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Water governance in Jordan: Managing a scarce resource

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Abstract

Water scarcity has become a global concern due to population growth, decreasing water resources, inefficient usage of water resources, impact of climate change and increase in water related conflicts. Therefore, water resources need to be managed in an effective and sustainable way to prevent resulting effects such as poor socio-economic development, decrease in living standard and increased migration due to water related issues. Jordan is one of the most water scarce countries in the world and is challenged by regional conflictual issues of the Middle East and North Africa region, which puts further stress on the Jordanian transboundary water resources. Despite these apparent challenges, Jordan seems to be the most stable country in the region and seems to manage its water resources increasingly effective and sustainable. This thesis aims at researching the water related actions of the Jordanian government, and to uncover the strategies that have been used to increase the effectiveness of water governance systems.

In order to undertake this study, a theoretical framework on global governance and effective water governance has been established, which has been used to examine the water governance in regards to global governance, and thereby highlighting the different levels on which water governance is being implemented and the inclusion of multiple actors in the Jordanian water governance system. Further, serving as a framework of analysis, the OECD Principles on Water Governance on the level of effectiveness enabled to research the performance of water governance systems and the contribution of the principles to achieve tangible objectives.

Through the analysis, it has been identified that the Jordanian water governance is increasingly effective especially in regards to innovating its water sectors to both increase sustainable practices and uphold socio-economic developments. This was realised especially in the most water demanding sector of irrigated agriculture, and the inclusion of strategies to implement new water extraction technologies to advance the continuation of sustainable national development. Moreover, it has to be enhanced that the Jordanian government includes a wide range of stakeholders, especially international and regional actors, which is highly important in managing their transboundary resources and decrease the likeability of conflicts over water resources. Additionally, it was identified through analysis that the Jordanian government received great technical and knowledge support from international organisations, which enabled the implementation of effective water governance. Thus, it may be assumed that these organisations have a high interest in increasing the effectiveness of the Jordanian water governance system, not only to decrease threats of water scarcity such as poor health and economic conditions but as well in order to avoid conflicts and enhance stability in the region.

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List of abbreviations

GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GWP	Global Water Partnership
IWRM	Integrated Water Resource Management
JVA	Jordan Valley Authority
JRPSC	Jordan Response Platform for the Syria Crisis
MENA	Middle East and the North Africa
MWI	Ministry of Water and Irrigation
NICE	National Implementation Committee for Effective Integrate Wastewater Management
NGO	Non-governmental Organisation
NWIS	National Water Information System
OECD	Organisation for Economic Co-operation and Development
PMU	Programme Management Unit
RSDSCP	Red Sea-Dead Sea Conveyance Project
SDG	Sustainable Development Goal
SMART	Sustainable Management of Available Resources with Innovate Technologies
UN	United Nations
UNDP	United Nations Development Programme
WAJ	Water Authority of Jordan
WASH	Water, Sanitation and Hygiene
WDMU	Water Demand Management Unit
WUA	Water Users Associations

Introduction

Water is the essence of life of any form. Access to safe drinking water is indispensable to sustaining healthy life and fundamental to preserve the dignity of human beings. The United Nations (UN) recognised this by declaring safe drinking water and sanitation as a basic human right and moreover, by advocating the "availability and sustainable management of water and sanitation for all" as being the Sustainable Development Goal 6 (SDG) (UNESCO, 2019: p 35; sustainabledevelopment.un.org). Only 3% of the planet's water is consumable freshwater, of which just 1.5% is accessible as the rest is enclosed in glaciers or deep aquifers (gwp.org). Caused by the combination of population growth, changing consumption patterns and socio-economic development the worldwide water use has increased significantly since the 1980s. Water demand is expected to continue to rise at a high rate, and it is projected that this will lead to an increase of 20-30% of water use above the current level by 2050. Currently, over 2,1 billion people live in circumstances where they experience high water stress, and approximately 4 billion people are affected by severe water scarcity during at least one month a year. Population growth represents a powerful driver for increasing water demand, as this growth may result in increased direct water demand, such as drinking water and sanitation, and increased indirect water demand, for example rising demands for water-intensive services and goods (UNESCO, 2019: p 1 & p 35). This constant demographic growth leads to a corresponding economic development, which puts extraordinary pressure on water resources, especially in the agricultural sector, accounting for about 70% of the water usage worldwide. Another aspect that is intensifying the current freshwater scarcity is climate change, which "is predicted to bring about increased temperatures across the world in the range of 1.6°C to as much as 6°C by 2050. For each 1 degree of global warming, 7 percent of the global population will see a decrease of 20 percent or more in renewable water resources" (fao.org). Furthermore, it is estimated that if the degradation of the natural environment and the unsustainable pressures on global water resources continue, 52% of the world's population, 45% of the global gross domestic product (GDP) and 40% of global grain production will be at risk by 2050. Additionally, climate change leads to increased water-related natural disasters, such as severe droughts and floods, which affect thousands of people around the globe. These frequent droughts have a great impact on agricultural production and simultaneously, rising temperatures lead to increased crop water demand (UNESCO, 2019: pp 14-17; fao.org). Thus, without safe and accessible water and sanitation, challenges arise such as poor health and living conditions and a lack of opportunities for education and employment. Furthermore, water stress can be associated with social unrest, conflict and violence, resulting in migration and human

displacement (UNESCO, 2019: p 1 & p 35). Conflicts in which water plays a role as trigger, weapon or casualty, can erupt due to diverse factors, such as territorial disputes, competition over resources, and political strategic disadvantages. Such conflicts rose from 94 in 2000-2009 to 263 in 2010-2018. Admittedly, these numbers must be interpreted with caution, as the awareness of such incidents increased, nonetheless, they do highlight the rise of water-related security issues (UNESCO, 2019: p 17).

The Middle East and North Africa region (MENA) is the most water stressed region worldwide, with an average of only 736 m^3 water per person/year, compared to the world average of 7,453 m^3 per person/year (UNESCO, 2019: p 129). It is an arid region with low precipitation, which makes water scarcity a major economic, political and social issue that not only affects the internal affairs of national states, but also must be seen as a transboundary problem, as two-thirds of the renewable surface water is of transboundary nature (Hussein, 2017: p 40). The already complicated characteristics of the water scarcity issues in the MENA region is increased by the several conflict settings the region is challenged by, in the course of which water infrastructure has been damaged or destroyed. Ensuring access to water services for all under such conditions represents a great challenge (UNESCO, 2019: p 130).

Jordan is one of the most-water stressed countries worldwide, which is caused by the aforementioned region-specific factors, such as aridity and low precipitation, climate change, a high dependence on transboundary water resources, unsustainable agricultural water use and population growth (Hussein, 2017: p 44; Gorelick & Padowski, 2015). Moreover, the water scarce situation in Jordan is continuously increasing due to the incoming refugees. Over the last decade more than 1,4 million refugees crossed the Jordanian borders, most of them driven by the escalating conflict in Syria. Presently, refugees account for approximately 15% of the country's population, stressing the Jordanian resources. Furthermore, Jordan's main water resources stem from the transboundary Jordan River Basin, which is located in an increasingly conflicted area with internal and cross-boundary conflicts between the riparian countries Syria, Israel and Palestine. Despite agreements among the riparian countries to manage water equitably, both Syria and Israel have retained significant control over water resources of the rivers leading to the Jordan River Basin. A treaty between Jordan and Israel from 1994 regulated the allocation of water between the states, however, Israel has broken the agreement in several occasions. Currently, Jordan, Israel and Palestine are trying to alleviate political obstacles in the transboundary water allocation by enforcing the Red Sea-Dead Sea Conveyance Project (RSDSCP), which aims at co-operating on maintaining the Jordan River Basin through the connection and allowance of water to flow from the Red Sea to the Dead Sea and further to

increase water resources through building a desalination plant. However, the RSDSCP is not without controversies and is still at an early stage (Rajeskhar & Gorleick, 2017: p 1; Yasuda et al., 2017: p 26).

The way in which transboundary water resources are managed is vital to promote peaceful co-operation and reaching sustainable development. Not only conflicts over water shares, such as the ones Jordan has with its neighbouring countries, require co-operation, but as well in order

> *"to deal with the impacts of climate change combined with the demands of increasing populations and economic growth requires a supranational, integrated approach to transboundary water resource management based on legal and institutional frameworks and shared benefits and costs"* (unwater.org).

Only through the effective governance of water resources and of water dependent sectors on a supranational-level, sustainable development within and beyond a country's border can be achieved (unwater.org). Acknowledging that water scarcity is an issue on the global-level and the need to manage water resources and water demanding sectors makes it an issue of global governance, which refers to "the exercise of authority across national borders as well as consented norms and rules beyond the nation state, both of them justified with reference to common goods or transnational problems" (Zürn, 2018: pp 3-4). The Organisation for Economic Cooperation and Development (OECD) outlines several intrinsic characteristics of the water sector, which make it highly sensitive and dependent on multi-level governance. Such characteristics include the issue that hydrological boundaries and administrative perimeters often do not coincide, the plethora of actors that is affected and must be involved into decision-making processes and that water policy is highly complex and strongly connected to other domains, which are critical for a sustainable development, such as health, energy and poverty alleviation. The UNESCO and the OECD argue that in order to reach the successful implementation of effective water governance policies, the implementation of good governance is decisive, which draws upon the principles of transparency, accountability, rule of law, human rights and inclusiveness (UNESCO, 2019: p 158; OECD, 2015: pp 4-5). Consequently, the importance of water-related issues cannot be underestimated, and as the UN phrases it,

> *"water is at the core of sustainable development and is critical for socio-economic development, energy and food production, healthy ecosystems and for human survival itself. Water is also at the heart of adaptation to climate change, serving as the crucial link between the society and the environment"* (un.org - water).

Considering this mentioned importance of water and the global threat of water scarcity, it is the purpose of this thesis to contribute to the research on the effective governance of water. Jordan represents a unique case, as it is one of the most water scarce countries in the world, facing not only pressures resulting from climate change but being increasingly stressed by its location in a conflict-stricken region, which results in population growth due to incoming refugees and conflicts over transboundary water resources. Taking into account the importance of the effective management of water resources for a global sustainable development and the unique position Jordan inhabits in regards to this issue, the following research question of this thesis emerges:

Which factors influence Jordan's water governance and how effective is its governance system in implementing water governance policies?

In order to answer the research question, first, a theoretical framework on global governance theory, based on the approaches of Dingwerth & Pattberg (2006) and Zürn (2018), and effective water governance, based on Rogers & Hall (2003) and Pahl-Wostl et al. (2008) will be established. Hereafter, the OECD Principles on Water Governance concerning the effectiveness of water governance policies will be presented as framework for analysis. In the chapter of analysis, the Jordanian water governance system and its actions will be analysed with the theoretical framework and according to the OECD Principles on Water Governance. Concluding, the findings of the analysis will be discussed in regards to the attributes and criteria of effective water governance.

Methodology chapter

Research Method and Design

The research design of this thesis draws upon empiricist tradition. Empiricism enhances the importance of natural science research into the social sciences, as it is based upon the broad assumption that knowledge can be collected through experience and observation. This also refers to the assumption that international relations should be studied as a social science, and should therefore be studied in a systemic, replicable and evidence-based manner. The used theories in such a research design, should thus seek to observe and explain behaviour while also testing falsifiable hypothesis derived from observations of empirical facts (Lamont, 2015: p 19).

In this thesis, the research topic focuses on Jordan as being one of the most water scarce countries in the world. In an attempt to narrow this broad topic, emphasis will be put on Jordan's water governance in order to understand which factors influence Jordan`s water governance and how effective the implemented system is. The research question takes an empiricist stand and seeks to uncover and explain Jordan's water governance using the theory of global governance with an emphasis on water governance. The purpose is to analyse the dependent variable of Jordan's water governance, in regards to both independent variables, which can be identified using the chosen theory, and identifying explanatory variables, by observing a range of factors, rather than isolating single events to explain Jordan's water governance (Lamont, 2015: pp 34-35). Moreover, this study includes the OECD Principles on Water Governance as framework of analysis. As one of the dimensions of the Principles focuses on the effectiveness of water governance policies, this enables an elaborate analysis of the effectiveness of the governance system, its actions and policies in Jordan and therefore substantially contributes to answer the research question.

Collection and choice of data

Qualitative research methods will be used for the collection of data. Qualitative methods refer to the collection and analysis of non-numeric data, and seek to acquire a better understanding of meaning and processes that constitute international politics (Lamont, 2015: p 78). This type of method consists of tools and resources, which will enable to collect and analyse data of both written and spoken sources and will rely on inductive reasoning. Inductive reasoning refers to generating theoretical propositions out of empirical observations. This thesis will mainly be collecting qualitative data, such as internet-based data, grey literature, official documents and media sources. Using internet and academic sources will give access to traditional academic material such as journals, articles and books. Moreover, internet-based research will enable the gathering of large amounts of information on the research topic, however it is important to be critical to the sources and publicists of this information. Gaining access to official documents will allow to analyse governance structures as well as acquiring access to information about water-related matters of both internal and external happenings in regards to the research topic.

This thesis will be using both primary and secondary sources. Primary sources will include grey literature produced by organisations such as the OECD Principles on Water Governance, used as framework of analysis in this thesis. Further, knowledge on Jordan's governance system will be gained directly from the government's online platform. Secondary sources will be used to gain further information on Jordan, the governance system and

evaluation of the functioning of Jordan's water governance. Media sources will also be included to strengthen the evaluation of Jordan's governance system, the state of the water scarce situation and current political developments.

Limitations

In order to conclude on the research question of this thesis, it is important to gain access to information on Jordan's water governance. Thus, there are a number of limitations associated with this thesis. When relying on document-based data, the access to reliable resources and certain information can be limited, due to restricted admission. Moreover, the decision to not conduct interviews increases the dependency on data-collection through the internet, documents and media. These aspects pose the main limitation to this thesis.

Moreover, the use of qualitative data has its limitations compared to using quantitative method. Quantitative research method enables to look at so-called data aggregation such as statistics and mathematics, and large datasets (Lamont, 2015: p 98). Using qualitative data, this thesis faces the limitation of not including the direct consequences of Jordan's water governance in regards to calculating developments in water levels and consumption patterns.

Choice of Theory

In order to conduct a solid analysis and to answer the research question, a profound theoretical framework has been established with the combination of different approaches to global governance theory and effective water governance. In order to enable the usage of a solid theory on global governance, the approaches of Dingwerth & Pattberg, in their paper *Global Governance as a perspective on World Politics* (2006), and Zürn in his publication *A Theory of Global Governance: Authority, Legitimacy, and Contestation* (2018) have been combined. The combination of these two theories enables a comprehensive approach on global governance and the inclusion of water governance being one of the spheres of global governance, which is why they are highly suitable to be applied in this thesis. The theoretical framework has its offset in the theory on global governance, as proposed by Dingwerth & Pattberg. The authors base their theory in the approach established by Rosenau, which can be seen as one of the first and increasingly recognised approaches to global governance (Weiss, 2000: p 796). According to this theory, global governance is based on the four constitutive elements of (1) system of rule; (2) levels of human activity; (3) pursuit of goals; and (4) transnational repercussion. This enables the analysis of goings-on in global governance focusing on the four mentioned elements. Following, the theory presented by Zürn with its three layers of (1) normative

principles; (2) specific institutions; and (3) interactions between authorities, the focus of the analysis can be broadened. Further, it enables the analysis of behavioural implications and the determination whether actions by society or institutions lead to a deepening or a decline in governance activities. Thus, the combination of the two theories facilitates to analyse goings-on and its implications in global governance from diverse perspectives and on different layers. In addition to the theory of global governance, the theory of water governance is crucially important for this thesis. As global governance theory highlights, activities in global governance are sectorally defined and water is one of those spheres of activity. The combination of the approaches *Effective Water Governance* by Rogers & Hall (2003) and *Governance and the Global Water System: A Theoretical Exploration* by Pahl-Wostl et al. (2008) enables the analysis of water governance in regard to its multi-actor perspective and its inclusive approach. Furthermore, they highlight the important issue of different forms of governance as these shape and influence the way of implementing policies. This theoretical framework will enable the analysis of Jordan's water governance in regards to the different levels water governance is performed on, considering the plethora of actors that are engaged in activities related to water. Furthermore, it will facilitate the analysis of Jordan's actions and implementation in regards to water governance and therefore enables to answer the research question of this thesis.

Framework of analysis

The OECD Principles on Water Governance, as adopted by the OECD Regional Development Policy Committee on 11 May 2015 and welcomed by Ministers at the OECD Ministerial Council Meeting on 4 June 2015, will be used as the framework of analysis for this thesis. The Principles on Water Governance present a framework, which enables the understanding of whether water governance systems are performing in an optimal and effective way and, if necessary, help to adjust those systems and therefore enable to answer the research question of this thesis.

In order to overcome challenges that water governance faced previously, the Principles target to achieve measurable objectives in pre-determined and time-scheduled at an appropriate scale, that rely on a clear assignment of duties across responsible actors, that are regularly monitored and evaluated. Further, the Principles contribute in achieving tangible and outcome-oriented public policies, which are based on the three mutually reinforcing and complementary dimensions of water governance: effectiveness, efficiency, and trust and engagement (OECD, 2015: pp 3-4). Moreover, the Principles are rooted in the concept of good governance, which is explained in the theoretical framework. If acting according to the Principles, water governance

systems are enabled to manage their water resources "in a sustainable, integrated, and inclusive way, at an acceptable cost, and in a reasonable time-frame" (OECD, 2015: p 5). Water governance is considered to be successful if the applied policies can help to solve key challenges, using a combination of top-down and bottom-up processes while simultaneously fostering constructive state-society relations. The Principles enhance a problem-solving approach by designing the governance systems according to the challenges they address. Hence, structuring, institutionalising, and/or formalising institutions should not push into the background the "ultimate objective of delivering sufficient water of good quality, while maintaining or improving the ecological integrity of water bodies" (OECD, 2015: p 5).

