

Role of Bilateral Memoranda of Understanding in the Hungarian Water Diplomacy

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Abstract

This paper explores the role of bilateral Memoranda of Understanding (MoU) in Hungary's water diplomacy, focusing on the creation of over 50 agreements signed in large numbers between 2013 and 2024, although cooperation in the field of water management had been established even before the period under review. These MoU's primarily aim to foster professional cooperation between Hungarian institutions, such as the General Directorate of Water Management, and their counterparts in various countries, in general those without shared water resources with Hungary. This is an original research, which delves into the historical context and motivations behind these agreements, highlighting their significance in promoting export and political relations rather than addressing the fragmentation of Hungary's water governance system, but touching upon that matter. While MoU's provide a flexible framework for cooperation without the binding obligations of formal treaties, they also present limitations, such as a lack of enforcement mechanisms and clear ownership, which can hinder effective implementation. The thesis suggests that for complex projects requiring clear obligations, formal treaties may be more appropriate. Future research directions include a detailed analysis of economic relations, educational and scientific collaborations, and a comparative study of similar programs in Europe. Overall, this work contributes to understanding Hungary's international water governance and diplomacy, emphasizing the need for better coordination among institutions involved in water management and clear definition of intended purpose when assigning resources.

Keywords

Bilateral Memorandum of Understanding, water diplomacy, sustainable water resources management, Budapest Water Summits, non-binding agreements, water scarcity, legal frameworks, transboundary water management, export strategy.

A Magyar Vízdiplomácia kétoldalú együttműködési megállapodásainak jelentősége

Kivonat

Ez a tanulmány a kétoldalú együttműködési megállapodások szerepét vizsgálja Magyarország vízdiplomáciájában, a leginkább 2013 és 2024 között aláírt több mint 50 megállapodás alapján, bár a vizsgált időszak előtt is születtek együttműködések a vízügy területén. Ezek az megállapodások elsősorban a magyar intézmények – például a Vízügyi Főigazgatóság – és a különböző (többnyire Magyarországgal közös vízkészletekkel nem rendelkező) országok – intézményi megfelelői közötti szakmai együttműködést hivatottak elősegíteni. A kutatás tárgya e megállapodások történelmi kontextusának és motivációinak vizsgálata, kiemelve jelentőségüket az export és a politikai kapcsolatok előmozdításában, amihez csak érintőlegesen kapcsolódik a magyar vízügyi irányítási rendszer széttagoltságának kérdése. Míg ezek a megállapodások rugalmas keretet biztosítanak az együttműködéshez a hivatalos szerződések kötelezettségei nélkül, ugyanez korlátokat is támaszt, hiszen például ebben a konstrukcióban hiányoznak a számon kérhető végrehajtási mechanizmusok és az egyértelmű felelősségvállalás. Mindez akadályozhatja a hatékony végrehajtást. A cikk utal rá, hogy az egyértelmű kötelezettségeket igénylő összetett projektek esetében a hivatalos államközi szerződések szükségessé válhatnak. A javasolt jövőbeli kutatási irányok kiterhetnek a gazdasági kapcsolatok, az oktatási és tudományos együttműködések részletes elemzésére, valamint a hasonló európai programok összehasonlító vizsgálatára. Összességében ez a munka hozzájárul Magyarország nemzetközi vízügyi szerepvállalásának megértéséhez, és hangsúlyozza a vízgazdálkodásban érintett intézmények közötti jobb koordináció szükségességét, a forrásokallokálásokor meglévő világos célkitűzés fontosságát.

Kulcsszavak

Kétoldalú együttműködési megállapodás, vízdiplomácia, fenntartható vízgazdálkodás, budapesti Víz Világtalálkozó, nem kötelező érvényű megállapodások, vízhiány, jogi keretmegállapodások, határokon átnyúló vízgazdálkodás, exportstratégia.

INTRODUCTION

The subject

• For about a decade (from 2013 to 2024) Hungary signed more than 50 bilateral MoU's (Memorandum of Understanding) with focus on water resources, mainly with distant countries for promoting professional cooperation between Hungarian institutions (prominently the General Directorate of Water Management), organisations and their equivalents in the other countries. The current research is concentrating on the history and the motives behind these paperworks, and subsequently the chosen form of cooperation. Beyond the history, the fact, that these

states commonly do not have shared water resources with Hungary is raising various questions, worth to explore.

- What does the character (MoU's with no legal consequences) of these cooperations indicate?
- What is the afterlife of these initiatives? Where is the focus? Is it on the act of signature or is it on actual implementation?
- Is export promotion a purpose of these instruments (MoU's) in the water industry and are they serving as diplomatic tools for opening markets or are there rather different goals (i.e. water management knowledge and experience can be key to doors of politics)?

- Is there a gap of any kind when we consider implementation, shall that be financial, institutional, human, or just the lack of political will?
- Are the resources used efficiently - even if limited - for supporting the sector and its export?

- The recent improvements in the Hungarian water governance system (i.e. restructure of ministry responsibilities and organization) gives an extra topicality to the subject and is raising the question: what is going to happen to this activity in the future?



Photo 1. Minister of Foreign Affairs and Trade Péter Szijjártó and Saudi Minister of Environment, Water and Agriculture Abdulrahman Abdulmohsen A. al-Fadley in Riyadh on October 21, 2020. (MTI/KKM/Kkm/M. Király)

1. kép. Szijjártó Péter külgazdasági és külügyminiszter és Abdulrahman Abdulmohsen A. al-Fadley szaúdi környezetvédelmi, vízügyi, és mezőgazdasági miniszter találkozója Rijádban 2020. október 21-én (MTI/KKM/Kkm/Király M.)

Connections to other areas

When we try to answer the above main questions, there are several others that we cannot go by. Who are the partners? Are there patterns existing, that connect them in terms of politics, economics, natural resources (especially water) or culture? Where does the background of Hungary put the country on this map? Beyond our own motives why is Hungary a desirable partner for these countries to sign an MoU in water management?

Resources, means of study

For presenting the background and to create an analysis that aims to find patterns, some of the memoranda and implementation reports were used. Occasionally references to legislation and the National Water Strategy were included. I use recent studies about the current (and changing) setup of the Hungarian water governance and some older ones for depicting the historical background. There is a big emphasis on interviews with water professionals and ministry officials. Additionally, I reach out for publicly available statistical data from international organisations like World Bank, UNDP, UNEP etc.

MEMORANDA OF UNDERSTANDING AS A TOOL IN (WATER) DIPLOMACY

Emerging role of water in diplomacy

Water

Water is a vital resource of a multifunctional nature, central for all life, economic and social development. The hydrological cycle is essentially contributing to sustainability and the stability of the environment. Due to the direct and indirect consequences of the intense economic growth and the worldwide ignorance of environmental destruction, currently we experience a degradation of the bio-

sphere, climate change and pollution (a triple planetary crisis) transmitted through and impacting mostly water, water habitats and water resources.

There is an interesting duality present in the availability of water resources: While the industrialized world takes abundant water resources for granted, on parts of our planet access to even the primarily needed water-quantity means a daily struggle. 26% of the world's population lacks access to safe drinking water (Kőrösi 2023). Also important to note that the most water-stressed parts of the world, that have the lowest capacity in resilience and are hit most seriously by climate change, have the most limited possession of the resources necessary for adaptation. Interestingly the modernization and economic growth in the "Global West" while having greatly contributed to climate change, also provided the financial resources and technological innovations to bail out climatic disadvantage and eventual resource scarcity. Unfortunately, the Global South is deprived of these (Cziko 2016).

Security

Water both as a sensitive and complex global common, tends to force international actors to engage in long-term cooperation because – as quite early the 1977 Mar del Plata congress recognized – water availability is one of the greatest security challenges of our times (Grafton *et al.* 2023). This finding was underlined later in several instances, ranking water even as No1 security risk (Davos World Economic Forum 2015).

Water as a strategic resource can have a Janus face depending on the hand directing its flow.

Its uneven distribution and increasing scarcity can lead to tensions and conflicts between countries. Quite often water has been used as a weapon. The continuous supply of water and control of water bodies was used as a coercive tool or has been simply diverted, shut. That has often led to water disputes, water conflicts, having disrupting effect on the weak and often resulting in migration of people or degradation of land. "Many of the wars of the 20th century were about oil, but wars of the 21st century will be over water unless we change the way we manage water" (*Global Water Forum 2013*). Predicted Ismail Serageldin, vice president of World Bank, seeing that the world's policymakers lack long-term perspectives in the management of water and for preserving social stability, the governments are reluctant to recognise shortages, that eventually can lead to devastating consequences. Summarizing the role of water from security perspective safe and sufficient drinking water and proper sanitation is vital for human (human security) thus the availability of this is a strong factor of social stability. Ecological stability and rich biosphere provide vital ecosystem services and prevent environmental degradation (environmental security) thus contribute to resilience against natural hazards, economic development, eventually to national security. However, since water creates a worldwide strategic interdependence due to the relation of water and climate, there are no "national solutions" for most of the water problems. Institutionalised international solutions and water management mechanisms are essential and the character of water also provides the opportunity for promotion of good water governance: "the range of political, social, economic and administrative systems that are in place to regulate development and management of water resources and provisions of water services at different levels of society" (*Baumgartner and Pahl-Wostl 2013*).

Despite of its currently relative abundant supply Hungary's position in terms of water is highly vulnerable to outside activities and climatic factors. This puts water to a priority position in Hungarian foreign political considerations and also motivated the country for centuries to accumulate experience in efficiently managing water supply and treatment, irrigation methods, inland navigation. In connection with this, it is obvious why is the domestic capacity of water industry and water engineering too, vital for the security of the country and why is important to provide export opportunities for the Hungarian water sector in times when the domestic investment is temporarily limited.

Water diplomacy

The increasing scarcity of this special resource at the same time requires and provides new types of foreign political tools. As Csaba Körösi in a presentation said, a zero-sum game with a global common inevitably leads to the destruction of that global common (thus eventually to a negative sum game). Water diplomacy aims to create an additional benefit by common use of the water resources, making everyone interested in cooperation. Water diplo-

macy is not only focusing on shared water resources, resolving and preventing conflicts, but is also addressing various aspects of water management to promote cooperation between countries based on the use of water resources. Water diplomacy is building on the unifying character of water that derives from the vulnerability and vital importance of this special resource. Utilising water as a creator of peace and cooperation is what water diplomacy aims for, for bringing parties on a common ground (*Körösi 2023*).

Concerning Hungary as a small player, water diplomacy provides a unique opportunity to become visible in the international stage, focusing its resources to a niche area within the globalised international relations.

