The Common and Uncommon Political Economies of Water and Oil 'Wars'

PAUL A. WILLIAMS

This article compares the political economies of water and oil conflicts. It suggests that the 'common pool resource' (CPR) framework only partially explains the prototypically 'upstream-downstream' disputes over flowing water and oil 'flows', as CPR rivalry stems from users' inability to exclude each other, while water and oil conflicts stem from certain users' ability to exclude others. Yet, it also argues that key differences, related to the exclusivity of upstream sovereignty over resources, the ecological or economic nature of 'downstream' flow benefits, the practicality of 'upstream' flow control, and the size of the political benefits of gaining and exerting 'upstream' control relative to its high economic costs, make 'water war' much less politically economic than oil conflict.

The Middle East has long hosted resource conflict. Yet, the 'water war' alarms being rung in the mid-1980s to early 1990s, as well as the alarmists sounding them, have become quieter.[1] This does not necessarily indicate that water is cementing regional peace.[2] Nonetheless, the epicenter of resource conflict has again shifted to the Persian Gulf. This is not because it empties a vastly diminished volume of Tigris-Euphrates River streamflow, a by-product of almost 30 years of conflict-prone but generally lower profile upstream damming and draconian marsh drainage, but because the region holds two-thirds of the earth's proven reserves of oil, the industrialized world's lifeblood.[3] As opposed to scholarship on water, which rarely transcends speculation on whether and when its scarcity could provoke war, observers have been much less ambivalent in attributing conflicts in oil-rich regions to their oil riches.[4]

This article examines the similarities and dissimilarities between water- and oil-related conflicts. It first surveys the literature on 'common pool resources' (CPRs), which is increasingly being employed to analyze the political dynamics associated with the paradigmatic 'tragedy of the commons' that inheres in a unique combination of subtractibility (zero-sum consumption) and non-exclusivity (users cannot be barred from consumption). The assumption here is that the most highly intractable water-sharing disputes are asymmetrically structured as 'upstream-downstream' conflicts, in which most resource destruction is uncommonly concentrated downstream precisely

Paul A. Williams is Assistant Professor in the Department of International Relations at Bilkent University, Ankara.

The Review of International Affairs, Vol. 3, No. 1 (Autumn 2003), pp. 13–28
ISSN 1475-3553 print
DOI: 10.1080/1475355032000227149

because upstream actors are poised to exclude downstreamers from the benefits of the resource system and externalize their environmental 'bads' downstream. Thus, 'water war' tends to pivot as much on shifts *away from* the classically symmetrical CPR parameters as on a worsening of rivalry *within* these parameters. Oil war is not generally conceptualized in terms of these parameters because it is thought that the 'tragedy' of its depletion and associated conflict are inevitable; yet, this may be an area where aspects of the CPR analytic are relevant as well.

The article then examines the precise differences in the 'upstream-downstream' dimensions of water- and oil-related conflict dynamics. It argues that in terms of seeking to obtain control of, or 'enclose', a resource that downstreamers have enjoyed in common or, conversely, to break an owner's natural control over downstream flow, the relative ability to prevail in particular resource conflicts depends on how certain variables shape the cost-benefit ratio of seizing the resource relative to that of preventing this outcome. Specifically these factors comprise:

- the extent to which upstream states are agreed to hold exclusive sovereignty over territorial resources;
- whether 'downstream' benefits are produced by natural forces or 'upstream' technology;
- whether excluders hold primarily 'upstream' or 'downstream' interests vis-à-vis resource flow; and
- the extent to which the political benefits of gaining and exerting 'upstream' control are perceived to justify its high economic costs.

THE UNCOMMON BURDEN OF THE 'TRAGEDY OF THE COMMONS'

Natural resources have long provided a focus for studies of conflict and cooperation. A recent trend in this area is towards an increasingly systematic analysis of how the unique structural attributes of CPRs complicate the building of institutions to moderate competition among users while sustaining the economic productivity and environmental integrity of the resource itself.[5] The prototypical 'tragedy of the commons' implies a relatively symmetrical set of consequences related to these infelicitous circumstances: total quantity of benefits available to users is subtractable, yet it is 'costly (but not impossible) to exclude potential beneficiaries from obtaining benefits to its use'.[6] That is, common access places users of these scarce resources in a position to harm each other reciprocally through over-consumption. Centralization and privatization, modalities for excluding free riders and regulating resource uses, are argued to be less effective than inducing users' voluntary and collective self-restraint, especially at the international level.[7]

It remains open to question whether, and to what extent, the CPR framework can incorporate the salient 'upstream-downstream' parameters of many resource contests. Ostrom's seminal work explicitly avoids examining conflicts over non-renewable resources (where non-use is the surest safeguard against

depletion) or situations where some users gain control over supply or impose negative externality costs on others.[8] A partial resemblance to private goods is implied in the identification of 'diverse CPRs for which at least *some* potential beneficiaries cannot be excluded'.[9] But any exclusion possibilities are seen less as a potential driver of conflict between resource users than as a stimulus to their cooperation. While an 'open-access CPR' is fully non-excludable and rival, with a 'limited-access CPR', the natural demarcation distinguishing all non-users from the relatively fewer users who enjoy direct access to resource benefits gives the latter a potential 'opportunity to coordinate their activities in the interest of … optimal and sustainable use … and thereby avert a tragedy of the commons'.[10] A less positive overlap with private goods is subtractability of CPR flow *units*; however, even if units are appropriated sequentially (for example, water taken from successive rivers), this does not make the CPR *system* less jointly accessible among the rival users.[11]

Nonetheless, it is not inconceivable that any sequential appropriation process itself confers on advantaged users an ability to deprive others of meaningful access to the system. This possibility arises because, while excluded beneficiaries 'cannot directly subtract from the ability of the owner of the good to gain benefit from it',[12] gaining control over the system itself may permit or induce the 'owner' to subtract most of the available benefits and impose the effects of any consequent degradation in the system's productive capacity on the losers of access. The concepts of 'resource capture' and 'ecological marginalization', interactions among supply-induced, demand-induced and structural forms of 'environmental scarcity', are useful here.[13] Resource capture occurs when falling supply and rising demand 'encourage powerful groups … to shift resource distribution in their favor', thereby aggravating structural scarcity (that is, unequal resource access) and accelerating ecological marginalization of the excluded, whose increased demand is concentrated on the smaller area that remains open to access.[14]

