THE POLITICAL ECONOMY OF WATER SCARCITY AND HYDRO-INJUSTICE:

A COMPARATIVE CASE STUDY OF THE ISRAELI-PALESTINIAN, ARAL SEA, AND NILE RIVER WATER CRISES

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"Now that the fish buyers have gone, only the foreign ecologists come, to stare appalled at the ruined landscape, impressed and depressed at the scale of the catastrophe. I have in my notebooks this thought, scribbled after talking to an Israeli hydrologist who had seen what there was to see and was returning with a message of gloom for his colleagues in Israel and America: 'Maybe that'll be the Aral's only legacy. It will help make things better elsewhere by frightening people half to death' "

Marq De Villiers
Water: the fate of our most precious resource (2003) (p. 119)

1. INTRODUCTION

Many regions around the world are considered water scarce and many more are expected to fall into that category in the near future. Although water is a renewable resource, only a finite amount can be used up before tapping into non-renewable supplies. Water is used in an unsustainable way when the rate of extraction exceeds the rate of replenishment. Not all people living in water scarce environments are similarly affected. Hydro-(in)justice refers to the social (mal)distribution of the benefits from water and the impact of water scarcity and pollution. The concept of hydro-justice is based on the idea that everyone is entitled to have an equal chance to access clean water and enjoy its services and that nobody or no group of people should be disproportionately exposed through no fault of their own to the risks posed by declining water quantity and quality. Hydro-injustice can be direct (e.g. health problems caused by polluted drinking water) or indirect (e.g. regressive distribution of the financial costs arising from efforts to undo ecological damage or the need to protect oneself against its negative effects).

Consider the following three cases of water resource degradation and their implications for the people who depend on these resources:

Case 1: The Aral Sea, located in Central Asia,[1] was once the world's fourth largest inland body of water. In less than forty years, excessive water withdrawals from the two rivers that feed the Sea, the Amu and the Syr Dar'ya, to irrigate fields of cotton have caused the Sea to dry up to less than half its original size. The salt and pollutants concentration has increased dramatically, killing most of the fish and along with them, the thriving local fishing industry. Former ports and coastal towns are now over 100 kilometres away from the shores. The exposed seabed is a mixture of sand, salt and chemicals that is picked up by strong winds and spread over villages and farmland within a 250-kilometre radius. Many of the five million people who live in the "disaster area" suffer from a host of health problems, ranging from respiratory problems to cancers, directly attributable to the ecological degradation in the Aral Sea basin.

The Aral Sea crisis has been called the "quiet Chernobyl" and is a tragic example of what unsustainable water use can lead to. Yet, what is most shocking is that although evidence of the Sea's desiccation and its ecological and human toll have been known for decades, the Amu and the Syr Dar'ya continue to be over-exploited and the volume and area of the sea continue to decline.

Case 2: The Nile River stretches through nine countries in Northeast Africa and many fear that it is being drained dry and will be the site of future water conflicts. The amount of Nile water that reaches the Mediterranean Sea has gone from 32 billion cubic meters (bcm) prior to the building of the Aswan Dam in the 1960s to just 1.8 bcm in the mid-1990s.[2] It is the source of tensions between the riparian countries, namely the three most downstream: Egypt, Sudan and Ethiopia. Egypt, which has been called "the gift of the Nile," derives all of its water from this river, making it very vulnerable to upstream water developments. Although a treaty with Sudan guarantees Egypt a fixed amount of water, this hasn't diminished Egypt's fear that one day the flow of the Nile will be reduced by upstream water developments. In 1979, then Egyptian President Anwar Sadat warned that "the only matter that could take Egypt to war again is water." In the early 1990s, Egypt prevented Ethiopia from obtaining a loan from the African Development Bank to build a dam that might have reduced the flow of the Nile.[3] There have

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[1] See maps for each case in annex

[2] Sandra Postel (1999), Pillar of Sand: Can the Irrigation Miracle Last? New York: Norton & Company; p. 71.

[3] American University, Washington, D.C. Inventory of Conflict and Environment project, http://www.american.edu/ted/ice/NILE.HTM

also been reports that in 1994, Egypt planned an air raid on a dam that was being built in Khartoum, the capital of Sudan[4]

While Egypt's aggressive stance on water vis-à-vis its neighbours seems to indicate that water in Egypt is scarce, developments on the domestic front give the impression that water supplies are plentiful. For one, Egypt is expanding its (irrigated) agriculture and encouraging the domestic production of staple grains. Relative to other crops like fruits and vegetables, grains tend to require more water to grow and could be economically substituted with grains available on the international market at subsidised rates. Second, in 1997, Egypt embarked on ambitious and costly land reclamation projects that consist in turning vast areas of desert land into arable land through massive irrigation. The projects, notably Toshka in the South Valley, will require large amounts of water and financial investment. The problem is that Egypt is already using all of its allocated water and the consequences of excessive water withdrawals are starting to be felt downstream where farmers are seeing their water supplies dwindle and salt water intrusions in the Nile Delta and complain that the recycled wastewater is not up to the standard needed for irrigation.

Case 3: Israelis and Palestinians struggle not only over land, but also over the scarce water in the region. The combination of low natural supplies of renewable water resources on this arid to semi-arid land and the influx of immigrants to Israel and the high population growth rate in the Israeli settlements and in the West Bank and Gaza have set the stage for a water crisis. A substantial proportion of Israelis' and Palestinians' water comes from sources whose levels have been continuously dropping over the years, letting in salt water and concentrating the load of pollutants.

Despite these dire conditions, the average amount of water available to an Israeli citizen for his or her private consumption is about 275 litres a day, an amount which is comparable to that consumed in European countries. In contrast, a recent study carried out for the World Bank reports that the effective daily water availability in the Occupied Territories if one subtracts industrial consumption and takes into account water losses in the municipal networks is only 50 litres per capita.[5] Aside from the many limitations such low levels of water mean for social and economic life, the rising salinity and pollution levels have serious health effects. In the Gaza Strip, on the shores of the Mediterranean Sea, the water in the wells has reached such high salinity levels that its consumption over time can lead to dysentery, kidney failure, and cardiovascular diseases. Over 60% of Israel's renewable water resources come from the Mountain and Coastal aquifers, which "lie beneath the West Bank and Gaza Strip, regions that are slated to become an independent Palestinian state if peace discussions succeed."[6] Over three-quarters of all the water withdrawn from these two aquifers go to Israel, while Palestinians get less than one quarter of the water that comes from under their feet. Since the Six Day war in 1967, Palestinians have been prohibited from drilling new wells, rehabilitating old ones and there are caps on the amount of water that can be withdrawn from the pre-1967 wells. They are dependent on Israel to supply them with water.

Why, despite the alarming evidence of damage wrought by the unsustainable extraction of water in the Aral Sea basin, is it allowed to continue? Why is Egypt pursuing such a water-intensive development path when its share of the Nile water is fixed and fully used, and water

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[4] Idem

[5] Stephan Libiszewski (1995), "Water disputes in the Jordan Basin region and their role in the resolution of the Arab-Israeli Conflict," Berne: Center for Security Studies and Conflict Research at the ETH Zurich/ Swiss Peace Foundation Berne; p. 34/115.. http://www.mideastweb.org/Mew_water95.pdf

[6] Jonathan Lautze et al. (2005) "Water Allocation, Climate Change, and Sustainable Peace: The Israeli Proposal," *Water International*, Vol. 30, No. 2; p. 199

resources are tight in the river basin? Why is Israel allowing the levels of the Sea of Galilee and the aquifers it shares with Palestinians to drop to such perilously low levels?

Conventional explanations of water resource depletion emphasize 'natural' and 'economic-technical' causes, namely an imbalance between resource availabilities and population levels, over-consumption due to an undervaluation of the resource and inefficient techniques and technologies. Accordingly, the solutions are to curb population growth; price water to reflect its scarcity in order to reduce waste and encourage frugal use; and develop techniques and technologies to access more water (e.g. water harvesting, cloud seeding and deep well drilling), make more with the available water (more efficient irrigation systems), and augment supplies where they are most needed (desalination, bulk water transfers or river deviation). Hydro-injustice, in these frameworks, is a related, but quite different problem.

