

The role of the private sector in sustainable water management in Kazakhstan

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Abstract

The social and environmental impacts associated with corporate water use and discharge in Kazakhstan is historically high, and in certain watershed pose a significant threat to the health of the local communities and ecosystems. Today the industries are consuming almost a third of freshwater and remain one of the biggest polluters in the country. The situation is aggravated with the changing climatic conditions, economic and population growth. Thus, the possibilities to enhance the environmental responsibility of the private sector are appeared to be essential to achieve sustainable water management. Yet, it is not known, to which extent the private sector is involved in this process. Based on the identified gap in knowledge, this research focused on two goals, formulated as: 1) Define the level of engagement of the private sector in Kazakhstan in sustainable water management; 2) Document the driving forces and barriers that determined the current level of business engagement in the country. Research questions were built to correspond to the overarching research goal and were approached through the five case studies on the ‘water role’ of the private companies from fuel, mining and chemical industries in different regions of Kazakhstan; but also through a range of expert interviews and a literature review on relevant topics. The inductive research design also included the analysis of the collected data through the ‘codes’ or ‘parameters’ that reflect different aspects of the notion of sustainable water management: operations, watershed improvements; stakeholders; local community; water policy; and transparency. The qualitative analysis of collected data revealed the following main findings: the case study companies are to a larger extent involved in the activities imposed by the regulation, while less intensively employ the voluntary water stewardship mechanisms. Thus, the engagement at the operational level is limited by the intentions to comply with the regulation. While the ongoing changes in regulation are often perceived by the companies as a serious obstacle to including water issues in long-term strategies. A ‘somewhat weak’ involvement is a common characteristic, which can be applied to most of the other parameters. The variations in case studies were explained by different disclosure strategies, the physical scope of the impact and the need to interact with affected stakeholders; and level of international involvement (shareholders and listing on international exchanges stocks).

Keywords: sustainable water management; corporate water stewardship; engagement of private sector; CSR

Executive Summary

Water as a finite and vulnerable resource is under growing pressure caused by increasing global consumption. The estimations show that half of the world's population and half of the GDP will be at risk by 2050 because of the water scarcity. The gap between water availability and demands will need the global productivity improvements of about \$60 billion annually over the next two decades (Boccaletti et al., 2009). The private sector is one of the main water user and polluter globally. The water threats aggravated by the implications of climate change on the hydrologic cycle have brought water to the forefront as a strategic concern for companies around the world. However, the perception of the possibilities for the private sector to contribute to sustainable water management vary in different countries. In recent years, the dialogue of private sector, government and society around water-related issues in western countries, for instance, has vastly moved to the recognition of water challenges as shared risks that faced by companies themselves, but also by the communities and ecosystems in which they operate (CEO Water Mandate website). A few studies on this topic in Kazakhstan outlined the lack of understanding of the current and possible role of the firms in sustainable development. The other group of authors identifies the significant water impact from the industries to the health of the affected local residents and ecosystems. In a transition period for the economy starting from the 1990s, the efforts of the emerging private entities were focused on surviving in the newly established market conditions, maximising of the revenues and accumulation of capital. Some of the companies continue to function in a similar regime today. Meanwhile, the environmental regulation is poorly enforcing the companies to include the sustainability issues in their focus. The low environmental standards are often kept behind the international norms in favour of the friendly financial conditions for businesses in extraction-based transition economies. Some studies claim that the trend is changing and today private sector actors are becoming more concerned with environmental protection and water management often applying some best practices and policies from their origin countries. However, the situation in Kazakhstan is not described in the academic researches. There is no synthesis study defining the role of the private sector in sustainable water management today. In relation to this, a need to better understand driving and limiting forces behind sustainable water management among firms in Kazakhstan was identified. The answers to these questions appear to be especially important in relation to the state programmes proclaiming the greener direction of the economic development in Kazakhstan (Green Economy concept, Strategy 2050). Based on that, the research is focusing on two main goals:

- 1) Define the level of engagement of the private sector in Kazakhstan in sustainable water management;
- 2) Document the driving forces and barriers that determined the current level of water engagement of business in Kazakhstan.

More precisely, the study aimed to define the role of business in sustainable water management, which includes different aspects of this notion within the company's operations and beyond. In order to approach the stipulated research goals, five case studies in Kazakhstan were selected based on their type of operation and scope of the water impact, and geographical diversity within the country. The study also carried out a thorough literature review in the field of corporate water stewardship worldwide, sustainable water initiatives in Kazakhstan, and general water management within the industries in the country in order to address the research goals. The collected data was further analysed through the developed 'coding', which included the various parameters for the analysis reflecting the respective aspects of sustainable water management, these are company's operations; watershed engagement; stakeholders; water policy; local community; and transparency. Using the

described methodology for addressing the research goals, the following main findings were revealed and described in the paragraphs below:

The water impact from the operations mainly relates to the pollution from the wastewater discharges, rather than depleting water sources. The study did not reveal the improvements at the production sites that go beyond the required by regulation norms. Despite some of the companies in Kazakhstan already started to employ the recognised international practices in water management, the overall level of engagement with the best available techniques is low. This is explained by the voluntary character of most of the mechanisms and tools. Moreover, the government does not exercise sufficient encouraging measures in relation to business' involvement. A few of the registered barriers lay in the regulative dimension. They include the constantly changing rules and norms, lack of the explanation to the imposed from the state mechanisms, which are designated in water, environmental, subsoil codes, but not explained in details further. This, in its turn, causes another barrier related to inconsistency in the interpretation of the water policy and regulation by the authorities of different levels and sectors.

Despite the contamination of the water bodies in the basins takes a place, the engagement of the companies with the watershed level improvements beyond the operational level is very weak. There are some observed examples of participation in the basin management and planning through such instruments as basin agreements and basin councils. The findings reveal that the existing basin level initiatives of the companies were partially forced by the local environmental activists and NGOs. This is an emerging driving force enhancing environmental responsibility of business. However, due to the abovementioned lack of written procedures explaining the possibilities of these and other instruments for business, the overall engagement in watershed level projects remains low. The study yielded a lack of cooperation on water issues with other parties in the basin, which also can be applied to the supply chain. The main interactions of business on a water-related project executed with the public authorities. The role of public authorities in the CSR was also assessed as very high. This generally determines the interactions of the companies with local communities, which are to a large extent scoped by the local authorities. Another constraining factor for sustainable water engagement related to the local communities is the lack of representation of the local residents in both the governing board and the top management. The level of international connections and obligations according to the study can drive the disclosure policy of a firm and impose better transparency on water impact. The water governance is reflecting in a smaller scale the overall governance system in the country, which is highly hierarchical and lacks the capabilities to execute more autonomous and flexible water policy that could better address the local problems. Meanwhile, the support and consistent efforts from the local public authorities are no less important as the encouraging measures from the government. This implies the readiness to cooperate on watershed improvements and commitment of the local authorities to remediate the water impact from the industries.

With respect to the overarching aim of the research, the study was able to address both research subquestions. The lack of readiness of the companies to participate in the survey was the main limitation, which restricted access to the primary data. Thus, the alternative approach was taken to collect the data through the examination of the documentation of the selected companies. Yet, the collected data was sufficient to formulate the answers for the research questions. The study has contributed to the promoting of better environmental corporate responsibility in Kazakhstan. The research carried out the first step towards better engagement through defining the role of the private sector and the main factors explaining the current state.

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Abbreviations

AGMP - Association of Mining and Metallurgical Enterprises
BAT - Best Available Techniques
CDP - Carbon Disclosure Project
CSR - Corporate Social Responsibility
EITI - Extractive Industries Transparency Initiative
EMS - Environmental Management System
EUWI FWG - European Union Water Initiative Finance Working Group
FAO - Food and Agriculture Organisation
GEMI – Global Environmental Management Initiative
GWP - Global Water Partnership
HSE - Health, Safety and Environment
IBRD - International Bank for Reconstruction and Development
ISO - International Organization for Standardisation
IWRM - Integrated Water Resources Management
LBMA - London Bullion Market Association
LLP - Limited Liability Partnership
NGO - Non Governmental Organisation
OECD - Organisation for Economic Cooperation and Development
PPP - Public Private Partnership
SDG - Sustainable Development Goals
SEA - Strategic Environmental Assessment
SSU - Subsoil and Subsoil Use
UN - United Nations
UNECE - United Nations Economic Commission for Europe

1 Introduction

After Rio 1992 water was recognised as a finite and vulnerable for many regions resource (Salman and Bradlow, 2006). The water stress caused by the growing world population and economy over the past 25 years (UN Water and Sanitation, 2018) is also escalated by the local consequences of global climate change. Experts estimated that if the degradation of the ecosystems is continued and the pressure on the clean water resources is not decreased, "45 per cent of the global gross domestic product, 52 per cent of the world's population (...) will be put at risk by 2050" (UN Water and Sanitation, 2018). By recognising Agenda 2030, UN member countries took responsibility to undertake actions on the national level to "ensure availability and sustainable management of water and sanitation for all" (SDG 6). The goal 6 aims to include all water-related problems covering access to water and sanitation, operational efficiency, problems of transboundary sharing, ecosystems' needs, cooperation of stakeholders and allocation, and the overall water management system. This indicates that many actors and agendas are involved in a well-functioning process of water management, thus a coordinating structure or framework is required (Salman and Bradlow, 2006). At a broader conceptual level, the model of coordinated inter-sectoral and multi-level water resources management Integrated Water Resource Management (IWRM) has been put forward as a sustainable approach from the early 1990s onward by international organizations such as the Global Water Partnership (Scott, Kurian & Wescoat, 2015; GWP, 2000; Biswas, 2004). It is based on the hydrographic principle (managing by boundaries of the watershed) in contrast to prevailing in past administrative principle (by state, regions, administrative districts boundaries) (GWP 2000). The administrative approach was broadly criticised due to the fact that water is an integral part of the ecosystem, and thus should be managed along its natural boundaries rather than human-created ones. In this context, IWRM has an advantage over other traditional sector-by-sector, top-down management systems that have dominated the past. The IWRM is not a short time approach or static management system. "The art of IWRM lies in selecting, adjusting, and applying the right mix of tools for a given situation" (GWP Website, 2017). One of the main principles of IWRM, which is also a key assumption for this research, is recognition of the benefits of a participatory approach for stakeholders involved in basin planning and management, and also for water ecosystems. Thereby, this research will focus on the principle of multisector and multilevel cooperation underlying sustainable water management. This principle complemented with the theories of stakeholder participation, corporate social responsibilities will help to define the role of the private sector in sustainable water management.

A working water management system requires a strong institutional framework, participatory and transparent governance, an inter-sectoral approach to decision making, tools for effectively managing water resources as well as the financing (GWP website, 2017). The costs of water management include both so-called 'soft' and 'hard' categories. The first category implies governance, administrative costs, the involvement of all stakeholders, joint planning, monitoring, education, and awareness raising. The 'hard' component relates to water infrastructure, operation, and maintenance, water allocation, flood management, etc. (OECD, 2010). Both categories are paid from the three main sources: the national subsidies (revenue from selling natural resources, taxes), fees and permits, and transfers (external aid, philanthropy) (GWP website, 2017), though the 'soft' projects are more willingly supported by the international organisations.

Basin organisations existing in different forms (council, commission, inspection, etc) are primarily responsible for managing and planning at the basin level, but also should facilitate the engagement of all interested parties in this process, including business. To a large extent due to the support of international development agencies, the basin organisations were

established in most of the biggest shared basins around the world and in many internal ones (Hooper and Lloyd, 2011). However, the state water programmes and basin plans in most of the developing countries are not implemented due to the lack of institutional and human capacities and financial resources (UN IWRM, 2018).

1.1. Background

Sustainable water management for a company: a burden or an opportunity?

As the matter of fact, all private firms of small or large size use water in the operations to produce their goods and services. However, water resources could be included in the materiality of industrial sectors with a higher probability compared to, for instance, the financial sector. In the recent decade, the decrease of water availability, lack of access to water drinking and sanitation, degraded ecosystem function, and the “implications of climate change on the hydrologic cycle have brought water to the forefront as a strategic concern for companies around the world” (Morrison, Schutle & Schenck, 2010). There are many opportunities for the private sector to contribute to sustainable water management. It starts with the improvements of the water operations and investing in new technologies to reduce water intake as well as the produced pollution. But also, business, being one of the most powerful actors in terms of resources can support the improvements in both the livelihood of the local population and watershed functioning. In recent years, the corporate dialogue around water-related risks and possibilities has noticeably shifted into “discussions about managing the shared water challenges faced by companies themselves, as well as the communities and ecosystems in which they operate” (Morrison et al., 2014). Early efforts focused almost exclusively on improving operational efficiencies within factories or on farms, but an understanding of the nature of water-related risk has matured, stewardship activities have moved far beyond a company’s boundaries to address issues such as water scarcity, pollution, water access, inadequate governance, and other concerns in the basins in which companies operate. The estimations show that annual water-related funding in all its aspects has to be doubled to about \$180 billion over the following two decades (GWP, 2000) in order to meet the demands of the current and growing population. The uncertain consequences of climate change will most likely increase the associated costs of water management. As stated by the UN Environment report on the progress of IWRM (2018) half of all countries report (51%) the insufficient or missing national budgets for recurring costs of IWRM activities. A large number of international organisations, as well as the aid flow from the North to South countries, support national budgets on sustainable water management in most of the developing countries. However, the donor’s projects are a too risky source of permanent funding. According to the EU study, the main source of finance for recurrent costs [meaning hard category of costs - operation and maintenance] in the long term is likely to be user payments” (EUWI FWG, 2007). Business is an essential water user and partner in sustainable water management and governance. At the global level, only the industrial sector accounts for 19 % of water withdrawal (FAO website).

Integrated and participatory water management and planning brings both public and private benefits in terms of valuable goods and services, but also the elimination of the costs associated with water-related risks (Salman and Bradlow, 2006). Some of such benefits are difficult to monetise. The private sector is not always eager to participate in water management beyond the operational issues, underestimating or not being aware of the potential cost reductions behind water sustainability. According to estimations the share of public sources for water investments in developing countries accounts for 75% from total funds (Rodriguez et al., 2012). Moreover, in integrated approaches, the water expenses overlap with environmental, social, sometimes economic issues and other indirect costs. Thus there

are more possibilities to optimise water costs within a basin by coordinating and planning different water-related activities with the participation of all water users including business. As such, it appears that the role of the private sector can become crucial in sustainable water management. From the business perspective, “it is difficult to mitigate water-related business risks if they only look internally; many risks stem from external factors, such as local environmental conditions and public water policy and management” (CEO Water Mandate, 2011).

According to Boccaletti et al. (2009), the gap between water availability and demands requires large productivity improvements globally, which could approximately cost \$50 billion to \$60 billion annually over the next two decades. The study concludes that governments will be able to cover only half of these expenses, while the business will account for the rest. However, the perceived burden of these investments can yield positive returns in both short and long term perspectives. First of all, it is important to define, how business can be involved in general. The preliminary studies to this research (ARPEA paper) based on the publications of Global Water Partnership (GWP) and Organisation for Economic Cooperation and Development (OECD) allowed formulating the following types of engagement:

- 1) Improving the operations: adjusting to the national standards, applying international reporting standards (like GRI), benchmarking.
- 2) Financing improvements of the watershed, including local communities and functioning of the local ecosystems, supporting national and external projects.
- 3) Investing in water projects, focusing on profits and creating additional social and environmental value.
- 4) Non-financial participation: sharing the expertise and knowledge, making the watershed management process more transparent and accountable by participating in the collective actions (like basin council’s meetings or other basin platforms).

There is a growing number of companies globally, which realising these benefits try to apply the best water stewardship practices. In many cases, “such engagement helps the companies to overcome complex water risks with interrelated social, environmental, and economic dimensions” (CEO Water Mandate, 2011). The concept of shared responsibility and benefits is based on the hypothesis that risk to businesses is best to be addressed through joint efforts with society and governments that helps to reach common understanding, approaches, and solutions. The global context must be transposed down to the needs of individual regions and countries. Kazakhstan is one of such countries that face water management challenges and at the same time is expected to significant exposure to the impacts of climate change. The country sets multiple goals in national water and development programmes to reach water security in the next few decades. Kazakhstan is also the 9th largest country in the world by territory. The water challenges, therefore, should be addressed by collective actions in each basin of the country, which all vary significantly by geographical, climatic and often economic conditions.

How water is managed in Kazakhstan?

The IWRM was recognised in the country as the most sustainable approach and embedded into the national water sector in 2003 with a new Water Code and updated accordingly regulatory framework (Petrakov and Kenshimov, 2012). The country is divided into 8 watersheds, which spread across 2.7 million km³ and should be managed on the basis of

IWRM principles. In reality, decades of “budget and staffing cuts have had dramatic effects on the authorities’ ability to manage water” (GWP, 2010). The reforming of the water sector initiated at the high political level and followed the political commitments of the country. However, its practical implementation at the organisational, institutional and cultural level has not yet been achieved.

The newly established ‘basin councils’ with the aim to ensure the participatory approach in each basin, in fact, operate constantly only in a few basins. The meetings of the council are served as a platform for different water users to learn about the changes in regulation or to include some problems into the list of recommendations, which are further forward to the respective state executive agencies. These executive agencies are the regional authorities (akimats), basin inspections and the Committee for Water Resources. Though the water governance structure was changed several times over the last decades, the management approaches and respective entrenched habits inherited from the Soviet and transition periods can still be observed in the governance system. These organisations are primarily responsible for the implementation of the national water programmes. The targets of these documents are often inconsistent and overambitious. For instance, the targets on the water supply of the last programme (100%) were recognised unachievable later and replaced with more justified targets in the later regions’ development programme, which also more realistically distinguished rural (62%) and urban (97%) water supply goals.

The government sets the overall goal to ensure the sustainable water supply for Kazakhstan’s population in all basins by 2020, for agriculture by 2040, and to completely close the water gap by 2050 (Green Economy Concept, 2013). Meanwhile, it was also mentioned that ambitious economic goals of the country (like Strategy 2050) should not be achieved at the expense of the stability of ecosystems and preservation of unique natural resources of Kazakhstan (Green Economy Concept, 2013).

Despite the expression of lofty goals by the government, their achievement is threatened by a range of internal and external challenges for the water sector. According to the estimates, runoff in surface water streams in Kazakhstan will decrease by 11.4 km³ by 2040 (the current annual surface water runoff is 101 km³) if the current adverse climatic and hydrological trends remain the same (Agricultural Strategy, 2016). Water deficit is a very probable perspective for some of the basins, like Nura Sarysus, Esil, Tobol Torgai. The other basins due to the various climatic and geographic conditions of the huge territory have to face the issues of transboundary water sharing, pollution from agricultural and industrial wastewater and other environmental and socio-economic problems. Meanwhile, the growth of the total water consumption in the country will continue, and by 2040, water abstraction is expected to be in the amount of 1.28 km³ (in 2012 this amount was 0.84 km³) (General Complex Water Use Scheme, 2016).

Water use efficiency in agriculture, industry and municipal uses remains very low. Industries is one of the most significant and largest consumers of water in the republic. The problem of water availability decrease is accompanied by the extensive contamination of surface and groundwater. High volumes of water consumption and discharges into natural water bodies are happening due to inefficient and often outdated technological processes and water management systems in production. Of the total volume of wastewater discharges registered in the wastewater system, 11% were released from the housing and utility sector, 89% from industry (General Complex Water Use Scheme, 2016). There are no statistics on the unregistered untreated wastewater discharges. Pollution from heavy industry and agriculture, have resulted in land and water resource degradation, including biodiversity loss, hindering development in many areas of the country (ADB, 2016). In fact, the ecological status of 50–

70% of surface water resources in Kazakhstan has been rated “polluted” and “highly polluted” (Karatajev et al., 2017; ICSD, 2016). Sewage and industrial waste are dumped directly into rivers; only 7% of wastewater is fully treated prior to being returned to waterways (Karatajev et al., 2017). Such numbers affect the health of the local population. The percentages of people suffering from poor water quality diseases are much higher in Kazakhstan (1.5%) compare to other developed countries (for instance, UK 0.1%) (WHO, 2017).

Kazakhstan’s environmental laws are often poorly enforced and companies in the past have often been more focused on increasing profits rather than sustainable development (GBR, 2015). The low environmental standards are still kept behind the international norms in favour of the friendly financial conditions for business, particularly when one views water extraction. Some studies claim that the trend is changing and today private sector actors, especially those with foreign shareholders, are becoming more concerned with environmental protection and water management often applying some best practices and policies from their origin countries (GBR, 2015). However, other experts argue that the basin agreements on improvements of water performance with mining companies are not implemented (Kenshimov, 2016), while the new version of the Ecological Code has even lower standards for business (Interviewee 2, 14 February 2019).

1.2. Problem definition

Overall, although the presence and contribution of the industries are inevitable in Kazakhstan, it is blamed for not contributing enough to society (Mahmood and Orazalin, 2017). Major water users, undoubtedly, make some progress to adjust to water standards and the legislation of the country. Yet, it is not known, to which extent they are involved in the process. The preliminary literature review in English and Russian did not yield any synthesis study on the role of the private sector in sustainable water management in Kazakhstan. The reasons for a business to be involved/not involved are also not described in the literature. The study of OECD (2016) explores the opportunities for private water supply companies to compete/cooperate with public utilities in water provision and sanitation services. This report provides a detailed analysis of sustainable business models, however, is scoped by the water supply and sewage sector and rural areas. The study of Mahmood and Orazalin (2017) investigates the state of art with sustainability reporting of the extraction sector in Kazakhstan, including social and environmental aspects. This study of more general character inspired the methodology of current research, however, it does not answer the research questions formulated below. Another report by Shibusov (2017), prepared for Switzerland Global Enterprise, provides a general overview of the current water management systems and existing contradictions between major water users, including industry. The study also mentions the opportunities for business in the construction of hydraulic engineering structures and water supply systems.

