

WATER SCARCITY AND INTERSTATE CONFLICT

NEO-MALTHUSIANISM VS. RESOURCE OPTIMISM – A SOCIAL CAPITAL APPROACH

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ABSTRACT

Water scarcity is an increasingly important and widespread issue in a world of changing climate. Neo-Malthusians argue that it will lead to increased conflict between states. Resource optimists, who view water as far too important to fight over, have refuted this viewpoint and argue that people will always find alternative solutions before conflict occurs.

This paper aims to demonstrate that the truth sits somewhere in between: although conflict over water alone is highly unlikely, shared water resources may exacerbate an existing conflict in water-scarce regions. If there is ample social capital between the states, this exacerbating factor significantly decreases – in fact, the higher the social capital between the states, the less likely it is that water will aggravate existing tensions. This is true in the case of Israel and Jordan. During a period of declining water resources, when water had the potential to exacerbate existing issues, the high level of social capital between the two countries enabled the establishment of a clear dispute management process that has reduced the risk of violent confrontation.

INTRODUCTION

Water scarcity is an existential threat to state survival, one which environmental scientists contend will worsen significantly. As water scarcity¹

increases, exacerbated tensions and potential recourse to violence become far more likely.

Previous research in the field presents a neo-Malthusian, alarmist argument, which assumes war is likely over scarce water resources. With the benefit of recent literature, this paper provides full consideration of the countering resource optimist argument, ensuring that the conclusions are significant, based on current environmental trends and academic debate.

In analysing current literature, it is apparent that war over water resources alone is extremely unlikely, with the ‘water wars’ theory being nothing short of alarmist. Conflict² data confirms this contention, with no interstate conflicts occurring over water resources alone in water-barren regions in the last 4,000 years. However, despite conflict over water alone being unlikely, water issues can still exacerbate existing issues. Water availability can be used to quell existing areas of contention, rather than acting as an antagonising factor. Further, it considers whether social capital is a factor in this.

Social capital is shown to be used to link communities and promote cooperation, particularly in water management. This theory is tested on a shared water basin case study between Israel and Jordan, in the context of social capital factors,

focusing on elements of trust and reciprocity, and how water resources have ceased to act as an aggravating influence in existing conflict. The study is used to determine whether social capital could be a factor in lowering the likelihood of water shortages exacerbating existing disputes.

NEO-MALTHUSIANISM VS. RESOURCE OPTIMISM IN WATER SCARCITY-RELATED CONFLICT

There is a significant body of literature exploring conflict over water issues. The two predominant paradigms in the field relate to neo-Malthusianism and resource optimism.

They present antithetical views on the effect of resource scarcity and its influence on conflict. Neo-Malthusians espouse the concept of ‘water wars’, whereas resource optimists believe that the ability of humans to adapt to resource shortages is underestimated. Resource optimists consider scarcity as being more likely to drive innovation than conflict.

WATER AND CONFLICT: A NEO-MALTHUSIAN APPROACH

The neo-Malthusian approach is closely aligned with the realist interpretation of international relations (Waltz, 1979).

¹Water stress is defined by the United Nations as less than 1,700 cubic metres of water per capita annually. Water scarcity, where economic development is hampered, is defined as below 1,000 cubic metres of water per capita annually. This paper incorporates this definition of water scarcity (Renewable Resources and Conflict, 2012).

²‘Conflict’ in this paper is taken to mean interstate armed conflict, involving the military of at least two states on the orders of the legitimate state government.

The realist paradigm suggests that states are likely to go to war over a resource as fundamental to survival as water, so they see cooperation as an unlikely outcome. In the allocation of water between states, realists assess fairness in the context of relative gains rather than absolute ones (Waltz, 1979).

This could make negotiations difficult. Where water basins are shared, a level of interdependence arises that realists see as a sign of weakness or vulnerability. This is more likely to occur in areas of water scarcity, especially if the relations between the states can already be considered tense (Dinar, 2013). Waltz (1979) sees this as a conflict-inducing factor, rendering cooperation difficult. Much of this discussion then turns to population growth and its heightened effect on conflict.

