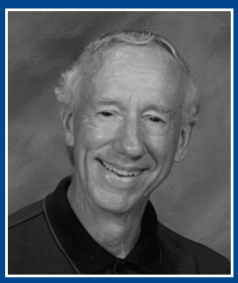
AMERICAN UNIVERSITY STUDIES

Religion, Law, and the Present Water Crisis

RICHARD A. HUGHES

Religion, Law, and the Present Water Crisis documents current and impending global water shortages and opposes policies of commodification and privatization of water ownership by multinational water corporations. On the basis of the religions of the world, Richard A. Hughes appeals to pure, running water as a symbol of the sacred. Furthermore, he argues that all bodies of freshwater are commons and that they should be protected by the public trust doctrine. In addition, he contends that there is a right to water and that this right is independent, free-standing, and the prerequisite of other human rights, applying to all states and occupied territories. The increasing acidification of the oceans makes it mandatory to protect them under the reserved water right doctrine and to designate them as "national parks" of the seas.

More generally, this book presents a synthesis of water studies and encompasses the religions of the world, theologies of baptism, American water law doctrines, public trust doctrine with special attention to Islamic water law, and international water law treaties. Clean water is a necessity of life. Therefore, it is compelling to recognize the urgency of water scarcity and the need to guarantee the purity of and accessibility to water for all people.



RICHARD A. HUGHES is the M.B. Rich Professor of Religion at Lycoming College in Williamsport, Pennsylvania. Dr. Hughes received his doctoral degree from Boston University and also studied at universities in Geneva and Paris. He has published many books and numerous articles in the fields of theology, biblical studies, depth psychology, ethics, and law. His academic awards include grants from the Louisville Institute/Lilly Endowment and the Szondi Foundation of Switzerland.

AMERICAN UNIVERSITY STUDIES

www.peterlang.com

Religion, Law, and the Present Water Crisis

AMERICAN UNIVERSITY STUDIES

SERIES VII
THEOLOGY AND RELIGION

VOL. 320

PETER LANG
New York • Washington, D.C./Baltimore • Bern
Frankfurt • Berlin • Brussels • Vienna • Oxford

RICHARD A. HUGHES

Religion, Law, and the Present Water Crisis

PETER LANG
New York • Washington, D.C./Baltimore • Bern
Frankfurt • Berlin • Brussels • Vienna • Oxford

Library of Congress Cataloging-in-Publication Data

Hughes, Richard.
Religion, law, and the present water crisis / Richard A. Hughes.
p. cm. — (American university studies. VII, Theology and religion; v. 320)
Includes bibliographical references (p.) and index.
1. Water rights. 2. Human rights—Religious aspects.
3. Economic development—Religious aspects.
4. Water—Religious aspects. I. Title.
K3496.H84 346.04'32—dc23 2011036393
ISBN 978-1-4331-1728-2 (hardcover)
ISBN 978-1-4539-0231-8 (e-book)
ISSN 0740-0446

Bibliographic information published by **Die Deutsche Nationalbibliothek**.
Die Deutsche Nationalbibliothek lists this publication in the "Deutsche Nationalbibliografie"; detailed bibliographic data is available on the Internet at http://dnb.d-nb.de/.

The paper in this book meets the guidelines for permanence and durability of the Committee on Production Guidelines for Book Longevity of the Council of Library Resources.

29 Broadway, 18th floor, New York, NY 10006
www.peterlang.com

Printed in Germany

DEDICATED TO

The Clean Water Institute
of Lycoming College

Table of Contents

Chapter Four: Sacrament of Baptism

Chapter Five: Natural Sacramentality

Chapter Six: Water and the Common Law

Chapter Seven: Water and the Public Trust

Chapter Eight: The Right to Water

Conclusion

Preface

When my father died on November 26, 1989, I felt an immediate dislocation with respect to water. He and my mother had been living in a rural home near the shore of Lake Wawasee in northeastern Indiana. That lake was the center of my childhood and adolescence. Lake Wawasee was the site of a church camp I had attended for many years and a place for swimming, boating, and other water-related activities. Since I could not maintain the property, living more than 500 miles away in Pennsylvania, I had to sell it and lose my connection to the lake. On the following March 7, 1990, when the rays of the sun were glistening on the waves of the lake, a young married couple purchased the house. Thereafter, I had to satisfy a deep need to be near a large body of water.