However, none of the sources provide the overall conclusions on the level of engagement of the private sectors. There is also no general study to consist of the map of the factors driving and constraining this process in the country. The research aims to fill the knowledge gap by analysing the level of engagement of the major private entities in the country, which include the water resources in their materiality, with current water management process in Kazakhstan, as well as to provide the insight on the opportunities from better involvement and conjugate the constraints. The goal of the study is also justified from a practical perspective due to the growing need to address the challenges of water management and pollution in Kazakhstan.

1.3. Research goal and objectives

The overarching research question can be formulated as: What is the role of the private sector in sustainable water management in Kazakhstan at the present time? In order to approach this question, two research subquestions were identified:

- Research Question 1: What is the level of engagement of the private sector with different aspects of sustainable water management in Kazakhstan?
- Research Question 2: What drives and constraints current business engagement?

The main goal of the research is to define the present role of business in sustainable water management in Kazakhstan. The underlying assumption of the research is based on the internationally recognised approaches to corporate water stewardship as the UN Global Compact. It can be formulated as follow: participation of the private sector in water management is an essential element for the sustainability of the process, which brings a positive effect to business and presumably yields positive externalities to the watershed and local population. The knowledge gap was identified on the current level of participation in Kazakhstan. Thus, the goal of this research is to fulfill this gap and make the first step towards the enhancement of the corporate water stewardship by describing the current state of the art for business, public sector, and other stakeholders.

The philosophical goal of the research is to promote the sustainability agenda in the described context for the audience and draw the objective reasons of the current state of affairs, but also to enhance public demand for more responsible behavior of private sector as a response to the current level of engagement.

Research objectives:

- Define the level of engagement of the private sector in Kazakhstan in sustainable water management
- Document the driving forces and barriers that determined the current level of business engagement in Kazakhstan.

1.4 Scope and Limitations

The scope of this research was limited to the defining of the current role of the private sector in sustainable water management. The research did not aim to analyse the potential role. The choice of case study objects was based on the following criteria: the presence of water in the materiality of the company; geographical dispersion in different regions of Kazakhstan; representation of the main economic sectors that contribute to GDP; availability of data; private ownership. For the purpose of this research, the author initially has chosen to conduct an online survey to collect the primary data from the private entities. The preliminary assessment of all the companies from the KASE (Kazakhstan national stock exchange) was done in order to select the sample of the object for participation in the survey. There were no responses received from the selected companies, thus, the alternative research methodology was applied to approach the research gap. The main limitation of the research is the lack of primary data from the interviews with representatives of the case study objects. The emails with a detailed and clear description of the goals of the research were sent out. However, the lack of responsiveness was also indicative in terms of the main question of the research and characterised the overall unwillingness to participate in any initiatives/project aimed to light

up the impact of the companies on the environment.

The focus of this research is made on the role of private entities in sustainable water management. However, it is important to understand that the share of state-owned industries and their respective water impact is not less or even more significant. Thus, there is a large potential to continue the research in this direction.

1.5. Ethical considerations

This research was conducted with no external funding involved. For reasons to respect the integrity of the interviewees, at the very start of each interview, the interviewee's consent for the citation was requested. Confidentiality was also addressed by consulting interviewees on whether the use of their name and their answers provided during interviews were accepted. A draft of the final version of this document will be sent to all the involved interviewees prior to the publication in order to receive their consent on the content presented in this research in relation to their respective input. In case there are comments to the text, these will be taken into consideration and adjusted for before publication.

1.6 Audience

This paper is written for the fulfillment of the Master of Science in Environmental Sciences, Policy & Management (MESPOM) jointly operated by Lund University (Sweden), University of the Aegean (Greece), Central European University (Hungary). The audience, for whom the findings of this study could be of value for, include (but is not restricted to) corporate specialists and academics. The audience with respect to practitioners is corporate sustainability experts or operational managers in Kazakhstan and other countries with similar socio-political context. The content of this report could be also interesting for the representatives of the public sector seeking for analysis of the current status of business engagement and recommendations to improve it. The practitioners from both the private and public sector could benefit from getting greater insight into the underlying factors for the weak level of engagement identified by the study. The study could also be of interest for international organisations working in Central Asia region on sustainability projects.

Academics, on the other hand, could find in the research the missing synthesis study on the overall role of the private entities in sustainable water management. They would also gain a greater understanding of the constraining factors and the leverages, to which the companies are exposed.

1.7 Disposition

The first Chapter introduces the background of the problem raised in the research. This is followed by a more specific definition of different aspects of the problem: global water threats; the notion of sustainable water management; business' perceptions. In the next section, the research questions are presented, through which the overarching goal of this research will be achieved. This is followed by research limitations, the potential audience, and the outline.

Chapter 2 presents a literature review, which outlines the current state of the art in the research area. The literature review includes an overview of corporate water responsibility and global initiatives promoting better engagement; the water impact from the industries in the country; the perception of SCR by local stakeholders; and drivers and barrier for greater involvement in sustainable water management.

In Chapter 3, the methodological approach for the research is described, as well as research design, theoretical framework, and methodology for data collection and analysis.

Chapter 4 introduces the main findings from the examined case study objects, in relation to

the different research questions. These findings are also validated from the expert interviews. Chapter 5 provides to the readers the analysis of the respective findings. The answers to the research questions are formulated based on the analysis, discussion, and comparison of the findings.

Chapter 6 presents the overall conclusions of the research, gives some insights on further enquiries on the topic and formulate some general recommendations based on the findings of the research.

2 Literature Review

The following chapter outlines the state of the art in a corporate water stewardship starting from global initiatives downwards the local context in Kazakhstan. The general water impact from industries is described and, further, the possibilities of application of water and environmental responsibility tools and frameworks in the country are explored in a literature.

2.1 Corporate water stewardship: theory and global application

There are many definitions of sustainable water management provided by both academic literature and respective international development organisations. This can be explained primarily by the multiple interpretations of the term “sustainability”, which is defined differently by various groups depending on their interests. Wescoat (2015), for example, in addition to traditional environmental, economic and social components of the term consider psychological, behavioural and cultural aspects of sustainable water management. The more general understanding of sustainable water management typically includes human water demands and ecosystem requirements within this process (Richter et al., 2003). Richter’s et al. (2003) framework for ecologically sustainable water management consists of six-step approach including problem definition, search for solutions and adaptive management stages. This cycle is consistent with the IWRM process stages. The working definition for this research combines the definition of IWRM provided by GWP and UN SDG 6: *sustainable water management* is “a process, which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”; but also aiming to improve access to safe drinking water, improve water quality, increase water-use efficiency, capacity-building and involve local communities in water management issues (UN SDG website; GWP website).

Business, particularly extractive industries, often have a tight relationship with water. The water impact of the industries is discussed further in section 2.2.1. Generally speaking, the industrial operations need water as production input for such stages as mineral processing, cooling of equipment, metal recovery and control of dust and cleaning, water is also used in energy production systems. Thus, the impact from the industries should be considered in two dimensions: from the perspective of the depletion of the resource in the basin and in regard to the pollution of water resources. Both affect other businesses and water users, and local communities. The concerns about this impact were reflected in emerging international initiatives aiming to question the sustainability of water use and management by the firms.

CEO Water Mandate is one of the most prominent global initiatives that appeared as the result of cooperation between the United Nations Global Compact, the Government of Sweden, a group of committed companies and specialised organisations dealing with the problems of water scarcity and sanitation (CEO Water Mandate, 2011). The initiative was created with the aim to support the private sector with the methodological and practical information and solutions for more sustainable performance. It combines the efforts of a variety of stakeholders from different sectors. The initiative strives for engaging the firms from around the world to apply the best practices addressing the emerging water crises and reducing the overall water impact from the companies. Although, it is also a voluntary tool, it indicates the commitment to positive changes. The structure of the Initiative covers six main areas, which represent the components of sustainability and served as the basis for the analysis framework of current research. They are Direct Operations; Supply Chain and Watershed Management; Collective Action; Public Policy; Community Engagement; and Transparency.

The Global Reporting Initiative is another recognised tool for the companies to harmonise their performance with the indicators developed by the international independent organisation with its network of experts. The water metrics are collected in a guideline called GRI 303: Water and Effluents of 2018, which is available online and also regularly updated. The water-related reporting framework includes several core issues, which companies are required to cover. They are: “total water withdrawal by source; water sources significantly affected by withdrawal of water; percentage and total volume of water recycled and reused; total water discharge by quality and destination; identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organisation’s discharge of water and runoff” (GRI Water, 2018). Critics of the GRI point to the shortcomings of the framework, which they claim demands that companies switch attention to the reporting system to the detriment of operations. Morrison et al. (2010) specify the disadvantages of GRI, which they claim are useful to a certain extent, but still rather limited in the nature and scope of the information they provide. Such specific of the locality and respective specific risks cannot be taken into account by the general framework. Moreover, according to the view of the authors, the overall volume of water used by the company should be considered in the context of the water availability and predictions in the watershed (Morrison et al., 2010). Pegram, Orr, & Williams (2009) claim that such notions as “availability, management and impacts” of water should be examined at the local or river basin level. The authors highlight the importance of the location and associated exposure to water stress to business risk strategy. Hence, the most effective approach described in a study by Pegram et al. (2009), would be the establishment of the management system addressing the local situation in contrast to the global management and markets around carbon, for example.

Another initiative, which places most weight on transparency, is a Carbon Disclosure Project (CDP). Initially, it was oriented on the greenhouse gases and carbon emissions, but later embraced the overall environmental impact of the companies. This is an organisation, which collects the climate and water-related, as well as forest and supply chain information from the companies around the world (CDP website). Further, the organisation transforms received data into the detailed analysis on critical environmental risks, opportunities, and impacts and hand it to the interested parties, including policymakers, business, investors and the public in general. There is a growing number of transparency initiatives. In the CEO Water Disclosure Guideline, Morrison et al. (2014) provide the companies the framework (Figure 2-1) for corporate water management. The authors define the components of the company’s water profile, which are interactions with water, opportunities, and challenges, commitment and response. Further, the Guideline outlines the instructions on sustainable water reporting. According to the authors, “showcasing progress and articulating future targets and commitments via disclosure strengthens corporate accountability and builds credibility with employees, local communities, civil society, and governments” (Morrison et al., 2014). Building trustful relationships and accountability with the key stakeholders ensures both the companies’ legal and social license to operate.

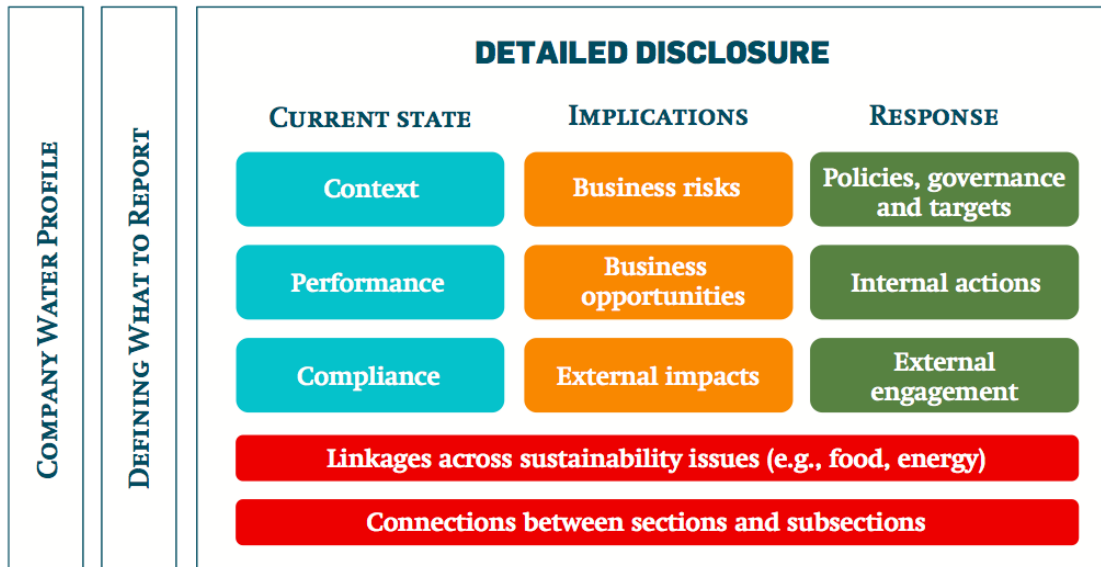


Figure 2-1. Water Disclosure Framework

Source: Morrison et al., 2014

In this way, the number of international projects, global non-profit organisations and public initiatives dealing with the water-related improvements in business performance are constantly growing. This is an indication of the fact that the perception of the public and social demand for the market changes is also evolving: starting from the appearance of “ecosystem services” approaches to bring up the value of nature to the economic landscape and ending with the general appreciation of the intrinsic value of the nature and fragility of the ecosystems. As such, there is growing evidence that business and government clearly have to adapt to these changes in order to avoid social problems and risks, as well as to deliver economic and basic needs.

2.2 Evolution of business perspectives on water engagement

The prevailing assumption of the 20 century in most of the industrial countries was that the water impact from the industries was not threatening the livelihood of the local communities and functioning of ecosystems (CEO Water Mandate website). The water management system was grounded in the trust in technocratic solutions (Daniell and Sojamo, 2012). The Pegram et al. (2009) in their research claim that the typical position of the private sector used to be limited to resistance to tightening regulation and financial or expertise/management support up to the level required by “requests” from the government. In the past two decades, according to the authors, this paradigm has shifted when water was recognised as not a renewable resource anymore and the respective social, economic and ecological expectations from water management were established in a response to a changing environment.

Morrison et al. (2010) outline the stages in changing of firms’ perception of water management. The first step towards sustainability was done with operational improvements. This was driven by law and regulations in most of the developed countries since at least the 1970s (Morrison et al., 2010). The first improvements were related to the establishment of internal water accounting systems so that this data became available for decision makers in companies. The operational efficiency, eco-design, and cleaner production in general, were the following steps to make the water management system more efficient. In developing countries, there are often not enough incentives for the industries to move further from

measuring water use and discharge from the operations. However, even these measurements are mostly driven by the aspirations to minimise operational costs (energy, infrastructural optimisation, wastewater treatment, water use costs).

At the next stage identified by Morrison et al. (2010), the companies started to switch the attention from operational level to the external factors. At this period, the evidence of global freshwater scarcity became more prominent. The supply chains of corporations often extended to a large number of countries in different regions. So the companies had to pay their attention to the surrounding watersheds to assess the risks related to water access. This, according to the authors, allowed the companies to obtain a better understanding of the negative impact of operations for the communities and ecosystems. The first assessments of the water resources status, particularly physical water availability in the basin was conducted by the companies in 1980-90s (CEO Water Mandate, 2011). Dealing with water-related business risk imposed the companies to consider the local context and include in into risk strategies. At the current time, the companies are not just assessing, but also trying to manage their water impact both quantitative and qualitative. The methodology and instruments were developed to help the firms in accurate measurements. Moreover, the methods for assessing the social impact from operations with respect to business risks are also available for the companies. Today according to the authors, even in water-rich areas, firms can be exposed to reputational and regulatory risks if they operate in an area where there is insufficient access to water services or if their industrial wastewater impacts human health (Morrison et al., 2010). The future stage of evolution in company engagement can be characterised by an increasing level of transparency. The disclosing of the information to main stakeholders and the public, in general, is becoming approach demanded from society. While such indicators as accountability and transparency are being included in more global business ratings.

A recent paper (Northey et al., 2019) presents the view that the quality of disclosures has improved considerably over time. Northey et al. in their study also support the claims of Hilson (2011) (in chapter 2.1.3) on a generally positive trend occurring in environmental disclosure of the companies. To meet the diverse needs of stakeholders and government regulatory authorities, mining companies have become more transparent regarding their water management practices. Over the past two decades, the mining industry has increasingly made public disclosures of water use as part of environmental management and corporate sustainability reporting. The authors also emphasise that such disclosures may include both mandatory reporting and voluntary initiatives, and the number of the latter is increasing.

The study of Morrison et al. (2014) lists the tools to measure the water impact from the private sector. These measures include: “water footprint” (the total volume of water used by business or its products); Life Cycle Assessment (the overall environmental sustainability of products including water use/discharge through all steps of the value chain); WBCSD Global Water Tool (an open online platform that couples corporate water use, discharge, and facility information input with watershed- and country-level); GEMI Water Sustainability Planner/Tool (another online tools for better understanding of the companies’ water-related needs and circumstances). A company’s ability to measure and account for their water use and wastewater discharges using these or other tools is a critical element of the risk assessment and mitigation efforts (Morrison et al., 2014). Corporate water accounting also helps the other stakeholders in the watershed to monitor the social and environmental impacts of the firms and through the feedback mechanisms make impact the decision making. However, this evolving engagement is not just a burden for the firms, but also a deliberate approach entailing multiple benefits for the companies as well. These benefits are well described by the CEO Water Mandate, as one of the main initiatives aimed to promote water stewardship for business. Based on the Guide to water-related collective actions (CEO Water Mandate) the

potential benefits for the private sector from engagement can be also outlined without being country specific:

- 1) Understanding of the context of performance, water challenges and realities for better strategic planning; shared responsibility and better joint planning;
- 2) Decision making that is based on comprehensive information from all the engaged parties;
- 3) More sustainable outcomes due to support from all stakeholders contributed to the decision-making;
- 4) Achieving credibility and legitimacy with all stakeholders in the area of operation, which facilitates obtaining the legal and social license to operate;
- 5) Establishing more sustainable water governance system by engaging multiple parties, including water users;
- 6) Saving operational costs by optimising the processes and applying water-saving technologies;
- 7) Ensuring the sustainability of the supply chain and resources;
- 8) Improving the reputation of the company, accenting on the water investments in brand strategy;
- 9) Increasing the national and global ratings of the company and investment attractiveness;
- 10) Creating competitive advantages;
- 11) Starting new productions and/or services.

Another approach was suggested by Pegram et al. (2009), who presented the benefits of companies through the lenses of different groups of risks, which can be mitigated by business accordingly. The study leaves a peripheral role to water impact on ecosystems' functioning. The water-related risks for business are categorised as follow: physical risk (volume of available water (scarcity or flooding), quality of water, sometimes lack delivery services to supply water and sanitation, poor management of physically available water); regulatory risk (government's management of water resources, changes, often unpredictable and inconsistent in regulations, incompetence or corruption); reputational risk (pressure from customers and forming of their purchasing decisions); financial risk (impacts on revenue and costs associated with each of abovementioned risks, other indirect cost for energy, insurance etc.); other risks (indirect consequences of physical water scarcity, like public health, social services and environmental functioning). These potential outcomes from ignoring these risks have negative consequences for operations, sales, investments, and other business performance. In practice, many companies are now recognising these risks and taking some efforts to mitigate them. However, these efforts are not necessarily associated with increasing accountability and disclosure policy in general, especially in less developed countries with a lower level of "environmental pressure" from the public. The business almost always "report a much more limited and context-neutral set of information, such as their total water use, total wastewater discharge, water use efficiency, or the total amount of recycled water" (Morisson et al., 2010). Such general separate indicators picked out the total materiality usually serve as the basis for the companies' water reporting, however, can be disputed on the subject of their meaningfulness and legitimacy.

2.3 Industries and water in Kazakhstan

A large share of extractions in the country is state-controlled rather than private. In 2008 inspired by the example of Temasek Holdings in Singapore, the president of Kazakhstan created the Sovereign Wealth Fund Samruk-Kazyna through the merge of two large state conglomerates: Sustainable Development Fund Kazyna and Kazakhstan's Holding for Management of State Assets Samruk (Samruk Kazyna website). The Fund aims to support the

growth of the national economy, enhance competitiveness and sustainable development of the country. In practice, the fund is responsible for managing the shares and interests of the biggest national companies. The asset of Samruk Kazyna includes such sectors as oil and gas, power energy, metallurgy, chemistry and petrochemicals, and infrastructure. At the first stage, the fund united 22 national companies, which accounted for 24% of the country's GDP (Samruk Kazyna website). Among these companies, there were such monopolies, as Kazakhstan Railways, KazMunayGas, national energy network management Company KEGOC, Kazpost, and Kazakhtelecom. The supreme decision-making body of Samruk-Kazyna and its sole shareholder at the same time is the government of Kazakhstan. The managing body is the Board of Directors (Samruk Kazyna website). Interests of both the state and private business intertwined in Samruk-Kazyna fund. Some experts claim that the fund has all characteristics of the state monopoly structure even despite the latest privatisation initiative, which aim to increase the private shares within the structure.

