking of watercourses to develop all available resources. Global warming and the consequent decrease in the availability of natural water resources leads to a water disaster. Therefore, urgent actions are needed at the regional level to contain transboundary tensions and for water management. The creation of the international research and educational center in conjunction with the Middle East and North African (MENA) cluster, the development of the best water management practices, and exploration for additional water sources are powerful incentives for understanding and cooperation in the unstable MENA region.

At present, the Peoples' Friendship University of Russia (RUDN University) is one of the leading public higher education institutions, occupying a leading position among Russian universities in terms of the international focus of its activities. It is a research and educational center, and currently 78,000 of its graduates (including over 5,200 Doctors of Sciences) are employed in 170 countries worldwide. More than 26,000 graduates are citizens of non-CIS (Commonwealth of Independent States) countries: about 7,000 are from Asia, approximately the same

number of graduates are from African countries, 6,000 are Hispanic graduates, and about 5,600 are graduates of Arab countries (RUDN University, 2020).

Making higher education more international has several advantages for students, universities, and for states. Students with an international component to their educational program receive the opportunity for diversified cultural and social development, as well as for the development of professional skills. As a result, they are better trained for the global labor market. In return, universities have the opportunity to establish professional and scientific contacts, receive additional sources of income, and benefit their public image. At the national level, the education of foreign students makes a certain contribution to the country's economy and is an effective instrument of “soft power”. Thereby, the world market for educational services is growing rapidly, and moreover, the market's development potential is quite high (Asmyatullin, 2016).

RUDN'S WATER RESOURCES MANAGEMENT INITIATIVE

As a result of international cooperation with the countries of North Africa and the Middle East, the Faculty of Ecology of RUDN University, created the international scientific and educational center, “Integrated Water Resources Management (IWRM): Water Resources Management in the Middle East and North Africa” in 2020. The primary goal of this center is to ensure a modern international level of educational and scientific activities, including through the international cooperation of teaching and research groups. The center also pursues the goal of realizing

quite ambitious ideas not only for training personnel in the field of integrated water resource management, but also for carrying out innovative scientific and technical research.

This project is aimed at increasing the academic recognition of RUDN University throughout the world as an internationally oriented research university, through the creation of a database of educational policies in both English and Russian languages. Bringing RUDN University to a leading position in the field of water resources management for the countries of the thematic cluster in the MENA region will provide the following functions:

- coordination, provision, and implementation of scientific and research developments (R&D), participation in international projects, creation of a scientific and educational base for personnel development of all levels in the field of sustainable water resources management in MENA regions
- involvement of scientific and technological potential of the Middle East and North African clusters in co-educational programs, including development of a collaborative distant master's program
- implementation of a synergistic approach to water resources management; scientific research for the sustainable development of the MENA region in related, climate-dependent industries: "Agriculture–Food–Energy"

In terms of the center's functioning, it is planned to attract partners not only from the MENA regions, but also from European countries (e.g., Brunel University London, Polytechnic University of Milan, and Wrocław University of Science and Technology). The primary concerns of the center include: personnel development for MENA regions, providing and organizing online lectures and conferences, internships for students on the basis of Russian and foreign practices, and the establishment of cooperation with foreign employers.

As part of the activities of the center, RUDN University will introduce advanced world educational strategies and training technologies in order to develop graduates' competencies, including their adaptability to work in the new socio-economic conditions. The creation of a distance (cross-border, online) master's degree program within the center will attract foreign students in in case of force-major (i.e., environmental

disasters, pandemics, socio-economic uncertainties). Based on the research results, cooperative programs for personnel development and retraining programs in the field of sustainable water resources management will be developed.

In conclusion, it should be pointed out that the established international center will contribute not only to international, but also to regional development through granting patents, simultaneously being a technology transfer center. The international research and educational center activates an entrepreneurial climate in the region, promotes the creation of start-ups, and transfer of know-how. Currently the center discusses and prepares for signing agreements with the Moscow Region (Ministry of Ecology of the Moscow Region), and on the territories of Russian Federation regions (Ministry of Industry and Trade), for example, the implementation of the federal projects "Clean Water" and the National Project "Ecology".