Four years after my father's death I received an invitation to travel to Zürich, Switzerland and deliver a lecture. On June 18, 1993 I spoke on the theme of "The Symbolism of the Bridge" at the University of Zürich. In that lecture I discussed the meanings of the bridge symbol in dreams and in the religions of the world. I suggested that the bridge symbol in dreams signified a transcendent unity of the self in a time of personal change or transition (Hughes 1991: 48).

The existential context for my lecture was the fact that six weeks before my wedding on December 29, 1973 I had a series of bridge dreams with two perspectives. In one a man holding a book and a woman crossed over a bridge spanning a large body of water and reached the distant shore. In the other the same man and woman stepped into a boat at one shore, travelled across a body of water with several islands, maneuvering safely around them, and arrived at the distant shore without mishap. These dreams came to me in a regular nightly succession for six weeks.

The primary meaning of those dreams was that I had made a good marriage choice. If I had fallen off the bridge into the water below or if I had wrecked the boat, then these images would have signified a poor marriage choice. Crossing the water was a successful rite of passage that represented a wholeness at the highest level of selfhood.

My wife and two young children accompanied me to Zürich, and we stayed in the city one week. After the day of my lecture, we took a sight-seeing ride on one of the tourist boats in the city. We stepped into the boat that was docked at a pier on the Limmat River, and we rode to the southern

tip of the city which opened out onto Lake Zürich. The boat moved across the lake to the middle, where it stopped unexpectedly and stayed motionless for several minutes. Sitting in the boat in Lake Zürich, which was about the same size as Lake Wawasee in Indiana and gazing at the distant mountains, suddenly I came to terms with my father's death. I felt a profound sense of peace and oneness with the water.

My peace on Lake Zürich was only temporary, however, because a few years later my need to be near water erupted again. On Easter weekend, 1999 my family and I travelled to Virginia Beach, Virginia to visit my sister-in-law. We stayed at an ocean-side hotel, and for most of the weekend I walked back and forth on the boardwalk, intensely contemplating the waves of the sea and watching the ships passing in the distance. At sunrise and sunset I sat on the outside balcony of our seventh-floor room, and I became enchanted by the rays of the sun glistening on the bright morning waves and glowing on the dark evening waves. With twilight at the ocean an acceptance of my father's death came to me again.

Eventually, I realized that I needed to visit large bodies of water every four or five years. Consequently, we returned to Virginia Beach in July, 2003. Once again I walked back and forth on the boardwalk to renew an acceptance of my father's death. During those years, I knew that the ocean embodied two dimensions of meaning. On one level, it was a source of relaxation, as many vacationers enjoyed swimming in the water and walking on the beach. On a more profound level, however, I understood that the ocean provided a regeneration or renewal of life. This deeper meaning has been represented symbolically in the religions of the world, particularly in the creation stories in which life arises from the primordial, oceanic water. In some religions without creation stories the ocean is a nurturing mother to whom we return for a rebirth.

In May, 2006 my wife, son, and I attended commencement at Boston University School of Theology, from where my daughter was graduating. At a weekend seminar I listened to a presentation by John Hart, Professor of Christian Ethics in the School of Theology. He spoke about his forthcoming book *Sacramental Commons* (2006) and explained that he had brought together the sacramental and commons traditions into a synthesis. I became intrigued by the title, and in the fall of 2006 I read the book and was enthralled by its originality and visionary power. The chapter on "Living Water" served as a turning point in my professional life, and it compelled me to initiate a scholarly study of water.

In March, 2009 I responded to a call for papers from Hamline University School of Law, home of the *Journal of Law and Religion*, and decided to

prepare a paper on water. Having just published my book *Pro-Justice Ethics* in January of that year, in which I discussed water issues in a preliminary way, I submitted a proposal for an essay entitled "Pro-Justice Ethics, Water Scarcity, Human Rights." I surveyed factors of water scarcity, criticized corporate policies of privatization, argued for a right to water, and contended that all freshwater bodies should be protected under the public trust doctrine. My proposal was accepted, and Marie Failinger, Professor of Law at Hamline and editor of the journal, invited me to present my ideas at the 19th Annual Symposium of the *Journal of Law and Religion* on October 16, 2009 at St. Paul, Minnesota. I presented my paper at the symposium, and in the following spring it was published in the journal (Hughes 2009−2010).