There is a significant body of research into the link between rapid population growth, poverty and low economic growth in developing states. The argument is that, if the development needs of a state increase, resulting in a higher demand for clean water, competition over a shared source with another state is likely to be more intense (Myers, 1994).

Environmental Refugees

Many people who are affected by a food crisis or lack of water (especially in the agricultural industry) move into cities or to other states as environmental refugees (Homer-Dixon, 1999). The effect of this migration can be to exacerbate underlying tensions in relationships at a state level.

Perceived military power of riparian state

Should a downstream state hold a higher level of military prowess, realists view this as likely to increase the chance of conflict between the states (Renner, 1996).

Large water infrastructure

Dam construction and/or diversion of water sources are also contentious issues in water scarcity, and sit at the core of Conca's work (2006) on the relationship between water scarcity and conflict. This has been shown to increase tension between states.

Water allocations

When considering water-related tension between states, much of the debate is centred on water allocations of the shared resource. This tension can be intensified if the parties are not clear on the level of control and access to the water source; how and who can influence allocation; the structure of shared management of the resource, and the strategy to manage changes in the rate of use over time (United Nations, 2012).

Climate Change As An Exacerbating Factor

A warmer environment not only affects the volume of rechargeable freshwater, but also affects its quality (Intergovernmental Panel on Climate Change, 2014).

Altering the temperature of the resource may encourage insects and parasites that were previously unable to breed in a cooler environment (ibid).

As such, the effects of climate change exacerbate both supply and demand-induced scarcity. In conjunction with population pressures, water scarcity due to climate change may aggravate existing water tensions.

RESOURCE OPTIMISM: COOPERATION OVER CONFLICT

Resource optimism, conversely, sees population growth as having a potential positive effect on the state, believing that this growth has the capacity to propel modernisation in developing nations.

The resource optimist approach considers three key areas that refute the neo-Malthusian argument and point towards interstate cooperation in water-scarce areas: the adaptability of humans, establishment of a global water regime and shared interests between water-sharing states.

Adaptability of humans

Adaptability is a factor largely ignored or discounted by neo-Malthusians. Resource optimists argue that water scarcity exacerbated by population growth is unlikely to cause conflict; a more probable result is that the

crisis will facilitate technological improvements to meet demands (Boserup, 1990).

People will move to newer, more efficient methods to replace water, sustain agriculture and generate power. In the case of agriculture in developing states, many are utilising old, inefficient farming techniques that use substantially more water than methods adopted in more developed regions. Many of these techniques, which stem from the 20th century green revolution, use fertiliser and pesticides that have a detrimental impact on waterways. In a number of these states, the land used for farming is not suitable and enormous quantities of freshwater are required to irrigate the terrain. New farming techniques that use crops that are less water-intensive and less prone to biological attack can significantly increase output. These techniques can improve productivity of both land and labour in the region (ibid).

Population growth can also increase taxation revenue to further develop large infrastructure projects that were previously deemed too expensive or inefficient. Such infrastructure may include a piped water network, water dosing to improve quality and large dams to generate electricity (ibid).

Establishment of a global water regime

Increasing water scarcity has led to the emergence of a global regime in freshwater resource management (Conca, 2006).

The 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses outlines a framework of water use and management that is equitable and reasonable for multiple states utilising a single water source (*Convention on the Law of the Non-Navigational Uses of International Watercourses*, 1997, 21 May 1997). This is the only document that defines the global use of freshwater and provides codes of conduct for both upstream and downstream states. Unfortunately, the convention is yet to be adopted, as the required number of states have not ratified it (Dinar, 2013).

It is nevertheless important in signifying a push for a global water regime, and the increasing importance of water scarcity may encourage ratification.

Riparian states with effective water agreements are shown to avoid conflict, instead facilitating a cooperative environment (ibid). Water agreements are very common between watercourse-sharing states. Currently, there exist just under 450 agreements between states regarding the use and maintenance of international water sources (UN Water, 2013). They are more likely to occur in places where a potential dispute over a valuable basin may arise (Zawahri, Dinar and Mitchell, 2011).