The extractive sector generates totally more than 30% of GDP (OECD Mining Report, 2018). KazMunayGas is the biggest oil and gas company in Kazakhstan and includes 191 organisations under its umbrella. It accounts for 28% of the total crude oil and gas condensate production volume in Kazakhstan and is almost a monopolist in the oil and gas transportation market (KazMunayGas website). Mineral fuels contribute approximately 60% of export earnings, with hard minerals and metals accounting for roughly 22% (OECD Mining Report, 2018). Kazatomprom and Tau-Ken Samruk are among the largest state-owned non-fuel mining operators under the Samruk Kazyna. In addition, Kazgeology, which carries out exploration activities, is owned by the state and 40% of the Eurasian Resources Group shares are owned by the Ministry of Finance. Thus, the state's participation in the extractive industries of the country is mainly carried out through Samruk Kazyna, which unites such companies as National Company KazMunaygas JSC (90.09%), NAC Kazatomprom JSC (100%), the National Mining Company "Tau-Ken Samruk" (EITI National Report, 2017).

The overall growth of the mining sector in the country accounts for the biggest percentages among the sectors: mining (9.3%), manufacturing (5.1%), utilities (4.9%) and transportation (4.8%). In mining, "crude oil output rose by 10.5% in 2017, supported by a significant increase in oil prices and the launch of Kashagan production, while natural gas output expanded by 10.1%" (Samruk Kazyna Macroeconomic Outlook, 2018). In 2017, there was an increase in mining production to the level of 2007 ranging from 8% -15% to 100-326%. The extraction of uranium (326%), copper (47%), lead (25%), and gold (19%) increased particularly significantly (EITI National Report, 2017). This increase is mainly explained by the geological explorations. The constant growth of these industries requires the respective environmental management approaches to alleviate the respectively growing impact.

2.3.1 Water-related impact of the industries in Kazakhstan

The actual social and environmental impacts associated with corporate water use and discharge can vary significantly depending on the conditions in certain watersheds. However, in a long-term perspective, the social conditions (physical availability of infrastructure, access to water), as well as the climatic conditions (decrease of stream flows and depletion of aquifers), may drastically change and aggravate the consequences. The exposure of the local population to historical contamination from Soviet time industries is a typical situation in industrial regions of the country.

There is a number of studies of national agencies (like KazHydromet) and international organisations on the water impact from industries. Yet, not so many comprehensive academic research works were found on this topic. Most of the scientific works focus on the very specific geographical locations (Hrkal et al., 2006; Beiseyeva and Abududwali, 2013; Chibilev,

2018; Kyzyltayeva et al., 2016; Ilyushenko et al., 2013). It is possible to track the changes in water engagement of the firms in the country. In a transition period of the 1990s, the efforts of the emerging private businesses were focused on surviving in the newly established market conditions and maximising of the revenues and accumulation of capital. Some of the firms keep functioning in a similar philosophical regime. However, there are some pieces of evidence of changes in the level of engagement found in the reports of OECD and UNECE.

Currently, industries are the second largest water user in the country after agriculture. In 2016 the use of the water by industries reached 27.08 % of the total water consumption in Kazakhstan, most of these abstractions account for surface sources (UNECE Review, 2019). Companies in the heat-energy industry, non-ferrous metallurgy, and the oil industry together account for the largest share of total water abstraction (UNECE Review, 2019).

Water contamination is another issue in Kazakhstan, which has a long history in the past. Local media and non-governmental organisations regularly report on industrial activities leading to pollution of water and sewage systems, threatening access to safe fresh water sources in some basins (OECD, 2018). The Strategical Ecological Assessment of the Concepts of fuel and energy development until 2030 produced by UNECE (2018) summarises the water impact from different energy-related industries, including coal, oil and gas, uranium and hydropower. The water impact from the mining industry is generally significant for the hydrological state of any region in the country. The deterioration of the water quality is primarily explained by the infiltration of toxic elements into groundwater. The amount of sediments impacting water bodies is also increasing. The technogenic impact from any sorts of mining is huge. The contaminated water is coming directly from mines and quarries, but also from the washing of the mine sites surfaces and cleaning on the operational sites, and tailings. Mining work leads to the formation of funnels shaped depressions. This leads to the drying of wells, and the depletion of springs, streams and small rivers (UNECE SEA, 2018). The vast impact is caused by the liquidation of mines. After the flooding of mines, this water turns into a source of permanent pollution with iron, manganese and even hydrogen sulphide, causing also a significant increase in groundwater salinity (UNECE SEA, 2018). Oil extraction is contaminating water resources through formation waters; drilling and well repair wastewater; as well as technical wastewater. Often, local lowering of the ground surface due to extraction works causes a change in the water and thermal conditions; waterlogging of the territory occurs due to the inflow to groundwater from the operations. The use of hydropower is safer from the contamination perspective. However, construction of reservoirs of large scale (like Bukhtarminskoye) requires the flooding of large areas, often fertile, which has a social impact. At the same time, the impact from large dams to biodiversity, specifically migration pathways for fish is also significant.

Currently, water bodies are intensively polluted by mining enterprises, metallurgical and chemical industries, and municipal services of cities. The most polluted rivers are Ertis, Nura, Syrdarya, Ile, Lake Balkhash (Hydromet Bulletin, 2019). One of the reasons for the registered pollution is the lack of wastewater treatment facilities and lack of water reuse accordingly. Most industrial objects do not have wastewater treatment facilities. Thus, wastewater is released directly into water bodies or into urban sewerage systems, sometimes by illegal connection. Another problem is that often the industrial wastewater ends up in the urban wastewater treatment plants, which were not designed for industrial pollution treatment and simply do not have the capacities for treating such water. According to UNECE Review (2019), up to 50 % of wastewater discharged by large industries does not meet the national standards. However, the investment in environmental protection by the industrial sectors is growing and reached 68 % of total (public and private) investment in environmental protection in 2017 (UNECE Review, 2019). This number includes total investments for

energy, manufacturing and mining sectors and water management sector. From the total investments by the industrial sector, mining accounts for 48 % (UNECE Review, 2019).

2.3.2 CSR as a framework for business engagement in Kazakhstan

In the early 1980s, a number of international corporations began to champion the importance of Corporate Social Responsibility (CSR) (Hilson, 2012). At that time, the ideas of the company's performance were limited by the regulation frames, and firms were not very enthusiastic about becoming water stewards and contribute to the improvements at the watershed level. The first examples appeared in Western countries. Today this tool has spread around developing countries as well. However, the context of CSR is different in terms of lack of comprehensive environmental regulations, labour unions and general consumer demands (Hilson, 2012). Hilson (2012) provides the following characteristics of the CSR context in developing countries: (1) the rates of economic growth as well as the possibilities for profit-making for business are typically much higher compare to developed countries; (2) these countries are currently more exposed to social and environmental crises; and (3) such processes as globalisation and economic growth are likely to have bigger social and environmental impacts for the societies of these countries. Another interesting argument was formulated by Hilson debating Porter and Kramer' papers on CSR (2006). Hilson criticises the authors for not paying enough attention to the initial economic incentives, which brought the corporations to the developing market, as well as tax breaks, low royalty payments, and so forth. These attractive conditions for corporations were implemented by the means of the worsening of labour standards, levels of pollution, lack of tax flow to the state budget, corporate lobbying to resist social and environmental improvements.

Kazakhstan did not set a policy for corporate social responsibility promotion. Some initiatives were developed by the ministries after the president brought up this topic in 2005 during the first CSR conference in Kazakhstan (Novikova, 2015). However, the undertaken efforts were fragmented and there was no ministry assigned for further promotion of CSR and developing the policy for it. A legal definition of CSR first appeared in the regulation in 2006 in a Law on Private Entrepreneurship; after some information about government's efforts towards CSR was mentioned in the Business Code (Mahmood and Humphrey, 2013). Today, some companies have introduced the practice of CSR and started to allocate budgets to social projects. However, according to Mahmood and Humphrey (2013), "these funds are being managed by regional authorities (akimats) as part of budgets for regional development, without being earmarked to specific projects". Thus, such an interpretation of this tool may undermine the main principles of CSR, which should primarily address the problems associated with the companies' impact on the local community (Mazurkiewicz, 2004). Moreover, the participation of the local communities in decisions on CSR in this context cannot be assured.

Another characteristic of CSR development in Kazakhstan was pointed by the study of Novikova (2015), which highlights that CSR culture is not yet integrated into the strategic management of the most of the companies operating in Kazakhstan: "it is not beneficial for companies beyond reputational aspect". Responsibility of the firms is not perceived in society as an important factor underlying the corporate reputation. The author claims that it is the public sector in a country that is largely dominant in setting the CSR agenda. According to her study, the absence of broad public discourse on CSR is further illustrated by the data in the Reputation Capital Group's study of "Kazakhstan's Most Reputable Companies-2013". It indicates that only 10.7% of the population of Kazakhstan (compared to the average of 15% of consumers globally) view "responsibility" as a contributing factor to corporate reputation. Other numbers provided by the study illustrate the position of the business and the perceived

motives to involve in CSR. Thus, only a third of all private companies in Kazakhstan recognises the benefits that CSR brings to business. Other third of respondents believe that CSR is still beyond the interests of the local stakeholders. 17% of the respondents expressed generally negative perception CSR, which was explained by the novelty of the idea that represents just another trend imposed on the companies externally. The rest of the respondents were not confident in their ability to assess the situation with CSR.

In Kazakhstan as a transition economy country, both internal stakeholders and the government still place more emphasis on economic and legal responsibilities for the sustainability of business organisations. (Mahmood and Humphrey, 2013) There is a lack of research and methodological works on CSR activities in Kazakhstan. The specifics of the CSR in the country can be also explained by a mixture of the Soviet heritage and current market-oriented strategies, explained by the study. Most researchers of this topic agree that the corporate involvement in social improvements is a new phenomenon for the country and people are not yet getting accustomed to this instrument (Novikova, 2015; Mahmood and Humphrey, 2013).

Hilson (2012) in this study also specified the role of CSR activities in the mining sector, which appeared to be much more profound due to the characteristics of the operations. Most of the mining activities are located on land, unlike the oil and gas industry that is often explored offshore (Kazakhstan has both offshore and onshore reserves). Thus the impact of mining is more visible and often has more direct consequences for the communities living in the area. Another characteristic of mining is a longer pay back period compared to the oil and gas industry. It takes more years for all stages of extraction, starting from strategic prospecting, identification and mining work to refining (Hilson, 2012). Thus the overall period of interactions with local communities is usually longer. In the case of oil and gas operations, which are mainly connected to host governments and do not have a community presence per se, the same critics find themselves scrutinizing a process or agreement with a government, the dynamics of which they often know very little about (Hilson, 2012). This argument was also taken into account in the selection of the case studies objects.

2.3.3 Water policy in regard to the private sector

Public policy aims to set the frames, the rules and the instruments for government to implement water management. It also embraces the main risks for the national water sector. Pegram et al. (2009) present a perspective on water-related public policy in regard to corporate operations risks, which has three levels: “enabling framework” – principles and legislation for the governing mandates; “strategic intent” - strategy and planning around water allocation and management; “implementation practice” - the way in which decisions and strategies are realised. Pegram et al. (2009) also highlight the different levels of government that locate the public policy. Thus at the national level, the legislation is developed. Further, in some countries, the role of watershed-level organisations is higher and the water management process is carried out through them. Otherwise, it is a local government responsible for water supply and sanitation services. Thus, local government level is usually in the main focus for the firms. The UNECE Review (2019) supports such differentiation and suggests the following levels of water policy in regard to Kazakhstan:

- First-level documents define the long-term vision of the country’s development (Strategy "Kazakhstan-2050", the Forecast Scheme of Territorial Development and the Strategy of National Security);
- Second-level documents describe the development strategy for specific areas and/or sectors (state and governmental programmes, usually for more than five years period);

- Third-level documents provide the details to implement the vision of the first- and second-level documents (strategic plans of ministries, programmes for the development of territory for shorter periods and strategies for development of national holdings and companies) (UNECE Review, 2019).

The Programme Kazakhstan 2050 (2017) and Transition to Green Economy (2013) serve as a general framework for the respective regulation aiming to ensure water security in all its aspects for the country in the future. The mining sector was described by program Kazakhstan 2050 as vital to the country's economy but lacking in foreign investment (Global Business Report, 2015). The main national water programmes are:

- State Programme for the development of Agriculture and Industry 2017-2021;
- State Programme for the development of the regions 2020;
- State Programme for Water Resources Management in Kazakhstan 2014-2020.

The State Water Programme (2014) aims to ensure the access to water for the population, and its availability for the environment and economic sectors, increase the efficiency of water use and ensure the conservation of water ecosystems. The separate action plan was developed for the programme, which envisaged the detailed allocation of financial resources. However, the implementation reports for 2014–2015 yielded the insufficient allocation of funding in reality (35.3 percent of the planned amount) (UNECE Review, 2019). In 2017 many of the indicators of the programme included in another Agriculture and Industry Development for 2017–2021. The water programme specifically for water supply and sanitation services aimed to increase the general coverage of these systems in the country. One of the suggested measures aimed to increase the participation of the private sector in water management (Ak Bulak, 2011). The Programme was cancelled in 2014 and targets on water supply and sanitation were integrated into the Programme for Development of the Regions until 2020 (2014).

The 'Concept of Transition to Green Economy' (2013) is another document, which reflects the aspiration of the country to improve resource productivity, including water use and general modernisation of the economy in a sustainable way. It also sets the water goals and indicators, the paramount water goal is to "ensure universal access to drinking water by 2020, and sufficient irrigation water for agriculture by 2040". In regard to the industries, the water-related goals include completion of the remediation of historical water contamination and decrease of the current level of pollution caused by industries by 2030 (Green Economy Concept, 2013). Other goals for industry focused on modernisation of production operations, cooperation with science in this process towards a shift to green technologies.

Regulation and control in the field of environmental protection are ensured by a two-level approach – the national and territorial levels (UNECE Review, 2019). The main state institutions for environmental issues in Kazakhstan are: the Committee of Environmental Regulation and Control of the Ministry of Energy and its territorial bodies (16 departments of ecology); the Committee on Water Resources of the Ministry of Agriculture and its eight basin inspections; the Committee on Forestry and Fauna of the Ministry of Agriculture and its territorial bodies (16 territorial inspections of forestry and fauna); akimats - local executive authorities of oblasts and the cities of Almaty and Astana, through their departments of natural resources and regulation of nature use.

Local executive authorities, akimats, are responsible for the implementation of these programmes on the local level. Another document that determines the local water governance

is basin-specific schemes of integrated use and protection of water resources (SIUPWRs). These are the thorough description and analysis of the water situation in the watersheds. The document provides information to decision makers and serves as the basis for basin planning, water use, restoration, and protection. From 2003 to 2009, SIUPWR has been developed and agreed for 12 river basins; the General SIUPWR covering the entire territory of Kazakhstan was developed in 2012 and officially adopted in 2016 (UNECE Review, 2019). This general scheme defines the situation with surface and groundwater availability assesses the current water use and water needs of different economic sectors in the future. The Water Code of the country also envisages such water management instrument and basin plan. Unlike the scheme, a basin plan is developed under the coordination of basin inspections, has shorter terms (5 years), and combine the list of various actions from a state programme or other sources aimed to improve the situation in the watershed. The implementation of the Basin Plan is a competence of the local authorities – “akimats” at a city, district and region levels. Basin councils under basin inspections are served as platforms for discussions, cooperation between watershed stakeholders and monitoring of the implementation of basin plans.

Despite a number of water projects in Kazakhstan, there is evidence that most of them suffer from lack of local community and stakeholder participation and involvement. Previous studies (Yakubov and Ul-Hassan, 2007; Zizani, 2015; Ospanova, 2016) also reported that the water resource management problems in Kazakhstan are also caused by the fact that the water complex is managed by many centralised departments, causing a lack of clear assignment of responsibilities between ministries and local authorities (Karatayev et al., 2017).

2.3.4 Water legislation related to the private sector

The mining sector is a very important contributor to local and national economies for all former Soviet Union countries. Often, the mining sector in these countries can be characterised by “inappropriate planning, operational and post-operational practices, including a lack of an adequate regulatory framework and inadequate implementation of mine rehabilitation and closure activities” (Peck et al., 2005). The industrial activities leading to water contamination have been an issue for the country in the past and continue to create obstacles to access to safe fresh water in some regions. The incidents of water pollution further highlight the importance of effective regulatory measures of water resources management and their implementation.

The primary legislative frameworks for industrial water use and discharges are set by the Water, Environmental, Subsoil and Subsoil Use Codes. Some related information could be found in Tax and Criminal Codes. Water Code provides the general rules for water use and discharges by industries. Chapter 19, for instance, obliges the industrial and heat-and-power organisations to have a recycling water supply (with an exception for cooling from water bodies) (Article 103, Water Code). The organisations that do not have recycling water supply are obliged to submit a plan for the transition to recycling water supply with an indication of specific deadlines to all authorised bodies. Industries are classified among others as special water users and possess the respective rights and obligations. The possibilities of involvement for private companies in the use and protection of water resources, water supply, and wastewater disposal are described in Article 79:

- “intake of water resources for use;
- intake of water resources for water conditioning and purification and (or) its supply to water users, and (or) to water consumers;
- collection, treatment, and discharge of the used, wastewater and drainage waters;
- use of water bodies without water intake;
- improvement of water quality and water facilities’ condition;
- provision of services in water and environmental marketing;
- and other directions in compliance with the legislation of the Republic of

Kazakhstan”.

It is also claimed in the Water code that the state supports the entrepreneurship aiming to use and protect water, water supply system, and wastewater treatment.

The new Code on Subsoil and Subsoil Use was adopted in 2017 and based on the Subsoil and Subsoil Use Law 2010, which in its turn integrated the Law on Subsoil and Subsoil Use 1996 and Law on Oil 1995. The Code introduces a number of changes in the regulatory environment for minerals extraction. The Code changed the legal regime of subsoil use in the country, with an aim to ensure a balance of interests between investors and the State (UNECE Review, 2019). One of the changes is a more streamlined licensing procedure, which follows from the Kazakh government’s commitment to adopting the standards of the State of Western Australia, a leading Australian mining province (OECD Mining report, 2018). The new Code introduces a “first-come-first-served” model to the licensing process, which is generally perceived as a positive change by the operators seeking new opportunities. It also ensures the guarantees to the operators holding the exploration license to obtain extraction licenses as well in respective areas. The new Code also obliges the operators to prevent pollution and reduce the negative impact of the operations, provide the preference to local employees, and comply with new national environmental and civil protection regulation, as well as ensure rehabilitation of sites through a guarantee, bank deposit and/or insurance (UNECE Review, 2019). The obligations to rehabilitate the damage and comply with environmental requirements are mainly covered by the Environmental Code. OECD Mining report (2018) indicates the lack of explanation of the interactions between the SSU Code and Environmental Code. The critics of SSU Code also relates to the missing indication of an establishment of a risk-based approach to waste classification for hazardous material, which directly influences the potential liability concerns for long-term investors (OECD Mining report, 2018). The SSU Code refers to the national water legislation but leaves unclear the precise requirements for subsoil extractors. In addition, the new Subsoil and Subsoil Use Code reaffirmed the commitment of the country to such global initiative as EITI, imposing the respective reporting requirements.

The Environmental Code covers such issues as environmental pollution prevention and control, conservation of biodiversity, compliance with environmental regulations, environmental monitoring, and public access to the information on pollution and any potential threat to the health, as well as the participation of public in decision-making on environmental issues. The Code provides for the issuing of integrated environmental permits and defines types of hazardous activities. Self-monitoring and reporting requirements are also described in the Environmental Code. The organisations of categories I-III have to submit their self-monitoring reports to the Committee of Environmental Regulation and Control every three months. However, the number of non-compliance with this rule remains high: in 2016, 291 fines were imposed for failure to submit self-monitoring reports (UNECE Review, 2019). Also, the quality of the self-reporting is not guaranteed. The firms are obliged to submit to the Committee on Statistics the quantitative reports on water and toxic waste. Similar reports are submitted on water use, but only once per year. The Environmental Code also makes provisions on the conducting of the inspections. The decisions on the inspections are usually based on the self-monitoring reports.

The rates for pollution charges are provided by the Tax Code. According to the Latest Tax Code of 2017 (Article 720), the following payments and taxes exist for the subsoil users: 1) subscription bonus; 2) payment for reimbursement of historical costs; 3) alternative tax on subsoil use; 4) royalties; 5) the share of the Republic of Kazakhstan in the production division; 6) tax on mining; 7) excess profits tax. Emissions below authorised emissions limit values

(ELVs) are the subject to pollution taxes while emissions of pollutants above ELVs have been subject to two distinct types of payments: i) administrative penalties; and ii) monetary payment for environmental damages (UNECE Review, 2019). The limit values are defined through the permits by environmental authorities at a national or regional level depending on the scale of the operation. Revenues are also collected at the regional level and allocated to the regional and national budgets (national fund). Water standards are established for drinking water and for water bodies used for domestic needs, water bodies used for fishery and for seawater. Maximum allowed concentrations are set for more than 1,300 substances including chemical substances in water bodies used for domestic and recreation needs (Order of the Minister of National Economy No. 209, 2015).

The review of the legislative context revealed that the regulations remain to be the subject of constant changes. This can be seen as an obstacle for business to set a long-term water targets and risk strategy. However, despite the reform of the rights and taxation and some tightening of the regulations, Kazakhstan policies continue to provide strong incentives for the development of the fossil fuel and mining sectors.