Water diplomacy toolset

The toolset that water diplomacy uses, includes negotiation and dialogue, facilitating communication on sharing and managing water, sharing hydrological data, and providing transparency in water management for building trust and cooperation. It encourages shared projects in infrastructure development (dam construction, water treatment facilities, irrigation systems, flood protection dykes) that benefit all parties involved, knowledge exchange and training to develop water management expertise. Broad stakeholder consultation, including academic and professional contribution is part of the essence of water diplomatic solutions. Last but not least it creates legal framework by developing and operating international agreements, treaties and institutions that govern water sharing and management.

Conclusion

By contributing to conflict prevention, cooperation and regional stability, economic integration, more efficient and sustainable water use practices and providing improved access to water, water diplomacy is a powerful, yet soft and friendly tool in improving relationships of countries.

Saying this, we must point out that water diplomacy is not just about government-to-government relations. Non-governmental organizations, private sector, and civil society can also play an important role in promoting water cooperation. Here must be mentioned public diplomacy that can use water and the tools of water diplomacy as a powerful diplomatic PR tool, because of the importance and unifying character of this resource.

If we think about the growing number of Hungary's MoU's in water management, it's important to see that water diplomacy will likely have a growing importance as water scarcity becomes a growing challenge in the future as a result of climate change and population growth in the developing world. Endeavours in water-based cooperation and sustainable water management practices should serve a future, where water is a source of peace and development. Existing and future technological solutions in engineering, data collection and monitoring can facilitate these cooperations.



Photo 2. Signature of the Hungarian-Pakistan MoU in water management in Islamabad - Ambassador István Szabó and Muhammad Ashraf, Secretary of State for Water Resources (mfa.gov.hu)

2. kép. A Magyar-Pakisztáni vízügyi megállapodás aláírása Islamabadban - Szabó István nagykövet és Muhammad Ashraf vízkészletekért felelős államtitkár (mfa.gov.hu)

Role of MoU's in international diplomacy and the evolution of relations

What can be the reasons for choosing a soft, legally non enforceable cooperation form such as Memorandum of Understanding's in the diplomacy practice? How do these MoU's fit in the legal framework of international water management cooperation?

In the past few decades, there has been an increasing trend of both states and international organizations using this instrument, in bilateral or even multilateral relations, including fields like trade, environment, human rights, culture, etc. While MoU's were a rare phenomenon in the first half of the twentieth century, their number has increased exponentially in recent times (Poast *et al.* 2010).

Non-binding

International cooperation is an essential element of our age when globalization puts national sovereignty in a new context. MoU's are written and non-binding paperwork that are meant to regulate cooperation in issues where a treaty is either unnecessary, infeasible, or the parties involved do not want to create binding obligations. The "Agreements between two or more parties to do or refrain from doing an act or acts in the future." A shared course of action, a shared desire to collaborate on a specific issue or set of issues or establishing a framework for cooperation. They are not meant to be treaties with a different name, still they are not completely independent of treaties, frequently containing references to treaties and using treaty language. Depending on the depth of the agreement, an MoU can take on many forms, sometimes presenting concrete terms of agreement and conclusion statements, or in other cases serving as a mere "gentleman's agreement". The extent to which MoU's are related to treaties often impacts their role and success in effecting the actual cooperation.

Framework

Signing an MoU can establish a solid foundation for future partnerships and collaborative efforts. By defining areas of mutual interest and outlining potential joint initiatives. This can be in relation to almost anything: trade relations, drug enforcement, scientific research, or other matters. Additionally, MoU's facilitate communication and information exchange between the involved parties.

Flexible

MoU's provide a framework for cooperation without the rigid obligations associated with a treaty. This flexibility can be very attractive and allows parties to explore potential partnerships without a long-term commitment. In some cases, a successful MoU can pave the way for a more formal agreement in the future. MoU's can form an agreement (not in legal terms) without being a formal treaty and express the understanding with intent to eventually follow up with a treaty or maybe to avoid it in the event of undesired intention.

Perspectives

MoU's are applied in various fields of international diplomacy. They can be used to foster collaboration on scientific research projects, establish cultural exchange programs, promote trade and economic cooperation, or address common environmental challenges. If a temporary MoU isn't successful, parties can simply neglect to renew it, and no harm is done. On the other hand, completion of a successful MoU can lead to the natural progression of more formal agreements or treaties. By fostering dialogue and building trust, MoU's play a significant role in international relations.

Limitations

Despite of being a valuable tool for international diplomacy, MoU's have inherent limitations. Most significantly because of the non-binding nature, deviation from the paperwork cannot have legal consequences (unlike more for-

mal treaties). If a party violates the terms of an MoU, there's no legal mechanism to enforce compliance. So can cooperations easily fail or commitments go unfulfilled if parties are less motivated.

Wording of the paperwork can be often ambiguous or vague or lack the specific details of a formal agreement. This ambiguity can lead to misunderstandings or different interpretations by the involved parties. Additionally, MoU's typically focus on creating a framework for cooperation rather than outlining specific actions or deliverables. What comes useful for initial discussions, might not be enough for complex projects, requiring clear goals and timelines.

Conclusion

In conclusion, MoU's offer a valuable tool for initiating cooperation and building trust. However, their limitations, particularly the non-binding nature and lack of enforcement mechanisms, need to be carefully considered when choosing this approach in international diplomacy.

For complex projects or situations requiring clear obligations and enforcement, a formal treaty might be a more suitable option (Csaba 2024).

HUNGARY – Background, engagement and interest of Hungary in international water relations

Historical background

Focus areas on the history of Water governance in Hungary

The special location in the Danube Basin is so determining in several aspects, but perhaps it played the most crucial role in shaping water management practices in Hungary (Fleischer 2013). From the earliest times on, it had an ever-changing but never decreasing importance that helped the water management sector in the country to be as developed and versatile as it is today. Since the earliest times, the country went through several periods when different water-management practices were applied, different water-related challenges were in focus and different water governance paradigms (Allen 2003) were followed.

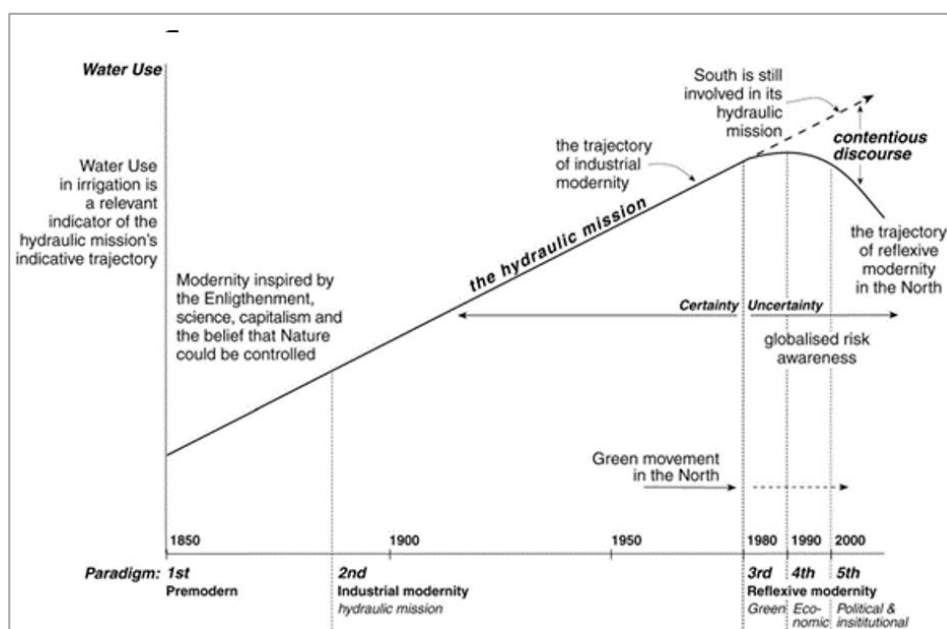


Figure 1. Hydraulic mission and neo-liberal modernity in water sector (Allen 2003)

1. ábra. Küldetéses vízügy és neo-liberális fordulat a vízgazdálkodásban (Allen 2003)

The stages of development in water governance (in Hungary and other developed countries), are reflecting the challenges, developing countries are facing currently, exacerbated by the impacts of climate change (Nováky and Bálint 2013).

Concluding: Hungary as a developed country, has a long and intense history in managing water resources. It not only has a wide range of versatile experiences in water engineering, research, and innovation, but also a strong capacity in building water and wastewater related structures. In whichever stage a country is while managing of its water resources (shall that be on the intensive track or in the realization of natural risks), the water sector of Hungary is very likely in the position of offering engineering, industrial or institutional solutions (Kovács 2024).

History of foreign relations with focus on water

Beyond all that, its special location makes Hungary extremely sensitive to the issue of shared watercourses, thus

to the problems of water diplomacy in general. Post world war Hungary has a very strong hydrographical dependence, which is very often characterized by the ratio of 95% of our waters coming from foreign countries. While this is a much more complex relationship that is by far not accurately expressed through this sole figure as Tamás Fleischer (2013) points out in a study exploring opportunities in water use Hungary's dependence on surface waters from beyond its borders is no question (Statista 2024). The situation also highlights the importance of water diplomacy, international relations, for understanding interrelationships and addressing water-budget issues effectively. The sensitive approach towards water-matters and the rich experiences make the country a desirable partner to others, when facing water-related challenges and Hungary's image in the field is just strengthened by its repeating engagement in forward-looking efforts like the creation of the SDG's, the embracement of sustainability problems

through the Budapest Water Summits, Planet Budapest Expo and as organizer and participant of other international events. While water diplomacy is a fairly new notion, water was a common factor of the countries international relations from early times on.

Initiated by VITUKI (Research Center for Water Management, founded in 1952), – largest research centre and information base of Hungarian water management – Hungary built a number of overseas projects in Algeria, Nigeria and elsewhere together with a foreign company called TESCO (International Technical Scientific Cooperation Office). Through these projects VITUKI have brought Hungarian water knowledge to the market for a fraction of the international price, funding a reputation that outlasted the institution itself (*Major 2024*).

VITUKI's involvement in the UN and other professional organisations and institutions (including the UNESCO IHE Delft Institute for Water Education), participation in the UNESCO International Hydrology Decade has contributed to the international standing of the Hungarian water knowledge. Later Hungary was among the first signatories of the two determining international water conventions, the UN watercourses agreement (United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses) and the UNECE Water Convention (Convention on the Protection and Use of Transboundary Watercourses and International Lakes). Both of them emphasize the same principles in transboundary water management and by the participation in their formation the country affirmed not only its commitment to international cooperation and responsible management of shared water resources but also its position in international water governance. Over time the general

principles of modern water-law (equitable and reasonable utilization, prevention of transboundary harm, and the exchange of information among riparian states) due partly to these overarching international agreements strongly shape international relations.