The International Water Resources Association (IWRA) facilitated the negotiation of many of these treaties, with the aim of enabling ongoing dialogue to create a firm institutional framework in which to manage the resource (Wolf, 1998). Seventy-two per cent of treaties from 1950 through to 2000 contain at least one institutional provision relating to monitoring, enforcement, conflict management and the delegation of authority to a third party (Tir and Stinnett, 2012).

Tir and Stinnett have shown that the more institutionalised the water treaty, the lower the chance of militarised conflict over the water resource (ibid). They have confirmed, through extensive research, that treaties have proven to be very effective over time in promoting cooperation and avoiding conflict over water issues (ibid). These gains exist even when there is tension between the states in other areas (Wolf, 1998), explicable through shared interests.

Shared Interests Between Riparian States

A shared interest between states deters conflict over water issues. When interests are shared, states are more likely to uphold water agreements so as not to hinder their own development opportunities. Conflict over water is not strategically rational when the cost of war could be better spent creating infrastructure such as desalination plants (Deudney, 1991). This was the rationale used in the Israeli-Lebanon

war of 1982, when it was argued that the war was not based on resource gain (Wolf, 1998). Developed states have jettisoned the idea of military conquest for the purpose of increasing their water resource pool and, in its place, have found that economic cooperation brings greater gains (Gartzke, 2012).

Polachek (1980) argues that the greater the dependence on trade, the less chance there is of two states going to war.

The principle is based on economic rational actor theory, in which states will aim to maximise their utility and welfare. Polachek (1980) contends that cooperation and peace make economic sense for two trading states, as a conflict would incur further costs from a loss of revenue due to diminished trade. Hence, it is in their common interest to use existing funds to create water infrastructure that will enhance their network, rather than use these funds to engage in armed conflict to secure a water resource.

STEPPING AWAY FROM THE REALIST PARADIGM

As population pressure increases, it is likely to have an effect on water resources and the perceived lack thereof. It will no doubt be an issue in the future, however, neo-Malthusians and realists present a sensationalist view that ignores the capability of people to adapt, and is too willing to suggest a state's primary response to water scarcity will be a military one.

Water agreements, although not guaranteed to avoid conflict, tend to be an effective peace-building measure (Dinar, 2013). Realists may argue that any interdependence between states is considered a weakness, and that they will reduce the risk of being attacked if they obtain full control over water resources. This is a flawed argument and is unlikely to solve the water scarcity issues of the state. War is expensive, and the hold on the resource post-conflict is likely to be tenuous and prone to skirmishes.

The effects of war on the water resources themselves also warrant a mention, as maintenance of infrastructure tends to become

neglected, or targeted by the warring state (Troell and Weinthal, 2013). It seems far more rational that a state would maximise its utility through cooperation where its access to water is jeopardised.

This argument does not imply that water scarcity will have no negative effect on the relations between basin states, or on any existing tension, but that a war over water scarcity alone is extremely unlikely.

Water issues between states may be embroiled in an existing protracted conflict, which could exacerbate the situation. This places water resource issues, especially when water scarcity is considered, in a context that makes it fodder for any pre-existing tension. At times, the urgency of cooperation over water resource disputes can facilitate cooperation in other long-standing disputes (Dinar, 2013). This mutual dependence could create further trust in other areas of the relationship between the states. A key neglected area exists here, particularly in how a state fosters the cooperative powers of a shared resource management system without this becoming an exacerbating factor in any pre-existing tension. This is explored in the next section, through social capital theory.

A SOCIAL CAPITAL APPROACH TO WATER AND CONFLICT

A gap in existing literature creates an opportunity for a new understanding of how to prevent water scarcity concerns exacerbating existing issues between states. Social capital theory has previously been used to analyse conflict between intra-state communities. This chapter extends the theory to test its application to interstate water management relations in water-scarce, conflict-prone regions.

Social Capital – What Is It?