The three cases introduced above clearly show that 'naturalistic' and 'economic-technological' explanations are incomplete. According to the Food and Agriculture Organisation (FAO), for the 1998-2002 period, Uzbekistan's total annual renewable water resources were 1961 cubic meters per capita (cm pc), well above the accepted water-stress mark of 1666 cm pc and almost twice the water-scarcity threshold. Yet, it withdrew an annual average of about 2250 cm pc. For the sake of comparison, the Canadian equivalent figure is approximately 1500 cm pc. Clearly, there is more at play than 'natural' water scarcity. The case of Israel undermines 'economic-technological' interpretations of water problems. It is a rich, economically developed country and is widely recognised as a pioneer of technologies for maximizing its scarce water resources. Yet, it is depleting its and Palestinians' water resources to provide the heavily subsidized agricultural sector with over half the amount of available renewable water, some of which is even virtually exported out of the country in the form of agricultural exports.

In this paper, I argue that the answers to the questions above lie in political economy. Water resources degradation and hydro-injustice are really just two manifestations of a more fundamental problem and need to be understood as political economic issues. As Selby (2005) has put it

> "water problems are not water problems alone, but are in large measure products of the relative ability or inability of different states and societies to address their economic and social problems, water problems included. And it is this differential capacity of different societies […] that one must above all concentrate on, if one wants to understand the roots of water crisis."[7]

More specifically, water is used unsustainably when the costs of doing so can be passed on to people, inside or outside the state boundaries, who have little political economic influence, what is here called the 'non-selectorate'. The greater the capacity of the non-selectorate to absorb the costs of ecological degradation, determined by its size and the sheer disparity in political economic power between itself and those who benefit from water-intensive activities, the more likely that ecological degradation will be greater, lasts longer and that it will be more difficult to change the status quo.

Bueno de Mesquita (1999) defines the 'selectorate' as the subset of a country's citizens that participates in the selection of the political leadership. He adds that "all members of *S* [the selectorate] have the right to participate in choosing the government. A subset of the selectorate forms a winning coalition, which we denote as *W*. Members of the winning coalition are those people whose support is required to keep the incumbent in office."[8] Using a rationalist approach,

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[7] Selby (2005) "The Geopolitics of Water in the Middle East: fantasies and realities," *Third World Quarterly*, Vol. 26, No. 2, p. 333.

[8] Bruce Bueno de Mesquita (1999), "An Institutional Explanation of the Democratic Peace," *The American Political Science Review*, Vol. 93, No. 4; p. 793.

he goes on to explain that political leaders have limited resources on which to draw to distribute benefits, through public policies, to the *S* and members of the *W* to win their support. As he explains, "scarcity necessarily requires leaders to make choices over just how much to focus their limited time and other resources on providing generally beneficial public policies and how much to focus on just satisfying the wants of their core supporters."[9] Milner and Kubota (2005), who use these basic concepts to understand the relationship between democratization and trade liberalization, add that "in a democracy, the selectorate is the part of the population that is eligible to vote. In a nondemocracy, the selectorate is that subset of the population upon whose political support leaders could potentially rely to remain in office. The winning coalition is the minimal set of individuals in the selectorate whose support an incumbent needs to remain in office."[10] Here, the definitions of the selectorate and winning coalition are modified to also refer to non-citizens. While Bueno de Mesquita understands those outside the selectorate to be disenfranchised citizens, here the non-selectorate is understood to extend beyond the state's geographical boundaries to people who stand to be affected (positively or negatively) by water policies in that state. Similarly, foreign actors can be the members of the winning coalition. Just as water flows across geopolitical boundaries, so do the costs and benefits of its overexploitation or sustainable use.

The literature on the politics of water has largely focused on conflict and cooperation *between* riparian states and assumed that the state is a unitary actor and that all states' preference is necessarily to maximise its water allocations or the benefits it derives from the shared water resources. The problem with those explanations is that a state's demand for water from the stock of shared water resources are first and foremost determined by how much water a state actually uses, which is a function of its power relations with other riparian states but more importantly of its domestic political economy.

Work on the political economy of water reform has drawn heavily from economics. It has emphasised the inefficiencies of non-market economic systems, the path dependent effect of economic development, rent-seeking behaviour and position in the global political economy. Explanations of the first type suggest that state intervention in the economy distorts market signals and the usual conclusion is that intervention should be reduced. Economic path dependent explanations of water resource exploitation stress that a country's economic development shapes its political economy by institutionalising and entrenching the interests of the (formerly) economically dominant actors. Changing policies when these actors are no longer as economically dominant is difficult because their interests remain protected or privileged by the political or policy-making process. Interpretations based on rent-seeking theory stress the costs of collective action. When the costs of a policy are thinly distributed across a population, but the benefits are concentrated, those who expect to reap the benefits have a greater incentive to mobilize and pressure the policy-makers into adopting that policy. Based less on economics and inspired by the world system and dependency theories, explanations stressing countries' position in the global political economy show how globalisation affects the policy choices available to societies.

In this paper, I do not argue that these explanations are fundamentally incorrect, just that the political economy of water could benefit from bringing the 'political' back in. Explanations

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[9] Idem.

[10] Helen V. Milner and Kubota (Winter 2005), "Why the Move to Free Trade? Democracy and Trade Policy in the Developing Countries," *International Organization* 59: 115.
Milner and Kubota take their definition from Bruce Bueno de Mesquita, James D. Morrow, Randolph M. Siverson, and Alastair Smith (1999), "An Institutional Explanation of the Democratic Peace," *American Political Science Review* 93 (4): 791–807

pointing to the inefficiencies of non-market economic systems do not ask why the state can and chooses to intervene as it does in the economy, nor why its capability as a regulator or service provider is high or low. Economic path dependent explanations have trouble explaining policy change. And coalition-based explanations assume away the political structures within which lobby groups can form and operate and/or the possibility for political entrepreneurship (fragmenting coalitions). [11] Explanations stressing the importance of a state's position in the global political economy are not sufficient because they fail to recognise that states do have a choice (though admittedly constrained) as to how to interact with the global political economy.

Looking at the selectorate allows us to better consider the role of political regimes in explaining water resource degradation and hydro-injustice. In the following pages, I look at each of the three cases in greater detail to see how the political economy affects water resource use. In each case, I focus on the most powerful riparian country – Uzbekistan in the Aral Sea basin, Egypt on the Nile and Israel – which not coincidentally also happen to be the highest water consumer in the basin. The comparative case study analysis shows that who the selectorate is and the 'absorptive capacity' of the non-selectorate are important in explaining the three cases and explain (are prior to) the economic explanations described above. In the conclusion, I consider the implications that such an interpretation of the water problems has for efforts to ameliorate them as well as other pressing environmental problems.

2. UZBEKISTAN AND THE ARAL SEA

The sad history of the demise of the Aral Sea begins in the late 1950s when Soviet Union central planners decided to turn Central Asia into a provider of raw materials. Their 'Plan for Nature Transformation' consisted in an extensive expansion of irrigated agriculture into semi-arid land, leaving less and less water to flow in the rivers down to the Sea. According to Bortnik (1999), at least four preliminary environmental assessments were conducted, all of which "unambiguously pointed to forthcoming negative changes of the sea's regime if the planned water management policy in the basin was instituted."[12] Uzbekistan, the most downstream country on the Amu Dar'ya and today the largest consumer of water from the basin, was turned into a vast cotton field. The local people resented the imposition of the monoculture of cotton, a very water-intensive crop, by the Soviet planners and considered themselves "cotton slaves." Nevertheless, cotton brought economic benefits to Uzbekistan and started being called "white gold."

Already during the 1960s, the water level started to drop and dredging had to be done to allow boats to safely reach the ports. By the mid-1970s, it had become clear that the Sea was shrinking and that the salinity level had risen beyond the threshold at which the reproduction of a number of commercial species of fish becomes impossible. Even though the progressive desiccation of the sea was measured and well-documented, it is only with the separation of the Aral Sea in two in the late 1980s that the Soviet Union leaders acknowledged the need to take urgent action. A government commission was established to advise leaders on what action needed to be taken. A number of measures were proposed over the following years, few of which

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[11] see Italy Fischendler and David Siberman (2004), "Packaging Policies as a Vehicle forReforming the Water Sector: the Case of the Californian drought and the Central Valley Project Improvement Act," pp. 31-38, in World Water Council. Proceedings of the Workshop on Water and Politics: Understanding the Role of Politics in Water Management. Marseille, France February 26-27, 2004. and Tara A. Maddock (2004), "Fragmenting regimes: how water quality regulation is changing political-economic landscapes," *Geoforum* 35: 217-230.