Budapest water summits (BWS) and the Planet Expos

From the year 2013, Hungary organised 3 events (2013, 2016, 2019) of the BWS under the umbrella of the UN. These summits, driven by UN member states growing concern for global water challenges and the need for international cooperation, played a significant role in shaping global water policy discussions and served as a platform for international collaboration in the field of water.

The BWS-s created an excellent opportunity for Hungary to emphasize its capabilities and background in development of water economy and creation of water policy and to enhance international relations along these themes. Starting from 2013 (with only a few of such paperwork existing previously) Hungary signed a range of non-binding international paperwork MoU's with countries which whom it does not share any transboundary waterbodies.

Past 2019 there was no subsequent Water Summit organised, but Hungary remained engaged in water-related and sustainability issues. In the last year with President Áder in office the Planet Expo has been introduced as an international sustainability fair. While water might not be always the lead subject of the individual Expos (in 2023 it was agriculture and food supply chain), it is a most determinate factor of sustainability, thus a steady subject on these events. So are representing the Planet Expos a continuation in the signature of MoU's.



Photo 3. Sándor Pintér (Hungary) and Karim Hasni (Algeria) signing on Planet '21 (www.mfa.gov.hu)
3. kép. Pintér Sándor (Magyarország) és Karim Hasni (Algéria) aláírása a Planet '21-en (www.mfa.gov.hu)

Institutionalisation of water in Hungary

Despite the international recognition and the extensive list of professional and diplomatic achievements during these years, water management has struggled for long to earn an adequate representation within the state administration. While responsibilities and competencies related to water management were present across various levels of the state's organization, the majority of powers and

administrative duties in this regard are carried out by the Government and its affiliated bodies. Each branch of power plays a dedicated part in water management, whether it be in the realms of water extraction, water conservation, or prevention of water-related damages. Furthermore, Parliament participates in water-related endeavours by means of legislation and the implementation of the National Environment Programme. However, division of

tasks and responsibilities even within the Government structure were very much fragmented and the separate voices/parts, did not form a harmonious whole. The very same structure has limited the communication and proper coordination between the involved stakeholders. Recent changes in government structure (i.e. concentrating more and more water management areas at one place even if this is the ministry responsible for energy management) eventually might support the implementation of the MoU's. However, it has not happened yet, and current ownership of the MoU's is rather based on personal commitment than on institutional setup.

This is a critical obstacle as the signature of the MoU's point towards a cooperation in various policy and water governance issues with the possibility of creating export-potential. Both presumes the involvement of organisations either from the side of government and the public sector or from sectoral or connecting non-governmental organisations.

Priorities of the Hungarian foreign economy

Improving international position- Opening to the South (Tarrósy and Solymári 2022) and East (Shishelina 2022)

In the 2010's Hungary announced the "Opening to the South" and the "Opening to the East". Historically there is a repeating endeavour from the side of Eastern-European countries to develop their relations with the Global South, especially with Sub-Saharan Africa (SSA). However, the previous focus from ideological solidarity (supporting liberation movements, offering educational scholarships as soft power strategy) shifted towards a more pragmatic approach (*pragmatic solidarity*). The post-communist era saw a re-evaluation of Hungary's foreign relations, prioritizing economic cooperation and leveraging education as a tool for fostering long-term relationships with these countries.

From the perspective of pragmatic solidarity, the improvement of relations with the global south (and especially SSA) has a significant role based on the position of these countries in geopolitics and economics, because of their rich natural resources and their emerging markets. This shift towards engaging with the Global South shows a recognition of the region's potential in contributing to global economic growth and political stability. However, as we can experience with some of the MoU's in focus, actual political and economic stability is very strongly impacting the eventual successes of once positively started initiatives (see the MoU with Sudan). The need for sustainable policies and a commitment to multilateralism further highlights the South's importance in global affairs, especially in climate change and EU-Africa relations. The focus on SSA within Hungarian foreign policy, emphasizing education and economic cooperation, illustrates the region's role in fostering long-term international relationships.

The Opening to the East, policy of Hungary shows numerous similarities. Likewise, it was initiated after 2010,

and by reinitializing the relations built during the communist times it aims to diversify the country's foreign relations and economic partnerships beyond its Western focus that was predominant (and in most part still is) for two decades after 1990. This strategic paradigm is driven by the same pragmatic approach to address economic challenges related to resources, mainly energy (gas, gasoline, and electricity supplies) and acquiring markets for Hungarian products. By developing relations with countries in the East, including Russia, Central Asian states, Turkey, and China (more recently India), Hungary seeks to secure economic benefits and enhance its energy security. The policy also reflects Hungary's intention to play a more significant role in global geopolitics by establishing stronger ties with key Eastern economies and political entities. The policy includes significant engagement with Turkey, demonstrating the multi-vector nature of the country's foreign policy by balancing its relations between the East and the West. This approach enhances Hungary's global position and intends to secure tangible benefits for its citizens, reflecting a consistent trend towards pragmatism in its international relations.

In this regard the water-management MoU's are tools that enhance Hungary's multi-vector foreign policy creating professional cooperation in political level, which can possibly serve export endeavours.

Hungary's current export strategy – a more economical approach

Hungary is one of the most export-oriented economies of the EU with 81.2% of the GDP deriving from export. The export-potential indicator (currently 13th in the world ranking according to *The Observatory of Economic Complexity trade ranking (2024)*) is supporting the same picture. The national export strategy (NEXT) 2019-2030 -that is currently undergoing a revision - is clearly defining water as one of the 5 focus areas and breakout points of the Hungarian industry that regularly returns on the conferences of the Joint Economic Commissions (Horváth D. 2024). Within the sector, the engineering services, innovative construction solutions and digital technologies are listed as the most promising areas. Geographical potential of water industry according to the export strategy offers some interesting learnings too. It defines the South-East Asian markets as the most promising focus areas for Hungary and Africa, South America (together the Global South) as markets interesting in medium term, while eastern European and other Asian markets as existing active markets for the Hungarian Water Industry. Developed countries are not seen as prospective export markets. Projecting the potentials of the other four sectors, which are discussed (Food industry, Agricultural technologies, Pharmaceuticals, Medical Technologies, and Construction) the strategy assigns an icebreaker role to water industry. The existing markets of the water industry more or less overlap with the promising markets of the other sectors and the potential best markets of the water sector are medium-term opportunities for the others (*Ministry of Foreign Affairs and Foreign Trade 2017*).

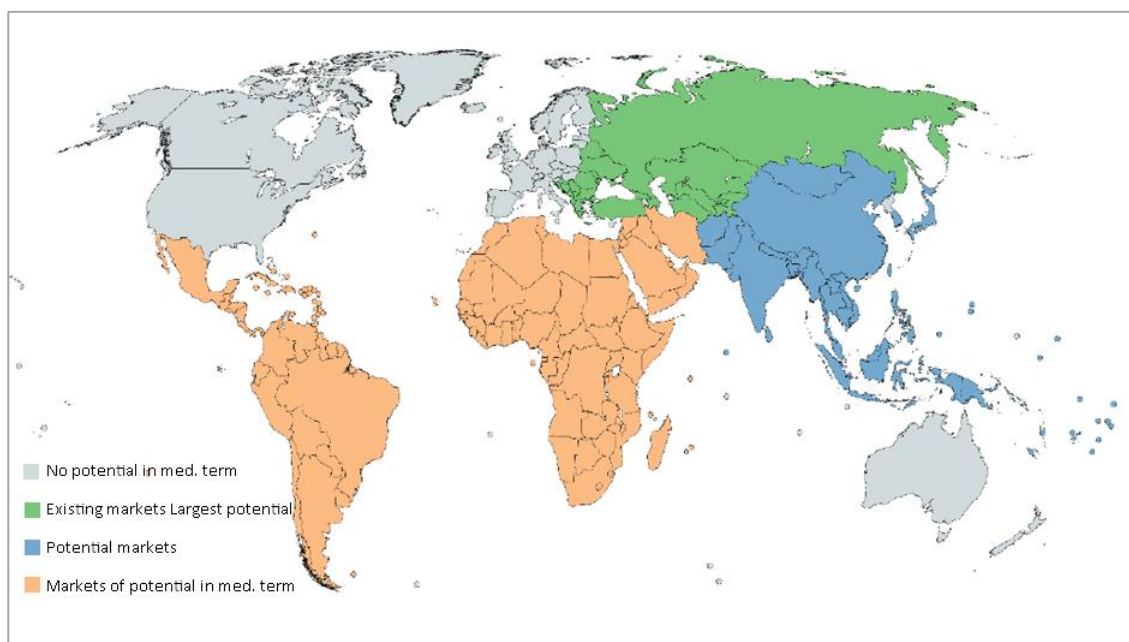


Figure 2. Market potential of the Hungarian Water Industry (National Export Strategy 2019)
2. ábra. A Magyar Vízipar piaci lehetőségei (National Export Strategy 2019)

Possible benefits and international perspectives of Hungary participating in professional water-based collaboration

Export promotion

If water industry is an icebreaker for other export sectors, then the MoU's are potential icebreakers for the water export. Bilateral Memoranda of Understanding (MoU's) on integrated water management, though signed at the ministerial level for establishing cooperation between professional organizations of both countries, can also boost export ambitions of the country that has more developed practices in the sector concerned. There are several ways this can happen.

For once in cultures with a more hierarchical structure, even a non-binding state-level paperwork can be a valuable reference point for foreign investors. Some MoU's are even initiated by export-oriented companies themselves, to pave the way for their intended export-endeavours in water management technology and services (Kovács 2024).

Not least ministers and ministerial officials often play a key role in decisions on water-related infrastructure projects, which require knowledge-exchange, technology-transfer, or even full-scale imports of solutions from a country with more developed practices (B2G).

Beyond this direct influence on project decisions, stronger political ties fostered through MoU's can lead to indirect economic benefits too. Countries may be more likely to secure development loans for infrastructural/water management projects, in a favourable political atmosphere (supported by the signature of an MoU) and for companies of a country with stronger political ties. Additionally, MoU's can create a more supportive environment for trade and investment in general by promoting regulatory harmonization.

Finally, the high-level political visits and ongoing collaborations established through MoU's can turn into momentum, fostering connections between companies and government officials. These connections can be crucial triggers for translating MoU intentions into actual export deals or investments (Horváth D. 2024). These MoU's can be instrumental in creating a framework for successful collaboration.