For the purpose of this study, this thesis will focus on the Principles that are covered by the dimension of effectiveness. The following table presents the dimension of effectiveness as formulated in the OECD Principles on Water Governance:

Table 1: The OECD Principles on Water Governance

Enhancing the effectiveness of water governance: relates to the contribution of governance to define clear sustainable water policy goals and targets at all levels of government, to implement those policy goals, and to meet expected targets.	
Principle 1: Clearly allocate and distinguish roles and responsibilities for water policymaking, policy implementation, operational management and regulation, and foster coordination across these responsible authorities. To that effect, legal institutional frameworks should:	
a)	Specify the allocation of roles and responsibilities, across all levels of government and water-related institutions in regard to water • Policy-making, especially priority setting and strategic planning. • Policy implementation, especially financing and budgeting, data and information, stakeholder engagement, capacity development and evaluation. • Operational management, especially service delivery, infrastructure operation and investment. • Regulation and enforcement, especially tariff setting, standards, licensing, monitoring and supervision, control and audit, and conflict management.
b)	Help identify and address gaps, overlaps and conflicts of interest through effective coordination at and across all levels of government.
Principle 2: Manage water at the appropriate scale(s) within integrated basin governance systems to reflect local conditions, and foster co-ordination between the different scales. To that effect, water management practices and tools should:	
a)	Respond to long-term environmental, economic and social objectives with a view to making the best use of water resources, through risk prevention and integrated water resources management.

b)	Encourage a sound hydrological cycle management from capture and distribution of freshwater to the release of wastewater and return flows.
c)	Promote adaptive and mitigation strategies, action programs and measures based on clear and coherent mandates, through effective basin management plans that are consistent with national policies and local conditions.
d)	Promote multi-level co-operation among users, stakeholders and levels of government for the management of water resources.
e)	Enhance riparian co-operation on the use of transboundary freshwater resources.
Principle 3: Encourage policy coherence through effective cross-sectoral co-ordination, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning and land use through:	
a)	Encouraging co-ordination mechanisms to facilitate coherent policies across ministries, public agencies and levels of government, including cross-sectoral plans.
b)	Fostering co-ordinated management of use, protection and clean-up of water resources, taking into account policies that affect water availability, quality and demand (e.g. agriculture, forestry, mining, energy, fisheries, transportation, recreation, and navigation) as well as risk prevention.
c)	Identifying, assessing and addressing the barriers to policy coherence from practices, policies and regulations within and beyond the water sector, using monitoring, reporting and reviews.
d)	Providing incentives and regulations to mitigate conflicts among sectoral strategies, bringing these strategies into line with water management needs and finding solutions that fit with local governance and norms.
Principle 4: Adapt the level of capacity of responsible authorities to the complexity of water challenges to be met, and to the set of competencies required to carry out their duties, through:	
a)	Identifying and addressing capacity gaps to implement integrated water resources management, notably for planning, rule-making, project management, finance, budgeting, data collection and monitoring, risk management and evaluation.
b)	Matching the level of technical, financial and institutional capacity in water governance systems to the nature of problems and needs.
c)	Encouraging adaptive and evolving assignment of competences upon demonstration of capacity, where appropriate.
d)	Promoting hiring of public officials and water professionals that uses merit-based, transparent processes and are independent from political cycles.
e)	Promoting education and training of water professionals to strengthen the capacity of water institutions as well as stakeholders at large and to foster co-operation and knowledge-sharing.

(OECD, 2015: p 3 & pp 8-10).

The analytical framework of the OECD Principles and the presented theoretical framework on global governance theory and effective water governance enables a profound analysis of the effectiveness of the water governance pursued by the Jordanian government and will therefore facilitate to answer the research question. In the following chapter, an analysis on the effectiveness of the Jordanian water governance according to the OECD Principles on Water Governance will be conducted.

Theoretical framework

In the following chapter, a solid theoretical framework will be presented on global governance theory and the concept and theory of effective water governance.

Global Governance Theory

When studying global governance, it is evident to realise that it is both manifold and controversial. According to Dingwerth & Pattberg this "stems mainly from the fact that the concept is evoked not only where governance in the sense in which it has been introduced in political theory is at issue, but also in a variety of further contexts" (2006: p 188).

In order to establish a precise theory on global governance, it is important to firstly understand both terms. The adjective global can relate to two different domains, that are the (1) top-level scale of human activity and (2) the sum of all scales of activities. There is no single definition of governance, but the important themes coincide among the diverse approaches. The United Nations Development Programme (UNDP) gives an elaborate definition:

> *"Governance is the exercise of economic, political and administrative authority to manage a country's affairs at all levels […] it comprises the mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences"* (2001 as in Rogers & Hall, 2003: p 9).

Hence, governance is more inclusive than government, being the main decision-making political entity. It embraces the relationship between a government and the civil society. Generally, governance involves mediating practices through norms and values and simultaneously includes laws, regulations and institutions as well as government policies and actions, including international markets, the private sector and non-governmental networks (Rogers & Hall, 2003: p 4). It can be stated that "governance refers to governing with and through networks" (Rhodes, 2007: p 1246 as in Woodhouse & Muller, 2017: p 230). Governance deals with the way in which "allocative and regulatory politics are exercised in the

management of resources such as natural, economic, and social and broadly embraces the formal and informal institutions by which authority is exercised" (Rogers & Hall, 2003: p 7), as it balances diverse interests while facing political realities. Another key element of governance is the creation of an institutional and administrative framework within which actors from different backgrounds and with different interests can discuss, co-operate and co-ordinate their actions (Rogers & Hall, 2003: pp 8-9).

In accordance to the previous definitions of global and governance, global governance can be defined as referring to "the exercise of authority across national borders as well as consented norms and rules beyond the nation state, both of them justified with reference to common goods or transnational problems" (Zürn, 2018: pp 3-4). Dingwerth & Pattberg follow Rosenau's (1995) global governance theory to a large extent. The analytical approach of global governance theory attempts to capture the reality of contemporary world politics and has four constitutive elements: (1) systems of rule; (2) levels of human activity; (3) pursuit of goals; and (4) transnational repercussions. The first element, systems of rule, refers to a state where "a number of mechanisms are in place that relate to each other and that regulate or have an impact on the norms, expectations, and behaviour of the relevant actors within the regulated area" (Dingwerth & Pattberg, 2006: p 190). Even in the absence of established legal or political authority these systems of rule can be maintained and work efficiently (Rosenau, 1995: p 15). Further, the theory on global governance allows to recognise the emergence of new spheres of authority independently of sovereign nation-states. It is therefore possible to include private authorities that result out "of new steering mechanisms that differ from hierarchical domestic decision making or nonhierarchical interstate bargaining" (Dingwerth & Pattberg, 2006: p 193). The levels of human activity, being the second element, emphasise that the systems of rule exist at the local, subnational, national, international, and transnational-levels. Additionally, global governance knows no geographical, social, cultural, economic or political boundaries (Rosenau, 1995: p 15). Therefore, global governance theory has to be applied from a multi-actor perspective, which means that it does not aim at establishing any kind of hierarchy but considers the plethora of actors in global governance as equal. It needs to be considered that those different policy levels and actors are interdependently linked to each other, which helps to understand how different spaces and levels of the system interact (Dingwerth & Pattberg, 2006: pp 190-192). The third element, the pursuit of goals, determines that interactions between different actors can only be perceived as being part of global governance if they are intentionally directed at pursuing certain goals. These can be individual or collective goals. This in turn means that most of the processes that are not intentional cannot be considered as being a part

of global governance. The final element, transnational repercussions, constitutes a restrictive rather than a broadening element of global governance, as the third element already includes different levels of human activity (Dingwerth & Pattberg, 2006: pp 189-193).

Dingwerth & Pattberg highlight two strengths that global governance theory has compared to other theories in international relations. First, it does not restrict the analysis of international or transnational goings-on but enables to analyse worldwide transboundary interactions among various actors and various policy levels. Second, the theory of global governance highlights a variety of steering mechanisms and spheres of authority, as well those independent from sovereign nation-states, which enables the consideration of the diverse political developments around the globe (2006: p 196). However, as they posit, when applying a theory such as global governance to goings-on in the world politics, it is highly important to bear in mind that world politics are rapidly changing, and that concepts and theories have to be adjusted to those developments (Dingwerth & Pattberg, 2006: p 190). According to Zürn, "the liberal world order and international institutions appear to be much weaker than fifteen years ago" (2018: p 2), which leads him to offer a different approach to a theory of global governance that enables to understand and analyse the increasingly complex and rapidly developing global governance system.

When talking about global governance theory, it is important to point out certain basic assumptions concerning global governance. As stated above, according to Zürn, "global governance refers to the exercise of authority across national borders as well as consented norms and rules beyond the nation state, both of them justified with reference to common goods or transnational problems" (2018: pp 3-4). Global governance is therefore carried out in both international and transnational institutions and encompasses a pluralisation of governance actors. Further, this definition of governance includes the exercise of authority as well as rules and norms that are consented. Shared goals and elements of rule are thus a decisive element of global governance, which goes in line with the previously mentioned elements of systems of rule and levels of human activity. Moreover, Zürn emphasises that global governance always involves the element of publicness, which means that a public authority is needed to be carried out by either a state or a non-state actor. This authority needs to be justified as serving the global common good, even though it has to be considered that justifications for their actions by different actors might not be truthful. This aspect can be seen in close relation to the third element of the pursuit of goals according to Rosenau (Zürn, 2018: pp 4-5).

The global governance system on which the theory of global governance is based upon, consists "of patterns of authority relationships that endogenously produce conflict, contestation, and resistance" (Zürn, 2018: p 6). The rights and duties of actors result out of their position in an emergent normative order, which means that the global governance system is based on several general normative principles and a set of specific prescriptive institutions. Those normative principles and institutions are influenced by hierarchy and rule. Further, global governance encompasses not only institutions that produce regulations but also the interplay and the relationship between those institutions, which in turn are influenced by a wide array of actors. Responsibilities are allocated among the institutions and actors on different political levels. The outcome of actions taken by those actors are justified with a reference to global common goods (Zürn, 2018: p 6). Once more these aspects correspond with the element of levels of human activity as mentioned previously.

The global governance theory, as formulated by Zürn, has three different layers: (1) normative principles; (2) specific institutions; and (3) interactions between authorities. The three normative principles that constitute the first layer of the global governance theory qualify sovereignty. This layer "has a double constituency: states with conditional sovereignty and societal actors with rights to address international authorities" (2018: p 8). Further, global governance theory includes the assumption that a common global good exists, in which global regulations that reduce the autonomy of participating actors are based. Without this general belief, the international authority institutions and actors in global governance would not have any justification to act upon. The condition of an existing justification can be seen closely connected to the above-mentioned element of pursuit of goals. The second layer encompasses a set of specific institutions, which may be international or transnational and that exercise authority on different levels. The actions by those institutions are justified with reference to the normative principles of the first layer. The authority exercised by the institutions can be seen as reflexive authority which is "typically not internalized, but it allows a scrutiny of the effects of the exercise of authority at any time; it does not consist of commands but of demands or requests; and is embedded in sectoral knowledge orders" (Zürn, 2018: p 9). Further, it has to be distinguished between political authorities and epistemic authorities that produce interpretations with behavioural implications rather than decisions to which actors defer directly. All authority at each time require legitimation. The third layer of the global governance system encompasses the interplay of different spheres of authority. Zürn defines spheres of authority "as problem fields that are governed by one or more authorities. The interactions between spheres of authority produce the most important systemic features of global

governance" (2018: p 9). Inter- and transnational authorities need a basis of legitimation to act on. International organisations are often assessed against normative standards and they need justification by reference to common norms (Zürn, 2018: pp 8-10). Moreover, it is important to mention that "different spheres of authority in global governance are only loosely coupled with each other. Inter- and transnational authorities are most often sectorally defined and responsible for a limited set of issues" (Zürn, 2018: p 10). Therefore, the management of cross-sectoral issues is often difficult to execute and can lead to a legitimation problem, which then can increase the weakly established separation of powers in the global governance system. Executive representatives of powerful nation states often serve as the central decision makers in international institutions and show concern about their influence in these institutions. This leads to the fact that the most authoritative international institutions "contain formal mechanisms for ensuring that great power interests are given special consideration" (Zürn, 2018: p 10). This is how, according to Zürn, hierarchy between the global and the national-levels as well as different layers of states, representatives and societies get introduced and inequalities get institutionalised (2018: p 10). Here, Zürn's line of argumentation is highly logical even though it contradicts the argument established by Dingwerth & Pattberg, that there cannot be any kind of hierarchy in global governance as all actors are being seen as equally important (2006: pp 191-192).

In his theory on global governance, Zürn further mentions the impact of behavioural implications. Those are several hypotheses and causal mechanisms that can help to explain developments in global governance. The 'authority-legitimation link' enhances what was previously mentioned, that international institutions with authority require legitimation and explains the different dynamics of state and societal contestation in the global governance system. Societal actors often communicate their contestation via politicization. This involves protest against international institutions by non-state actors at the transnational or national-level. Moreover, politicization involves "utilization of international institutions for specific policy purposes […] and direct support for global governance" (Zürn, 2018: p 12). As a result, it can come to the polarisation of opinions on certain issues that are handled by international institutions and it can lead to mobilisation for or against this issue as well as to a growing perceptibility (Zürn, 2018: pp 11-12). In addition, "contestation by state actors takes place when states demand change in or the dismantling of international authorities" (Zürn, 2018: p 12). States can simultaneously recognise and challenge authorities in the global governance system as they often contest specifically those institutions they have created in the first place, if these take decisions they do not agree with. Another strategy is the counter-institutionalism, which is

when states set up new institutions in order to enforce their current interests by influencing or replacing the old ones (Zürn, 2018: p 12). The outlined contestation strategies can either lead to the decline or the deepening of global governance. International institutions can, in order to regain legitimacy, respond with deepening of global governance when confronted with delegitimation challenges. Strategies of organisations for deepening global governance could be increasing their transparency or the access of transnational actors to the affected organisation even though these actions are often regarded as being rather symbolic. Further, they could enforce more substantial revisions of decisions when being confronted with contestation. In the whole, "societal politicization and counter-institutionalization may lead to substantial reforms whose goal is to overcome institutional weaknesses and deepen global governance" (Zürn, 2018: p 13). However, contestation can as well lead to a decline in global governance, especially when actors are in the position to enforce a deadlock in international negotiations. Furthermore, the previously mentioned strategy of counter-institutionalisation can lead to an overall weakening of international institutions (Zürn, 2018: pp 13-14).

The Emergence of Water Governance

Authorities and their field of action in global governance are most often sectorally defined and therefore only responsible for a limited set of issues. Water governance can be seen as one of those spheres. In recent years, water governance has gained attention as a global policy concern. Narratives of the influence of water on social and political change have emphasised "the role of water infrastructure development as a more or less conscious strategy of building modern nation states in the early 20th century" (Woodhouse & Muller, 2017: p 227).

The first significant international conference on the topic was the UN Conference on Water in Mar del Plata, Argentina, in 1977. At this time, the objective of the concept of water management was to obtain facts on water by scientific measurements and calculations that are based on a combination of engineering and hydrology. Objectivity and rationality were important attributes for water management, as the demands for water were growing steadily and therefore, improved infrastructure was needed to maximize the benefits from water (Schmidt & Matthews, 2017: pp 6-7).

The conference in Mar del Plata called for "clarity on the roles and powers of government agencies and the way in which they conferred rights to use water on individuals" (Woodhouse & Muller, 2017: p 230) in order to co-ordinate the different actors, participation and legal frameworks regarding water issues. Further, attempts to enhance and organise rules of public ownership of water and a co-ordinated approach to water planning were established,

as it was hoped that by including perspectives and knowledge of diverse water users, this would improve the quality of water management decisions (Woodhouse & Muller, 2017: p 227 & p 230). After the Mar del Plata conference, the concept of sustainable development framed the broader global environmental agenda and thus issues related to water. The UN defines sustainable development as: "[...] development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (un.org - The Sustainable Development Agenda). The International Conference of Water and the Environment in Dublin was held in 1992, in order to ensure that water was set on the sustainable development agenda (Schmidt & Matthews, 2017: pp 8-9). Concluding the conference, the Dublin Statement on Water and Sustainable Development was presented. The report stated that "concerted action is needed to reverse the present trends of overconsumption, pollution, and rising threats from droughts and floods" (un-documents.net). It further set out the four Dublin Principles on which future action at local, national and international-levels should be based. The Dublin Principles focus on the importance of freshwater being a finite and vulnerable resource, the crucial role of stakeholder engagement and the economic value of water (un-documents.net). In the aftermath of the Dublin conference, "water professionals called for a step away from state-led planning and sought to co-ordinate multipurpose, multiple-means water projects through the concept of Integrated Water Resource Management (IWRM)" (Schmidt & Matthews, 2017: p 10). The concept of IWRM focuses on the identification and integration of the diverse ways, decisions regarding water are made in. It includes aspects of Rational Planning, the human impact on water resources, the role of states, as well as the importance of scientific knowledge of hydrology. Consequently, the concept of IWRM gained significant importance among the global water community after the Earth Summit. Thereupon, the Global Water Partnership (GWP), which was founded in 1996 by a joint initiative of the World Bank and the UNDP, articulated a definition and the main principles of the IWRM (Schmidt & Matthews, 2017: pp 10-11).

At the World Water Forum in The Hague in 2000, water challenges were increasingly connected to governance and highly promoted the Dublin Principles rather than management and planning issues. The concept of IWRM had been criticised for being too broad when it came to the provision of clear inputs to policy, appreciating existing institutions and coordinating water uses in a balanced way. Consequently, the IWRM was challenged by major institutional barriers, which required a political change (Schmidt & Matthews, 2017: pp 11-12).

The Ministerial Declaration of the World Water Forum in the Hague was among the first international declarations to call for good governance, which entails conditions such as "inclusiveness, accountability, participation, transparency, predictability and responsiveness" (Rogers & Hall, 2003: p 9). Further it demanded the need for "governing water wisely to ensure good governance, so that the involvement of the public and the interests of all stakeholders are included in the management of water resources" (Rogers & Hall, 2003: p 15).