'Resource capture' has its enabling conditions, causes and instrumentalities. While demand-induced scarcities arise only with subtractable or rivalrous resources like CPRs, 'structural scarcities arise primarily with resources that are *excludable*, which means that property rights or other institutions can be used to prevent access to the resource by some actors'.[15] Even some who emphasize the CPR feature of costly exclusion in the context of many resource disputes maintain that excludability is ultimately rooted in a mutable property-rights structure.[16] Structural scarcity may be motivated by fear of being left at a possible disadvantage, or by greed, as rising supply-induced and demand-induced scarcities make it 'easier … to capture such a significant fraction of the market that monopolistic profits can be extracted'.[17] Moreover, this exclusion is implied to be more readily attainable in the realm of domestic politics, where there is a 'state [that] is usually able to generate large economic rents by expanding the range of permissible uses of resources and by granting monopolistic access to resources'.[18]

Rather than being derived from rivalry over a subtractable flow of discrete economic benefits, resource capture is more similar to political contestation

over the *de jure* assignment of ownership and use rights. This evades the question of whether exclusion can also occur at the *international* level and, if so, what cost-benefit calculi, institutional forms, physical mechanisms and conflict stimuli distinguish it there. Analyzing issues, such as sharing transboundary river water, within the conceptual scope of the CPR framework may strain its explanatory power. It is difficult to assume, for example, that water is a 'common' resource, when the same author argues that individual states are also 'endowed' with a sovereign right to control territorial resources and, even more to the point, when at least one of these states 'control[s] a river's source or upper flow, placing the lower lying riparian states at a disadvantage'.[19]

This is indicative of the problem of accommodating asymmetrical conflict structures within the CPR construct. 'Upstream-downstream conflict', where one country takes actions harmful to another country that lacks reciprocal power, may be at best the limiting case of a 'common pool situation' in which 'one country may be totally unconcerned about the assimilative capacity of a shared river … while its neighbour is vitally concerned'.[20] Upstream-downstream conflict, which has considerable potential to shape the tenor of overall international relations in the shared resource space, seems more consistent with a violence-prone process of altering CPR structural parameters to provide one set of users with an exclusive possession that manifests itself in a (near) monopolization of flow benefits. Even if legal sovereignty over a 'captured' resource system and the controlled flow remains limited, practical excludability is recognized to the extent of the intensity of contest surrounding its realization.[21] To the extent that their vital interests are compromised by an anticipated loss of flow benefits, for example, states are expected to resort to linkage strategies, utilizing sources of leverage outside of the issue-area to compensate for obvious deficits in issue-specific power.[22] Similarly, states with obvious issue-specific leverage might refrain from exploiting it in exchange for positive outside inducements.[23]

Thus, while the CPR construct correctly underscores the costliness of gaining exclusive control over mobile resources, it proves less useful in identifying concrete conditions under which actors anticipate obtaining an array of benefits that will make the high costs tolerable. But this qualification should not be construed as presenting grounds for dismissing the CPR analytic entirely. Although realists plausibly claim that the upstream position consists of an axiomatic capacity to present 'actions that can be contested or countered by a downstream opponent only with considerably increased difficulty or cost',[24] this presumes, for most practical purposes, that upstream states have already absorbed the substantial costs of converting raw territorial location into an actual technological capacity to inflict major downstream losses.[25] In the case of water sharing, however, given that relatively older flood-recession agricultural practices and less mechanically demanding irrigation techniques have accustomed downstream areas to a certain supply of water,[26] probable loss of benefits is likely to stimulate downstreamers to take on the considerable risks of opposing upstream construction.

Consequently, the high value that downstreamers attach to *preserving* a customary pattern of resource use is just as likely to motivate a successful deterrence of upstream fait accompli in the first place. To the degree that 'capture' threatens an existing distribution of access and benefits associated with sequentially appropriable resources, captors will pay steeper costs to dominate a correspondingly riskier conflict escalation process. As explained below, however, captors' ability to prevail in particular resource wars is affected by a number of specific variables, namely the nature of upstream ownership, the status quo distribution of downstream flow benefits, the 'upstream' or 'downstream' interest in altering or maintaining this distribution, and the ability to derive extraneous political leverage from successful, albeit costly, efforts to exclude.

THE DYNAMICS OF CONFLICT OVER CONTROLLING RESOURCE FLOWS

Flowing Water

'Downstream' actors have a generic interest in retaining or getting more of whatever good originates 'upstream'. In the area of water sharing, downstream flow occurs naturally and upstream flow alteration is a product of political economy. Richard Matthew argues that flowing water is a 'structural CPR' rather than a 'pure CPR', because, although downstream states view water as a CPR, 'sovereignty gives it [the upstream state] a right to use the water as private property. It has the right to exclude other states from enjoying this good'.[27] Yet, exercising this right presupposes a costly process of reservoir filling, which can endanger 'one's own population downstream of the facility' unless upstream states develop 'the infrastructure and … agricultural base to use the water "in-house" as it were'.[28] The right is also balanced by competing normative considerations.[29] Downstreamers typically counter assertions of upstream sovereign 'rights' with the legal principle of prior appropriation or 'first in time, first in right' and the complementary convention of averting 'appreciable harm', which 'protects acquired rights by warning all second-in-time users to avoid any use that might cause harm to those with senior rights'.[30]

Thus, the economic costliness of enclosing long-standing downstream water flows stems as much from psychological resistance to allowing losses of existing uses to stand as to the relatively more formidable hydro-mechanical requisites of upstream diversion vis-à-vis gravitational flow. Upstream users have asserted a budding right of 'equitable utilization', which has largely supplanted the discredited doctrine of 'absolute territorial sovereignty',[31] but to minimal avail as a way of marshalling international financial support for their development projects. In short, downstream claims of harm are more tangibly grasped than upstream appeals to fairness.[32] Thus, it is not surprising to learn that 'downstream' interests have been reinforced by the World Bank's steadfast 'commitment to protect acquired rights, enshrined in its Operational Directive 7.50', which conditions funding on unanimous basin-wide consent.[33]

Egypt represents a paradigmatic example of the array of means that downstream states can wield to deter upstream flow control. In citing evidence

that Egyptian ground armor can be deployed to block Sudanese attempts to curtail the downstream flow of the Nile River, of which 55.5 of 84 billion cubic meters collects in the High Aswan Dam's Lake Nasser, and that its air power can be projected against less proximate installations, Michael Klare correctly argues that 'Egypt has always possessed sufficient military strength to deter its neighbors from proceeding in that direction'.[34] The 'water wars' thesis has been criticized for failing to consider whether states can more cost effectively meet key water end-uses through the global economy (for example, by accessing 'virtual water' contained in grain imports) than via further territorial exploitation[35] or whether heavily water-dependent states lacking high-value-added service economies even have the wherewithal to mount military operations.[36] While these observations apply less to Egypt's concern for preserving its *existing* water uses than to upstream states' interests in expanding their *prospective* uses, this is only because Klare pinpoints why, and with what means, a 'water war' would be fought – Egypt is using extraneous 'tools' to 'target' upstream water installations in order to achieve its 'goal' of preserving downstream flow.[37]

