Water Securization in The Middle East: the Unity Dam and the Disi aquifer
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CHAPTER 1

1.1 INTRODUCTION

The relations between natural resources and national securities have been object of numerous studies in the field of international relations, political ecology and development and security studies. The aim of this paper is to use the analytical tools of Barry Buzan and the Copenhagen School of Security Studies to explore two cases of transboundary water resources. The first case study is the Unity Dam on the Yarmouk river, object of a dispute between Israel and the Arab states for more than fifty years. The second case is the Disi aquifer, a fossil groundwater shared between Jordan and Saudi Arabia.

We will see how perception of security have shifted during different times and situations. An assessment of the different outcomes will be attempted as well. While the Unity Dam will be considered a success story of returning back to politics and dialogue among the parties, Disi is still “blocked” in a securitized phase, which impedes any positive outcomes of the dispute. The narratives of the two stories will be traced back in order to put the theoretical continuum of Buzan’s securitisation process into an historical perspective. After this historical analysis, political and social theories will help us to understand the “unsolved” situation of Disi securitisation.

We will thus claim that Disi’s securitisation is blocked inside this phase because the project for the exploitation of the resource is part of the Jordanian sanctioned discourse and of the national hydraulic mission. All the implications of the case will be assessed. The perception of a pumping race between the two countries is the most risky aspect of this “silent conflict” and this paper among the other aims, has also the will to put a basis for further researches and discussions on this last emblematic case. At the end we will place the two narratives in their proper security continuum according to Buzan’s securitisation stages.
1.2 RESEARCH METHODOLOGY

I will use reports and other secondary sources to provide evidence in the analysis. I have also visited Jordan three times in the past two years and have discussed the project with officials and scientists. The interviews and the use of secondary sources has been shaped by the use of a range of social and political theory.

1.3 LIMITATIONS

Disi project has been previously analysed\(^1\) and it has been argued that it is an unsustainable and very risky project. The focus here will be thus specifically on political and security aspects of the issue.

1.4 BUZAN THEORETICAL TOOLS

According to Buzan\(^2\) the main battles due to a lack of water will be basically regional. “The powers of the upstream and downstream zones of a certain lake or river and the other potential beneficiaries will look to each other both as a menace and as a potential allies. This could be considered as a regional security complex”. Water in the Middle East and, more generally, in arid countries, is part of the perception of the elements that constitute a nation; for this reason water is part of the national security discourse.

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\(^1\) Italian dissertation-unpublished 2003.
\(^2\) Buzan at al.1998:18.
CHAPTER 2: THEORETICAL FRAMEWORK: BUZAN
AND THE COPENHAGEN SCHOOL OF SECURITY STUDIES

2.1 Brief introduction to the Copenhagen school of international relations and Barry Buzan: the securitisation diagram

The Copenhagen School of Buzan, Waever, de Wilde and others (Neumann, Warner) has clarified how environmental resources as water have shaped the perception of security in conflict areas. The Israeli-Palestinian conflict has thus been taken as major field of analysis (Warner, Zeitun).

We will place our first case study (the Unity Dam) exactly into the same context; then we will move to another context, which is absolutely more stable than the previous one.

The dispute for the Disi water among Jordan and Saudi Arabia is not a case of violent outcomes; nonetheless we will try to trace the same “continuum” to the historical narrative of Disi, in order to understand whether a securitisation process is in progress or not.

Our point of view will not only be the one of the “securitisation” theory. We will follow a political and a social analysis as well (chapter 4). To do so, we will analyse the water policies trends of the last 2 decades and the consequences of the “sanctioned discourse” (Allan 2001). These two seem to provide the best framework to set the dynamics of our case study.

Now that it is clear what we trying to demonstrate, we will make clear how we will do it.

This paper will test recent theories of Security Studies on two water conflict cases. Buzan’s “securitisation continuum” will be a constant landmark for our analysis.

The “security theories” of Copenhagen School of international relations are the methodological tools that we will use.
To start dealing with the tools of our research, we will make an attempt to introduce the main concepts.

**Buzan and the securitisation continuum**

What is it a securitised issue? What does it make an issue become securitised?

“The Copenhagen School argues against the view that the core of Security Studies is war and force. Instead, it constructs a more radical view of Security Studies by exploring threats to referent objects, and the securitization of these threats are non-military as well as military.”

Barry Buzan³

“The Copenhagen School argues that securitisation can be thought of as an extension of politicisation”

Iver B. Neumann⁴

Buzan argues that issues can be placed in a ‘security continuum’ made by different phases. Starting with the non-politicised phase, then an issue can be “politicised” and thus placed in the second phase; going on into the continuum, when a politicised issue becomes “securitised”, it passes to the third phase of the diagram. It is also possible to run across all of these processes in a reverse order, as follows:

When is an issue being securitised?

According to the school, an issue may be securitised by the performance of the speech act of inscribing that issue with meaning as part of the security politics, and de-securitised by the speech act of unsubscribing to such a representation.\(^5\)

The securitisation act, thus, is something related to communication. It is something related to the “power of the words” and to the “discourse” in a Foucaultian sense, more than a deliberate use of the force. For this reason, as introduced before, we have been talking about “securitisation as an extension of politicisation”.

The securitisation process is a declaration of “intention” about a threat, which is not yet a violent action and which is not something that will necessarily become a violent act. However, a securitised issue is something related to the National Security. More precisely, a securitised issue is related to what politicians wants to show national security is to them.

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2.3 Neumann and the introduction of the “violisation” phase

Neumann contributed to the development of the ‘securitisation continuum’ by proposing a differentiation between the act of securitisation and the violent act itself (Neumann 1998). He suggested to fix a threshold between securitisation and violisation “at the point which is outbreak of war rather than at the point where one individual dies”. This because there is a difference between “societal violence” and violence in which the issue is representing the state as such. Adding the Neumann concept of violisation, and the symmetrical process of de-violisation, we will obtain the following “extended continuum”.

![Diagram of the extended continuum]

The violisation concept is here understood as “the process whereby an already securitised issue…..becomes a casus belli over which blood must run”. (Neumann: ibidem:20).

2.4 Why securitusation is important to our research

Looking at the issue of natural resources, and more precisely, to water issue, we find out a number of studies about water as a securitised and violised issue (Zeitun, Warner).
Warner’s study of the Ilisu Dam Project and Zeitun analysis of the Palestinian violisation framework, have given to the securitisation continuum a wide range of applicability to the water security issue.

Warner is exploring the “violisation/opportunisation” phase adding another option to the securitisation continuum, one which can be included in the securitisation process: the opportunisation. The securitisation/opportunisation process occurs when an issue “offers such an opportunity to improve a situation that is justifies risks and actions outside the normal bounds of political procedures” (Warner 2000).