2.3.5 Drivers and barriers

Burritt et al. (2016) explore the drivers of corporate water-related disclosures for stakeholders in Japan, which are examined through the lens of managerial stakeholder theory. The author presents two different aspects of stakeholder theory, which describes two different possible responses of the organisations to stakeholder concerns respectively. First - the normative or ethical branch of the stakeholder theory advocates all stakeholders be given equal consideration and assume that their concerns should be included in corporate decision-making. Second - the managerial branch of the theory suggests the importance of managers to stakeholder-related decisions and that managers will prioritise stakeholder interests according to each group's power and influence over the organisation. Engagement of various external stakeholder groups, according to Burritt et al. (2016) motivates corporations to introduce better social and environmental performance. In addition, the author points out that increasing CSR activities and disclosures have been viewed as a necessary way for management to portray a cleaner and greener image of this high profile "dirty" sector. In this context, large corporations are often more observable for the public and the larger impact respectively arouse interest from more diverse stakeholder groups. Another aspect that may become a driver or a constraint is corporate ownership. When it is concentrated in the hands of a few individuals, fewer group interest is considered accordingly. The same relates to the content of the Board. Another not direct, but rather supportive driver mentioned by Burritt et al. (2016) is the development of an integrated environmental management system with achievable and measurable indicators for cleaner production, and improvements of the business processes and their disclosure.

Brammer and Pavelin (2004) highlight the role of media as a driving force for the corporations. The attention from media can contribute to the public agenda and influence the transparency level in corporate reporting. Increased attention in media to the industrial impact leads to further enquiry from the public, NGOs, environmental activists and eventually public authorities. Pegram et al. (2009) confirm the importance of the broader public interest. According to the authors, the involvement in water management and policy is primarily driven by the aspirations of the company to eliminate or mitigate the risks. However, once the firm is committed to better engagement, the alignment of the corporate environmental strategy with the public is needed.

The three main motivations defined in Pegram et al. (2009) study are: the direct ongoing water-related threat to production (physical water scarcity, problems of water supply system

etc.); corporate strategic risk (defining business vulnerability and all potential water risks in both operations and supply chains); corporate leadership / stewardship position (reputational and regulatory risks, branding). The barriers listed in the study mostly relate to the uncertainties associated with policy and regulation, but also political or community commitment to ensure cooperation. The additional barrier from Pegram et al. (2009) is less tangible but may play a great role in transition countries with less developed institutions and cooperation history. The lack of trust between public and private sector, according to the authors, is based on the historical interactions and perception of the firms as the actor serving solely their own interests. While Pegram et al. (2009) claim that business' perspective is appropriate for risks that may vary and overlap with the risks for other stakeholders. Moreover, it is the public sector to ensure the efficiently and sustainably managed watershed to mitigate business risks.

Hilson (2012) based on the study of Knox and Maklan (2004) outlines the following motives for the companies to be engaged with CSR activities. They are: consumer preferences; investors requirements; preferences of the potential employees; engaging with stakeholders encourages innovation; reduction of the social and environmental risks arising from safety issues, potential boycotts and deteriorated corporate reputation. Most of the author refers to the "social license to operate" (Hilson, 2012; Northey, 2019) as the main driver for the companies to start CSR.

3 Theoretical framework and Methodology

3.1 Theoretical framework

The theoretical framework for this research was inspired by the study of Kivleniece and Quelin (2012), which considered the theories of “public partner opportunism” and “external stakeholder activism” to analyse value creation and capture mechanisms of private-public interactions. Such interactions are driven by positive externalities, resource complementarities, and cost efficiencies that redefine the role of the private actor in governance. According to the authors, the inherent tension between private and public interests requires a “critical examination of underlying value creation and distributions mechanisms to understand for whom they create value and how”. The private-public interaction also conceptually embraces public administration, project management, entrepreneurship, business model theory, and value distribution.

There is a number of studies on value distribution and capture mechanisms in interactions between the private sector and governance, which highlight the significant economic and indirect benefits for the firms from such cooperation (Rangan et al., 2006; Kivleniece and Quelin, 2012). What do we understand by the public-private interactions? According to the Kivleniece and Quelin’s definition relevant to current research, it is “any long-term collaborative relationship between one or more private sector and public bodies that combine public sector management or oversight with a private partner’s resources and competency for direct provision of a public good or service.” By this definition, the authors distinguish the public-private interactions based on voluntary collaborative structures, shared resources and competencies from public goods as the outcomes of such partnerships. The value is defined in this research as the overall amount of benefits resulted from such private-public interaction. By this, we assume as such the positive character of these direct outcomes and other externalities.

According to Kivleniece and Quelin (2012) the advantage of private-public collaboration in different forms is in the opportunity to combine the resources and capabilities (managerial abilities, know-how) of business that “deliver uncompensated value spillover as dispersed public benefits with public actors' institutional and tax-raising capacities that frame and offset the private costs incurred”. Private actors may act in a very self-interested manner when their activity is constrained by the interests of the shareholders seeking economic benefits. This explains the opportunistic character of the public-private collaboration. However, there are two emerging attributes of the business value. First, the definition of business value itself obtained a broader meaning under the pressure of social activism and sustainability endeavors at the political level. Second, even if considered in its traditional understanding as the financial returns, the factors influencing direct economic benefits were notably multiplied and today include social and environmental legitimacy to operate, reputation and public support, and proves of the corporate responsibility. However, the government’s role in such a partnership can be also considered from an opportunistic perspective. Public actors often having their political goals seek to involve business in as many as possible value-appropriation activities entailing the reduction of public budgetary expenses and putting a larger economic burden on business accordingly. So apparently there is a very fragile balance between creating public value and maintaining the attractive opportunities for business.

The authors place rationale behind private actors’ engagement in such partnerships into three different groups, namely the motives related to the reduction of environmental uncertainty; availability of compensation for the market externalities; and finally access to certain

resources. The different forms of a partnership have various rationale and capacities. These different forms also create respective sorts of value. More autonomous partnering forms create benefits through the productive and allocative efficiencies, while integrative forms give more opportunities for resource complementarities and increase of the governance efficiency (Kivleniece and Quelin, 2012). The authors also point out that the risks existing to the private actors should be taken into account in any forms of partnership, which are the market and technological uncertainty, resources-related issues and others. These risks influence the willingness to collaborate and partnering forms from the private actor's perspective. Moreover, the political and social claims on value distribution, the goals and the nature of the public policy itself can eliminate or reduce the share of potential value for the private sector. Thus we may consider social activism as barriers for better engagement.

The theory of public partner opportunism is complemented by the stakeholder theory, which will help us to broaden the number of considered stakeholders. Moreover, integrating the stakeholder theory with the CSR enables to better deliver on the business responses to various expectations from society. The approach to this research sees CSR as part of core business processes. The CSR embraces the social accountability and sustainability. This research postulates the responsibility of business as a part of decision-making framework. In other words, it implies the "key ideas of the stakeholder approach and it acknowledges that the management of any economic organisation includes, by definition, the management of the relationship with its stakeholders" (Post, Preston and Sachs, 2002). Freeman (1984) views that the stakeholder approach should be integrated into strategic management. They argue that companies that take stakeholder interests into account are more likely to be sustainable over time (Freeman et al., 2010). Moreover, according to Freeman et al. (2010) the stakeholder theory has clearly contributed to the development of the social accounting and sustainable reporting, both concept and practice. The shift of the focus from "social responsibility" to "accountability" of the firms is based on the acknowledgement of the advantages of the stakeholder approach: accountability here is defined as "identifying what one is responsible for and then providing information about that responsibility to those who have rights to that information" (Gray, 2001).

According to Lafreniere et al. (2012), the stakeholder theory traditionally considers the perspective of the governing body and the governance system, which enables (in more democratic societies) or constraints (in top-down centralised governance) the engagement. However, the theory also helps in "identifying, understanding, and valuing the views of stakeholders on how water should be allocated" (Conallin et al. 2011), and analysing how the shared vision can be attained on the way towards sustainable water management. The implementation of state water programmes requires keeping the delicate balance of the competing interests of various stakeholder groups. Moreover, the main criteria to assess such programmes should be the recognition of success and support from the key stakeholders.

The critics of the stakeholder theory in corporate governance doubt the benefits and relevance of its application. The main argument is the question if the firms in a chase for satisfying the needs of all stakeholders are able to bring the expected value to the economy in a classical theoretical explanation (Smallman, 2004). Or, companies are becoming multipurpose and unable to function in a 'normal' regime and deliver full benefits. According to critics, the business model, which are purely underlined by the stakeholder theory do not perform, while instead of 'stakeholders' it is suggested to use 'interest groups'. Only cooperation between such interest groups, according to the author, will enable the firm to focus on delivering benefits to the shareholders and by this not to harm any member of an interest group (Smallman, 2004).

The study of Mahmood and Orazalin (2017) applied the theory from the private sector's perspective. According to them, the private companies' goals and objectives can be achieved by balancing the conflicting interests of all participating stakeholders, including employees, customers, suppliers, communities, managers, and shareholders. Engaging a wide range of people in planning and management process indeed reduce the conflict, increase transparency and capacities for decision-making, but also "reduce the transaction costs of traditional top-down approaches" (Conallin et al., 2011). From the stakeholder theory perspective the responsibility of the firm is extended from taking care of the shareholders' concerns to protecting all stakeholders' interests. Thus, stakeholder theory supports "improvements in corporate disclosure policies, the implementation of CSR practices and the introduction of risk management policies to manage the conflicting interests of various stakeholders" (Mahmood and Orazalin, 2017).

It is important to understand the boundaries of CSR, as well as the motives to pursue this increasingly a mainstream concept. Business executes actions that help society and environment to thrive as a key component of ensuring that business thrives through obtaining the so-called social license to operate. Private sector has significant interactions with, and impacts upon both social and environmental systems. Genuine CSR efforts by a firm indicate that the firm accepts and understands the importance of the human and social capital, dependence upon natural resources and ecosystem services. And, within its scope it puts efforts to help society and environment to thrive, thus, also helping itself to prosper. The enquiries of this research through the CSR lenses would be whether CSR application and reporting is a part of business models of private entities in the country; or if it is just an effort that meets a relatively standard expectation of stakeholders; or, as the third option, whether this concept is not presented on the market at all/implemented in a different from developed countries way (Financier Worldwide, 2015).

Table 3-1: Research framing

The research framing				
Theoretical framework	Level of analysis	Parameters of analysis ("codes")	Subject of analysis	Result
Public partner opportunity (government as the main stakeholder?) + Stakeholder theory (shareholders' versus stakeholder' interests) + CSR (part of strategic management or imposed practice)	Organisation	operations	Private industrial entities – large water users and polluters	Defining the role of the industries in current water management system in Kazakhstan; Understanding the factors that enhance and diminish this role
	Basin	watershed impact		
		stakeholders		
		local community		
	Policy	water policy		
		transparency		

3.2 Research Design

Based on the theoretical framework, the research methodology takes into account the opportunistic character of the private sector’s involvement, as well as try to enquire the values and understanding of the sustainable water management by firms. How to create water-related social welfare and environmental benefits from sustainable approaches, while maintaining or improving private benefits to the company? In order to reach the main goal of the research and understand the role of the private sector, the study was also divided into two research objectives. Each objective involves a certain method, which are the literature review, interview, and examination of the primary documentation. The methods complement each other in searching the answers for the research sub-questions.

The case-oriented strategy was chosen to achieve the goal. The research objects are private sector entities in Kazakhstan. Thus, the five case studies objects were selected for the analysis. The initial research plan included the online survey, which was sent out to the sample of 30 companies selected based on the characteristics presented on the national stock exchange. However, despite of the detailed cover letter, explaining the purposes of the research and availability of the questions in both English and Russian, no responses were received. Thus, the alternative methods were chosen to substitute the missing data from other sources. The first stage of the research – background analysis conducted to prove that the problem was identified correctly. At this stage, the preliminary informal communications with experts were conducted to confirm the existence of the identified research gap.

Table 3-2: Research design

Research goal		
RQ1		RQ2
Data collection		
Literature review		Expert interviews
All sources (academic literature, reports)	Documentations of the companies (5 case studies)	Questions for the experts
First phase review		Transcription of the responds
Second phase of review		
Data analysis		
Content analysis and comparison	Developed by author coding of the data from survey (codebook)	Qualitative method – compare and evaluate the data
Triangulation of data from all sources: relate results, detect common findings and patterns		
Formulation of the conclusions		

3.3 Data collection

3.3.1 Literature review

The collection of data was accomplished through a thorough literature review within the field of water management in Kazakhstan, with a focus on corporate responsibility and initiatives within it. The review can be divided into two phases – the preliminary and the final reviews. The first phase is needed to build the hypothesis and back up the logic of the research and data collection frameworks, including questionnaires for experts and analysis framework. It aims the general overviews and publications to define the state of art in the field. The second phase involves a deeper and more specified review of the literature on three sub-topics according to the research objectives.

The literature can be also categorised by three main groups. The first group includes all the academic studies on the respective topics. The preliminary to the research review yielded the lack of academic knowledge on the topic. Thus the key terms and concepts for the search were extended to the broader range including “corporate governance/water governance in Kazakhstan”, “sustainable water management in Kazakhstan”, “stakeholders in water management”, “drivers and barriers for the firms in water management”, “private sector in water management”, “corporate sustainable projects in Kazakhstan”. For this category of the literature the search engines such as Science Direct and Google Scholar were mainly used. The Lund University and Central European University’s search tool for academic literature were also checked for the respective terms.

However, it should be admitted that both phases were relying on the academic sources as much as on the literature produced by a number of development organisations involved in the field. The websites of the Organisation for Economic Development and Cooperation (OECD), Global Water Partnership (GWP), CEO Water Mandate and UN Global Compact and others were examined for the theoretical publications and methodologies, as well as the relevant case studies from Kazakhstan and other regions in the world.

The third group of sources was the primary sources - documentation taken from the websites of the private companies selected for the case studies. These sources involved reading up in detail on the annual reports, sustainability reports, certifications, and other information published for the shareholders, and their content (with a special focus on water, key performance indicators and CSR) for the respective documents.

3.3.2 Interviews

Another method for collecting the primary data for the research was the interviews with experts. This was an important source of information to secure the outputs of the research, which were jeopardised by the lack of the will to participate in the survey that the firms demonstrated. The key representatives from the respective sustainability programs were selected for the interviews. The format of the questions was open-ended. All the interviews were conducted online (mostly by Skype), except the preliminary “reality-check”. A full list of respondents with their positions, affiliated organisation is provided in Annex 1.

The questionnaire for expert interviews was also developed to keep the data structured. However, the format of the interview and the questions were in some cases changed according to the level of expertise and knowledge of the experts demonstrated on some specific questions during the conversations. In case the experts were not available for the online interview by Skype, the answers instead were received through the other messenger services. The content of the questionnaire is very similar to the questionnaire for the

companies and aimed to derive the information on the problems and positive trends in the respected fields. In order to alleviate the transcription of the data, the interviews were recorded after the consent for it had been received from the respondents.

The interviewees were selected based on their expertise in water and sustainability, stakeholders’ engagement, experience in relevant state programmes, international projects and private initiatives. The contacts of the interviewees were found through the professional networks, and communications with other experts. The explanatory emails with a short description of the research goals were sent to the respondents prior to the arrangements on personal communication.

3.4 Data analysis

The data collected through the described methods were first of all manually transcribed (in case of interviews) and categorised based on the research objectives (in case of literature review). After categorisation under the respective subtopic, the analysis of the data was conducted. As well as the data collection method, the analysis methods chosen for the research were of qualitative character. The special codes were developed for this research. Codes are defined as “tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study” (DeCuir-Gunby et al., 2011) and their development is the first step in analysing raw data. According to DeCuir-Gunby et al. the process of coding is based on all literature review, theoretical framework and raw data collected during the research. Coding also is primarily created in accordance with the research goals. The set of codes is combined in the so-called codebook, which also includes the definitions, and examples used as a guide to help analysing data. For instance, the definition of sustainable water management is given as a key element of the codebook (provided in 2.1), while the criteria for such water management constitute the main criteria for data analysis. The criteria were based on the Global Reporting Initiative (GRI) standards for water, academic literature and respective guidelines for business on sustainable water management from CEO Water Mandate and UN Global Compact. The Codebook will primary be used for analysis of the data collected from the companies’ documentation.

CEO Water Mandate identifies six areas for company’s water responsibility, which was also a fortunate categorisation for the data analysis codes: Direct Operations; Supply Chain & Watershed Management; Collective Action; Public Policy; Community; Engagement; Transparency. The Table 3-1 below presents the codes for analysis, and the expected evidences, which would be searched through the research.

The findings collected through the secondary literature review will be also categorised based on their relation to some of the research subquestions. This data in a line with the data from the expert interview will be analysed through the codes.

Table 3-3: Coding for analysis and expected evidences of engagement in SWM

Codes for analysis	Evidences of the engagement with sustainable water management
Direct Operations	
	targets for the operations related to water conservation and waste-water treatment
	investments in and use new technologies to achieve these goals

	water sustainability considerations in business decision-making (eg. due diligence)
Watershed	
	a role in helping to protect and manage the area watershed
Stakeholders collaboration	
	work with national, regional and local governments and public authorities to address water sustainability issues
	supply chain (code of conduct for CC)
	ties with civil society organisations, at the regional and local levels; cooperation with international organisations
Water Policy	
	“business statesmanship” by being advocates for water sustainability in global and local policy discussions, presenting the role and responsibility of the private sector in supporting integrated water resource management
	join and/or support special policy-oriented bodies and associated frameworks
Local community	
	understanding of the water and sanitation challenges in the communities where operate and how businesses impacts those challenges
	work with public authorities to support the development of needed water infrastructure, including water and sanitation delivery systems
	support water-resource education and awareness campaigns
Transparency	
	published and shared water strategies and reports on KPI (including targets and results as well as areas for improvement) in relevant corporate reports

Source: CEO Water Mandate

3.5 Validation

In order to ensure the legitimacy of the chosen methodology as well as the research findings, transparency and various methods of validation were applied throughout the whole research process.

The main challenge was a validation of the data received from the companies' examination and interviews with experts. The first and the most important research subquestion for achieving the overall goal was investigated through objective examining of the water-related documentation of 5 companies. The expert interviews also contributed to the findings for the first research objective. Moreover, the literature review, though not yielding a lot of information due to the lack of academic papers on the subject, still provided valuable insights on the research subquestions. Thus, the findings for the first research objective were triangulated from three different sources. The sources for the next two research objectives

also varied and included both literature and personal communication with the experts in this field. Two research questions, therefore, were addressed using both primary and secondary sources.

The research is of descriptive and explanatory character, aiming to formulate the state of art in the area. Hence, the overall additional validation of the findings was not required. However, the final validation check was achieved by confirming the information and formulated conclusions with the experts participated in the research.

4 Findings

This chapter contains the results obtained from both examinations of the primary sources and literature study as well as the interviews with some experts from the field. The structure of the chapter is determined by the “codes” through which the information from primary sources was categorised and analysed. Each “code” is addressed in two subsections: first, through the findings from the case studies, and second, from the literature study and interviews. The “codes” or categories for analysis are direct operations, watershed, local community, stakeholder cooperation, water policy, and transparency. The exploration of the five case studies through these codes were made in relation to the two research questions. The codes were selected as different aspects embraced by the definition of sustainable water management. The “drivers” and “barriers” are formulated in the “analysis and discussion” chapter. While the “results” chapter addresses the first research question about the current role of the private sector in sustainable water management.

Table 4-1: General information about the case studies

	Company	Main activity	Location of the production/ extraction	River basin	Shareholders	Annual revenue
1	Nostrum Oil & Gas Plc	Gas and oil	North-Western Kazakhstan	Zhaiyk Kaspy basin (North)	Foreign investors (Netherlands, UK, Guernsey)	US \$ 389.9 million (2018)
2	Kazzinc	Zinc, non ferrous metals	Eastern Kazakhstan	Irtysy basin	Glencore, Switzerland; Tau-Ken Samruk, Kazakhstan	US \$ 3 075 million (2017)
3	Kazakhmys Corporation	Cooper, gold, silver	Karaganda region	Balkhash Alakol basin; Nura Sarysu basin	Vladimir Kim, Eduard Ogay (Kazakhstan)	No data (last report in 2013)
4	KAZ Minerals	Cooper, zinc, gold, silver	Eastern Kazakhstan, Pavlodar and Almaty regions	Nura Sarysu basin; Balkhash Alakol basin	Vladimir Kim, Oleg Novachuk (Kazakhstan), foreign shareholders	US \$ 1 663 million (2017)
5	KazAzot	Mineral fertilisers, gas	Mangistau region	Zhaiyk Kaspy basin (South)	TOEX B.V., Baharidin Ablazimov, Dinmuhamet Idrisov (Kazakhstan)	US \$ 36.939 million (2017)

Sources: *kase.kz*; companies' websites, *inbusiness.kz*

4.1 Introduction of the case studies

Nostrum. Zhaikmunai LLP is an oil and gas exploration company, which was acquired by Nostrum Oil & Gas Plc based in the UK in 2004. The current company's assets include the reserves in the North-West of Kazakhstan, among which the Chinarevskoye is the biggest field. The production system for the crude oil, dry gas, LPG and stabilised condensate includes the wells, oil and gas treatment facilities, power generation, storage facilities, three export pipelines, and one rail loading terminal, which all are owned by the company. Today Nostrum Oil & Gas Plc with Zhaikmunai as a subsidiary has a total annual revenue of US\$389.9 million in 2018 (US\$405.5 million in 2017) and positions itself as an infrastructure hub aimed to monetise utmost the resources of the region (Nostrum website). It is located on the Ural river, thus the gas and oil extraction activities have a potential environmental impact on the river, which has rich biodiversity.