While 'downstream' states stereotypically face a status quo of upstream 'capture' of oil reserves, military force in the area of water should truly constitute the *ultima ratio* for downstream states, which only have to deter 'capture'. Egypt, for example, has capitalized on 'a formidable position in several multilateral and bilateral aid and credit institutions'.[38] Existing treaty regimes also obviate the need to use blunter forms of coercion. A 1949 agreement posts Egypt's engineers at a gauging station upstream from Lake Victoria's Owen Falls Dam to verify that Uganda is operating the dam to simulate the Nile's natural flow, and, while the 1959 agreement with the Sudan permits each country to monitor the other's storage discharge rates, 'reciprocity has been unequal, with Egypt's two dozen or so engineers in the Sudan taking a more hands-on monitoring role than their Sudanese counterparts at the Aswan Dam'.[39] Finally, Egypt enjoys a form of structural power inhering in the endemic civil conflict that has thus far stymied any unilateral undertaking of upstream water projects.[40]

'Water war' is noteworthy precisely because conflicts over water so rarely escalate. As Homer-Dixon notes, escalation indicates a fortuitous coincidence of heavy downstream dependence on a flow of water, an upstream threat to cut it off, a history of bilateral tensions and a downstream perception that it can prevent the cut-off by force.[41] It is often claimed that Syria, lacking overt military leverage, deployed the Kurdistan Workers Party (PKK) insurgents to impede upstream construction of the Euphrates River dam and diversion components of Turkey's Southeast Anatolia Project (GAP).[42] While signally failing to block completion of Turkey's five centerpiece dam projects, which can collectively impound 90 billion cubic meters (mean annual flow times three), the insurgency's destabilizing effect in southeastern Turkey has probably rendered planned water diversions for irrigation too costly.[43] Yet, how the PKK's specific terrorist strategies and actions fulfilled Syria's water-related objectives remains to be demonstrated.[44]

Israel's more overtly belligerent actions beginning in the 1960s to protect its National Water Carrier (NWC) even more closely match Homer-Dixon's posited 'water war' criteria. The Arab League's 1960 Jordan River headwaters diversion plan resembles a 'tool' that was 'targeted' at Israeli installations to meet a subsidiary 'goal' of increasing Jordan's water supply.[45] Initially, Israel could not overwhelm Lebanon and Syria, the respective headwater states that were trying to divert the 260 million cubic meters of water from the Hasbani and Banias tributaries to a planned dam on the Yarmuk tributary and thus to by-pass Lake Tiberias, a natural reservoir storing the 350 million cubic meters that the NWC would convey to Israel's Negev and coastal regions. Earlier clashes with Syria forced Israel to move the NWC down to elevations from which water would have to be pumped 360 meters up, a process consuming 15 percent of national electricity and costing $0.60 per cubic meter to convey.[46] Hitting diversion works in 1966 and 1967 as well as seizing the Golan Heights (the Banias source) and critical Hasbani River locations in the July War clearly demonstrated Israel's ability to dominate the situation.[47]

Its array of 'downstream' values was secured by Israel becoming an upstream state.[48] The costliness of occupying that position and depriving non-Israeli Arabs of access to increased flow benefits indicates that the economic value of agriculture, which uses 95 percent of the water to generate only three percent of GDP,[49] was less of a compensating incentive than gaining 'strategic depth' and advancing an ideological goal of supporting Jewish settlements thought to be vital in substantiating that depth.[50] Israel relies on approximately 700 million cubic meters of Jordan-Yarmuk River water (almost half of which is derived from water originating in Arab territory), but the West Bank provides 500 million cubic meters of Israel's groundwater, which in turn makes up 60 percent of Israel's renewable water supply of 1.9 billion cubic meters.[51]

Therefore, seizing the West Bank as well gave Israel the de facto ability, but not the *de jure* right, to block Arab efforts to increase uses of groundwater that naturally flows into pre-1967 Israel. As Lowi writes, 'since July 1967, the water resources of the Occupied Territories have gradually been integrated into the Israeli water system and now come under the direct control of the Water Commission'; consequently, West Bank Arab water users have been held to 125 million cubic meters of water with rights to expand irrigation, dig new wells, pump more from existing wells and obtain well-drilling equipment correspondingly restricted.[52]

Upstream countries can succeed in altering the non-exclusion status quo. In that case, they are also more likely to consider using flow control for the purposes of demanding a commensurately higher 'price' for forgoing greater diversions of which they are capable and for which they have probably developed uses. It is the attractiveness of the sheer difficulty that a downstream country could face in finding substitute means of fulfilling vital functions, not the (low) intrinsic economic value of consuming a large share of that resource upstream, that may tempt the upstream country to absorb the high costs of acquiring the means to manipulate streamflow releases as well as focus downstreamers on preventing this possibility.[53] Whether this event does occur

depends to at least some extent on the social structure of overall relations between issue-area rivals, since worsening material scarcity may stimulate searches for negotiated solutions rather than escalating conflict.[54]

Clearly, given its heightened tensions with Arab states, Israel demonstrated that it was unwilling to accept the price of water diversions – potential loss of its sovereign identity – even relative to the high costs of seizing 'upstream' position. The aforementioned Euphrates River dispute between Turkey and Syria has certain parallels in the sense that Syria's suspected use of the PKK insurgency to thwart Turkey's GAP dam-building endeavor was bound, in a self-fulfilling manner, to increase Turkey's incentive to consider using the flow control enabled by its completed hydrological installations, especially the Atatürk Dam, to exact greater political concessions from its downstream rival. Turkey's apparent playing of the water card as this dam reached completion and began filling in the early 1990s manifested itself in then Prime Minister Demirel's veiled threat that 'the more [dams] it [Turkey] builds, the fewer threats it will be faced with'.[55]