2.5 Clarification about the word “conflict”

“Those analyzing conflict confuse themselves, if they do not distinguish between intensity of the conflictual relationship being discussed and the power relations of the entities in question”

Allan

In order to distinguish and clarify the differences between the two case studies of this paper, Allan suggestion and Zeitun’s clarification about the meaning of the word “conflict” will be very useful. Zeitun claims that “a conflict is a situation in which competing actors have different interests that they are prepared to aggress for or defend”. The “aggression” can be both violent and not violent at all. There can be “verbal” aggressions that are part of a conflict or just a conflict itself. When the conflict is “violent” the issue is being “violised” ; when the conflict is not violent but there is a verbal aggression the issue is being securitised. “Cold relations between neighbours, for instance, are form of conflict that elicits very different reactions that when the opponents are engaged in a full-out war” (Zeitun 2004a).

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7 Allan 2004.
It will be very useful to remember these clarification during the analysis of Unity Dam and Disi narratives.

The mentioned concepts (Securitisation, violisation, conflict) will be used to analyse our first case study, the Unity Dam Securitisation narrative in chapter 3.

Going on to the second case study of this paper, the Disi project, other theoretical concepts will be introduced, in order to have a more complete framework of analysis.

We will try to analyse Jordan hydropolicies not only from a “securitisation” point of view, but also thorough a “policy glasses”. In chapter 4 we will try to give a definition of the hydraulic mission and of the sanctioned discourse in its “Jordanian configuration”.

After having done this, we will be able to place the Disi project in the broader context of security studies. At this point we will try to understand whether a securitisation process is taking place or not. Exploring the narrative of the Disi project, our aim will be to demonstrate that:

- Disi project is indeed an object of non-violent conflict (Zeitun’s definition)
- Disi is part of the sanctioned discourse of Jordan
- Disi is part of the silenced securitisation process

After having illustrated the Unity Dam as a happy story of “journey” through the securitisation continuum, we will try to explain how Disi is a silenced issue, why it has been silenced and why it is a “silenced conflict” indeed, even in a non-violent context.

Then we will be able to move to our conclusions, to place the Disi in the “securitisation continuum” as well.
CHAPTER 3: THE UNITY DAM: A
POLITICISED/SECURITISED, DE-SECURITISED/
DE-POLITICISED ISSUE

3.1 THE NARRATIVE

A dam on the Yarmouk River has been suggested by the Arab states since the early 1950's; located before the Israeli borders, it was thought for storage and hydroelectric power generation. Called the Maqarin Dam in previous development plans, in 1986 it was renamed the Al-Wahdah Dam (Unity Dam) to reflect the political rapprochement that made the construction feasible.\(^9\) Syria and Jordan made the first step towards cooperation in 1989. The 1994 peace treaty between Israel and Jordan seemed to be the final landmark to the realisation of the Dam.\(^{10}\) However, it was not until the beginning of 2004 that a final agreement with Syria was reached and the works of the dam were initiated.

\(^{10}\) FAO [http://www.fao.org/docrep/w4356e/w4356e0f.HTM](http://www.fao.org/docrep/w4356e/w4356e0f.HTM) 1999 (accessed the 23th of August 2004).
We will now try to follow the logic of the securitisation continuum to describe the history of Unity Dam.

The politics of water practiced today in the Jordan River Basin has its roots in negotiations dating back to the early 1900s.

The Yarmouk River is the second largest river of the Jordan Basin in terms of annual discharge. It rises in southeastern Syria and flows into the Jordan a few kilometres downstream of Lake Tiberias. For this reason its water was the first big water contentious between the Arab states of the region and the Israel. There is no space here to provide the historical perspective of all the different allocation plans proposed in the past. In 1934 The Ionides Plan for the irrigation of the Jordan
Valley was stopped by the Israelis because it planned to irrigate the Jordan Valley with the water of the Yarmouk river; they replaced it with the Lowdermilk-Hayes plan, more favourable to them because it was diverting all those water into Israel territory.

However, we will simplify our historical analysis, considering only the narrative starting from the birth of Israel.

3.2 THE POLITICISATION or THE BUNGER PLAN

“As soon as water scarcity is evident then relations are likely to become politicised with claims and counter claims identified and constructed” Allan 11

The plan for diverting the Jordan River water by the Israelis started as early as the 1940s, but the very idea of capturing it is even more ancient. Much of the design of the civil works for capturing the Jordan River was completed in the 1950s, and Israel succeeded in diverting the entire volume of sweet water from the Upper Jordan by the late 1960s, when construction of the National Water Carrier system was completed, along the lines of the Lowdermilk-Hayes Plan. However, in 1951, other states announced unilateral plans for the Jordan watershed as well. Arab states began to discuss organized exploitation of two of the northern sources of the Jordan, the Hasbani and the Banias. The Israelis made public their “All Israel Plan” which included the draining of Huleh Lake and swamps, diversion of the northern Jordan River, and construction of a carrier to the coastal plain and Negev Desert, the first out-of-basin transfer for the watershed in the region. In 1952, Miles Bunger, an American attached to the Technical Cooperation Agency (established under the Truman Doctrine), first suggested the construction of a dam to help even the flow of the Yarmouk River and to tap its hydroelectric potential. The following year, Jordan and UNRWA signed an agreement to implement the Bunger plan. The diversion of part of the Yarmouk

11 Allan 2004.
River for irrigation of the East Ghor of the Jordan Valley was planned in order to resettle a large number of the Palestinian refugees in that country on both banks of the Jordan River. Along the lines of the Ionides Plan\textsuperscript{12}, Bunger advocated building the storage dam on the Yarmouk at Maqarin on the Syrian-Jordanian border with a capacity of 480 MCM. The impounded water was to be diverted by a second dam at Adasiyia near the Israeli-Jordanian demarcation line into canals along the East-Ghor of the Jordan Valley. Bunger estimated that the project would provide enough water for irrigation to settle one hundred thousand people. Jordan and Syria would have shared the electricity generated by power plants at Maqarin and Adasiyia (NOTE).

At Jordan’s announcement concerning the irrigation of the East Ghor of the Jordan Valley by tapping the Yarmouk, Israel closed the gates of an existing dam south of the Sea of Galilee and began draining the Huleh swamps, an act which infringed on the demilitarised zone with Syria. This action led to a series of border skirmishes between Israel and Syria that escalated over the summer of 1951.