[12], Vitalyi N. Bortnik, in Glantz, Michael H., Ed., (1999) Creeping Environmental Problems and Sustainable Development in the Aral Sea Basin. Cambridge: Cambridge University Press; 54.

were actually implemented.[13] From 1960 to 1995, the total decline of the Aral Sea is estimated at 17 metres.

The desiccation and increased salinity of the Sea and rivers have had important ecological repercussions. The deltas of the Amu Dar'ya and the Syr Dar'ya that used to harbour a rich diversity of fauna and flora have been virtually destroyed. The eolian transfer of dust and sand swept from the dried seabed - the area of which is over 36,000 kilometres square – kills or slows the growth of the plants it falls on.[14] The climate has also changed. The sea used to have a tempering effect on the regional climate, but now the winters are colder, summers are warmer, rainy days are fewer and the growing season is shorter. The change in the climate is accelerating the desertification process in the region.[15]

The impact of the desiccation of the Aral Sea on the health of the people living in the affected area is shocking. Third World medical, health, nutrition and hygienic conditions and practices are responsible for the most serious health problems, such as high rates of tuberculosis.[16] But, there are numerous health issues – respiratory illnesses and impairments, gastrointestinal disorders, eye problems and possibly even throat and oesophageal cancer – that can be traced directly to the drying of the sea and the related environmental problems. Pesticide intoxication has also been blamed for the high rate of diseases of the nervous system and mental disorders.[17]

The government's official discourse holds that the Aral Sea disaster was caused by the Soviets and is something in the past. Uzbek President Karimov is quoted as saying "It was Moscow, the centre, the Soviet Union … it was the barbaric use of water resources that led to the Aral tragedy."[18] However, the Sea is still shrinking and the health of the affected people continues to deteriorate. The crisis continues because, despite the Central Asian states becoming independent of the Soviet central planners, the political economy in the largest water consuming country in the basin, Uzbekistan, has not changed and may even have worsened. Indeed, the cotton fibre remains one of the country's principal exports, accounting for over one quarter of total merchandise exports.[19] The agricultural and agro-industrial sector account for over 40 percent of Uzbekistan's Gross Domestic Product (GDP) and cotton is the dominant crop, representing 45% of the country's agricultural exports in terms of value.[20] The direct beneficiary of the water-guzzling cotton production is the powerful authoritarian Uzbek government, which extracts substantial rents from the agricultural sector through a complex command economy. Auty (2003) has calculated that "[by] the late 1990s, the Uzbek Government secured almost one-third of its revenue from excise duties, possibly one-half of this from cotton."[21] While farmers could switch agricultural production to other less water-intensive crops, such as fruits and

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[13] Bortnik, p. 60

[14] Micklin, Philip, (2002), "Water in the Aral Sea Basin of Central Asia: Cause of Conflict or Cooperation?" *Eurasian Geography and Economics*, Vol. 43, No. 7; pp. 505-528.

[15] Tsuneo Tsukatani (1998), " The Aral Sea and socio-economic development," in Kobori, Iwao and Glantz, Michael H., eds. Central Eurasian Water Crisis: Caspian, Aral, and Dead Seas. Tokyo, New York, Paris: United Nations University Press; p. 66

[16] Micklin, 20.

[17] Tstukami, 65

[18] quoted in D.R. Smith (1995) "Environmental security and shared water resources in post-soviet Central Asia" *Post-Soviet Geography*, Vol. 36, No. 6, 1995 p.365.

[19] World Bank. Uzbekistan Country Brief 2003. http://lnweb18.worldbank.org/eca/eca.nsf/ExtECADocbyUnid/909615C3A1325A8A85256D5D006894FF?Opendocument

[20] U.S. State Department (October 2004), Bureau of European and Eurasian Affairs "Background note: Uzbekistan," http://www.state.gov/r/pa/ei/bgn/2924.htm

[21] Auty, p. 261.

vegetables, the government is preventing this by allocating almost three-quarters of the arable land to cotton and wheat cultivation and by setting high state targets for cotton. Fruits and vegetables not only require less water, but they also bring a higher economic return to farmers. But unlike cotton which is mainly sold on the international market, fruits and vegetables are sold on the domestic market which is more difficult for the Uzbek government to control.

The state has introduced some reforms, but these have made a bad situation worse. The government has engaged in some land reform, essentially allowing households to lease small plots of land for their own uses and devolving the responsibility for the administration of the farming cooperatives to the people who work in them. Kandiyoti (2003) argues that the reason the Uzbek government decided to distribute household plots is because it could no longer afford to pay wages, making the smallholder economy the "mainstay of rural livelihoods."[22] The government has also recently shifted to a policy of import substitution. Part of that policy includes increasing grain self-sufficiency. The acreage of land devoted to grain production has been increased. Although grains theoretically require less water than cotton, they have a lower return to inputs and require less labour. But, since most of the cultivated land in Uzbekistan is highly saline - due to the vicious circle of excessive irrigation to meet continuously rising state targets, salinization of the soil caused by high irrigation and poor drainage, and increasing use of fertilizers to compensate for decreasing yields due to salinization – the cultivation of grains, which are generally less saline-resistant crops, has made leaching the soil (flooding it) even more important.

The consequences of this political economic system for farmers and the environment are disastrous. For one, it is impoverishing farmers. The World Bank reports that "of the estimated 27.5 percent of the population -- or about 6.7 million people -- who are unable to meet their basic consumption needs, some two-thirds live in the rural areas."[23] Rural wages have dropped "from 15% above the national average to 33% below the national average during the 1990s"[24] and "most farms are loss-making cooperatives that have accumulated wage arrears."[25] This means that farmers, who now have the responsibility of managing and paying for the farm inputs, are not able to pay for the maintenance of the irrigation system. Kandiyoti argues that the reforms have hit women the hardest: "the reform process […] forces a growing number of women out of the recorded labour force into casual, unremunerated and informal work."[26]

In contrast to the power of those who benefit from the status quo, those who are most affected by the desiccation of the Aral Sea and the state's management of agriculture that is responsible for it have little political clout. Those who are most suffering from adverse health effects attributable to the drying up of the Sea and from the collapse of the local economy are downstream geographically and politically from the capital. In Uzbekistan, the most downstream and hardest hit region is Karakalpakstan. Karakalpakstan is a semi-autonomous region: it has the responsibility to manage its own affairs, but is no more independent from the Uzbek capital than an American state[27] and yet, the central government has little obligation towards this region. It represents 37 percent of the Uzbek territory, but has less than five percent of its population. Also, it is the only large region in the country where ethnic Uzbeks do not constitute a majority.

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[22] Deniz Kandiyoti (2003), "The Cry for Land: Agrarian Reform, Gender and Land Rights in Uzbekistan," *Journal of Agrarian Change*, Vol. 3, Nos. 1-2; p. 225.
[23] World Bank, Uzbekistan Country Brief 2003.
[24] Richard Auty (2003), "Natural resources and 'gradual' reform in Uzbekistan and Turkmenistan," *Natural Resources Forum*, Vol. 27, p. 261.
[25] Auty, p. 264
[26] Kandiyoti, p. 225.
[27] Reuel R. Hanks (2000), "A Separate Space?: Karakalpak Nationalism and Devolution in Post-Soviet Uzbekistan," *Europe-Asia Studies*, Vol 52, no. 5; pp. 939-953.

