



INTRODUCTION

Nature does not respect national borders; human beings seem incapable of managing their affairs without them. Nature has also not endowed every place or nation on earth with the same type and amount of resources. Herein lie the roots of likely interstate conflict and cooperation over essential and scarce natural resources. Hydropolitics is the systematic study of conflict and cooperation between states over water resources that transcend international borders.

This book focuses on hydropolitics in river basins that are shared by two or more sovereign states in the so-called Third World.¹ This thematic and spatial focus reflects two crucial facts: scarcity of freshwater for multiple societal needs is rapidly escalating in many parts of the Third World, and most remaining major exploitable sources of freshwater are now in river basins that are shared by two or more sovereign states.² If these states are not willing or able to develop and use their common water resources in a cooperative, sustainable, and equitable manner, the potential for acute (violent) conflict over water in the Third World will keep growing.

Water is first and foremost an essential biological need. Without an adequate input of potable water, the human body cannot survive or grow. Large amounts of water are also needed for personal hygiene, sanitation, and other household activities, including cooking, cleaning, and laundry. Furthermore, huge quantities of freshwater are needed for agriculture,

fisheries, mining, industrial production, generation of electricity, riverine navigation, maintenance of ecological assets and biodiversity, promotion of tourism, and many other societal demands. This multiple-use potential of freshwater, especially transboundary water resources, combined with the certainty of growing water scarcities in many arid and semiarid regions of the Third World, makes hydropolitics between riparian states that share international river basins one of the most urgent, complex, and contentious issues that the developing countries and the international community will have to face and resolve in the next century.

Water scarcity—understood here as a lack of secure, uninterrupted, and long-term availability of adequate amounts of freshwater, of required quality, on a regular basis, and for multiple needs—has already reached alarming proportions and is fast accelerating in many arid and semiarid regions of the Third World.³ High population growth rates, accompanied by urbanization, industrialization, agricultural development, and environmental degradation, are greatly intensifying pressures on the scarce and degraded domestic freshwater resources in many developing countries. As the demand for water increases and the currently available water supplies are exhausted, pressures on the transboundary water resources are multiplying.⁴

By itself, the unequal distribution or scarcity of natural resources does not necessarily lead to acute interstate conflict, because human beings have historically shown an ingenious capability to survive by adjusting their lifestyles to even the most resource-deficient environments on earth, and by engaging in trade in scarce resources as well as commodities produced from such resources. It is when severe scarcities of an *essential, nonsubstitutable, and shared resource*, such as freshwater, are experienced or anticipated by one or more states, or when such a resource is rightly or wrongly perceived as being overexploited or degraded by others at a cost to oneself, that states may become prone to conflict. Even in the absence of debilitating scarcities, conflict among states may arise from the belligerent, resource-expansionist claims of one or more states.⁵ Interstate conflict may also arise from the established, but increasingly challenged, notion of “national sovereignty,” which has traditionally been understood as bestowing inalienable and exclusive rights of ownership and use over all natural resources contained within or flowing through a state’s territory.

More than two hundred river basins in the world are currently shared by two or more sovereign states.⁶ Of these, fifty-seven are in Africa, thirty-five each in North and South America, forty in Asia, and forty-eight in Europe. All together, these basins cover about 47 percent of the total landmass on

earth, including 65 percent of continental Asia, 60 percent of Africa, and 60 percent of South America. The entire territory of some developing countries, such as Paraguay in South America and Uganda in Africa, is covered by international river basins. If, as has happened in Eastern Europe and the erstwhile Soviet Union, some of the existing states in Africa and Asia break up into smaller states in the future, the number of international river basins and the sovereign states sharing them will also increase. What is also important for this study is that although more than three hundred treaties have been signed worldwide by states to deal with specific concerns about international water resources and more than three thousand treaties have provisions relating to water, coordinated and integrated management of international river basins is still extremely rare. This is especially so for almost all international basins in the Third World.⁷

Within a recently accumulating body of literature, broadly grouped under the title "environmental changes and acute conflict,"⁸ some scholars have identified growing scarcity of freshwater as one of the primary causes of impending interstate conflict.⁹ The potential for conflict over water is predicted to be specially high in the arid and semiarid regions of the Third World, where rapidly growing water needs of individuals and societies are expected to put increasing pressures on the already scarce, overexploited, and degraded freshwater supplies.¹⁰ Others have warned that growing pressures on scarce domestic water supplies, combined with the fact that most remaining exploitable freshwater resources in the Third World are now in international basins, are bound to accentuate the potential for acute interstate conflict.¹¹ Some scholars assert that, in a geopolitical sense, water is likely to become the "oil of the next century."¹²

Some ongoing and anticipated global environmental changes may further accentuate the potential for interstate conflict over water. For example, a rise of only a few feet in the sea level from global warming would ruin the inland water supplies in many low-lying developing countries, such as Egypt and Bangladesh, which already depend heavily on freshwater supplies originating outside their borders.¹³ Millions of "environmental refugees," forced out of their habitats by water scarcity and other environmental disasters are expected to crisscross international borders in parts of Africa and Asia. Consequently, the territorial integrity and the stability of many states are likely to come under severe strain.¹⁴ At the very least, many developing countries may soon find water scarcity to be the most severe constraint for economic development and societal well-being.¹⁵ Thus, the literature on environmental changes and acute conflict suggests that, if not through

outright wars between states then certainly through great domestic upheaval, the growing scarcity of freshwater is likely to lead to large-scale dislocation and violence in the Third World.¹⁶