The UN repeatedly enhances the importance of water-related issues and of access to water and sanitation. Besides creating water-related organisations, in 2010, the UN General Assembly declared access to clean water and sanitation as a human right and aims in Goal 6 of the SDGs to "ensure availability and sustainable management and sanitation for all" (sustainabledevelopment.un.org; UNESCO, 2019: p 35). Another international organisation that is highly engaged in the field of water governance in recent years is the OECD. In 2015, the OECD published the twelve Principles on Water Governance, which aimed to contribute to concrete and outcome-oriented policies based on the three dimensions of effectiveness, efficiency, and trust and engagement (OECD, 2015: p 3).

It can be said that the concept of water governance emerged to overcome challenges previous concepts faced, such as being too broad in providing clear policy inputs and the institutional barriers, and as well as an approach to combine concepts that existed parallel to each other. A more elaborate approach was needed that respected social and political structures and would allow both diversity and sustainable development. Further, it was intended to avoid judgments about the desirability of certain political or social orders and instead emphasise the focus on a shared forum for global coordination. Moreover, water governance serves as a concept that is continuously adjusting to new realities and developments water-related issues are facing (Schmidt & Matthews, 2017: p 12). This goes in line with the theory of global governance, which enables the consideration of policy issues around the globe, when at the same time adjusting to the constantly changing realities in world politics. However, as mentioned previously, the management of cross-sectoral issues can cause legitimation problems, in order to overcome these problems, it is important to enforce effective water governance.

Water Governance

The concept of water governance needs to build upon the conditions of good governance (Schmidt & Matthews, 2017: pp 13-14). The World Bank gives a widely accepted definition of good governance:

> *"Good governance is epitomized by predictable, open, and enlightened policy making (that is, transparent processes); a bureaucracy imbued with professional ethos; an executive arm of government accountable for its actions; and a strong civil society participating in public affairs; and all behaving under the rule of law"* (1994: vii as in Schmidt & Matthews, 2017: p 14).

In case those conditions are not fulfilled, it is spoken about poor governance, which may lead to increased political and social risk, failure of institutions and degradation in the ability to cope with shared problems. In order to turn poor governance into more effective and good governance it is important to undertake structural and institutional reforms such as designing improved capacity for better policy formulation, implementation and enforcement mechanisms. It is further important to convert "decision-making and implementation into more inclusive processes where civil society and the private sector have clear roles to play with shared responsibilities on the basis of public-private partnerships" (Rogers & Hall, 2003: p 10). Modern governance therefore sees "formal authority being supplemented by an increasing reliance on informal authority" (Rogers & Hall, 2003: p 13). The central state can only adapt successfully to new realities by distributing governance action, as also argued by global governance theory. It has been identified that there is a strong causal relationship between good governance and development improvements, as good governance strives to create an institutional and administrative framework within which concerned actors can find common grounds to co-operate and co-ordinate their interests. In order to achieve effective good governance, it is therefore essential to improve development of management. Moreover, any developments in good effective governance should be made in correlation with governance reforms that will aid in sustaining the development, and not to weaken the state, especially if the governing system is already weak (Rogers & Hall, 2003: pp 11-13). As water must be considered being a governance issue, the OECD gives a useful definition of water governance:

> *"The Principles [on Water Governance] are rooted in broader principles of good governance: transparency, accountability, human rights, rule of law and inclusiveness. As such, they consider water governance as a means to an end rather than an end in itself, i.e. the range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders*

> *can articulate their interests and have their concerns considered, and decision-makers are held accountable for water management"* (2015: p 5).

This definition combines criteria from the concepts of governance and good governance. Water governance must have the goal to develop water resources in a sustainable way, make the implementation of policy approaches regarding water decisions effective and to involve all affected actors in the process (Rogers & Hall, 2003: p 16).

Effective Water Governance

To achieve effective governance, it is crucial to identify which type of governance is in place. It can be differentiated between three types of governance systems: hierarchical, market-led and distributed governance. Hierarchical governance systems are generally top-down systems with centralised institutional settings, and as part of modernisation, there is a tendency that the hierarchical systems evolve to a more decentralised administrative setting. There is a growing dissatisfaction with hierarchical governance as it has shown to be an ineffective, yet costly system, with a lack of vision, weak financial discipline and collapsing administrative functions. In developed countries, mechanisms that are needed to establish a new governance already exist. However, there is a lack of such mechanisms in less developed countries, which creates an increasing gap between rich and poor countries (Rogers & Hall, 2003: pp 11-12).

Market-led governance was created as a response to the end of the Cold War in the end of the 20th century. This system was proposed to enable economic growth and social equity and bring solutions for environmental issues. Evolving to a market-led governance system meant deregulation and increased involvement of the private sector, changing the role for civil society. Private companies and the market served as the superior resource allocation mechanism. This market-led system can be seen as the basis for examining water resource management and the delivery of water services in water governance. Nonetheless, market-led systems are being criticised for being too simplistic and not representing the wider common societal values. There is a need for new exchange between state and society, which can generate and ensure increased political control with societal support (Rogers & Hall, 2003: p 12).

Distributed governance is challenging the state's role of steering the society and proposes the need of co-management and co-governance. Local and global networks contribute to this dynamic relationship by challenging the governance, while also supporting the state in its aims of developing society (Rogers & Hall, 2003: p 12). This type of system developed from the belief that the state can no longer single-handedly solve societal problems, particularly socio-environmental ones, and that the private sector cannot address poverty and environmental

issues alone. The two aforementioned systems seem weaker compared to the concept of distributed governance, due to their lack of co-operation between sectors. This modern type of governance acknowledges that formal authority must be supplemented by an increased reliance on informal authority, and therefore the state needs to adapt to this new situation. Distributed governance is an institutional response to the changing environment, and an empirical indication of the state's adaptation to its external environment. This modern kind of governance therefore enables to maintain steering of capacities while facilitating external and internal societal independence (Rogers & Hall, 2003: p 13).

The establishment of distributed governance and the creation of effective governance need to compile certain key elements. Overcoming corruption is clearly an important element in all governance systems. Concerning distributed governance, aspects such as open competition, more accountable public administrations and increasing transparency processes can address the issue of corruption (Rogers & Hall, 2003: p 13). Another key element in effective governance are institutional reforms, which affects both state and social institutions, aiming at decentralising as many functions of the state as possible to the society, as well as democratising the organisations in civil society. This would result in a society with limited yet strong government and an increased political active society. The system would therefore move towards a constitutionally ordered democratically self-governing consolidation (Rogers & Hall, 2003: p 14).

Moreover, it is crucial to understand the different functional levels of water governance systems: "operational, organisational and constitutional" (Rogers & Hall, 2003: p 21). The operational level focuses on the use and control of water in order to fulfil certain needs and specific purposes. Within this level there is a surplus of operational enterprises, both private and public, which cover domestic water supply, wastewater treatment, irrigation, and other areas related to water services. The organisational level co-ordinates and reduces conflict between these mentioned competing operational enterprises, as it oversees the rules and policies on water use and the users in the water system. Finally, the constitutional level creates the enabling environment where the other levels function within. This level sets policies and legislation and takes into account external governance and political necessities and constraints. These stated levels, or also mentioned functions can seem unclear, as governments may be unwilling to exercise their responsibilities. However, including a participatory and consultative approach when reforming these levels in water governance systems can aid in strengthening local governance and reduce vulnerability for the governing system (Rogers & Hall, 2003: p 21).

A high number of interrelated actors and stakeholders, such as the civil society, Non-governmental Organisations (NGO), companies as well as governmental bodies are affected by and involved in water governance. Water governance entails an inclusive approach, it has to work with different communities, actors, and institutions at the same time which set the importance of diverse issues differently. Resulting, some goings-on can appear being equitable to one group being involved in the process, but not to another (Schmidt & Matthews, 2017: pp 15-16). This correlates with the multi-actor perspective in global governance theory, which states that all actors have to be seen as independently linked and equal to each other. In order to include all those actors in an equal and efficient way, water governance deals with internal functions, balances and structures to the water sector. Those include "the framing of social agreements on property rights and the structure to administer and enforce them known as the law" (Rogers & Hall, 2003: p 17) and are again as well influenced by the different actors. An impartial process is important to increase the chances of producing outcomes that are widely accepted as legitimate. Hence, the concept of water governance developed common grounds for reaching decisions by not necessarily following a strict framework, but by focusing on transparent and fair processes all involved groups can accept as being legitimate (Schmidt & Matthews, 2017: p 14). To make water governance effective, the mentioned actors have to be committed to work together on different levels. As water is a resource that affects a wide range of groups and interests, it can be assumed that treating the issue via networks in most cases serves to be more effective than when it is treated solely by one actor (Rogers & Hall, 2003: pp 17-20).

Another issue that continuously influences and shapes water governance is the question of property rights, which must be taken into account, due to the obligations related to who owns the right to the property. The balance between private and public sphere needs also to be taken into account, as this places who is responsible for the management of the particular water service or resource. The different kinds of property rights regimes include: (1) Open Access: There is no defined owner or user identified and the benefits are available to anyone in society. (2) Common Property: a management group has been assembled to manage the resource and defines the rules of appropriation. Non-members do not have the ability to influence the management but are obliged to follow to rules. (3) Private Property: individuals own and manage the resource and can exclude others from their right to the resource. However, these individuals do still have the duty to refrain from socially unacceptable uses. (4) State Property: the state owns the property rights, while acting for its citizens. Individuals have the

responsibility to observe use and access rules determined by state driven water governance (Rogers & Hall, 2003: pp 18-19).

Many cases of water resource management may start with open access regimes, however, the management is often appropriated by a group and therefore becomes a common property resource. This can be explained by global governance theory, which states that authorities need to be serving a global common good in order to justify their actions. In the case of water governance water must be seen as this common good. This is closely related to the suggestion that the key task of governance is to create a framework on water governance, both institutional and administrative which should pursue effective water management. In the creation of such a framework, information networks are important, as they are able to function in conditions where governments are not. Such frameworks must provide strong regulations as these are essential for both public and private water utility entailing a clear definition of water-related duties of regulator and operator. Therefore, governments must provide the rules and regulations established in detailed frameworks for the local population (Rogers & Hall, 2003: p 22).

Economic activities are the biggest users of the world's water resources, therefore it can be argued that it makes sense to use markets and prices as instruments of water governance. Further, water is "a fugitive, unequally distributed, highly variable yet renewable natural resource which is inherently part of the natural environment but whose use is essentially to all social […]" (Woodhouse & Muller, 2016: p 226) and not only subject to economic activity. Being a natural resource, the governance of water is highly influenced by geographical aspects. So called hydro-geographical boundaries can provide enabling opportunities for water governance. The actors affected in those closed regions are more easily to identify and they often have high incentives to reach an agreement. Nevertheless, such hydro-geographical boundaries can bear difficulties as well. Transboundary water resources on the one hand can increase the likelihood of water-related conflicts but on the other hand, water governance can contribute to solve such conflicts (Rogers & Hall, 2003: pp 21-23).

Continuing to the governance of water, it can be stated that a water crisis is often a reflection in crisis of governance. Water governance refers to the range of political, social, economic and administrative systems in place to manage the delivery of water and water services in all levels of society (Rogers & Hall, 2003: p 16). Hence, water governance can be divided into internal and external water governance. Internal water governance revolves around the functions, balances and structures internal to the water sector. It further concerns the social agreements, which structure and manage property rights of water. External governance

concerns the influence from civil society and from the governing system. Therefore, effective water governance requires the combined commitment to internal governance occurrences and external forces such as civil society and private sector (Rogers & Hall, 2003: p 17).

There are certain regulatory instruments governance systems can use in order to decrease the demand of water, which involve permits, restrictions and allocations to various users and uses. Demand for water can and should be reduced on a voluntarily basis using these different technical, social and economic tools. These are crucial to include into frameworks, as lower water use will decrease the likelihood of entering a water conflict. Further, effective governance regimes need to be designed to overcome failures on the government, market or system level, or a combination of these. When focusing on effective water governance, there are certain failures that cannot be addressed by water professionals, as these lie outside the water domain. This shows that the water community needs to engage and seek solutions with non-water organisations and increase understanding for external governance constraints (Rogers & Hall, 2003: pp 23-24).

To achieve effective water governance, certain principles are considered being essential. There is a growing perception that in order to increase effectiveness in governance of water resources and water services, there is a need for an open social structure which enables a broader participation of civil society, private enterprises and media, all co-operating to support and influence the governing system (Rogers & Hall, 2003: pp 26-27). Consequently, the approaches a governing system can take to increase effectiveness are: (1) Open and transparent: in addition to being open and understandable to the general public, good governance requires transparency on policy decisions so both internal and external actors can follow all steps taken. (2) Inclusive and communicative: Governance structures must ensure wide participation throughout the policy chain, from conception to implementation. All levels must follow an inclusive approach when developing and implementing new policies. Further, governance institutions need to communicate with all actors and stakeholders, which will lead to the inclusion of civil society into governance over a wide range of issues. (3) Coherent and integrative: All actions must be done in a coherent approach within a complex system between different levels and different institutions. This requires a strong political leadership, which will have to consider impact and connections of all existing uses and users of the traditional water sector in order to enhance the effectiveness of the water system. (4) Equitable and Ethical: water governance must manifest itself on the ethical principles of society based on rule of law. There is a need for monitoring the equity between and among all stakeholders, interest groups and consumers in the process of policy, development and implementation. Therefore, legal and regulatory structures should

be fair and enforced impartially in a water governance framework (Rogers & Hall, 2003: pp 27-28).

Moving on to the next attribute of effective water governance that concerns performance and operations and includes the criteria: (1) Accountable: included institutions must take responsibility for their service area and actions, moreover all roles in a legislative and executive processes must be clearly defined. In the governance framework is it necessary that the 'rules of the game' are clearly defined as well as the consequences for violating these rules. The governing decision-makers, private sector and civil society organisations must be accountable to the public and to institutional stakeholders. (2) Efficiency: as there is a demand of economic efficiency, it is important that this is balanced out with the concepts of political, social and environmental efficiency, to ensure a combined cross-sectorial efficient water governance. (3) Responsive and Sustainable: policies must be responsive to the demands and must deliver clear objectives, an evaluation of future impact and past experience. Moreover, policies must be incentive-based, which will ensure a clear economic and social gain to be achieved. As water governance must serve future as well as present issues, it is important that policy-making institutions should aim for long-term sustainability. The final criterion of effective water governance is the usage of IWRM tools and its implementation in political processes, as it is a general agreement that IWRM provides the preeminent approach for sustainable water use and management (Rogers & Hall, 2003: pp 29-30).

Effective water governance systems rely to a large extent on governance mechanisms outside the water sector. Water officials must therefore show an understanding for the external environment, and to the importance of internal agreements and seek to engage with trade counterparts. This is closely related to the need for partnerships, especially between the governance system, civil society and the private sector. This is due to water being a shared resource, and all partners should therefore have shared benefits and costs (Rogers & Hall, 2003: p 35). Moreover, internal pressures in the developed world have led to the development of water governance, these internal forces being economy, population, political pressure and declining water resources. The developing world is now also experiencing this kind of pressure from donors and international NGOs to develop effective water governance. Further, several pressing development issues that are occurring simultaneously, increase the pace of economic, social and environmental changes, this threatens to overwhelm the capacity of developing countries to develop institutions, policy systems and so on. In order to see these rapid changes to develop in a sustainable manner, sustainable and economic development must not be seen as separable (Rogers & Hall, 2003: pp 35-36). Finally, as mentioned previously, governance systems cannot

solve issues of water and demand single-handedly and must therefore work together with civil society and the market. All stakeholders must be allowed to engage actively to solve to growing issue of water issues.

Global Water Governance

When studying the theoretical framework of water management and water governance, an evidently fragmented field of study can be recognised. Water scholars and policymakers advocate governance on different levels including local, national and global, where the global perspective is the least advocated level and needs to be given more importance (Pahl-Wostl et al., 2008: p 419). A number of reasons for the need to pay attention to water management on a global scale can be identified: water is a public good, and should therefore be managed as a public good. Moreover, large amounts of financial, administrative and intellectual resources are being spent on the area of water governance, and are being closely linked to global environmental governance, which can find application in areas such as global governance on economy, human rights and security. When it comes to water policies, there is a tendency to focus on one of the following levels: local, national or the river basin-level. Nonetheless, studies on water governance argue that it is necessary to adopt a multi-level approach when conducting global water governance, due to the complexity of current governance processes and challenges (Pahl-Wostl et al., 2008: p 420). Of the four mentioned approaches, the first and most traditional level in resource governance is the local-level. It is being argued that in order to address governance issues, there is a need to understand local rights, needs and stakeholders. Therefore, from this perspective, water issues should be handled at the local-level. This notion is increasingly driven by the concepts of decentralisation and subsidiarity. The next approach argues that water governance should be organised at a national-level, justified from the perspective that water is a national good and should therefore be managed in regard to the national economy and society. However, regarding this argument, there are concerns about the national government's willingness to promote welfare of the people and the need for international equity. The third approach focuses on the basin-level and argues that water-related issues and conflicts are best managed in the natural sphere that is the hydrologically defined basin, catchment or watershed. Such approach enables to study the management of transboundary and international waters and allows problem analysis and internationalisation at their origination for otherwise externalised problems. The fourth and newest approach takes a global perspective, as for the increasing amounts of water-related environmental and societal problems, including water-use related conflicts, appropriate solutions cannot be generated on

neither of the three formerly mentioned approaches. Such issues must be addressed on the global-level. Due to the increased attention given to multilateralism in international politics of water, it is necessary to recognise that local, national and basin-level water governance are interlinked within global water governance. Therefore, the three aforementioned approaches are not mutually exclusive, but should indicate that different approaches are required to deal with different water-related issues and should all be managed within a frame of global water management (Pahl-Wostl et al., 2008: p 421). Furthermore, certain situations lie outside the reach of the local, national and basin-levels, such as the global environmental change and socio-economic phenomena, which must be dealt at the global-level (Pahl-Wostl et al., 2008: p 422).