Moreover, integral results of the creation of the international research and educational center include: strengthening partnerships with performers in the innovation ecosystem at municipal, national, and international levels, including key development institutions of the Russian Federation, the Water Problems Institute of the Russian Academy of Sciences (WPI RAS), and the Skolkovo Foundation; strengthening the network of regional hubs and universities located in large cities; and creating a new direction for the development of entrepreneurial innovation in water resources management (Far Eastern Federal University, Southern Federal University, the National Research Tomsk State University, and Kazan Federal University).

Within the framework of the center, in the near future the implementation of several projects in the field of water resources management is planned. These include: an integral assessment of the quality of drinking water in arid regions of North Africa; wastewater reuse in Jordan and its potential as an adaptation measure to climate change; and the use of bio-testing in assessing the ecological and toxicological state surface water bodies from the impact of pharmaceutical companies. As a result of the expansion of its regional activities, the center has signed an agreement with the University of the Armed Forces of Ecuador on the joint research and assessment of the quality of surface water bodies in the tropical zone.

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CHAPTER VIII:

WATER AND PEACE FOR FUTURE GENERATIONS
OF THE EARTH

8.1 YOUTH IN WATER AND PEACE



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One-third of the EU population is under the age of 30. In the last two years, many of these 170 million young Europeans expressed commitment towards the climate crisis, through different global and local initiatives. The European Youth Parliament for Water (EYPW) is building a collective voice of young people, supporting them to work together and to speak united and coherent.

The 15th session of the EYPW was a pivotal moment for combining the vision and aspirations of around 80 young people from Europe, for the common agenda “The River Basin: the Backbone of Regional Development” (EYPW, 2019). They acknowledged the importance of the river basin role as the most suitable scale for river management. The delegates of 19 countries committed to advocating for youth involvement in the water sector both by building their capacities in water resource management and participating in decision-making processes at both the European and local levels.

The Russian youth finds itself on the same page as its European fellows, sharing the values of peaceful cooperation for development and water security. Numerous Russian grass-roots projects on the local and regional levels are devoted to building peace and mutual understanding between water users, playing the core role of the bridge for ideas, values, and compromises.

Just as water connects territories and people, using it involves collective action, obstacles and opportunities. Challenges for river basin level cooperation concerning the formal negotiations may become more complex, influenced by domestic politics, and lead to local or cross-border conflicts. On the other hand, one-third of the world's population lives in extremely water-stressed areas. The link between water and conflict is never direct and straightforward. Water risks, like drought, pollution and floods can serve as threat multipliers that help trigger conflict or contribute to famine, loss of livelihoods or displacement. Thus, the human right of access to water is under risk in some parts of the world, which negatively affects (through demographic changes, climate change etc) other parts

where conflicts are relatively well-managed. Challenges can be addressed by a bottom-up approach. The involvement of all stakeholders in water, including youth as a separate one, will lead to the joint ownership of the solutions.

Although young people are strongly impacted by these issues, they do not have easy access to decision-making bodies and cannot easily make their voices heard. Water and security are still too often the prerogative of the governments.

In the shifting political and economic environment, the Russian youth faces the same structural obstacles as many public stakeholders do. Even though some researchers in the past considered that underestimation of the Russian youth problem-solving capacities hinders its empowerment (Labunsky 2008), we see important progress in the youth access to decision-making channels and the official support from the local government, especially during the 15th session of the EYPW that was held in Nizhny Novgorod.

The involvement of young professionals in finding solutions and advancing the dialogue between governments should be considered a great opportunity for economic and social development, as well as peace-building. Shared problems around transboundary water bodies can create cooperation in other sectors, when water in turn becomes an entry point of cooperation between states.

A concrete example is the current project of the Armenian youth at the Country Water Partnership Armenia supported by the EYPW. The goal of the project is to evolve long-lasting cooperation on sustainable water management and river ecosystem protection between the youth of Kura-Araks river basin, from Armenia, Turkey and Georgia, through the establishment of “Kura-Araks Youth Coalition”, and to foster the process of reconciliation through local small-scale initiatives.

The majority of the Russian youth-led initiatives in the environmental sector in general and in the water sector in particular seek governmental funding or is undertaken as part of the regional or local set of

pro-governmental initiatives (Zhirenko & Paltsev 2017; Podgornaya 2019). By all means, several successful grass-roots projects implemented that way should be noted. The Russian Geographical Society holds numerous river clean-ups and enlightenment events in the water sector using its well-established network (Sviridov, Sushkova, & Fedotov 2018). The initial impulse usually comes from the local branches of the Society led by youth (e.g., Ovcharenko 2018). The young generation runs a set of local NGOs and social groups, such as “Green Sail” . “Save the Talitsa River” , “The River Skalba to Be Clean Again” etc. which serve as an entry point of civic society cooperation and engagement.

