



## Water Corruption in Central Asia: A Rapid Review

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### ABSTRACT

Academic scholarship defines sectoral corruption, namely water corruption one of the main threats to the development of Central Asia. While applying a rapid review, the purpose of this article is to explore the current state of research on water corruption, its various forms, and typologies in different water sectors (such as water supply and sanitation, irrigation, hydropower, and water resources management). Specifically, the research seeks to answer the question of how water corruption in Central Asia is defined and analyzed in academic sources. The research findings suggest that academic studies on water corruption are poorly investigated and lack the analysis of sectoral corruption forms and ways to address it, particularly in Central Asia. A rapid review results demonstrate that while briefly mentioning the systemic and pervasive character of water corruption in Central Asia, academic scholarship evades in-depth studies of this problem. It is possible to notice the deficiency of reviews on water corruption studies not only at the regional but also at a global scale. Therefore, this review is anticipated to have academic and practical implications in identifying gaps in water corruption studies, particularly in Central Asia. However, considering the limitations of the rapid review method, to gain a more profound understanding of the problem of water corruption in the region, this study needs to be complemented in the future by a collection of primary and secondary data in Central Asian countries.

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## 1. Introduction

The international community considers water corruption as one of the main barriers that impede progress toward access to drinking water, adequate sanitation, food production, environmental sustainability, and efficient health (Plummer, 2008; Jenkins, 2017; Breen & Gillanders, 2022).

As the Nobel Prize winner and a prominent environmental and political activist - Wangari Maathai alerted water corruption allows powerful actors to break the rules, pollute the water sources, and steal the money meant for water infrastructure (Maathai, 2008). Therefore, the local population experiences difficulties accessing drinking water and adequate sanitation, particularly the poor and marginalized people in developing countries.

The Global Multidimensional Poverty Index (Global MPI) shows the percentage of multidimensionally poor populations deprived of drinking water, sanitation, electricity, housing, and other indicators. MPI country briefings for 2023 reveal that 20,1 % of Tajikistan, 5,2 % of Kyrgyzstan, and 1,8 % of Kazakhstan, 0,3 % of Turkmenistan, 0,2 % of Uzbekistan are vulnerable to multidimensional poverty. The censored headcount ratio shows that 3.6% of the population in Tajikistan and 0.1% in Kazakhstan, Kyrgyzstan, and Uzbekistan are both multidimensionally poor and simultaneously deprived of drinking water (Global MPI country briefings, 2023a, 2023b, 2023c, 2023d, 2023e). The numbers could be much higher because the Global MPI - as the index based on household surveys and national data, has limitations; for instance, surveys remain irregular in some countries (SDSN, 2015). Due to limited data, the MPI indicators show the same percentage for different years. For instance, the MPI percentage of the vulnerable to multidimensional poverty population in Kazakhstan, Kyrgyzstan, and Tajikistan remains unchanged for 2022 and 2023, as these calculations are based on the same sources, e.g., survey results that date back to 2015, 2017, 2018, 2021-2022 (Global MPI country briefings, 2023a, 2023b, 2023c, 2023d, 2023e; 2022a, 2022b, 2022c, 2022d). Therefore, due to limited data, the MPI encounters challenges in showing the actual percentage of multidimensionally poor populations in Central Asian countries.

Academic and media sources emphasize that during the last thirty years, Central Asian states launched different state programs and projects such as “Ak Bulak” and “Nurly Zher” in Kazakhstan, “Taza Suu” and “Ala-Too Bulagy” in Kyrgyzstan, and different state programs, strategies, and projects for the improvement of water supply, sanitation, and irrigation in other Central Asian states. Countries of the region received loans and counselling assistance from international organizations such as the World Bank, European Bank for Reconstruction and Development (EBRD), and Asian Development Bank (ADB), and other actors engaged in such activities (namely,

international development agencies, non-governmental organizations, think tanks, and other actors); however, the local population still experiences problems with access to drinking water, sanitation, and water for irrigation as well, as from poor water infrastructure.

According to academic and media sources and reports of international organizations, one of the latent reasons for such underperformance of state programs in the region could be corruption in the water sector (Marat, 2008; Isabekova et al., 2013; Riabets, 2017; France & Kukutschka, 2019).

Researchers Isabekova et al. (2013) mention: “The financial investments made, however, did not always underpin improvements in local water delivery, and the Kyrgyz Vice President once noted that: “the lion’s share of the credit was stolen.” (Isabekova et al., 2013, p. 1).