With the acceptance of my essay for publication I decided to expand those ideas into this book. During the years that I was working on the manuscript, a new development took place in northcentral Pennsylvania where I live. A vast underground deposit of natural gas known as Marcellus Shale had been discovered, and by 2008 natural gas drilling had begun. Several gas drilling companies, using a method of hydrofracture, moved into the region and by the spring of 2011 more than 300 natural gas wells were in operation. Through the news media we learned about blowouts of gas wells, spills of fracking water, filled with toxic chemicals such as methane, and contaminating our streams, rivers, and wells.

This book is dedicated to the Clean Water Institute of Lycoming College, ably directed by Melvin Zimmerman, the Frank and Helen Lowry Professor of Biology. With the assistance of students the institute monitors the quality and quantity of water, particularly in the Susquehanna River Basin. Pennsylvania contains 83,000 miles of streams, 4,000 lakes, 120 miles of coastal waters, and 80 trillion gallons of groundwater and aquifers. As of this writing, the institute has completed 43 stream assessments. The institute serves as a valuable resource on water issues as well as a partner with local watershed groups devoted to protecting our most precious natural resource. In the words of the New Testament the institute endeavors to maintain our "rivers of living water" (Jhn. 7:38).

Against the backdrop of natural gas drilling I raise the prospect of a long, twilight struggle to preserve the cleanliness of water. Incidents of blowouts and spills that contaminate surface water and groundwater heighten the concern for the health of our water supplies. Will we continue to enjoy pure running water in support of life and health, or will we suffer the degradation of our streams, rivers, and wells? In my experience water has been a means of coming to terms with death, but the potential perils of contamination pose the possibility of water becoming a means of death.

Acknowledgments

This book was begun in the first week of August, 2009 and completed in the last week of June, 2011. Research for the book was subsidized by the John G. Snowden Library of Lycoming College, Janet Hurlbert director. Library staff members Susan Beidler, Marlene Neece, Susan Nelson, Karla Procopio, and Alysha Russo assisted me with the acquisition of materials. My Lycoming colleagues Thomas Griffiths, Steven Johnson, Robin Knauth, Fred Thayer, and Melvin Zimmerman provided me books, papers, and important internet information.

My departmental colleagues read portions of the manuscript. George Adams reviewed the chapters on the world religions and made helpful comments. Steven Johnson read the biblical materials and suggested some critical changes. John McNassor read the chapters on baptism and natural sacramentality from his unique perspective as a Baptist minister and a member of an Episcopal Church. Melvin Zimmerman reviewed and approved the introductory scientific discussions and clarified a few points.

It was my privilege to work with two distinguished lawyers who specialize in water issues. Rebecca H. Hiers, an Oregon mediation attorney who has worked as a policy analyst for the Umatilla Indian Reservation, supplied court cases, her own papers, and the tribal policy statement on salmon, and she read the chapters on the law. Raya Marina Stephan, a Paris-based international water law specialist and consultant to the United Nations gave me a copy of her paper on Islamic water law. She also read the chapters on international water law and made helpful corrections and comments.

Heather Hughes and James Hughes assisted me in the preparation of the manuscript.

Selections from the Holy Qur'an are taken from Tarif Khalidi. 2008. *The Qur'an*. New York: Viking. Unless otherwise stated, the scriptural passages are from the New Revised Standard Version of the Bible, copyright 1989, by the Division of Christian Education of the National Council of Churches, U.S.A.

Introduction

Water Scarcity

The United Nations (UN) has projected that by 2025 approximately one third of the world's population will be living in regions of absolute water scarcity, and two thirds may have extreme water stress (UNESCO Water Newsletter No.180 2007). Water scarcity means that the volume of water extracted from rivers, lakes, and aquifers is so great that existing water supplies cannot satisfy human and ecosystem requirements. More precisely, water scarcity is present in situations when water availability falls below 1000 cubic meters per person per year (Shiva 2002: 1). Water stress occurs when water consumption surpasses 10% of renewable freshwater sources (Palaniappan and Gleick 2009: 1).