In June 1953, Jordan and Syria officially agreed to the Dam; they agreed that Syria would receive 2/3 of the hydropower generated, in exchange for Jordan’s receiving 7/8 of the natural flow of the river. However, Israel protested that its riparian rights were not being recognized. In July, Israel began construction on the intake of its National Water Carrier at the Bridge of Jacob’s Daughters, north of the Sea of Galilee and in the demilitarised zone. Syria deployed its armed forces along the border and artillery units opened fire on the construction and engineering sites. Syria also protested to the U.N. and, though a 1954 resolution for the resumption of work by Israel carried a majority, the USSR vetoed the resolution. The Israelis then moved the intake to its current site at Eshed Kinrot on the northwestern shore of the Sea of Galilee. Against this tense background, President Dwight Eisenhower sent his special envoy Eric Johnston in October 1953 to try to mediate a

\textsuperscript{12} The Ionides Plan was one of the water partition proposal before the birth of the Stat of Israel
comprehensive settlement of the Jordan River system allocations, and design a plan for its regional development.

3.3 THE SECURITISATION or THE REFUSAL OF THE JOHNSTON PLAN

“The issue is securitised when it is an existential threat requiring emergency measures and justifying actions outside the normal bounds of political procedure” Buzan

Both Israel and the Arab states were trying to securitize the Yarmouk waters; however, as Allan posits it, riparians in politically sub-ordinate positions are not able to securitize contested waters, because power relationships are far more important than the geographical conformations of a water resources. This is exactly what happened for the Yarmouk waters.

Dams along the Yarmouk were included in the Johnston negotiations. The Main Plan included a small dam forty-seven meters high with a storage capacity of only 47 MCM, because initial planning called for Lake Tiberias to be the central storage facility. As Arab resistance to Israeli control over Galilee storage became clear in the course of the negotiations, a larger dam, 126 meters high with a storage capacity of 300 MCM, was included. The Johnston plan was accepted in 1955 by the two expert’s committees (the Israeli and the Arab one) but no one of the involved countries (Syria, Lebanon, Israel and Jordan) ever signed it. While the hopes faded with the Johnston negotiations, the idea of a dam on the Yarmouk was raised again in 1957, in a Soviet-Syrian Aid Agreement, and at the First Arab Summit in Cairo in 1964 as part of the All-Arab Diversion Project. The All-Arab project of water diversion was called “Greater Yarmouk.” The project proposed in 1964 intended to build

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14 Allan 2004
1. Two dams on the Yarmouk River, Mukheiba and Maqaren, for storage and electricity
2. The West Ghor Canal and a siphon along the Jordan River in order to connect it its sister canal, the East Ghor Canal
3. Seven other small dams to exploit the seasonal fluxes coming from the highlands
4. Pumping stations and lateral canals, draining and protecting structures for the fluxes.\textsuperscript{17}

In order to fill the Mukheiba Dam, the Arab coalition started diverting the Banias and the Hasbani into the Yarmouk. The Jordan water strictly depends on only three rivers: Yarmouk, Banias and Hasbani; Israel, thus, considered the diversion as a direct menace to its national security. Israel perceived that “the political danger outweighed the economic cost”.\textsuperscript{18}

\textit{Shimon Peres had already declared that water issue would be a cause of war and Levi Eshkol was even more explicit: “This water is like the blood in our veins” he declared. If the Syrians persisted it would be they, not Israel, who had declared war”} \hspace{1cm} \textit{De Villiers}\textsuperscript{19}

The securitisation process was arrived to its maximum peak.

3.4 THE VIOLISATION or THE BOMBS OF 1966

\textit{Violisation is “the process whereby an already securitised issue becomes a casus belli over which blood must run”}. \hspace{1cm} \textit{Neumann}\textsuperscript{20}

As a consequence of the tensions, the 14 July 1966 Israeli planes destroyed the half-completed

\textsuperscript{17} ibidem
\textsuperscript{18} One Israeli Foreign Ministry official at the time- quoted in Rouyer, 2000: 125.
\textsuperscript{19} De Villiers 1999:22
\textsuperscript{20} Neumann 1998.
Maqaren Dam, permanently crippling the project. While this incident was directly caused by the Arab diversion scheme, other military confrontations continued to grow in intensity until the outbreak of war the next year. On three occasions between 1965 and 1966 the Israeli Army attacked the site, and it is these attacks that have led many analysts to conclude that water was a primary factor in the 1967 war (Starr 1991).

The construction of the diversion dam at Mukheiba, twenty kilometres downstream from Maqaren, was actually begun, but was abandoned when the borders changed after the 1967 war; one side of the projected dam in the Golan Heights shifted from Syrian to Israeli territory. After the end of the war, Israel occupied all the Syrian rivers on the Golan Heights, annexing “de facto” these lands and assuring for itself the Jordan waters into the Tiberias Lake. Also, the intake facilities for the East Ghor Canal along the Jordanian side of the River Valley were bombed in 1969. The East Ghor Canal, today known as King Abdullah Canal, despite this episode could be implemented once again. It is the only work of the Greater Yarmouk Project that has survived to the present day.

Some authors argue that water was the main cause of the 1967 war (Naff, Matson, Hillel). T. Amery is calling the period 1964-’67 the “Water Wars” phase. This slogan has been used by several authors (Starr, Naff & Matson) because of the water-related nature of the military actions that happened at that time. By the end of the 1980s several studies on the strategic aspects of water in the Middle East and the potential for conflict had been conducted. Basically, they concluded that the water resources of the region had great potential for conflict. The U.S. Defence Intelligence Agency was convinced that the changes in the water natural distribution system could be extremely disruptive. The result could have been often political conflicts, if not outright military actions. However, there is no agreement among in the literature on this point.

21 By the U.S. Defense Intelligence Agency (Naff and Matson 1984), the Center of Strategic and International Studies (Starr and Stoll 1987, 1988) and the Israeli Foreign Ministry (Sofer and Kliot 1988).
“Whether these attacks were part of a considered plan or targets of opportunity chosen in the midst of a war is, however, unclear” Brooks

Although this is not an ideal setting in which to discuss these theories, recent works tend to believe that water is one of the causes but not the most important (Neumann) neither the most urgent (Allan) in the framework of the Middle Eastern political situation. Allan in particular is claiming that there will never been “water wars” in the Middle East, for the evident reason that water scarcity has always been avoided by importing “virtual water” embedded in food from the international market.22

3.5 THE DE-VIOLISATION AND RETURN TO SECURITISATION

The Maqaren Dam was resurrected in 1975 as an idea in Jordan's Seven Year Plan, and Jordanian water officials approached their Israeli counterparts about the low dam at Mukheiba in 1977. While the Israelis proved amenable at a ministerial-level meeting in Zurich, as “a more-even flow of the river would benefit all of the riparians,” the Israeli government that year lost interest in the project23.