Using global water governance, the importance of taking cross-level interactions into account when dealing with global arrangements of water must be emphasised. Therefore, global water governance can be defined as the development and implementation of certain principles, informative tools and infrastructure to promote behavioural change on the global-level of water governance. Global water governance calls for:

> *"1) recognition that water has a global dimension; (2) inclusion of a global perspective on water governance at all other governance levels; and (3) adoption of more dense systems of multilevel governance from global to local level in water field, because water policies – if they are to be effective – have to be simultaneously designed at global, fluvial, provincial, and local levels"* (Pahl-Wostl et al., 2008: pp 422-23).

From the previous presented points, when analysing global water governance, it is crucial to identify the involved policymakers and stakeholders, to consider formal and informal governance, and further if it takes place regional or global, centralised or decentralised (Pahl-Wostl et al., 2008: p 425). As stated by the global governance theory, global water governance also includes a wide range of actors. The UN as a global intergovernmental agency is included, both as a top-down organisation but also with its large number of UN institutions, which allow the participation of non-state actors in global water governance. Other aspects of global water governance are organised on a regional level, such as the European Union that works on the one hand in a formal, centralised matter but on the other hand has informal arrangements where state actors engage side by side with market actors. A broader range of stakeholders are represented in international multi-stakeholder platforms such as the World Water Council, which co-ordinates international companies, local stakeholders, lobbyists, advocates and a wide range of researchers, scientists and water professionals. Finally, an important and increasingly influential stakeholder is the private sector. The transnational water corporations are key global actors in supplying water and private corporations now handle 10% of former public water

services and wastewater plants. The growing tendency of privatising water resources and services is a case of market governance (Pahl-Wostl et al., 2008: p 426). The importance of including such a wide-range of actors in global water governance is essential due to the cross-sectorial character of water. The water sector influences dimensions across developmental, environmental, economic and security sectors and hampers further development of an otherwise well-structured global governance system (Pahl-Wostl et al., 2008: p 428).

To conclude this theoretical framework on global governance theory, the aspect of multi-actor perspective must be highlighted as well as the inclusive approach to include a wide range of actors over the different sectors and levels. Also, the identification of the governance system is crucial when using global governance theory. Finally, the global governance theory presents different behavioural implications, that enable to analyse which kind of actions are taken by the societal sector, nation-states or international institutions, and if they result in deepening or declining of governance.

Analysis

In the following chapter, the four OECD Principles on Water Governance on the dimension of effectiveness are going to be used to analyse water governance in Jordan with global governance theory and water governance theory, as presented in the theoretical framework. The aim of this analysis is to clarify how effective the Jordanian water governance sector is in responding to the issue of increasing water scarcity.

Principle 1. Clearly allocate and distinguish roles and responsibilities for water policymaking, policy implementation, operational management and regulation, and foster co-ordination across these responsible authorities.

The first OECD Principle on Water Governance concentrates on allocating roles and responsibilities among responsible authorities and how those are being embedded in the institutional framework. Further, Principle 1a points out that legal institutional frameworks should specify those roles and responsibilities across responsible authorities in policy making, policy implementation, operational management, and regulation and enforcement. Principle 1b states that the legal institutional framework should address the identification of gaps, overlaps and conflicts of interests must be addressed through effective co-ordination at and across all levels of government (OECD, 2015: p 9).

The Ministry of Water and Irrigation (MWI) is the Jordanian governmental institution, which is assigned to take care of

> *"the overall monitoring of the water sector, water supply and wastewater system and the related projects, planning and management, the formulation of national water strategies and policies, research and development, information systems and procurement of financial resources"* (mwi.gov.jo - The Ministry of Water and Irrigation).

The MWI was established in 1988 as a response to Jordan's recognition of a joined approach to the national water management. Ever since, the MWI has been working in the development of water policy and water planning. In parts of its work it was continuously assisted by different donor organisations (mwi.gov.jo - The Ministry of Water and Irrigation). The MWI identifies the collaboration with public and private stakeholders as an option to make water supply and sanitation services more efficient, cost-effective and sustainable. These partnerships are possible in three different spheres (1) Public/private partnerships, which can offer significant possibilities to achieve a strengthening of institutional capacity for water sector implementation and management; (2) Partnerships with municipalities and local utilities show important to strengthen service delivery capacity, foster social cohesion in communities and to support local economic development; and (3) Partnerships with civil society institutions, such as NGOs and community-based organisations, can play a crucial role in developing a sustainable water sector (MWI, 2016: pp 50-51). Such collaborations with international donor organisations include for example the engagement of the German development agency, Gesellschaft für Internationale Zusammenarbeit (GIZ), the SMART project and the NGO EcoPeace Middle East, which will be elaborated on in more detail in the course of the analysis. The MWI obtains leadership in policy, strategic direction and planning of the water sector and has the authority for strategic planning, permitting/enforcement, water allocation and data collection and management. Further, the MWI takes an essential role in monitoring and evaluation of action plans of the sector (MWI, 2016: p 19). The publication of the National Water Strategy 2016-2025 is an integral document of the MWI's work as it aims at guiding the set-up of future goals and specific objectives in order to deliver results for the water sector in the timeframe from 2016 until 2025. The MWI states that the objectives to be achieved are in line with the "government's national vision for the sustainable development of the water sector" (MWI, 2016: p 6). The National Water Strategy defines approaches to ensure a sustainable future for the Jordanian water sector. Furthermore, "it uses the distinct opportunity to reinforce and strengthen integrated water resources planning and management that is aligned with the SDGs, revising the scope, context and relevance of the strategy for the sustainable future of water resource management in the

coming decades" (MWI 2016 p 5). The key areas of the strategy are (1) integrated water resources management; (2) water, sewage and sanitation services; (3) water for irrigation and other uses; (4) institutional reforms, and (5) sector information management and monitoring. Moreover, the National Water Strategy addresses cross-cutting issues, such as adaptation to climate change, transboundary water resources and Water, Sanitation and Hygiene (WASH) issues. The National Water Strategy focuses on building a resilient sector, which will be based on a unified approach for a comprehensive environmental, social, and economically viable water sector development (MWI, 2016: foreword). In order to achieve the objectives that are formulated in the National Water Strategy, the MWI published the following nine precise policies to be implemented in the water sector: (1) Water Demand Management Policy; (2) Energy Efficiency and Renewable Energy in the water sector Policy; (3) Water Substitution and Re-Use Policy; (4) Water Reallocation Policy; (5) Surface Water Utilization Policy; (6) Groundwater Sustainability Policy; (7) Climate Change Policy for a Resilient Water Sector; (8) Decentralized Wastewater Management Policy, and (9) National Drought Policy (mwi.gov.jo - The Ministry of Water and Irrigation). The nine water policies, which include background information, targets and action plans, offer a common ground to refer to and act on for stakeholders in the water sector and can therefore be identified as being the systems of rule in the Jordanian water sector, which is one of the constitutive elements of global governance theory. Systems of rule consist of a number of mechanisms and regulations, which relate to each other and have an impact on the norms, expectations and on the behaviour of actors within the affected area (Dingwerth & Pattberg, 2006: p 190). It can therefore be mentioned that the MWI obtains the leadership in roles and responsibilities regarding policy making and policy implementation, as mentioned in Principle 1a (OECD, 2015: p 9). Roles and responsibilities in the field of policy making address tasks such as priority setting and strategic planning, which is clearly stated in the mandate of the MWI. Regarding policy implementation, the OECD enhances financing and budgeting, data and information, stakeholder engagement, capacity development and evaluation as crucial parts, which as mentioned above, are as well tasks under the responsibility of the MWI.

The MWI executes these tasks in co-ordination with the two most important entities dealing with water in Jordan, the Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA) (mwi.gov.jo - The Ministry of Water and Irrigation). The distribution of governance tasks can be explained by the fact that the central state can only adapt successfully to the new realities it is facing by allocating fields of actions to different actors. Moreover, the distribution of governance actions accounts for the creation of an institutional and

administrative framework, which enables the actors to find common grounds for co-ordination and co-operation. As argued in the theory, this institutional set-up should finally lead to a better governance performance in the Jordanian water sector (Rogers & Hall, 2003: p 13).

The WAJ, originally established in 1983, is an autonomous corporate body, being financially and administratively independent, linked directly to the Prime Minister. In 1988, legislation was changed and the WAJ got directly connected to the MWI. The institution is responsible for the operational management of the Jordanian water sector, which includes "the public water supply, wastewater services and related projects as well as for the overall resources planning and monitoring, construction, operations and maintenance" (jordan.gov.jo - Water Authority). Moreover, the WAJ regulates water supply and wastewater utilities under private management via the Program Management Unit (PMU) (jordan.gov.jo - Water Authority). Therefore, the WAJ takes a critical role in policy implementation, operational management, and regulation and enforcement, which are important spheres of responsibility stated in Principle 1a. The JVA was established in 1977 with the mandate for the integrated socio-economic development of the Jordan Valley. In 1988, the institution became part of the MWI. The JVA "manages, and protects water and land resources and their supporting infrastructure in the Jordan Valley in an environmentally and economically sound manner, in the Jordanian national interest, through creating partnership with the private sector where appropriate" (jordan.gov.jo - Jordan Valley Authority"). In order to perform its activities, the JVA is appointed with a broad spectrum of financial and administrative authority and is representing the national government in the Jordan Valley. It can therefore be stated that the JVA is responsible for policy-making and -implementation, operational management, and regulation and enforcement in water issues in the geographic area of the Jordan Valley, being the responsibilities pointed out by Principle 1a.

The theory on water governance identifies three different functional levels of water governance: operational, organisational and constitutional (Rogers & Hall, 2003: p 21). The MWI acts on two of those levels, the organisational level and the constitutional level. The organisational level deals with the co-ordination of conflicts between competing organisational enterprises and oversees rules and policies. Especially overseeing rules and policies is a crucial part of the MWI's work. The constitutional level is responsible for creating the enabling environment of policies and legislations and further deals with external entities, which as well are tasks in the Jordanian water sector assumed by the MWI. The WAJ is responsible for the operational level, which deals with use and control of water. The JVA acts on all three levels, but its actions are restricted to the geographic area of the Jordan Valley. In relation to the

functional levels of water governance, it can therefore be stated that roles and responsibilities are distributed to each of those levels, which should lead to strengthening local governance and to reduce the vulnerability for the governing systems (Rogers & Hall, 2003: p 21).

According to water governance theory, markets and prices can be used as effective instruments of water governance. This is due to the fact that economic activities in most countries represent the largest consumer of water (Woodhouse & Muller, 2017: p 226). The Jordanian water sector applies such instruments, which is shown by the fact that WAJ and JVA have the responsibility to recommend water service cost changes and capital projects, however, the Jordanian Cabinet has the ultimate regulatory authority (MWI, 2016: p 18). Furthermore, the National Water Strategy recognises two options to make the water sector more financially viable and to improve cost recovery over time (1) cost savings from improvements in energy efficiency by modernising infrastructure, reducing physical water losses and optimise the system; and (2) revenue measures, which is a gradual approach to reduce administrative water losses, increase revenues collection through improvements of administration and rise the costs for water and wastewater services for households, industry and farmers (MWI, 2016: pp 20-21). Thus, the two institutions obtain responsibilities in the area of regulation and enforcement of Principle 1a.

The way roles and responsibilities in the Jordanian water sector are distributed shows that the "sector is quite centralised with little or no roles attributed to municipalities or governorates for project planning and development, or for the delivery of water services" (OECD, 2014: p 20). The set-up of the Jordanian institutional framework in the water sector can therefore be defined as being a hierarchical governance system, according to the three different types of governance systems. Hierarchical governance systems are top-down systems with centralised institutional setting (Rogers & Hall, 2003: pp 11-12). This appears to be the case in the Jordanian water sector, as the MWI, even though it is supported by other entities, is the central decision-making institution in the Jordanian water sector. However, there are some factors indicating an opening of the Jordanian institutional governance system in the water sector, such as the inclusion of civil society actors, for example through the co-operation with civil society via the Water Users Associations (WUA) in the Jordan Valley, and other mechanisms and platforms for stakeholder engagement. As prescribed in the theory, such an opening of the government system, can be seen as part of a modernisation process, which can ultimately lead to a more effective and less costly system (Rogers & Hall, 2003: pp 11-12). Another example is the collaboration of the MWI with different international organisations. The opening of the institutional setting and the inclusion of different donor organisations can

for example be observed in the creation of the WASH Task Force, which is a part of the Jordan Response Platform for the Syria Crisis (JRPSC) addressing the emerging needs of host communities in Jordan impacted by the Syrian crisis. The WASH Task Force is led by the Secretary General of the MWI and supported in different areas by UNICEF, different German governmental bodies, the Mercy Corps and other smaller NGOs. This initiative can be applied to the theoretical term of responsiveness, as the Jordanian government responds to current political goings-on in the area and proofs its ability to adapt to these developments and willingness to open up its institutional set-up, including donor organisations and civil society. Further, this also shows that a clear evaluation has been carried out on impacts the international goings-on can have on Jordanian water governance, as JRPSC serves to carry out risk prevention for the Jordanian and the other riparian countries' water sources (Rogers & Hall, 2003: p 29).

Principle 1b enhances the importance to "identify and address gaps, overlaps and conflicts of interest through effective co-ordination at and across all levels of government" (OECD, 2015: p 9). In 2014 the OECD identified gaps in the regulatory framework of the Jordanian water sector, such as uncertainties about changes in regulations and contract terms that are challenging the engagement in the sector. Further, the OECD stated that uncertainties surrounding the institutional and legislative framework for water and private sector participation would undermine the legal clarity, opportunities and stabilities in the Jordanian water sector (OECD, 2014: pp 32-34). The current National Water Strategy builds upon previous strategies that helped to shape the management of the water sector in Jordan in past decades. The strategies of the previous approaches have been updated and further developed and it can therefore be stated that the Jordanian institutional framework seems to have taken the OECD critique into account and acknowledges the propositions of Principle 1b, as additional laws and regulations have been passed and investment programmes extended.

The National Water Strategy, covering the period of 2016-2025, is in alignment with the royal initiative for economic change in all sectors that was adopted in 2015 in the 'Jordan 2025, A National Vision Strategy'. The Jordan 2025 Strategy built upon the SDGs and new developments in the sector, including the Action Plan to Reduce Water Sector Losses in 2013, the development of strategic projects, such as a Nuclear Power plan and the Red Sea-Dead Sea Conveyance Project (RSDSCP), and the increased water demand due to the incoming Syrian refugees. Besides considering the Jordan 2025 Strategy, the National Water Strategy 2016-2025 incorporates more decentralisation, commercialisation and consolidation of water and wastewater services and as well aims at increasing private sector participation and changes in

legislation. Moreover, it is in line with previous strategic approaches such as the National Energy Strategy 2007-2020, and the Agriculture Document of 2009. Thus, the National Water Strategy 2016-2025 can be seen as an examination of outcomes and achievements of previous strategies in the water sector. Therefore, it can be argued that the revised National Water Strategy will enable the responsiveness to substantive changes in the regional and geopolitical situation, including ongoing risks and threats to Jordan's water resources, such as the growing population and the economy, which depends on water and energy as it is highly vulnerable (MWI, 2016: pp 1-2). However, in order to establish an effective water governance system, the water sector needs to be engaged in seeking solution within the sector but as well with non-water organisations and simultaneously accounting for external development and governance restraints (Rogers & Hall, 2003: p 24). Moreover, it is important to acknowledge that the Jordanian water strategy seeks to contribute to the global sustainable development agenda, which is a crucial aspect, as the goal of effective water governance is to develop water resources in a sustainable manner (Rogers & Hall, 2003: p 16). Further, sustainable and economic development must not be seen as separable and therefore, governance systems cannot solve issues of water and demand single-handedly but they must include a range of stakeholders (Rogers & Hall, 2003: pp 35-36). It can be stated that the institutional and legislative framework related to the Jordanian water sector is constantly being revised in order to address gaps and overlaps while taking new developments into account. By revising its policies related to the water sector on a regular basis and considering current developments, the Jordanian government does take account for the aspects of Principle 1b.

Principle 2. Manage water at the appropriate scale(s) within integrated basin governance systems to reflect local conditions, and foster co-ordination between the different scales.

Principle 2 of the OECD Principles on Water Governance refers to the management of basins as the primary water resource. This Principle covers the need to manage water on the appropriate scale. Further, it is crucial to identify the gradations of governance, whether it is performing centralised or decentralised, internal or external and finally, which actors are involved and how they co-ordinate across scales and sectors. In order to ensure effective water management, the Principle presents certain tools and methods. These include Principle 2a the need to respond to long-term environmental, economic and social objectives with of goal of an efficient use of water resources; 2b encourages a sound hydrological cycle management from the capture and distribution of water; 2c promotes strategies and action programmes to obtain an effective basin management that are consistent with national policies and local conditions;

2d promotes multi-level co-operation among stakeholders and between levels of government for effective water management; and finally; 2e promotes riparian co-operation on an effective use of transboundary freshwater resources (OECD, 2015: p 9).

Jordan's main water sources derive from the Jordan River Basin, which provides for approximately 75% of Jordan's water demand of a total of 900 MCM/year. Moreover, Jordan's total dam capacity is 300 MCM divided among 10 dams (Hadadin, 2015: p 1). The Jordan River Basin is geographically located with 40% in Jordan, 37% in Israel, 10% in the Syrian Arab Republic, 9% in the West bank and 4% in Lebanon, which makes it a transboundary basin with a total area of approximately 18,500 km² (Aquastat, 2008b: p 1). The Jordan River Basin serves as the major water source for Israel and Jordan, as well as the three main aquifers to the basin west from the Jordan River, are central water sources for Israel, Jordan and Palestine.

There is a natural discharge of the Jordan River Basin, which is subject to extreme seasonal and annual variations. In winter months where the rainfall is at its highest annually, the river may carry up to 40% of its annual flow, however in the dry summer and autumn months, it carries only 3-4% of its annual discharge. Due to the high temperature changes, in summer times most side streams dry up completely, and therefore it is crucial for riparian countries to capture the winter floodwaters, which serves as the most important aspect of water management in the Jordan River Basin (Aquastat, 2008b: p 3). Per 2008, surface water accounted for 35% of the existing water resource in the Jordan River Basin, groundwater aquifers accounted for 56%, and reused wastewater and other non-conventional sources of water accounted for the final 9%. The region around the Jordan River Basin has one of the lowest per capita water resources worldwide, as it is below the typical water scarcity threshold of 500 m³/year per capita. However, water demand continues to increase due to high population growth rates and economic development (GLOWA, 2007 as in Aquastat, 2008b: p 3).