In conclusion, while Bilateral MoU's on integrated water management focus on professional cooperation, they offer significant indirect benefits for the country with more advanced water management practices. These benefits can range from increased foreign investment to securing contracts for technology and infrastructure projects.

GHG emission trade

In my research I only found one example for an investment where development in green infrastructure has led to a calculated carbon credit saving that became an element of finances and a factor of realization of the project. This case was in relationship with Serbia, which is a neighbouring country thus not subject of the MoU's in focus and is a country with a much more developed set of contracts and treaties with Hungary as most of the countries examined now. However, it is a fundamental theorem of the current work, that the MoU's are entrance tickets by their nature in international relations, not end stations. Successful cooperation fostered by MoU's can pave the way for more comprehensive agreements. These expanded agreements could explicitly address more complex matters (Hesham 2017).

Just with reference to the current subject (carbon credits) These can be frameworks for calculating, verifying, and trading carbon credits generated by green infrastructure projects (carbon credit accounting). Mechanisms to incentivize investments in green infrastructure by linking

them to potential carbon credit revenue (investment incentives). Collaboration on developing and financing green infrastructure projects that maximize environmental benefits and generate tradable carbon credits (Joint Project Development). A successful cooperation along an MoU would probably lead to an expansion of the system of agreements that support trade, investment, various fields of cooperation and possibly allow an accounting of items of more complex nature.

Carbon credits represent a valuable, tradable resource for developing countries. MoU's can be instrumental in creating frameworks for exploiting this funding source. These frameworks can help developing countries in attracting investments making green infrastructure projects (more) lucrative for investors in the more developed country by exploiting the potential for carbon credit. Revenue from carbon credits can help developing countries finance the upfront costs of these projects. By enabling the development of green infrastructure, MoU's can contribute to a more sustainable future for both partner countries and promote sustainable development in general.

Carbon credit is by all means an additional resource that can be traded by a developing country, always in the

search of funding for development for investments made in green infrastructure by a more developed industry.

Concluding: the fact that I have not found any other example does not mean that there aren't any for exploiting this additional funding source, but it needs a more developed paperwork (than an MoU) and real carbon-saving investments.

MOU'S OF THE HUNGARIAN WATER DIPLOMACY

Geographical focus

Even if the Global South is least a geographic category rather economic or socio-political, there is a clear picture that Hungary is signing these MoU's with countries "from the extended southern hemisphere". In Europe, with fellow nations Hungary is clearly cooperating through other channels. Once because the shared watercourses and the neighbouring status, we aim for a stronger and more detailed cooperation and because within the EU the collaboration of members is very much regulated and organised anyway. This way these European MoU's (going back to an earlier time and with a partly different content) count among the oldest, that the country has signed over the years.

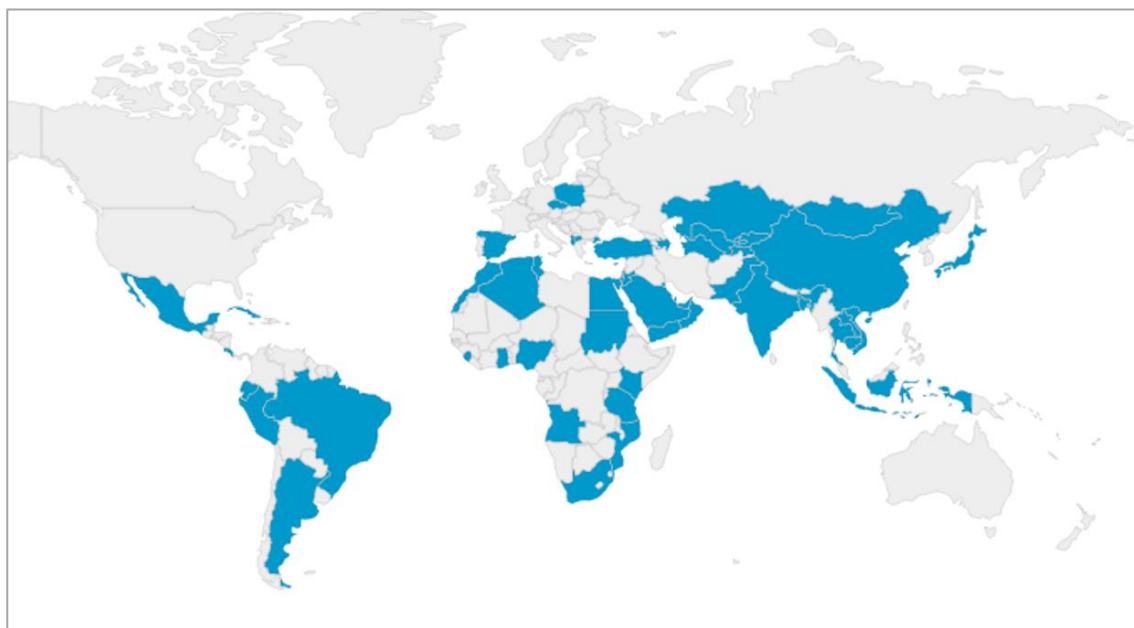


Figure 3. Water management MoU's of Hungary on a world map in 2025 (Rózsa 2024)
3. ábra. Magyar vízügyi együttműködési megállapodások a világban 2025 (Rózsa 2024)

Beyond that, there is a special strong presence in Central Asia and South-East Asia, in the Middle East covering almost every country in these regions and a systematically growing presence in Africa and South America. In the article I handled those paperworks that

were under preparation or standing before signature (at the moment including the Dominican Republic, Japan, Iran, Uruguay, Mozambique) as part of the set, but this mix is showing the multi-vectoral extension of cooperation.

Table 1. List of MoU's (Rózsa 2024)
1. táblázat. Együttműködési megállapodások listája (Rózsa 2024)

Partners		Signature			Memberships	
Country	Location	Where	Date	Occasion	UNECE Water convention	UN Water convention
Albania	Balkan	Tirana	2023-06-16		1994/01/05	
Algeria	North Africa	Budapest	2021-11-30	Planet Budapest		
Angola	West Africa	Budapest	2019-11-04			
Argentina	South America	Buenos Aires	2022-04-01			
Azerbaijan		Baku	2022-02-03	UN Climate Change Conference (COP7)	2000/08/03	
Bangladesh	South-East Asia	Budapest	2016-11-27	Budapest Water Summit		
Brazil	South America	Budapest	2022-02-17			
Cyprus	Middle East	Budapest	2019-10-16	Budapest Water Summit		
Costa Rica	Central America	Budapest - San Jose	2023-03-06			
Czech Republic	Central Europe	Prague	2001-09-18		2000/06/12	
South Africa	South Africa	Pretoria	2017-05-23	International Conference on Sustainable Development (ICSD)		1998/10/26
Ecuador	South America	Buenos Aires	2022-10-27			
United Arab Emirates	Middle East	Dubai	2022-02-16			
Egypt	North Africa	Budapest	2015-06-12			
Ghana	West Africa	Brussels	2019-01-22		2020/06/22	2020/06/22
India	South Asia	Budapest	2016-10-16			
Indonesia	South-East Asia	Budapest	2013-10-08	Budapest Water Summit		
Israel	Middle East	Ózd	2002-03-22			
Yemen	Middle East	Budapest	2023-07-19			2000/05/17
Jordan	Middle East	New York	2022-09-21	UN. General Assembly (UNGA) High-Level Meeting on Biodiversity		
Cambodia	South-East Asia	Phnom Penh	2019-11-03			
Kazakhstan	Central Asia	Nur-Sultan	2019-04-29	Astana Mining and Metallurgy Congress	2001/01/11	
Kenya	East Africa	Nairobi	2021-01-17	UN. Environment Assembly (UNEA)		
China	East Asia	Budapest	2003-04-17			
Kyrgyzstan	Central Asia	Budapest	2020-09-29			
Cuba	Central America	Budapest	2021-11-30	Planet Budapest		
Kuwait	Middle East	Budapest	2014-06-13	Danube River Basin Ministerial Meeting		
Laos	South-East Asia	Budapest	2016-11-29	Budapest Water Summit		
Poland	Central Europe	Warsaw	2017-03-22	Warsaw Climate Change Conference	2000/03/15	
Macedonia	Balkan	Skopje	2013-12-05	High-Level Meeting on the European Union's Eastern Neighbourhood and Western Balkans	2015/07/28	

Partners		Signature			Memberships	
Country	Location	Where	Date	Occasion	UNECE Water convention	UN Water convention
Kingdom of Morocco	North Africa	Budapest	2016-07-27			
Mexico	Central America	Budapest	2016-11-29	Budapest Water Summit		
Mongolia	East Asia	Budapest	1995-09-22			
Nigeria	West Africa	Budapest	2016-11-29	Budapest Water Summit	2023/03/22	2010/09/27
Oman	Middle East	Budapest	2022-12-15			
Pakistan	South Asia	Islamabad	2020-07-13	International Conference on Water, Environment, Energy, and Society		
Palestine	Middle East	Budapest	2018-09-03			2015/01/02
Peru	South America	Lima-Budapest	2022-05-20			
Sierra Leone	West Africa	Budapest	2021-11-30	Planet Budapest		
Spain	Southern Europe	Madrid	2001-11-21	UN Climate Change Conference (COP7)	2000/02/16	2009/09/24
Saudi Arabia	Middle East	Rijad	2020-10-21	Future Investment Initiative		
Sudan	North Africa	Budapest	2016-11-29	Budapest Water Summit		
Tanzania	East Africa	Dar es Salaam	2024-03-28	Africa Climate Week		
Tajikistan	Central Asia	Dushanbe	2018-05-04	High-Level International Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028		
Thailand	South-East Asia	Budapest	2019-10-15	Budapest Water Summit		
Turkey	Middle East	Ankara	2013-12-18			
Tunisia	North Africa	New York	2019-09-27	UN Climate Action Summit		2009/04/22
Turkmenistan	Central Asia	Ashgabat	2023-06-29	Central Asia Energy Investment Forum	2012/08/29	
Republic of Uzbekistan	Central Asia	Astana	2018-10-10	Astana Economic Forum	2007/09/04	2007/09/04
Vietnam	South-East Asia	Budapest	2013-09-17	World Water Week		2014/05/19
Cape Verde Islands	West Africa	Budapest	2019-10-16	Budapest Water Summit		
Dominican Republic	Central America		Prepared for signature			
Iran	Middle East		In prep.*			
Japan	East Asia		In prep.*			
Mozambique	East Africa		In prep.*			
Uruguay	South America		In prep.*			

* In preparation

Grouping of countries from political and cultural perspective

When attempting to categorize these countries in order to identify common trends, I encountered a lack of discernible patterns that could facilitate the extraction of

meaningful insights. There is no significant bias towards a particular religion (islamic, judeo-christian, buddhis, other backgrounds are equally present), cultural sway, or relation towards authority. Analysis from political perspective of form of government, dominant ideologies, foreign

policy determinants, or membership to international water conventions has not revealed any single defining factor that could establish a prevailing trend. Nevertheless, there exist certain attributes that may not directly influence the selection process but indirectly serve as common denominators among these countries. These include a notable prevalence of nations with colonial histories and varying degrees of democratic development, ranging from moderate to relatively lower levels. While apparently on political and cultural level these seem to be indirect connections, it all makes sense if we consider the economic perspective, that strongly resonates with the pragmatic solidarity detailed in the point where discussed opening to the south

and east (improving international position). Otherwise, we should consider culture and politics (beyond their developmental status) as negligible factors in the selection of partners for MoU's.

