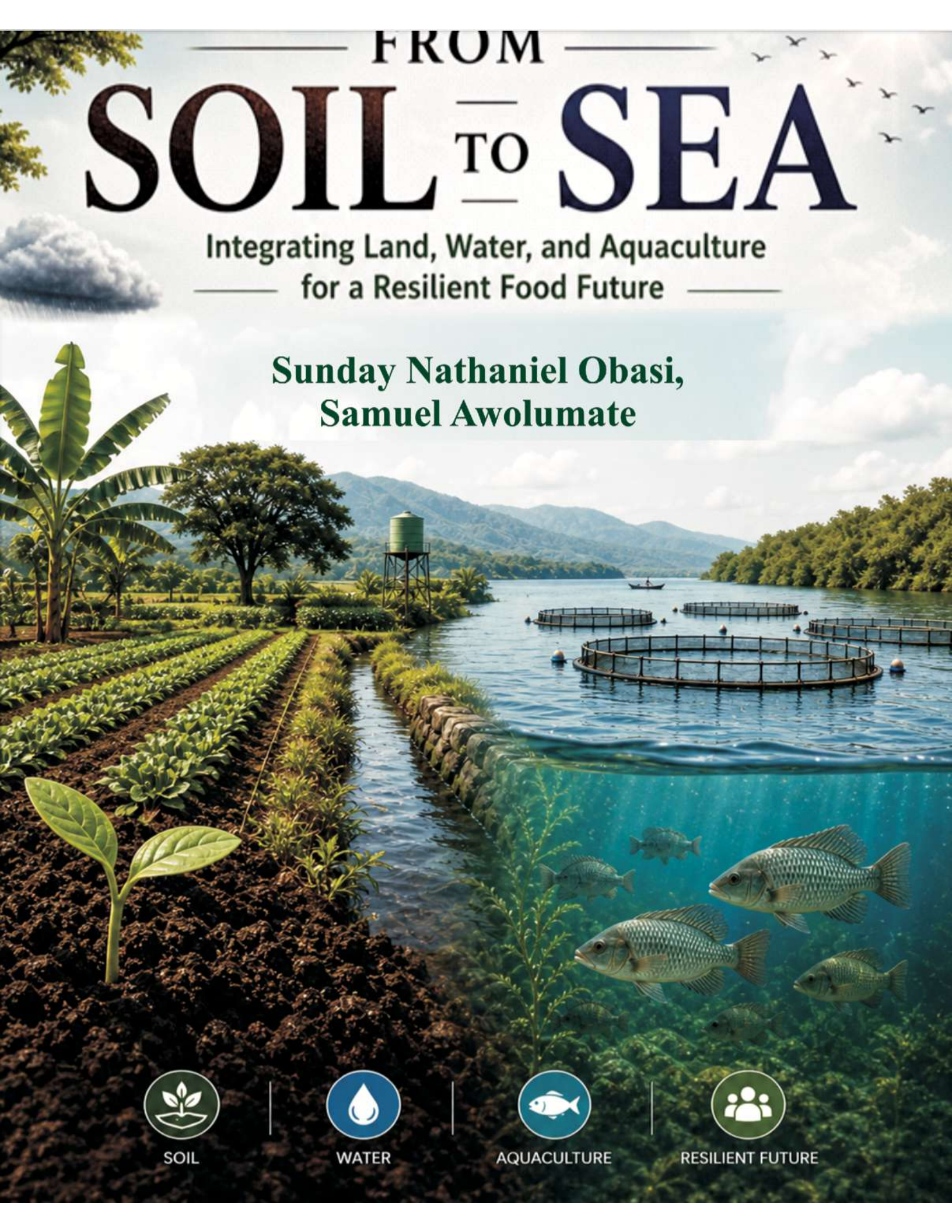
FROM SOIL TO SEA

Integrating Land, Water, and Aquaculture for a Resilient Food Future

Sunday Nathaniel Obasi,
Samuel Awolumate



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Dedication

This book is dedicated to our parents late Mr. & Mrs. Akpa Paul Obasi as Pa Matthew & Mrs Modupe Awolumate for investing their hard-earned resources on us, impacting us with the knowledge which has translated into this readable piece. May the Almighty God bless them so immensely in the mighty name of Jesus, Amen!

