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Great River and Waterway Landscapes of Africa and the Middle East: A Conversation with Kenneth R. Olson

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Abstract

This repository interview examines Kenneth R. Olson's book Great River and Waterway Landscapes of Africa and the Middle East as an interdisciplinary contribution to the study of large river and waterway systems. The conversation focuses on the Nile, Congo, and Jordan river landscapes and on the Suez Canal as interrelated examples of hydrological change, soil and sediment dynamics, engineering intervention, political conflict, environmental degradation, and public-health vulnerability. Particular attention is given to the long-term consequences of dam construction, sediment trapping, invasive species migration, port activity, chemical storage, water pollution, and transboundary governance. The interview emphasizes that great rivers cannot be understood solely as physical waterways or economic infrastructures. They are socio-ecological corridors in which climate variability, land use, navigation, hydropower, agriculture, institutional capacity, and conflict interact over long time scales. The discussion also highlights the need for resilient river-basin management that integrates hydrology, soil science, ecology, public health, environmental history, and political decision-making. The book is presented as a timely contribution to debates on freshwater security, environmental risk, and the governance of large river systems under conditions of accelerating climatic and anthropogenic pressure.

Keywords: Great rivers; Nile River; Congo River; Jordan River; Suez Canal; river landscapes; freshwater security; sediment trapping; hydropower; invasive species; pollution; public health; climate variability; transboundary governance; environmental resilience.

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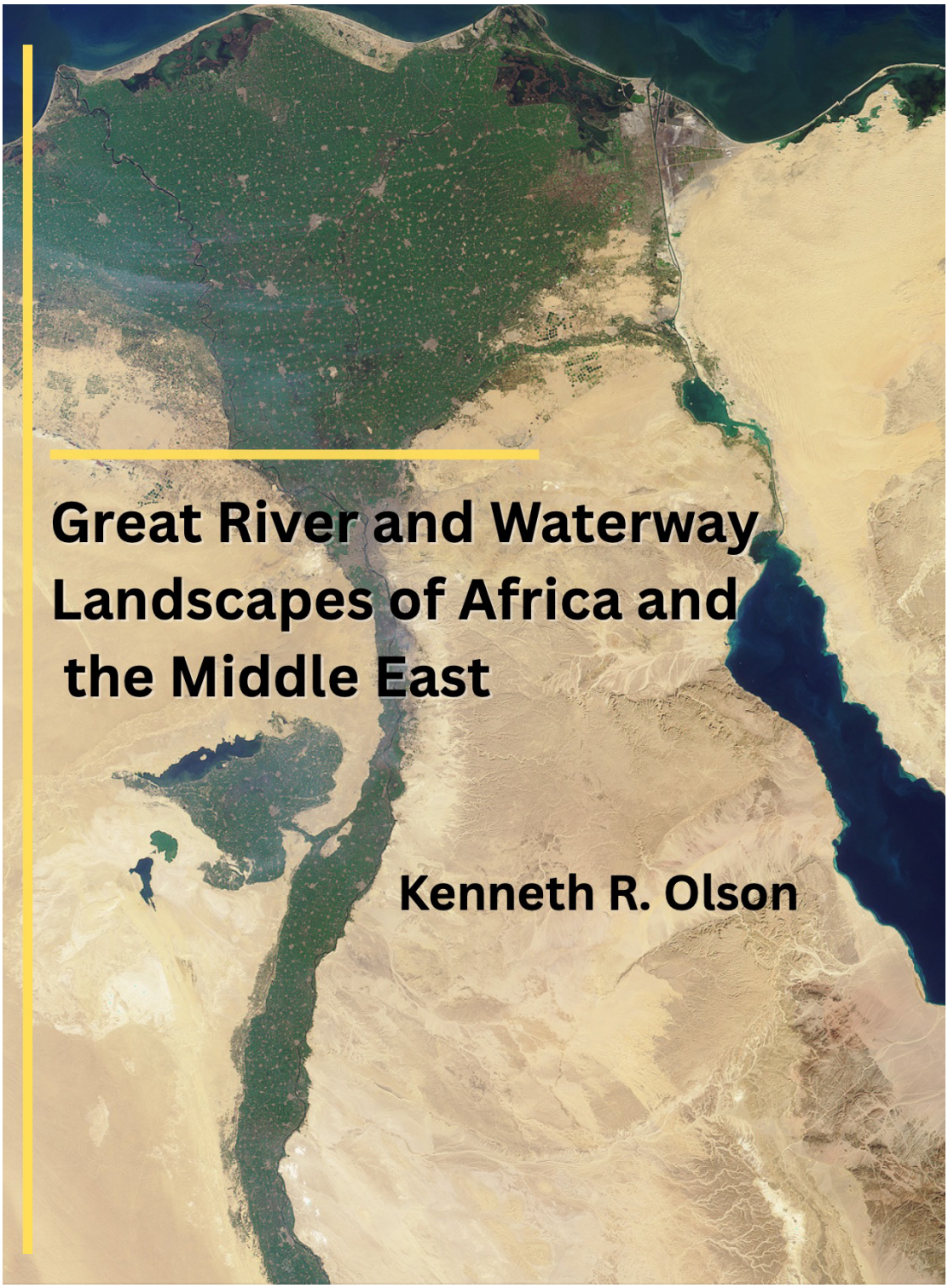