The concept of social capital emerged in the 1970s as a theory of describing decision-making. It incorporates the idea of capital that is neither human nor physical. Physical capital refers to the material items that one can accrue, while human capital encompasses the knowledge and skills of a person or people.

Social capital takes into account the social interactions between people and how this affects the way they make decisions and cooperate. Unlike physical or human capital, social capital cannot be exchanged or transferred.

Social capital theory has no singular accepted definition, with many theorists presenting differing approaches to define the concept (Uphoff, 2000).

Most approaches accept the theory as representing “the social glue that produces cohesion but also a set of cognitive aptitudes and predispositions” (Stiglitz, 2000) and “the values, attitudes, social structures and relationships that reinforce and reward such psychological ‘investment’ in each other” (Uphoff, 2000). These ideas underpin the general theory, that of interpersonal relationships and the social network surrounding them.

This paper adopts elements of Putnam’s strain of social capital theory, as it is arguably the most notable in the field. Putnam’s theory argues that high social capital within a society is likely to lead to economic progress and lower corruption (Putnam, 2000).

This theory of social capital is comprised of three major elements:

- **Strong social networks** Networks, in Putnam’s theory, refer to engaging with clubs and interest groups, an element of civic participation. Creating these sorts of networks is likely to be self-reinforcing. Strong social networks establish two central elements of social capital: common goals and a sense of connectedness among people.
- **Established norms of reciprocity** A norm of reciprocity is the assumption made by person A that, after doing a favour for person B, that favour will eventually be repaid in a similar manner. This creates a strong informal social contract between members.
- **High trustworthiness** Both norms of reciprocity and strong social networks have an overarching

theme of building trust. Through reciprocity, which is closely related to trust, value is created in social relations (Fukuyama, 1995). The theory behind the norm of reciprocity is that a society that utilises this concept is far more efficient than one that is distrustful (Putnam, 2000).

Merits Of Social Capital

Social capital has been at the forefront of recent research due to its many practical utilities. Elinor Ostrom (1992) has adopted the concept to formulate the collective action schemes on water-sharing projects within Asia.

Uphoff (2000) used social capital as a basis for a successful cooperative water management scheme in Sri Lanka. Serageldin and Grootaert (2000) adopted the idea to form a joint forest management initiative in the state of Gujarat in India, thus curbing previous violent confrontations and increasing land productivity. As these examples demonstrate, there is strong evidence of the practical utility of social capital theory and opportunities to explore its further usage.

Social capital is a public good and, as such, it does not just assist those who have directly invested in the concept, but also benefits the wider community (Coleman, 1988). Uphoff also acknowledges the merits of social capital as a public good, citing the efficacy of cooperation (Uphoff, 2000).

Collaborating and forming agreements establishes a degree of reciprocity in that the parties trust that agreements will be upheld. Considerations of reciprocity make it more difficult for a person to defect, or for one state to use brute force against another (Dinar, 2013). Social capital can promote economic progress (Arrow, 2000) by reducing transaction costs between people and fostering the belief that the other party will ‘do the right thing’.

Facilitating Social Capital

While social capital has been shown to have many benefits, this paper also considers how it can be formed, and exactly what facilitates social capital.

There are four clear indicators of social capital that are used in this study:

- Information sharing
- Establishing norms
- Collective decision-making
- Effective and legitimate institutions.

These factors have been derived primarily from Uphoff and Ostrom’s studies of social capital within a mutually beneficial collective action (MBCA). MBCA refers to the benefits that a cooperation can achieve by using social capital to achieve a common aim (Uphoff, 2000). This has been successfully applied to practical cases, particularly those involving environmental issues.

Information-sharing

A factor in successful social capital is the consistent and meaningful sharing of information. This is undertaken through formal means, such as regular meetings, or informally, through social relations that are maintained for other purposes (Coleman, 1988).

Establishing norms

Establishing norms is another factor in generating social capital. To curb self-interested behaviour, parties need to interact frequently to increase trust and limit the opportunistic behaviour that reduces social capital (Serageldin and Grootaert, 2000). The end goal is for the parties to create a set of shared values and norms founded on mutual trust and reciprocal expectation (ibid).