This stalemate might have continued except for strong US involvement in 1980, when President Carter pledged a $9 million loan towards the Maqaren project, and Congress approved an additional $150 million “provided that all of the riparians agree.” Attaché Philip Habib was sent to the region to help mediate an agreement. While Habib was able to gain consensus on the concept of the dam, on separating the question of the Yarmouk from that of West Bank allocations, and on the difficult question of summer flow, final ratification was never reached. Syria and Jordan reaffirmed mutual commitment to a dam at Maqarin in 1987, whereby Jordan would receive 75% of the water stored in the proposed dam, and Syria would receive all of the hydropower generated. The agreement

22 Allan “Why not water wars”
23 Brooks 1991
called for funding from the World Bank, which insisted that all riparians had to agree to a project before it might have been funded. Israel refused until its concerns about the winter flow of the river were addressed. Against this backdrop, Jordan in 1989 approached the US Department of State for help in resolving the dispute. Ambassador Richard Armitage was dispatched to the region in September to resume indirect mediation between Jordan and Israel where Philip Habib had left off a decade earlier. The points raised during the following year were left, once more, without a definitive solution:

1. The allocation of water for Israel during the winter months
2. The overall viability of a dam.

Both sides questioned what effects ongoing development by Syria at the headwaters of the Yarmouk would have on the dam's viability. Since the State Department had no mandate to approach Syria, their input was missing from the mediation. Israel eventually wanted a formal agreement with Jordan, a step that would have been politically difficult for the Jordanians at the time.

3.6 THE DE-SECURITISATION

3.6.1 Pic nic table talks

By fall of 1990, agreement seemed to be taking shape, by which Israel agreed to the concept of the dam, and discussions on a formal document and winter flow allocations could continue during construction, estimated to take more than five years. Two issues held up any agreement: first, the lack of Syrian input left questions of the future of the river unresolved; second, the outbreak of the Gulf War in 1991 overwhelmed other regional issues, finally pre-empting talks on the Yarmuk. The
issue was not been brought up again until the Arab-Israeli peace negotiations. A regional peace agreement was considered a prerequisite to build the Unity Dam. By 1991, several events combined to shift the emphasis on the potential for "hydroconflict" to the potential for “hydrocooperation”.24

The first event was natural. Three years of below-average rainfall in the Jordan basin caused a dramatic tightening in the water management practices of each of the riparians, including rationing, cutbacks to agriculture by as much as 30 per cent, and restructuring of water pricing and allocations. Although these steps placed short-term hardships on those affected, they also showed that, for years of normal rainfall, there was still some flexibility in the system. Most water decision makers agree that these steps, particularly regarding pricing practices and allocations to agriculture, were long overdue.

The next series of events were geopolitical in nature. The Gulf War in 1990 and the collapse of the Soviet Union caused a realignment of political alliances in the Middle East that finally made possible the first public face-to-face peace talks between Arabs and Israelis, in Madrid on 30 October 1991. The end of the Cold war has been regarded as a reason for the absence of conflict over water because a single super-power had emerged “in maintaining a version of regional stability” (Allan 2004) or in creating a regime of “hegemonic cooperation” (Lowi 1993).

While the region was still in the throes of drought, water was mentioned as a motivating factor for the talks. Jordan was squeezed hydrologically between two neighbours attempting to reinterpret prior agreements, but otherwise had no major territorial disputes with Israel. A researcher at the Middle East Studies Center in Amman therefore suggested that “Jordan was being pushed to the peace talks because of water”.25

It was an open secret that very senior representatives of the Israeli and Jordanian governments had been meeting for some time and that water officials had been working together for years at “pic nic table summits” to determine withdrawals from the Yarmouk River and management of the Jordan

24 Brooks 1991
River. The planned meeting of the two leaders initiated an open process of face-to-face meetings of officials in a tent literally on the border of Israel and Jordan. The bi-national peace process had advanced at the stage where joint projects and formal agreements could be considered.26

3.6.2. The return back to politics and the peace processes.

The Unity Dam in the Israeli-Jordanian peace-treaty

Politisation occurs when:

“The issue is part of public policy, requiring government decision and resource allocation”

Buzan27

In 1994, Jordan and Israel signed a peace accord. The two leaders, Prime Minister Yitzhak Rabin and King’s Hussein, agreed on mutual recognition of the “rightful allocations” of both parties to the Jordan and Yarmouk Rivers. Among the other things, the two parties approved financing for the Unity Dam on the Yarmouk. Also an agreement about importing water from the Red Sea to the Dead Sea was reached. Jordan and Israel would have “cooperated in finding sources for the supply to Jordan of an additional 50 MCM/year of water of drinkable standard. Israel and Jordan agreed to the construction of a diversion dam at Adasiya as well. The allocations during the summer and the winter were established, even if they caused other misunderstandings in the following years. The last examples are in the summer of 1999, and in 2001. In 1999 Israel wanted to rescind from its obligations to provide Jordan with water during the summer claiming that it was facing a water crisis because of the drought conditions. This event led to a political crisis that was finally resolved

by the leaders of Israel and Jordan through some aggressive diplomatic crisis. In 2001 Tel Aviv refused again to give 25 MCM to Jordan, according to the Peace Treaty. (MEED 2001).

Nonetheless these problems, the Unity Dam construction was an integrating part of the accord; it was never put into doubt. The last step to its realisation was now just a final agreement with Syria.

3.6.3 THE UNITY DAM IN THE FINAL AGREEMENT WITH SYRIA: THE DEPOLITISATION

In the absence of an agreement, both Syria and Israel were able to exceed their allocations from the Johnston accords, the former because of a series of small storage dams and the latter because of its downstream riparian position. Syria began building a series of small impoundment dams upstream from both Jordan and Israel in the mid-1980's, while Israel had been taking advantage of the lack of a storage facility to increase its withdrawals from the river. Syria currently had 26 dams in place on the upper Yarmuk in 1999, with a combined storage capacity of approximately 250 MCM (its Johnston allocations were 90 MCM/yr. from the Yarmuk).

Jordanians started worrying about Syria intentions. Because of is geographical position the upstream country could have played a selfish role.

“It is not certain that the Maqarin dam, renamed in 1986 to Al Wihdah dam, is feasible in light of the increased Syrian water activities in its catchment,” said a water expert, who asked not to be named. “Another understanding is necessary to stabilise the summer flow from the Yarmouk to Jordan,” the expert noted, adding, “It is to put a ceiling on the Syrian usage of springs and groundwater, and to limit the uses from the river until after a dam is built on it.”

Jordan Times 1999

However, between 2001 and 2003 the two young leaders of the countries, King Abdallah and President Bashar, started a series of diplomatic rapprochements meetings about regional security
and the feasibility of the Unity Dam. With the warming of relations between the two countries’ young leaders as each assumed power, in 2003 an agreement was finally signed to build the dam on the Yarmouk River. The 10th of February 2004 was the official date of the inauguration of the works of the Unity Dam.