As highlighted by Principle 2, which focuses on the need to manage water within integrated basin governance, this part of the analysis will mainly focus on the Jordan River Basin due to its importance as Jordan's main water source as well as the complicated nature as being transboundary. A combination of factors can be mentioned as reasons for the increased water scarcity in the region of the Jordan River Basin; the increasingly hostile area, the massive population growth, the semi-arid environment, which increases due to climate change, the over-allocation of water agriculture, the wrong pricing of water, a supply management bias and regional politics that complicate the already difficult situation (Alkhaddar & Nadhir, 2005: p 297).

The political history of co-operation in the Jordan River Basin includes several unilateral and bilateral agreements, which have increased competition between the riparian countries and fuelled the exploitation of water in unsustainable methods, these agreements will be discussed in more detail below. The riparian governments sought to the development of irrigable agriculture as a means to provide employment, food production, self-sufficiency and the securing of national development. These policies resulted in low cost land for agricultural purposes, water demands were heavily subsidised and poorly regulated (Alkhaddar & Nadhir, 2005: p 296). Tensions and conflicts occurred as consequences of unilateral plans to tap rivers leading water out of the basin, such as the all Israel plan, an Israeli unilateral plan, which resulted in military clashes with Syria and Jordan in 1951 (Yasuda et al., 2017: p 11). As a result of poor water management and infrastructure water levels are falling, which becomes an issue for all the interdependent riparian countries, and also a transnational problem. Therefore, such action must take a multi-actor approach, which is also promoted in Principle 2d, indicating the importance for taking both multi-actor and multi-level approaches to conduct effective water governance. The conflicts that have occurred might be explained by the failure to include all riparian countries in the attempt to find sustainable solutions. As the theory prescribes, there is a causal relationship between good governance and development improvements, therefore also referring to poor governance, which can lead to increased political and social risk, failure of institutions and degradation in the ability to cope with the shared problems (Rogers & Hall, 2003: p 10). The present circumstances of the Jordan River Basin's decreasing water resources can therefore be identified as a result of poor management with objectives to generate national development in unsustainable matters.

As an attempt to create a multilateral agreement, much alike how the theory prescribes the need of a common framework, the Johnston Plan from 1955 served to enable good governance as it proposed a contract with the purpose to bypass political boundaries and allocate water shares accordingly to the amount of water needed each year to sustain for agricultural practices and demands (Haddadin & Shamir, 2003 as in Yasuda et al., 2017: p 12). Moreover, the Johnston Plan approached water allocations as being rights-based, referring to the individual countries water rights, instead of the usual termination of water shares. The Plan was rejected by the Arab-countries and never implemented but is still considered to be the basis for new agreements (Yasuda et al., 2017: p 12). For the riparian countries, especially Israel, Jordan and Palestine, there is an increased interdependency to the water in the Jordan River Basin. Therefore, it is essential to create a joint agreement and co-operation on water management to ensure effective water governance, which is highlighted in Principle 2e. Further,

the theory argues the need for a common framework of legislations on water use, water rights, distribution of amounts and water quality, and in order to succeed, the involved actors must make this a pursuit of a common goal, as prescribed in the third element of the four constitutive elements of global governance theory (Dingwerth & Pattberg, 2006: pp 189-193).

Attempts across the national, regional, basin and global-levels have been made to find sustainable solutions for Jordan River Basin and providing water security in Jordan. On a regional-level, in order to create peaceful co-operation between Jordan and Israel, a peace treaty has been formulated in 1994, creating a common framework for a combined basin water governance on the main issues: "1) water supply to Jordan, 2) Rehabilitation of the Jordan River, and 3) the Red Sea-Dead Sea Conveyance Project" (Yasuda et al., 2017: p 25). Water-related issues are often best managed in the natural sphere of the hydrologically defined basin (Pahl-Wostl et al., 2008: p 422), and in this case by co-operating on sustaining the Jordan River Basin, this has generated the RSDSCP. This project is a regional agreement to connect and allow water to flow from the Red Sea to the Dead Sea and to build a desalination plant in Aqaba, which is Jordan territory, disposing the brine from its operation into the Dead Sea. In 2014, the actors agreed upon the initial phase of the project, which involved commencing to build the desalination plant and swapping water with Israel in the increasingly water stressed parts of Jordan (Yasuda et al., 2017: p 26). Regarding this interaction between authorities and the implementation of the RSDSCP, it does seem to be an effective solution to both creating a stable partnership as well as creating a solution for the increasing water shortage in Jordan, however issues have arisen in this process. The RSDSCP holds two main obstacles: neither of the countries involved are able to cover the estimated $10 billion it would cost to accomplish the project. Moreover, stakeholders have uttered big concerns about the construction of the desalination plant and the aspiration of diverting brine into the Dead Sea, as this might generate unknown chemical reactions, which could conceivably cause new environmental issues and limit the sustainability of the RSDSCP (Hurt, 2018). Nonetheless, a pilot of the project was implemented in 2016 to include research on the environmental impact of diverting brine and directing water to the Dead Sea. This project serves not only to alleviate the pressing issue of water scarcity, but also to saving the Dead Sea, due its dropping sea level. The Dead Sea is an important religious symbol for the riparian countries, but also has a significant role as a tourist attraction. In 2017, the Dead Sea had 3,6 million visitors, due to its famous body of water and the alleged curative minerals. Therefore, it is of cross-sectoral interest to save the Dead Sea, as it generates a big source of income for all involved stakeholders of the RSDSCP (Hurt, 2018). Throughout its implementation, the RSDSCP has faced criticism from environmentalists and

advocates, who have been attempting to tarnish the brand of the project. The criticism includes the argumentation that the project is not being sustainable due to the unknown reaction of dumping brine into the Dead Sea as well as its inability to include public opinion into decision-making. Non-governmental actors have expressed this critique by launching information campaigns against the project, calling for governmental action to reduce the invasive infrastructure, and instead restore water tributaries to their natural state. This can be seen as an act of civil society to communicate their opposition to the project through politicization, an aspect of behavioural implications in global governance (Zürn, 2018: p 12). Besides the perception that there is little support to the project from civil society, the Jordanian government decided to move forward with the RSDSCP. This manoeuvre from the Jordanian government can be seen as opposing the theoretical term of inclusiveness as the government chooses to pursue the project even though the civil society is showing resistance and therefore deliberately does not include the public opinion into decision-making. Moreover, by moving forward with the implementation, the government shows a lack of accountability to perform in the public's best interest. Both terms of inclusiveness and accountability are aspects of good governance (Rogers & Hall, 2003: p 9). Furthermore, as prescribed in the theory of global governance, actions undertaken by authority need to be justified by serving a global common good, even though this might not be truthful in some cases. The institutions that are pursuing the RSDSCP do pursue the goal of limiting the effects of water scarcity in the region, which can be interpreted as serving a global common good, however, as mentioned above, it seems questionable in how far this is truthful and the real interest of the people (Zürn, 2018: p 9).

Analysing the 1994 bilateral agreement between Jordan and Israel, it is evident that this agreement is cross-sectoral, as it would secure water for the Jordan population, but would also be of strategic interest for Israel to maintain stability in its relationship to Jordan's government. Such agreement between Israel and an Arab country, much alike the 1994 peace treaty, is the first of its kind. Such actions correlate well with Principle 2a proposing to respond to long-term economic and social objectives through risk prevention. Creating stability between the two governments increases risk prevention in securing their individual water sources. However, the unintended effects of creating such bilateral agreement have been the continuation of civilian protests against co-operation between the countries. This was fuelled by the complication of the relationship between Jordan and Israel after an Israeli embassy security guard shot two Jordanian citizens outside the Israeli Embassy in Amman. Protests occurred in the Jordanian population to scrap the 1994 peace treaty with Israel, reinforced by the civilian's pro-Palestinian sentiments (Al-Khalidi, 2018). This has caused Israel to put the RSDSCP at a deadlock until it

is allowed to reopen its embassy in Amman, and putting Jordan in a scrape due to the need of the desalination plant. Moreover, the Jordanian government cannot cover the costs of the project without the involvement of both Israel and USA. Israel pledged to pay $1 Billion from its defence budget to ensure stability in its relationship to the Jordanian regime prior to the incidents in Amman. The USA was committed to pay $100 million prior to the incidents in Jerusalem, that were caused by the US president Donald Trump's decision to move the embassy to Jerusalem, which generated uproar from the pro-Palestine Jordanian population and further complicated the relationship between Jordan and Israel (Hurt, 2018).

Due to the mentioned difficulties, the RSDSCP has not been accepted by large parts of the civil society. Especially regional issues such as Jordan's population being increasingly pro-Palestine and the issue of a possible chemical reaction when disposing brine into the Dead Sea, which speaks directly against finding a sustainable solution for the water scarcity problems, are being criticised. When comparing the above stated issues of the project with the OECD's definition of good water governance, it can be stated that it works against certain stakeholders best interest, and contradicts the goal of developing water resources in a sustainable way (OECD, 2015: p 5; Rogers & Hall, 2003: p 16).

Other aspects of good governance are the inclusion of non-state actors, the increase of public-private partnership and the reliance of informal authority (Rogers & Hall, 2003: pp 10-13). Such decentralised form of governance was executed when the riparian countries enabled the organisation EcoPeace Middle East to facilitate the process of developing the so-called Regional NGO Master Plan for Sustainable Development in the Jordan Valley, finalised in 2015, and being the first ever regional integrated Master Plan in the Jordan Valley (Yasuda et al., 2017: p 26). Through this Master Plan, the EcoPeace Middle East stressed the importance to replace the seemingly existing competitive approach of compromising perspective of mutual gains by not including quantitative water allocations, but rather implementing a joint institutional structure. The emphasis is upon factors such as climate change that can disrupt past and future agreements on peacefully allocating and distributing water resources, as it affects water availability in the Middle Eastern region and the Jordan River Basin. Therefore, attention needs to be upon hydro policies related to regional co-operation and bilateral affairs that can withhold regional peace and water security (Escudero, 2018).

The National Water Strategy highlights to collaborate with public/private and other partnerships to make water supply and sanitation services more efficient, cost-effective and sustainable (MWI, 2016: p 51), and as mentioned above, the strategy states that civil society institutions also can play an important role in developing and facilitating service provision,

referring to the need to work cross-sectoral in order to generate effective results, much like the theory prescribes as the distributed governance system where responsibilities are distributed to propose co-management and co-governance (Rogers & Hall, 2003: p 12). As mentioned in the previous section of the analysis, the Jordanian governance system can be identified as a hierarchical governance system with a top-down management and centralised institutional setting, however developing into a decentralised system by distributing responsibilities and acknowledging the importance of including civil society. This form of governance and the inclusion of civil society and NGO's can be related to Principle 2d, referring to the promotion of multi-level co-operation of government for the management of water resources.

A further act of decentralisation as a means to create an efficient institution to deal with the falling water levels of the Jordan River, was the creation of the JVA, as mentioned in the previous section. The initial strategy of the JVA worked towards creating sustainable solutions to elevate socio-economic developments. The JVA, in particular, serves accountable for the stakeholders of the Jordan Valley and has successfully carried out functions to increase development of both residential and industrial areas and tourism. Further, the JVA was appointed to work cross-sectorial such as in the sectors of health, public work, rural affairs, environment and ministry of municipality, which leads to the conclusion that the government not only acts in an open and transparent way regarding its water policy decisions but also in an inclusive and communicative manner, as it includes several sectors in an approach for governance institutions to communicate with all involved stakeholders (Jordan Valley Authority: p 2). These steps correlate with the approaches presented by Rogers & Hall on how to increase effectiveness in water governance (2003: pp 27-28). In accordance to the theory of water governance, certain regulatory instruments can be used by governance systems to reduce demand of water, which involves permits, restrictions and allocations. Such tools are presented in the JVA strategies through certain water management goals. Goal one refers to "Water Resources Development and Management" (Jordan Valley Authority: p 5) which is equivalent to Principle 2a and b, as its strategies serve to rehabilitate existing water resource infrastructure as well as implementing efficiency improvements to increase availability of water to JVA customers. This refers both to creating a sound hydrological cycle to sustain the water resources as well as securing the stakeholders who are interdependent of these resources. The strategy also includes to improve the quality of water resources and ensure a sustainable use, referring to technical tools to develop new sources of brackish water, as well as securing an effective use to avoid groundwater aquifer salinisation and implement projects to increase use of surplus flood water and treated wastewater. This is in line with Principle 2a, which mentions the need

to “respond to long-term environmental, economic and social objectives with a view to making the best use of water resources” (OECD, 2015: p 9). Goal two of the strategy refers to the need for a cross-sectoral approach, where the objective mentions the need for an increased involvement of the private sector in irrigation water management, as the agricultural sector is the single biggest consumer of water in the Jordan Valley. The strategy includes the co-operation with non-state actors and the private sector to modify irrigation technologies to secure a continuation of national agricultural development and food security. This correlates with the attribute of effective water governance that the governance system should serve responsive and sustainable as the policies must be incentive-based and ensure a clear economic and social gain to be achieved. The policies should also aim for a long-term sustainability, which refers to modernising the old non-sustainable methods of irrigable agriculture (Jordan Valley Authority: p 5; Rogers & Hall, 2003: p 30).

As a means of taking a multi-stakeholder approach, the JVA has been setting all necessary regulations to control water uses, and works together with WUAs in order to “encourage community and private sector participation in managing public resources and to provide services for customers” (MWI, 2016: p 19). The WUA’s are created with the intention “of making water distribution for agriculture in the JV [Jordan Valley] more efficient, technically and financially, as well as more effective in managing the day-to-day activities” (Mustafa et al., 2016: p 170). The German development agency GIZ initiated and implemented the WUA’s in 2001 with the intention to promote participatory water management in the Jordan Valley. Each WUA in the Jordan Valley has a contract with the JVA, specifying the budget of the duties of the two parties. The WUA’s administer land, which is allocated to them and are responsible for the technical distribution of water (Mustafa et al., 2016: p 171). This can be related to the Principle 2d, promoting the need for multi-level co-operation between stakeholders, in order to generating effective water governance.

Principle 3. Encourage policy coherence through effective cross-sectoral co-ordination, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning and land use.

The third Principle refers to policy coherency and the need to act efficiently in all involved sectors. This need for coherency especially refers to the sectors, which are highly demanding and dependent on water. The Principle offers a number of ways this can be done through, including: 3a the encouragement of co-ordinated facilitation of coherent policies across the different levels of government, including ministries, public agencies and cross-sectoral plans;

3b the encouragement to foster a co-ordinated framework of use, protection and clean-up of water resources, which includes policies across sectors that affect water availability, quality and demand; 3c calls for the need to identify, assess and address the barriers to policy coherency in and beyond the water sector; and 3d encourages to bring the sectoral strategies into line with water management needs and to identify solutions that fit with local government and norms. This is also needed to mitigate conflicts among sectors and stakeholders (OECD, 2015: p 9).

The sectors with the highest water demand in Jordan can be identified as: the agricultural sector, domestic use such as rural and urban householders and industrial sectors, being mainly potash and phosphate industries. As of per 2013, agriculture consumed 53% of the total MCM, using a majority of the treated wastewater, where domestic use obtained 42% of total demand, however none of the treated wastewater. The industrial sector, as the third most water-consuming sector, only consumed 5% of the total water supply (water.fanack.com). In the National Water Strategy, the MWI presents Table 1, which can be retrieved from appendix 1, giving an overview of the projected development of resource extraction and resource demand, taking population growth into considerations. The table takes its offset in 2015 and gives projections until 2025, approximately the same period this strategy aims to cover. As per 2015, the total water demand was 1401 MCM/annually, differentiating between water demand and irrigated demand. The total number of resources covered 992 MCM/annually, where only 832 MCM was marked as being sustainable resources. It can be inferred from this table that there is a deficit of 409 MCM in 2015. The National Water Strategy expects that as of 2025 there will not be a change in the demand for irrigation, referring to the agricultural sector, however the sector mentioned as Municipal, Industrial and Tourist demand will rise with 77 MCM since 2015, which can be explained by population growth. Also, new water demanding sectors include Oil Shale and Nuclear Power, which by 2025 are projected to need 70 MCM/annually. This increases the total demand to 1548 MCM/annually. A significant observation is that the deficit in MCM/annually is prospected to decrease significantly from 2015 until 2025, despite the projection of an increase of the total demand. The projected deficit per 2025 is only 88 MCM/annually, which can be explained by the estimated increase in especially treated wastewater and additional resources, including approaches such as desalination, which will increase with the implementation of the RSDSCP. With the rise in total water resources, especially the extraction of sustainable resources, the Principle as well as the theory call for the need of a common framework to manage these resources to reassure that there will not be an additional rise in demands concurrently with the increase in water resources (Appendix 1).

The sector, which is currently experiencing the most growth in water demand is the municipal sector, providing water for domestic consumption and tourism. This sector's demand is rapidly growing due to population growth, economic development and increasing living standards. Jordan's population is growing, not only due to high birth rate but also due to the earlier influx of Palestinian and Iraqi refugees, and the current Syrian refugee crisis, which has caused 1,4 million Syrian refugees to reside in the country and has increased domestic water demands by roughly 20% (Arsenault, 2017; Ritter, 2018). In order to control domestic consumptions, the government has implemented strict water-rationing programmes, regulating that the planned consumed amounts of water to be only 120 litre, per capita, per day (L/C/day) in the capital Amman, 100 in other cities and only 80 L/C/day in rural areas. This is also controlled by the Water Reallocation Policy, which controls and manages the amounts of water supplied to the individual governorates (MWI, 2016: p 12). Such regulatory instrument, which is enforcing restrictions, is mentioned in the theory as an effective tool to decrease the demand of water and should be enforced on voluntary basis. Further, the implementation of such water-rationing programme is crucial to decrease the likelihood of entering a water conflict due to poorly regulated water management and a desperate need for additional water resources (Rogers & Hall, 2003: p 23).