What is often not recognized is that many so-called ethnic conflicts and separatist movements currently raging in the Third World are already closely tied to water resources, and some are bound to further intensify the potential for acute interstate conflict. For example, the movements for independence and separatism launched by Palestinians, Kurds, and Kashmiris in the Middle (Near) East and South Asia, if successful, may some day create new states on the headwaters of some large rivers and aquifers that are already shared by two or more hostile states. The new states will very likely claim sovereignty over the waters flowing through or lying underneath their territories, in the process further complicating the already contentious hydropolitics in several international basins.¹⁷

However, despite this gloomy prognosis, there is nothing inevitable about water scarcity necessarily leading to acute conflict in the Third World. There are many intervening variables—geographic, political, economic, cultural, and so forth—that mediate any resource scarcity–acute conflict relationship. As we shall see in the case studies presented in the following chapters, the hydrology and the geography of an international river basin tie all the riparian states sharing it into a highly complex web of economic, political, environmental, and security interdependencies, leaving them no choice but to interact with one another indefinitely. These interdependencies grow with time as the demand for water for multiple needs grows in all the riparian states. Although states are inherently inclined to unilaterally exploit the rivers flowing across or along their borders, the hydrologically induced interdependencies in international basins gradually compel states to entertain at least the possibility of cooperation with their neighbors. An important fact to remember about the behavior of states in the “anarchic” international system is that, despite all the nationalistic posturing and confrontational rhetoric, even states otherwise openly hostile to each other do often cooperate in many overt and covert ways on a variety of issues and problems of mutual concern;¹⁸ hydropolitics has historically not been immune to this aspect of international relations.¹⁹

Thus it may be that an awareness of growing water scarcity and of the prospects for large-scale violence if conflicts over water are not resolved may impel Third World states to seek collective solutions for the water-related problems they currently face and are likely to face in the future. The hope is that in the arena of hydropolitics, at least, interstate cooperation rather than

conflict will become the norm in the Third World. However, cooperation between states that share international basins is never easy to achieve, especially when such cooperation challenges some core concerns of the states such as sovereignty, territorial integrity, and security. There are other political, economic, technical, and strategic impediments that can also stand in the way of interstate cooperation in specific basins, as we will see.

What the case studies also will show is that sustained international initiatives and support are often needed to overcome the many barriers to interstate cooperation in hydro politics and to persuade and enable the respective riparian states to see cooperation as a “win-win” situation for all concerned. Consequently, as water scarcity for multiple needs grows in the Third World, more and more international efforts will be required to bring about peaceful resolution of conflicts over transboundary water resources and to help forge interstate cooperation for the development and sharing of their full multiple-use potential. It should be obvious that such efforts will need to be informed by systematic knowledge about the factors, circumstances, and strategies that can help to overcome the many barriers to interstate cooperation. Such knowledge can be best developed by undertaking systematic and comparative case studies of hydro politics in a select set of international basins in the Third World. Based on the specific and generalizable findings from such case studies, a whole host of complicated policy-related questions will need to be addressed, including: How can sovereign states, pursuing their national self-interest, be persuaded to cooperate for the development and sharing of transboundary water resources? What global, regional, and domestic conditions and factors enhance or frustrate the possibility of interstate cooperation for the collective ownership and use of transboundary water resources? What role can actors and agencies from outside the region play in facilitating and sustaining basinwide cooperation? How can domestic and international nongovernmental organizations (NGOs), “epistemic communities,”²⁰ and professional networks facilitate such cooperation? What kind of cooperative “regimes” can be designed to ensure long-term and sustainable cooperation in the international basins?²¹

These are some of the questions and issues this comparative study of hydro politics in the post-World War II era, in six major international river basins—the Paraná-La Plata, Nile, Jordan, Euphrates-Tigris, Ganges-Brahmaputra-Barak, and Mekong basins—addresses from a geography-centered yet multidisciplinary and policy-oriented perspective.²² The hope is that the specific and generalizable findings from a systematic analysis of

hydropolitics in these basins will inform local, national, regional, and international efforts to ensure that the full potential of transboundary water resources in all the international basins in the Third World is developed and used in a cooperative, sustainable, and equitable manner for the benefit of all concerned.