Collective decision-making

Collective decision-making is crucial to forming a good social capital base from which to propel MBCA. When the collective develops bridging social capital, the group establishes a set of procedures and rules that are collectively agreed on (Ostrom, 2011). This increases the legitimacy of decisions, while also strengthening cooperation.

Effective and legitimate institutions

All these areas feed directly into forming institutions that are representative, legitimate and fair (Serageldin and Grootaert, 2000).

Institutions should incorporate rules and roles that are agreed on collectively, and have a system in place for sharing information and developing shared norms (Uphoff, 2000).

Incorporating Social Capital Into Research

Social capital, or its absence, is a key factor in the likelihood of exacerbating existing conflict in water-scarce regions. The conflict theories discussed have presented a strong framework for understanding why states do not go into conflict over water resources; however, the framework is not wholly conclusive, as many cases include other conflict-generating factors, allowing water to act as an amplifying influence.

Social capital theory explains this shortfall. Previous social capital research on warring communities showed how a collaborative and cooperative community depends on the level of social capital (Uphoff, 2000). Applying this to an interstate context, the relationship between people is the key element in establishing cooperation.

The development of social capital occurs at both a community and a policy-making level. In tandem, this amounts to a greater level of cooperation over water issues and lowers the chance of conflict.

This research rests on the basic foundation that trust serves to deter or prevent conflict through norms of reciprocity and social networks.

Using the following framework, this paper aims to demonstrate the importance of social capital in avoiding conflict over resources, and uses the case of Israel and Jordan as an example. The framework in assessing social capital rests in the following areas:

- Shared institutions and decision-making
- Shared knowledge and information diffusion
- Effective social networks
- Development of shared norms/values
- Effective dispute resolution.

These elements are used to explain how high levels of social capital have enabled the states to avoid conflict over water resource allocation and management. Although there are existing tensions, these are not adversely affected by disagreements over water issues, even with water scarcity increasing. This is predominantly due to the increasing levels of social capital built between the states.

JORDAN AND ISRAEL: HIGH SOCIAL CAPITAL IN A CONFLICT-PRONE REGION

Jordan and Israel both share a common water source in the Jordan River. Rising population and declining water resources have made the region one of the world's most water-scarce

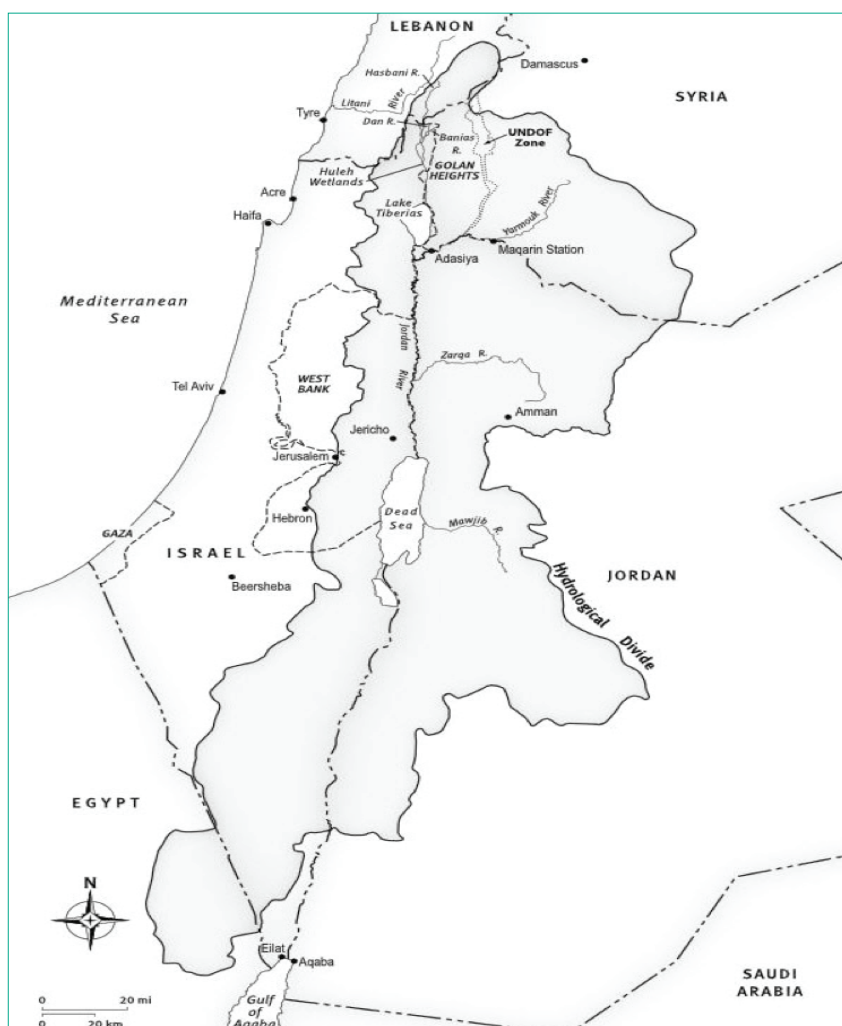
environments. The existing tension over Palestine between Israel and Jordan has been a key focus in many discussions between the states.