Grouping of countries from economic perspective

Hungary has a Memorandum of Understanding on the field of integrated water management with a wide range of countries (*Table 1.*). The 51 countries (plus five in different stages of preparation) with whom Hungary signed a bilateral memorandum, have a mixed background as seen before, with very little recognizable pattern. However, if we try to characterise them along economic factors finally there are some patterns taking shape.

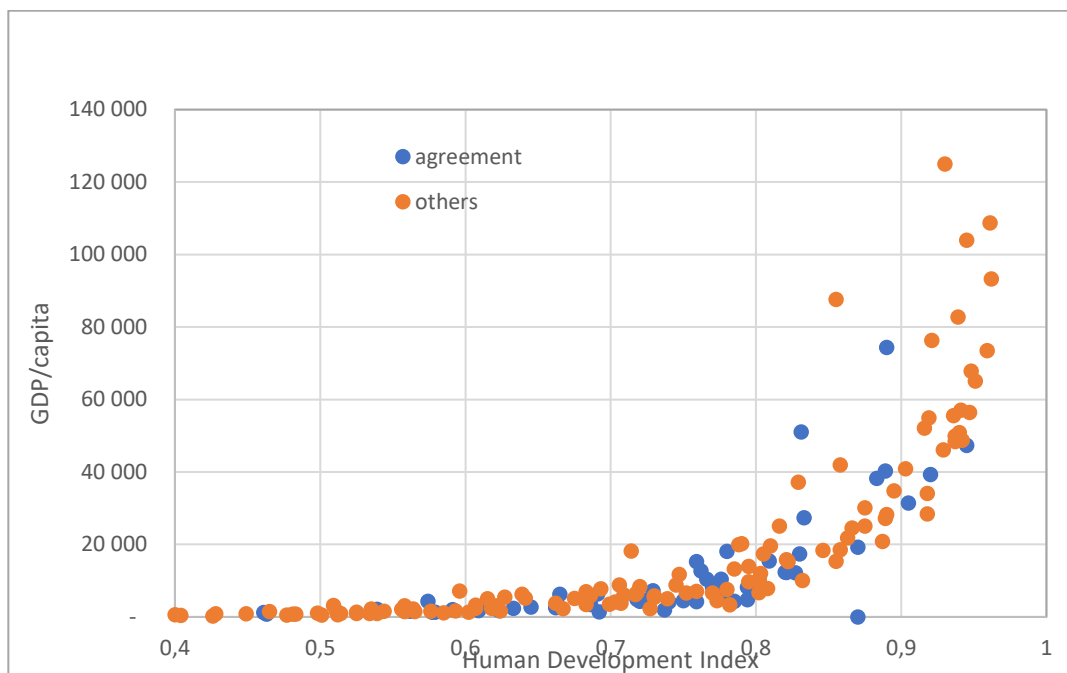


Figure 4. Countries along the level, of their Human Development Index and GDP value, coloured differently depending on whether they have or not an MoU with Hungary (Rózsa 2024)

4. ábra. A világ országainak diagramja Human Fejlődési Index és GDP alapján (kék színnel akiknek van és narancssárgával akiknek nincs vízügyi kétoldalú együttműködési megállapodásuk Magyarországgal) (Rózsa 2024)

Among the countries with whom we have signed a Memorandum of Understanding, considering GDP/capita for assessment of the economic development and financial possibilities of a country we will see the following: A significant proportion comprises low and lower-middle income nations. It shows a trend towards collaboration with countries, which are facing economic challenges. The representation of the absolute poorest countries is lower and there are very limited instances of MoU's with high income countries, clearly indicating a selective approach in forging these cooperations (*UNDP Country Insights 2024*) (*World Bank Open Data 2024*).

Grouping of countries from the perspective of water resources and cooperations on water management

As mentioned before at the geographical focus, Hungary is cooperating on other platforms with neighbouring and EU countries. There is the legislation of the EU itself and various international public and civil organisations providing multilateral platforms for collaboration (Danube commission, ICPDR). With neighbouring nations having

shared water resources, Hungary also signed a long row of bilateral treaties, that (contrary to MoU's) do represent legal obligations and have a much more extensive and detailed content, assigned institutions (bilateral commissions and subcommissions to the individual waterbodies).

Membership of the two multilateral water-conventions (UN Watercourses Convention and UNECE Waterconvention) provides another forum and toolset for Hungary to handle water management issues on international level. Subject of the current article, the MoU's however create an excellent tool for Hungary to connect on a one-to-one basis with distant countries that have (or just lack) water-resources that need to be managed efficiently and sustainably. For this purpose, they might require both up to date knowledge and experience in the field of integrated water management, water governance policies and handling shared water resources, a highly valuable intellectual asset, that Hungary possess. Additionally, the sharing of developed practices and know-hows through visits, workshops trainings etc can open a further connection to the Hungar-

ian higher education and the lack of industrial and engineering capacity in the host country can also provide an opportunity for the Hungarian water industry.

When looking for common patterns among the countries concerned, water scarcity issues clearly come up as common characteristics. Changeable precipitation patterns, due to climate change, challenge water economics of these countries more and more and almost without exception. In areas like the Middle East, Africa and Central Asia it “only” means a growing scarcity, but in South and South-East Asia or Latin America flood management is posing another difficult challenge. Population growth is exacerbating these problems and adds water pollution issues, with the degradation of natural habitats and biosphere. This latter characterises northern African and Sub-Saharan countries as South and South-East Asia as well. South America is slightly less concerned with these issues at the very moment but is excitedly preparing behind the curtain for the role of one of the worst hit parts of the world by climate change and global warming.

Shared water resources create a very serious issue in the Middle East, in Central- and in South and South-East Asia.

Different groups of countries have a varying set of problems, but most of them face with more than one of these issues and are keen for any assistance that can help in resolving them. The fact that unlike Hungary, majority of these MoU's are signed from the partner side by a ministry dedicated to water matters (whether its exclusively water or paired by agriculture, energy or something else like forestry, changes) show that it is a very much recognised challenge by the partners in these cooperations. According to research proportionally the larger the international basins of a country are (compared to their area), the

more likely it is that they form bilateral water treaties (*Molly at al. 2004*). While this concerns mainly international treaties, putting water resources in the center of thinking, it is also a factor of forming MoU's with distant countries like Hungary.

This latter fact has some far-reaching consequences in terms of most of these countries having similar MoU's with other countries of similar background to Hungary. Just for example Thailand has the same level MoU's on Water management not just with us, but with the Netherlands, with China, South-Korea, Vietnam. Four partners that of two are partners of Hungary too in a bilateral MoU in integrated water management.

Water management MoU paperwork in Hungary

History

Hungary as discussed at the history of foreign relations has a long and rich history in cross border water-based co-operations. However, these were either absolutely informal or based on paperwork between private or state-owned companies or not-distinguished parts of higher relations. We only signed our first watermatter MoU in 1995 (*Rózsa 2024*) with our longterm water-partner: Mongolia and in the next almost 20 years only added 4 more with Israel, the Czech Republic, Spain and China. But even those in the first part of that period and absolute none in the decade between 2003 and 2013. However, in 2013 something happened and the initiative for signing water-based MoU's took off and since then we are signing more and more in a growing number. At the time of writing this article Hungary has 51 MoU's most of them signed on ministerial level (further 5 under preparation) with the exception of Vietnam, Kuwait and Brazil, having government level MoU's (*Nagyné Soós 2024*).

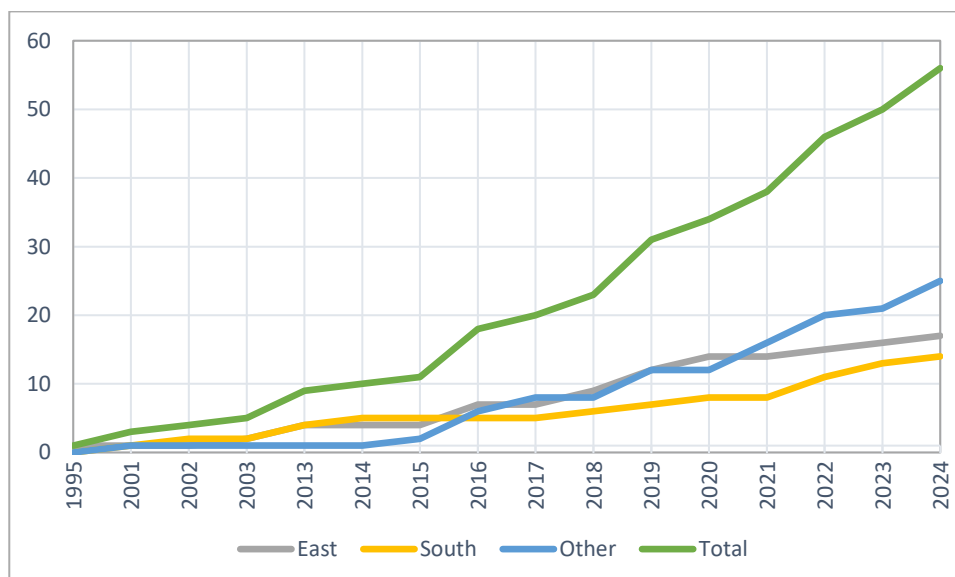


Figure 5. Signatures of Memoranda over time in main relations (Ministry of Interior 2024)

5. ábra. Vízügyi együttműködési megállapodások gyarapodása fő külgazdasági irányokban (Belügyminisztérium 2024)

In 2012 János Áder (*Wikimedia 2024*) has been elected as President of the Republic of Hungary and along with the conference of Rio de Janeiro, he announced a program with emphasis on environment and sustainability, putting the water issue in a central place on the Hungarian foreign

agenda. In 2013 the Government of Hungary, the United Nations System and World Water Council organised the first Budapest Water Summit (*World Water Council 2013*), an event that beyond creating a forum for discussions around water in the realm of international relations,

aimed promoting water as a single Sustainable Development Goal and played crucial role for water becoming the 6th SDG on the verge of creating the Program "Transforming our World".