Though academic scholarship warns about the pervasive character of water corruption in Central Asia (Bucknell et al., 2003; Warner et al., 2009; Hakala et al., 2023), however, presumably due to its sensitivity, the subject is still poorly investigated in the context of Central Asia. The academic community mainly covers such problems as the conflict potential between Central Asian countries for transboundary water resources, water scarcity, namely shortages of water for irrigation, and poor water infrastructure, however neglects the problem of systemic corruption in the water sector, which poses a serious internal threat that hinders the progress of Central Asian countries toward Sustainable Development Goals, namely SDG 1, SDG 2, SDG 3, SDG 6, and SDG 7.

Considering the deficiency of academic literature on water corruption in the region, this article aims to explore the current state of research on water corruption, analyze its various forms and typologies, and identify research gaps in water corruption studies in the Central Asian context.

It is possible to notice the shortage of review works analyzing the problem of water corruption not only in Central Asia but also on a global scale. Therefore, this research contributes to the existing body of knowledge by proposing an original review paper analyzing the current state of the art on water corruption (its root causes, types, and forms), identifying research gaps, and proposing future research prospects.

However, it is essential to mention that such a complex and multifaceted problem as water corruption requires a further in-depth analysis of the reasons that nudge it and ways to address it. Therefore, this rapid review could be considered as the initial study, suggesting the overview of the existing academic knowledge on water corruption, particularly in Central Asia, and is intended to draw the attention of academia and practitioners to this urgent and acute problem widely covered by media, but rarely analyzed in academic sources (e.g., Chronicles of Turkmenistan, 2022; Gazeta. Uz, 2021; Weber, 2019; Mirsaidov, 2009).

## 2. Data Collection & Methodology

### 2.1. Data Collection

The author narrowed the data searching and inclusion criteria to the type of sources, databases, language, and publishing dates. Namely, for the review, the author collected and analyzed secondary sources, particularly academic articles and reports of international organizations (such as the World Bank, Water Integrity Network, and U4 Anti-Corruption Resource Center) covering the problem of water corruption worldwide, and specifically in Central Asia, published in years between 2000 - 2023, in English and Russian languages. The author limited data searching and data extraction to four databases: ScienceDirect (Elsevier Collection), Web of Science, The SAGE, and the Russian Science Citation Index database (for sources capturing the problem of water corruption in Central Asia written in Russian).

### 2.2. Methodology

The research applies an enhanced rapid review analysis. Rapid reviews became, particularly, popular during the pandemic, when clinical researchers needed to draw the attention of main stakeholders to the problems of high priority or urgency (Furlong et al., 2021; Moons et al., 2021). A rapid review can be used to overcome time and resource constraints as compared to other review methods (such as a systematic review and a scoping review) that typically take a minimum of six to twelve months to complete (Ganann et al., 2010; Furlong et al., 2021; Moons et al., 2021).

Despite the recent emergence, the academic community characterizes a rapid review as: “another emerging type of evidence synthesis” and “a part of the knowledge synthesis family” (Munn et al., 2018; Moher et al., 2015 in Garritty et al., 2021). Academic scholarship defines the advantages and limitations of this review method. As advantages of rapid reviews, academic scholarship names its time and resource efficiency, the possibility to draw the attention of main stakeholders to urgent and high-priority topics, elaboration of rapid recommendations, and the possibility to identify directions for future research (Watt et al., 2008b, Moons et al., 2021; Garritty et al., 2021; O`Leary et al., 2017).

The academic community has no common opinion regarding whether rapid reviews can be an alternative to traditional review methods. One camp of researchers (e.g., Khangura et al., 2012; Featherstone et al., 2015;) stress that rapid reviews may be subject to more significant bias and lack the depth of research and mainly miss the analysis of social and economic factors of the problem. Another camp of scholars, for instance, (Watt et al., 2008a, Ganann et al., 2010; Tricco et al., 2015), emphasize that overall conclusions do not vary significantly when both rapid and full systematic reviews are applied. As the main limitations of rapid reviews, the academic literature names the possible oversight of relevant works due to the acceleration of the data extraction process (Ganann et al., 2010).