A major factor in water scarcity is population growth. The world's population is expanding by about 80 million people a year and increasing freshwater demands at about 64 billion cubic meters a year (UNESCO Water Newsletter No.249 2011). Water usage has been expanding at twice the rate of population growth in the 20th century, so that already many regions of the world are chronically short of water (UNESCO Water Newsletter No.180 2007). Between 2008 and 2025 the world will need 17% more water to grow food for the larger populations, and by 2025 total water usage will increase by 40% (UNESCO Water Newsletter No.205 2008). Most of the population growth will take place in Southern Asia (30%) and Sub-Sahara Africa (32%). (UNESCO Water Newsletter No. 249 2011). In those regions the urban populations are expected to double between 2000 and 2030, when the cities of the developing world will constitute an estimated 81% of urban humanity (UNESCO Water Newsletter No.249 2011). Although the global population slowed modestly from mid-2009 to mid-2010, increasing only by 1.16%, it was on track to reach seven billion by the end of 2011 (www.worldwatch.org. 2010).

Water scarcity is a basic cause of poverty for about 1.1 billion people (UNESCO Water Newsletter No.159 2006). Problems of poverty are due to a lack of availability of and proximity to water sources, as well as poor quality and limited quantity of freshwater. In many developing countries women and young girls are often the main providers of water for their households (Palaniappan et al. www.pacinst.org 2010). In some countries of the world,

such as India and South Africa, women and young girls walk long distances many times a day, carrying pots on their heads, to fetch water for their families.

Water scarcity and lack of basic sanitation are implicated in global health problems. More than 2.5 billion people worldwide have no basic sanitation, and over one billion lack access to safe, affordable drinking water (Palaniappan et al. 2006: 117). These are mainly poor and marginalized indigenous people. Poor water quality is mainly the result of sewage discharge into water sources. Preventable diseases caused by poor water quality and inadequate sanitation kill about 10,000 people every day (International Experts' Meeting UNESCO 2009: 1).

Unclean water is the second leading cause of childhood mortality in the world (UNESCO Water Newsletter No. 183 2007). Each year 1.8 million children die from diarrhea and other water-borne diseases. In water-borne diseases water transmits pathogens in excreta from humans. The World Health Organization (WHO) has reported that contaminated water lurks in 80% of diseases,, and that a child dies every eight seconds from drinking dirty water (Barlow 2007: 2). For every child killed by HIV/AIDS five children perish from preventable diseases caused by unsafe drinking water, poor hygiene, and inadequate sanitation (International Experts' Meeting UNESCO 2009: 1). Lack of clean water for hygiene produces water-scarce infections, such as trachoma which causes blindness (Barry and Hughes 2008: 784−785). Snails and flees breed water-based infections, and mosquitoes, black flies, and tsetse flies carry water-base diseases.

Another category of water-related disease is that caused by pollution of water supplies. As many as 70 million people in Bangladesh are exposed to high levels of arsenic in their drinking water, and a major factor is contamination of at least half of the estimated tube wells in the country (UNESCO Water Newsletter No.215 2009). Arsenic contamination in groundwater is a causal factor in lung, bladder, and skin cancer (Barry and Hughes 2008: 785−786). Three hundred million Chinese lack access to safe drinking water, because water supplies in China are polluted with arsenic, excessive fluoride, and toxins from industrial waste and agricultural chemicals (Gleick 2009: 76, 81).

Cholera, a water-borne disease, is spreading in poverty-stricken Africa. Epidemic cholera indicates contamination of drinking water with human feces (Mintz and Guerrant 2009: 1060). The cholera epidemic persists in Zimbabwe, where the fatality rate remained above 4.7% through February 12, 2009, while at the same time spreading to South Africa and Zambia (Mintz and Guerrant 2009: 1061−1062). In 2005 the reported rate of cholera

in Africa was 95 times that in Asia and 16,600 times that in Latin America (Mintz and Guerrant 2009: 1063). Preventable deaths from cholera are the results of inadequate sanitation, inaccessible safe drinking water, and poor health care delivery systems.

During the 20th century, the use of water for irrigation in agriculture increased six times the growth of the population (UNESCO Water Newsletter No.185 2007). Historically, irrigation has taken 70−80% of all water uses, but these percentages will increase with the expected growth of population (UNESCO Water Newsletter No.185 2007). In the American West farmers use about 80% of their respective states' water supplies to grow alfalfa, cotton, wheat, corn, and rice. These are water-intensive crops that could grow more efficiently in other regions of the nation without irrigation (Glennon 2002: 211). In Nevada, the driest state in the country, farmers grow alfalfa to feed cattle.