Book title	Great River and Waterway Landscapes of Africa and the Middle East
Authors	Kenneth R. Olson
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Publisher	Pollution & Diseases Book Series
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Key Points

1. The book interprets the Nile, Congo, and Jordan river systems and the Suez Canal as dynamic socio-ecological landscapes rather than as isolated hydrological or engineering systems.
2. It shows how river modification, including dam construction, canal excavation, navigation infrastructure, and port development, can generate both economic benefits and long-term environmental costs.
3. The discussion connects soil processes, sediment movement, water quality, invasive species, chemical exposure, and public-health risk within a single analytical framework.
4. The interview emphasizes that political conflict, military activity, colonial extraction, and weak governance can intensify environmental degradation in major river basins.
5. A central conclusion is that river management should be organized around resilience, long-term monitoring, pollution control, sediment management, and international cooperation.

Introduction

Interview conducted on June 25, 2026.

Prepared for the journal "Pollution and Diseases."

Professor Kenneth R. Olson is an American soil scientist, environmental researcher, and author whose work focuses on great river landscapes, environmental degradation, flooding, war-related ecological damage, and freshwater systems around the world. In this interview, he reflects on decades of interdisciplinary research, the environmental consequences of war, and the future of the world's great rivers and deltas.

Why This Book Matters Now

This book is important because large river systems are becoming increasingly vulnerable to climate variability, pollution, engineering intervention, geopolitical conflict, and competing demands for water, food, transport, and energy. The Nile, Jordan, Congo, and Suez Canal illustrate how rivers and waterways function not only as physical landscapes, but also as ecological corridors, economic infrastructures, public-health environments, and political spaces. By examining these systems together, the book shows that river management must move beyond narrow technical solutions and adopt a long-term, interdisciplinary approach focused on resilience, cooperation, and the protection of soil and water resources.

INTERVIEW

Q: What is this book about?

A: The book examines major river and waterway landscapes in Africa and the Middle East, with particular attention to the Nile, Congo, and Jordan river systems and to the Suez Canal. These systems have been shaped over long periods by climate

variability, seasonal flooding, sediment movement, channel change, and human intervention. They also provide important examples of how rivers become ecological corridors, economic infrastructures, political boundaries, and sources of public-health vulnerability.

Through case studies supported by maps and photographs, the book considers how river landscapes are formed, altered, managed, and sometimes damaged. It reviews historical and contemporary pressures, including population growth, agricultural development, engineering works, climate change, pollution, navigation, hydropower, and conflict. A central theme is that river systems are never static. Their management requires attention not only to water flow, but also to soils, sediments, ecosystems, communities, and institutions (figure 1).

Q: Why did you decide to write this book specifically?

A: After studying the great rivers and waterways of Africa and the Middle East, I wanted to examine these landscapes in a more integrated way. The Nile, Jordan, and Congo rivers, together with the Suez Canal, show how water systems can sustain civilizations, create economic opportunity, and at the same time generate environmental risks when they are heavily modified or poorly governed.

Q: What makes this topic scientifically important?

A: The Suez Canal is a particularly important case because it is a sea-level artificial waterway connecting the Mediterranean Sea and the Red Sea through the Isthmus of Suez. It shortened the maritime route between Europe and Asia and became a major element of global trade. However, the same engineering achievement also produced long-term environmental effects.