However, according to Taylor-Phillips et al. (2017), in contrast to rapid reviews, the application of the enhanced rapid review allows for minimizing the research bias by introducing the dual reviewer screening of all selected review sources: when one researcher screens all sources for their relevance to the research purpose, while the second researcher also independently screens a random sample of 20% of selected for the review sources (Taylor-Phillips et al., 2017). Therefore, the dual reviewer screening allows for minimizing the research bias and lessens the risk of the inclusion by the author of the inapplicable literature or on the contrary, the omission of relevant sources. Taking into account the pros and cons of this review method, scholars stress that although there is a growing need for more accelerated reviews for high-priority topics that require urgent attention, however rapid reviews need to be complemented later by a systematic review for a more profound analysis of the problem (Taylor-Phillips et al., 2017)

The rationale of the author of this research paper to apply the rapid review is driven by the intention to draw the attention of the academic community and practitioners to this acute problem of water corruption in Central Asia. Considering the growing scarcity of water resources in Central Asia due to climate change (World Health Organization, 2022), water loss, and corruption in the region (e.g., Hakala et al., 2023; Iskakova, 2014), this rather neglected topic by the academic community as water corruption in Central Asia requires urgent attention and support for future profound analysis.

Another reason for applying a rapid review is resource deficiency. "Rapid reviews may be determined by limited time and resources to conduct full systematic reviews." (Watt et al., 2008a; Watt et al., 2008b in Ganann et al., 2010, p. 2). The author of this review is an independent scholar who does not receive any funding for this research. Applying a systematic review or other research methods requires long-term research funding and preferably the group work of Central Asian and international researchers (e.g., for primary and secondary data collection in local languages and data analysis). Considering the aforementioned reasons of time and resource deficiency, the author has chosen to apply an enhanced rapid review over other review methods.

Following the enhanced rapid review methodology (Taylor-Phillips et al., 2017), the paper applies dual reviewer screening of all eighty selected sources to minimize the research bias. Namely, two reviewers from Central Asian countries (Kyrgyzstan and Tajikistan) independently from each other screened all sources for their relevance to the research topic, research purpose, and research questions. After the dual review, eight sources were excluded due to their irrelevance. After the dual reviewer screening, seventy-two sources were selected and categorized as relevant for this review.



### 3. Results

The research presents results in the following way: firstly, the paper explores how academic scholarship defines water corruption and considers its various typologies, forms, and root causes. Secondly, the research analyzes how the existing academic scholarship determines sectoral water corruption, specifically in the Central Asian region. The Discussion and Concluding remarks section defines gaps in the academic literature on water corruption in Central Asia and suggests directions for future research.

#### *3.1. Defining Water Corruption, its forms, and typologies*

The academic sources analyzed in this review do not propose any definition of ‘water corruption’ or ‘corruption in the water sector’; instead specify only various definitions of corruption. For instance, Stålgren (2006) considers corruption as an act of breaking socially established expectations of appropriate behavior (Stålgren, 2006, p. 7). While Adam & Fazekas (2021) apply the widely used definition of corruption as: “the misuse of public office for private gain” (Rose-Ackerman, 1978 in Adam & Fazekas, 2021, p. 3). Since water corruption involves not only public but also private actors, some researchers apply the definition of corruption as: “abuse of entrusted power/office for private gain” and “use and abuse of resources found in manipulation of budgets” (Schrodt, 2006, p. 5; Plummer & Cross, 2007, p. 232). Overall, without much specification of water corruption, the academic scholarship only briefly mentions that: “corruption can potentially be found at every point along the water delivery chain.” (Transparency International, 2008, p. xxiv; de la Harpe & Butterworth, 2009, p. 1).

Considering the reasons that nudge corruption, e.g., in the water sector, Stålgren (2006) stresses that it is possible to define at least three driving forces of corruption: individual choice, institutions, and norms. Individual choice to engage in corrupt practices is determined by the value of potential gains ‘weighed against the anticipated punishments and risks of being caught’ (Stålgren, 2006, p.11). However, it is essential to mention that the motivations to engage in corrupt practices may vary depending on the type of corruption, e.g., grand or petty corruption, and whether we consider the supply or demand side of corruption. For instance, households lacking access to formal water networks have to purchase water from informal water providers and ‘pay bribes when they sought a water connection’ (Acción Ciudadana, 2006 in Sohail & Cavill, 2008, p. 44). While the causes of grand systemic corruption in society can be related to power abuse, the dominance of patronage networks, embeddedness of corrupt practices into societal relationships. In such cases, the root causes of corrupt practices might be embedded in organizational culture or social



norms. For instance, Suhardiman & Mollinga (2017), while analyzing the problem of institutional corruption in the irrigation agency in Indonesia, mention that:

“Putting the notion of gift giving and loyalty to family or clan, rather than the rule of law, central to the practice of institutionalized corruption, the upeti system not only provides psychological atonement for being involved in corruption practices, it also justifies corruption practices as the prevailing social norm.” (Suhardiman & Mollinga, 2017, p. 0155).