3.7 A HAPPY-ENDING STORY

Unity Dam is a perfect example of what Zeitun calls “cooperation under a violent context”; or, quoting the realist Lowi, it is an example of “second level cooperation” over water, which is possible even if at a top-regional level there are still no agreements on red-line issues.

During the last 60 years the Unity Dam has been used as a political, security and military target, depending on the “opportunisation”28 of the context.

In a very violised context, as the pre-’67 war, the Dam “took part” to the conflict and was included into the issues of the war. However, in less-conflictual times, the Dam has been realised in a sound manner, without any particular heavy repercussion on the regional water balance, under the implementation of legitimate peace treaties.

Following the interpretation of the Copenhagen Security School, the Unity Dam represents a good example of how perceptions of security may vary in relation to time, circumstances, political leaders and political “opportunities”. The Unity Dam is a good example of how the contextual events of a region have shaped the destiny of a water project. The water facilities bombed during the 60s by Israel were part of the “security idea” of the Israeli leaders. This “security idea” was shaped by certain ideologies and beliefs about the meaning of water and, consequently, the agricultural sector in the new-born Hebrew State. The idea of “new Hebrew” was strictly linked to the concept

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of the Land which had been promised to him since centuries. For this reason water was so important in the leaders’ ideology.

Water policies in 2004 are different; other options are viable and practicable. Israel is much more modern. Recently it was able to reduce water consumes when sever draughts happened. The Unity Dam, which was considered a massive solution in the 60s, is now not much more than a small help, compared to the water needs of contemporary Israel and Jordan.

The securitisation process was, thus, reversible and, if the term is not so inappropriate, it can be considered a “happy ending water story”.

It is a happy story because just few months ago (February 2004) it has been completely gone “out of the tunnel” of the securitisation continuum. With this expression -out of the tunnel- I simply mean that Unity Dam has come back to the “non-politicised” status after more that 50 years. Now it is being treated as a pure technical agreement between Jordan and Israel. Even national newspapers are not underlining any more the construction of the dam as an historical achievement. Now Unity Dam is just as a positive, consequence of an international technical agreement.

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29 1994,1991
Figure 2. The history and securitisation continuum of the Unity Dam
CHAPTER 4: THE DISI PROJECT

4.1 Securitisation of the Disi project

This study is an attempt to make clarity over a silenced case of water securitisation. Exploring the narrative of the Disi aquifer will be vital to the demonstration of our three hypotheses. The first hypothesis is that Disi is part of the Jordanian “Hydraulic Mission” and it represents an important component of the national “sanctioned discourse” over water; the second hypothesis is that there is a silent non-violent conflict between Jordan and Saudi Arabia over the shared groundwater of Disi; the third is that Disi is part of a securitisation process. It has been “securitised”, “opportunised” and “silenced” to avoid a return to the “politicised” phase of the continuum.

4.2 Disi groundwater and the pipeline to Amman

This study is part of research carried out in Jordan between January 2002 and June 2004 on a water project which is the main priority for the Jordanian Ministry of Water and Irrigation. A huge aqueduct will bring water to the city of Amman from a southern area of the Jordanian desert near the border with Saudi Arabia. Water will be extracted from a fossil groundwater aquifer called “Disi”. The project that we are going to analyze has been chosen as a case study for a range of different reasons: the non renewable nature of the water; the transboundary configuration of the resource; the huge investment the project will require; the high priority given to the project by the Jordanian Government and the heavy environmental impact of the work.
The pipeline through the desert will split the country into two parts, running for 325 kilometres from South to North. It will supply the capital and, in emergencies, other southern cities with 100 million cubic metres (MCM) a year for at least one hundred years, according to official sources. The exploitation of Disi is not environmentally sustainable because the aquifer renews itself every thirty thousand years, and this implies that the extraction of its water will cause its disappearance for at least as many years. This is the reason why, from its conception in the early 1990’s until 2002, the project did not obtain any kind of financing from international sources, including the World Bank. Furthermore, only the World Bank specifically criticized the non-sustainability of the

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31 Although it is difficult to find reliable sources affirming these data: see Appendix 1 “Conflicting data on the Disi project”
Disi project. The environmental damage the project would have caused was assessed in every single pre-feasibility study commissioned by the Minister of Water and by a number of different consultancy companies. These studies were freely accessible as public record in 2002 in the library of the Minister of Water and Irrigation. However, the Minister played down the environmental impact (El-Naser 1999) and the initiative was undertaken following a semi-private scheme.

Why Disi? Sanctioned discourse and the hydraulic mission

Disi is part of the constructed knowledge concerning water in the Middle East and of the Jordanian sanctioned discourse.

The exploitation of the Disi aquifer was targeted as a short-term solution during the 1990’s because both politicians and water professionals thought that it was the only possible “escape” for the country. Desalination was still considered too expensive for Jordan, and big water projects at a regional level, such as Read-Dead and Unity Dam, were still politically inconceivable. However, there must be other factors which led to the choice of Disi over other feasible alternatives. In order

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35 “The aquifer is deep and has no impact at the surface, the strata is sandstone and land settlement is not anticipated, resettlement is not required and biodiversity is not an issue” wrote El-Naser; however, Harza is writing that there will be a heavy impact over national natural reserves with a huge danger on wildlife and that the pumping rate of the aquifer should be monitored because there is a big risk of pollution from another salty aquifer overlying the Disi (Khreim aquifer); see note 3

36 The BOT (built operate and transfer) scheme was modified to include a Governmental participation to the funding of the project (source: personal interview with the head of the financial planning unit doctor Meisun Esob-February 2002

37 Interview to professor Shatanawi (University of Jordan), Hazim El-Naser(ministry of water), Sa’ad Bakri (secretary general of the minister)March 2002

to understand why Disi has been selected, we will utilise political and social theory so as to construct a more complete analytical framework.