But countervailing apprehensions instill a certain reluctance to flout any capacity to use flow control to condition downstream-state behavior. Upstream countries do have concerns for projecting a 'good neighborly' image and prefer to avoid fuelling interpretations of streamflow releases as reflecting the influence of downstream pressure.[56] Some sources have stressed that Turkey's dams provide the public goods of flood control and drought mitigation.[57] Moreover, upstream countries often contain powerful domestic elites with interests in diverting *less* water from a controlled supply. Turkey's Euphrates River dams store a huge volume, but the highest-value-added water use is hydro power, which intrinsically limits irrigation diversions and maintains a certain level of downstream flow.[58] While 90 percent of GAP's electricity generating capacity has been finished and is primarily benefiting the relatively more developed western part of the country, only five percent of its irrigation sub-projects, which will provide more employment to residents of the impoverished southeast itself, are operating.[59]

The 'Flow' of Oil

On the issue of controlling oil flows, it is 'upstream' storage that occurs naturally, while 'downstream' flow is the product of political economy. In disputing the logic behind then Turkish Prime Minister Demirel's 1991 analogy between water and oil, for example, Arab states argued 'that oil is like other mineral resources that stay in one place until drilled and pumped out by human effort, while the water in a river naturally flows to the downstream riparians unless interrupted by human intervention'.[60] When demand approaches supply constraints, greater geophysical containment of 'upstream' reserves imbues source countries with a more practical capacity to control 'downstream' flow that substantiates their sovereign right to curtail it.[61] This reality facilitated the decisive shift in the balance of oil-issue-area power from the seven major foreign oil firms to the OPEC members, in whose territory possibly four-fifths of the world's proven reserves are located.[62] Thus, scarcity induced OPEC host

states' coercive re-negotiation of profit-sharing concessions and nationalization of company assets in the late 1960s and early 1970s as well as Arab states' implementation of the 1973–74 oil embargo.

Resource immobility raises the cost-benefit ratio of coercing increases in 'downstream' flow of oil relative to that of retaining 'upstream' control. This point has to be understood within a context where their generally shared interest in maintaining higher oil prices has not prevented occasionally violent disputes among 'upstream' producers over who gets to provide a larger quantity of 'downstream' flow. Resembling the CPR problem more closely than the asymmetrical upstream-downstream structure of transboundary water-sharing conflict, this inherent cartel dilemma is resolvable if a hegemonic leader provides the collective good by itself and enforces overall compliance (a secondary collective-action dilemma) with group norms.[63] Saudi Arabia has, on the one hand, dominated as a 'swing producer', restricting its own production to maintain OPEC's overall target output and price range (the upper end of which is capped by the need to prevent recession in consuming countries and discourage production elsewhere). And, on the opposite hand, it has dominated as an enforcer, increasing output substantially to lower world prices and deny market share to discipline 'free riders', that is, quota violators and non-OPEC producers, like Mexico, Norway and Russia, with relatively higher extraction costs.[64] Saudi Arabia's possession of 25 percent of the world's proven oil reserves and excess production capacity of 3 million barrels per day (which adds to its roughly 29 percent share of OPEC output) gives it 'the energy equivalent of nuclear weapons, a powerful deterrent against those who try to challenge Saudi leadership and Saudi goals'.[65]

Like countries exercising 'upstream' control over the flow of transboundary water, OPEC often conflates its pricing policy with an act of providing the collective good of 'stable oil prices, which are fair and reasonable for oil producers and consumers'.[66] Prior to September 11, 2001, even energy officials in the USA, which consumes 25 percent of world oil and imports 52 percent of this consumption (14 percent from Saudi Arabia), expressed confidence in Saudi assurances that it would 'use its capacity to mitigate the impact of oil supply disruptions in any region'.[67] While faulting OPEC's attempts to maintain above-market prices for increasing volatility, this praise seems consistent with a corollary observation that a number of friendly OPEC producers, including Saudi Arabia, had begun to commit to opening their oil-production sector to foreign investment.[68] Besides benefiting from 'free' or 'futures' oil markets,[69] major 'downstream' consumers, such as the USA and France, have concluded arms-for-oil barter deals or strategic military alliances with such surrogate powers as Baathist Iraq, pre-Khomeini Iran, Saudi Arabia and the Gulf Arab States, in order to gain and hold access to geographically concentrated and more cheaply extractable 'upstream' supply sources.[70]

However, the interests of 'downstream' consumers in increasing flow benefits often entail costlier efforts to secure command over a wider area of extraction, in part because competition to restrain each other's output can push neighboring rivals among 'upstream' producers to attempt to 'capture' more

source territory, which may already be contested. Having already had its oil exports involuntarily curtailed from a high of almost 3.5 million barrels per day in 1979 to a yearly average of 1.5 million during its 1981–88 war with Iran,[71] a key trigger for Iraq's invasion of Kuwait was then President Saddam Hussein's desire to rein in Kuwait's superseding of its OPEC quota, which had helped to drive the price of oil down to $12 per barrel in July 1990 and Iraqi oil revenues down to $11 billion from a pre-1981 level of $26 billion, and to compel Kuwait to cease its diagonal drilling from a part of the Rumaila field claimed by Iraq.[72] The line between fear and greed as a motivation for this attack was blurred, as Iraq was thought to have been poised to gain the upper hand in decisions affecting the disposition of 56 percent of the world's oil reserves (its own in addition to those of Saudi Arabia, Kuwait and the UAE) by intimidation or by direct occupation and destruction of rival oil fields.[73]

While this was unacceptable for the USA and, by implication, its allies dependent on Persian Gulf oil, it has been considerably costly for the USA to establish and extend its own security of access to a reliable flow of Persian Gulf oil. Beginning prior to the Iran–Iraq War (with the Carter Doctrine) and accelerating since the end of the Gulf War, this has meant stationing a large military contingent and 'prepositioning' equipment and material in Saudi Arabia and now the Gulf States.[74] This has not only raised costs in terms of the very oil supply needed for transporting these forces but also in terms of any related increase in anti-American resentment, to which terrorist attacks against US embassies in Africa, troop barracks in Saudi Arabia, and the World Trade Center and the Pentagon have been partially attributed.[75] Claiming that the use of F-117A fighter aircraft sorties, an aspect of the Revolution in Military Affairs (RMA), helped to achieve the 1990 Gulf War coalition forces' goal of neutralizing Iraqi military targets with comparatively greater efficiency (the ratio of targets hit to 'collateral' civilian damage),[76] creates a false impression of the cost-effectiveness of efforts to counter Saddam Hussein. By January 2000, coalition aircraft had conducted more than 240,000 patrols over the fixed-wing-plane exclusion zone below the 33rd Parallel and fired over 1,000 missiles against 359 targets in Iraq, 'about three times the number of targets attacked during Operation Desert Fox'.[77] It has been roughly estimated that directly administering Iraq could cost the USA up to $200 billion.[78]