The first BWS has brought the world political and water leaders to Budapest and presented an important success and excellent opportunity for Hungary to present its current position at the peak of water diplomacy. The world

visiting Budapest created a momentum to meet and sign a row of MoU's. Since then, there is a periodicity to be observed. There are MoU's signed in the meantime's too, but there was always a jump during the repeatedly organised BWS's (in 2013, 2016 and 2019) and finally in the last year of János Áder's term. However, with President Áder's stepping down from office the process hasn't stopped. There are MoU's signed year after year with, at the time of finishing this article, 5 in preparation phase.

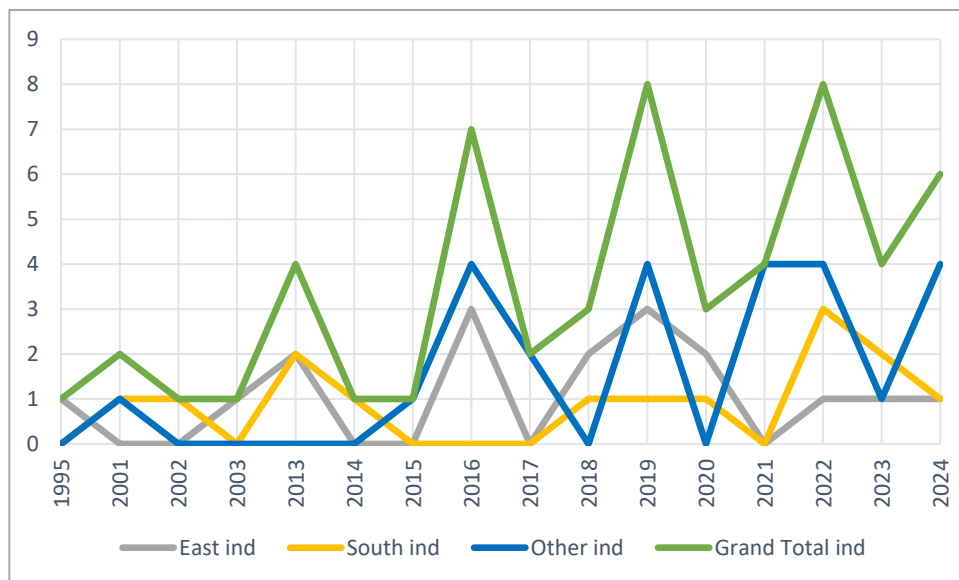


Figure 6. Periodicity of signature of Memoranda in different relations (Ministry of Interior 2024)
6. ábra. Aláírások időszakossága fő külgazdasági irányokban (Belügyminisztérium 2024)

Content, procedural, organisational framework

Over the years a mature structure has been developed for the upcoming MoU's as much that according to Peter Kovács (Kovács 2024): "Who has seen one of the MoU's has practically seen all of them." (It needs to be noted, that there are some exceptions like the three of them signed on government level and occasionally there are countries offering their own version for adaptation, which might slightly differ from the Hungarian draft.) The considerably greater part of the MoU's is based on the same three-pages-long template, which defines the objective, the areas and forms of cooperation, outlines an implementation, defines cost-bearers, mentions intellectual property rights and dispute settlement and some final provisions.

Without contemplating on the motives for signing the paperwork (that I already did in "Possible benefits and international perspectives") the objective of the MoU's is a policy cooperation on equal and reciprocal basis to which the parties enter for mutual benefit. The duration of the cooperation is variable, often (and more recently) signed for 5 years period, automatically prolonged after the deadline for a consecutive 5 years. A paragraph is dedicated in each case to the protection of intellectual property rights.

From procedural perspective it creates a collaborative framework grounded on the principles of parity, reciprocity, and shared advantages, while upholding compliance with domestic regulations. Possibly occurring disputes regarding the MoU's interpretation or execution are intended to be resolved amicably through bilateral discussions,

excluding any external adjudication processes. Modifications to the MoU presumes the mutual consent and formal agreement of both of the involved parties. According to the general financial provisions both parties are responsible for their own costs incurring with the implementation.

From organisational perspective the participating organisations are to foster collaboration among other governmental bodies, educational and research institutions, commercial entities. A Joint Steering Committee, consisting of an equal number of representatives from each participating entity, is to supervise, monitor and evaluate the operational execution of the MoU, to ensure its effective implementation. It serves as coordination and communication channel. The MoU calls for collaboration in a wide range of the sector, encompassing initiatives related to water resource management strategies, efforts towards climate change mitigation, and the sustainable exploitation of water resources.

Recurring themes, avoided subjects

According to Peter Kovács Hungary's expertise is widely recognised in all the areas offered for cooperation, practically all areas of water management. Shall it be surface water extremely in focus in North Africa or groundwater especially concerned in Mongolia, Hungary has a wide range of experience recognised in the management of these resources from engineering, sustainability, education or policy side. Hungary has extensive experience in managing shared watersheds and also in international water diplomacy as founding member of both of the two multilateral waterconventions (Kovács 2024).

The main areas of cooperation are Integrated Water Management and related Legal Frameworks including elaboration and implementation of integrated water management strategies and legal regulations. The Sustainable Utilization and Protection of Water Resources to ensure their longevity and health. Climate Change Mitigation and Adaptation, calling for joint efforts to address the effects of climate change and adapting to its impacts. Risk Management for Natural Disasters including collaborative work on drought and flood management, including monitoring and risk mapping. Water Supply and Treatment with possible cooperation extending to drinking water supply and treatment, as well as sewage and wastewater

treatment. Education and Research Collaboration, strengthening cooperation between educational and research institutions in the field of water management and Technology Innovation, encouraging innovation in technologies related to water management.

While this is the set Hungary offers for cooperation to the partners, it doesn't mean that in every memorandum all these areas are listed. Again, referring to the discussion with *Péter Kovács in 2024*, some countries might be uninterested, sensitive, even dismissive to areas of cooperation. As an example, he mentioned Turkey, who was refusing any kind of mention of shared water-resources even in an as basic instrument as an MoU.



Photo 4. János Áder's visit in Mongolia one of our oldest partners in Water management (Bruzák N. MTI)
4. kép. Áder János látogatása Mongóliában, egyik legrégebbi vízügyi együttműködő partnerünkénél (N. Bruzák MTI)

Workplans

Workplans are essential for creating real value from the MoU. The cooperation initiated by the MoU can be addressed through specific work plans designed to the development of the chosen areas. Activities or projects started under the MoU's operation can continue even after its termination, suggesting that workplans for these initiatives are expected to be comprehensive and long-term.

For creating the workplans and for the practical implementation of the MoU, a Joint Steering Committee will be established of equal numbers of participants from the signatories as defined above.

Signatories, participating organisations

With three exceptions (Vietnam, Brazil and Kuwait) the signatories are Ministries responsible for water management in their countries, thereby representing their own country in this field on international level. For the other three the two governments are the participating organisations, which make the implementation (*Kovács 2024*) of the paperwork very difficult, as there is no party that would have a clear responsibility. However, there are two distinctive cases when a signature on government-level is required. One of them is if there is serious commitment involved with the implementation of the MoU or if that is the only possibility allowed by the other party's government structure.

In the further development of the relations, signatures of further agreements can become necessary like the involvement of the CO₂ quote (state property), the protection of investments or dual taxation, which lead to more serious cooperation, going beyond the MoU's of water management.

Presentation of 3 memoranda

There are common components and characteristics for the three cooperations pulled under examination in this article. From stakeholder perspective while being bilateral instruments all of them highlight the importance of multi-lateral engagements in addressing water management and sustainability issues, besides the bilateral relation.

From content perspective recurring theme is the integration of technology and innovation in water management practices, aiming to enhance efficiency and also sustainability since the cooperations align with global sustainability goals, particularly SDG 6, related to water and the climate action (SDG 13), and partnership (SDG 17) goals. Each cooperation initiative includes elements of capacity building, education, and knowledge exchange to foster long-term resilience and expertise in water management, manifesting a definitive focus.

As methodology of the research, I relied mainly on the following information sources: The Ministry of Interior (MI) keeps a record of the progress of each cooperation that served as a basis for this summary. It is strictly limited

to the formation and work of workgroups and implementation of workplans, official visits. It doesn't hold any record of educational-, water industry cooperations, water export. To find out more of possible cooperations I contacted the attachés of foreign trade in the Hungarian foreign missions, which was provided for Egypt and China, but was not for available for Thailand.

Thailand

The MoU with Thailand was signed during the last BWS in 15. 10. 2019. As mentioned at the grouping of countries, Thailand has an extensive set of MoU's with other countries, and it also has a row of bilateral treaties of shared watercourses. Furthermore, Thailand is member of the Mekong River Commission for Sustainable Development, one of the most advanced river basins cooperations today.

Despite having abundant water resources overall, Thailand faces several challenges like water shortages for agriculture and even civil consumption due to the unevenly distributed rainfall and severe flooding during the monsoon season at other areas, both expected to strengthen as a result of climate change. Industrialization and agricultural fertilizer-use contribute to water pollution reducing usable freshwater resources. Urbanization, population growth and aging infrastructure add further strain that make the country highly interested in water-based cooperation.

The report shows a great interest in cooperation on both sides and contains a clear definition of the areas where the other party is especially interested (drought management and monitoring, drinking water treatment) and a wide set of presentations, visits, discussions, even donation of an appliance that successfully filled the MoU with content. Important to mention that the Covid epidemic has had a destructing effect on the implementation, similarly to many other cooperations, but the Thai relation gained a new impetuous after the normalization of the situation. The workgroup in this case is operational and the document defines financing needs as requirements for the further development of relations.

Egypt

Despite of being the "Gift of the Nile", Egypt is considered as a water-scarce country, because of its arid climate and high population density. Its special situation as a downstream hegemon, depending almost entirely on the Nile as a renewable water-resource, makes the state extremely interested in water-sharing and dispute resolution, sustainable agricultural practises.