Explaining the factors that lead to the formation of institutional corruption, the academic scholarship mainly refers to Klitgaard’s corruption formula:

“ $C = M + D - A$ , which means: Corruption equals Monopoly power plus Discretion by officials minus Accountability” (Klitgaard et al., 2000, p. 26). Institutional corruption appears in an environment lacking accountability where exists the *monopoly of power* and the discretion to decide whether someone gets that good or service (Klitgaard et al., 2000). It is possible to apply Klitgaard’s formula to explain corruption in the water sector. As the researcher Jenkins (2017) argues, the incentives for corruption in the water sector are high because of the monopoly of power (the dominance of natural monopolies) and the discretion power of officials who manage projects with initial high capital. Following the Klitgaard’s formula, all these factors and lack of accountability lead to water corruption exposure. Since corruption may be embedded into the institutional culture and social norms, finding ways to address different types and forms of water corruption requires a profound study of both formal (agency, organization) and informal institutions (norms) in a given agency and society.

While analyzing academic literature and reports of international organizations, the author of this paper suggests that it is possible to differentiate at least four typologies of water corruption:

- *by scale*: to grand (also referred to political, administrative, or bureaucratic) corruption and petty corruption (Gonzalez de Asis et al., 2009; Kenny & Soreide, 2008; O’Leary, 2009)

- *by forms of behavior*: individual and collective or systemic corruption (Gonzalez de Asis et al., 2009; Stålgren, 2006)

- *by forms of stakeholder interactions*: public-public, public-private, and public-consumer interactions (Stålgren, 2006; Plummer & Cross, 2007; de la Harpe & Butterworth, 2009; Gonzalez de Asis et al., 2009; Calow et al., 2012);

- *by sectors*, e.g., corruption in water resources management (e.g., groundwater management), water supply and sanitation, irrigation, and hydropower sectors (UNDP, 2011; Haas, 2008; Shandling & Lock, 2008).



**Table I.** Typologies of water corruption (a self-constructed table based on a literature review analysis)

Typologies of Water Corruption	
By scale	Grand (political and administrative/bureaucratic) corruption and petty corruption
By forms of behavior	Individual and collective or systemic corruption
By forms of stakeholders interaction	Public - public, public - private, public - consumer interactions
By sectors	Corruption e.g., in water resources management, water supply and sanitation, hydropower, irrigation, and other water sectors

Grand corruption is considered in some sources as a part of political or bureaucratic corruption since actors involved in corrupt practices in these cases are public officials, e.g., mayors, governors, and local planning boards, but also such private actors as “water cartels” (Calow et al., 2012; Anbarci et al., 2009; Gonzalez de Asis et al., 2009). These actors can misuse public funds for their private gains, receive bribes as “awards” for large contracts to operate water systems, and impose high water tariffs (for instance, through overpricing).

Special attention the academia in recent years paid to studies of “water mafias” that control the informal water supply in informal settlements, for instance, in Kenya, Ecuador, India, Bangladesh, and other countries of the world (Jenkins, 2017; Birkinshaw, 2018; Sohail & Cavill, 2008; O`Leary & Stålgren, 2008).

Birkinshaw (2018) suggests the new term - “water mafia politics,” which, according to the author: “implies an assertive-aggressive dominance over the market, with a strategic approach to regulation (‘informality’) facilitated through the involvement of politicians and state employees” (Birkinshaw, 2018, pp. 189-190). This interlinkage and engagement into corrupt practices of public officials (politicians, political party representatives, local government officials) and private actors (water cartels and informal private water service providers) lead to the formation of a complex network of corruption in the water sector.

Petty corruption, in contrast to grand corruption, involves small payments to get access to water connections and “informal” salaries to the technical staff e.g., to install illegal connections to water or for water bill corrections, mainly reduction of prices indicated in water bills (Gonzalez de Asis et al., 2009). However, despite the small number of such payments, according to some studies, the frequency of such payments in developing countries is high (Sohail & Cavill, 2008; Davis, 2004).

Another typology is individual vs. collective/systemic corruption in the water sector. The main difference is that individual corruption represents isolated cases of corruption driven by greed and wishes to receive personal gain, while collective or



systemic corruption occurs when the institutional culture permits corrupt practices and allows corruption to be widely present in the whole organization: public or private institutions and agencies (UNDP, 2011; Kenny & Søreide, 2008). Though it is essential to mention this differentiation between grand and petty, individual vs. collective corruption is rather blurry and conditional, as petty corruption or individual cases of corruption should not be considered in isolation from an environment where such corrupt practices are spread.