As Micklin explains, it is "politically impotent and [does] not have influence at the national level."[28]

The selectorate in Uzbekistan are clans and cotton (and indirectly the water that is necessary to produce it) is a major source of patronage for President Karimov. As Collins (2004) explains, the politics of Uzbekistan are the politics of the clan and their patronage networks. In the late 1980s, as the Soviet Union was crumpling, the major clans manoeuvred to displace the leader imposed by then Soviet Union leader Gorbatchev. They agreed on Islam Karimov, who "was not entrenched in any one network but rather was a balancer and legitimate broker."[29] Clan politics reduce the selectorate by

> "engag[ing] in 'crowding out,' a process by which they participate politically through their network and effectively crowd out non-clan forms of association or participation. […] Clan elites use the clan to mobilize social support for their agenda and thereby avoid the costs of creating new organizations, such as political parties or unions, that would have broader but less reliable constituencies. The politics of clans is insular, exclusionary, and nontransparent."[30]

Collins explains that in Uzbekistan, the clan pact upon which President Karimov relied for power at the time of independence was tenuous. "Karimov has struggled to maintain state power apart from clan domains and has waged an on-going battle with clans that seek to disperse executive power and resources to their control."[31] Collins further explains how "he [Karimov] was besieged by ever-increasing demands – primarily by three major clan networks […] to control a greater share of the state's natural resources (especially gold, oil and gas, and cotton). They expected to be able to exploit these public resources for their network's private gain."[32] She goes on to describe how "attempts to crack down on clan-based patronage and asset stripping in the massive cotton sector have met with little success"[33] and concludes that "Karimov's agenda [is] largely controlled by informal politics"[34] and that the "symbiotic relationship between clans and the president makes reform unlikely. Karimov is dependent on clan support, and invested clan elites are highly dependent on his patronage."[35]

The authoritarian regime and clan-based politics also presents little chance for a civil society to emerge and exert pressure on the government to adopt better policies. Turner comments that "Without these basic tenets of democracy, civil participation in water and environmental management remains a fallacy."[36]. If it wasn't clear before that the Uzbek government did not need the population's support to remain in power, the massacre of several hundred protestors by government troops in Adijan in May 2005 certainly clarified the situation.

3. EGYPT AND THE NILE RIVER BASIN

Water resources in the Nile River Basin are not overexploited like they are in the Aral Sea basin, yet they are starting to come under increasing pressures. All of the Nile waters are proportioned out according to a treaty concluded in 1959 between Egypt and Britain (on behalf of

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[28] Micklin, p.15
[29] Kathleen Collins (2004), "The Logic of Clan Politics: Evidence from the Central Asian Trajectories," *World Politics*, 56; p. 242.
[30] Collins (2004), p. 245
[31] Collins (2004), p. 251.
[32] Collins (2004), p. 252.
[33] Collins (2004), p. 253.
[34] Idem.
[35] Idem
[36] Turner, p. 62

Sudan, a British colony at the time). It allocates 75% of the water to Egypt (55.5 billion cm) and 25% to Sudan (18.5 billion cm). The seven upstream riparian countries were not included in the treaty and no amount of water, above what they were consuming in 1959, is reserved for them, even though over three-quarters of the water that flows down to Sudan is generated upstream.[37] In 1959, 55.5 billion cm of water must have seemed plenty. But since 1959, Egypt's population has increased significantly. With the country's population now approaching 70 million, Egypt's per capita water resources are at 800 cm, below the water scarcity threshold of 1000 cm pc.[38]

Many experts agree that Egypt faces a serious and growing water deficit and predict that, given both limited water and financial resources, agricultural production will either stagnate or decrease and that food imports will increase in the future.[39] However, the Egyptian government is resisting. It has made food self-sufficiency an important policy goal[40] and is investing in large land reclamation projects.

Efforts to increase food self-sufficiency have resulted in considerable inefficiencies. In the 1980s and 1990s, wheat and rice production have increased while cotton production has decreased.[41] Close to a third of domestic wheat production is purchased by the government to produce the subsidized baladi bread.[42] While this bread is intended to provide subsistence to the rural and urban poor, in rural areas, Egyptians prefer to eat their own bread and have been reported to feed the baladi bread to their farm animals. Rice is an even more water-intensive and slightly less labour-intensive crop than cotton. While the government is reported to have recently decided to discourage rice production,[43] the fact is that close to half a million tonne of milled paddy rice were exported in 2002 and that exports have increased over the last decade.[44] Wichelns (2003) explains this by saying that "[t]his shift from cotton to rice production have occurred, in part, because farmers are allowed to sell rice at market prices, while the Egyptian government still controls the farm-level price of cotton" (542).

The land reclamation projects are expected to turn tracks of arid land into cultivatable land through massive irrigation. The new lands are intended for the production of horticulture crops meant for export to European and Arab Gulf markets. On the surface, there is much to commend these projects. Horticulture crops are less water-intensive than cereal grains and cotton and have a high water-unit value. Exports will also generate valuable foreign exchange. Moreover, the crops will be grown organically, thereby minimizing pollution into the Nile. The main purpose of the projects is to encourage population resettlement out of the Nile Delta and provide employment opportunities. The government also hopes that spin-off economic activities will also be created.

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[37] Postel, p. 143.
[38] Food and Agriculture Organization (FAO) (2005), "Irrigation in Africa in figures 2005: Egypt," p.3.
[39] See Yang, Hong and Zehnder, Alexander, 2002, "Water Scarcity and Food Import: A Case Study for Southern Mediterranean Countries," World Development, Vol. 30, No. 8; pp. 1413-1430, Mohamed, A. S. (2000), "Water Demand Management in Egypt: Policy Objectives and Strategy Measures," *Phys. Chem. East (B)*, Vol. 25, No. 3; pp. 243-249; Mubarak, Jamil A., 1998, "Middle East and North Africa: Development Policy in View of a Narrow Agricultural Natural Resource Base," *World Development*, Vol. 26, No. 5; pp.877-895; Radwan, L. S. (1997) "Farmer Responses to Inefficiencies in the Supply and Distribution of Irrigation Requirements in Delta Egypt," *The Geographical Journal*, Vol. 163, No. 1; pp. 78-92.
[40] Mohamed, 2000, 244.
[41] FAO Aquastat database. http://www.fao.org/ag/agl/aglw/aquastat/main/index.stm
[42] Kherallah et al. 2003, p.156 in Hans Lofgren, Ed. Food, Agriculture, and Economic Policy in the Middle East and North Africa. Washington, D.C.: International Food Policy Research Institute.
[43] Mohamed, p. 244.
[44] FAO, Economic and Social Department. Key Statistics of Food and Agriculture External Trade. http://www.fao.org/es/ess/toptrade/trade.asp?lang=EN

However, many observers have criticized the project as a drain on the country's financial and water resources. During a debate in the legislature in April 2006, Egyptian journalist Gamal Essam El-Din reports that

> ""In 1997," said Muslim Brotherhood MP El-Shaer, "the government attempted to sell Toshka to the Egyptian people as the country's fourth pyramid, a beautiful vision that would not only meet Egypt's huge food needs in the 21st century but turn the country into a major agricultural exporter." Ten years on, he continued, and the dream has turned into a nightmare. Toshka, he said, has failed to meet every one of its objectives."[45]

The investments required to carry out these ambitious projects are very important. Swain (2002) reports that the project will cost a total of $US 88.5 billion by 2017.[46] According to the government, the private sector is expected to foot over two thirds of the bill. However, the private companies will benefit from a 20-year tax holiday. The opportunity costs of these projects may be important since the significant investment could have gone instead to the achievement of other arguably more pressing national goals, such as health care, education, economic development in less water-intensive sectors, and improving the existing water system. About five bcm of Nile water, or about 10% of Egypt total Nile water quota, will be pump out by the Mubarak pumping station to irrigate 200,000 hectares of land.[47]

Farmers are already seeing their water supplies dwindle. Farag, an Egyptian journalist, reported that

> "According to the Ministry of Irrigation and Water Resources, with the development of a modern irrigation system and the cultivation of crops requiring minimal water, the country should have more than enough water to supply the national land reclamation project including the 5 billion cubic metres of water per year required by the first phase of the Toshka project to reclaim 500,000 feddans of land. But the installation of modern irrigation techniques is costly and the overhaul of the national irrigation system is taking time. And hence every year there are reports of agricultural lands within the Nile Valley that are not receiving sufficient irrigation water."[48]

In the same vein, Swain decries that

> "The Egyptian government claims that by the time the project is finished, it will be able to adequately supplement the water supply through groundwater abstraction, more efficient irrigation systems, and wastewater reclamation. In reality, however, there has been no sincere effort to develop these alternative sources. Instead, the government is busy implementing new projects and bringing new desert areas under cultivation, thus increasing its dependence on the Nile."[49]

It should also be noted that the land in the Southern Valley is much less fertile than in the Nile Delta and that evaporation rates are higher. It seems reasonable to ask why the government did not instead promote the cultivation of horticulture crops in the land already under irrigation. This could have provided farmers will good incomes, which would in turn increase their food security.