The higher costs of preventing hostile exercises of sovereign 'upstream' rights of exclusion are likely to be offset by tailoring the 'upstream' political economy to support broader 'downstream' objectives. This might include laying political foundations for the signing of long-term oil-sale contracts, which protect consuming nations against spot-market volatility,[79] or simply freeing market forces to allow supply to increase until marginal cost equals marginal price. Unlike in the previous Gulf conflict, when Iraqi forces damaged over 700 Kuwaiti wells, coalition troops in the latest invasion rapidly seized critical infrastructure in Iraq's oil-rich south and north.[80] Although companies from China, France and Russia, all permanent UN Security Council members opposing a US invasion of Iraq, had respectively negotiated deals with Saddam Hussein to develop Iraq's al-Ahdad, Majnoon and West Qurna fields,[81] any US-

backed regime could abrogate these agreements and award infrastructure-repair contracts to American firms.[82] The fact that Iraq's oil production has been hampered by war or sanctions for the last two decades, causing it to lose an estimated $100 billion in revenues during the post-1991 sanctions regime and worsening its debt, which amounts to $400 billion owed to foreign creditors and for 1990 Gulf War compensation claims and Iran reparations payments, has increased pressure to maximize the quantity of oil drilled and exported.[83] It has been estimated that a $30 billion investment could raise Iraqi oil production from two million to eight million barrels a day, thus lowering oil prices to $15 and threatening the viability of OPEC's 'swing producer' function and Russia's ability to produce its current daily output of six million to seven million barrels.[84]

Downstream countries do not bear the high costs of occupying land to seize a resource like water with low market value unless 'upstream' states are about to block enough flow to cripple crucial biological and certain ideological functions in which water is non-substitutable. Conversely, major 'downstream' countries may assume the higher costs of occupying oil-rich lands and controlling critical supply routes in expectation of gaining rents from global demand *expansion*. It is generally agreed that oil demand and supply tend to respond flexibly over time to higher prices, as 'downstream' countries not only develop sophisticated exploration and drilling technologies and increase domestic production, but also conserve oil and adopt alternative energy sources.[85] While US consumption is projected to increase to 24.7 million barrels per day by 2020, 64 percent of which will be imported, it is expected to fall from 25 to 22 percent of world consumption; however, developing Asia's demand is expected to increase by 79 percent to 24.3 million barrels per day and climb from 18 to 22 percent of global consumption.[86] China, for example, relies on oil for 30 percent of its energy consumption and imports 60 percent of its oil supplies from the Persian Gulf, a percentage that may rise to 90 percent.[87] Besides increasing incentives to invest in Caspian Sea and Iraqi oil exploration, this reliance has also led China to exert an exclusive claim to all of the disputed Spratly Island archipelago, where underwater reserves may total 130 billion barrels, by granting drilling concessions to foreign firms and using naval force to block neighbors' interference with the operation of these firms.[88]

CONCLUSION

The dynamics of interaction over natural resources shared by at least two countries are similarly driven by scarcity, whether the resources in question are renewable or nonrenewable. Thus, conflicts over water and over oil are both partially explicable within the analytical framework of CPRs. Because transboundary river water is a mobile renewable resource and because the status quo distribution of streamflow reflects the historically formidable costs of large-scale upstream storage and the value of benefits that downstream states are more determined to protect, it is thought to be more costly for upstream states to 'capture' and divert its flow away from its natural downward course.

Yet, if upstream states are willing and able to pay the high price of exploiting their geographical position, they may derive compensatory benefit from instrumentally denying access to downstreamers. Thus, the conflict may be as much about 'privatization' of a CPR as it is about aggravation of rivalry over consumption, which is also likely to escalate after enclosure has been accomplished.

Conversely, because oil is a stationary non-renewable resource that can be 'cartelized' it is thought to be relatively less costly for 'upstream' states to control resource flows than for 'downstream' states to seize these assets by force. But it shares a collective-good characteristic with CPRs as well. For one, many disputed oil reserves are symmetrically accessible to more than one 'upstream' producer. But equally important, maintaining a tighter price range is a collective good among the cartel producers that is generally maintained by hegemonic members who switch between sacrificing their own production and attempting to punish free riders, either by increasing production enough to depress worldwide prices or through overt uses of force. Like water, oil may also provoke 'downstream' states to intervene in cartel politics in various ways, by forming strategic alliances with hegemonic cartel members, by opposing them militarily and even by occupying their territory in order to restructure their political economic structure of oil production to favor downstream goals. These all entail higher costs than for a downstream water-sharing state, who faces relatively fewer logistically difficulties in disrupting upstream actions to protect an economically less valuable resource. However, oil's resiliently high demand and higher-value-added end uses also identify why the recent US invasion of Iraq is likely to be a growing trend and 'water war' an ever-receding mirage.

NOTES

1. A typical sample of this literature includes Thomas Naff and Ruth Matson, *Water in the Middle East: Cooperation or Conflict?* (Boulder, CO: Westview Press, 1984); Joyce R. Starr, 'Water Wars', *Foreign Policy*, Vol. 82 (Spring 1991), pp. 17–36; John Bulloch and Adel Darwish, *Water Wars: Coming Conflicts in the Middle East* (London: Gollancz, 1993).
2. Ken Conca and Geoffrey D. Dabelko, *Environmental Peacemaking* (Washington, DC: Woodrow Wilson Center Press; Baltimore, MD and London: Johns Hopkins University Press, 2002).
3. These conflicts even overlap, as illustrated in the environmentally disastrous efforts by ousted Iraqi President Saddam Hussein to drain the marsh areas of Southern Iraq, inhabited by the Ma'dan people and containing the Majnoon and West Qurna oil fields, which respectively hold proven oil reserves of 10–30 billion and 15 billion barrels. See Human Rights Watch, *The Iraqi Government Assault on the Marsh Arabs* (Washington, DC: Human Rights Watch, 2003), http://www.hrw.org/mideast/iraq.php.
4. A recent report on Saddam Hussein's 'Arabization' policy in the Kirkuk region of Northern Iraq, which effectively led to the expulsion of 120,000 Kurds, Turkomans and Assyrians, mentions the term 'oil-rich region' three times on the first page alone. See Human Rights Watch, *Iraq: Forcible Expulsion of Ethnic Minorities* (Washington, DC: Human Rights Watch, 2003), http://www.hrw.org.
5. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1991); Eyal Benvenisti, 'Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law', *The American Journal of International Law*, Vol. 90, No. 384 (1996), pp. 384–415; Samuel J. Barkin and George E. Shambaugh (eds.), *Anarchy and the Environment: The International Relations of*

Common Pool Resources (Albany, NY: SUNY Press, 1999); John Waterbury, *The Nile Basin: National Determinants of Collective Action* (New Haven, CT and London: Yale University Press, 2002); Erika Weinthal, *State Making and Environmental Cooperation: Linking Domestic and International Politics in Central Asia* (Cambridge, MA and London: MIT Press, 2002).