Why do decision makers prefer to proceed with “spectacular” but unsustainable projects unsupported by international cooperation? Why increase the offer of water when resources are running out instead of lowering the demand for water through a sound reform policy? As Allan suggests,

“Spectacular hydraulic projects can gain wide support where there is high awareness of the social value of water and no awareness of its economic value or any will to manage it as a commodity. The significance of symbolic engineering projects should not be underestimated.” Allan 39

The policy makers are conscious of the contradictions in their own policies and are very much aware of the situation40. Indeed, they comprehend the strategy that, in the opinion of the World Bank, should be executed41 (Allan 2001:104): lowering the quantity of water utilized by agriculture and increasing industrial usage. This would increase the productivity of water and the efficiency of its exploitation. However, these reforms require a long-term vision and courage very difficult to sustain (Allan 2001:105). Also, the agricultural lobby in Jordan is so strongly influential42 (Ferragina 2001) that a reallocation of water from the rural sector to the industrial would provoke a

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39 Allan 2001:105
40 “How should policy best move increasingly limited water resources away from traditional and heavily subsidized low value agriculture towards more economically productive uses?” The Ministry of Water and Irrigation, Nazim El-Naser (El-Naser & Macoun 1999)
41 “WB …strongly advocates en economic approach on water allocation and use based on principles of allocative and productive efficiency. Only Israel has firmly adopted such principles although Jordan and …West Bank have acknowledged the unavoidable role of these principles in future approaches to water allocation and management”
dramatic loss of support for the government (Allan 2001). Jordan is thus still pursuing its “hydraulic mission”, an idea here discussed by Buzan:

“The hydraulic mission of rapidly developing countries is about mobilising water resources and improving the ‘security of supply’ as a foundation for social and economic stability, which are also key elements of ‘national security’. This has clear implications for water resource management, particularly in water-scarce regions, where access to water has a direct impact on the economic growth potential of the state concerned.” Buzan

Jordan’s hydraulic mission stems from the Middle Eastern “big lie over water” (Allan 2002). According to Allan, the big lie is that there is need for “a little more water to be secure”

Politicians in Jordan are aware that their country is far away from achieving water security only through engineering works. They know that the country is depending on crop imports to fill the gap and that there is no water security in reality, except for that given by accessing the international crop market. However, they tend to present these grand water works, as well as future technology, as the only possible solutions. In the light of this political analysis, it is plausible to claim that the Disi aquifer represents to them just that amount of “little water” which is necessary to maintain a sanctioned discourse over water security. Our claim is that Disi, being part of the hydraulic mission, is thus part of the constructed knowledge over water in the Middle East. Disi is part of the Jordanian sanctioned discourse.

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4.3 The narrative

Except for geological and hydro-chemical surveys, few studies have discussed the Disi project from a political point of view. Shapland (1997) is one of the first to talk about the aquifer in this sense, and the case is reported under the title of “Water ground disputes”. Shapland illustrates a tense situation resulting in part from the cold relations between Jordan and Saudi Arabia after the Gulf Crisis of 1990-91.

During the 1990’s, the Disi aquifer was already used by both countries. Saudi Arabia was abstracting around 650 MCM per year, mainly for irrigation, and Jordan was using no more than 75 MCM per year, mostly for irrigation, but also to supply the Southern town of Aqaba (Shapland 1997:148). Since it extracted relatively little from the Disi aquifer, Jordan was already planning to raise its rate of extraction to supply the Greater Amman area and to increase the quantity destined to aid Aqaba and irrigated agriculture.

In 1992, the Jordanian Minister of Water was aiming to extract an annual amount of 80 MCM for 200 years^{45}. The necessary capital and operating expenses would have increased the cost of delivering water to the end user in Amman to US$.80-90 per cubic meter; however, this cost was still regarded as acceptable and much cheaper than other possibilities, such as desalinisation or importing water from other countries (Shapland 1997).

In the same year, Jordan publicly charged Saudi Arabia with over-exploiting the aquifer^{46}. However, there was no Saudi response, not only because of cold diplomatic relations with Jordan. As a matter of fact, Saudi Arabia at the time was widely criticised for its policy of paying farmers

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^{45} Source: Jordan Times, 8 December 1992
for wheat and for subsidising the purchase of diesel fuel for use in pumping water from the aquifer. This was, of course, economically unsound and environmentally unsustainable. Shapland suggests this might have been the reason Saudi Arabia did not want the issue to be brought into the light of public discussion\textsuperscript{47}.

At the time, there was already an academic debate over Disi. However, the first scientific critiques of the impact of the project would not be put forth until nearly a decade later, in 1999 and 2000.

Some Jordanian scientists opposed part of the project or the entire proposal. One professor at the University of Jordan, Omar Rimawi, claimed that, with the same investment, Jordan would have been able to desalinate the brackish waters of the Ma’an region and the Ghor Aditha area. This was a project much closer to Amman and, above all, much more sustainable for future generations\textsuperscript{48}. Furthermore, these other projects, being environmentally sustainable, would have been financed by international cooperation and, hence, would have cost the Jordan government less than Disi.

Another study conducted by Professor Elias Salameh proposed a total abolition of the irrigated zone in Disi in favour of supplying Amman, claiming that the aquifer was not able to provide more than 70 MCM a year\textsuperscript{49}.

4.4. The information gap

In 2002, reliable data on the Disi project was almost unavailable: How much water was contained in the aquifer? What was the real rate at which Saudi Arabia was pumping water? What was the actual plan for the Jordanian exploitation of the aquifer? Why did neither national environmental

\textsuperscript{47} Shapland ibidem
\textsuperscript{48} Personal interview : February 2002
\textsuperscript{49} Personal interview in February 2002 & Elias Salameh  “Water Quality Degradation in Jordan” Friedrich Ebert Stiftung & Royal Society for the conservation of the Nature- Amman 1996 - Jordan
associations nor international environmental NGO’s complain about the heavy repercussions on the environment to which the Disi Project would have led? Since the 1990’s, the national press and official sources had been unable to provide any unequivocal information on the project. (See Appendix 1: Conflicting data on the Disi project)

Other doubts about the reliability of the project arose in 2001 when the World Bank stipulated a list of conditions that Jordan had to fulfil in order to receive funding, an amount between 50 and 100 US$ million. Environmental sustainability was one of the most important points, and Disi was impossible to preserve in the long term\(^{50}\). Among the other conditions, there was an obligation to make an agreement with Saudi Arabia over the shared aquifer before starting work. Jordan never satisfied these conditions, and the World Bank was consequently unwilling to provide any aid.

Since 1992, many things have changed in the international situation: the last war against Iraq, the 11 September Crisis and the re-alignment of the United States’ allies against the so-called rogue states have all come to pass. Jordan’s international position has changed as well. After the peace treaty with Israel in 1994 and passive support for the American-led military force during the Iraqi war in 2003, Jordan’s relationship with Saudi Arabia as regards the Disi Issue should have been improved. This, however, was not the case. Little has changed in the Disi water dispute. As foreseen by Shapland, in 1997:

“The lack of contact between the two governments can only stand in the way of the most effective exploitation of the resource of both countries. At worst it could lead to a pumping race.”

Shapland\(^{51}\)

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\(^{50}\) World Bank : 27 of June 2001: meeting with the potential donors: source: Italian Embassy of Italy policy brief: international cooperation office archive.