Nostrum is a company with mainly foreign shareholders and fully foreign composition of the Board. The national company KazStroyService Global B.V. is one of the shareholders of the Nostrum Oil&Gas. However, the size of the share is not open on KASE or the website of the company. It is an example of the firms operating in accordance with both Kazakh and second country (the UK in this case) legislative and regulatory requirements in relation to QHSE standards. The company claims its aspirations to comply with ISO 14001 Environmental Management System and ISO 50001 Energy Management standards. It is still working towards full compliance with these international standards. However, it should be mentioned that among all five case studies, the Nostrum company has the closest reporting system to the international standards and guidelines for the responsible business. The environmental sections are included in the annual reports of the company, to some extent the water issues are considered in the risks and strategic planning. The latest annual report available on the website was for the performance year of 2018.

Kazzinc is a company operating in the East-Kazakhstan region, which produces zinc and associated with it copper, non-ferrous metals and lead credits. In 2004 Kazzinc was certified under ISO 9001 (Quality Management System). In 2006 the integrated environmental, health and safety management systems were certified for compliance with ISO 14001 and BS OHSAS 18001 (Kazzinc website).

The assets of the company include a large number of objects, namely the biggest Ust-Kamenogorsk Metallurgical Complex (with zinc and non-ferrous metals refineries, lead smelter, copper and acid plants), Altay Mining and Concentrating Complex, Ridder concentrator, and all ores of different types, namely sulphide Zinc/Lead/Copper to silicate Gold and Gold-bearing tailings located in East-Kazakhstan region, but also near Kokshetau and Karaganda (Kazzinc website). The production system consists of energy, chemical, mining, and metallurgical equipment, hoisting machines, pressurised vessels and pipelines, drilling and exploration equipment; manufacturing of ferrous and nonferrous cast metal products and testing and diagnostics of fixed assets including nondestructive testing (Kazzinc website). The energy demands of the company are covered by the operation of the Bukhharma hydroelectric plant on the Irtysh river. The power plant is managed by Kazzinc under a long-term concession agreement with the government. It is also integrated into the national power grid system. The infrastructure of the company also includes 117 km of railways, 23, and 1490 cars, which is according to the company's website continue to expand.

Kazakhmys is a large mining and metallurgical corporation. The largest copper producer in Kazakhstan (90% of the market) and eleventh largest in the world (Kazakhmys website). The mining activities were started in the early 20 century, continued during the Soviet period and independence. After the dismantling of the Soviet Union, the company, which was previously called "Zhezkazgancvetmet" was privatised. The government decided to attract foreign

investments into the country, and in 1995, the 40% share of the company was acquired by the South Korean corporation Samsung. In 2014, Kazakhmys Group was reorganised into two separate companies: private (non-public) Kazakhmys Corporation LLP and public KAZ Minerals PLC (Kazakhmys website).

The non-public company includes facilities and mining objects of the Karaganda region and the mine site Shatyrkul. Kazakhmys Corporation includes the production associations Zhezkazgantsvetmet, Karagandatsvetmet, and Balkhashcvetmet, which today constitute the so-called Mountain Production Complex. Since the separation in 2014, **Kazakhmys Corporation** does not disclose its annual reports. Despite the lack of information on the operations, it was decided to include this company into the research due to its lasting cooperation with the Balhash Alakol Basin Council.

The company has a fully integrated copper production system, starting with the extraction of the ore and ending with the production of final products in the form of copper cathode and copper rod (Kazakhmys website). The full production cycle includes searching, exploring, extraction, enrichment, processing and export of copper and other minerals, like gold and silver, sulfuric acid, selenium and copper telluride, lead dust (Kazakhmys website). The assets of the company in addition to the mine site in Karaganda, Balkhash, and Zhezkazgan, include several fields in central Kazakhstan, two thermal power plants, one hydropower plant, and smelting plants. The website of the company does not contain any information on ecological performance or sustainability issues in the company. The information was mostly extracted from the local media and published interviews with the local experts.

KAZ Minerals is a public company managing the mining projects in the East Kazakhstan region and Kyrgyzstan: the mine site Bozshakol, open pit mine in the Pavlodar region, the Aktogay open pit mine and three underground mines in the East Region of Kazakhstan (KAZ Minerals website). Today the company is listed on London, Kazakhstan and Hongkong stock exchanges. Thus the disclosure of the information on operations is one of the responsibilities of the company to its shareholders.

The corporation tries to align its environmental reporting system with the GRI standards “where possible” (KAZ Minerals). The Group also has an environmental policy, which sets the goals towards more efficient water consumption, but they are not published on the website. The operations’ General Directors are responsible for implementing efficiency initiatives to minimise water consumption at the site level. The Group HSE Committee is responsible for monitoring water use. All company’s mine sites and production facilities are located in the areas close to the water sources and are not exposed to the water stress (KAZ Minerals website). Water use and management are included in the materiality of the company and were rated as both high external stakeholders priorities and internal business risk in the materiality assessment.

KazAzot JSC is one of two companies in Kazakhstan producing chemical fertilisers for both export and national agricultural sector. The company was founded in 2005 on the basis of the Caspian Mining and Metallurgical Combine, built in 1968-1977 (KazAzot website). In addition to the production of chemical fertilisers, KazAzot has a 25-year subsoil user contract for gas production from the Shagyrly-Shomyshty field in the Mangistau region, as well as a contract for the exploration and production of gas from the Kosbulak field in the Mangystau region. Mineral fertilisers are one of the most important chemical products for the national economy. The plant produces the following fertilisers: ammonium nitrate, mixed nitrogen phosphate fertilizer, nitrogen acid, ammonia and in addition natural gas. KazAzot production chain includes all stages from the crude to the final products ready for use. The production also includes such facilities as a gas power station and granulation tower (KazAzot Annual report,

2017).

There is no separate unit responsible for the HSE or sustainability issues in the structure of organisation. However, according to the Charter, the ecological monitoring and ecological surveys are listed among the main activities of the company. Water and steam in energy production were listed among the expensive resources, which may affect the profits of an enterprise. The tariffs for the seawater intake and steam are mentioned among the factors influencing the cost price further in the annual report for 2017.

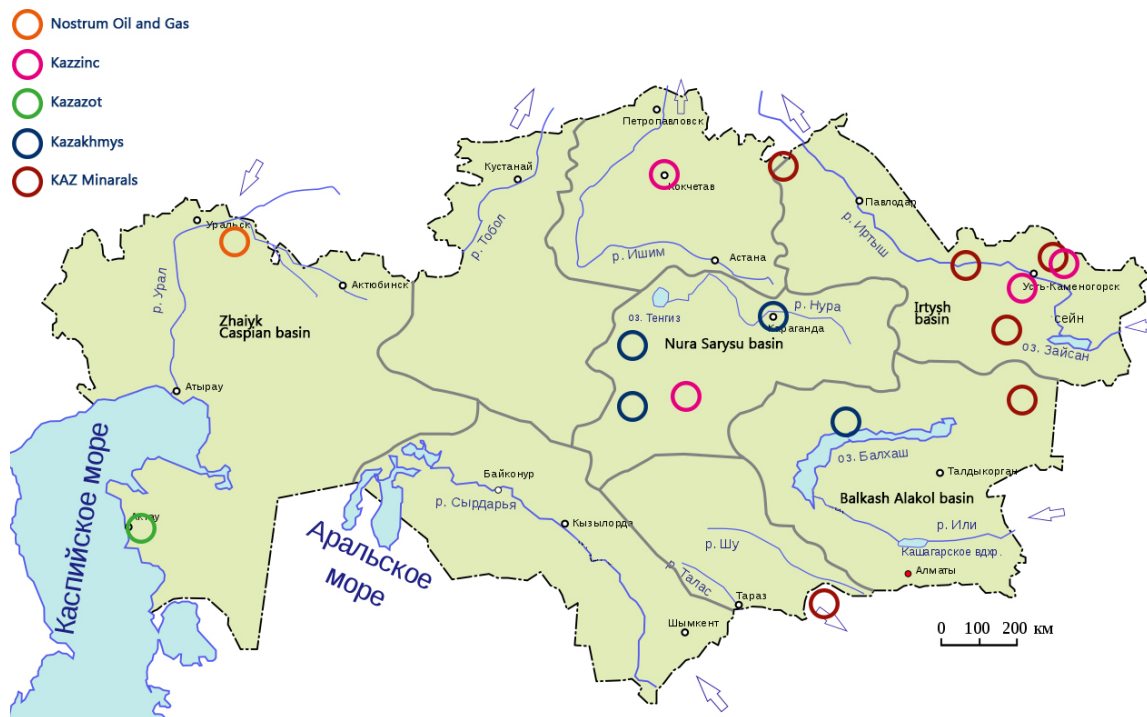


Figure 4-1. Mine sites of the case study companies

Source: Nostrum, Kazzinc, Kazazot, Kazakhmys, KAZ Minerals websites

4.2. Direct Operations

4.2.1 Reported performance

Nostrum. The surface water is threatened by the proximate location of the Embulatovka river, the middle stream tributary of the Ural River. Most of the impact relates to groundwater. The area is recognised as a very fragile water ecosystem, which requires special attention and regular ecological monitoring. According to the website of the company and the annual report, a site monitoring programme was set to organise a thorough control over all oil and gas fields and to ensure the protection of the water resources and rational use. The company aims to minimise the impact of its activities and recognises the potential harm for the environment from such geological works. It claims to have environmental objectives. However, no details are provided in relation to the water targets. The environmental aspects of the performance in Nostrum are monitored by the Quality, Health, Safety, Environment (QHSE) department. Among key performance indicators (KPI), there are mostly operational and financial indicators, nothing related to water and one environmental indicator on the GHG emissions reported in the document (Nostrum Annual Report, 2018). However,

further, in the document it is mentioned that such KPI as GHG emissions, waste management, water and soil pollution rates, as well as the progress of work are reported to senior management on a monthly basis. So the lack of information can be explained by the lack of the will to disclose the performance indicators.

The water on the operational site's utilises is mostly recycled due to the recently installed facilities. In 2011 the company installed water injection facilities, as it was written in the infrastructure development scheme. But no further information was published on the impact of the installation. The water-related operational problems caused significant financial losses for the company in both 2017 and 2018. Due to the decline in production, the company decided to drill a few additional wells in the area. One of the wells encountered the boundary of the aquifer and thus was flooded and could not operate respectively. In 2018 a wellbore collapsed again during the drilling. The company decided to invest in a thorough survey to identify more precisely the areas for further drilling. Thus, production was 20% lower and the company did not meet the operational and financial KPIs in 2018. The environmental impact from the drilling of the multiple new wells and the information about the safety of the aquifers from these incidents were omitted in the annual report and not published on the website later.

Kazzinc. The regular monitoring of the volumes and quality of water consumed for production needs is conducted by the company (Kazzinc Code of Conduct). However, these numbers, as well as the pollution rate, are not disclosed by the company. Kazzinc is trying to install the water recycling systems on most of its production facilities. Despite the reported progress, such wastewater treatment systems are not yet in place on all objects. The company assures about the constant improvements of water management efficiency through installing new water treatment facilities, replacing the old absorbents with the modern safe ones and introduction of water recycling systems. The positive examples, which the company published online include the Ridder zinc refinery and acid plant. The wastewater from there historically was released directly to the Tikhaya River without going through any treatment. Kazzinc has made a limestone membrane for acid waste neutralisation and built the wastewater treatment facilities. By these measures the recycle water consumption was increased from 60% to 95% (Kazzinc website). Currently, the company is trying to install the third stage of wastewater treatment through modern filters at some of the facilities. Similar measures are implemented in other sites: an advanced wastewater treatment project based on the use of activated aluminosilicate absorbent will be soon installed on Ust Kamenogorsk Metallurgical Complex (Kazzinc website).

The lead smelter at Ust Kamenogorsk metallurgical complex produces arsenic-bearing waste. Currently, the company installed safe waste disposal with multilayer impermeable pad to prevent the pollution of underground water and soil. There is a boundary of the aquifer 20 meters below from the disposal (Kazzinc website). Thus, the regular monitoring of the water quality is needed, but not reported by the company in open sources. Another example of the water pollution source until recently was the Altay concentrator, which used the fresh water for the ore processing. The wastewater from the concentrator was discharged to the river. Recently Kazzinc has set up the additional water treatment to improve the quality of the water, which prior to this was purified only in the oxidation pond. At Ridder concentrator, the company applies the removal of the water from slimes before transporting it to the plant in order to avoid the heavy metal leaching in the environment. These measures were implemented during the last few years. The information on the pollution caused before was not found in any open sources. Moreover, East Kazakhstan is famous for its historical contamination of the environment inherited from the Soviet time industries and continued in the period of independence.

Currently, Kazink is introducing the project “Hydropolymet”, which seeks to maximise the efficiency of the mining process and minimise the ecological effect from it. It will mainly reduce air pollution, but also improve the water impact through the use of more efficient technological methods for processing low-quality raw materials using nanotechnology (East Kazakhstan akimat website 2017).

Kazakhmys. Kazakhmys Corporation was a holder of ISO 14001 certificate from 2008 before the reorganisation and division of the company into two firms. There is no information about current environmental management system in open sources. The website of the company omits any information on ecological and water performance, policy and projects. The company constantly implements programmes of different scale for technical re-equipment of mining production and renovation of existing facilities. In 2015 after reorganisation, Kazakhmys invested 55 billion KZT (about 129 thousand EUR in May 2019) for such programme (KazInform, 6 April 2015). The new equipment allowed to increase production efficiency, however, there is no analysis on the conjugate changes of the environmental impact.

Despite the lack of information on the official website, according to the publications of the local authorities, Kazakhmys was one of the first industrial companies that had developed a “rational water use” plan. The company included the number of environmental measures to decrease the impact, but also envisaged the budget and clear indication of the sources of financing until 2018 (Balkhash akimat, 19 October 2009).

KAZ Minerals. Water consumption was first time decreased by 13% in 2018 since the separation of the company in 2014 (KAZ Minerals Annual Report, 2018). The operational improvements at the Bozshakol sulphide concentrator are responsible for this reduction. Water withdrawal at another concentrator Aktogay has, in contrast, increased during 2018. The production in the East Region also managed to reduce the water consumption by 31% reflecting the lower quantity of ore processed. Both sulphide concentrators are expected to recycle more than 75% of water withdrawn from local sources. The wastewater in the concentrators’ recycling systems is piped to the tailings storage site where water in the tailings material is reduced to 40% (KAZ Minerals Annual Report, 2018). The waste further transferred to the tailings storage site. And water extracted from the tailings is recycled for use in the concentrators. Thus, the most significant water loss in the system happens during the evaporation in the tailings storage site. The further reduction of the water consumption at Bozshakol is listed among the strategical goals for 2019 (KAZ Minerals Annual Report, 2018). This is included in the Bozshakol clay plant optimisation plan. The goal is planned to be achieved through the upgrading of the water recycling system.

The company committed to conserve and recycle as much water as possible trying at the same time to differentiate the sources of water for industrial uses from those used by the local communities. KAZ Minerals assures that each operational site tries to combine both surface and underground water use in the proportion causing the lowest possible impact on the environment. Sources of water for use in new mining projects are considered in detail prior to commencement of construction and this analysis forms an integral part of any scoping or feasibility study. Water withdrawal rates are monitored and reported regularly to management, the HSE Committee, and local authorities.

The total water extraction in 2018 reached 0.04 km³, and more than a half from it was extracted from the surface water sources including rivers or municipal water supplies and 0.02 km³ taken from the aquifer (KAZ Minerals Annual Report, 2018). The wastewater discharges directly into the environment in 2018 were reduced. Such discharges still occur at three

locations in the East Region. Two of these sites are underground mining located far from the processing plants, which makes it too expensive to transport the wastewater for recycling. The third discharge occurs at waste rock dumps adjacent to a retired open pit mine, where acidic drainage water is collected. According to the company's annual report, the wastewater at all three sites is treated prior to being discharged. The monitoring of the water quality in the area is conducted on a regular basis by the company. The water issues are included in the operational risks for the company, which are categorised as the risks beyond the control of the corporation. These risks include geological and technological challenges; weather and any natural disasters; loss or interruption to key inputs such as electricity and water and other. The Climate Change impact is also listed among the strategic risks in the future.

KazAzot. The ecological policy of the company includes monitoring of the operational emissions. The control of the ecological performance indicators aims to decrease the overall environmental impact of the production. For these purposes, the company also developed the action plan for the environmental protection, which includes debarment of any leakages from water supply and sewage systems; water consumption metering; rational water use, minimisation of the pollution of water sources; environmental impact assessments; training for the personnel.

The company claims to not have any waste storage, and it uses the contractor's services for the timely waste disposal to avoid keeping the hazardous waste on site of the plant. However, Kazazot does carry out the discharges of wastewater, which is claimed by the company to comply with the norms in regulation into the wastewater channel owned by Kazatomprom, another industrial company of the region. The company provides compulsory environmental insurance in accordance with the legislation of Kazakhstan in order to protect the interests and compensate the harm caused to life, health, the property of third parties and/or the environment as a result of some emergency pollution events.

The main objectives of the company in the field of environmental protection are complex measures designed to reduce negative impacts and respect regulatory technical documentation, for example, ensuring environmental safety at production facilities is achieved by constant industrial environmental control, monitoring is conducted in the following areas: atmospheric air; regulatory - clean drains; soil and vegetation; waste management (KazAzot Annual Report, 2017). Monitoring is carried out by the own Testing Center, which acts based on the Accreditation Certificate issued by the relevant state authorities and third-party accredited laboratory on a contractual basis.

In order to achieve higher standards of environmental quality and reduce negative impact is underway to: introduction of new progressive technologies, equipment modernization, and upgrading process control automation; protection of land and water resources; preventing contaminants from entering the ground and groundwater through the timely updating of chemical technological protection equipment; rational use of natural resources, minimization of water losses through modernization metering stations and other.

4.2.2 Findings from interviews and literature

In 2014 the Ministry of Energy approved the list of best available techniques (BAT) for the agriculture, mining, oil and gas, food, chemical and energy industries (egov website). The BAT include the best practices that the country recognises for the companies to deal with the operational emissions. However, even when the companies apply some of the BAT, they do not refer to this list, which was published as an amendment to the Environmental Code. No further detailed practical guidelines for business were developed in regard to BAT. This is

interpreted as evidence that there is a lack of methodological support for the industries from government for the introduction of the BAT.

According to Article 40 of the Environmental Code of Kazakhstan, all the economic and other activities should be classified into four categories based on the impact on the environment. The categories have a different obligation for the area of the sanitary zone starting from the minimum 0-100 meters for category IV, to the most hazardous production with sanitary zones up to 1000 meters and more in category I (Environmental Code of Kazakhstan). The companies also have to obtain a permit for emissions into the environment, including wastewater discharges. According to Article 68 there are two types of permits: permits for emissions into the environment and integrated environmental permits (Environmental Code). An integrated environmental permit is a comparatively new possibility for the business. It is “a single document certifying the right to exercise a nature emission to the environment with the condition of implementation of best available technology and technical compliance of specific emission standards established by the environmental legislation” (Article 79, Environmental Code). Although it was introduced more than a decade ago, as of early 2018, no integrated permit had ever been issued until 2018 (UNECE Review, 2019). Apparently, the companies prefer the traditional permits system and do not apply for the integrated permits. According to the UNECE Review (2019), there are could be two reasons for that: the lack of awareness and information for the business, which simply does not see the reasons to apply: another issue is the lack of knowledge on BAT. There are also two types of payments for the companies accordingly: the pollution charges for the emissions within the volumes established in the permit; and pollution fines for any exceedings of the allowed volumes. The companies of the categories I–III are obliged to self-monitor their emissions. Quality assurance and quality control of the self-monitoring, however, are not yet always guaranteed (UNECE Review 2019; Interviewee 1, 25 January 2019).

The article 86 of the Water Code of Kazakhstan describes the requirements to decrease water withdrawal by all water users, state water supply enterprises, municipalities, and private entities. The water users are obliged to annually analyse their water consumption, water losses and the possibilities to reduce the amount of consumed water. At least once per five-year period, the water users have to review the norms of internal water use and the existing technologies on the possibilities to reduce the consumption (Water Code of Kazakhstan). According to the literature review, none of the companies reported a clear plan on water consumption reduction with an indication of the specific targets. The information about Kazakhmys was published on the website on the local public authorities. In case of other companies, the aspirations on the improvements of the environmental impact are clearly outlined in the documentation; however, the specific targets and plans are not published in open sources.

Another Article 103 defines that all industrial organisations are required to have recycled water supply. Organisations that do not have recycled water supply are required to submit to the authorised state bodies in the field of environmental protection, sanitary and epidemiological well-being of the population, a transition plan for recycling water supply with an indication of specific dates (Water Code of Kazakhstan). Extracted along with other minerals groundwater, representing a threat to public health and the environment are subject to mandatory disposal. Among five companies, two companies, Kazzinc and KAZ Minerals reported about the introduction of water recycling, both planned and already functioning systems. Nostrum mentioned about the use of recycled water on the operational utilities, but does not give any information on the water recycling in the production cycle. Other companies either do not have such systems and plans or did not disclose this information in their annual reports, websites, and other open corporate documentation.