WATER SCARCITY IN THE THIRD WORLD

Unlike oil, which is a finite and nonrenewable resource, water is a finite but renewable resource.²³ The total amount of water in the earth's ecosystem has remained the same over millennia, despite all the transformations and recycling it has gone through. This amount is estimated to be about 1.4 billion cubic kilometers;²⁴ the generally accepted figure for the average annual freshwater requirements of a human being is a mere 1,000 cubic meters—the so-called water barrier.²⁵ Thus, if all the water in the earth's ecosystem were freshwater, and if it were available for human use in its entirety and in an equitable manner, there would be no problem of water scarcity on earth for a long time to come. However, about 95 to 97 percent of the total volume of water on earth is in the oceans. "Of the remaining, about 77 percent is stored in ice caps and glaciers, 22.4 percent is in groundwater and soil moisture, and 0.35 percent is in lakes and marshes. Allowing for 0.04 percent in the atmosphere, there is a bare 0.01 percent of the world's freshwater supplies in streams."²⁶ In particular, although they currently provide human beings about 80 percent of their freshwater needs, rivers carry a mere 0.000003 percent of all the water on the planet.

Although minuscule in comparison to the saline ocean waters, the world's renewable freshwater supplies are still capable of supporting a much larger population than exists today.²⁷ The problem is that whereas some states and peoples in the world enjoy and even suffer from time to time from water surpluses, for a large portion of the world's population, especially in the Third World, serious water shortages have become an everyday fact of life.

Some eighty countries, supporting 40 percent of the world's population, currently suffer from serious freshwater shortages for personal and household needs. As many as 1.2 billion people, mostly in the Third World, are suffering physically from shortages of potable water and 1.8 billion people lack adequate water for sanitation. About 80 percent of all illnesses and 30 percent of all unnatural deaths in the Third World are due to waterborne diseases and consumption of highly polluted water.²⁸ By the year 2025, thirty-seven countries are likely to be without enough water for household

and agricultural needs, let alone water for industries, energy production, navigation, recreation, and other societal needs.²⁹

The worst affected by water scarcities are often the poorest strata of society. In the rural areas of many developing countries, scarce water supplies are usually monopolized by the ruling elites. Access to water resources is often limited to a select few by a whole host of historical, political, economic, and sociocultural "entitlements."³⁰ Women and children in the poor rural families often suffer the most since typically they are responsible for fetching water, in some cases from sources as far away as two or three hours of walking time. This activity can burn off up to 600 calories per day, about one-third of their average daily food intake.³¹ Even then the available water may not be usable without extensive treatment. In addition, many contaminated sources carry waterborne diseases that, if not treated adequately and in time, lead to very high mortality and morbidity rates among the poor. The water resources of the rural poor are also often the worst affected by floods, droughts, and other natural calamities, such as earthquakes and cyclones. The "urban biases" inherent in most developing countries' economic development programs also lead to a severe deprivation of basic needs, including water, among the rural poor.³² Even in the urban areas, scarce water of potable quality is likely to be provided disproportionately to the upper strata of society. Either the urban poor have to buy water of questionable quality from private vendors, at prices estimated to be four to one hundred times higher than piped city water, or they have to make do with free but highly contaminated water from other sources.³³

Estimates prepared by the World Bank in 1980 showed that a complete coverage of rural and urban populations in the Third World, with varying levels of service for just household water needs, would require an investment of at least \$82.2 million (1978 dollars) *per day* for at least ten years.³⁴ More recent estimates show a need for an investment of \$600 to \$700 billion over the course of a decade for irrigation, hydropower, and water supply and sanitation.³⁵ Already, about \$10 billion per year is invested by the developing countries in water and sanitation systems.³⁶ But most developing countries are currently heavily in debt and likely to remain so for the foreseeable future.³⁷ As their populations continue to rise, more and more water-related investment will be needed just to maintain even the currently dismal standard of living and quality of life for hundreds of millions of people in the developing countries. Whether the international community will be able or willing to make the needed financial resources available to such countries remains highly doubtful.

Agriculture is still the primary economic activity for a very large portion of the growing populations in many developing countries; in some countries, as much as 85 percent of the population derives sustenance from agriculture and related activities. Overall, the agriculture sector currently accounts for about 80 percent of all water consumption. The Food and Agriculture Organization (FAO) has estimated that for the Third World to simply maintain its presently inadequate food supply will require the extension of irrigation to an additional 22 million hectares (54 million acres) of farmland and delivery of an additional 440 billion cubic meters of freshwater by the year 2000.³⁸ This is because modern agriculture has become increasingly dependent on higher and higher inputs of water, as demonstrated by the so-called green revolution in India and some other developing countries. Urban encroachment on productive farmlands and the growing need to open up more and more marginal lands to irrigated agriculture will further intensify pressures on the available water supplies in the Third World.

In some developing countries, a large portion of the population relies heavily on freshwater marine catch as a major source of protein. As ecosystems, freshwater marine environments tend to be very fragile and vulnerable to human activities as well as to nature's vagaries. Degradation or contamination of these ecosystems can have devastating consequences for the health and well-being of millions of people. Survival of all domesticated livestock and wild animal species on which millions in the developing world rely for sustenance depends largely on the availability of adequate and uncontaminated freshwater supplies. Moreover, biodiversity in the Third World—a great concern of international environmentalists recently—cannot be maintained without preserving the Third World's dwindling and deteriorating freshwater sources.³⁹

The success of many ongoing economic development programs in the arid and semiarid regions of the Third World is also contingent upon the availability of adequate amounts of water for industries and other economic activities. Every form of commercial energy production, whether petroleum based, thermal, nuclear, or hydroelectric, also requires huge quantities of water. The water intensities of some industrial products are shown in table I.1.