The opening of the canal removed a biogeographic barrier between two marine systems. Since the late nineteenth century, species from the Red Sea and the Indo-Pacific region have entered the Mediterranean through the canal, affecting local and endemic species and altering ecological relationships. Port activity and maritime transport also affect air quality, surface water, groundwater, and the health of communities along the canal and adjacent ports.

The scientific importance of the topic therefore lies in the interaction between engineering, ecology, public health, and governance. The findings may help policymakers design adaptation and protection measures for coastal areas, ports, and communities affected by climate change, land-cover change, invasive species, and anthropogenic pollution.

Q: Which regions or case studies are central to the book?

A: The main case studies are the Nile River and the Aswan High Dam; the Jordan River landscape and the need for international cooperation; the Congo River as a hydropower and development corridor; and the Suez Canal as an engineered connection between the Mediterranean and Red Sea. Together, these cases show how river and waterway systems operate as environmental, economic, and political landscapes (figure 2).

Figure 1. Map of the Nile River. Photo credit: World Atlas. Reprinted with copyright permission of the Managing Editor of the Open Journal of Soil Science.

Figure 2. Power pylons at the power plant of the Aswan High Dam. Photo credit: Vyacheslav Argenberg. Reprinted with copyright permission of the Managing Editor of the Open Journal of Soil Science.

Q: What were the most difficult aspects of the research?

A: The most difficult aspect was obtaining reliable, locally grounded information in politically sensitive regions, especially within the Jordan River watershed. Field access for an American researcher was often difficult or impossible because of the Israel-Arab conflict and related security concerns. For that reason, collaboration with co-authors who lived in the watershed or country was essential. In some cases, however, potential collaborators asked for their names to be removed because of concerns for their own safety or the safety of their families.

Q: Did anything during the research surprise you?

A: One point that surprised me was the extent of Soviet involvement in the design, financing, and construction of the Aswan High Dam, together with the participation of Egyptian engineers and workers. This history is important because it shows that river engineering is never only a technical matter; it is also connected to international politics, development strategy, and state capacity.

Q: Which environmental processes described in the book are the most underestimated?

A: One underestimated process is the environmental effect of connecting the Mediterranean Sea and the Red Sea by means of the Suez Canal. The canal became an economic lifeline for Egypt, but it also changed ecological connectivity between marine systems. The removal of a salinity and geographic barrier allowed animals and plants from the Red Sea and Indo-Pacific region to colonize parts of the eastern Mediterranean.

Another underestimated issue is the cumulative impact of port activity, chemical storage, shipping, shoreline change, and land-cover transformation. These processes can affect air quality, water quality, ecological stability, and community health. They do not always appear dramatic at first, but over decades their effects can become substantial.

Q: How are environmental systems connected with political or military processes in this topic?

A: The Suez Canal illustrates this connection clearly. After the 1949 armistice between Israel and its Arab opponents, Egypt denied use of the canal to Israel and to ships trading with Israel. The canal was then closed during the Suez Crisis of 1956-1957, and again after the Arab-Israeli conflict of June 1967. During these periods, the canal was not merely a waterway but also a geopolitical front line (figure 3).

Figure 3. Israel borders with soil tunnel locations. Map credit: Mic Greenberg. Reprinted with copyright permission of the Managing Editor of the Open Journal of Soil Science.

Several ships were trapped in the canal during the first closure, and during the second closure 15 ships, later known as the Yellow Fleet, were stranded in the Great Bitter Lake. The canal reopened in June 1975, and after the 1979 peace treaty between Egypt and Israel, ships of all registrations again had access to the waterway. These events

show that water infrastructure can be simultaneously an economic asset, a strategic chokepoint, and an environmental system.

Q: What should readers understand after reading this work?

A: Readers should understand that river landscapes are dynamic socio-ecological systems. They are shaped by floods, droughts, sediment movement, channel change, land use, engineering, political decisions, and community needs. The same river can support agriculture, transport, hydropower, fisheries, cities, cultural identity, and public health; it can also become a pathway for pollution, disease risk, conflict, and ecological degradation.

The broader lesson is that change is the only certainty in river systems. Managing rivers therefore requires resilience: the capacity to adapt to uncertain future risks while protecting soil, water, ecosystems, and human communities.

Q: Who is this book intended for?

A: The book is intended for public and private landowners, river-basin managers, policymakers, and researchers concerned with the great rivers of Africa and the Middle East and with the Suez Canal. It may also be useful for soil scientists, wetland specialists, hydrologists, geologists, geomorphologists, conservationists, public-health specialists, urban planners, economists, agronomists, foresters, sociologists, geographers, and readers interested in river landscapes generally.