6. Ostrom, *Governing the Commons*, p. 30.
7. Ronald B. Mitchell, 'International Environmental Common Pool Resources: More Common than Domestic But More Difficult to Manage', in Barkin and Shambaugh, *Anarchy and the Environment*, pp. 26–50.
8. Ostrom, *Governing the Commons*, p. 26.
9. Ibid., p. 22, emphasis added.
10. Benvenisti, 'Collective Action in the Utilization of Shared Freshwater', p. 389.
11. Ostrom, *Governing the Commons*, p. 31.
12. Samuel J. Barkin and George E. Shambaugh, 'Hypotheses on the International Politics of Common Pool Resources', in Barkin and Shambaugh, *Anarchy and the Environment*, p. 8.
13. Thomas Homer-Dixon, 'Environmental Scarcities and Violent Conflict: Evidence from Cases', *International Security*, Vol. 19, No. 1 (Summer 1994), pp. 5–40; Thomas Homer-Dixon, *Environment, Scarcity, and Violence* (Princeton, NJ: Princeton University Press, 1999). See also Michael T. Klare, *Resource Wars: The New Landscape of Global Conflict* (New York: Henry Holt and Company, 2002); Larry Swatuk, 'Environmental Cooperation for Regional Peace and Security in Southern Africa', in Conca and Dabelko, *Environmental Peacemaking*, pp. 120–60.
14. Homer-Dixon, 'Environmental Scarcities and Violent Conflict', pp. 10–11; Homer-Dixon, *Environment, Scarcity, and Violence*, p. 73.
15. Homer-Dixon, *Environment, Scarcity, and Violence*, p. 48, original emphasis.
16. Barkin and Shambaugh, 'Hypotheses on the International Politics of Common Pool Resources', p. 4.
17. Homer-Dixon, *Environment, Scarcity, and Violence*, p. 74.
18. Ibid., p. 102.
19. Helga Haftendorn, 'Water and International Conflict', *Third World Quarterly*, Vol. 21, No. 1 (2000), p. 52.
20. David G. LeMarquand, *International Rivers: The Politics of Cooperation* (Vancouver: University of British Columbia, 1977), p. 11.
21. This is analogous to the emergence of de facto sovereign political capacity in the absence of formal legal recognition of this sovereignty by international society. See Scott Pegg, *International Society and the De Facto State* (Brookfield, VT: Ashgate, 1998).
22. Robert O. Keohane and Joseph S. Nye, *Power and Interdependence: World Politics in Transition* (Boston, MA and Toronto: Little, Brown and Company, 1977), pp. 30–32; LeMarquand, *International Rivers*, p. 13.
23. Haftendorn, 'Water and International Conflict', pp. 52, 62, 64–5. On Kyrgyzstan's release of water in the Syr Darya Basin for Kazakhstan oil and Uzbekistan natural gas, see Erika Weinthal, 'The Promises and Pitfalls of Environmental Peacemaking in the Aral Sea Basin', in Conca and Dabelko, *Environmental Peacemaking*, pp. 111–13; Weinthal, *State Making and Environmental Cooperation*, pp. 186–93.
24. Naff and Matson, *Water in the Middle East*, p. 193.
25. The *economic* benefits of 'resource capture' are likely to be outweighed by the costs of capture itself because of the phenomenon of 'rent dissipation'. See Ostrom, *Governing the Commons*, p. 48.
26. A similar observation is found in Waterbury, *The Nile Basin*, p. 28. Another complication arises where senses of entitlement to traditionally abundant flows of water extend even to engineered flows of water. See J.A. Allan, *The Middle East Water Question: Hydropolitics and the Global Economy* (London and New York: I.B. Tauris, 2002), pp. 276–7.
27. Richard A. Matthew, 'Scarcity and Security: A Common-Pool Resource Perspective', in Barkin and Shambaugh, *Anarchy and the Environment*, p. 161.
28. Waterbury, *The Nile Basin*, p. 23. See also Patrick McCully, *Silenced Rivers: The Ecology and Politics of Large Dams* (London and New York: Zed Books, 2001), pp. 118–19; 'Syrian Dam Collapses', *BBC News World Edition*, 4 June 2002, http://www.news.bbc.co.uk.
29. Haftendorn, 'Water and International Conflict', p. 51.
30. Waterbury, *The Nile Basin*, p. 28.
31. Paul Wapner, 'Reorienting States Sovereignty: Rights and Responsibilities in the Environmental Age', in Karen Litfin (ed.), *The Greening of Sovereignty in World Politics* (Cambridge, MA and London: MIT Press, 1998), pp. 277–8.