Many developing countries are still at the preindustrial stage or the beginning stages of industrialization. As table I.1 shows, they are likely to face severe water constraints as they attempt to industrialize and modernize their economies. It is very likely that growing water scarcities will actually lead to substantial deterioration and, perhaps, the demise of many existing and nebulous industries in some countries.

Table 1.1. Water Intensities of Selected Industrial Products^a

Quantity and product	Quantity of water consumed
1 liter of petroleum	10 liters of water
1 can of vegetables	40 liters of water
1 kilogram of paper	100 liters of water
1 ton of woolen cloth	600 liters of water
1 ton of dry cement	4,500 liters of water
1 ton of steel	20,000 liters of water
1 ton of dacron	4,200 cubic meters (140,000 cubic feet) of water
1 ton of rayon	2,000 cubic meters (70,000 cubic feet) of water
1 ton of kapron fiber	5,600 cubic meters (200,000 cubic feet) of water

What is also often not recognized is that international tourism, including the rapidly growing business of “eco-tourism,” now plays a very important role in the local and national economies of many developing countries. Not only does this sector generate substantial income and employment for a sizable portion of the population in some countries, but it also generates substantial tax revenues for the cash-starved local and national governments.⁴¹ Tourism is also now one of the main sources of foreign investment and foreign exchange earnings for many developing countries. Clearly, international tourism cannot be initiated or sustained either in the short or long run by any country without adequate and assured supplies of freshwater for drinking and sanitation, for maintaining the nation’s ecological assets and biodiversity, and for satisfying other recreational needs of the tourists.

Historically, rivers have provided humankind one of the most cost-effective and ecologically sound means of transporting people and goods. Inland riverine navigation is especially important for many developing countries that lack other forms of transportation infrastructure, such as roads and railways, and/or face severe scarcities of energy to operate the transportation systems. For some landlocked countries, riverine navigation may be their only means of conducting international trade. Water deficits in navigable rivers can seriously impact the economies and well-being of landlocked countries by paralyzing their transportation arteries.

To make matters worse, the more easily accessible water resources in many Third World regions are already being overexploited. At the same time, the cost of discovering new supplies and constructing large water projects is fast escalating. According to an international water expert, Asit

K. Biswas, "Many countries do not have any major additional sources of water to develop economically," and "even for those countries that may have additional sources of water, time periods required to implement water projects are likely to be much longer than expected at present."⁴² Typically, even under the best of circumstances—that is, when the needed interstate cooperation, financial resources, and technical expertise are all in place—large water projects such as dams and irrigation systems take fifteen to twenty years to develop and implement.

Many developing countries worst affected by water scarcities currently lack the financial, technical, material, organizational, and human resources to unilaterally design and implement large water projects. Without substantial external aid and technical/managerial expertise, it will be very difficult for these countries to maintain even their few existing water projects. At the same time, the developed countries and international organizations that can provide such assistance have become very reluctant to support large water-related projects, especially those that may create environmental problems and may, consequently, encounter opposition from the growing and increasingly more powerful domestic and international environmental movements and lobbies. The international donors and creditors have also become reluctant to invest in water projects in those international river basins where interstate conflict over the shared water resources have not been resolved.

Clearly, there is an urgent need for concerted efforts at all levels—local, national, regional, and global—to enable and support the Third World states sharing international basins in cooperatively developing the full potential of their common water resources. This need for interstate cooperation is mandated also by the hydrologically induced interdependencies in international river basins.

HYDROLOGICAL INTERDEPENDENCE

Hydrological cycles—linking the stocks and flows of water in the atmosphere, on the surface of the earth, and below the ground—are primary examples of natural phenomena and processes that transcend national borders. Rivers, in particular, are indifferent to the national borders that run across or along their banks; some rivers have the habit of meandering from their established courses, violating and distorting international borders in the process. Underground aquifers and other water bodies, such as marshes and lakes, also often transgress national borders and territories. Thus,

transboundary water resources, especially rivers, raise three major concerns for the riparian states—sovereignty, territorial integrity, and national security.

The hydrology of an international river basin also links all the riparian states sharing it in a complex network of environmental, economic, political, and security interdependencies, in the process creating the potential for interstate conflict as well as opportunities for cooperation among the neighbors. This is because any unilateral action by one riparian state that may affect the quantity and/or quality of water flowing down a shared river can have serious consequences in some or all of the other riparian states. Withdrawal of water for household and agricultural needs, curting of forests, construction of large hydroelectric and irrigation projects, use of chemical fertilizers and insecticides in agriculture to enhance productivity, overexploitation of marine life, and discharges of toxic industrial wastes into the shared water bodies are but a few of the ways one riparian state can alter the quantity and quality of water available to other riparian states. Thus, states sharing a river basin naturally form a highly interdependent unit, whose economic, political, and security dynamics are intimately tied to hydropolitics, especially in a situation of growing water scarcity.⁴³

Periodic floods and droughts already play havoc with the political, socioeconomic, and environmental stability of several Third World countries sharing international basins, one of the most dramatic examples being Bangladesh in South Asia.⁴⁴ In some cases, these problems can be best addressed by constructing large dams and reservoirs on the headwaters of the shared rivers. The stored floodwaters can then be released downstream during droughts.⁴⁵ Many developing countries also suffer from severe shortages of electricity for household, agricultural, and industrial needs. In some basins, hydroelectric power plants built on the shared rivers can provide a substantial portion of these needs as well as help prevent severe deforestation for fuelwood. However, because of hydrological interdependencies, such projects necessarily require cooperation among some or all of the riparian states in an international basin.