4.3 Watershed

4.3.1 Reported performance

Nostrum. The activities of the company within the watershed are very scant. In 2017 a sanitary and ecological campaign was undertaken at the river to prevent surface water contamination by auto washing and illegal water discharge (Nostrum Annual Report, 2018). The surface water samples testing taken by the company and the monitoring did not reveal any violation of the maximum permissible concentration levels of pollutants. There is a wide range of opportunities to engage in research and cooperate with academia for the operational safety to better deal with the water-related operational problems of the company described in “direct operations”. However, the company is yet not involved in any activities in the field of research and development at the watershed level.

At the same time, the company recognises the external water-related risks and tries to include them into the strategic risk management. The risks are the pollution of the local environment and respective regulatory actions, legal liabilities, business interruption and any consequential impact on financial performance. The company emphasises that the “legal framework for environmental protection and operational safety is not yet fully developed in Kazakhstan and, given the changing nature of environmental regulations, there is a risk that the Group [Nostrum] will not be in full compliance with all such regulations at all times” (Nostrum Annual Report, 2018). The problems of inconsistent views between local, regional and national authorities may cause some uncertainties related to the environmental and water taxes. This risk is associated with potential financial losses due to possible penalties.

The potential risk related to the impact of climate change is also considered in the reports of the company. Particularly, this includes the impact of the extreme weather events interrupting the operations, or financial losses due to higher insurance premiums and water and climate impact on the supply chain.

Kazzinc. In 2006 the representative of the company participated in the first constituent meeting of the Irtysh Basin council. The council according to the Water Code includes all main water users of the basin and serves as a platform to develop recommendations and joint solutions for better watershed management. During the meeting, the company along with the other industries present in the basin was assigned to participate in the working group for the development of the first “basin agreements” between regional authorities (“akimat”) of East Kazakhstan and the firms, as stakeholders with the large water impact (Work Plan for the Basin Council for 2007). The instrument of basin agreement was also incorporated into the new text of the Water Code. Irtysh basin was one of the first, where this instrument was tested. As a result, the basin agreement was signed in 2007 between Kazzinc, Akimat of East Kazakhstan region, and three other water and ecological organisations of the region. The main subject of the agreement was the water area and water protection zone around Bukhtarminskoye reservoir. The parties agreed to maintain the chemical and ecological state of the water body, protect it from pollution and any environmental damage; develop and implement joint action programme to ensure protection of water bodies and rational use of water resources; establish joint monitoring system on the quality and quantity of water in Bukhtarminskoye reservoir, and delimitate the water protection zones, which would constrain any use by the current industrial facilities, and construction of the new ones within the defined zones. Kazzinc mostly took financial responsibility for the implementation of the listed measures. The Irtysh basin council was assigned as a body responsible for the coordination of the parties. The agreement expired at the end of 2009. No evaluation of the achieved results is

available for the public. In 2008-2011 Kazzinc has invested US \$ 4.2 million to undertake environmental measures on the waste dump of Shubinsky mine site to protect the river Breksa (Filippovka). The measures included the coverage of the dump with foil, and building the water catching trenches on the mine's industrial site and along the road (Kazhydromet Bulletin, 2019).

Kazakhmys. The company positions itself as an active stakeholder in watershed management since the reforming of the water sector and introduction of basin level management and planning. Kazakhmys has been participating in the meetings of the Balkhash Alakol basin council since its establishment. The Council invites representatives of Balkhashcvetmet, which operates in this basin, to most of the meetings. In 2006 the basin agreement was signed between the authorities of the Balkhash city ("akimat"), the company and Balkhash Alakol basin inspection. Balkhash lake has a status of the water body with special importance for the state. The Bertys bay near Balkhash city is a source of water supply not only for the industrial use by the metallurgical complex Balkhashcvetmet, but also for the city power plant and irrigation. According to the experts, the water level in the lake has been constantly decreasing since 2006 (Deng et al., 2011). At present, the ecosystem of the lake is exposed to a significant anthropogenic impact (Balkhash akimat website, 19 October 2009). The local authorities taken into account the conclusions from the expert society have decided to establish better control over industrial water pollution and impose more responsibility to the industries through such a new instrument as a basin agreement. An integrated approach to the lake management according to akimat allows protecting the rich biodiversity and preserving the ecological state of the lake, as well as preventing the region from further erosion and desertification. The state of the lake influences the sustainable development of the whole basin. The basin agreement was signed by all parties in 2009. The main activity for Balkhashcvetmet stipulated by the agreement was to establish the water protection zones. The industrial complex was also obliged to reduce the pollution of the respective zones as well. The construction of the urban wastewater treatment plant was discussed between the akimat and Balkhashcvetmet. However, the project was not implemented until today (KazInform, 23 April 2017).

KAZ Minerals. In contrast to the Kazakhmys Corporation, Kaz Minerals is not active in watershed management. There are no evidences found on the participation of the company in the meetings of any basin council. The company is constantly seeking opportunities to improve its performance and minimise the impacts on the environment in the region, but not through direct involvement in the work of the watershed level platforms.

KazAzot. The territory of the Mangystau region is very poor in terms of surface water bodies. The surface waters of the region are represented by the Caspian Sea, which is a source of water supply for the city of Aktau, settlements and industrial enterprises. The quality of groundwater is characterised by highly mineralised chloride waters calcium type. In the area of Aktau, groundwater is not suitable for the organization of drinking and technical water supply. The biggest share of wastewater from the industries of the region is coming from MAEK Kazatomprom channel, which discharges the wastewater into the only water body of the region - the Caspian Sea. It accounts for about 90% of the total discharges. KazAzot is also discharging its wastewater to this channel according to the agreement between the companies (Kazazot website). However, the exact share of the company's wastewater from overall ending in the Caspian Sea is not known. The seawater samples are classified as clean and meeting the regulation.

4.3.2 Findings from interviews and literature

With the new Water Code and introduced instruments, the multiple opportunities emerged for business to be engaged with watershed improvements. These opportunities vary from

improving watershed planning, using the companies' expertise to consult the respective authorities and developing mutually beneficial solutions to investing in water infrastructure projects. The deterioration of the water infrastructure at almost all levels of its use is one of the most decisive factors of the malfunctioning of the local water systems. Hydrotechnical structures (reservoirs, waterworks, etc.) and canals that have been in operation for more than 20 years have not undergone major and reconditioning repairs in recent years, some of which do not have owners that are responsible for the maintenance, which leads to large organisational and technical water losses (Petraikov and Kenshimov, 2012). These are not just the problems, but the missed financial opportunities for the companies, which can, for instance, rehabilitate the ownerless water object and bring both economic values to the company and social value to the communities.

However, at the present stage, the participation of the companies in watershed improvements is limited by several examples. While the contribution of the majority of the companies to the watershed is mostly related to pollution. The contamination of the surrounding water bodies is still the biggest water problem associated with the private sector. This was also to a large extent confirmed by the literature and experts in relation to the presented case studies.

The most contaminated territories are in the Almaty, East Kazakhstan and Karaganda regions. These areas are characterised by high water salinity, the hardness of water and concentrations of sulphates and chlorides exceeding maximum permissible concentration in surface waters (UNECE Review, 2019). The western and northwest regions have a high level of the groundwater pollution generated by humans. In these oil-extracting and mining regions the iron, manganese and hexavalent chromium pollution of water are recorded (UNECE Review, 2019).

The Zhaiyk Kaspy is the biggest basin presented by the two case studies: Nostrum in the West Kazakhstan region (North of the basin) and KazAzot in Mangystau region (South of the basin). The evidence of the pollution from both can be found in the literature. According to the study of the Russian Academy of Science (Chibilev et al., 2018) the intensive development of the Chinarevskoye oil and gas field in the West Kazakhstan region threatens the unique ecosystems of the middle stream of the Ural river, in particular, it has already led to pollution of the largest alluvial groundwater field. The authors insist that establishing a nature reserve would be the most rational measure to protect the watershed. The proposal includes giving the Ural river the status of a specially protected area and the natural symbol of the respective regions of Kazakhstan and Russia. The protection of unique aquatic and biological resources of the Ural River is in critical condition. The event of mass mortality of fish associated with different chemicals happens regularly in the basin. In 2019, this problem reached the status of the ecological disaster. More than 110 tons of dead fish were found in the river (Zakon, 17 January 2019). The catastrophic event was caused by ammonia discharges to the river. The experts claim that any of the upstreaming industries could cause an ecological tragedy.

The situation in Mangystau is a little bit different since the groundwater due to its high mineralisation level is not used for the drinking purposes and, thus, is not under the scrutiny of the local ecologists. The main contribution to the pollution of the Caspian Sea in the area is made by MAEK-Kazatomprom wastewater channel. As it was mentioned in the previous chapter KazAzot also uses this channel to partially discharge its wastewater. Overall, the channel accounts for about 90% of the total discharges to the Sea. In 2015, the fact of emergency and unresolved discharge of KazAzot LLP through a canal to the existing Koshkar Ata tailing facility was detected. However, according to hydrochemical indicators in the waters of the Special Economic Zone (SEZ), the Seaport Aktau in 2015 is characterized as "regulatory and clean" (National report on the ecological state 2015). In addition, the cases of

illegal waste storing were registered on the site of the company despite its assurance in the timely disposal of all waste from the territory. The ecological inspection was conducted in 2012 at Kazazot site by the Ecology Department of Mangystau region. “The inspection discovered more than 96 thousand tons of pyritic sulphur chemical waste and more than 400 thousand tons of sulphur at the territory where the sulfate plant used to be” (Onishchenko, 14 November 2013).

The Irtysh basin is famous with the registered by ecologists and local residents pollution events. The attention from ecologists and media can be explained by the transboundary character of the river, which further flows to Russia and comes to Kazakhstan from China. The National report on the state of the environment and the use of natural resources (2015), which collects the data from different relevant state agencies, documents the multiple pollution events caused by both corporations Kazzinc and Kazahmys in the areas of their operation. The Fillipovka river is contaminated by the discharges from Shubinskiy and Ridder-Sokolskiy fields of Kazzinc; the Tihaya river receives the wastewater streams from other operations of Kazzinc corporation; the Ulba river is polluted by the Tishinskiy mine site and Ust-Kamenogorsk metallurgical complex (National report on the state of environment, 2015). The national media and social networks confirm that local flora and fauna are regularly exposed to the ecological consequences of wastewater discharges from Kazzinc facilities. Such events are observed visually by the local residents, who describe the changes in the colour of water and the scent of reagents, which periodically appearing in the tributaries of Irtysh river (Asylhanova 2016; Ugay 2016). Kazzinc claims to fully compensate the damage for excessive discharges in the manner and amount determined by the state regulation. Despite the signed basin agreement, the pollution events continue to be recorded. The samples from Ridder Mining processing plant wastewater, which end in Filippovka river showed that the zinc ions concentrations were exceeded the maximum allowed concentration by 7 times, for manganese ions - by 13 times; the wastewater released from Tishinsky mine to the Ulba river had 2 times higher zinc ions than permissible level, and 4.5 times more than manganese ions (Kazhydromet website). At present, part of the waste and drainage of the waste dump with high zinc and manganese contents ends in the Martynov Klyuch stream, which further flows into the Filippovka river (Kazhydromet website).

The pollution rate per each resident of Ust-Kamenogorsk in 2008 was about 3 tons of toxic substances produced by the industries (Osipova, 2018). The same year, the International Bank for Reconstruction and Development launched the project in Irtysh basin aimed to 1) prevent the groundwater contamination plume’s from further movement towards the residential areas, Irtysh river and the sources of drinking water; and 2) strengthen institutional mechanisms for groundwater quality monitoring to enable control of ongoing groundwater pollution from local municipal and industrial sources (IBRD Implementation Report, 2016). The project gave some positive results, for instance, the amount of toxic industrial substances per person decreased by 650 kg (Osipova, 2018). However, there is a high risk that water contamination would continue with one waste dump not fully remediated and another highly radioactive site not remediated and vulnerable to increased pollution due to damage of its protective cover (IBRD Implementation Report, 2016). The government of Kazakhstan took the counterpart funding responsibility. However, money was allocated with delays affecting implementation pace. Further, after the completion of the project, the Committee of Water Resources had to apply to the Ministry of Finance for the budget to complete the remediation of the waste dumps, which cause the contamination of the groundwater. There was no evidence of the sufficient budget allocated for this purpose (IBRD Implementation Report, 2016). There is a need for a study to investigate the correlation between water contamination and mortality and human health problems. According to IBRD studies, there are proved a correlation between high outmigration rate and pollution in the region. Another problem of the Irtysh River,

besides pollution, is a regulated flow. The Bukhtarma reservoir, which is managed by Kazzinc on the long-term concession, generally collects two annual flows in it. The reservoir is a very powerful regulator, and the natural flow system is significantly disrupted by its existence.

In 2016, exceedances of hydrogen sulfide and sulfur dioxide were recorded in the Krasnoyarka river, another tributary of Irtysh. These pollutants cause central nervous system diseases, paralysis, acute pulmonary edema, and cancer. The Krasnoyarka river is contaminated by Kazahmys corporation (National report on the state of environment 2015). The company Kazakhmys Energy (a subsidiary) was obliged to pay 60 million KZT (about 140 thousand EUR in May 2019) to the budget of the Karaganda region for the illegal use of water from the Kengir reservoir for technical purposes and the subsequent return of water to the reservoir after its use. During the audit, the ecology department of the region found out that the company used water for six months and subsequently carried out emissions to the reservoir along with the return water. The water was used in the production cycle for cooling equipment (KazInform, 25 May 2017). In 2016, the company also paid 100 million KZT for illegal discharges in 2014-2015 (KazInform, 6 September 2016). The number of polluting events is not decreasing.

Kazakhmys also operates in Balkhash Alakol basin, where the ecologists also register the deterioration of the ecological state. Kazhydromet regularly publishes the reports of the ecological situation in all regions of the country. The measures in Balkhash lake typically exceeds the maximum permissible concentration of hazardous substances. The heavy metals concentration in Balkhash lake is measured from both Karagandinskiy and Almatinskiy regions. The copper concentration in the first one is 4,5 times bigger than the permissible norm, zinc – 1,8 times more than the permissible level. In Almatinskiy region these numbers are even higher: copper – 10,5 times more than the permissible norm; zinc – 1,4; plus Manganese – 1,3 times of the allowed level (KazHydromet Bulletin, 2018).

Despite Kaz Minerals being much more transparent in reports compared to Kazakhmys, there is some evidence in mass media pointing out the need for an independent assessment of the environmental impact of the company. The local residents of the Ayagoz, which is located near the Aktogay mine site are trying to attract the attention of the local authorities and media to the deterioration of the ecological state of the area, where the mining is operating. The local activists claim that the international technological requirements to the construction of the tailing storage were ignored on the mine site. Thus, the risk of the penetration of the hazardous elements into the groundwater is very high (Mukankyzy, 2017). According to the activists, the absence of a geomembrane will inevitably lead to the infiltration of reagents from the tailings pond, which is used to enrich the crushed ore of the sulphide plant (Mukankyzy, 2017). This, in its turn, may contaminate the connected system of lakes Balkhash – Sasykkol – Zhanashkol. Moreover, the local residents blame the company for not implementing the water supply project promised to the locals by Kaz Minerals. An interesting for our case study fact, the reputation of Kaz Minerals in the neighbouring country Kyrgyz Republic, where the company owns Bozymchak mine site, was put at risk by the environmental scandal. In November 2017 the license of KAZ Minerals Bozymchak was suspended by Kyrgyz government due to environmental claims (Akchabar, 3 November 2017). As a consequence, the price of the company's shares on the London stock exchange fell. However, the scandal influenced not only the company's rating but also the rating of the country on the London stock exchange (Aksenova, 2017).

4.4 Stakeholders cooperation

4.4.1 Reported performance

Nostrum. The company claims to be actively engaged both formally and informally with the stakeholders in the area of operation, including local communities, suppliers and government. The feedback mechanism through the corporate website intends to collect the opinions of the local residents and other interested parties. Nostrum has a proactive position towards engagement of the staff and all contractors on the subject of their role in the life of the community. The company supports local communities through financing social infrastructure and community projects. The social corporate obligations, which are put to the company from the government in 2018 included, for instance, US\$133 thousand for funding of the development of Astana city (Nostrum Annual Report, 2018). None of the social initiatives financed by the firm were related to water use or protection.

The company reports to give the preferences to the local companies in their supply chain policy. It is also included in the criteria of the selection. By implementing this measure, Nostrum aims to support Kazakh companies. Another criterion, which the firm has to its potential contractors is environmental performance. The QHSE management audits are regularly scheduled for all contractors.

Kazzinc. In the company's Code of Conduct it assures that the company will on a regular basis "engage in dialogue with governments on issues that affect its operations and activities" (Kazzinc Code of Conduct). All communications with government are executed by the respective senior management or authorised personnel. The main principle of this communication is ensuring that all the shared with local government information is accurate and not misleading (Kazzinc Code of Conduct).

Kazzinc is also committed to adhere to London Bullion Market Association (LBMA) Responsible Gold and Silver Supply Chain Guidance. It means that the company should build long-term trustful relationships with all relevant stakeholders, which will allow ensuring mutually beneficial cooperation with everyone concerned. It also implies the development of the programmes to mitigate any short and long term risks in the supply chain, including the environmental ones (LBMA Guidance, 2018). In the support of local communities section on the website, Kazzinc mostly emphasises the inclusiveness of the procurement policy for the local contractors. The company aims to increase the number of local producers in the supply chain.

Kazakhmys. The company actively works with regional and local public authorities to address water sustainability issues. The information was found on the websites of the public partners of the company. The Code of Conduct of Kazakhmys describes the procedures for the interaction with public authorities and non-governmental organisations and business partners (contractors). However, they include ethical issues, conflict of interest, and corruption, but not the environmental and water performance in the supply chain.

KAZ Minerals. The company has an environmental due diligence system, which is applied prior to the development of new mining projects. The system allows to monitor the environmental impact from the company and its supply chain. The green procurement mechanism is envisaged in the Environmental Policy of the company. The Suppliers' Charter includes commitments from the suppliers to comply with local environmental protection regulations and implement the necessary actions to limit the impact of their activities on the environment; promote greater environmental responsibility and the use of goods and services which help to mitigate our environmental impact, as well as better managing and utilising

resources such as energy, paper, water and waste; and promote the development and distribution of environmentally friendly technologies (Kaz Minerals Annual report, 2018). According to the website, KAZ Minerals cooperates closely with the local public authorities. Water consumption rates are monitored and reported by the local authorities.

KazAzot. The company is building a strategic partnership with the government, which in its supports one of the two largest national producers of mineral fertilisers that is crucial for the agricultural sector of the country. Thus, the company receives some references on the market in terms of payment under sales contracts guaranteed by the government: the agrarians can pay only 50% of the total price in advance for the KazAzot fertiliser, while in case of other foreign producers it is 100% prepayment. Kazazot is the only national company producing ammonium nitrate and liquid ammonia. Taking into consideration the state policy to support national contractors for the state orders in national tenders, KazAzot has an evident advantage on the market.

Ammonia is produced from natural gas, so the company had to cooperate with the natural gas producers in the region. However, the KazAzot managed to acquire its own gas deposits and today fully provides itself with the raw materials. There is no information on the participation of the company in Zhaiyk Caspian basin platforms or cooperation with the non-governmental sector, academia or local activists.

4.4.2 Findings from interviews and literature

Kazakhstan is the first country in the region to implement the integrated basin management approach. Basin councils become an important instrument to engage various stakeholders in water resources management. The insufficiency of the information on the activities of each basin council out of 8 existing is a significant barrier to promote this instrument. The lack of staff at both levels – national in the Committee on Water Resources, and regional – in basin inspections and councils, is called as the main reason of such poor functioning of the newly introduced councils (Interviewee 5, 5 May 2019). Thus, the basin councils do not always fully serve its initial goals to ensure the cooperation of the stakeholders on the watershed improvements.

The review of the case studies did not reveal any evidence of regular cooperation of the companies with other businesses, NGOs, academia and local communities on water issues. Kazzinc and Kazakhmys are the most active in cooperation with regional public authorities, and to a large extent execute the interaction with other stakeholders through or under the directive of the akimats. The akimats determine the directions of the CSR activities of the companies in the basin as well. Civil society is rarely involved in the selection and implementation of social projects financed by enterprises, raising important questions about the transparency of the process through which the project money is allocated (OECD, 2014). The evidence of a lack of understanding of the stakeholders' interests and needs demonstrated by both the analysed companies and public authorities in the basins found in the study indicates that there is a need to establish a due diligence system in relation to the production partners in the basin and supply chain for the companies to ensure environmentally safe performance.

4.5 Water policy

4.5.1 Reported performance

Nostrum does not report any activities aimed to influence the water policy at the regional or national level. The aim of Zhaiyk Caspian Basin Council, as a consultancy body, according to

the Water Code (2004) is to develop and forward recommendations to the relevant water management agencies in order to improve the overall process of watershed management. There is no evidence that the company participates in the meeting of water management platforms at any level, including transboundary (the Ural river is shared between Russia and Kazakhstan, and there is also a functioning joint Commission on the Ural river). The company does not express any intention towards participation in water policy formation process in the published documents.