32. This observation in Waterbury, *The Nile Basin*, p. 32, is consistent with the author's later point on p. 46, that 'it is likely that the riparians with acquired rights will have developed agricultural sectors that yield higher returns per unit of water than any riparians who came "second in time"'. According to prospect theory, summarized in Arthur A. Stein, *Why Nations Cooperate: Circumstance and Choice in International Relations* (Ithaca, NY and London: Cornell University Press, 1990), pp. 91–6, downstream states with an established agricultural sector dependent on upstream water should risk more to avert a probable loss of status quo values caused by upstream development than upstream states are willing to spend in altering this status quo.
33. Waterbury, *The Nile Basin*, p. 32. See also Allan, *Middle East Water Question*, p. 69.
34. Klare, *Resource Wars*, p. 148.
35. Richard Rosecrance, *The Rise of the Trading State: Commerce and Conquest in the Modern World* (New York: Basic Books, 1986); Daniel Deudney, 'Environmental Security: A Critique', in Daniel H. Deudney and Richard A. Matthew (eds.), *Contested Grounds: Security and Conflict in the New Environmental Politics* (Albany, NY: SUNY Press, 1999), p. 205. On 'virtual water', see Allan, *Middle East Water Question*.
36. Homer-Dixon, 'Environmental Scarcities and Violent Conflict', p. 19; Jon Barnett, *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era* (London and New York: Zed Books, 2001), p. 54.
37. These categories are discussed in Peter Gleick, 'Water and Conflict: Fresh Water Resources and International Security', *International Security*, Vol. 18, No. 1 (Summer 1993), pp. 79–112.
38. Waterbury, *The Nile Basin*, p. 11.
39. Ibid., p. 133.
40. Klare, *Resource Wars*, p. 159.
41. Homer-Dixon, *Environment, Scarcity, and Violence*, p. 139.
42. Bulloch and Darwish, *Water Wars*, pp. 58–78; Robert Olson, 'Turkey-Syria Relations since the Gulf War: Kurds and Water', *Middle East Policy*, Vol. 5, No. 2 (May 1997), pp. 168–93; Klare, *Resource Wars*, pp. 173–82.
43. As suggested by Klare, *Resource Wars*, pp. 179–80. On storage volumes, see John Kolars, 'Managing the Impact of Development: The Euphrates and Tigris Rivers and the Ecology of the Arabian Gulf – A Link in Forging Tri-Riparian Cooperation', in Ali İhsan Bağis (ed.), *Water as an Element of Cooperation and Development in the Middle East* (Ankara: Hacettepe University and Friedrich Neumann Foundation, 1994), p. 137.
44. But see Bulloch and Darwish, *Water Wars*, p. 63; Natasha Beschorner, 'Water and Instability in the Middle East', *Adelphi Paper*, No. 273 (Winter 1992–93), p. 43; Henri J. Barkey and Graham E. Fuller, *Turkey's Kurdish Question* (Lanham, MD: Rowman and Littlefield, 1998), p. 36.
45. Klare, *Resource Wars*, pp. 168–70.
46. Özden Bilen, *Turkey and Water Issues in the Middle East* (Ankara: Southeastern Anatolia Project [GAP] Regional Development Administration, 1997), pp. 42–3, 146; Allan, *Middle East Water Question*, pp. 74–7, 97.
47. Klare, *Resource Wars*, pp. 171–2.
48. Matthew, 'Scarcity and Security', p. 171.
49. Allan, *Middle East Water Question*, p. 79.
50. Miriam R. Lowi, 'West Bank Water Resources and the Resolution of Conflict in the Middle East', *Occasional Paper Series of the Project on Environmental Change and Acute Conflict*, No. 1 (Sept. 1992), pp. 38–40.
51. Ibid., pp. 31–6.
52. Ibid., p. 41.
53. A similar point is made in Frederick W. Frey, 'Power, Conflict, and Cooperation', *Research and Exploration*, Water Issue (1993), p. 31; Homer-Dixon, *Environment, Scarcity, and Violence*, p. 139. On the low value of water in agriculture, see Allan, *Middle East Water Question*, pp. 274–6.
54. Alexander Wendt has argued that 'material resources only acquire meaning for human action through the structure of shared knowledge in which they are embedded', in 'Constructing International Politics', *International Security*, Vol. 20, No. 1 (Summer 1995), p. 73. On an analogous criticism of the 'water wars' hypothesis, see Barnett, *The Meaning of Environmental Security*, pp. 54–8.
55. Quoted in Beschorner, 'Water and Instability in the Middle East', p. 42; Klare, *Resource Wars*, p. 179.
56. LeMarquand, *International Rivers*, p. 12; Frey, 'Power, Conflict, and Cooperation', p. 31; Gün Kut, 'Burning Waters: The Hydropolitics of the Euphrates and Tigris', *New Perspectives on Turkey*, No. 9 (Fall 1993), p. 9.

57. Özden Bilen, 'Prospects for Technical Cooperation in the Euphrates-Tigris Basin', in Asit Biswas (ed.), *International Waters of the Middle East from Euphrates-Tigris to Nile* (Oxford: Oxford University Press, 1994), pp. 99–103; Bilen, *Turkey and Water Issues in the Middle East*, pp. 14, 64, 68–73. It has been claimed that, although upstream projects have effectively reduced the downstream flow to 15–16 billion cubic meters, Syria could not have developed reliable uses above this amount prior to the operation of Turkish storage. See Allan, *Middle East Water Question*, pp. 231, 255–6.
58. Bilen, *Turkey and Water Issues in the Middle East*, p. 100. The notion that Turkey's hydro power operations will limit water depletion via diversions is speculative, since official Turkish figures of ten billion cubic meters of depleted water (which equals the capacity of the Urfa Tunnels diverting water from the Ataturk Dam) are probably underestimated by seven billion cubic meters. See John Kolars, 'Problems of International River Management: The Case of the Euphrates', in Asit Biswas (ed.), *International Waters of the Middle East*, p. 70.
59. Barkey and Fuller, *Turkey's Kurdish Question*, pp. 189–90.
60. George E. Gruen, 'Recent Negotiations over the Waters of the Euphrates and Tigris', in International Water Resources Association (ed.), *Proceedings of the International Symposium on Water Resources in the Middle East* (Urbana-Champaign, IL: International Water Resources Association, 1993), p. 101. Demirel had remarked that '[w]ater is an upstream resource and downstream users cannot tell us how to use our resource. By the same token oil is an upstream resource in many Arab countries and we do not tell them how to use it'. Cited in ibid., p. 101.
61. Early post-World War II Middle East oil production occurred in a buyer's market, in which sovereign host countries, like Nasser's Egypt and 1960s Iraq, paid prohibitively high opportunity costs, in terms of the revenues lost from any undrilled and unexported oil, for trying to alter the royalty-payment and profit-sharing terms (originally, 50–50) of concessions that effectively invested the large integrated oil firms with contractual rights to determine how much oil should be extracted and sold. Conversely, the tightening of supplies and the growing sophistication of host-country producers by the late 1960s and early 1970s created a seller's market, allowing OPEC countries greater latitude to force companies to market oil at higher prices and remit a greater share of the corresponding rents. See Ian Skeet, *OPEC: Twenty-Five Years of Prices and Politics* (Cambridge: Cambridge University Press, 1988), pp. 4–5; Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power* (New York and London: Simon and Schuster, 1991), pp. 432–3, 523–4, 535, 578, 583, 585, 592.
62. This is roughly 845 billion barrels of oil out of 1,033 billion barrels of oil of proven reserves for 1999. See OPEC, *Annual Statistical Bulletin 2001*, http://www.opec.org; Klare, *Resource Wars*, p. 41. At the time of OPEC's founding in the 1960s, its five original members (Iraq, Iran, Kuwait, Saudi Arabia and Venezuela) accounted for the same percentage of crude oil exports, as noted in Yergin, *The Prize*, p. 523.
63. Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton, NJ: Princeton University Press, 1984).
64. Skeet, *OPEC*, pp. 184–5, 192, 206–8; Edward L. Morse and James Richard, 'The Battle for Energy Dominance', *Foreign Affairs*, Vol. 81, No. 2 (March–April 2002), pp. 18–19. OPEC's ideal price band is thought to be $22–28 per barrel, as noted in Neela Banerjee, 'With the War Largely Over, OPEC Fears Oil Price Drop', *New York Times*, April 21, 2002, http://www.nytimes.com.
65. Morse and Richard, 'Battle for Energy Dominance', p. 20. With its oil production having fallen to a low of 3 million barrels a day in 1986, Saudi Arabia adopted 'netback' pricing (i.e., contracts linking crude-oil costs to refined-oil earnings), thereby increasing its market share as well as reducing prices to $14 per barrel and in turn restoring a greater degree of cartel discipline, which allowed prices to climb back to $18 per barrel by later that year and gave the Saudis a greater guarantee that it would have at least a 25 percent of OPEC output. See Skeet, *OPEC*, p. 208; Fareed Mohamedi, 'OPEC Since the Gulf War', *Middle East Report*, Vol. 22, No. 176 (May–June 1992), p. 39.
66. As the claim is expressed at http://www.opec.org. On the equivalent Russian argument, see Morse and Richard, 'Battle for Energy Dominance', p. 17.
67. *National Energy Policy: Report of the National Energy Policy Development Group* (Washington, DC: US GPO, 2001), pp. 8-4–8-5.
68. Ibid., p. 8-5. This, in turn, was in part due to a perceived need to lure foreign investors away from fields in the Commonwealth of Independent States (CIS), as noted in Morse and Richards, 'Battle for Energy Dominance', p. 23.