Examples Of Social Capital

Although there is existing tension between Israel and Jordan over territorial claims, and particularly the treatment of Palestinians, since the peace treaty there has always been cooperation in regards to water.

This is in large part due to increased levels of social capital between the states over the management of shared water resources.

Using the framework as previously described, the following examples attempt to show social capital as having served to create an environment of cooperation, rather than increasing tension over shared waters.



The Jordan River watershed (Sosland, 2007).

Institutions and collective decision-making

Many examples exist of structural frameworks covering the joint decision-making of shared water resources in the Jordan/Israel scenario.

A high-profile element of the negotiations in the early 1990s was the establishment of the Israeli/Jordanian Peace Treaty. Signed in October 1994, this agreement includes a detailed annex based on the management and sharing of water assets. It clearly outlined the volumes that can be drawn, operation and maintenance of the system, storage and water quality. The signing of the peace treaty signalled a pivotal moment in diplomatic relations between the two previously warring states.

A component of this agreement is the formation of the Joint Water Committee, a forum of members from each country to oversee shared water matters between Jordan and Israel and discuss disagreements or misunderstandings, particularly those relating to the ambiguities in the water annex (Haddadin, 2002a). There is also organised cooperation at community level through Friends of the Earth Middle East (FOEME) and its Good Water Neighbours Project (GWNP). FOEME is the first environmental organisation to include representatives and groups from Jordan, Israel and the Palestinian territories, with offices in each region (Lalasz, 2003). Through this cross-border initiative, the scheme aims to develop trust and cooperation between the communities, based on their shared interest base in the preservation of joint water resources (Kramer, 2011).

FOEME and the Joint Water Committee work in tandem to create an effective institutional and collective decision-making framework, at both a policy making and community level.

Shared knowledge and information diffusion

Maintaining significant social capital requires an effective system to share and disseminate data. Jordan and Israel share a Regional Water Data Banks Project (RWDBP) that is set up for this purpose. RWDBP was established in 1995 through the

Executive Action Team (EXACT), the multilateral working group on water resources, comprising two members from each of the regional parties (ibid).

Effective social networks

Networks tend to perform well in informal settings without established rules (Islam and Susskind, 2012). To develop such a network, personal connections and the establishment of trust are major components.

The GWNP uses this network structure to establish cooperation and mutual dependencies to bridge cross-border communities (FOEME – Good Water Neighbours Project, online). There are frequent meetings between these communities, including their mayors (Kramer, 2011).