The older irrigation systems sprayed fine mists of water into the air with high pressure systems, but most of the water evaporated before reaching the ground. Currently, many farmers use center-point irrigation systems that reduce evaporation by low pressure and by unique nozzles that spray large droplets of water into the ground with an efficiency of 90% (Glennon 2002: 149). Center-point irrigation systems produce wide green circles on the ground in sharp contrast to arid landscapes, and farmers employ these systems in the High Plains between Texas and North Dakota.

Generally, extensive irrigation tends to accelerate desertification (Barlow and Clarke 2002: 45). Desertification does not mean the creation of deserts; rather it means the degradation of land in arid, semi-arid, and dry sub-humid climates of the world. It is a process caused by human activities and climate change, both of which are facilitated by population growth. In California irrigation has degraded wetlands, harmed wildlife with chemicals in agricultural drainage waters, and increased toxic levels of selenium (Barlow and Clarke 2002: 68). Over 70% of the world's dry lands are degraded, resulting in dust storms and air pollution, putting one third of the world's population at risk, and reducing annual incomes by US$ 42 billion (UNESCO Water Newsletter No.188 2007). These figures represent, however, only the direct costs.

In California farmers employ irrigation in the more arid and semi-arid regions, where it builds up salt through evaporation (UNESCO Water Newsletter No.185 2007). Salinization diminishes the productivity of 20−30 million hectares of farm land globally, and 35% of this is under irrigation (UNESCO Water Newsletter No.185 2007). As a result of salinizaton, several countries have built desalinization facilities. By 2002 there were

12,500 desalinization plants in 120 countries, mainly in the Middle East, North Africa, California, and parts of Florida (UNESCO Water Newsletter No. 206 2008).

By 2005 the United States had 2,000 desalinization facilities; one half treated brackish water and one fourth river water (Glennon 2009: 153). The two principal problems with desalinization are the enormous amounts of electricity it requires and the question of how to dispose of the salt concentrates (Postel 1997: 45). One method of desalinization is distillation, and the other is running water through filters that block the salt (Glennon 2009: 152). In Southern California water from the Colorado River flowing into the Imperial Irrigation District has an increased salinity rate of 530%, and evaporation from the All-American Canal concentrates the salt (Glennon 2009: 257). Farmers use flood irrigation to leach the salt.

In the 20th century 800,000 small dams and 40,000 large dams were constructed for water delivery management, irrigation, and hydroelectric power; but these dams harnessed 60% of the world's 227 major rives to the detriment of their natural stream flows and ecosystems (Postel and Richter 2003: 2, 13, 16−17). In addition to the dams many dikes, canals, reservoirs, and levees were installed. In the United States the Army Corps of Engineers was founded in 1775 to dam rivers, control flooding, and facilitate navigation. The United States Bureau of Reclamation, founded by Congress in 1902, began building dams in the American West in the 1930s, and currently 75,000 large dams of at least six feet high and 2.5 million smaller dams are in operation (Glennon 2009: 108). Large dams have a reservoir capacity of up to three million cubic meters (Imhof and Lanza 2010: 9). The primary reason for building dams in the West has been the need to control river flows (Glennon 2002: 19−20). In the spring surface flows are abundant due to rainfall and snowmelt, but by mid-to-late summer surface flows tend to diminish. Dams store water in reservoirs, and water is released to stabilize surface flows throughout dry periods.

Half of the world's large dams have been built in China, where since 1950 public policy has ordered transfers of large amounts of water from one region to another (Gleick 2009: 90−91). For example, the Yangtze River, the longest in the country, has an estimated 50,000 dams, including the Three Gorges Dam, the biggest in the world. The dam generates electricity equivalent to that of about 25 coal-fired power plants, but it has been plagued by sky-rocketing costs, corruption, environmental disasters, and human rights violations (Imhof and Lanza 2010: 9−10). The Yellow River, the second longest river in China, has had since 2000 more than 10,000 reservoirs in operation, 23 of these involving large dams for the purpose of

hydropower production (UNESCO Water Newsletter No.241 2010). Meanwhile, the general health of the Yellow River has declined, along with the disappearance of wetlands and harm to aquatic life. In mid-January 2007 Chinese officials announced that one third of the fish species in the Yellow had become extinct (Postel 2007: 20−21). Previously, the river had been host to 130 species of fish.