69. Persian Gulf region oil remains attractive because of the comparatively low cost of lifting it to the surface. In comparison to lifting costs of $12 in China, $5 a barrel in the former Soviet Union and in Africa, and of $4 a barrel in North America, the North Sea and South America, it costs on average only $3 for the Middle East and as low as $1–2 in Iraq. Data taken from Fiona Hill and Regine Spector, 'The Caspian Basin and Asian Energy Markets', *Brookings Institution Conference Report*, No. 8 (Sept. 2001), p. 7; Paul Klebnikov, 'Hitting OPEC By Way of Baghdad', *Forbes*, Vol. 170, No. 9 (Oct. 28, 2002), p. 127.
70. Gawdat Bahgat, 'The Iraqi Crisis in the New Millennium: The Prospects', *Asian Affairs*, Vol. 31, No. 2 (June 2000), pp. 151, 154; Klare, *Resource Wars*, pp. 54–68.
71. Based on data in Bahgat, 'The Iraqi Crisis in the New Millennium', p. 150.
72. Abbas Alnasrawi, 'Oil, Sanctions, Debt, and the Future', *Arab Studies Quarterly*, Vol. 23, No. 4 (Fall 2001), p. 6.
73. Robert J. Lieber, 'Oil and Power After the Gulf War', *International Security*, Vol. 17, No. 1 (Summer 1992), pp. 155–76, notes on p. 166 that the bulk of Saudi oil production, located at the Ras Tanura fields, lay within 200 kilometers of the Kuwaiti border, and that a 1,000-man Saudi National Guard battalion would not have been expected to defend this area against an assault from Hussein's 100,000-strong armed forces.
74. Klare, *Resource Wars*, pp. 61–4.
75. Ibid., pp. 30–32, 75–8. The author notes on p. 75 that 'in return for protecting the [Saudi] royal family against its enemies', by means such as upgrading the Saudi National Guard, 'American companies will be allowed unrivaled access to Saudi oil fields'.
76. John Orme, 'The Utility of Force in a World of Scarcity', *International Security*, Vol. 22, No. 3 (Winter 1997–98), pp. 146–7.
77. Klare, *Resource Wars*, pp. 71–2.
78. Blaine Greteman *et al*., 'All About the Oil', *Time*, Vol. 161, No. 7 (Feb. 17, 2003), pp. 32–4.
79. David N. Balaam and Michael Veseth, *Introduction to International Political Economy* (Upper Saddle River, NJ: Prentice Hall, 2nd edn. 2001), p. 379.
80. Greteman *et al*., 'All About the Oil', pp. 32–4.
81. Bahgat, 'The Iraqi Crisis in the New Millennium', pp. 150–51.
82. Greteman *et al*., 'All About the Oil', pp. 32–4; Michael Klare, 'Oiling the Wheels of War', *Nation*, Vol. 275, No. 11 (Oct. 7, 2002), pp. 6–7; 'The Bigger Threat Still Lurking', *The Economist*, Vol. 367, No. 8319 (April 12, 2003), pp. 62–3.
83. Bahgat, 'The Iraqi Crisis in the New Millennium', p. 156; Alnasrawi, 'Oil, Sanctions, Debt, and the Future', p. 12.
84. 'Don't Mention the O-word', *The Economist*, Vol. 364, No. 8290 (Sept. 14, 2002), pp. 25–7; Klebnikov, 'Hitting OPEC By Way of Baghdad', pp. 126–7. In contrast to observations that Russia might be willing to court a price war, made in Morse and Richards, 'Battle for Energy Dominance', pp. 28–31, David G. Victor and Nadejda J. Victor, 'Axis of Oil?', *Foreign Affairs*, Vol. 82, No. 2 (March–April 2003), pp. 50–51, assess that Russia needs to earn at least $18 per barrel in order to maintain desired budgetary revenues.
85. Skeet, *OPEC*, pp. 94–5; Fadhil Chalabi, 'Iraq and the Future of World Oil', *Middle East Policy*, Vol. 7, No. 4 (Oct. 2000), pp. 167–72; Balaam and Veseth, *Introduction to International Political Economy*, pp. 378–80.
86. Derived from Klare, *Resource Wars*, p. 39, and *National Energy Policy*, pp. x, I-13. The same report notes on p. I-10 that per capita oil consumption has fallen 20 percent in 2000 relative to 1978 levels.
87. Shibley Telhami and Fiona Hill, 'America's Vital Stakes in Saudi Arabia', *Foreign Affairs*, Vol. 81, No. 6 (Nov.–Dec. 2002), p. 171.
88. Klare, *Resource Wars*, pp. 118–27.