Q: Which chapter is personally most important to you?

A: Chapter 3, on the need for international cooperation between Israel and other Middle Eastern nations to protect the Jordan River landscape, is especially important to me. The Jordan River watershed shows how environmental degradation, water scarcity, agricultural waste, untreated sewage, saline inputs, and military activity can intersect in a politically sensitive region.

Soil tunnels in the Jordan River watershed and along the borders of Israel, Syria, and Lebanon have been used for military movement, smuggling, and storage of rockets, missiles, and ordnance. Their construction and destruction can have environmental and human-health consequences. The research therefore argues for a multi-country clean-up, mitigation, and protection plan for the Jordan River.

Q: How does this book relate to current global environmental challenges?

A: The Congo River is central to this question. It is one of the world's largest rivers and is associated with extensive water resources, fertile soils, and major mineral deposits, including copper, cobalt, diamonds, uranium, coltan, gold, and oil. Yet the Democratic Republic of the Congo has experienced severe poverty, institutional weakness, conflict, and resource exploitation (figure 4-5).

The Congo River also has major hydropower potential and is often discussed as a possible energy lifeline for Africa. However, hydropower development must be balanced against social and environmental costs, including resettlement, loss of

agricultural land, reduced food security, ecological disruption, and disease risk. The challenge is not simply to produce more power, but to design development in a way that improves livelihoods rather than reproducing extraction and vulnerability.

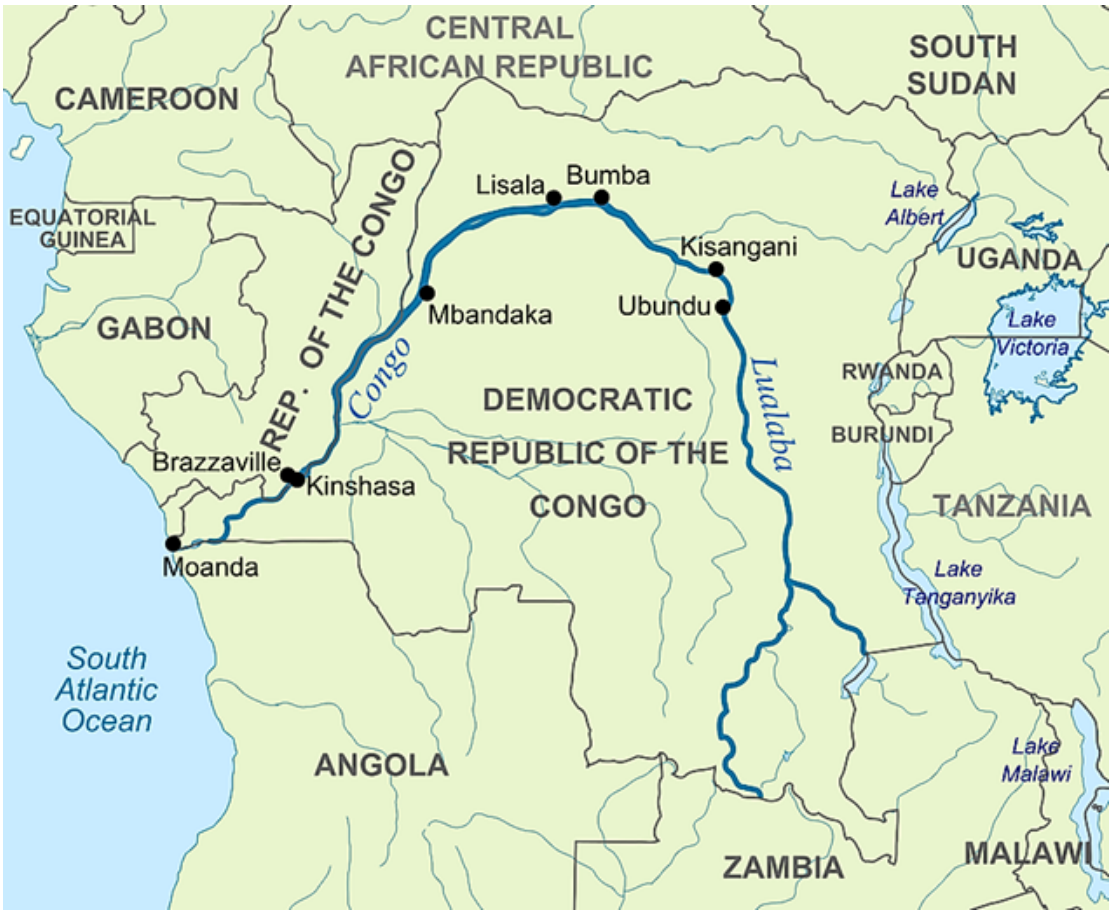

Figure 4. Congo map. Map credit: South Atlantic. Reprinted with copyright permission of the Managing Editor of the Open Journal of Soil Science.