The problem of systemic corruption requires a closer look at the forms of interactions between different actors involved in the water sector. The researchers Plummer and Cross (2007) elaborated a comprehensive “Value Chain Framework: Corrupt Interactions in Water Sector” including such classifications as public-public, public-private, and public-consumer relationships, showing in which spheres in the water sector risks of corrupt interactions might occur. For instance, policymaking, regulation, planning, budgeting, tendering and procurement, construction, and others can be prone to corruption (Plummer & Cross, 2007; de la Harpe & Butterworth, 2009). As the researchers underline, such interactions involve every level of government, including city councils, mayors, and local planning boards, and link government leaders with suppliers, contractors, and consultants who are often affiliated with major multinationals that operate in the water sector (Anbarci, 2009).

Considering the typologies of water corruption, examining corruption in specific water sectors is essential. The UNDP report (2011) differentiates four sectors with high corruption risks: namely, water resources management, water supply and sanitation, hydropower, and irrigation. The authors of the UNDP report (2011) underline that such differentiation in these four sectors is not final and comprehensive.

According to academic sources, among the widely spread types of water corruption, is the corruption in water supply and sanitation sectors (Gonzalez de Asis et al., 2009; UNDP, 2011). The forms of petty corruption in the water supply include the payment of bribes, e.g., to falsify the water meter readings. For instance, survey results in India in 2004 found that `40 percent of water customers had made multiple small payments in the previous six months to falsify meter readings to lower their bills` (Sohail & Cavill, 2008, p. 43). Forms of grand corruption in water supply and sanitation include embezzlement of government and foreign aid funds and assets, political mismanagement of municipality utilities to win votes with low tariffs, the capture of profitable contracts, and (re) negotiations by private companies for water concessions (Davis, 2004; UNDP, 2011). The researchers Breen & Cillanders (2022) provide a vivid example of grand corruption in the sanitation sector, namely the case of the Khlong Dan wastewater plant in Thailand. The construction of this plant, which was planned to be one of the largest wastewater plants in the world, lasted about three decades. However, it was later shuttered due to a corruption scandal when it was revealed that `government officials and local landowners inflated the purchase price of the land required for construction by as much as 1000%` (Sohn, 2007 in



Breen & Gillanders, 2022, p.3). Therefore, as the leading cause of corruption in this sector, academic scholarship sees power monopoly and the lack of accountability.

In the irrigation sector, the root causes of corruption are explained by the scarcity of public canal - irrigation systems, in particular in developing countries, and the discretion power of local irrigation agency officials, who `illegally supply more water to farmers who can offer bribes` (Rinaudo, 2002). The academic studies of corruption in the irrigation sector started relatively recently and mainly covered the analysis of corruption in water canal systems in Asia, namely in India and South Korea (Wade, 1982; Wade, 1997; Mollinga, 1998). While emphasizing the contribution of these works in corruption studies in the irrigation sector, Rinaudo (2002) names the limitations of these works as being based on a few observations. In contrast, Rinaudo (2002) suggests alternative ways of data collection, specifically the analysis of socio-economic information related to the groups of farmers receiving water in this area and also a thorough physical examination of the irrigation infrastructure because: "corruption leaves physical marks on the irrigation " (Rinaudo, 2002, p. 407). The results of this study demonstrate deplorable results that administrative corruption involves `approximately one-fourth of the rural population, affecting large, medium, and small-scale farmers in the studied irrigation systems in Pakistan` (Rinaudo, 2002, p. 419).

Another large water sector with high corruption risks is water resources management. This sector is involved in water-use rights assignments, for instance, erosion control, regulation of groundwater use, water harvesting, and control of water pollution by domestic wastewater, industry, and agriculture. Bribery forms in this water sector are related to the awarding of licenses (for example, for wastewater discharges), water use rights allocation (including groundwater), and the cover-up of environmental impacts of projects or industries (UNDP, 2011).

Among mentioned in the UNDP (2011) report on water sectors, corruption in the hydropower sector is presented as less investigated and reported. However, precisely this sector is related to large-scale contacts with high costs and international tendering. According to the report authors, in the hydropower sector, corruption forms might include extortion in the procurement procedures for design, construction, and maintenance work, bribery, nepotism in assigning water use licenses, misuse of resettlement and environmental mitigation funds, corruption in energy provision deals and other forms (Haas, 2008; UNDP, 2011).