This maintenance of social networks has resulted in 78% of participants holding a more positive view of their neighbours across the border (FOEME – Good Water Neighbours Project, online). At a state level, the quality of social networks increased during negotiations beginning in 1991 as a result of more face-to-face meetings and interactions between Israeli and Jordanian policymakers. Ministers from both sides began to see each other as peers rather than adversaries (Haddadin, 2011). This led to a more informal style of talks, which improved communication as negotiators got to know one another and developed mutual respect (Haddadin, 2009). Cooperation created understanding and sympathy on both sides, ultimately resulting in situations where a party conceded more than water experts had recommended on the issue of allocations from the river (Jägerskog, 2003). This demonstrated the clear trust on both sides that resulted in the signing of the historic treaty.

Haddadin describes the casual nature of the conversations where interstate delegates regularly joked and even invited each other to social outings (Haddadin, 2002a).

Development of shared norms/values

A cognitive factor in social capital is shared values between the states, especially the importance of water and of cooperating to achieve a positive result. This has been achieved at both

a local and national level (Kramer, 2011). When surveyed, 72% of youth trustees within the GWNP answered that it was not possible to protect water resources without cooperating, while 86% of participants understood the necessity of protecting water catchments (FOEME – Good Water Neighbours Project, online). FOEME's Israeli director has stressed that the final push for cooperation on rehabilitating the shared resource came from the communities themselves, not from FOEME (Tate, 2006).

This exhibits a key characteristic of high social capital: the shared value in cooperating to achieve a common goal, in this instance, the protection of water resources. Grassroots support and awareness of water scarcity issues is shown to be a key factor in supporting policy at a national level (Kramer, 2011).

At the national level, it is clear that there is great emphasis placed on cooperating and upholding the water agreement. Both Israeli and Jordanian policy makers are well aware of the constraints on the Jordan River Basin, with the river system already strained by over-exploitation and increased salinity. There is a strong culture of shared understanding that working together and cooperating is the only way to achieve a positive result (Haddadin, 2011). Despite ongoing tension between the Jordanians and the Likud Party over Israeli policies with regard to Palestinians, water has remained a source of cooperation.³

There are also examples of a norm of reciprocity in play. Reciprocity serves to create a basis for trust, increasing the value of the relationship. Reciprocity was apparent when Israel was awarded concessions in energy and the environment, an area the Jordanian policy makers knew was important to Israelis. In response, Israel gave Jordan concessions relating to water allocations (Haddadin, 2009). Haddadin describes the respect that the Jordanians had for the sympathetic way in which the Israelis regarded their water shortage issues (ibid). This sympathy was demonstrated on more than one occasion, with Israel agreeing to augment Jordan's water supplies during times of shortage, expecting nothing in return (Haddadin, 2011).

³ *Tense Jordan/Israel relations in early 1997. Israel developed settlements on Jabal Abu Ghanim/Har Homa outside Jerusalem. King Hussein sent two letters condemning these actions. (Lucas, 2012); (MJ Haddadin, 2002a)*

Trust has played a central role in the relationship between Israel and Jordan in water-related matters. Through reciprocal actions and assistance in times of drought, it is clear that there is an expectation on both sides that each will uphold their agreement. As a result of cooperation on water issues, Israel enjoys better relations with Jordan than with any other Arab state (Segev, 1998).

Effective dispute resolution

Trust developed between Israel and Jordan over water issues had a positive impact on the nature of their dialogue and dispute resolution procedures, and the channel of communication has been kept open, especially since the signing of the peace treaty in 1994 (Haddadin, 2011). The states have never had to resort to violent conflict, or even the threat of violent conflict, as each issue has been dealt with effectively.

The first major disagreement between Israel and Jordan during this period occurred in 1994, the same year that the peace treaty was signed. The dispute revolved around a misunderstanding about who was liable to pay for pumping from the Yarmouk River to Jordan. Israel had not commenced pumping, as it was waiting for payment from Jordan, while Jordan was unaware of these financial obligations (Haddadin, 2002b).⁴ The issue was resolved through negotiation. It was clear to both parties that there had been a misunderstanding and that the annex was not clear in this respect. The parties agreed that Jordan did not have to pay, and began pumping from the Yarmouk River.