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[45] Gamal Essam El-Din (6-12 April 2006), "Parliament to scrutinise Toshka," Al-Ahram Weekly On-line, issue no. 789. http://weekly.ahram.org.eg/2006/789/eg2.htm

[46] Swain, Ashok (2002), "The Nile River Basin Initiative: Too Many Cooks, Too Little Broth," *SAIS Review*, Vol. 22, No. 2; p. 300

[47] Postel, p. 144.

[48] Fatemah Farag (23-29 January 2003), "Green desert – at what cost?" *Al-Ahram weekly*, issue no. 622.

[49] Swain, 2002, p. 300

The authoritarianism of the government in Egypt and its superior power position in the Nile River basin allow Egypt to push through its water-intensive policies despite the costs they create for farmers and the limits they place on upstream countries' development. While Egypt has a legislature elected by universal suffrage, the electoral system is very undemocratic. The president, Hosni Mubarak, has extensive executive powers and his party has ensured that the elections would give it a large majority in parliament since the late 1970s. Unlike Karimov in Uzbekistan, Mubarak is firmly in control of his party and of the country, which he has now ruled for over a quarter of a century.[50] The Egyptian elite does not depend on the support of the farmers in the countryside or in the Nile Delta. The government cracks down on any form of mobilization that could make forceful demands on the state. At the same time, the private sector actors who are benefiting from the land reclamation projects are contributing to propping up the authoritarian state. The Egyptian government has slowly liberalised the economy, not by opening the doors to the private sector but by carefully integrating it into the existing state-controlled corporatist structures. This has allowed Mubarak to perpetuate his iron hold on the economy and use the revenues to maintain the state's coercive apparatus. Five years before the Egyptian government gave the go-ahead for the land reclamation projects, Springborg (1993) described the processes that are behind such projects. He describes how private sector groups (like the investors in the Toshka project) invest in massive joint-venture projects that lose millions while benefiting from government contributions and providing patronage to the sub-contractors and personnel involved.[51] John Waterbury has described the arrangement between the state and the private sector as one of "you [the government] pretend to liberalize, we [business] pretend to invest."[52] As Springborg claims, this relationship has produced a private sector that is a "parasitic bourgeoisie" complicit in the persistence of authoritarian rule.[53]

4. ISRAEL AND PALESTINE

The land that Israel and Palestine share is semi-arid to desert. Combined, their populations have access to one of the lowest levels of natural renewable water resources per capita in the world. Over the last couple of decades, water withdrawals from the aquifers they share have almost always exceeded the renewable supplies.[54] "Red lines" have been set as warning signals indicating the minimum level of water below which no water should be withdrawn. The lines have been repeatedly lowered in recent years. This has resulted in severe environmental stress. The declining level of water has concentrated the salt and pollutant loads and allowed seawater intrusions into aquifers. A number of wells have been shut down as a consequence. There are also problems of pollution due to the infiltration of untreated and insufficiently treated sewage water into the groundwater.

Israel is a world leader in developing technologies and methods to make the most of its water resources, imports a significant proportion of its food, is working on increasing its

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[50] This could also explain why Mubarak is so intent on building Toshka. Nasser built the Aswan High Dam and Pharaons also built cities in the desert. A large hydrological projects, which show that man can control nature and leave those who look upon them in awe, seems only fitting for a man whose power over Egypt has been absolute for so long.

[51] Robert Springborg, (1990), "Agrarian Bourgeoisie, Semiproletarians, and the Egyptian State: Lessons for Liberalization," *International Journal of Middle East Studies* 22, 4; p. 466.

[52] John Waterbury (1993) Exposed to Innumerable Delusions: Public Enterprise and State Power in Egypt, India, Mexico and Turkey. Cambridge, UK: Cambridge University Press.

[53] Springborg, p. 449.

[54] Italy Fischhendler (Forthcoming) "The politics of water allocation in Israel." In: Feitelson, E., and Shamir, U (Ed.). Water for Dry Land. Resources for the Future Press.

desalination capacity and has even signed an agreement with Turkey to import bulk water. Despite these efforts, it is still over-pumping the aquifers, on which an independent Palestine may depend, and the gap between the water allocations for itself and Palestine is large.

Many have called for Israel to further reduce its water allocations to the agricultural sector and to increase its food imports. Israel has been able to reduce agriculture's water allocations in recent years, but Fishhendler (forthcoming) and Feitelson (2005) describe how the agricultural lobby has on repeated occasions been able to obtain higher water allocations than what was calculated as possible without irreversibly threatening the water sources. Agriculture accounts for about 55-60% of Israel's total water withdrawals. While this is much lower than the world average, especially given Israel's hot and dry climate, the Israeli economy is diversified and its workforce well educated unlike developing economies that are heavily reliant on agriculture as a source of income. In 2004, gross domestic product (GDP) per capita in Israel was US$ 17,300 in constant 2000 value and US$ 920.[55]

While the political economy of water resource degradation in Egypt and of the on-going desiccation of the Aral Sea have been less well-documented, a number of authors have argued that the roots of Israel's water problems lie in its political economy.[56] They advance a number of reasons to explain why the agricultural sector has been able to capture that much water (relatively speaking): founding myths and ideologies, centralised economy, powerful lobby of the agricultural sector, and a water policy-making process that gives greater access to agricultural interests than to other users.

The goal of "making the desert bloom" was central in the ideology of the first generation of Israeli settlers and their ability to turn desolate land into productive cultivated land remains an important source of national pride. Obviously, water was crucial to that goal, such that "water was never regarded as merely another economic resource but as a prerequisite to create a new society in the land of Israel."[57] The country's early years attempting to build a collectivist agrarian society has left it with a social, political and economic organisation that has an institutionalized bias in favour of the agricultural sector. Historically, the kibbutzim (collective communities in which agriculture is a central activity) have produced many politicians and the movement inspired the political ideology of some important political parties. Still today, a number of politicians come from the agricultural sector; some have farms (including former Prime Minister Sharon who has a farm in the Negev desert), are members of a kibbutz or moshav and/or have held positions in one of the important agricultural organisations. Feitelson explains that until 1977, Israel's politics were dominated by the labour movement, which favoured a statist approach and "established centralized control over all natural resources."[58] Most of the agricultural land continues to be operated by kibbutzim and moshavim cooperative farming settlements. The fact that so little of the land is privately-owned and that the Israeli economy is highly centralised and bureaucratic means that, Alwyn argues, "nearly all agricultural sector enterprise is carried out within an anti-competitive system of production and marketing boards whose regulations are supported and enforced by the Ministry of Agriculture."[59] The 'cross-fertilization' and close cooperation between the agricultural sector and the government has

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[55] GDP figures are from the World Bank Development Indicators Database http://devdata.worldbank.org/dataonline/; employment data for Israel are from … and employment data for West Bank and Gaza are from

[56] Alwyn R. Rouyer (2000) Turning Water into Politics: The Water Issue in the Palestinian-Israeli Conflict. Houndmills : Palgrave; Selby (2005), Fischhendler (forthcoming; Eran Feitelson (2005), "Political Economy of Groundwater Exploitation: Israeli case," Water Resources Development, Vol. 21, No. 3; pp. 413-423.

[57] Fischhendler, p. 5.

[58] Feitelson, p. 416

[59] Alwyn, p. 164

resulted in water allocation policies favouring agriculture over other users, including the environment.