In 2002, the MWI established the Water Demand Management Unit (WDMU) for the purpose of being responsible for the Water Demand Management Programs for the urban sector in Jordan. As the government of Jordan aspires to raise standards of living for its citizens while also expanding sectors such as commerce, industry and tourism, this puts additional stress on the country's water resources. Therefore, there is a need of fostering co-ordinated water demand management across sectors to both secure the country while maintaining the social and economic benefits of water use. The WDMU has been created to engage its efforts in increasing efficient and sustainable water use and co-ordinated water management across municipal, industrial, tourism and agricultural sectors (mwi.gov.jo - Water Demand Management - Introduction). The creation of WDMU correlates with Principle 3a as the unit serves as a mechanism with the aim to facilitate coherent policies across sectors. This can be realised due to their attempt to create coherent water demand management across the most water demanding sectors while taking the government's interest into account, such as the continuation of social and economic development. The WDMU has created the Water Demand Management Policy, which includes cross-sectoral strategies on efficient water use and water loss risk prevention. These include sets of procedures and measures providing guidance on (1) Construction, Standards and Specifications, (2) Reduction of Non-Revenue Water, (3) Reducing Water

Losses, (4) Non-Conventional Water Resources, (5) Water Conserving Landscaping, and (6) Studies and Research (WDMU, 2016: pp 3-5). The establishment of the WDMU serves both as a decentralisation of formal authority and a distribution of governance actions. Moreover, the establishment of the Water Demand Management Policy serves as the creation of an institutional and administrative framework where actors across sectors can co-operate and co-ordinate actions and create development improvements. These identifications correlate with both modern and good governance (Rogers & Hall, 2003: pp 11-13). Moreover, the definition on water governance as a concept enhances the need to continuously adjust to new realities and developments in water-related issues (Schmidt & Matthews, 2017: pp 13-14). This is apparent by the inclusion of the Energy, Mining and Oil Shale Industries Sectors in the Water Demand Management Policy, which serve as new strategic projects with water demands, and the need to regulate these sectors according to cross-sectoral water demands and total water resources through legislation, tariffs and the creation of innovative practices avoiding pollution and other non-sustainable practices (WDMU, 2016: p 6). Regarding this emerging sector, it can be observed in Table 1 from the National Water Strategy that the Oil Shale and Nuclear power demand is predicted to increase from 2018 onwards, only gradually ascending its demands in correlation with the increase of water resources due to new water harvesting techniques (Appendix 1). Therefore, by gradually scaling water demands, this will not compete with the other water demanding sectors and subsequently foster a co-ordinated management of use and availability, as prescribed in Principle 3b.

The most water-demanding sector is the agricultural sector, representing around 60% of the total national water needs, estimated demanding 700 MCM/annually. The agricultural sector is an important stakeholder, contributing approximately 3-4% to the GDP as per 2013, and it is currently the largest user of irrigated water as only 5% of the land receives enough rainfall to support cultivation. Moreover, it is important due to its socio-economic activity and serves as the main food contributor for the continuously growing population (MWI, 2016: p 12). The agricultural sector is facing difficulties due to climate change, including droughts, fluctuating rainfalls and hot winds, besides this irrigated agriculture are constrained by the limited water resources, which leads to over exploitation of groundwater, using wastewater for irrigation purposes, and the siltation of dams and rivers. Finally, the agricultural sector is facing a marketing problem due to their negative reputation of over-exploiting Jordan's water resources (Aquastat, 2008a: p 4). The theory identifies the crucial need to manage water in sustainable ways. Especially the attribute of effective water governance calls for the need to manage water in a responsive and sustainable way while policy-making institutions should aim for long-term

sustainability (Rogers & Hall, 2003: p 29). This demands a reform of the past practices of irrigated agriculture into a more sustainable practice, and this reform needs to be overseen by the MWI and the WDMU. In the National Water Strategy, the MWI mentions that according to the National Water Reallocating Policy, the aim is to reduce the water allocations to irrigated agriculture and will eventually be reduced and replaced by treated wastewater. With the development of new water supply sources, there will be an increase in treated wastewater, which will replace the current irrigation approaches. Finally, the Water Reallocation Policy confirms the need to replace freshwater used for irrigation purposes by treated wastewater, and that a possible expansion of irrigated agriculture can only happen in the case of increased availability of treated wastewater (MWI, 2016: p 13). This policy correlates well with Principle 3b as it decreases competition between the water demanding sectors and emphasises the need to co-ordinate and regulate the water reallocation so all sectors are able to meet their water needs, and finally, facilitates a sustainable development in the sectors by only increasing their demands with the expansion of water resources.

In order to maintain development in the agricultural sector, it has shown crucial that farmers undertake continuous upgrading and innovation, which requires investments. Water that is distributed to farmers is below quota allocations in order to avoid over exploitation of water resources, however, even farmers who have invested in improving irrigation system efficiency, such as drip irrigation and farm reservoirs, are unable to satisfy their crops' water requirements (van den Berg & Al Nimer, 2016: p 24). Therefore, it is evident that even though measurements have been made to secure water to meet the needs of the agricultural sector, there is still increased internal competition to get satisfactory amounts of water, and only the farms with fully upgraded irrigation systems and high capital investments are able to compete in this sector. In order to keep the aforementioned socio-economic advantages of this sector, the government needs to meet the requirements of all involved stakeholders, and therefore also incorporate the farmers, who are in need of such investments in order to develop according to the market. The theory mentions that good governance needs to be inclusive, and governance institutions need to include and communicate with all stakeholders, which eventually will lead to the inclusion of civil society into governance (Rogers & Hall, 2003: pp 27-28). The MWI addressed this specific issue in the National Water Demand Management Policy, formulated in 1997, updated and enlarged by 2006, stating that water pricing should aim to cover actual operational and maintenance expenses as well as future rehabilitation. However, differential pricing needs to be enforced over irrigation water, taking into account water quantity and quality, and as well considering socio-economic aspects. Further, to accommodate the issue of

financial differences in the agricultural sector, the policy mentions the need to review existing incentive programmes and systems to include "the establishment of sustainable funding mechanism, providing low interest long-term loans, tax incentives, grants and fee waivers for efficient water use equipment" (MWI, 2006: p 8). Moreover, the policy commits to capacity development through programmes aimed at increasing farmers' awareness and knowledge of water demand management, in order to make water-demanding practices more efficient and to streamline the water saving actions in the agricultural sector. The MWI's response to the internal issues in the agricultural sector correlate well with Principle 3c as the mentioned policies identify and address the barriers to policy coherency for stakeholders within this water demanding sector. Furthermore, as prescribed in Principle 3d, they provide incentives to mitigate an internal sectoral conflict, as it brings strategies to both manage water sustainably as well as addresses the socio-economic complications and attempts to find a solution that fits with local government and norms. With these policies, the MWI shows responsiveness to all aspects of the agricultural sector, responding both to the need of the stakeholders, and attempting stakeholder engagement and capacity development. Meanwhile, the National Water Demand Management Policy commits to the development of practices aiming at consuming and using water much more efficiently, in order to yield more crops from the limited water sources as well as limiting water loss. This can be identified in the policy on Best Management Practices, committing to less-water consuming high-value crops to replace high-water consuming crops (MWI, 2006: p 8). The theoretical term responsiveness, an attribute of good governance, can be acknowledged in the inclusion of risk prevention in the Policy on Drought Management. There is a realisation that drought is inevitable, especially with the occurrence of climate change, however the policy commits to increase stakeholder engagement and create a warning system which will improve drought preparedness while developing a strategy and action plan to manage such a crisis to limit its impact on all water demanding sectors (WDMU, 2016: p 9). Even though this policy is listed as a policy under the agricultural sector, it is evident that this policy will touch upon and influence across the water demanding sectors and create policy coherency in risk prevention in the occurrence of drought.

As Principle 3 refers to the need for policy coherency across sectors, it is evident to include the analysis of the third chapter of the Water Demand Management Policy on Cross Cutting Themes, which focuses on the aspect of implementing legislation on water demand management across sectors and spheres. The chapter includes the sections: (1) legislation and institutional framework, (2) tariffs and pricing of water, (3) awareness, training and capacity building, (4) financial mechanisms for improving water efficiency, (5) best management

practices, (6) information program, and finally (7) water exchange (WDMU, 2016: pp 9-13). With the implementation of legislation on these cross-cutting themes, the interaction between spheres of authority and sectors is encouraged, as prescribed by the theory, as both national and international authorities need a basis to act upon and a justification for common norms (Zürn, 2018: p 9). Such a set of policies provides the common norms for water demand management and provides the most important systemic feature for Jordan's water governance.

From the section of legislation and institutional framework, it can be extracted that the framework aims at being continuously adjusting to new realities and developments in the level of water resources (Schmidt & Matthews, 2017: p 12). This is important due to continuously changing circumstances, caused by differences in annual rainfall, the menace of drought or other extreme climate related occurrences, the variation of use and demand between the different sectors and finally, the possibility of loss of water from natural and unnatural causes. Moreover, especially the first point in this framework shows preparedness to continuously adjusting legislation and approaches to fit the current state of the water scarcity issue and to implement the best practices in water use. This correlates well with Principle 3b as it advises to foster co-ordinated management of use, protection and clean-up of water sources, especially taking into account policies that affect water demand. The mentioned point pledges to manage these water-related policies. Further, this framework mentions the implementation of institutionalisation of forums and committees to encourage participation across sectors and levels, and especially in engagement of local communities to control use of water, reduce losses and promote more efficient management of water resources (WDMU, 2016: p 9). This point coincides with Principle 3a as it encourages co-ordinated actions on promoting coherent policies across spheres and sectors. Also, the creation of institutions serves as a way of decentralising all water-related legislation to the governing body and including civil society and enforcing transparency to enforce participation. Such implementation of institutional reforms affects both state and social institutions and is described as a key element of the theoretical explanation for enforcing effective water governance (Rogers & Hall, 2003: p 14).

Finally, the inclusion of cross-cutting themes in the Water Demand Management Policy shows a great commitment to including civil society in the management and the reduction of water use and demand. The policy shows a big engagement to create public awareness as a tool to reduce water demand, which will be enforced in campaigns and water education, and public awareness programmes will be implemented for staff and employees across all sectors to increase public awareness as well as the importance of facilitating efficient management of water (WDMU, 2016: p 10). This is a very direct way of enforcing public participation in the

issue of water scarcity and an effective social tool to reduce demand of water (Rogers & Hall, 2003: p 23). Also, this policy advocates an intensification of public-private co-operation, by including and increasing private sector participation in public awareness campaigns to implement water-related policies. Such co-operation is crucial for the effectiveness of water governance systems, as these cannot solve issues of water and demand single-handedly, and it is essential to include civil society and the market to aid the implementation of policies and other management tools. Moreover, all stakeholders must be allowed to engage actively in solving the growing issue of water-related issues, as without engagement it is hard to find common grounds and co-operation for policy implementation and sustainable water management of use and demand (Rogers & Hall, 2003: pp 35-36). By improving co-operation between water demand sectors, as well as including civil society and engaging all in policy implementation, it mitigates the outbreak of conflicts across sectors as well as it increases the enablement of finding solutions that fit with local governance and norms, as promoted in Principle 3d.

Principle 4. Adapt the level of capacity of responsible authorities to the complexity of water challenges to be met, and to the set of competencies required to carry out their duties.

The fourth OECD Principle on Water Governance sets its focus on the development of capacities of institutions and stakeholders involved in the water sector. Principle 4a addresses the need to identify and focus on capacity gaps in the implementation of IWRM; 4b enhances the need to match the different levels of technical, financial and institutional capacity to the nature of needs and problems; 4c encourages to assign competences upon demonstration of capacity in an adaptive and evolving manner; 4d promotes to hire public officials and water professionals that are independent from political cycles and use merit-based and transparent processes, and ultimately; 4e recommends the promotion of education and training of water professionals in order to strengthen the capacity of stakeholder and water institutions and to, on the large sight, foster co-operation and knowledge-sharing (OECD, 2015: p 10).

In the National Water Strategy, the great need for professional technical knowledge in different spheres of action, such as monitoring and evaluation; engineering, social sciences; and law is being addressed. In order to achieve a high level of exchange of such knowledge, the MWI promotes staff exchanges and sharing of experiences as additional learning opportunities for all levels. Professional development and training of individuals must be accompanied by institutional strengthening in order to make it effective. As formulated by the MWI, the overall goal is the establishment of strong institutions staffed by skilled professionals. The MWI

stresses the importance to act on the three different functional levels of water governance as well as to respect and include the multitude of stakeholders that are involved in the Jordanian water sector, both important aspects of global governance and water governance theory (Dingwerth & Pattberg, 2006: pp 190-192; Schmidt & Matthews, 2017: p 14). It further shows that the MWI is aware of the fact that water governance is a sphere of action, which is interrelated with other spheres and simultaneously requires high technical and sectoral knowledge (Zürn, 2018: p 10). These aspects can be mentioned as being crucial for the development of effective water governance policies in Jordan. These approaches are coherent with Principle 4b, which puts emphasis on the importance of matching technical, financial and institutional capacity in the water sector to the nature of problems and needs. Further, they go in line with Principle 4d and 4e, which encourage to hire public officials and water professionals that are independent from political cycles and education and training of water professionals and stakeholders in order to strengthen the capacity of water institutions as well as to foster co-operation and knowledge-sharing (OECD, 2015: p 10). Moreover, in the National Water Strategy it is stated that the aim is to adopt

> *"Integrated Water Resources Management (IWRM) as a strategy and process to promote the co-ordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare gains in and equitable manner, without comprising the sustainability of vital ecosystems"* (MWI, 2016: p 22).

Implementing IWRM strategies in Jordan aims at meeting the SDG on Water and Sanitation. The overall goal of implementing IWRM is to secure that the national water resource management is based upon principles of sustainable use, social equity and economic efficiency. The adaptation of IWRM, in combination with criteria of good governance and water governance, is highly promoted among water professionals. The GWP, which formulated the main principles of IWRM, defines it as being an outstanding approach for sustainable water use and management and therefore as being crucial for reaching efficient water governance (Rogers & Hall, 2003: p 30). Moreover, it is acknowledged in the National Water Strategy that developing an institutional regulatory framework, which is capable of integrating economic, social and political systems, still represents a big challenge to the Jordanian water sector. This emphasises the need for major improvements in the water sector regarding institutional and economic involvement, participation and education of all concerned stakeholders as well as technological improvements (MWI, 2016: pp 22-23). In order to implement such improvements, several strategic objectives were formulated by the MWI, such as to

> *"facilitate the creation of an enabling environment for integrated planning and management of shared water resources that includes support to the establishment and strengthening of shared watercourse institutions and ensuring a meaningful role for civil society to participate in decision-making for river basin/watershed management"* (MWI, 2016: p 23).

The realisation of such structural and institutional reforms, that improve policy formulation, implementation and enforcement can turn poor governance into good governance and finally lead to achieve a sustainable development in the Jordanian water sector (Rogers & Hall, 2003: pp 10-13). Other objectives in this regard are the development of a National Water Information System (NWIS) and a monitoring system to facilitate the monitoring of the SDG's targets. Moreover, it is planned to establish a national policy dialogue and forum in order to raise awareness and consensus among the involved stakeholders (MWI, 2016: p 24). With the aim to create an enabling environment for planning and managing shared water resources the MWI shapes the constitutional level of water governance. When establishing the NWIS and a monitoring system, it acts on the organisational level. In combination with IWRM, which is an approach that focuses on the operational level of water governance, the MWI takes all three functional levels of water governance into consideration. This should lead to a strengthening in local governance and reduce the vulnerability for the governing system (Rogers & Hall, 2003: p 21). Besides these strategies, the National Water Strategy further sets up a clear distribution of capacities in the IWRM implementation process. The MWI inhabits the leading role of the IWRM process and is therefore responsible for planning, rule-making and the coordination of dialogues among stakeholders. Further, the sectors of finance and budgeting fall under the MWI's responsibility. The MWI is supported by different institutions such as the WAJ, JVA and other national entities. Moreover, it is stated in the National Water Strategy that "other facilitating institutions/ mechanisms will be established where appropriate, including the Inter-Ministerial Committee/Task Force. Institutional capacities and partnerships will be built for better management" (MWI, 2016: p 28). In order to address gaps of capacities in the implementation of IWRM, it is planned to revise the institutional structure of the sector and review the existing legislations continuously and, if necessary, prepare for adjustments and changes (MWI, 2016: p 29). These reforms can play a great role in reaching effective water governance in Jordan, as institutional reforms, that aim at decentralising functions of the state to other stakeholders and democratising organisations of civil society, are a key element of effective water governance (Rogers & Hall, 2003: p 14). As an example of the establishment of an inter-ministerial committee in the Jordanian water sector, the National Implementation

Committee for Effective Integrated Wastewater Management (NICE) must be mentioned. In 2013, in the course of the implementation of the Sustainable Management of Available Resources with Innovative Technologies (SMART) project, on which will be elaborated further on, the MWI established NICE to develop administrative and regulatory tools for implementing integrated wastewater management systems in the country. The NICE committee, including decision-makers from different Jordanian ministries and authorities and other important national stakeholders, developed regulatory and administrative tools for implementing decentralised wastewater management systems in Jordan. By 2016, NICE regulations were adopted by the Jordanian Cabinet, which led to the adoption of the Decentralized Wastewater Management Policy, the first of its kind in the Arab World (Lange et al., 2019: pp 64-65). This shows a high level of awareness from the responsible authorities in the Jordanian water sector of the importance to distribute governance actions to diverse stakeholders in order to guarantee the adaptation of the central state to new realities and developments (Rogers & Hall, 2003: p 13). Furthermore it shows, as mentioned in previous sections, that the Jordanian water sector finds itself in the development from a hierarchical governance system into a distributed governance system, characterised by a stronger role of networks and civil society (Rogers & Hall, 2003: p 12). All these mentioned aspects can be related to Principle 4a, as they enhance the importance of identifying and addressing capacity gaps in the implementation of IWRM, especially in regards to planning, rule-making, finance, budgeting, project management, data collection and monitoring and risk management and evaluation.