At no point has water been used as a weapon in other areas of conflict. Even in cases of tension, where conflict could have occurred in other areas, the water agreement has been upheld. In May 1997, a dispute arose over the issue of an additional 50 GL (gigalitres) of water that was awarded to Jordan as part of the annex in the peace treaty. The treaty did not stipulate from where the water would be sourced. Israel did not believe Jordan was entitled to the 50 GL, due to the ambiguity of its source. This resulted in a summit meeting that concluded in the agreement that Jordan would receive 25–30 GL from Lake Tiberias until a desalination plant was constructed to provide the agreed 50 GL. This dispute was resolved through talks, despite the fact that relationships were strained

during the period (Haddadin, 2002b). Clearly Jordan and Israel share a relationship that has elements of trust and reciprocal action.

High Social Capital And Links To Decreased Conflict

Prior to the peace treaty of the early 1990s, the relationship between Jordan and Israel was a volatile one. The region has consistently been in conflict over varied issues, most notably Israel's occupation of the West Bank and Gaza, in which water resources have acted as an exacerbating factor. Examples include the 1967 Arab-Israeli war and the deployment of troops to the Jordan River in 1979.

Since the early 1990s, there have been consistent efforts to build institutions, social networks and norms between Jordan and Israel. The peace treaty has served as an important and symbolic outcome of these efforts. In the last 20 years, there have been many indicators of the relationship strengthening, and signs of reciprocity and trust between the two states. These factors have been shown to exist in the establishment of a legitimate shared water management institution, ground-level schemes such as the GWNP, and the development of informal networks among diplomats and policy makers.

As the levels of engagement and trust have increased over water issues, there has been a decrease in military confrontations between the states generally. When disputes arise over water resources, they do not exacerbate existing issues, but are resolved on a cooperative basis. Both states recognise the need for effective water management, and both also recognise going to war over water as ineffective for the ultimate goal of securing access to the resource. As social capital has increased, so has efficacy in managing water-related disputes.

CONCLUSION: A NEW WAY OF UNDERSTANDING INTERSTATE WATER COOPERATION

Social capital theory takes into account interactions between individuals, an area that is not addressed in overall Neo-Malthusian accounts of understanding

conflict. Although the likelihood of water scarcity causing conflict between states is low on the basis of shared water resources alone, conflict may still occur if water scarcity heightens existing tensions.

This study incorporates previous research used to explain trust-building interactions between communities sharing a water source that results in cooperation and better management of the shared scarce water supply. This research has taken this model and applied it to an interstate situation, determining that this can be used as an effective way to understand how to avoid conflict. The case of Israel and Jordan shows a relationship building high levels of social capital, especially in the last 20 years. At a policy-making level, structural factors include the establishment of a shared decision-making arrangement in the Joint Water Committee and the sharing of data through the databank management program.

This demonstrates elements of trust and shared norms in developing an effective water management scenario cognisant of the neighbouring state's needs. At a community level, the GWNP works effectively to bridge communities across borders to cooperate and understand water issues. This helps to foster grass root support for mutually beneficial collective action defined through policy at state level.

Further factors include cognitive ones, such as increased social networks, trust generation and shared values. The fact that both states have developed shared networks, both formally and informally, signifies relationship building. There is a clear understanding and even sympathy to water shortage issues within both states, and concessions each made to the other in times of need.

These shared norms and values have come directly from the establishment of closer relationships that led both sides to no longer see their neighbouring state as merely 'the other', but view it as a partner in finding alternative solutions to the water scarcity problem of the Jordan River basin. In this way, they have developed a closer relationship that has opened communication and understanding, thus allowing diffusion of any disputes before violent conflict could arise.

⁴Further examples exist to highlight these points. See Haddadin, 2002b.

Further Research

Due to the limitations of this research, further study in the area is encouraged. The situation between India and Pakistan constitutes another case study that shows social capital working to alleviate tensions surrounding water resources. It is outside the scope of this paper to analyse the India-Pakistan case, however it represents a fertile area. A general extensive study on the merits of social capital on water resources should also be further explored and developed into policy measures.

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