The originally on 12. 06. 2015. signed MoU's implementation was initialized only after a few-years stillstand by the Joint Economic Committee under the Ministry of Foreign Affairs and Trade, however the Covid pandemic paused the further developments and the first session of the workgroup was held only 7 years after the signature of the MoU. Due to the current economic difficulties of Egypt, the initiatives of the Hungarian party are mainly failing because of financial obstacles (Horváth P.2024).

China

China's interest in water-based cooperation comes from several challenges and opportunities related to water resources:

Uneven water distribution: (plenty of rainfall in the south, water scarcity in the north), severe water pollution (from rapid industrialization and fertilizer use), changes in weather patterns due to climate change (droughts and floods), aging infrastructure with high water loss pose serious challenges while it is not a one-sided (developed-developing) relationship as often in the case of the MoU's.

There are excellent opportunities present like sharing best practices on both sides and develop successful water management strategies and policies. There is a promising possibility to develop joint largescale water management projects.

The EU and EU members are strong partners for China in water-based cooperation because they can address water challenges more effectively, give access to advanced technologies, and share expertise.

One of the first MoU's Hungary signed (namely the 5th) has been concluded with China on the 17. 04. 2003. It was an actual codification of the previously existing cooperation over flood-protection, water quality and the adaptation of the EU Water Framework directive (Ministry of Environmental protection from the Hungarian side). The cooperation went through some renewal and modification and its history is fairly rich in visits, occasionally on high level of state administration until the hit of the Covid pandemic. Since then, the bilateral cooperation hasn't taken up a new start. However, the China-EU Water Platform is operational and has its meeting every year. Hungary is participating in this multilateral cooperation.

IMPLEMENTATION - BASIC QUESTIONS OF FULFILMENT / SEARCH FOR THE DRIVERS OF SUCCESS

Description of current practice

Initialization, stakeholders

Currently the initiative for creating an MoU can be either political (foreign relations) or economical (export). Concerning prospective implementation in the case of a Top-Down practice, it is a vital question whether the signature was initiated from high levels only wishing for an act of PR to present as just an instance to sew the ties tighter with another country, or based on real economic motivations (not contradicting to each other, but placing the emphasis to different places). If it is a Bottom-Up practice from an export-oriented company or maybe an educational institution (however I haven't found an example for the latter in the current set) looking for a reference when seeking/strengthening business or partnership overseas, then implementation is better founded (see the question of ownership in the conclusion), but still requires help from the state(s) for an ideal development. Until recently both were transmitted by the Ministry of Foreign Affairs and Trade (MFAT) towards the Department of Watershed-management, which in this regard was really impressively serving well-justified interests of other entities mainly based on foreign relations or trade. Currently with Peter

Kovacs as department leader having moved to the General Directorate for Water Management, the process became even more fragmented than before.

The correspondence was managed through the Missions by MFAT. The MoU would be signed after permission of the MI on level of a state-secretary, most often by the Minister of the MFAT.

From this point on the interests of the initiators were satisfied, whatever this was, and the MI had a new MoU to look after.

After the recent changes in the governance structure the role and future of the MoU's seem to be neglected and it remains a question for now, how long the inertia will take the currently operating cooperations.

Workgroups (number, participants, work)

Following the signature the work starts with the creation of workgroups or joint steering committees and their first session. Members of this team of experts are assigned by the parties, from Hungarian side usually professionals from the MI, the General Directorate of Water Management and occasionally the local Water Directorates, depending on the themes in focus. The workgroups have regular but not frequent meetings (ideally 1 per year) online or in person. The creation of a workplan can take up some time (occasionally several years according to the records) and contain a set of areas for collaboration and projected activities on those areas. Beyond capacity building (webinars, seminars, courses, exchange of young professionals), there are instances for project generation, definition of potential joint research, mutual participation on conferences and technical visits. The workplans are usually created for three years with a final completion report and definition of possible future collaboration.

There might be obvious opportunities where Hungary can assist with know-how, technology or capacity. For example, if the partner is unable to measure or monitor water yield. In this case we are able to provide with a measuring group and even train the partner. The work of the workgroup aims to define those areas where collaboration can be beneficial for both parties by defining problems and assessing the availability of knowledge, technology, institutional capacity.

Memoranda without workgroups, upcoming challenges

Currently only about 10 of the 51 memoranda are proving useful (for example Thailand, Bangladesh, China, Pakistan). The failure of a MoU can be traced back to various reasons. For once it might not even be a failure from the side of the initiator, because the original purpose was never the intensification of water-based cooperation, but "only" the development of the political relations. There also might occur political changes (like in the case of Sudan) that reduce the importance of this kind of relations, rendering the cooperation uninteresting. Sudden change in economics might pose challenges that affect the implementation of the collaboration (see the case of Egypt in at presenting the concerning memoranda). Once the MoU is there however, it does not take any resources to keep the paperwork. It is an ever-available basis for potentially emerging needs. If

one of the parties feel it coming useful and can find common ground of interests, it is possible to reinitialize the co-operation with a short process.

Results – what's BEYOND the MoU's

Even as a hidden subpoint in this subject that is one of the critical factors and unfortunately even the most difficult one to acquire data for. Who are the stakeholders beyond the MI involved in the relations initiated or supported by the MoU's? Difficult to define what role of the MoU had in the development of the relations, but what happened in terms of export, investment or educational/research co-operation beyond the implementation of the MoU? This also raises the question who should keep records, follow-up these various aspects of relations? I thought of collecting this information from the foreign-economics attachés of the Hungarian missions. This however has proved problematic. Most of them referenced the MI as the sole responsible party for the implementation of the MoU's. While the MI has neither the capacity nor the interest in following development of foreign relations, very few of the attaché's could or wanted to provide information for the original thesis about water-based relations. There is information about few companies that found the existence of a MoU useful for investment in a developing country (for example Pureco – Ghana; Budapest Water Works - Pakistan). There are few students studying with Stipendium Hungaricum in Hungary (for example University of Public Service, Faculty of Water Sciences – Nigeria, Kazakhstan; Budapest University of Technology and Economics - Algeria), but much less than the program would allow in general, and in the area of water in particular (*Stipendium Hungaricum 2024*). There is cooperation between the Hungarian Water Association and the Vietnam Water Supply and Sewerage Association, having organised a full-day seminar in water-management, but it's a side activity for an organisation like this.

The MFAT is supporting the export-oriented relations through the Joint Economic Committee's (JEC) repeatedly meeting with 40-50 countries. This has its declared purpose of exploring and defining business opportunities. Water is an often recurring, strongly emphasized subject on the JEC's program and in case it there is one, the MoU is referenced in the record of the JEC's meeting. The MFAT has also a flagship exporter program listing export-oriented companies from the water-industry and *HEPA (2024)* (Hungarian Export Promotion Agency) promotes also companies of a mature export-potential in foreign markets.

In the implementation of the MoU's the engagement of the ministerial background institutions (General Directorate of Water Management – Viziter Export), chambers of commerce, remains random and unexplored.

Gap assessment

Intention

There was plenty of contemplation about the possible motives behind the MoU's of water management when discussing the geographical focus. However, it is quite clear that the Ministry of Interior, as (former?) owner of the set of these instruments has no direct interest in the implementation of these. While even if it seems strategically

problematic, from a certain perspective it is possible to be justified subordinating the water-resources management to the Ministry of Interior. (That is changing as more and more areas of water-management become concentrated under the Ministry of Energy.) However, when we specifically touch upon the subject of the MoU's it is absolute logical to raise the question: why would be a department in the MI responsible for setting up this kind of relations shall it be export-focussed, foreign relationship centred or water management concentrated. The answer of the MoU's being cooperations in water-policy thus handled by the owner of the watershed-management come short when we ask about the initialization of the collaboration.

As discussed at the current practice the MI managing the MoU's was serving interests in foreign politics and trade. It's difficult to name any particular reason why the Department of Watershed Management (DWM) under the Ministry of Interior would engage for its own sake in a collaboration with Sub-Saharan or Latin-American countries based on water-policy and management. The cooperation eventually serves foreign policy and/or export purposes (responsibilities of the MFAT).

So, is there an intent to utilise these paperworks from every respect possible as discussed in among the possible benefits and international perspectives? I also turned the question a little more realistic, since the MoU's are not created for their own sake and are not goals themselves but serving other goals. So, is there an intent to utilise the MoU's up to their capacity?

From the side of the DWM or even the MI, there certainly isn't. Neither the political respect of the country, nor the export promotion, even additional possible benefits like carbon credit trade are relevant factors from the area of responsibility of the Ministry of Interior or any of its departments. Knowledge exchange is always useful and usually there is something to learn from everyone, however an institutionalised knowledge-exchange with the set of mainly developing countries we have MoU with, is somewhat overscaled, especially if we consider the mutually beneficial character of the cooperation and the more we narrow down the conceived knowledge exchange. With those having bilateral cross border water-treaties with Hungary, we don't even sign MoU's focusing on knowledge exchange. There is no valid reason for the MI to assign resources to the creation or successful implementation of the MoU's. This can be different in the case of the Ministry of Energy, assuming its growing involvement with water matters. Last year the government took big steps for eliminating the decade-long fragmentation of water governance and is concentrating more and more areas under a separate state-secretary for water management under the leadership of the Ministry of Energy. The case of the currently discussed paperwork clearly shows that there is still a long way to go in terms of reducing fragmentation, because currently the Ministry of Energy and the State Secretary of Water management still has absolutely no responsibility in the field of the water management MoU's.

We can ask the same question with respect of the Ministry of Foreign Affairs and Trade. There are present the

responsibilities that we miss from the side of the MI. However, the question sounds different in this consideration. Is there an intent from the side of the MFAT to utilise the MoU's to their full capacity in favour of reaching its own purposes: export-development and international recognition, development of political relations, thus making them an integral part of its strategy? Probably there isn't, otherwise the MFAT would not just acknowledge the existence of these professional cooperation and occasionally use their signature as a PR act but would be active part of the workgroups and at least closely monitor but rather influence and stimulate the actual implementation. The MFAT seems to acquire information and incentive through the Joint Economic Committee's and rather uses the MoU's as occasional reference basis, but for that their pure existence is sufficient.

Eventually both the MI and the MFAT are serving higher political interests as ministries responsible for areas assigned to them. But is there a higher political will to utilize the MoU's to their full capacity? While there is no exact answer for that, the obvious lack of a coherent strategy in water and environmental management that is best expressed by the still the partial homelessness (Water in a statesecretariat in the Ministry of Energy) and fragmented institutional background and lack of coordination (see the section Institutionalisation of water in Hungary) even by limited flow of information, indicates that the creation of the MoU's is not fitting in an elaborate strategy promoting a sustainable integrated water management or a coordinated presence on foreign markets. However, there might be a conceptual direction in foreign politics (Tarrósy and Solymári 2022) which is well served by occasional signing of the MoU's but doesn't go beyond that in their utilization and ignores their actual implementation.