These grass-roots activities, aimed at enhancing youth capacity, and strengthening the network between the youth of neighboring countries, are recognized as a major step forward in advancing water cooperation. Such initiatives lead to better collaboration at the regional and international level and including water diplomacy. Therefore, young people need support from international institutions, such as the Geneva Water Hub, in facilitating the implementation of local initiatives and supporting youth to carry actions beyond their community.

The 15th European Youth Parliament for Water, held in Nizhny Novgorod, Russia, catalyzed the cooperation between youth all across Europe and highlighted the importance of including the Russian youth in the multicultural dialogue (ISW 2019). Young people are drivers of change, indispensable mediators between citizens and decision-makers. The EYPW young delegates have been working to ensure youth participation in basin committees, raising the voice of youth and involving them into concrete projects. The Scheldt Youth Parliament (SYP), with youth from the Netherlands, Belgium, and France having a specific role of consulting to the Scheldt River Basin Management committee, are a vivid illustration of their abilities. Another case is the involvement of the EYPW in the Programme Advisory Committee (PAC) at the Amsterdam International Water Week. Moreover, the EYPW has become a member of the EU Water Alliance and Water Europe Association, giving the youth an opportunity to participate in the policy-making process.

Despite certain institutional challenges (Asadov 2014), a number of international water management projects are led by Russian youth groups. One of the most successful examples is the Youth Declaration of the Gulf of Finland, signed in 2014 through the collaboration of Russian, Finnish, and Estonian youth groups. There is also an ongoing youth-led dialogue within the Barents Euro-Arctic Council and the Arctic Council. However, international youth cooperation of this scale is yet to be achieved on the eastern frontier of Russia.

“The UN SDG Youth Ambassadors in Russia” programme empowered a branch of youth leaders across the country to raise awareness among their peers and communicate the youth aspirations to policy-makers. This program focused on the UN SDG 6 “Clean

Water and Sanitation” (UN General Assembly 2015), and formed a network of young water professionals and activists in the water sector through the Youth World Water Forum Model (Vologzhina, Ryazanova, & Eroshenko 2020). The results of the program and views of the Russian youth were also presented at the international events, such as the UN-Habitat Assembly in May 2019 and EYPW in November 2019.

Still treated as a common good, water should be, therefore, managed on a democratic basis, with citizens, including young people, participating in the decision-making process. It is the youth that will inherit the virtues and vices of today’s decisions. The future of the European continent is to be decided by the current generation of committed young men and women. The sooner the accountability for water resources will be shared with the youth, the higher the chances for a sustainable and peaceful water policy to be pursued.

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This document is the result of a dialogue between leading international and Russian experts in the field of water diplomacy, transboundary water management and international multilateral cooperation. The views expressed in this report are based on the expert opinions of the authors, and do not necessarily reflect the positions of their institutions in their entirety.

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WATER IS LIFE AND IS AT THE CORE OF A SUSTAINABLE FUTURE FOR MANKIND

Fresh water is a limited and irreplaceable vital resource that transcends natural, sectorial and political boundaries, being at the core of all fundamental kinds of security – health security; food security; energy security; environmental security; human, social and economic security.

Alongside problems associated with scarcity, conflict, and cooperation, sustainable management of water resources is a top challenge for humanity at the local, national, regional and global levels.

The present publication “The Drama of Water in a Time of Global Transformation” is a collaborative effort between the Geneva Water Hub and the International Association of Lake Regions. It is written on the basis of consultations and discussions started in 2018 in Moscow within the framework of the international conference on water diplomacy.

The content of this book reflects a trilateral dialogue between Russian experts, the International Association of Lake Regions, as well as the Geneva Water Hub and its partners. Thirty-eight prominent experts have contributed to this dialogue. Their thoughts are presented in eight substantive chapters addressing specific issues related to water resources, and offering insight on innovative water diplomacy and effective water management.

This publication contains exciting explorations, dealing with the problems of water from a variety of angles. It provides a comprehensive overview of Russian expertise in water resources management and water diplomacy, and shares perspectives of top water experts on global water diplomacy in the 21st century.

“WATER IS THE MIRROR OF OUR FUTURE”



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