Q: Are the problems discussed in the book improving or worsening today?

A: In many respects, they are worsening. In the eastern Congo, armed conflict and competition over resources continue to affect communities and institutions. Roads, healthcare, education, and public administration remain fragile in many areas. Mineral extraction has generated enormous wealth, but much of that wealth has not translated into broad public benefit for the people living above those resources.

This is one of the central tragedies of the region: natural abundance has not automatically produced social well-being. Without stronger governance, environmental protection, and community-centered development, river-basin resources can deepen inequality and vulnerability rather than reduce them.

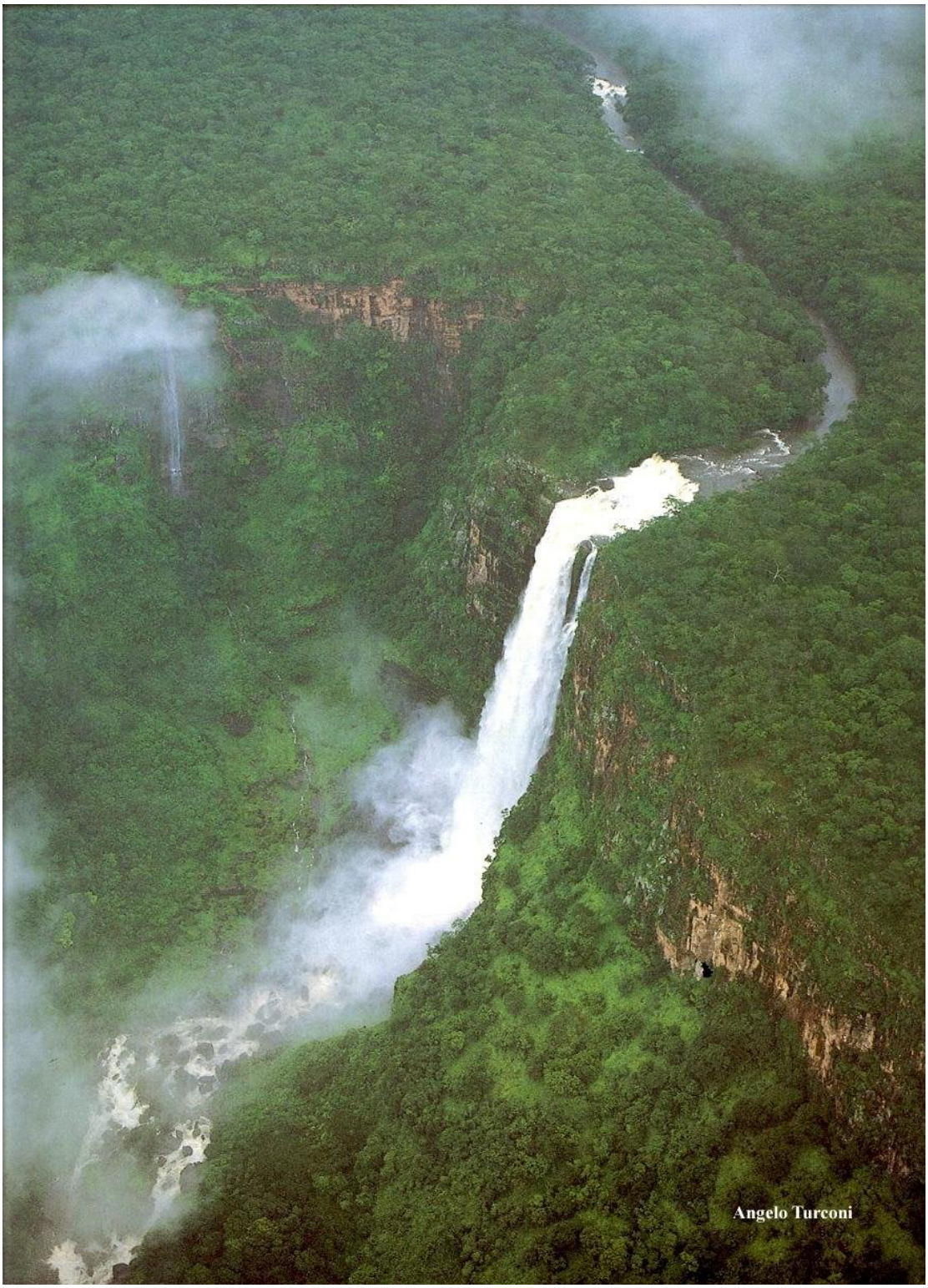

Figure 5. Congo River falls over an escarpment. Photo credit: Angelo Turconi / flanderimage.com. Reprinted with copyright permission of the Managing Editor of the Open Journal of Soil Science.

Q: Climate change and increasing climate variability are making river systems less predictable in many parts of the world. How might these changes affect the Nile, Jordan, and Congo basins and the Suez Canal,

especially flood frequency, drought risk, sediment trapping, soil erosion, agricultural productivity, and the long-term reliability of waterways?

A: The Aswan High Dam provides an important example. It brought major economic benefits by regulating the annual Nile flood, storing water, supporting irrigation, and generating electricity. At the same time, sediment trapping in Lake Nasser reduced the downstream delivery of nutrient-rich silt that historically supported Nile floodplain and delta agriculture. This has contributed to erosion in the Nile Delta and to changes in agricultural and coastal systems.

Climate variability may intensify these problems by increasing the uncertainty of floods, droughts, sediment transport, and water availability. In the Jordan River basin, climate stress interacts with water diversion, pollution, and political constraints. In the Congo Basin, hydrological change could affect hydropower reliability, river transport, floodplain agriculture, and ecosystems. Along the Suez Canal, sea-level rise, port activity, shoreline change, and land-cover transformation may increase risks to infrastructure, ecosystems, and communities.

The policy lesson is that river development must include long-term monitoring, sediment management, water-quality protection, shoreline protection, and institutional cooperation across borders.

Q: How did the decision to build the Suez Canal affect farmers and local communities in the adjacent upland, and were their voices adequately considered in the decision-making process?