Especially in the region of the Jordan Valley, with its hot and dry climate and general water scarcity that is accompanied by a growing water demand, caused by the rapid population growth, the thorough implementation of an effective water governance is needed. However, the establishment of a basin-wide IWRM concept in the Jordan Valley presents to be complicated due to the different institutional settings in the riparian countries Jordan, Israel and Palestine, and their distinct social and economic approaches to water policy. The SMART project was established as a multilateral research and development project with the overall goal to “develop a concept for integrated water resource management for the Jordan Valley to ensure an optimized and sustainable use of all water resources in the region” (Klinger et al., 2016: p 754). The three different phases of the SMART project were implemented from 2006 until 2019. The project was funded by the German Federal Ministry of Education and Research and involved public and private stakeholders from Jordan, Palestine, Israel and Germany. The aim of SMART was to reach well developed, applied and validated concepts that are transferable to other regions suffering from water scarcity. The project addressed ecologic, economic and

social issues and built upon the assessment of conventional and unconventional water resources. The activities implemented related to the SMART projects were planned in a multifaceted manner and performed on almost all technical and institutional levels, reaching from technology demonstration and field investigation to stakeholder consultation (Klinger et al., 2016: pp 754-756; Lange et al., 2019: Executive Summary XV). Besides research and technical approaches, the SMART projects as well focused on the institutional implementation of IWRM and on capacity development in order to

> *"address the sustainable implementation in relevant institutions and the wider society by guidelines, standards, manuals and recommendations, the promotion of inter-ministerial co-operation on water resource protection and wastewater management, institutional development at both technical and expert levels, and the training for companies of the water sector"* (Lange et al., 2019: Executive Summary XVI).

The interdisciplinary approach of SMART included an expert consortium of German and regional partners from academia, and local decision-makers and stakeholders, which have been consulted on a continuous basis in order to support the transfer of technologies and management practices into the local water management practice (Lange et al., 2019: Executive Summary XVI). Global governance has previously been defined as being "the exercise of authority across national borders as well as consented norms and rules beyond the nation state, both of them justified with reference to common goods or transnational problems" (Zürn, 2018: pp 3-4). Following this definition, the SMART projects, with its transnational approach that goes beyond just one nation state and its focus on water as being a common good and the water scarcity and mismanagement in the region, presents a very good example of a global governance initiative in the water sector. Aiming at reaching a sustainable use of water resources in the region and establishing systems of rule in order to achieve this aim, the SMART project accounts for the elements of pursuit of goals and systems of rule of global governance. Further, geographical, national, international and transnational borders do not exist in global governance, which is why multiple stakeholders have to be included and considered as being equal. Moreover, global governance actions take place on the local, subnational, national, international and transnational-level, which represent the levels of human activity, another element of global governance (Dingwerth & Pattberg, 2006: pp 190-193). Thus, the SMART project fulfils the four constitutive elements of global governance. Further, the involvement of Jordan in the SMART project shows the recognition of the importance to not only include local and national, but as well the basin-level into water governance considerations, as all these levels are interlinked. Working together with other riparian countries and different international

organisations, and therefore considering the basin-level, lifts the Jordanian water governance to take a global approach (Pahl-Wostl et al., 2008: p 421). With its approach that includes capacity building on all levels of IWRM in the transboundary context of the Jordan Valley, the SMART project further goes in line with Principle 4b, which advocates for matching the level of technical, financial and institutional capacity to the nature of the problems and needs. Further, with the education and training programmes, the SMART project acts according to Principle 4e, that promotes the education and training of water professionals and other stakeholders.

The National Water Strategy addresses capacity development, defining it as one of the crosscutting issues for the Jordanian water sector. This highlights the awareness of the institutional constraints the water sector in Jordan is facing and it acknowledges that there are significant gaps at various levels in technical, operational and management capacities, which is why "current capacity gaps and knowledge gaps need to be assessed on a sector-wide basis and a capacity development plan formulated along with a budget and a supervisory monitoring plan" (MWI, 2016: p 51). Via this approach, the MWI tries to make sure that an ongoing process of renewal of skills and expertise is set in place, which is supposed to facilitate to build a workforce that can manage and deliver the needed services efficiently and effectively. Moreover, the MWI states that capacity development efforts are not only to be limited to government agencies but should include diverse stakeholders, such as knowledge institutions, NGOs, relevant private sector entities and the civil society (MWI, 2016: p 51). These points stress the importance of taking a multi-actor approach, considering all actors as being equally important with their activities on all levels, which is as well supported by water governance theory (Dingwerth & Pattberg, 2006: pp 190-192). Further, these approaches can be related to Principle 4b that states that technical, financial and institutional capacity must be matched to the nature of problems and needs and 4 e), which promotes education and training of institutions and stakeholders in the water sector. An impactful example for a capacity development approach that includes multiple actors in the Jordanian water sector, such as private stakeholders and knowledge institutions, is the 'Water Fun – hands, minds and hearts on Water for life' school programme. The Water Fun programme is part of the SMART project and developed, implemented, monitored and evaluated by the Training and Demonstration Centre for Decentralised Sewage Treatment. The Helmholtz Centre for Environmental Research and the Centre for Environmental Biotechnology give scientific and technical support. Further, the Al-Balqa`Applied University is involved with giving infrastructural and linguistic support. The project carries out training workshops for primary school teachers in order to contribute to the

"development of the institutional school level and facilitating the enabling environment which supports an informed and accepting society for sustainable water management" (Ibisch et al., 2016: p 351). The programme's aim is to contribute to early environmental education and to eradicate unsustainable practices regarding water usage and achieving early progresses in water use and water management. With its approach, the Water Fun programme simultaneously enables teachers, disseminators and students to identify, name and understand the destructive local and regional water cycle and unsustainable water practices. Further, the programme facilitates the development and implementation of potential solutions on the local and regional-level and empowers the involved stakeholders to shape their mind-sets and actions in order to achieve a sustainable way forward (Ibisch et al., 2016: pp 351 - 352). It can be argued that the Water Fun school programme takes an important multi-actor approach and as well by being part of the SMART projects takes a multi-level approach, considering the development in the Jordan Valley and at the same time co-working with stakeholders from in- and outside Jordan. Furthermore, it can be observed that the Water Fun programme, with its aim to contribute to early environmental education and to tackle unsustainable water practices, acts as a reflexive authority, which is based on the demand for more sustainable water usage and embedded in sectoral knowledge. Moreover, it produces behavioural implications rather than decisions and can therefore be identified as an epistemic authority (Zürn, 2018: p 9).

WASH is another integral and consistent issue in the National Water Strategy and plays a crucial role in raising the level of capacity of institutions and other stakeholders in the Jordanian water sector. The 'WASH in schools' programme is a strategic intervention that not only ensures that children have adequate water and sanitation facilities but as well serves as a development intervention, as schools serve as an entry point for introducing societal changes as they can be the centre of people's sensibilities and values. The focus of the WASH programme is not only to be an infrastructure intervention but also a more encompassing development approach, including the assurance of quality and adequacy of WASH facilities in schools; the review and update of curricula in order to set a focus on WASH; training of teachers; the collaboration with parents' associations; mobilisation of municipalities to support schools; developing networks with related stakeholders (MWI, 2016: p 31). The WASH programme enables the interaction between different spheres as it refers to cross-sectoral action in the water sector, the health sector and impacts living conditions for the Jordanian population. Furthermore, the WASH programme is part of a global initiative in water governance, as it is an important part of the SDGs. By including this programme in the National Water Strategy, the Jordanian government shows affiliation to enact in this global approach to enforce this

WASH programme as a part of basic human rights. Consistently recognising both approaches, the SDGs and WASH in the National Water Strategy, the Jordanian government is including the management of water on a global scale.

Finally, having analysed the Jordanian water governance in regards to the OECD Principles on Water Governance on the dimension of effectiveness, this enables to conduct a discussion where previous identified findings will be discussed with the theoretical approaches to increase effectiveness in water governance and the criteria in performance and operations of effective water governance as presented by Rogers & Hall in order to answer the research question (2003: pp 27-30).

Discussion

In the analysis the Jordanian water governance system has been analysed thoroughly with reference the OECD Principles on Water Governance on the level of effectiveness. In order to answer the research question, a discussion will be conducted discussing the findings from the analysis with the theoretical approaches on effectiveness, followed by a discussion on the criteria on performance and operations.

The first part of the discussion will focus on the approaches that governing systems can implement in order to increase effectiveness, as presented in the theory: (1) Open and Transparent, (2) Inclusive and Communicative, (3) Coherent and Integrative, and (4) Equitable and Ethical (Rogers & Hall, 2003: pp 27-28). These approaches will be discussed with the findings from the analysis on Jordan's water governance.

Commencing with the approach of Open and Transparent**,** it is mentioned that a governing system should aspire to achieve openness and being understood by the general public, as good governance requires transparency, which allows both internal and external actors to partake in decision-making. Being open and transparent refers to a number of facets within a governance structure. One aspect where Jordan's government is remarkably transparent is in the accessibility of information on water-related strategies and policies formulated by the MWI. This has been identified by the ability to access the National Water Strategy from the MWI's website, which has been used consistently throughout the analysis in order to regard the concrete strategies that the MWI is pursuing to relive the increasing water scarcity issues. Moreover, through its website, the MWI grants access to thoroughly defined policy frameworks on the nine water-related policies. Additionally, a high level of transparency can be identified in the accessibility to annual reports dating back to 2010 and to other documents, such as the Water Demand Management Framework and legislation, thereby the

work of the WDMU, groundwater resources management, and the efforts and achievements of the JVA and the WAJ. The openness of the governance system refers to their inclusion of internal and external actors and allows these to follow the steps and results of water governance decisions. This has been identified in the analysis where it is stated that the MWI identifies the collaboration with both public and private stakeholders as crucial to optimise and increase effectiveness in water supply and sanitation services. Further, the transparency of water-related policies and strategies offers a common ground to refer and act on for stakeholders across sectors.

Moving on to the next approach of Inclusive and Communicative, this correlates well with the first mentioned approach, as in order to be transparent and open, the governance system must be willing to being inclusive and communicative to the internal and external actors who show attentiveness and relevance in policy decisions. This approach mentions that the governance structure must ensure participation throughout the policy chain. When developing and implementing new policies, it is essential to take an inclusive approach and communicate with all stakeholders, which leads to the presence of civil society in governance structures. One of the most apparent ways of including civil society actors in the Jordanian governance system is the co-operation with the WUA's in the Jordan Valley, as this provides a platform for civil society stakeholders to engage in decision-making processes in water-related issues. Furthermore, there is a high level of global governance initiatives in the National Water Strategy, these include the implementation of IWRM, which is formulated by the GWP for the establishment of good water governance and allows the admission into the GWP partnership. The partnership provides access to the GWP network aiming at aiding governance systems in performing efficiently and implementing sound water governance as well as creating the possibility of including private sector water specialists into the national water governance frameworks. Additionally, it has been identified that Jordan's government co-operates with international actors to partake in water governance actions, for example the GIZ and other national governmental entities, has been mentioned several times throughout the analysis. Therefore, it is evident that the Jordanian water governance system is including civil society actors and organisations, private sector and international networks. Nonetheless, the issue of the RSDSCP also showed a weak point of such inclusiveness. Even though the civil society used politicization as a way of showing their opposition to the project, the government continued the implementation of the initial phase of the project and therefore limited the inclusion of civil society into this particular case. Therefore, in this specific case, the government's interest in including civil society in decision-making can be questioned.

The third approach is Coherent and Integrative, which refers to the need to act integrative across sectors and levels. Further, this approach calls for the consideration of impacts and connections between all existing water demanding actors in order to enhance effectiveness. There is an obvious correlation between this approach and the analysed third OECD Principle, as it calls for policy coherency through effective cross-sectoral co-ordination between policies and sustainable water management. In the analysis, it was realised that the three most water demanding sectors are the agricultural, domestic and industrial sectors and therefore these are the prominent sectors to co-operate on water-related policies. The creation of the WDMU is an important product of the MWI's strategy, attempting to manage water as effective as possible, which can be examined in the Water Demand Management Policy. As identified, the theory offers a number of ways to control demand, and in Jordan's water governance these can be identified through a number of legislative frameworks. The Water-Rationing Programme and the Water Reallocation Policy are tools to strictly manage water allocations. This is done in the domestic and agricultural sector by only supplying a certain level of water and restricting the consumption to a certain L/C/day. Moreover, in the National Water Reallocation Policy it is stated that the aim is to reduce the use of freshwater for irrigation purposes and replace it with treated wastewater. This was identified as a way to mitigate conflict and competition between the sectors as there is an aim to divide water resources so freshwater meets the demand of domestic purposes, while treated wastewater meets the demand of agriculture. Hereby, ensuring that a possible increase in demands only can happen with a simultaneous expansion of water resources. Moreover, co-operating with the reallocation programme ensures that reallocation will correlate with the water sources to avoid over-exploitation while avoiding favouring of one sector's water demands over the others'. Furthermore, it is apparent that the WDMU aims at integrating all levels of the water demanding sectors into their policies, which shows a high level of inclusiveness, as identified, by the need to revise existing incentive programmes on sustainable funding mechanisms to uphold the socio-economic contribution provided by the agricultural sector. This integrative approach has also been identified in the section on cross-cutting themes as presented by the WDMU, where public participation is being advocated as an effective social tool to reduce demand of water and further, encouraging an intensification of public-private co-operation to ensure specialists taking part in water demand management. These points highly convey to the aforementioned approach of inclusiveness and communication as it includes all levels of society to partake in water governance actions and decision-making on reducing water demand and enable a sustainable water consciousness.

Finally, the approach Equitable and Ethical is mentioned, referring to the need for governance systems to manifest themselves on ethical principles based on rule of law. Further, legal and regulatory structures should be fair and equally accommodating to all water demanding sectors. The aspect ethical refers to values and differentiating good from bad, and as climate change is one of the biggest global issues, especially in regards to water resources and lack thereof, governing ethically must serve environmentally sustainable. As it was identified in the analysis on Principle 2, poorly managed irrigated agriculture has been one of the main causes for the shortage of water resources in the Jordan River Basin. Therefore, it is crucial to realise how the MWI is working towards changing this sector's way of using water to a more sustainable way as well as how to rehabilitate the Jordan River. The bilateral agreement between Jordan and Israel from 1994 is an example of an attempt to create ethical water management through environmental rehabilitation, securing water supply for Jordan while attempting to secure an important religious symbol of the Dead Sea, which is also an important source of income through the tourist industry. It can be acknowledged as being a cross-sectoral agreement as it affects all sectors in the Jordan Valley. Moreover, the water demanding sectors are relying on this increase of water supply that the agreement would generate. Furthermore, in regards to ethically changing the way of conducting irrigated agriculture, in the National Water Strategy it is mentioned that the National Water Reallocating Policy aims at reducing water allocations to irrigation, and increasing the use of treated wastewater for this purpose. As acknowledged in the analysis, this policy aims at mitigating competition between the water demanding sectors, and securing all actors' equity for the joint water resources. Additionally, it is mentioned that there can only be a growth in water demand, if this can be supplied in increased water resources, and therefore delimiting overuse and exploitation and securing sustainable usage. Moreover, the National Water Demand Management Policy from 2006 responds to the issue of inequality between stakeholders and internal conflicts in the agricultural sector through recognising the need of sustainable development. This is highlighted by the incentive to generate innovative sustainable solutions to make irrigated methods more effective, and moreover, the need for incentive programmes to secure socio-economic developments.

The second part of this discussion will focus on the criteria concerning performance and operations of effective water governance, as presented in the theoretical framework, which are (1) accountability, (2) efficiency, (3) responsiveness and sustainability and (4) the usage of IWRM (Rogers & Hall, 2003: p 30). The findings of the analysis will be examined in regards to these criteria. The first criterion is the accountability of the water governance system, which

includes whether roles and responsibilities are clearly distributed and acknowledged and whether the rules of the game and the consequences for their violations are spelled out precisely (Rogers & Hall, 2003: p 30). Resulting from the analysis, it can be stated that the roles and responsibilities of governmental institutions are clearly distributed, as it can be retrieved from the National Water Strategy. The MWI takes the leading role and is supported by the WAJ and JVA. Further, it has been identified that the MWI is continuously working on closing gaps and eradicating overlaps in the institutional setting, for example via the clear distribution of tasks among the involved entities, changes in the institutional setting and the collaboration with a wide range of stakeholders. Besides the three main governmental institutions that inhabit important responsibilities regarding water governance in Jordan, the MWI is distributing governance actions to other stakeholders, especially to actors involved in the IWRM process and other entities that are built with the purpose to take over important tasks in the water governance system, such as the WDMU. Moreover, it has to be stated that the MWI serves as the main institution of the water sector to which other non-governmental bodies can refer to with their concerns regarding water-related issues, which increases the accountability of the governmental institutions in water governance. Furthermore, it has been analysed that the National Water Strategy creates the overall framework for the formulation of objectives in the Jordanian water sector. These objectives then shape the nine water policies, which have been identified as being the rules of the game in the Jordanian water sector. These policies address highly important aspects of the Jordanian water sector in depth, such as climate change, groundwater sustainability and wastewater management. Each of the policies sets out targets and action plans for their own field of action and thus contributes to more detailed rules of the game. Further, the different projects invested in the water sector, such as the SMART project, have their own objectives, restricted to their area of action, and therefore they have their own systems of rules as well. All of these projects' and institutions' rules of the game seem to go in line and draw upon the national approach to water governance and simultaneously, as the different institutions and projects are interlinked, it can be assumed that their objectives and rules of the game shape, influence and complement each other. Therefore, similar to the objectives of the SMART project, the objectives of the NICE inter-ministerial committee, the WDMU, the WASH Task Force and the Water Fun school programme, coincide with the National Water Strategy and can be identified as being part of the systems of rule in the Jordanian water sector. Another important aspect is the fact that the Jordanian water governance system is currently under a process of modernisation and is evolving from a hierarchical system to a distributed governance system. This is proven by the Jordanian government's inclusion of

a wide range of civil society actors, for example via the WUA's and the Water Fun school programmes, and other platforms and mechanisms in order to include non-governmental stakeholders, such as the WASH Task Force and the SMART project. Thus, it is evident that the Jordanian government in its approach to water governance does account well for the criterion of accountability, which is needed to enforce effective water governance. Although, it has to be acknowledged that the National Water Strategy indeed serves as a strategy paper which lays out objectives and by which means to achieve those, but it does not clearly account for consequences in case any actor does not comply its duties, nonetheless, this does not mean that these consequences are not accounted for at all in the Jordanian institutional setting.