Historically, rivers had provided the means for the colonization of hinterlands in Africa, Asia, and Latin America by the European powers. The navigational needs of the competing colonizers had often led to wars over navigational rights on many rivers in these continents.⁴⁶ Today, for many developing countries, especially those lacking adequate surface transportation infrastructure and/or facing huge energy costs for the transportation of people and goods, river navigation is becoming increasingly important. For some landlocked countries, such as Bolivia, Laos, Nepal, and

Paraguay, unrestricted navigational access to the sea for bringing in essential supplies and for conducting international trade has become a matter of economic viability and survival. These growing needs for unrestricted freedom of navigation on the shared rivers both reflect and create hydrologically induced interdependencies among the riparian states.

Unfortunately, a recognition of the hydrological interdependence of states sharing a river basin, of the growing water scarcities for multiple societal needs, and of the urgent need for interstate cooperation does not guarantee that such cooperation can be easily arrived at, implemented, or sustained, even when it can be shown to be in the best interests of all the parties concerned.⁴⁷ There are many political, economic, strategic, and technical impediments to interstate cooperation in the arena of hydropolitics, as we shall see in the case studies. But the case studies will also show that growing scarcities of freshwater for multiple needs create the imperatives for cooperation among the riparian states that share international river basins.

STUDY PERSPECTIVE AND ORGANIZATION

The analysis of hydropolitics in this book is based on a state-centric view; that is, riparian states are seen here as the main actors who engage in hydropolitics in international river basins. Whatever their specific nature and constituents, these entities are ultimately responsible for engaging in conflict or cooperation with other riparian states, and for entering into negotiations and agreements for the control and sharing of transboundary water resources. While both impelled and constrained by a myriad of domestic and external factors and circumstances, the riparian states in an international river basin also have the primary responsibility for developing and maintaining domestic support for both conflict and cooperation with other riparian states. In the arena of hydropolitics, international organizations and nonbasin states also interact primarily with the riparian states. This is not to imply that individuals, political parties, domestic and international NGOs, epistemic communities, and other stakeholders do not exercise considerable influence on the stands taken and strategies adopted by different riparian states, or that a consensus has always or necessarily to exist on water-related issues among the different organs and agencies of a state, as the case studies will demonstrate.

In our view, equitable sharing of the waters of international river basins to fulfill multiple societal needs is one of the most complex issues that many Third World countries and the international community will have

to resolve in the next century. Consequently, in each case study we will examine the role played in hydropolitics by geography and hydrology; the riparian structure of the basin; international and domestic politics; the history of interstate relations; the power resources of the riparian states; the personal authority and political clout of national leaders; the nature and timing of changes in regimes; the severity of the needs for water for multiple uses; the role of NGOs and regional and international organizations; and the successes and failures of attempts at developing bilateral and multilateral agreements relating to the transboundary water resources.

A substantial body of literature is now available that documents and analyzes different aspects of interstate conflict and cooperation over transboundary water resources in international basins. Several comprehensive case studies on hydropolitics in specific international river basins have also been written.⁴⁸ Although this study makes use of many theoretical and empirical insights developed in the available literature, it is distinguished by its comparative approach, by its balanced perspective between “water wars” doomsaying and starry-eyed optimism about international cooperation, and by its emphasis on the central role that geography—broadly defined here as the physical, economic, and political geography of states and peoples—plays in defining or circumscribing hydropolitics in international river basins.⁴⁹

Geography and Hydropolitics

The physical geography of a river basin comprises its morphology, hydrology, climatology, and ecology, which together determine the physical parameters of its catchment and drainage area; the periodicity, amount, and rate of flow of precipitation, sedimentation, nutrients, and pollution along the channels; and the rates of water evaporation aboveground and seepage underground. These parameters, in turn, define the spatio-temporal aspects (the where and the when) of water availability in the basin as well as the potential uses of water for household needs, agriculture, industry, hydroelectricity generation, navigation, recreation, and so forth in the riparian states. Consequently, the physical geography of a basin defines the possibility for where, how, and when the multiple-use potential of its waters can be developed and utilized by which of the riparian states. To a large extent, the physical geography also determines the nature and degree of dependence of each riparian state on the shared waters as well as the urgency of its need for cooperation with other riparian states. The fact that many of the physical parameters of a shared basin can be substantially altered by

intentional or unintentional human activity sets the stage for both conflict and cooperation among hydrologically interdependent riparian states.