\(^{51}\) Shapland, 1997.
In 1999, Jordan again accused Saudi Arabia of overexploiting the Disi aquifer. In the same year, the Saudi government was notified about the Jordanian exploitation of the aquifer, but “it did not formally respond, although the Jordanian Minister was verbally advised that the Saudis had no objection” (El-Naser & Macoun 1999). This is a clear sign of “voluntarily silencing” the issue for the media and the public. In the following years, the two parties showed that they would not cooperate, and that they would go on with their unilateral decisions over the exploitation of the shared resource (El-Naser 2002).

Examining the international narrative analytically, we could place the Disi Dispute in the structure of Gleick’s classification scheme. Disi seems to fit perfectly in the category of “Development Disputes”, wherein water resources are a major source of contention and dispute in the context of economic and social development. According to Gleick, there is a case of development dispute when conflicting interests are neither fought over militarily nor resolved peacefully, as in the case of Disi. (See Appendix 2: Gleick’s classification of water conflicts)

Another useful political analysis of Disi is Chatterton’s:

“The leap in consumption in Jordan in the period since 1990 has also in a sense been due to a scramble to obtain water(...) Jordan has increased its water consumption by pumping the shared Disi aquifer which lies across its Southern international border with Saudi Arabia ... In the 1990s,

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32 Jordan Times 25 November 1999
36 Chetterton 1996.
however, in order to establish its “rights” over the groundwater Jordan has been developing wells from which water has been pumped to irrigated crop production. Such water rights may not be sustainable in the long term but they are significant to establish negotiating positions”.

Chatterton 57

These considerations of Disi’s “prior use strategy” and the statements over the pumping race are closely tied to the concept of “opportunisation” that we mentioned before in Chapter One. Jordan is trying to opportunistically pump water from a shared resource without being publicly blamed. This “perfect outcome” has been possible through a process of “silencing” the issue in the public arena by both countries’ respective governments.

4.5 The end of political debate: Securitising Disi

4.5.1 Limitations of the analysis

The application of the securitisation continuum to the narrative of the Disi aquifer has some limitations that must not be ignored.

Firstly, although the Disi aquifer is in the Middle Eastern Region, the dispute in question is not in the same “security complex” as the Unity Dam. As mentioned in Chapter One, Buzan defines a regional security complex as “a set of states whose major security perceptions and concerns are so interlinked that their national security problems cannot reasonably be analyzed or resolved apart from one another”58. The Jordan River Basin has been identified as a water security complex and

58 Buzan et al.1998,p.12
analysed as such in a number of studies; the previous case of the Unity Dam was studied in this context as well.

The Disi aquifer problem is a water dispute as well, and it is a competition over a resource in the same hydro-geographical region: the Middle East. However, this is a controversy between Jordan and Saudi Arabia, and the security complex is different because the resource and the states in question are different. Furthermore, the Jordan River security complex has been the object of several studies. There is an established literature on it, and that the application of many theories, such as regime theories and game theory, has been tested. The Disi aquifer is almost unknown, and the political literature is nearly nonexistent.

However, it is our intention to test whether there is a securitisation process going on in this complex, and we hope this study will form a useful basis for the study of further developments in the case.

4.5.2 The securitisation narrative

In February 2004, the World Bank seemed to have changed its position on the Disi project. If approved, the feasibility study would receive partial funding as a guarantee to the private sector\textsuperscript{59}. The hypotheses about the origin of this change of policy are very difficult to formulate: A U.S reward after the Iraqi war? A Saudi move in favour of Jordanian exploitation of the aquifer in exchange for silence over its own exploitation? These explanations are unproven and so far unproposoble.

\textsuperscript{59} MEED Middle East Business Weekly 12th February 2004
The data about renewability of the aquifer, the amount of water present in it and the environmental impact have been officially classified by the Minister of Water and Irrigation as “secret information”\(^{60}\). Disi began to be addressed as an issue of “National Security” and thus became a non-negotiable\(^{61}\) matter, as in official declarations to the national press and public speech in 2004\(^{62}\). The academic community suddenly seemed to have changed its position, embracing an unanimous consensus over the project\(^{63}\). During a international conference on water demand management held in Amman in June 2004, the Minster of Water and Irrigation Nasima El-Naser publicly refused to answer questions regarding the Disi project. Documents on the feasibility study will be approved by the Jordanian government and submitted to the World Bank in hopes of receiving partial funding. In a change from 2002, in 2004, there is no access to the feasibility study of the consulting company\(^{64}\). This precautionary measure has been justified by Sa’ad Bakri, the Secretay General of the Minister of Water, as a “prevention for eventual information escape, which could damage the success of the project” \(^{65}\).

Having described the Disi narrative so far, it is now possible to place the state of the Disi case at that time in the securitisation phase of our theoretical continuum. Public speeches putting Disi among the issues of national security, the lack of political debate, classification of data, and, finally, the desire to secure a natural resource for a country’s exclusive use are all elements that fit the Buzan’a theoretical model very well. According to Buzan, the nation is being identified with one of its resources, and the possession of water represents, in the Middle East, the effectiveness of the state. As water is critical to the state’s perception of security, therefore Buzan’s definition can be applied to our case studies, in the sense that there might be a water security complex between Saudi Arabia and Jordan, due to the close interrelations of their mutual security perceptions about water.

\(^{60}\) Sa’ad Bakri; personal interview. February 2004
\(^{61}\) Jordan Times 12 Jan 2004
\(^{62}\) Jordan Times 2004: 2 Feb 2004
\(^{63}\) Personal interviews with Salameh, Shatanawi and Rimawi in February 2004
\(^{64}\) Consolidated Consultants – Amman - Jordan
\(^{65}\) personal interview : February 2004
I would like to underline that the “prior use strategy” also suggests that Disi may be part of that category of securitisation called “opportunised” by Warner (Warner 2000).

4.5.3 The silenced process: The end of the debate

Having put the Disi in the context of the securitisation continuum, we will discuss the future development of the issue. It is not plausible that the pumping race between Saudi Arabia and Jordan will ever cause an armed conflict. However, the intensity of the dispute is high because there has never been any sign of collaboration of the two countries over the shared resource. This process of “silencing” the question actually impedes movement toward further cooperation. The lack of communication, as well as the lack of information sharing, also hinders a return to the politicisation phase. Disi is in the middle of a securitisation process without any apparent chance of moving on.