The second criterion for effectiveness regarding performance and operations is efficiency. This criterion not only addresses economic efficiency, but also accounts for the importance of simultaneously aiming at political, social and environmental efficiency in order to reach cross-sectoral efficiency (Rogers & Hall, 2003: p 30). As laid out in the analysis, the MWI stresses that the collaboration with private and public stakeholders make water supply and sanitation services more efficient, cost-effective and sustainable. This proves the MWI's recognition of the importance of overall cross-sectoral efficiency. Regarding economic efficiency, it has been identified that the MWI strives to improve the financial efficiency of the water sector, by (1) cost savings from improvements in energy efficiency via the modernisation of infrastructure, and (2) gradually increasing revenues by improving the administrational procedures and the increasement of costs for water and wastewater services. Further, in order to achieve cross-sectoral efficiency, the MWI is working together with different other governance institutions, NGOs and other private and public stakeholders. The JVA, being a governmental institution, for example manages all cross-sectoral issues in the Jordan Valley. The WUA's in the Jordan Valley manage the adequate distribution for water in agricultural uses, to increase technical and financial efficiency and thus work cross-sectoral. Another organisation aiming at increasing the efficiency in the water sector is the WDMU, which works on expanding the efficient and sustainable water use and co-ordinated water management across agricultural, municipal, industrial and agricultural actors. Moreover, it has been analysed that the SMART project plays a crucial role in the cross-sectoral and cross-level management of water resources in the Jordan Valley. It not only acts on different levels of water governance but also, with its multi-level approach and implementation on all levels of water governance, shapes the political, social and environmental efficiency. Especially through education projects, such as the Water Fun school programme and the SMART project, it aims at affecting environmental education and thus social efficiency. The SMART project is part of the

implementation of a sound IWRM strategy, which is enforced by the MWI in order to make the management of national water resources sustainable, which builds upon principles of social equity and economic efficiency. Another important aspect that is supposed to improve the efficiency of the water governance system is capacity building. Capacity building is an important factor in the MWI's water governance approach, as building capacities of water professionals, institutions and other stakeholder can facilitate to build a well-qualified workforce which can finally manage and deliver the needed services in the water sector efficiently and effectively. The combination of these presented approaches aims at increasing the overall efficiency of the water sector, related to finance, as well as politics, social, and environmental efficiency.

According to the third criterion concerning performance and operations in effective water governance, responsiveness and sustainability are the decisive aspects. This criterion states that policies must deliver their services according to the demand and with clear objectives and further considering future impacts and past experiences. The aspect of responsiveness moreover requires that the incentive-based policies have a clear social or economic gain and are built on the goal of long-term sustainability (Rogers & Hall, 2003: p 30). As it has been identified in the analysis, the National Water Strategy serves as the main strategic paper of the Jordanian water governance and defines the objectives to be achieved in the water sector. These objectives include the implementation of a sound IWRM strategy, the enforcement of the nine water sector policies, the adoption of legislation in order to facilitate procedures, initiation of institutional reforms, the improvement of internal efficiencies, building of technical capacities and the enhancement of fiscal discipline. The overall objective is the achievement of a sustainable development of the water sector and therefore fulfils the aspect of taking into account long-term sustainability and are aiming at shaping future impacts. The National Water Strategy can be identified as taking a comprehensive approach, including the analysis of the Jordanian water sector. Resulting from this analysis, the general national objectives are established, which take into consideration the available resources and demand, as well as other cross-cutting issues. These objectives are clearly defined and built upon well researched grounds. Further, the most important sectors of the water governance system are addressed by the nine water policies, which all include objectives and action plans for the concerned field of action. As the third criterion states, services must be delivered according to demands. In order to manage this aspect in a comprehensive way, the MWI established the WDMU, which is responsible for programmes of water demand management and for increasing the efficient and sustainable water use and the co-ordinated management of water across sectors. Another overall

goal of the Jordanian government can be identified as the aim to increase citizens living standards. This goes in line with the criterion pledging for a clear social or economic gain to be achieved by policies. Moreover, it has to be acknowledged that the Jordanian government, regarding the aspect of responsiveness, indeed considers past and present developments in different aspects of its water governance. With the WASH Task Force, which is a part of the JRPSC, the Jordanian government, in collaboration with other stakeholders, addresses the impact that the incoming Syrian refugees have on Jordan`s water situation. This kind of reaction shows, that the Jordanian government did learn from the consequences previous incoming refugee waves had on the water resources of Jordan. Further, the establishment of the JVA and its engagement in the SMART project accounts for the fact that the Jordanian government is aware of the distinctive circumstances the Jordan Valley is facing. As it has been analysed, the National Water Strategy builds upon the SDGs, and is actively engaged especially in regards to the SDG 6 on water and sanitation, which can be proved by the MWI's involvement in projects such as the WASH Task Force and the Water Fun school programme, that highly correlate with the goals of this SDG.

The fourth criterion in performance and operations that supports the implementation of effective water governance is to enforce IWRM approaches as a strategy of managing water resources (Rogers & Hall, 2003: p 30). It has been analysed that it is the MWI's aim to "promote the co-ordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare gains in an equitable manner, without comprising the sustainability of vital ecosystems" (MWI, 2016: p 22). This commitment to the sound implementation of IWRM strategies takes great importance in the National Water Strategy and is obviously put into practice through the engagement in projects, such as the SMART project. Regarding implementing IWRM approaches as a strategy in the Jordanian water sector it must be acknowledged that the above-mentioned approaches to increase effectiveness of water governance as well as the mentioned criteria of performance and operation go in line with IWRM procedures and contribute to the aim of implementing a sound IWRM strategy in Jordan.

The presented discussion elaborates on the Jordanian government's achievements and shortages in relation to the four approaches to increase water governance effectiveness and the four criteria on performance and operations. The results have been predominantly in favour for the Jordanian water governance system, as they are showing a devotion to implement IWRM, which by the GWP is formulated as being essential to adopt in an effective management of water. As mentioned, both the approaches and criteria are increasingly in line with the

framework of IWRM. These results identified in the analysis and discussion can and must serve as an exemplar of how the Jordanian government is implementing effective water governance through strategies that highly correlate with global water governance theory.

The National Water Strategy serves as a direct strategy to implement IWRM in all Jordanian water consuming sectors, through formulating national goals, providing water policies and strategies, such as the nine water policies, and finally, providing an incentive for actions of implementation. As ascertained in the analysis and highlighted in the discussion, the Jordanian government has been identified as a hierarchical system, however going through a modernisation process, acknowledged by their distribution of duties to other governmental actors such as the JVA, WAJ and WDMU. Moreover, the theory highlights that the collaboration with both private and public stakeholders in the Jordanian water demanding sectors can be attributed for a big part of the efficiency improvements. In this case, emphasis must also be accredited to capacity development strategies for all stakeholders, which is an important tool for improved consciousness about water resources, leading to a sustainable water use. Furthermore, Jordan has demonstrated to be exceptionally innovative in the creation of bilateral agreements in the MENA region, when being part of the 1994 agreement with Israel in co-operation of peaceful water management, which was the first of its kind. Such cross-national co-operations have proven to be crucial for managing transboundary water resources, especially due to Jordan's geographical location in a conflicted and drought-stricken region. Managing water on a global-level led to supranational co-operation between Jordan and members of the GWP Partnership, including creating water managing projects with international actors such as the GIZ. Jordan has been very successful in developing a solid enabling environment and moreover, by the encouragement of participation from both public and private stakeholders, this has expanded Jordan's scope in regards to securing and increasing efficient water management. Furthermore, it is apparent that Jordan's government is determined to find innovative solutions to secure both environmentally sustainable and socio-economic interest to strengthen cross-sectoral development.

One of the shortcomings of the Jordanian government the analysis was able to identify is the implementation of the RSDSCP, through which the government disregarded the inclusion of civil society and opposed public interest. This is an apparent example that the hierarchical governance system is still in place as the government overthrows public interest. Nevertheless, the National Water Strategy proposes multiple strategies to increase the inclusion of civil

society into the decision-making processes in the water sector as well as creating public awareness on sustainable water usage. Another aspect where the Jordanian government could improve is the formulation of clear consequences for not complying with the legislation in the National Water Strategy. Even if such consequences are formulated in national legislation, these must be included into the National Water Strategy in order to increase the transparency of the water governance system.

Further, the Jordanian water governance shows to be efficient in decreasing overuse of water, by regulating water use through stringent water reallocation. This proved to be a quick and efficient response to an emerging water scarcity crisis, through which the government was able to prolong its latitude to create long-term sustainable water-related policies. Finally, it must be acknowledged that Jordan is reinforcing its devotion to sustainable practices by amending its former unsustainable irrigation approaches, which were put in place to rapidly increase socio-economic developments but neglected sustainability. However, the water governance system is now dedicating its actions to sustaining the socio-economic developments while improving all unsustainable irrigation approaches, overuse and resource exploitation. Therefore, it must be highlighted that the Jordanian government undertakes actions to equally include and sustain all involved sectors and continues to mitigate internal and external conflicts, while securing all stakeholders.

The MENA region in which Jordan is located is the most water stressed region in the world and stricken by several conflicts in and across nation-states. Jordan presents to be one of the most stable countries in the region. Due to this water stressed reality, implementing an effective water governance system is not only highly important in order to sustain the livelihoods of the growing Jordanian population but it as well reduces the likeability of conflict over the shared water resources between Jordan and its neighbouring countries. The intensified co-operation with civil society, international institutions and the management of transboundary water resources on the basin-level proves that the Jordanian government strives to increase the efficiency of its water governance system. However, it must be highly acknowledged that the engagement of international organisations and donor agencies play a crucial role in enabling and supporting the Jordanian government in improving its water governance approach and implementing efficient water management. This shows a high level of interest of the international community to remain Jordan’s stability in this conflict-stricken region. As water plays an increasing role in conflicts in the past years, this can as well be seen as a strategy to

prevent these numbers from rising. For countries in comparable situations, having the developments in Jordan as an example can be useful in order to improve the effectiveness of their water governance systems and simultaneously prevent conflicts over water resources. The Jordanian approach proves not only successful in the management of its transboundary water resources but as well in finding approaches in order to reduce water use, improve wastewater management and to sustain the country's socio-economic developments. It is therefore evident, that in order to successfully implement effective water governance that contributes to a global sustainable development, such as in the case of Jordan, international co-operation and involvement in the management of water on a global-level is crucial.

Conclusion

To sum-up the findings of this thesis, it can be acknowledged that the Jordanian government has been successful in implementing effective water governance designed to fit the unique circumstances of the country. This has been identified through an extensive analysis, where the theoretical framework of effective water governance and global governance was applied on strategies and policies presented by the MWI according to the OECD Principles on Water Governance on the dimension of effectiveness.

Introducing the thesis, it was identified that water scarcity is an increasing global issue as the worldwide water demand is rising and more countries face difficulties to meet their national water demands. This is even aggravated due to growing population, water-demanding economies and effects of climate change. Also, it has been recognised that the number of conflicts due to water-related issues has risen significantly in the last decade. This shows the necessity for governments to increase their attention to the water-related sectors and to manage water sustainable in order to secure the water demanding sectors as well as avoiding water-related conflicts. This proves being especially crucial in the MENA region, as this is the most water scarce region, while also being a region affected by internal and cross-boundary conflicts. Jordan is one of the most stable but also most water scarce countries in the region, and serves as a special case due to its dependence on water resources of the transboundary Jordan River Basin, sharing its water resources with the riparian countries of Israel, Palestine and Syria. This area has been particular hostile due to the conflicts between Israel and Palestine, and the civil war in Syria. As a consequence, Jordan has received high numbers of refugees, which have led to rising water demands. These realisations have led to the research question aiming at studying the effectiveness of the approaches Jordan's government takes in managing its water resources:

Which factors influence Jordan's water governance and how effective is its governance system in implementing water governance policies?

In order to answer this research question, a theoretical approach was established, based on theories of global governance by Dingwerth & Pattberg (2006) and Zürn (2018) and effective water governance by Rogers & Hall (2003) and Pahl-Wostl et al. (2008). Furthermore, the OECD Principles on Water Governance, that shed light on the effectiveness of water governance systems, were presented in order to serve as a framework of analysis. This enabled a thorough analysis of the effectiveness of the water governance approach of the Jordanian government. The main sources for this study were retrieved from strategies and policies of the MWI. The findings of this analysis have then been discussed in regards to approaches and criteria of effective water governance, as formulated by Rogers & Hall.

As mentioned in the methodology chapter, water governance can be considered to be successful and effective when policies and frameworks are applied and enforced in a combination of top-down and bottom-up processes, which help to overcome key challenges while simultaneously fostering constructive state-society relations. In the analysis and discussion of this thesis it was identified, that stakeholder engagement is crucial in order to implement effective water governance. Jordan has been increasingly successful in including both private and public stakeholders in their water strategies. The Jordanian government does apply bottom-up approaches, for example when it includes the WUA's in the Jordan Valley, and top-down approaches, when implementing policies in order to restrict the water demand. The fact that the MWI enhances the importance of including multiple stakeholders in its National Water Strategy as well as in the different policies designed for the water sector demonstrates the inclusiveness of the MWI's approach. Moreover, through the engagement in different projects, such as the SMART project and the NICE committee, the MWI facilitates the co-operation between different water demanding sectors and includes all stakeholders into the decision-making processes. However, it is not only important to mention the improvements in the Jordanian institutional setting and stakeholder engagement, but as well the Jordanian government's willingness and approach to co-operate with its neighbouring countries in water governance practices, albeit the political tensions that the countries are facing. The collaboration with these diverse stakeholders, the engagement of the Jordanian government in different projects and the establishment of entities with very specific tasks, such as the JVA and WDMU, show that the Jordanian government recognises the importance to act on and take into consideration all levels of water governance simultaneously.

Furthermore, the Jordanian government has increased its efforts in making the country's water use more sustainable. The agricultural sector is the most water demanding sector in Jordan, and due to its socio-economic importance, it is simultaneously one of the most important stakeholders. Previously unsustainable irrigation practices were put in place in order to increase the economic efficiency of the sector, however the Jordanian government recognised the necessity to amend those practices and develop and implement environmentally sustainable practices while upholding the socio-economic benefits of the sector. In order to achieve this, the MWI has enforced a strict water reallocation policy to ensure that there is less overexploitation of the water sources, which controls and manages the amount of water used for irrigation purposes, as well as domestic use. Moreover, the MWI has laid out a strategy to reduce all use of freshwater used for irrigation purposes and replace with treated wastewater to optimise the total water use and reuse. Additionally, the MWI is also trying to sustainably manage the country's water demand by enforcing the Water Demand Management Policy and by applying an educational approach which is leading to an increased knowledge about the water cycle and a more sustainable water use.

Concluding and answering the research question of this thesis, it can be stated that the Jordanian government highly increased the effectiveness of its water governance approach in recent years through repeatedly adjusting its institutional setting in regards to the water sector, and by continuously accounting for the current developments in Jordan and its neighbouring countries. The Jordanian government has shown a high level of responsiveness to developments in the water sector, which has shown to be crucial when dealing with water as a fugitive resource, as well as Jordan's location in an increasingly hostile and drought-stricken region. Such responsive approach to obstacles in the water demanding sectors in combination with different bottom-up and top-down policies and the co-operation with diverse stakeholders on all levels of water governance will enable the Jordanian government to continue to be adaptive to new challenges either caused by unforeseen water needs, drought occurrences or changes in external circumstances. Moreover, it will enable Jordan to decrease threats that result from water scarcity, such as poor health and living conditions of its citizens and a lack of opportunities for education and employment and finally move towards a future sustainable development.

Nonetheless, subsequent to the study of the government's implementation of effective water governance, it can be assumed that the Jordanian government would most likely not have been as successful in implementing an effective water governance system without the support and engagement of international organisations. Not only have these organisations delivered

financial contributions, but they played a crucial role in delivering technical support and knowledge. Being a part of the GWP partnership facilitated establishing and implementing the approach of IWRM in Jordan, which serves as an important part of the National Water Strategy. This highlights the importance of international co-operation for reaching a global sustainable development and serves as one of the biggest influences in the success of Jordan's water governance.

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Appendix 1

Table 1: Development of Resources and Projected Demand in MCM/a

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Groundwater Safe yield	275	275	275	275	275	275	275	275	275	275	275
Non-renewable groundwater	144	145	146	147	178	189	174	240	241	242	243
Groundwater Over Abstraction	160	156	152	148	144	140	136	131	127	122	118
Surface water (Local + Tiberius Lake)	263	265	267	269	271	276	284	293	306	311	329
Treated wastewater	140	140	175	176.6	176.6	181.6	191	191	195	195	235
Additional Resources (Desalination + SWAP)	10	11	12	18	19	20	106	107	108	109	260
Total Resources	992	992	1027	1034	1064	1082	1165	1237	1251	1253	1459
Sustainable Resources	832	836	875	886	920	942	1030	1106	1125	1131	1341
Municipal, Industrial, Tourist demands	701	703	712	717	723	730	737	746	755	766	778

Irrigation demand	700	700	700	700	700	700	700	700	700	700	700
Oil shale and Nuclear power demand	-	-	-	25	25	25	48	48	48	70	70
Total demand without irrigations	701	703	712	742	748	755	785	793	803	836	848
Total Demand	1,401	1,403	1,412	1,442	1,448	1,455	1,485	1,493	1,503	1,536	1,548
Deficit in MCM/a (with over abstraction)	(409)	(411)	(385)	(408)	(384)	(373)	(320)	(256)	(252)	(283)	(88)

(MWI, 2016: p 11).