Kazzinc. Despite the participation of the company in the activities of the basin council from the very first day of its establishment, Kazzinc does not provide any information about it on the website. According to the reports from the Basin Council meetings (2006), the Council was a newly introduced instrument to include the industries in formulating and implementing the regional water policy. As it was mentioned in the previous chapters Kazzinc participated in the working group on basin agreements, which was responsible for the application of this new tool and development of the text of the agreement. The same example of active engagement in basin platforms is presented by **Kazakhmys**. The company is trying to play an active role in improvements to the watershed. The basin council is used as an instrument to transfer the questions and concerns of the corporation to the respective water authorities. The role of **KAZ Minerals** in the formation of regional water policy is less profound. The company does not use the basin platforms or other instruments to influence the water policy.

KazAzot is an interesting example from the Climate Change policy perspective. On March 26, 2009, Kazakhstan ratified the Kyoto Protocol to the UN Framework Convention on climate change. The company claims to support the measures of the government aimed at stimulating the reduction of human-induced impact on the global climate (KazAzot website). The company is actively involved in the discussion and implementation measures to control greenhouse gas emissions and is committed to reducing greenhouse gas (GHG) according to the Protocol. KazAzot is a subject of quoting greenhouse gases and is included in the National Plan for the distribution of quotas for greenhouse gas emissions 2018-2020 (KazAzot website). KazAzot environmental policy endeavors address the economic interest of the company. As it is mentioned in the annual report, the vision of the company is to become a strategic partner of the government in increasing the agricultural efficiency.

4.5.2 Findings from interviews and literature

According to one of the interviewees (Interviewee 3, 15 April 2019) the water management system is an inseparable part of the overall national governance. This system, according to the expert is characterised by the top-down and vertical structure of the management and decision-making. The water sector is politicised not only because 7 out of 8 basins of the country are transboundary and involve the interests of the neighboring countries. The water sector is generally highly dependent on the overall political course of the country. For instance, the experts claim that the tariffs for the special water use were frozen for the upcoming 7 years in 2018 due to the growing social protesting moods (Interviewee 3, 15 April 2019). This decision was taken in response to the social situation, ignoring at the same time the concerns and needs of the special water users. This inclusively socio-political decision also influenced the tariffs for the industries, which are one of the “special water users” in line with state water management (gorvodokanal), which are responsible for the water withdraw to provide the population with water services.

There are not so many formal instruments for industrial companies to influence the water policy. Two out of five participate in the work of the basin councils. Another instrument is the association of mining and metallurgical companies of Kazakhstan, which is shortly called with abbreviation AGMP. Kazzinc, Kazahmys Corporation and KAZ Minerals are the members of

the association. According to the Charter (2005), AGMP is a non-profit organisation, which was created with the aims to consolidate the efforts of its members for the development of production, protection, and support of their rights and interests in state and executive bodies, ensure the participation of business structures, their associations in the formation of and pursuing the economic and social policy of the government; facilitate negotiation between the members of the AHMP and social partners at all levels. The Association helps its members not only to protect their interest but also develop recommendations to the state bodies. These recommendations aim at creating the most favorable conditions for the development of the industries. Moreover, the Association provides assistance in organising an independent public examination of draft laws and other regulatory legal acts related to the industry, including taxes, financial and credit policies, plans, programs of socio-economic development of the national economy, as well as large technological and scientific projects.

The changes for the new subsoil and subsoil use code were discussed by the members during the forum organised by the Association in April 2019. These changes mostly proposed the simplifying of the procedure for granting the right to explore and extract common minerals. In particular, one of the proposals was to introduce a temporary (until 2021) simplified mechanism for granting subsoil use rights for the minerals for the construction of roads and hydraulic structures based on the permission of the local executive body (agmpportal website).

Another illustrative discussion from the forum relates to the composition of the Council for the mining and metallurgical industry, geology and subsoil use for solid minerals under the President of the Republic of Kazakhstan. Currently, the Council includes only the heads of the relevant ministries and national companies. The executive director of the Association on behalf of the represented industries made a proposal to expand the composition and include other business representatives: shareholders, executives, and managers of companies, large investors (agmpportal website).

4.6 Local community

4.6.1 Reported performance

Nostrum. The company is actively engaged with local communities, but not on the water issues. Nostrum does not demonstrate the understanding of the water and sanitation challenges in the areas, where it operates and how the company may positively or negatively impact those challenges. There is a formal Public Relations and Government Relations procedure, which regulates the relationships with the local community and government, and it sets the rules on how and in which cases the company should engage with various stakeholder groups. “We have established a good reputation in Kazakhstan through operating in a responsible and socially conscious manner to create value for our stakeholders and the local community” (Nostrum Annual Report, 2018). In 2019 the Company’s Board of Directors established a Health, Safety, Environment and Communities Committee of the Board to introduce the sustainability practices across the operation of the company and beyond that. The company is committed to improving the overall environmental performance and better address important issues such as climate change to reduce the impact of its activities on the local communities.

Kazzinc. The lack of participation of the local communities in developing the basin agreements and in the work of basin council, in general, was identified through the examination of the documentation of the Irtysh Basin council and Kazzinc. The scope of corporate involvement and the specific tasks for the business in the watershed are determined

by the local authorities, which play the role of the mediator between business and local residents often not taking into account the real concerns of the local people directly exposed to the environmental impact caused by the industries. The company is financing some charity project to support the socially unprotected members of communities. The charity projects include the construction of medical and childcare centers, donations to the mosques and Orthodox churches. The abovementioned LBMA Guidance also recommend the companies to set the Due Diligence system. Such a system implies a regular assessment of the environmental impact and impact (positive and negative) on local communities within the operation and the supply chain of the company. The company does not disclose any information on the implementation of this recommendation.

Kazakhmys. Kazakhmys Corporation claims to be a socially responsible company, which cares about for the well-being of both its employees and the population of the regions of its presence (Kazakhmys website). Most of the interactions with local communities are determined by the agreements with the state local authorities. The company concludes public agreements on mutual cooperation in the form of integrated plans, which are also further monitored by the akimats (Kazakhmys website). Moreover, the CSR activities of the company also include direct charity and sponsorship to the local residents based on their applications for support. Among the top areas the company is involved highlight are: cultural and educational facilities; sports events; social support of citizens, pensioners, veterans; housing stock and development of regional infrastructure.

KAZ Minerals. The company assures that the projects division, together with senior management and the Board, always consider the availability of fresh water for copper processing and any likely adverse effect on local communities or the surrounding environment before approving a new development project. Each operational site uses a combination of surface water and groundwater sources and seeks to access different water sources to those used by local communities. The company emphasises its role as one of the major economic contributors to Kazakhstan: “our tax contributions support the Government in providing public services and infrastructure” (KAZ Minerals Annual Report, 2018). The Group funds a large number of social projects at a local and national level, none of the projects mentioned on the website address the water-related problems of the local communities.

KazAzot. The firm claims to have long-term cooperation with local executive bodies, employment, and social programs through which it supports the local communities (KazAzot website). It also aims to attract local people to work in the company. The social responsibility contributions to the local community in 2017 were equal to about EUR 7.5 thousand. The one-time financial support was given to sports centers, childcare, war veterans, and mosque.

4.6.2 Findings from interviews and literature

The local communities are the main stakeholders in terms of the exposure to the ecological impact from industries. In case of the CSR, most of the projects in the selected case studies focus on social issues, such as health care, children and elderly care centers. There are no projects related to the access to safe drinking water and sanitation found in the case studies. This was explained by one of the interviewees (Interviewee 4, 22 April 2019): all CSR activities in Kazakhstan are imposed by the local and regional authorities. Thus the CSR projects, first of all, are determined by the local policy and demands from the regional authorities, which are the traditional orderers of such projects. The lack of water-related projects therefore signals about different priorities in the basin.

Despite, Kazakhstan is the 10th largest exporter of the oil in the world, leaving behind it such countries like Norway and Venezuela and the US, the revenues from these resources are not reaching the local communities in the regions, where they are extracted. The study of Najman et al. (2005) on the oil revenue distribution found that the two largest oil-producing regions remain, on average, the poorest region of the country. Quite the opposite is situation in the two biggest cities of the country, which traditionally concentrate the biggest investments in the livelihood of the residents and have higher standards of living. From another side, the study considers the redistribution of the revenue within the companies. The shares that are allocated to local investments and charity are low. Neither redistribution which oil companies undertake through social projects nor official redistribution through regional budgets seems to reach the poorest population in oil and gas producing regions (Najman et al., 2005). The oil sector sees its biggest local contribution to jobs and employment opportunities. However, these are typically low paid and often low qualified jobs. The oil companies' headquarters, especially in the case of non-operating foreign companies, employ a very limited number of the local staff (Najman et al., 2005). The direct employment in the oil sector of the country is estimated to be less than 50,000 people, including workers in the refining sector; this was about 1% of the economically active population in 2002 (Najman et al., 2005).

At the same time, the problem of safe water supply and sanitation remain one of the biggest social problems for the local communities of the country. According to the National programme for the Development of the regions (2013), the problem with drinking water in rural areas is caused by two main reasons: the deterioration and total destruction of the water supply system and the high level of pollution of surface and groundwater. More than 63% of rural settlements (4862) on average in the Republic use water from decentralised sources of water supply - wells, springs, artesian wells without diverting networks; the quality of water in them does not meet the standards for microbiological and sanitary and chemical indicators in the country (Programme for the Development of the Regions, 2013). The rural communities are mostly exposed to the pollution caused by the industries. Thus, there is a high potential for CSR activities to improve access to water and sanitation.

For instance, the company KazAzot, which is not yet closely involved in local social water projects, has a wide range of possibilities to be engaged. Drinking water supply an important issue requiring an immediate solution in the region. The annual population growth, the active implementation of industrial, infrastructural and social projects from year to year lead to an increase in drinking water deficit, and according to forecasts, taking into account the pace of development of the region, by 2020 it will reach 70 thousand cubic meters per day (Chokin, 2017). The region is considering the initiation of desalination projects, which are due to the high costs of implementation, could be with more chances realised in a public-private partnership.

Another study on the benefits of the oil industry to the local communities (Jones Luong and Weinthal, 1999) concluded that oil revenues strengthened the inequality gap between rich and poor people in the country. The authors also highlight the generally positive perception of the big industries by local communities, which see in them as the solvers of their current economic and social problems, not realising the costs of the environmental impact and its future consequences for their own lives and health of the next generations. This is one of the reasons for the lack of environmental activists among local communities in the rural areas and lack of support of the non-governmental initiatives in the areas of industrial operations in some cases. Foreign oil companies are often "considered like heroes by the local populations" (Jones Luong and Weinthal, 1999). The foreign oil companies commonly channel the financial support to the regions, where they operate, but the distribution of these funds is carried out

according to the priorities of the development is the prerogative of the local and regional authorities.

4.7 Transparency

4.7.1 Reported performance

Nostrum. The main environmental goal of the company for 2019 is to participate in CDP Disclosure, which is a global disclosure system for investors, companies, cities, states, and regions to manage their environmental impacts (CDP website). Should the company engage fully with the guidelines and procedures for the CDP disclosure system, then it is likely that it will have a more transparent data on water impact. Currently, such information is not open. Nostrum claims its commitment to transparency in its business activities and payments to governments. In 2017, for instance, a total of US\$ 32,909,896 was paid to governments by the company and its subsidiaries (Nostrum website).

Kazznik. The LBMA Guidance (2018), which the company assures to comply with, obliges the internal Due Diligence system to ensure the control and transparency over gold supply chains, which also includes the environmental aspects. The company is not yet disclosing the information related to the water and environmental impact and strategy for future operations. On the contrary, **Kazakhmys** Corporation and none of its subsidiaries have disclosed the environmental and water reporting for the years since the reorganisation. The non-financial annual reports are not in open access.

KAZ Minerals. The company opens the information on water consumption and discharges on the website and in its annual report, which is also published online. The listing of the corporation on several international exchange stocks influenced the disclosure policy and environmental management system, which is not only seeking to address the best international standards, but also tries to make it accessible for the public. In case of **KazAzot** there is a profound lack of environmental performance data. The company publishes the annual report and opens the financial performance information. However, no environmental and water data is disclosed in the report or on the website.

4.7.2 Findings from interviews and literature

According to the interviewees, there is no general interest and no perceived motives for the industries to make the information about their environmental performance indicators open for the public (Interviewee 1, 25 January 2019; Interviewee 2, 14 February 2019). None of the regulations require mandatory disclosure of non-financial information such as social and environmental activities in annual reports of listed companies in Kazakhstan. According to the CDP list, only two companies in Kazakhstan disclose their environmental information. And only one company - Kaz Minerals made public the water-related information and hold the D-score for water security (CDP website). The experts note that even the foreign companies, which traditionally have a more open policy for the public information, do the “cherry-picking” in their materiality reports and very carefully decide what to make publicly available (Interviewee 1, 25 January 2019).

Kazakhstan is participating in a number of international transparency initiatives. One of them is the Extractive Industries Transparency Initiative (EITI) initiated by the World Bank, which the country joined in 2013. The implementation of this initiative is led by the Ministry of Investments and Development. The Ministry, specifically its Committee on Geology and Subsoil Use, is coordinating the issue of the regular country reports, which are usually produced by independent consultancy organisations in Kazakhstan. Although EITI

implementation has significantly promoted transparency in the mining sector, “there appears to be limited impact on greater accountability and reform and these data are not further used for analytical purposes in order to address challenges and reform needs in the extractive industry sector” (UNECE Review, 2019). The main focus of the Initiative is the distribution of the revenues, and similar initiatives are concepts of responsible spending of revenues, especially by governments, and similar initiatives are embedded with the EITI. It also recognises that poorly spent income and revenues result in negative externalities. Environmental disclosure even being mentioned in the EITI country reports, are not elaborated in details.

Another international initiative, the Aarhus Convention was joined by Kazakhstan in 2000. Today the numbers of Aarhus centers are functioning in the country. The main mission of the centers is to promote public access to information on environmental and health risk. According to the UNECE Review (2019) “data and information about the performance of the environmental regulatory and compliance assurance system are publicly available but they are scattered throughout various sources and not presented in a form that would allow for assessment and identification of trends”. The local authorities do not have a systematic approach to publishing environmental information. Some information can be accessed only upon request; other is disclosed in an irregular manner. The public is provided with information about the fines but “only a very determined person would be able to gather and analyse such information to see how effective the system is” (UNECE Review, 2019).

The interviewed experts also confirmed the lack of comprehensive responses to the requests from environmental activists and non-governmental organisations (Interviewee 4, 22 April 2019). The UNECE Review (2019) listed the cases when the requests of the NGOs were refused without explanation of the reason or the provided data was not complete and precise. Moreover, the bureaucratic procedures usually serve as obstacles for the relevant authorities to provide the information. There are several topics, which are typically hard to get clear information on sanitary protection zones of hazardous facilities; sanitary and epidemiological results or conclusions for hazardous facilities; EIA; project documentation for a planned economic activity; and cartographic materials containing environmental information and other (UNECE Review, 2019). At the local level, local authorities (akimats) are responsible for ensuring access to environmental information. No assessment is available on whether such access is ensured in reality.

5 Analysis and Discussion

The following chapter contains two sections: in section 5.1, the first RQ is formulated from the findings; section 5.2 extracts the answer from both case studies and respective literature, and the expert interviews for the second research question. In the first section, the emerging patterns are formulated and then discussed in a broader context, seeking to address the main research question. The next section summarises the most important enabling and constraining factors for the business engagement respectively and also covers a discussion of the research as a whole.

5.1 Analysis of the companies' engagement

From the presented findings, it can be generally concluded that there is slight variation in the water performance of the investigated case studies at all levels of analysis, although some similarities and patterns were found. From studying companies' descriptions, annual reports, and web sites, it becomes clear that the level of engagement is generally low and in many aspects is limited to the compliance with the respective regulation.

Table 5-1: Summaries of the level of engagement of the case study companies based on the "analysis codes"

	Characteristics of the companies' engagement:				
	Nostrum	Kazzinc	Kazakhmys	KAZ Minerals	KazAzot
Water Parameters	<ul style="list-style-type: none"> strong (leadership inter industries); somewhat strong (the evidences of constant positive improvements); moderate (a few evidences of engagement, but it is not systematic, and can be a one-time measure); somewhat weak (some efforts and attention to the problems from the company can be registered, but there is general lack of actions) weak (lack of information and/or poor engagement); <hr/> absent (no information in primary and secondary sources)				
Operations	somewhat weak	somewhat weak	absent	somewhat weak	somewhat weak
Watershed	weak	somewhat strong	somewhat strong	somewhat weak	somewhat weak
Stakeholders	somewhat strong	somewhat weak	somewhat strong	weak	weak
Local community	somewhat weak	somewhat weak	somewhat weak	somewhat weak	weak
Water Policy	absent	moderate	moderate	moderate	somewhat weak
Transparency	somewhat strong	weak	absent	moderate	weak

First of all, when we are talking about the **operational** level, it is important to understand that the companies were not assessed on the subject of water intake and discharges numbers. The specifics of the company, scales of production are different and cannot be compared by the qualitative criteria. So the companies, which were rated positively in performing, have demonstrated the signs of reducing the water impact and steps to get closer to the international standards of performing in the industry. All of the investigated companies have reported the operational improvements of water management to a slightly different extent. The absence of data on Kazakhmys firstly characterises the disclosure policy of the company. However, the reported measures relate mainly to the pursuits of the companies to comply with water regulation requirements. There is an obvious lack of awareness of the companies on the best available technologies and the methodologies of their application. Some attempts to introduce benchmarking indicators can be observed in companies with foreign shareholders. Most of the companies have obtained the voluntary ISO 14001 certification (except KazAzot). Yet, the literature review showed that generally, the increase in the number of ISO 14001 certifications have been very modest in the country up to present (UNECE Review, 2019). A well-functioning minerals extraction and processing require the use of large volumes of water and there are invariably discharges of wastewater. There were no problems for the companies related to water availability detected in the case studies. In case of the wastewater discharges, despite the attempts to introduce cleaner production, the overall water impact from industries remains significantly high. Both literature review and respondents confirmed the pollution from the oil and gas, and mining industries continues to be a threat to local communities and ecosystems.

The involvement at the **watershed** level varies significantly from one case study to another. Two companies Kazzinc and Kazakhmys both actively employ such instruments as basin agreements and basin council, using the second as the basin level platform for negotiations with other stakeholders. The motives of the companies are not written in the open documentation. According to one of the interviewed experts, this approach was chosen by the companies mainly in order to ensure the support from the regional and local public authorities (Interviewee 2, 14 February 2019). Another expert assured that the active engagement of the industries to the basin planning and management was a deliberate strategic decision made as a response to the growing protests from the environmental activists and NGOs (Interviewee 4, 22 April 2019). Nevertheless, the companies can be called the leaders among other private entities in the country in terms of watershed engagement criteria. The poor engagement of the other companies does not necessarily mean the lack of the will. The weakly functioning basin council in the basin of operation can be also the factor constraining the engagement of the companies. This can be explained by a number of reasons starting from the human factors, lack of staff and expertise, to the financial inability of the basin council to operate fully in accordance with the Water Code. Another water aspect that relates to the watershed parameter is the pollution of the basin rivers and main water objects, as well as the changes of the natural streams by the construction of the hydro facilities (dams, reservoirs). From this perspective, all of the companies were accused of continuous negative water impact by both civil society and local media, and less common by academia. Overall engagement in basin management and planning remains low despite some separate success stories.

Engagement with other **stakeholders** on the water issues is also different among case studies. One of the sub-parameters here was the water requirements of the company towards the supply chain. Two companies, Nostrum, and KAZ Minerals have more profound environmental criteria for the supply chain. Kazzinc demonstrates some elements in the contractor selection procedures. In case of Kazakhmys and KazAzot, this information was not found. In this category of analysis, we can again observe better compliance with internationally recognised standards from the companies with the majority of foreign shareholders. Looking

at similarities in terms of stakeholders' cooperation strategies, all the case study objects clearly distinguish the respective local public authorities as to the main and often the sole actor to cooperate on water issues. Moreover, most of CSR and water initiatives are imposed from the local akimats. The interactions with academia and expert society, non-profit, other businesses on watershed improvements were not detected by the review.

None of the companies demonstrated the understanding (or attempts to attain) of the water concerns of **local communities**. The situation with a water supply and sanitation in most of the operation areas leaves the space for the engagement with CSR activities from the perspective of funding. There is also a growing interest in country in a public-private partnership in water supply and sanitation for the private operators. However, the possibilities for public service provision by extractive industries is a topic for additional scientific enquiry. Most of CSR projects found in the case studies address the social problems of the region prioritised by the akimats. The country does not have any comprehensive policy to promote CSR. However, the general level of industries' involvement in the development and wellbeing of local communities where they operate have improved during recent years (UNECE Review, 2019). Yet, the CSR activities in most of the cases follow the top-down approach toward the local recipients. Among all case studies, only Kazakhmys in addition to traditional cooperation with akimats on CSR established the "bottom up" charity mechanism, which allows receiving direct requests from local communities through the website of the company.