Agricultural interests form a well-organised and powerful lobby group. On that point, Alwyn writes that "the settlement cooperative movements, which dominate most sectors of agricultural enterprise in Israel, are organized through the Agricultural Centre of the Histradrut," adding that "Israel is unique in the world in having its agricultural sector under a single political umbrella."[60] Moreover, "the agricultural lobby remains powerful as it increasingly consists of a coalition of Knesset members (MKs) from different parties, across the political spectrums, all of which come from the various types of agricultural settlements or are aligned with the agricultural sector."[61] The high level of organization within the agricultural sector facilitates the forming of coalitions in the Knesset and "is very active in internal party politics" so that "the total number of MKs from this sector is larger than their percentage in the population."[62]

Feitelson (2005) and Fischhendler (forthcoming) argue that the agricultural lobby is further empowered by the structure of the water allocation process, to the detriment of other groups that would have an interest in a more sustainable and socially just use of water. Until 1990, all the water commissioners, which have the responsibility to manage all water uses, came from the agricultural sector. The water allocation process is such that "a decision to cut water allocations to the agricultural sector requires the support of several ministers, committees, and different branches of the government."[63] Feitelson describes how "in the 1998-2000 drought, the Water Commissioner […] first attempted to cut allocations to farmers or raise water rates. But he was blocked in both attempts by a coalition of the Minister of Agriculture, the Knesset and the Prime Minister."[64] Other Israeli groups that have an interest in sustainable water use, such as environmental groups and the tourist industry, are not formally integrated into the water policy-making process. Fischhendler explains that "the Ministries of Tourism and Environment are not represented at all in the water institutions. Often their only channel to try and wield influence is during Parliamentary Question time through their lobby in the Knesset."[65]

In sharp contrast to Uzbekistan and Egypt, Israel has a democratic political system based on broad participation. But up to now, the main victims of its water use have been Palestinians, who are most definitely outside the selectorate. However, now that Israel is approaching the limits of its own water resources and is prevented from decreasing its already derisory water transfers to Palestinians by an international treaty, the costs of water resource degradation are starting to be felt at home. The outlook for domestic coalitions to form and force the domestic water allocation system to change is better in this case than in the other two. But there is no reason to believe that Palestinians, who remain outside the selectorate, will concomitantly see their water situation improve.

5. CONCLUSION

Water resource degradation and hydro-injustice are symptoms of a more fundamental problem in societies political economy. While natural water availability makes it harder to sustainably use the resources, it is not a necessary cause of water resource degradation and hydro-injustice. Water is relatively abundant in the Aral Sea basin and yet, it is the site of the world's

[60] Alwyn, p. 165
[61] Feitelson, p. 418
[62] Idem
[63] Fischhendler, p. 13
[64] Feitelson, p. 419
[65] Fischhendler, p. 18

worst hydrological crisis. Technologies to stretch available water supplies and access other sources are no panacea. Water is a bit like money in this way: it seems you could always use more and when you do have more, there are always more ways to spend it.

The failure to recognise the political roots of the water crisis have important implications for efforts to resolve them. For instance, once we understand the clan politics and the importance of cotton and water as a source of patronage for Uzbek President Karimov, it becomes clear that any effort to push for water pricing or shift agricultural production to other crops will fail unless they also address the political context. As Collins explains, it is clearly not in the President's interest to give up an important source of patronage that keeps him in power and the clans in check. When international aid agencies and foreign donors pour money into improving the irrigation system, it also amounts to consolidating Karimov's hold on power since it is a form of patronage that that President can use to placate clans. Turner even suggests that the states in the Aral Sea basin "perhaps used the ecological catastrophe of the Aral Sea as a means of attracting international aid."[66]

The political economy of water resource degradation also allows us to see through some of the dominant discourses over water. One discourse that comes up in all three cases is that of food self-sufficiency. Indeed, Egypt and Uzbekistan have introduced policies to increase food self-sufficiency and the Israeli agricultural lobby stresses the importance of food production as a national security issue. However, in Egypt, the land reclamation projects will be devoted to producing fruits and flowers for export to European and Arab Gulf groceries and markets. The water used for this means less water particularly for farmers at tail-ends of irrigation canals lower on the Nile to cultivate food for their own consumption and ensure their food security through the income they can make selling cotton and other cash crops. In Uzbekistan, while wheat production has increased, cotton has not. As a result, Babu and Rhoe (2001) found that "the food self-sufficiency policies within these countries [in the Aral Sea basin] have increased the amount of cultivated land for grain and ultimately grain production for all countries except Kazakhstan, but this policy has resulted in lower production of other food products that are higher in nutrients."[67] In Israel, agricultural products are also exported and given that agriculture substantially contributes to the depletion of natural water resources, it is more likely that it is undermining future food self-sufficiency.

On a final note, in his article, Selby (2005) also argues that "water problems should neither be understood in naturalistic nor in liberal – technical terms, but instead as questions of political economy."[68] But he goes to write that

> "nature and natural resources do not just sit around waiting to be consumed. Resources, to the contrary, are material social constructs and products, brought into being through economic and technological development, through the fact that humans are producers and not just consumers of 'nature' (a 'nature', we might add, that no longer really exists)."[69]

He is correct in saying that humans can be producers of nature, but he is wrong in thinking that this is part of the solution and not part of the problem. The more a society lives beyond the carrying capacity of its environment and the longer it does so, its defensive expenditures increase exponentially. After the low-lying fruits are collected (covering irrigation ditches, deep well

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[66] Turner, p. 60.
[67] Babu, Suresh and Rhoe, Valerie, 2001. Food Security, Regional Trade, and Food Safety in Central Asia: Case Studies from Kyrgyz Republic and Kazakhstan. International Food Policy Research Institute: Washington DC 20006 U.S.A.; p. 3 http://www.ifpri.org/pubs/confpapers/2001/babu_090501.pdf
[68] Selby (2005, p. 325
[69] Selby (2005), p. 332

drilling, importing food), it becomes increasingly difficult (expensive) to reach for the higher ones (drip irrigation, artificially refilling aquifers, desalinating sea and brackish water, importing bulk water, diverting rivers, reducing the salinisation of the soil caused by drip irrigation, etc.). Societies dependent on 'produced' water today will soon have to deal with the by-products of desalination, rising world prices for grains, and a host of other problems as more and more societies fail to 'nip' scarcity in the bud. It will become increasingly difficult to achieve higher levels of well-being or even just to stay in place.

A common belief is that environmental sustainability is temporarily expendable if overexploitation helps achieve a higher level of development which will be less taxing on the environment. The danger, however, is that overexploitation will last longer than it was intended to. Much like the political economy of international trade policy tells us that those who benefit from trade protection will seek to keep their rents, actors who are allowed to degrade the environment will seek to maintain their 'environmental rents' and see environmental compliance as an extra expenditure. As Tony Allan has said of water allocations in the MENA, "this access to water has been transformed by users to perceived rights."[70] Another danger with this line of thinking is that it assumes that "only" nature bears the costs,[71] when in fact it is often the case that environmental exploitation goes hand in hand with social injustice. When the environment is considered expendable, it is often because some people's well-being is considered expendable.