Overall considering water corruption in different water sectors, academic scholarship mentions such forms of water corruption as bribes, collusion, embezzlement and theft, fraud, extortion, abuse of discretion, favoritism, nepotism, and clientelism (Calow, 2012; Gonzalez de Asis et al., 2009) For instance, in case of grand corruption, this might be the bribery for allowing informal groundwater extraction to foreign

companies and small payments to fake meter readings in case of petty corruption. According to academic sources analyzed in this review, widely spread in all four water sectors are such forms of corruption as favoritism, nepotism, and clientelism, for instance, when public officials or private actors use entrusted power to provide preferential treatment to their relatives, friends, clans, or members of one political party or due to other personal preferences; also, nepotism, in assigning water rights and irrigation; fraud, expressed, e.g., in the falsification of the documentation; embezzlement of government and foreign aid funds and assets (Davis, 2004; Stålgren, 2006; Visscher & Hermann-Friede, 2011; Suhardinam & Mollinga, 2017). It is essential to mention that grand corruption manifests in different forms and is difficult to capture and document due to the power monopoly and discretion power of officials or private managers in water sectors that operate with large amounts of financial resources and funds. The researchers also draw attention to such forms of grand or political corruption as the use of water provision by politicians for vote buying (Baillat, 2013, p.14). Thus, in water mafia politics, political actors manipulate access to water for their political games (Birkinshaw, 2018). However, favoring a particular clan, kinship, and other groups and affiliated companies might have long-term negative impacts, such as the rise of societal tensions, loss of trust in public institutions, and water conflicts in the future. Therefore, countries need to analyze the root causes of water corruption and ways to address them to minimize the risks of such negative scenario development.

### *3.2. Water corruption in Central Asia*

Although academic scholarship continuously mentions the chronic and pervasive character of corruption in the water sector in Central Asia (e.g., Iskakova, 2014; Baleha, 2020), finding academic literature that profoundly analyzes this problem is challenging. The sensitivity of the research topic could explain this fact. For instance, researchers Warner et al. (2009), while comparing water licensing systems in Kazakhstan and Chile, argue that one of the reasons for the deficiency of water corruption research in Kazakhstan is related to the lack of a “significant tradition of corruption research or anti-corruption activism linked to water in Kazakhstan.” (Warner et al., 2009, p. 7). The authors underline: “A local researcher may lose job opportunities by researching and publishing on corruption and may face the threat of lawsuits and physical violence.” (Ibid, 2009, p. 7).

Another problem is a deficiency in explaining data collection techniques and the methodologies applied in existing research. Therefore, academic sources lack evidence to support argumentation about the all-encompassing and chronic character of water corruption in Central Asia. For instance, in the World Bank paper “Irrigation in Central Asia,” authors Bucknell et al. (2003) only briefly touch on the problem of



corruption in the irrigation sector while pointing out that corruption in irrigation hinders the realization of the full economic potential of Central Asian countries.

It is noteworthy to mention that research papers published by the Water Integrity Network are specific and explicit regarding the methodology applied in research papers - for instance, the previously mentioned work by Warner et al. (2009), which compares two systems of water licensing: a market system in Chile and a state-focused one in Kazakhstan, is based on data collected through field visits, expert interviews, and surveys. The researchers argue that the potential corruption risks in water licensing exist because, in both Chile and Kazakhstan, the water licensing systems are `skewed towards the powerful` (Warner et al., 2009, p. 17). As the authors underlined, the situation with water pollution licensing is particularly worrying in Kazakhstan because of the absence of comprehensive and enforceable water quality legislation. Thus, if to measure water quality at the end of a channel that ten or fifteen industrial companies pollute, it is impossible to work out how much each company polluted. Therefore, the corruption risks of misreporting and malpractice are high due to the lack of monitoring and accountability (Warner et al., 2009).

A more detailed analysis of corruption in the water management sector in Kyrgyzstan captures the work of Isabekova et al. (2013), who compare two water projects realization from an anti-corruption perspective. Namely, the researchers assessed one project related to agricultural irrigation that involves Water User Associations (WUA`s), and the second one was a large-scale potable freshwater project - "Taza Suu," which did not involve WUA`s. The paper explicitly explains the research methodology based on literature reviews and in-depth expert interviews. The research results demonstrate that the project that involved WUA`s showed better outcomes than the Taza Suu project, where, according to authors: "tendering procedures were the locus of irregularities, fraud, and possibly corruption." (Isabekova et al., 2013, p.6). The authors conclude that from the anti-corruption perspective, the user`s engagement in the water management bodies can enhance accountability and reduce corruption risks.