The reasons for this impasse are manifold. Firstly, in the world of international relations, the Jordan River security complex has always been prominent, and the possibility of violent episodes has long played an important role in the development of securitised water issues. International press, academic studies, and links to the Israeli-Palestinian peace process have been the prime engine for movement from the securitised stage, most of the times with a positive outcome, as in cooperation over water rather than violent actions (Allan 2001). The Disi project does not have this attention from any international witness. The pumping race is there, under the eyes of anyone who goes there, but there is no incentive for it to be stopped. There is no incentive for cooperation. The geographical nature of the aquifer also plays a key role. A fossil aquifer does not guarantee a long-term return on a state’s investment, so the motivation cooperation and the creation of lasting ties is low. Finally, from a social and domestic policy-based point of view, there is the sanctioned discourse that unquestionably plays an major role.
4.5.4 The Disi securitisation continuum

The Disi project can now be placed in its securitisation continuum; the narrative of the case and the analysis from a political, social and security framework permitted us to say that Disi is a particular case of securitisation process. It is an *opportunised* process because of the “pumping race” which is taking place to secure the contended water. It is a *silenced* process because it is part of the sanctioned discourse of Jordan. Among all of these characteristics, the silenced process is the main factor impeding a return back to the politicized stage of the continuum. At the same time a violisation of the issue seems very unlikely to happen. The Disi project, as matter of fact, is a “blocked securitisation” case.

This graphic is an attempt to set the Disi in its historical and theoretical framework, as we did for the Unity Dam.
The history and the securitisation continuum of Disi project

- Politicisation 1990’s
- Securitisation 2002-2004
- Non-politicised
- Politicised
- Securitised
- Opportunized & silenced
- De-securitisation

Jordan accuses Saudi Arabia of over-exploitation (1992 and 1999)
Disi is declared a national security issue and, therefore, it is silenced

: Phases / : Processes / : Events
CONCLUSIONS

“Desecuritisation of water resource management is a healthy manifestation, because it opens up the discourse and allows a wider range of roleplayers to become involved in the resolution of the core problem. This tends to foster institutional development and manifest as a win-win outcome, which is inherently more conducive to economic growth and hence positive peace”. (Turton 2003).

This is clearly relevant to the Unity Dam case study, and this work has shown the re-politicisation as a way to reconciliation over dam construction. On the other hand, we have seen how the Disi case study is just the opposite of the win-win situation resulting from the Unity Dam conflict.

On the contrary, Disi can be described as a zero-sum game.

To quote Buzan:

“The politicisation of the problem, rather than the securitisation of the problem, is thereby allowing normal political processes of dialogue, negotiation and agreement to resolve the issue. Seen in this light, politicisation allows the issue to be dealt with in the open as a matter of free choice between the parties involved. In this context, security (or the securitisation of the issue) should be seen as being a failure to deal with the matter as normal politics” (Buzan et al 1998: 29).

Thus, Disi is rightly an example of failure. The incapacity and non-willingness to come back to a politicised stage and the persistence of silence over the issue are leading to the intensification of the pumping race already envisaged in the 90’s. (Shapland 1997).

The processes of securitisation, opportunisation and “silenced policy” over the issue are clear indicators of how deep the stalemate is and how rigidly the government is continuing its policy.

Why has the Disi project been silenced? Why was the securitization process blocked?

The answer can be found in the characteristics of Disi’s water.
We must always keep in mind that a securitization process is made of “perceptions” of security and “opportunisation” of issues. There are calculations made about whether a certain issue should become an object of national security or not and for how long.

As we are aware of this “perception” component of the securitisation process, we may claim that Disi project is a win-lose situation because the incentive to cooperation is almost nil (and it is a zero-sum game).

No one of the two parties knows for certain the amount of water in the aquifer of the other, because they do not communicate; no one is sure about the potential duration of exploitation. They are trying to spend as little energy as possible over negotiations, and as much effort as possible on the pumping race. Therefore this is a win-lose situation, a zero-sum game. Because the players are calculating the risk of bargaining as opposed to the risk of silencing the dispute, will this pumping race go on until the end? If the answer is yes, this is the explanation of the securitisation process going on. This is the reason for the silence.

**FINAL REMARKS**

The two case studies analyzed in this work have shown how water resources can be part of the security issues of a nation, depending on different circumstances and events. In a war context, violence is more likely to happen in water disputes because water facilities can become military targets. In a non violent context, on the other hand, even a huge conflict over water can be silenced, nonetheless the entity of the resource is consistent and the parties are perceiving the issue as something in relation to their national security. The Unity Dam and the Disi project have both been good examples of what has just been argued above.
Appendix 1: Conflicting data on the Disi project

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Estimate</th>
<th>Duration</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>El-Naser</td>
<td>125 MCM a year</td>
<td>50 years</td>
<td>(Schiffler 1998:223)</td>
</tr>
<tr>
<td>1997</td>
<td>Halliburton KBR</td>
<td>Maximum of 40 to 50 years at a rate of 100 MCM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>Feasibility Studies of Consultancy Companies</td>
<td>Estimate of only 50 years, at a rate of only 80 MCM per year (Harza Group 1996)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>USAID report</td>
<td>50 MCM a year for 100 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>Jordan Times</td>
<td>Guarantees 200 years with a rate of 100 MCM a year; in 2002, it suggests 100 years with a rate of 80 MCM a year, all without quoting any precise sources (Jordan Times 17 October 1999 and 8 January 2002)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Minister of Water El-Naser in a personal interview</td>
<td>200 MCM per year for 200 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Different functionaries interviewed</td>
<td>Periods going from 100 and 150 years, maintaining a rate of 80 MCM a year</td>
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</tbody>
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Appendix 2: Gleick’s classification of water conflicts\textsuperscript{67}

<table>
<thead>
<tr>
<th><strong>Base of conflict</strong></th>
<th><strong>Suggested criteria</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control of water resources</strong></td>
<td>A changed outcome in physical or effective control of the resource following the end of the conflict</td>
</tr>
<tr>
<td>Where water supplies or access to water is at the root of the tensions</td>
<td></td>
</tr>
<tr>
<td><strong>Water as a political tool</strong></td>
<td>Coercion: use of advantageous hydraulic (or security) position to advance interests in non-water domain</td>
</tr>
<tr>
<td>Where water resources, or water systems themselves, are used by a nation, state or non-state actor for a political goal</td>
<td></td>
</tr>
<tr>
<td><strong>Water as a military tool</strong></td>
<td>Use of flooding, moats, poisoning</td>
</tr>
<tr>
<td>Where water resources, or water systems themselves, are used by a nation or state as a weapon during a military action</td>
<td></td>
</tr>
<tr>
<td><strong>Water as a military target</strong></td>
<td>Deliberate destruction of wells, reservoirs, treatment or distribution facilities</td>
</tr>
<tr>
<td>Where water resources systems are targets of military actions by nations states</td>
<td></td>
</tr>
<tr>
<td><strong>Development disputes</strong></td>
<td>Conflicting interests are neither fought over militarily nor resolved peacefully</td>
</tr>
<tr>
<td>Where water resources or water systems are a major source of contention and dispute in the context of economic and social development</td>
<td></td>
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</table>