Whereas the riparian structure of a basin—that is, which state is the uppermost, middle, or lowermost riparian, and which state is co-riparian with which other state—is determined primarily by the way international borders have been demarcated in the basin, physical geography plays a substantial role in defining the relative bargaining powers of the riparian states in hydropolitics. For example, it is generally accepted that the uppermost riparian position in a basin is potentially the strongest since the quantity and the quality of water flowing down a river may be substantially altered by the uppermost riparian state. Such a position may not only allow the uppermost riparian to dictate terms to the lower riparians in any negotiations over the shared waters, but it may also make the uppermost riparian state oblivious to any manipulation of the downstream hydrological regime of the river.

What is often not recognized, however, is that some unique features of a basin's physical geography may substantially curtail the degree of freedom and clout of even the uppermost riparian state. For example, the terrain through which the river flows within the territory of the uppermost riparian may be such that it may not be able to exploit fully or even partially the potential of these waters: a low gradient of the river may not allow substantial production of hydroelectric power whereas a very high gradient may make any navigational use of the river very difficult, if not impossible.⁵⁰ In addition, marine catch and fisheries in the uppermost riparian's territory may be highly dependent on upstream migration of fish through the territories of the lower riparians. The pattern of precipitation in a basin may be such as to deprive the uppermost riparian state of large flows whereas the lower riparian(s) may enjoy substantial water surpluses. Thus, the presumably strong bargaining position of the uppermost riparian state in hydropolitics may be substantially moderated by the unique physical geography of a river basin. As we shall see, this can have substantial implications for developing international laws for the nonnavigational uses of international rivers since the guiding principle in international law has often been the protection of the interests of lower riparian states.⁵¹

In some basins, physical geography, in combination with the national borders, may also create a very complex riparian structure such that an upper riparian on some portions of a river may also be a co-riparian and/or a lower riparian on different stretches of the same river, as is the case of Brazil in the Paraná–La Plata basin (chapter 1). This can complicate the stand(s) the upper riparian state may be able to take in hydropolitics, as the

gains from taking one riparian position may be negated by losses from its other riparian position(s). In other cases, a state may share one river basin with one set of states and another basin with a very different set of states. For example, in South Asia, India shares the Indus basin with Pakistan and the Ganges-Brahmaputra-Barak basin with Bangladesh, Bhutan, Nepal, and Tibet-China (chapter 5); the same is the case for Brazil in the Paraná-La Plata and the Amazon basins (chapter 1). In such a situation, the state sharing different river basins from different riparian positions may have to weigh carefully the stands it may want to take in hydrogeopolitics. Of course, a powerful state, whatever its riparian position in a basin, or a strategically located riparian state may still manage to have its way in hydrogeopolitics, but the strong influence of physical geography on hydrogeopolitics cannot be underestimated.

The physical geography of a river basin also forms, to a large extent, the material basis for its economic geography, especially in the resource-oriented, primary production economies of most developing countries. And economic geography, in turn, impacts hydrogeopolitics in a variety of ways, as we shall see in the case studies.

The economic geography of a river basin encompasses the locations of all natural resources, human settlements, economic activities, and infrastructure—roads, railways, power grids, and so forth—as well as the spatial organization of all related activities in the basin as a whole and within the territory of each riparian state. Other economic geographic variables include size, rate of growth, demographic composition, and migration patterns of populations. Historically, availability of water has played an important role in the evolution of the economic geography of states and regions. Because all human activities require direct and indirect inputs of water, the economic geographic variables together determine the magnitude, location, and timing of the demand for freshwater. Conversely, changes in the availability of water can substantially alter the magnitude and rate of change of nearly all the demographic and economic variables. Thus, alone and in combination with its physical geography, the specific economic geography of a river basin has substantial impacts on hydrogeopolitics.

On the one hand, the physical geography and the economic geography of a river basin can work together in such a way as to negate or at least moderate the potential advantages of an otherwise strong riparian position. For example, whereas a basin's physical geography may have endowed a riparian state with a huge potential for generating hydroelectricity on a stretch of the shared river within its own territory or on its borders, the

agribusinesses and other industries within the country, which could consume the electricity to produce substantial economic returns, may be located so far away as to make the transmission losses and costs prohibitive. Such is the case of Paraguay in the Paraná–La Plata basin, where the construction of the Itaipu hydroelectric project has made the country one of the largest producers of hydroelectricity in the world (chapter 1). However, most of its industries and agribusinesses are located far away from the project site, making very costly the transmission of electricity to potential users. Further, the current level of development of its economy is such that Paraguay cannot hope to consume even a fraction of its huge surplus of electricity anytime in the foreseeable future. Thus, Paraguay currently has no choice but to sell its surplus electricity to its neighbor Brazil in a “one buyer–one seller” market. The same is true of Ethiopia, Bhutan, and Nepal, in other international basins (chapters 2 and 5).

On the other hand, the physical and the economic geography of a river basin and of its riparian states may also create the possibility of substantial trade-offs in hydropolitics. For example, in some basins it may be possible to trade the hydroelectric potential of one riparian state for navigational rights through another state’s territory. In other basins, where more than one river is shared by two or more states, the economic potential of one river at one location may be traded for the economic potential of another river at another location. Thus, physical and economic geography may also dictate the nature and extent of possible cooperation between and among the riparian states sharing an international basin.