In contrast, Mirzayev (2016) and Norov (2022), while analyzing Water Users Associations (WUAs) in the management of irrigation systems in Uzbekistan and Tajikistan, evaluate their work in terms of their technical, institutional, legal, and financial capacities as dissatisfactory. Mirzayev (2016) stresses that the work of WUAs in the irrigation system in Uzbekistan might be prone to corruption. The researcher emphasizes that one of the indicators of the successful work of WUAs serves their financial independence, which is ensured through a collection of payments for irrigation services (in Russian "плата за ирригационные услуги").

However, WUA`s show poor performance in collecting such payments because of two categories of users: those who do not want to make payments and those who cannot pay. The first category, argues Mirzayev, can be divided into two sub-groups: The first has corrupt ties with authorities and makes no payments. While the second category of water users observing such corrupt practices does not wish to pay, expressing their discontent with the unfair payment system (Mirzayev, 2016). Thus, as the author underlines, because of corrupt practices, the population does not trust the heads of WUA`s as they are unable to address both internal pressure, so-called telephone law - “solving of a problem through telephone calls of bigwigs” and external pressure from influential users “who steal water without punishment” (Mirzayev, 2016, p. 35).

In contrast, Norov (2022) does not mention corruption as a reason for WUA`s underperformance in Tajikistan but stresses that these institutions demonstrated their institutional, financial, and legal incompetence. According to Norov (2022), WUAs started to emerge in Tajikistan in the middle of the 2000s; currently, out of 400, about 150 WUAs do not properly function, and many stopped functioning as they could not adapt to the local context. Norov (2022) stresses that WUAs do not demonstrate any positive impact on better management of irrigation water provision or any positive impact in solving the water loss problem. Overall, both researchers, Mizayev (2016) and Norov (2022) see active public engagement and the appointment as the heads of WUAs of competent and honest individuals as a solution for improving WUAs work. However, the authors are not explicit about how to stimulate greater public control and address informal constraints such as patronage, nepotism, and other corrupt practices in WUA`s work.

Except for irrigation, the deficiency of research works capturing the corruption in such sectors as hydropower, water supply, and sanitation is also observable.

The researcher Junxia (2019) draws attention to the problem of corruption risks in the energy sector in Central Asian countries, which has become “a big concern for foreign investors” (Junxia, 2019). While Marat (2015), on the example of a few cases from Kyrgyzstan, analyzes how access to global financial institutions and the availability of offshore markets strengthens a corrupt regime`s grip. The researcher underlines that offshore connections contributed to the emergence of a vast shadow economy inside Kyrgyzstan, including “clandestine hydropower exports” (Marat, 2015, p. 46).

Researchers Zhao et al. (2020) while exploring the sustainability performance of the Rogun Hydropower Plant (HPP) in Tajikistan, which is planned to be the highest in the world and, when completed, will become the largest hydropower plant in Central Asia, underline that corruption is one of the serious problems which might collapse the engineering quality of this expensive project due to procurement of low-quality materials, and other practices. The researchers underline that no



effective anti-corruption measures have been undertaken so far. The scholars argue that: “the high rate of corruption in Tajikistan is an important reason for the lack of anti-corruption measures in the Rogun HPP and the lack of transparency in financial information” (Zhao et al., 2020, p. 15). To address the problem of corruption and other risks, the authors suggest a checklist of sustainable hydropower assessment, which among many other indicators should include the assessment of financial viability and corruption risks. Namely, such risk assessment should consider whether there are policies to mitigate corruption risks and whether procurement procedures are transparent and accountable (Zhao et al., 2020). It is essential to mention that Zhao et al. (2020) research not only states the problem of corruption in hydropower in Tajikistan but also suggests ways to address these corruption risks by introducing a sustainability assessment checklist, which Central Asian countries can apply to evaluate the sustainability of hydropower projects before their implementation. The researcher Sojamo (2008) also draws attention to corruption in the water sector, characterizing it as a severe problem in the Central Asian region. The author stresses that educating a new generation of officials is essential to reduce corruption risks. Also, the funding should be more carefully coordinated in the Aral Sea basin (Sojamo, 2008, p.85).