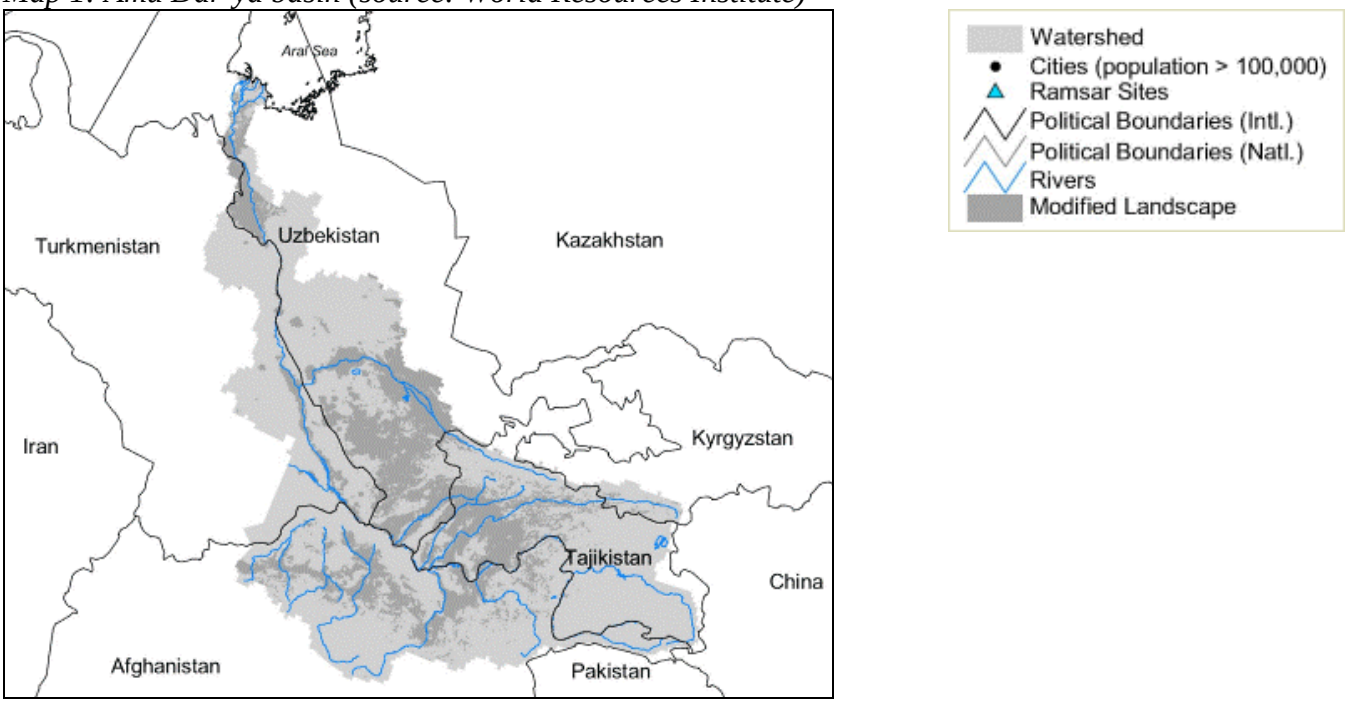
[70] Tony Allan (1996), "The political economy of water: reasons for optimism but long term caution," in J.A. Allan, Ed. Water, Peace and the Middle East. London, New York: Tauris Academic Studies; p. 82.

[71] Whether the possibility that "only" nature suffers is a valid justification is an issue not entirely beyond the scope of this article, but left out due to space and time limitations.

Annex I

Aral Sea Basin

Map 1: Amu Dar'ya basin (source: World Resources Institute)



Map 2: Syr Dar'ya basin (source: World Resources Institute)

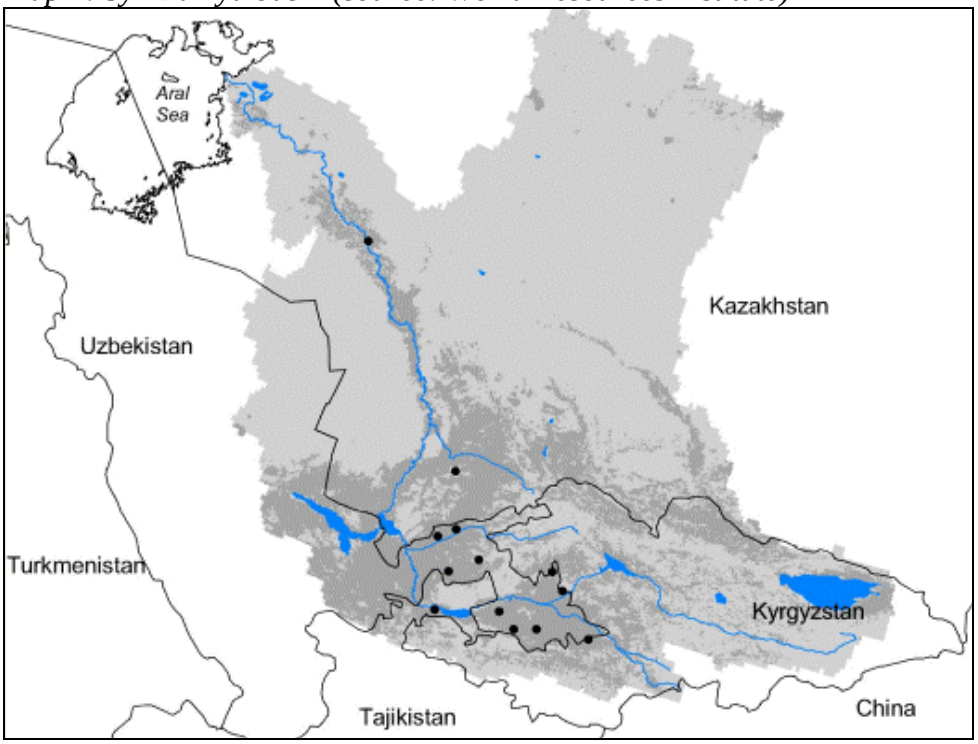
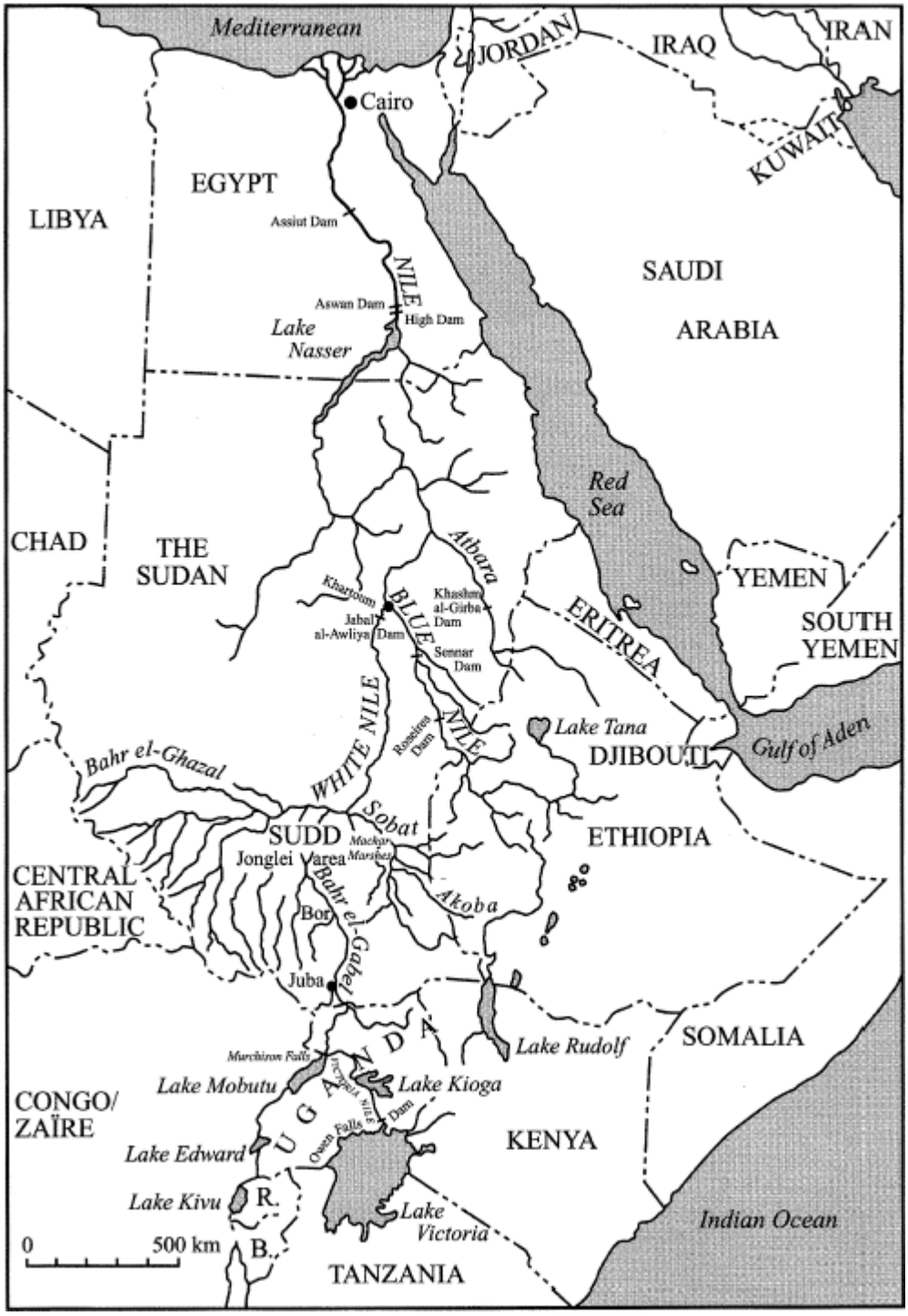


Figure 1. Desiccation of the Aral Sea

Sources: Nikolai Denisov, GRID-Arendal, Norway; Scientific Information Center of International Coordination Water Commission (SIC ICWC); International Fund for Saving the Aral Sea (IFAS); The World Bank; National Astronautics ans Space Administration (NASA); United States Geological Survey (USGS), *Earthshots : Satellite images of environmental change*, United States Department of the Interior, 2000.