While dam construction may have created immediate benefits, it has led to serious long-range environmental problems. Dams alter natural river flows and increase salt or trap sediment in river basins (Postel and Richter 2003: 131). Normally, sediment nourishes flood plains, deltas, and estuaries. River flow changes are devastating to species, as they eliminate those whose survival correlates with predictable flow patterns. Low flows prevent species from reaching their destinations for feeding or breeding, and they allow non-native species to enter rivers and threaten native species (Postel and Richter 2003: 20−21).

Dams disconnect rivers from flood plains, so that their nutrient loads cannot spread out into river banks normally due to periodic flooding. Reservoirs drown lands and cause mercury-absorbing bacteria to grow and enter the food chain, while releasing carbon dioxide and methane into the environment (Barlow and Clarke 2002: 48−49). Large dams deform the earth's crust and trigger earthquakes. This process is called "reservoir-induced seismicity." In May, 2008 the 7.9 magnitude Sichuan earthquake in China killed about 90,000 people because of the Zipingpu Dam on the Min River. According to one geophysical hazards scientist, the "several hundred million tons of water behind the Zipingpu Dam put just the wrong stresses on the adjacent Beichuan fault" (Imhof and Lanza 2010: 11). There are more than 100 cases of dams causing earthquakes globally.

Dams diminish the capacity of rivers to purify water through watersheds and to carry their pollutants downstream. For example, the Mississippi River drains about 40% of the land on the North American continent, and the fertilizer deposits from upstream farms contribute to algae blooms and the "dead zone" of low oxygen in the Gulf of Mexico (Postel and Richter 2003: 25). This "dead zone" kills fish and other aquatic life in the Gulf. Globally, the most common water quality problem is eutrophication resulting from excessive phosphorus and nitrogen (UNESCO Water Newsletter No.215 2009). Eutrophication constitutes physical, chemical, and biological changes that occur in a lake, estuary, or slow-moving stream after taking in plant nutrients from natural erosion and runoff from adjacent land (Miller 1996: A46).

In the last 60 years dams have displaced 60−80 million people, most of whom have resided in China and India (Barlow and Clarke 2002: 61). Building the Karibu Dam in Africa displaced 57,000 people and destroyed the flood plain (Postel and Richter 2003: 43). By 2010 more than 1.3 million people had been displaced in China to make room for the Three Gorges Dam on the Yangtze River (Imhof and Lanza 2010: 10). Many received only tiny, barren plots of land in compensation, or they were sent to urban slums without adequate housing. The people who relocated in towns around the edge of the Three Gorges reservoir witnessed the collapse of the reservoir in about 91 places, killing many residents or forcing them to flee (Imhof and Lanza 2010: 10). Protests by displaced people triggered repression, imprisonment, and physical assault by government armed forces. Generally, displaced people neither receive a just compensation or resettlement, nor do they retain access to natural resources (Palaniappan et al. 2006: 133). Indigenous people see their ancestral lands desecrated, and ethnic minorities experience discrimination.

Amnesty International has reported human rights violations associated with the construction of the La Parota Dam in Guerrero State in Mexico, a region of high marginalization and low social development (www.amnesty.org. 2007). Begun in 2003, the dam project was intended to produce 1,527 gigawatt hours of electricity a year. The dam wall was supposed to be 162 meters high, flooding an area of approximately 17,000 hectares of land and diverting water from the Papagayo River. This river was the main source of water, transportation, and livelihoods of adjacent communities. The investment for the dam was expected to exceed US$ 850 million.

Local communities were not given adequate information or allowed an informed consent. Questions as to relocation, compensation, and continued access to natural resources were not answered. The people's right to effective legal remedy was violated by death threats, criminalization of opponents of the dam project, and disproportionate use of force against opponents. The right to participate in consultation was denied, and women were largely excluded from any deliberation.

According to international human rights law, Mexico has the obligation to protect local communities from forced evictions. Mexico is a state party to the International Covenant on Economic, Social and Cultural Rights, which recognizes "the right of every one to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions" (art. 11(1). Forced evictions violate this right, as well as those of informed consent and