Water corruption in the region, particularly multi-sectoral corruption in the hydropower, irrigation, water management and water supply, still needs to be investigated by Central Asian and international scholars. Overall, captured by the academic scholarship problems such as corruption in water licensing systems, hydropower plant construction, and maintenance, as well as nepotism, favoritism, and bribery in the work of Water User Associations in irrigation systems management and other research topics, provide great potential for further in-depth elaboration and academic discussion in terms of diagnosis of different forms of water corruption in Central Asia and ways to address it. The limitation of this research is that a rapid review presents only a quick overview of the current state of research on water corruption. However, in-depth analysis of each topic raised by researchers requires the application of different sets of research methods, for instance, expert interviews, surveys, a systematic review, critical discourse analysis comparing state, media and academic discourse on water corruption in the region, and other research methods as well as group work of local and international researchers as ‘the relative risk researching on water corruption for an external researcher is smaller’ than of a local researcher (Warner et al., 2009, p.7). Therefore, international academic cooperation is essential to analyze such sensitive topics as water corruption in the region.



#### 4. Discussion & Concluding remarks

The multifaceted nature and complexity of interactions between different actors (public and private entities and consumers) in environments lacking transparency, civic control, and accountability might lead to power and information asymmetries and water corruption exposure in Central Asia. However, this problem rarely appears on the current academic agenda.

The rapid review results demonstrate that the academic literature explains the deficiency of water corruption studies worldwide and in the Central Asian region by the topic sensitivity and difficulties in data collection that could put a researcher and, to a greater extent, his or her informants at risk (Rinaudo, 2002, p. 406; Warner et al., 2009). In particular, it is problematic to keep the confidentiality of respondents' identities in rural areas in the case of the application survey or interview methods (Rinaudo, 2002)

It is noteworthy to mention that researchers worldwide are trying to find new alternative ways of data collection, from physical examination and documentation of the water infrastructure, studying social and economic data collected by national and international organizations and think tanks, application of experimental studies (e.g., the simulation of corruption decisions) and other research methods.

A rapid review results show that the current state of the art on water corruption in Central Asia is rather fragmented and lacks the analysis of its root causes, typologies, and forms. Taking into consideration the deficiency of primary and secondary data (for instance, statistics on water corruption cases) in Central Asia, the analysis of media could serve as an alternative source for obtaining information about the corruption cases frequency and scope in each particular water sector. For instance, in contrast to academic sources, media extensively covers the problem of corruption in irrigation, water resources management, water supply, sanitation, and hydropower in Central Asian countries (e.g., Mirsaidov, 2009; Mirsaidov, 2010; Tukmenportal, 2018; Biyatov, 2020; Gazeta. Uz, 2021; Chronicles of Turkmenistan, 2022; Kabar.Kg, 2023).

Considering the lack of academic sources as a prospect for future academic research, the author recommends conducting media discourse and content analysis to understand how water corruption in Central Asian countries is presented and framed in local and international media discourse. A comparison of academic and media discourse might help identify the research and policy gaps in water corruption in Central Asia. For instance, it is possible to conduct research on “Media Discourse Analysis of Water Corruption in Central Asia.”



As a policy recommendation, it is possible to suggest developing with interested parties a *Sectoral Corruption Assessment Framework for Central Asia* with the engagement of expert community from Central Asia and abroad to analyze the problem of sectoral corruption (e.g., water and land corruption) and ways to enhance anti-corruption laws and policies in these fields. It is anticipated that the joint elaboration of indicators for the *Sectoral Corruption Assessment Framework for Central Asia* might stimulate rather absent at the moment academic discussions on sectoral corruption in the region and ways to address it.

International organizations and academic scholarship as primary policy recommendations suggest that Central Asian countries should enhance accountability in water governance. It is essential to mention that strengthening accountability is a lengthy and complex process, which will require confronting informal constraints (for instance, closed network systems based on kinship, clan, or other connections). Thus, addressing water corruption requires in-depth studies of formal and informal institutions, like laws and regulations, organizational culture in water governance institutions, behavioral patterns, social norms, and informal practices in the region. For instance, the exploration of the research by Pasquino & Pelizzo (2022) studying the relationship between accountability and political culture, namely the influence of social patterns, cultural norms, and values (such as familism, civicness, post-material values on accountability) might bring new ideas and perspectives in the understanding the culture of accountability and ways to foster it (for example, in natural resources governance in Central Asia).

The limitation of this work is that it does not cover academic works written in local Central Asian languages. Therefore, this review needs to be complemented by a systematic study on water corruption in the region with joint teamwork of local Central Asian and international scholars in the future for a more profound analysis of this problem.

Despite possible skepticism on every possibility even to discuss such sensitive topics as water corruption in the region, Central Asian countries need to unite their efforts and enhance academic cooperation to start profoundly analyzing the problem of water corruption that hinders the progress of all Central Asian countries towards Sustainable Development Goals.

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