Picture 1. Aerial view of Aral Sea (source: FAO)

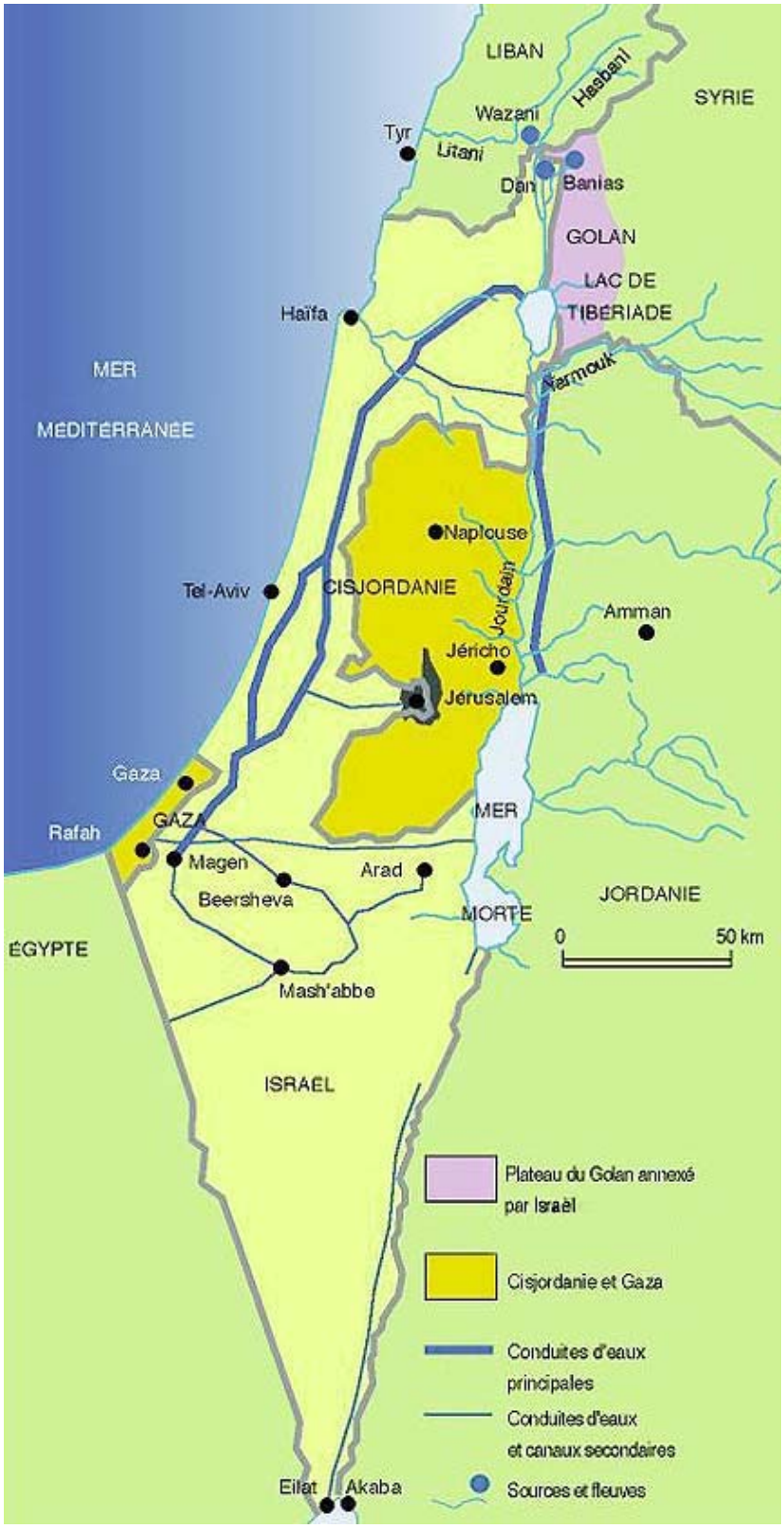
Annex II
Nile River Basin



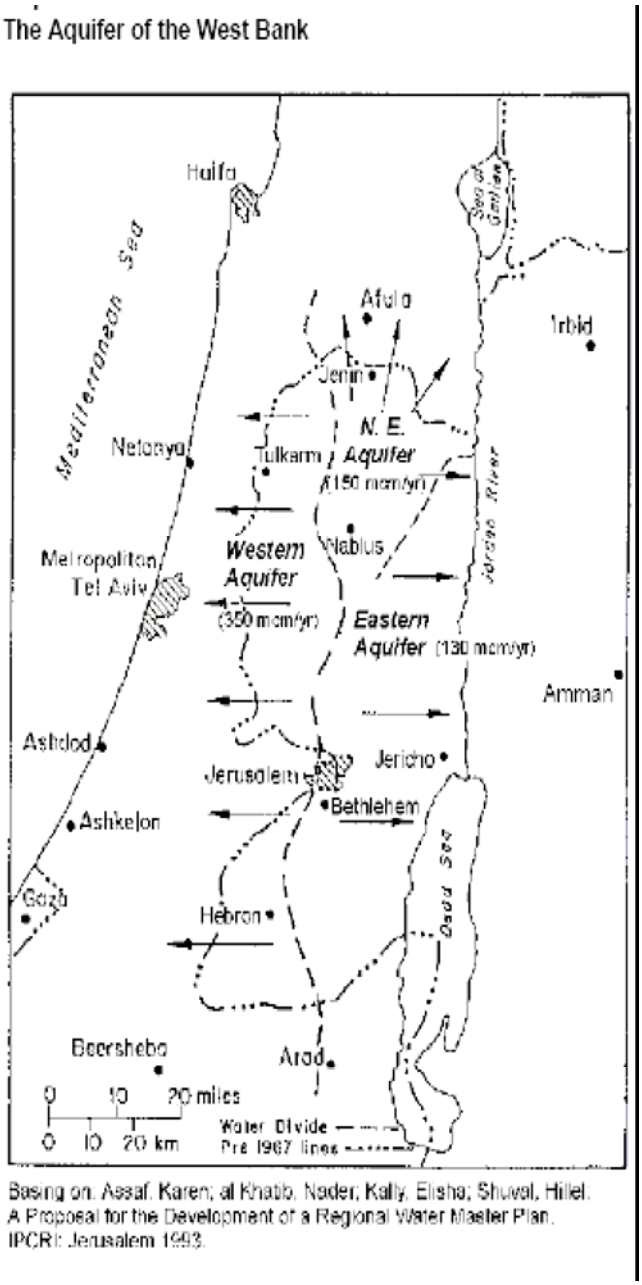
Source: Swain, Ashok, 1997, "Ethiopia, the Sudan, and Egypt: The Nile River Dispute," *The Journal of Modern African Studies*, Vol. 35, No. 4; p. 678.

Annex III – Water in Israel and Palestine

Annex III: Maps of Israel-Palestine water resources



Source: Monde Diplomatique, June 2000



Source: Libiszewski, Stephan (1995), "Water disputes in the Jordan Basin region and their role in the resolution of the Arab-Israeli Conflict," Berne: Center for Security Studies and Conflict Research at the ETH Zurich/ Swiss Peace Foundation Berne.
http://www.mideastweb.org/Mew_water95.pdf