In addition to the physical and economic geography of a basin, its political geography is likely to impact hydropolitics in substantial ways. The domain of political geography covers the sources, dynamics, and spatial manifestations of political power at different levels of geographical aggregation within and among states. In the arena of hydropolitics, a geography-centered analysis requires linking the political geography of individual riparian states as well as the whole basin to the nature and conduct of interstate conflict and cooperation. By pointing out not only the individuals and the groups that hold power within the different riparian states, but also where exactly their power bases are located, and which activities and places the individual states are likely to favor with patronage and for what reasons, political geographers can greatly enhance the understanding of hydropolitics. Clearly, the political geography of different regime types (for example, democracies and dictatorships) differs greatly, with different implications for hydropolitics.

Earlier it was suggested that concerns for national sovereignty, especially as they relate to the control and use of scarce natural resources located within or flowing through a state's territory, may make it difficult for the riparian states in an international basin to cooperatively develop and share their transboundary water resources. In the Third World especially, where, with very few exceptions, nearly all states have emerged as sovereigns in the post-World War II era after long periods of colonial rule, there is likely to be great resistance to any dilution of sovereignty that cooperation with other states necessarily requires. The symbolic value of large water projects for such emergent states; the highly politicized nature of water allocations; the vagaries of domestic politics; the problem of reconciling diverse water-related interests within the riparian states; and so forth may make it difficult for them to collectively develop and share the multiple-use potential of common water resources. As we shall see, even the long-established Third World states, such as those sharing the Paraná-La Plata basin in South America, have not been immune to the symbolic value of large water projects. And they too have taken a very long time to overcome the impediments to basinwide cooperation created by their particular political geography (chapter 1).

An often ignored fact in the literature on the genesis, conduct, management, and resolution of interstate conflict is that ultimately all international accords have to be implemented in concrete geographical spaces (places) within the territories of the signatory states. All international agreements and accords, when implemented, benefit some places and people more than others; the costs of reaching and implementing international accords are also distributed unequally across places and peoples. This spatial mismatch in the costs and the benefits of interstate cooperation may engender severe domestic conflict in one or more states. Rapid changes in the ruling regimes may also make it problematic for a state to honor its obligations under an international water agreement. Ignorance or neglect of these facts on the part of negotiators and mediators attempting to resolve interstate water disputes may thus lead to even an excellent international water accord being rendered ineffective or problematic, because it may not be subsequently ratified or may have to be renegotiated.

Thus, overall, although geography may not strictly be "national destiny" in the modern world, if it ever was in the past, clearly geography can and does play a substantial role in defining and shaping hydrogeopolitics in international river basins. Of course, each basin is geographically unique, making it necessary to examine how specific geographical features, alone

and in combination with one another, and with other factors and circumstances, may play different roles in defining and shaping hydropolitics in different international basins.

Choice of Cases

There are more than 165 international river basins in the Third World that are shared by two or more sovereign states.⁵² Ideally, a comprehensive study of hydropolitics would examine a representative sample of comparable cases from this large set to identify the conditions, factors, actors, and strategies that have engendered interstate conflict and facilitated or impeded interstate cooperation in international basins. This is clearly beyond the scope and resources of the present project. The six cases examined in this study have been selected for the primary reason that they exhibit some important similarities as well as differences, making it possible to carry out a smaller comparative study that will still allow us to derive some generalizable conclusions from the findings.⁵³ The other reason is the availability of extensive secondary source materials, in English, on each of the six basins.

The similarities the six international basins share include the following: These basins are among the largest river basins, in terms of their catchment and drainage areas, in the respective continents and subcontinents. All the basins are shared by more than two riparian states, and a substantial portion of the respective region's population currently lives in these basins. On the whole, these populations are growing at rates faster than the world average. Rates of urbanization and rural-to-urban migration are also higher in these basins than in other regions. With very few exceptions, all the riparian states sharing the six basins are currently characterized as low to middle income by the World Bank and all are currently heavily in debt, making it very difficult for them to unilaterally undertake large water projects. Most of the states also lack the material, technological, organizational, and human resources required for unilaterally implementing and maintaining such projects.⁵⁴

In each basin at least one country is already a dominant regional power or has the potential to become one—Brazil in the Paraná-La Plata basin, Egypt in the Nile basin, Israel in the Jordan basin, Turkey in the Euphrates-Tigris basin, India in the Ganges-Brahmaputra-Barak basin, and Thailand (or Vietnam) in the Mekong basin. These states place great strategic and economic value on the transboundary water resources they share with their neighbors, and they have the power to veto or delay any multilateral water accords in their respective basins.⁵⁵

In all the basins the boundaries of two or more riparian states were demarcated by the colonizing powers, often without much regard for the hydrological/geographical integrity of the respective river basins. There are also unresolved conflicts over the international borders, ethnic conflicts of different degrees of severity, and, in many cases, violent movements for autonomy or separation, all of which have substantial effects on hydropolitics. This should enable us to examine the role of contestations and conflicts about identity, territory, and ethnicity in hydropolitics.