A: The canal was constructed through an arid corridor rather than through a densely settled agricultural landscape. For that reason, the immediate effect on established farming communities in the adjacent desert upland was limited compared with the effects of many river-dam projects. However, the broader point remains important: nineteenth-century infrastructure decisions were rarely based on modern standards of public consultation, environmental impact assessment, or community participation.

Q: Your book shows that river management is not only a scientific or engineering problem, but also a political, legal, economic, and social one. What does this reveal about the limits of expertise in managing large river systems?

A: It shows that technical expertise is necessary but not sufficient. Engineers and scientists can measure flow, sediment, shoreline change, water quality, and ecological impacts, but decisions about large rivers also involve economic priorities, legal authority, political power, military security, and public values.

The Suez Canal demonstrates this problem. It improved navigation and shortened maritime routes, but it also created an ecological connection between two marine systems, increased the importance of port activity, and introduced risks related to invasive species, chemical storage, air quality, groundwater contamination, and coastal vulnerability. Expert analysis can identify these risks, but governance determines

whether they are addressed. The limits of expertise become clear when scientific knowledge is not integrated into long-term public decision-making.

Q: If you could recommend one major change in river and floodplain management policy based on this book, what would it be?

A: I would recommend that river and floodplain policy be organized around resilience. This means preparing for risks that cannot be predicted fully, protecting soil and water resources, maintaining ecological connectivity where possible, reducing pollution, and ensuring that development decisions account for long-term social and environmental consequences.

Q: Which future research directions emerge from this work?

A: The next step is to expand the research on great rivers and waterways to include additional systems in Western Asia and Eastern Europe, including the Volga, Dnieper, Danube, and Rhine rivers. Comparative work across these river basins may help clarify how pollution, war, climate variability, navigation, hydropower, agriculture, and public health interact in different political and ecological settings.

Q: If readers remember only one idea from the book, what should it be?

A: Change is the only certainty in river systems. River management must begin from that fact.

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The Editorial Board of the journal "Pollution and Diseases" wishes you continued scientific success, new discoveries, and inspiration in your work.

Conflict of Interest

The authors declare no conflict of interest.

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Data Availability Statement

No new data were created or analyzed in this study.

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