Resource

If there is no will, then usually availability of resources is at least questionable. When talking to ministry officials the most often raised complaint referred to the lack of funding. The current funding is sufficient for operation that is to be observed currently: gradual expansion of the set of MoU's and operation of the currently active relations, with occasional visits in every few years. It's a limited but existing financial background. The MI certainly has no other resources to be dedicated to this activity, being completely outside of its focus. Shall that be a completion of a feasibility study or any kind of support for export activities, foreign investments, the MI is not going to be able to finance that. The MI only can afford one person representative of the country to participate on some international water management conferences and represent the attractive knowledge present in Hungary. The MFAT had tenders in previous years for companies active in the water industry for stimulate export activities (before 2022). The *Exim bank* (2024) can contribute to successful investments with tied-aid loans and investment guarantees. The Hepa can facilitate the presence of the Hungarian industry abroad on trade fairs. Stipendium Hungaricum with an oversized (but decreasing) program can also support the expansion of water-based collaboration, however there are only a few applicants for the offered places. There are private initiatives like the Hungarian Water Partnership and

HWTC, financing their activities and operation from private sources.

So, considering the resources, while it is a returning deficiency and one difficult to overcome, I have to point out

that there are resources available, but even those are being utilised fragmented, with limited efficiency, for the reason of lacking coordination and comprehensive strategy behind.



Photo 5. Delegation of Hungarian Water Experts in India led by Péter Kovács (www.ovf.hu)
5. kép. Kovács Péter vezette magyar vízipari szakemberek küldöttsége Indiában (www.ovf.hu)

Institution

When collecting the information for my original thesis, it became painfully obvious that while the MoU's create an easy but handy basis for cooperation, they have no real owner who would be – apart from the conscientious performance of duties - substantially interested in developing the foreign relations whether it is policy and knowledge or export based. There are capable institutions responsible for various tasks, but there is no real coordination utilising these into a coherent system and no real driver behind. There are also some cluster-like organisations in the private sector (Hungarian Water Technology Corporation - HWTC, Hungarian Water Partnership - HWP) who have partial knowledge of the current activities (*Hungarian Water Partnership 2024, Hungarian Water Technology Corporation 2024*), but are not involved in the collaboration in any way, however they could really act as driver of the co-operation as could also the MFAT if invited into the workgroups.

CONCLUSION - MAPPING OPPORTUNITIES, FORMING SUGGESTIONS

Potential of the Memoranda of Understanding of water management

The MoU-like non-binding instruments are a useful tool that the Hungarian Diplomacy has discovered and started to use in fairly large scale. It is easy to create them. It has a positive image. It can improve personal, political and economic ties through professional collaborations that

encourage and facilitate knowledge transfer. The better relations can lead to actual and well-funded (based on real knowledge) businesses that improve not just the human well-being but also the state of the environment and provide developing countries with the most up to date (most effective and cost-efficient) solutions. An MoU without workplan and workgroup can improve political relations, and the pure act of signature can be conceived as “a form of communication” (*Kardos 2024*). It can also facilitate the relations between a Hungarian exporter and a recipient country, creating a reference and providing a contact (since the MoU has been signed by someone). All this for a minimal cost. However, the MoU really rises to a useful level when a workgroup is formed and a workplan is created. The realisation of successful common projects – shall that be policy and management based or an actual export – due to successful implementation of an MoU, that opened the door for further, more serious treaties can/could bring in convertible strengthening of political relations, in addition to tax-income from foreign work and order.

Financial resources, motivators

Beyond the formation of workgroups financial resources are the next decisive factor of contributing to the potential benefits of an MoU. During my research and the formation of this work, I repeatedly met the issue of limited financial resources. Finances can play an important role in implementation of the MoU at several stages. Without facilitating actual visits and common participation on

conferences even the political effect can stay very limited, reduced only to the act of signature. Even more true for the actual exchange of knowledge and experience that is vital for discovering the real potential for export or Hungarian presence on trade-fairs and exchange programs or scholarships that are to build a network of experts, related to Hungary. In case of available resources, the Hungarian party could be in the position of financing a feasibility study based on the discoveries made by the workgroup of an MoU. Depending on the financial position of the partner, in case of existence of those the Hungarian companies might be preferred applicants on an international tender (due to the complementary creation of the study) or in case the partner lacks financial resources a tied aid loan can bring Hungarian companies' ready businesses.

Despite the complaint from various sources, there are certain resources available. The MI has/had a department focusing on the development of the MoU's and occasionally can organise visits to and from Hungary for the workgroups. Hepa is supporting Hungarian companies, including those from the water industry presence in trade fairs. MFAT is including water in the joint economic committee's program and has a department exclusive for water diplomacy (but not exclusive for the overseas relations). Private sector companies and a cluster or consortium like the HWP or HWTC can gather their strength and finance activities, presences that they hope to bring some breaking point in their export endeavours. With a still noteworthy but recently lowered budget the Stipendium Hungaricum is bringing in year after year students to Hungary, however neither their choice of major nor their relationship to actual companies is coordinated or advertised in the above channels and I'm not aware of an alumni program.

All in all, there are resources available, however these are scattered and fragmented, their efficient use is not ensured.

Supporting legislation and organisational structure

Unfortunately, the still fragmented institutional background of the Hungarian water governance leaves its mark on the question of the MoU's too. There are several players involved, each responsible for a separate field, lacking a coordination process between them, while the limitless flowing and connecting characteristics of water itself is similarly true for its management process too. Boundaries in water matters are rarely exact and eventually everything is connected. The same water that comes into the country through a shared watercourse (don't forget to consider quantity and quality) will be used for the energy-industry as power-generator or coolant, agriculture as irrigation, will cause flood or drought, will eventually penetrate underground and serve as drinking water for the populations and after being returned to the environment contribute to the health and well-being of the biosphere. All this is interconnected and requires a holistic approach, which would be called integrated water management.

However, it is difficult to talk about integrated water management when the institutional background, handling water is greatly disintegrated and difficult to provide know-how for developing countries when even communication is limited within our own system and suggest best

practices, when we don't even consider reasoning for our own as a best practice.

Additionally, without clear separation of the responsibilities and the proper connection of stakeholders the successful operation of management processes is not coded in the system but often left to personal commitment and willingness of undertaking.

Specific suggestions

From the focus of this article the fragmentation of the Hungarian water management system has only tangential significance. The MoU's to my view (as discussed before) have their main role in promoting export and political relations. Creating a supportive environment for their implementation (so that they can perform their role at an optimal level) would be easier with an integrated legislative background, but the connecting of various players within the frame of the MoU would be necessary anyway and that is possible even among the current circumstances. However there seems to be missing a coherent strategy behind the MoU's that would clear up their purpose and define the goal of Hungary with these MoU's as a whole and also one by one. Another approach would be to define how these MoU's can fit in a more-comprehensive strategy of foreign politics or foreign trade, but an important finding of the current work is that apart from the above, the MoU's can prove useful and beneficial in many respects. So, I really suggest a strategy behind the MoU's as a whole and also for each. With an individual MoU, Hungary might have a definite export purpose, might have a simple openness, or might not aim to complete anything beyond the signature. So, I suggest a definition of Hungary's goal with each MoU. According to the strategy this status can be revised from time to time and be changed, automatically initializing necessary actions (in case of raising importance calling for a workgroup or adding dedicated resources etc or in case of being reduced in importance postpone activities etc).

To complete any kind of achievements though there is an essential factor missing: A proper owner of the process with strong motivation. This is a two-component factor, very difficult to be replaced by personal commitment and dedication. There are partial solutions that can produce better results than today, meaning here for example invitation of export-oriented organisations into the workgroups and providing them with initiator role. For a real useful, efficient system of MoU's however there would be a motivated process-owner necessary who is required to involve a wide range of stakeholders both in the formation and update of the system of the MoU's and in the implementation and further development of the individual collaborations. This player should play a forward-moving coordinator role in connecting the stakeholders and operating those MoU's in a professional way that points in a determined direction. About what that direction is, a decision must be made by the involved stakeholders which suppose that the meeting of workgroups does not exclusively mean the conferences held with the party, but also the thorough coordinated preparation of those. So, for using the MoU's up to their full potential I find absolutely necessary a strong coordination between the stakeholders and that of the process.

Also, necessary but only after what was mentioned above, I take the question of the availability of resources. What these resources are and how to define them is a far-reaching question to answer. It certainly is the strategy where this has to be handled. From a goal-oriented, progressive approach strategy must touch upon the matter of the aim of these paperworks and depending on their validity dedicate sufficient resources to their implementation. However, it is rarely the case that strict financial limits are not to be considered. As the MoU's are expected to bring actual income (direct and/or indirect tax benefits and profit for Hungarian companies) for the country, the definition of these prospective resources could/should be a source of the finances and a reason for dedicating them. Beyond the above there are two more components to consider. One is that behind the MoU's the economic reasons are not exclusive and there are political goals involved too without direct economic benefit. The other is that even so far, there were resources used for this purpose (as listed at section Financial resources, Motivators).

Finally, not to be excluded that the efficient and coordinated use of the resources is a requirement that I would hope to fulfil by a motivated owner and a coherent strategy but absolutely include in the latter by a detailed budget.

Limitations of the current work and possible prospective research

The chosen subject is touching upon an unexplored area with scientific resources only peripherally relevant. Most of the information had to be collected from individuals working in the area. For some of this, in future research I would probably use or suggest a conform questionnaire and seek support from MFAT to acquire comprehensive data, that would allow to properly assess the actual situation of the relations in the partner countries.

I have conducted several interviews and run a general inquiry, but the subject is quite extensive. Future research should include detailed analysis of economic relations, assessment of export (the share of water sector), educational, scientific relations on various fields, human and financial capacity of potential Hungarian exporters, possibly a more detailed mapping of the place of water in the Hungarian administration, comparison/analysis of similar programs in Europe or the developed world.

Even going further, prospectively I would concentrate on the relation between bilateral and multilateral collaborations and trying to optimise mechanisms that could pair the capacity and funding present in the individual countries and international organisations with the needs and opportunities across the world.

This is subject of extensive research, which is going beyond the capacity of the current work but is well based on this research.

In fact, it was a conscious choice of mine not to cut too short the limits of this original research to a certain area, but rather creating a full picture, which creates a detailed outline for future work. Like a sketch that can be filled by fine brushstrokes and detailed fine work but has all the main elements and gives a general understanding.

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