The formal role of private companies in **water policy** is low. This does not relate to the extraction industries, which are the part of the national holding Samruk Kazyna controlled by the government. Some of the experts point out the prevalence of the informal channels of lobbying and participation in policy formation in the country. However, no studies on informal water lobbying from the private industries were found. Three companies out of five are represented in the association of mining and metallurgical companies of Kazakhstan. This is a working tool for companies to advocate their interests. Most of the water-related proposals of the association pursuit the simplification of the procedures and abating of the standards.

The companies have a different level of openness about their water impact. The reports of Nostrum and KAZ Mineral contain data on water intakes; other three case studies miss such data at all. The **transparency** of any industrial activities bearing health or ecological threats is supported by the Aarhus centers and the EITI initiative through the Ministry of Investments and Development. The companies are not obliged to disclose the information requested by private individuals. The access to the information can be only received through the local public authorities, which in their turn request the respective information from the companies. However, the procedures of getting the information and the quality of the provided data, in reality, do not enhance the transparency of the environmental performance of the industries.

Looking at similarities in the approaches taken by the companies, all case study objects regularly pay a significant amount of fines to local budgets for contamination of water bodies. Taking into account the lack of awareness on the BAT and lack of encouraging measures from the government to introduce the new green technologies, such approach can look like a deliberate strategy of the companies. The costs of the environmental fines are slowly but continuously increasing since the 90s (Interviewee 3, 15 April 2019). However, they are still bearing a lower burden for the annual budget of a company allocated for environmental needs compare to the potential cost of introduction of cleaner water technologies (Interviewee 4, 22 April 2019). Moreover, there is no evidence that the pollution fines going to the budget are later spent for the remediation of the contamination of the same water object or even any other water body. According to the estimations, in 2016 only one-third of all environmental

penalties were spent on environmental protection measures (UNECE Review, 2019). In this case the lack of accountability and incentives for the companies to establish cleaner production cause the continuous contamination of the environment and pose the health and ecological damages. The environmental penalties system should be more accurately aligned with the polluter pays principle (UNECE Review, 2019). And this process should be accountable for the local communities, which are exposed to the pollution event.

Another pattern extracted from the case studies relates to CSR activities. The first observation is that the share of CSR projects covering the sustainability issues and water particularly is negligible. Another peculiarity of CSR in Kazakhstan is that it does not exist in an independent form, but rather as a continuation of the top-down governance system. The expectations from the public authorities, therefore, define the areas for the application of CSR. The lack of water-related initiatives from the companies in the reviewed basins to a large extent indicates that the local akimats have other priorities in their development agenda.

The factor of reputation or branding generally plays a less significant role in Kazakhstan in defining the “water behavior” of the company. There is no general demand from the public to drive the changes in water performance of the private sector detected by the research. This is to a large extent exacerbated by the lack of available information. The scattered attempts to attract attention to industrial water pollution are mostly executed by the local activists and environmental NGOs, or local communities exposed to the immediate consequences of such pollution event. None of the examined companies use water performance indicators as a basis for positive branding. However, the overall environmental and water reporting is typically closer to the international standards in the companies, which are listed on the international exchange stocks, and have a greater share of foreign owners.

5.2 Drivers and barriers

The answers in relation to the second research question are presented in this section, in where the driving and forces and main obstacles for the companies were identified in all examined sources: companies’ documentation, literature, and interviews. It was decided to present them together in one section to demonstrate that the obstacle can be transformed into the opportunity and thus become a driving force. The positive and negative factors are summarised in Table 5 and presented more in detail in the text below. The number of the identified barriers exceeds twice the enabling factors, which also characterises the overall situation with the private sector’s engagement. Unlike the barriers that were found equally through the analysis of all sources, the driving forces were mainly identified during the case studies analysis.

Table 5-2: Summary of the barriers and drivers from the case studies, literature review and interviews

	Nostrum	Kazzinc	Kazakhmys	Kaz Minerals	KazAzot
Barriers					
1. Fines are more affordable than investments in BAT	✓	✓	✓	✓	
2. NO general understanding and written procedures on basin	✓				✓

agreement as a tool					
3. Lack of local representatives in Board, top management	✓	✓	✓	✓	✓
4. Ongoing changes and varying interpretations of the regulation and legislation; inconsistency between authorities of different levels	✓	✓	✓	✓	✓
5. Inconsistency with environmental norms & charges rate	✓	✓	✓	✓	✓
6. Lack of measures and incentives provided by the government to stimulate the introduction of BAT	✓	✓	✓	✓	✓
7. Lack of remediating measures from the state; no commitment from local authorities	✓	✓	✓	✓	✓
8. Lack of the state institutional and financial capacities for monitoring and collection of water data	✓	✓	✓	✓	✓
9. NO policy, strategic goals on compliance assurance on environmental matters	✓	✓	✓	✓	✓
10. EMS are voluntary					✓
Drivers					
1. Compliance with regulation	✓	✓	✓	✓	✓
2. Market – listing on international stock exchange	✓			✓	
3. ISO 14001 certification entails water improvements	✓	✓	✓	✓	
4. Local environmental activism		✓	✓		
5. Climate change – changes in water availability; disruptions to operations due to weather conditions	✓				

Barriers

For the purposes of analysis, the barriers can be considered in four categories: *financial, institutional, awareness, policy and regulation*. The financial barriers generally indicate the dominance of the perception of cleaner production as financial losses or a burden for the corporate budget. The companies based on economic motives prefer to allocate the annual budget for environmental fines to the large immediate investments in cleaner production technologies. For examples, the construction of the tailing according to the best international standards require as a minimum the installation of impermeable pads. In order to construct it, a company needs to invest enormous funds, approve the new location with all respective authorities and take care of the old facility. These actions would threaten the expected revenues for the shareholders, who with a high probability would prefer to allocate some budget for annual pollution payments. However, there is another financial problem for the companies, which even plan the annual amount of environmental fines. The country's tax legislation and regulations, including water-related is constantly changing and leaves a room for the interpretations. The examples of inconsistent opinions between local, regional and national tax authorities are not unusual (Nostrum Annual report, 2018). Moreover, according

to the director of the association of mining and metallurgical companies of Kazakhstan, there is no clear explanation to the public about the reasons of annual growth of the number of environmental fines paid by the companies. This growth might be associated with the increase of emission, while in fact, it often can be explained simply by the increased rates (AGMP website). Another proposal promoted by the Association is the reconsideration of the methods of economic assessment of environmental damage. For example, currently exceeding emission standards by 0.1% is legally counted as the same damage as exceeding by 1000% (Umarova, 2016). Finally, the last financial barrier relates to the lack of incentives provided by the government to encourage the introduction of best available technologies (BAT). This barrier is similar to the first one, however, it is broader and covers the other financial and non-financial incentives and leverages from the government (not only fines), like tax and charges preferences, methodological and practical support to the companies.

The next group of barriers has a common underlying feature – the lack of awareness and understanding. The first example is basin agreement, which was offered to the private sector, and especially big industries with significant impact as a mechanism of joint planning and involvement in watershed improvements. However, there is no general understanding of how to deal with this instrument, what benefits it entails and problems can address. There are few examples of the application of simplified versions of such agreement, which are basically targeting some specific events that the akimats want the firms to fund (Interviewee 4, 22 April 2019). No examples behind that scope are yet implemented in country after 15 years since the introduction of this instrument. The respondents also noted the lack of the written procedures for application of basin agreement and other instruments. The new mechanisms are added to Water and Environmental Codes but the detailed guideline for each step and different aspects of implementation are missing and leave too much space for interpretation. Another barrier is based on the lack of awareness of the advantages of establishing environmental management systems (EMS) in organisations. The ISO 14001 certification like in most parts of the world is still a voluntary tool. However, in Kazakhstan, there are practically no incentives for the companies to set up the EMS systems. The number of companies that implemented the systems is low, and they still do not see the direct benefits of getting ISO 14001 certification.

The lack of coordination between the authorities in different sectors and levels is a common situation not only for water management. The water and environmental legislation and regulation to the same extent as the tax one are still evolving and continue to be the subject of regular modifications. Thus, the inconsistency of the interpretation of this regulation in the context of lack of coordination and ongoing changes is a coherent outcome of the overall governance system. The situation is complicated by another barrier in a policy and regulation domain, which is a lack of assurance on environmental issues. The penalties and procedures of violation are relatively well described. However, there is no policy documentation with compliance assurance goals and strategy of the state (UNECE Review, 2019). The “inspection” is the main instrument of monitoring over environmental compliance. The companies are informed about the inspections in advance, which make it easier to make invisible some of the violations.

The flaws in the monitoring system are not limited by the way the inspections are organised, but also occur in the collection of information. There is a lack of institutional capacity and financial resources to collect information about groundwater. According to UNECE strategical environmental assessment (2017), the political and social processes in country have obscured the problems of groundwater management to the long-term plan and perspective, which complicates the assessment of the scale of current contamination. Even when proper assessments were conducted, like in case of IBRD project, which invested in such assessment in Ural basin in the area close to Kazzinc operations. At the time of the project’s closing, the government took the responsibility to allocate budget for remediation measures after the

removal of the industrial dump. Although the project raised the attention and recognition from the local authorities, it failed to receive the formal commitment from the city authorities to continue the contamination analysis on the regular basis with the provided equipment and trained staff (IBRD Implementation report 2017). Another barrier can be related to the internal institutions of the companies. The composition of the Board and the presence of local representatives in the top management is also an important and underestimated factor in companies' decisions on the sustainability approach. There are many examples similar to Södra Cell Mörrum in Sweden (pulp production plant), where the Boards' members and shareholders are mostly the members of the local communities and are primarily interested in the protection of the local ecosystems for the next generations. The main motive in the introduction of sustainable production is to preserve the natural goods for their descendants (personal communication, October 2018). In Kazakhstan companies often are simply not interested in building the long-term partnership with local stakeholders and communities in particular. They do not count for the long-term mutually beneficial co-existence, but rather the short-term and immediate monetisation of the natural resources ignoring the future generations' health and wellbeing.

Drivers

The compliance with environmental regulation remains the biggest driving force for the changes in water management (Interviewee 3, 15 April 2019; Interviewee 4, 22 April 2019). This driver can be applied to all case studies. Two out of five companies (Nostrum and Kaz Minerals), which listed on the international stock exchange demonstrated better sustainability reporting. Moreover, the water issues are better presented in the strategic plans of these companies. The green tendency occurring on the international market have a negligible impact on the national companies unless they become more public, have international contracts and foreign shareholders. However, it is also important to distinguish between environmental performance and the reporting system, which are not always coherent.

The cases of Kazakhmys and Kazzinc showed the possibilities of local environmental activism. The environmental NGOs and local activists attracted attention to the problems caused by the operation of the corporations, which could contribute to better engagement of the company with basin councils (Interviewee 2, 14 February 2019; Interviewee 4, 22 April 2019). Finally, climate change risks are already included in the strategy of Nostrum for 2019 and appear in other companies' documentation.

The fluctuations of seasonal temperature are making an operating environment harsher and cause both physical disruptions due to changing weather conditions and changes in regulation and insurance policy, as well as the changes in demand for fossil fuel in general.

The findings of the research apply to Carrol's (1979) view of CSR, which is based on societal expectations. The societal demands in the country are very low in this regard, which determines the behavioral attitude taken by corporations to responding. Based on the stakeholder theory, it was assumed that business top management has certain duties to promote the interest of all stakeholders in the scope of its impact. However, the duties of some stakeholders appeared to be seen as more important than the duties of other stakeholders. Thus, sometimes, and in the case of this research, the findings conclude "the lesser interests of more important stakeholders take precedence over the greater interests of less important stakeholders" (Carson, 1993).

6 Conclusions

6.1 Main conclusions of the study

The last section presents the conclusions from the research in relation to the overarching research question. It also describes how this study contributed to the identified research gap, provides some general recommendations, and outlines suggestions for future research.

Approaching the main research question ‘What is the role of the private sector in sustainable water management in Kazakhstan?’, the level of current engagement was defined in the answers obtained through Research Question 1: the case study object demonstrated generally a low level of engagement at operational level, and low and moderate level of participation in watershed management, though the cases varied in some parameters significantly. The answers for Research Question 2 summarised the reasons for the current state of involvement and provide some insights on the recommendation for the audience.

The operational level, being the only one parameter regulated by the state yielded the relatively even results for five cases, four of which have “somewhat weak” level of engagement, and one was not available for analysis due to lack of open information. Most of the reviewed companies continuously pay the environmental fines for exceeding the permitted level of discharges and polluting the environment. However, the companies cannot be classified as non-conformants in a common understanding of this term (Orsato, 2006). The research revealed the flaws and inconsistency in current water-related regulation, which is also a subject of ongoing changes.

At the “watershed” and “stakeholders” level, the engagement varies the most. The wide variability among answers was explained in the research by two factors: the lack of details and procedures on the application of such watershed management instruments as basin agreement from one side; the lack of sustainability agenda in strategies of the companies, from another. The facts of pollution events within watersheds were detected in each case study.

The involvement with the local communities was defined as “weak” and “somewhat weak”. The low engagement by this parameter is explained by the immaturity of CSR phenomenon in the country, as well as the dominating role of the local public authorities as a CSR agenda setter and intermediary actor between local communities and firms. The involvement of companies in water policy is “somewhat weak”. This explained in the research by the membership of three case study objects in a mining association to promote the interests of the companies at the policy-making level. However, there was no evidence found on strong formal policy engagement from private companies in the country. The transparency parameter can be also characterised differently depending on each case study. The overall transparency level was observed higher in the companies, which are cross-listed on different stock exchanges, which have various requirements for sustainability reporting and put more obligations for disclosure accordingly. This is a factor indicating on the positive externality of the globalisation process on environmental disclosure. However, the research also concludes that one should differentiate the reporting system from the in fact performance and environmental impact, which are not always coherent.

Certain factors have been registered as important drivers and barriers in relation to the defined status of engagement. The reviewed companies revealed the lack of written procedures and overall support from the government; inconsistency in interpretation of regulation between different authorities; constantly evolving regulation; frequent changes in norms and charges rates; lack of commitment from local akimats and remediating measures ensured by the state;

lack of policy and strategic goals in relation to industrial water impact to be the most important barriers for better corporate water stewardship. The identified success factors for greater involvement included compliance with a regulation; listing on the international stock exchange; emerging environmental management instruments on the market; local environmental activism; and climate change. The observed factors affecting the degree of engagement with sustainable water initiative had strong coherence with findings from the literature review, and expert interviews. Should the government of Kazakhstan enhance the involvement of business in sustainable water management, it needs to cover the identified flaws in regulation and develop a comprehensive policy for corporate water stewardship, as well as to set the detailed written procedures for introduction of the respective instruments (basin agreements, BAT, unified disclosure forms etc.).

6.2 Suggestions for future research

This study found significant evidence that sustainable water management is a prerequisite for dealing with upcoming water challenges caused by climate change and anthropogenic impact. There is a growing number of international initiatives on sustainable corporate performance and relevant studies by international organisations and think tanks. However, there is still room for enquiry on the applicability of these global initiatives in the context of less developed countries. Further research could be undertaken to conduct more corporate stewardship studies in other regions historically lacking traditional market mechanisms, and where the governance system differs from the European countries, which typically benchmark in environmental corporate responsibility. Therefore, the study could be expanded to other geographic areas. In regard to Kazakhstan, the current study focused on the private companies' involvement, while mining and fossil fuel sectors are to a larger extent represented by the state-owned corporations. The further research could examine the consistency between state-produced policy and strategies defining the future direction of economic and social development and compliance with these documents, goals, and philosophy from the state-owned extractive corporations. The future study could provide the investigation or pathways to facilitate uptake of the sustainable water management or sustainable development of the country. The scattered efforts of the companies need to be systematised through the solid policy framework and regulations. The future studies addressing the possibilities to unify and systematise the private sector engagement and disclosure in water management could bring value to both the public and private sector.

The exploration of the water-related CSR activities brought up the questions on general application of CSR concept in the country. The studies on how the private companies impact the uptake of CSR in emerging economies will be a valuable area for researcher to pursue. Another direction for study can grow from the identified driving forces for Kazakhstan, which is a listing on the international stock exchanges. The investigation on the implications of globalisation on different aspect of water management and corporate performance could be an interesting topic for future studies.

Furthermore, the current research focused on the investigation of companies' perspectives. While, the positions of the public sector in relation to business, as well as the level of public awareness and environmental demands in society could be considered through interviews with these stakeholders and provide some more insights on the corporate stewardship situation. There is an observed lack of analysis of water regulation, which inconsistency and existing gaps serve as one of the identified barriers for business. Thus, the research on water policy and regulation, and its implementation would bring great value to both academia and professionals in the area. The studies in this direction can be oriented on the development of

practical recommendations for the government on how to get business onboard in the pathway towards sustainable development of the country.

6.3 Final reflections and recommendations

Sustainable watershed management includes various issues, which are complex and often local by their nature. As such, there is no one general approach to existing challenges. The scope of corporate responsibility as one of the drivers for sustainable water management can be defined differently depending on the conceptual basis of the research. This study aimed to consider different aspects of sustainable water management and define the appropriate water and environmental responsibility of the firms. Different aspects required a different theoretical approach. Thus, the material reviewed in this study indicates that CSR is the most relevant concept to assess the ‘engagement with the local community’ parameter. The stakeholder theory provided the lenses for reviewing of ‘stakeholder cooperation’, ‘watershed management and planning’ aspects. The elements of public partner opportunism helped to look at the public-private collaborations in a form of basin agreements. The context of corporate engagement is determined by the general availability of water resources, low costs of use and discharges.

This research has attempted to coordinate and bring together several pieces of knowledge from quite a disparate body of literature. First, literature about sustainable water management sets the scene to adequately scope the interaction between the private sector and other stakeholders. The research then drew water legal and regulatory frameworks that operate in Kazakhstan in relation to the private sector. That delivered contextual knowledge on the flaws in penalties system, ongoing changes as a barrier for business and existing inconsistencies in implementation of the regulation. Finally, the study explores evidence of the engagement of firms with sustainable water management based on the five case studies. The main contribution to knowledge, which could be valuable within the context of evolving water policy in Kazakhstan, is that this research synthesises academic and practice-oriented studies found in Kazakhstan and other countries within the corporate water stewardship area. It places sustainable water management in the specific context of Kazakhstan – in essence a country that is going through the transition from the Soviet system to a market based economy, and where the instruments of corporate water stewardship (developed in western countries) should be applied with respect to this specificity of the country’s economy and governance system. Such synthesis study was not done before and contributes to the attracting of public attention to the topic, and, therefore, additionally brings value to the awareness-raising for the wider audience in the country.

If there is truly a desire to achieve the better engagement of the private sector and impose the environmental responsibility, the recommendation for the national and regional level authorities would be to better coordinate the work of the state executive bodies of different level and sectors. The government should provide methodological and practical support to the firms. The first step towards better involvement is the clarity of all available mechanisms and written procedures for all types of engagement. The “rules” of such engagements should be coherent to regulation and state policies, described in details and be in open and easy access for business. In essence, this work has shown there is great value in achieving cooperation between public and private sectors. However, if the government wants to increase the role of business in water management, then the national policymakers must develop the special policy with the strategic vision of corporate environmental responsibility and concrete goals for the country.

Moreover, if the higher level of transparency in water management is to be achieved, then the definitions of the incorporated and emerging concepts and tools like “water footprinting” “corporate stewardship” and others will be required to be unified for the country and promoted among the companies. Kazakhstan is a signatory to the Aarhus Convention, but does not comply fully with the intent due to the weak local institutions, too complex procedures and lack of public involvement. A better compliance with the intent from the government would make the impact data more available and, therefore, would ‘encourage’ stakeholders to pressure industry for better performance. From another side, the government is expected to take more responsibility for remediation measures of the damage caused by the industries. Currently, even when polluter is identified and the fine is paid, there is still no guarantee from the government that these funds will be spent on remediation measures. There is no regulation on sustainability reporting. However, the government could develop the unified reporting criteria for the companies operating in the country. This would also help to better measure and communicate the water-related information to other interested parties.

If business chooses the strategy of more profound engagement in sustainable water management addressing global trend of the emerging demand for this, more detailed assessments of the current water situation in the operating areas must be undertaken possibly in cooperation with academia. This would allow better corporate accounting and a better understanding of the local concerns for more inclusive decision making. Moreover, such studies can also drive the public enquire of the industrial impacts and contribute to the formation of public pressure for better environmental performance. In addition, as it was observed in the study, in order to achieve the better involvement, the government must provide the encouraging mechanisms for the introduction of environmental management system and international certifications, which in practice entails better water management in a company.

Overall, sustainable water management does not go much beyond the requirements set by the government. The proactive water strategies are still perceived as an alternative agenda, while the investments in sustainable water management are seen as a burden, rather than a beneficial for the company approach.

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Appendix 1

The list of the interviewees

Respondent	Organisation	Means and date of communication
Interviewee 1	Independent Industry Expert and Economic Geographer	Facebook messenger, 25 January 2019
Interviewee 2	Secretary of Balkash Alakol Basin Council and Water counselor of the Kazahmys corporation	Skype, 14 February 2019
Interviewee 3	Water Lawyer, co-author of the new Water Code	Skype, 15 April 2019
Interviewee 4	Regional Advisor, Transboundary Water Management in Central Asia, GIZ	Skype, 22 April 2019
Interviewee 5	Emerson, Oil and Gas Exploration & Production Software Company in Kazakhstan	Skype, 5 May, 2019