Nearly all the states sharing the six basins are now members of the United Nations, the World Bank, and the International Monetary Fund, as well as several other regional and international organizations that, given the opportunity, may be able to facilitate and support interstate cooperation over the shared water resources.⁵⁶ Further, for each river basin, integrated plans for the development of transboundary water resources have been proposed from time to time; however, to date, none has been implemented in its entirety.

All the basins studied here have experienced colonial rule, albeit over different time periods and of varying severity, by one European power or another. This has made the riparian states especially susceptible and sensitive to issues of sovereignty, territorial integrity, and national self-interest.

But these “macro-level” similarities notwithstanding, each international river basin is unique in its physical, economic, and political geography, and the nature and dynamics of its political, economic, and security structures. Many historical, social, cultural, and behavioral factors also condition differently the way the riparian states in each basin perceive themselves and the world, and their position and evolving role in it. The particular historical experiences of specific states with their respective neighbors and with the rest of the world also color their perceptions of, and interactions with, one another in different ways. This uniqueness of each basin and of the states sharing it, as well as the similarities they share, should enable us to identify the set of factors that, individually and in combination with other factors, shape hydropolitics in international basins in the Third World.

Choice of Time Period

This study is limited to the period following World War II, for a number of reasons outlined below. Earlier historical information is analyzed for each case only when it pertains directly to the nature and conduct of hydropolitics in the particular basin during the past five decades.

Among the primary reasons for the limited time frame of the study are the following: The end of World War II created a radically new geopolitical

context for interstate conflict and cooperation in the Third World. The defeat of some erstwhile colonizers—Germany, Italy, and Japan—and the substantially reduced geopolitical clout of others—Belgium, Great Britain, France, Portugal, Spain, and The Netherlands — created the conditions for the emergence of two superpowers, the United States and the Soviet Union, that then engaged in the long Cold War whose impacts in the Third World, especially on the nature, longevity, and severity of interstate conflict, have been and continue to be considerable.

Many sovereign states now sharing international river basins in the Third World achieved independence as a result of the post–World War II wave of decolonization; in some cases, new states were created by partitioning the erstwhile colonies. Boundaries of these states were often demarcated without much regard for the integrity of large river basins. Decolonization thus left the Third World states with legacies of unresolved territorial conflict, and transboundary resource claims and counterclaims continue to fuel such conflict among the states to this day.

The end of World War II also created the need and conditions for the establishment of new international organizations, such as the United Nations, the World Bank, and the International Monetary Fund, among many others. Many regional organizations for military and economic cooperation were also created in the post–World War II era. These organizations have provided new forums and resources for dealing with interstate conflict and, in some cases, for achieving interstate cooperation over a range of issues, including water, in the Third World.

There has also been a growing awareness over the past five decades of the importance of water for multiple uses other than navigation, which often was the primary concern of the erstwhile colonizers. In many Third World states, large-scale economic development programs have been undertaken only in the past few decades. Many large dams, irrigation systems, and other water-related infrastructure projects have been implemented, often with the assistance of the United Nations and the World Bank. These projects—both implemented and planned for the future—have created new imperatives for conflict as well as cooperation among the respective riparian states.

The post–World War II era has also witnessed substantial militarization of some states in the Third World. This has, in some cases, changed the historical regional balance of power, leading to new insecurities and conflict. At the same time there has been a growing recognition of environmental and economic interdependence among states. Many global and

regional “initiatives” (e.g., the 1992 Earth Summit in Rio de Janeiro, Brazil, and the Rio-plus-Five in 1997 in New York) have been and are being launched that would have been inconceivable in the past. The large number of international and regional accords the states have signed in the recent decades also show that there has been a growing acceptance of some dilution of state sovereignty for the larger purpose of dealing with global problems as well as avoiding interstate conflict.

Now another geopolitical context for conflict and cooperation in the Third World is emerging. The demise of the Soviet Union as a superpower and the end of the Cold War have led some to proclaim the “end of history,” others to contemplate a “new world order.” For the moment, it is not entirely clear whether this new geopolitical context will facilitate or impede the resolution of transboundary resource conflicts in the Third World. This comparative study attempts to throw some informed light on this question, based on the experiences from five regions and six major international river basins over a period of half a century.

A final note is due on the ordering of the cases. Simply put, in the absence of any analytically rigorous criteria for ordering the cases, the strategy adopted here is to begin with the most “western” of the six selected Third World basins—the Paraná–La Plata basin in South America—and to end with the most “eastern” basin—the Mekong basin in Southeast Asia.

Within the comparative and geography-centered focus of this study, each of the six case studies in the following chapters (chapters 1 through 6) begins with a brief description of the physical, economic, and political geography of the particular basin and of the riparian states sharing it. This is followed by a discussion and an analysis of the specifics of interstate conflict and cooperation over the shared waters in each basin, and of the factors, circumstances, and actors that have been and are instrumental in hindering or facilitating interstate cooperation. A summary of findings from each case study is presented at the end of each chapter. Finally, the generalizable findings and conclusions from the six case studies are consolidated and presented in the concluding chapter.