Foreword

Water does not recognize the boundaries we draw on maps, nor do nutrients, sediments, or the organisms that depend on them. What happens in a field, a ditch, or a roadside drain is carried quietly but persistently through streams, wetlands, and estuaries, shaping fisheries, aquaculture, and the livelihoods that depend on them. This book embraces that continuity. It follows a simple but powerful idea: that land and water are not separate domains, but parts of a single, connected system that must be understood and managed as one.

At a time when agriculture is under pressure to produce more, waters are under pressure to remain clean, and coastal systems are under pressure to sustain life and livelihoods, the need for integrated thinking has never been greater. Too often, solutions are pursued in isolation—soil fertility without hydrology, water quality without production, aquaculture without upstream context. The result is inefficiency at best and failure at worst.

This volume offers a different path. It brings together the science of soils, hydrology, water quality, and aquatic production with the practical realities of design, operations, governance, and finance. It does not stop at explaining processes; it translates them into workable systems with sizing rules, operational playbooks, monitoring frameworks, and decision tools that can be applied in the field, on farms, and in policy settings.

What stands out is its insistence on timing and pathways. The recognition that a few critical events, storms, heatwaves, and bloom periods, drive much of the system's behavior, reframes how we think about management. It shifts attention from averages to moments that matter, from static plans to responsive operations. In doing so, it aligns engineering with ecology and practice with reality.

Equally important is the book's attention to governance and people. Technical solutions alone do not endure. They must be supported by incentives, transparency, and trust, which the author aptly frames as the "hydraulics of behavior." By linking measurement to action, and action to accountability, the book shows how systems can be not only designed but sustained.

The inclusion of playbooks, case studies, field methods, and capstone frameworks makes this work especially valuable. It serves not just as a reference, but as a guide for doing, for students learning to integrate disciplines, for practitioners improving

systems under real constraints, and for policymakers seeking credible, implementable solutions.

This book is an invitation: to look beyond silos, to follow flows, and to design with both rigor and humility. It reminds us that resilience is not built in a single place, but across connections from soil to sea; and that progress comes from aligning how water moves with how we manage.

Those who engage with these pages will find not only knowledge, but a practical framework for action. And in that, the book makes an important contribution to the future of sustainable agriculture, water management, and aquatic production systems.

Prof. C. M. Mbah
Department of Soil Science,
Ebonyi State University.

Acknowledgments

To farmers, fishers, students, and communities who shared data, patience, and wisdom. And to the readers who will turn these pages into wetlands, better soils, cleaner estuaries, and fuller nets.

Preface

This book began with a simple observation: the problems we face in agriculture, water quality, fisheries, and aquaculture are rarely caused in one place, and they are never solved in one place. A decision made in a field can shape a river; a storm in a watershed can determine whether a cage farm thrives or fails. Yet we often study, design, and manage these systems in isolation.

As researchers and practitioners working across soil systems, land use planning, fisheries, and aquaculture, we have spent years examining how land, water, and production systems interact under real-world conditions. These experiences, from terrestrial landscapes to aquatic environments, converge on a shared question: how do interconnected systems respond to stress, and what determines their capacity to sustain productivity under change?

This book is our attempt to answer that question by following a single, unifying thread: movement. Water, nutrients, sediments, and oxygen are constantly in motion across landscapes, rivers, and aquatic systems. Understanding their pathways, and especially their timing reveals opportunities to improve productivity while reducing risk. Over time, it became clear that managing totals is not enough; we must also manage when and how things move.

The goal of this book is therefore practical. It is not only to explain processes, but to translate them into design, operations, and decisions. You will find equations and concepts, but also playbooks, SOPs, dashboards, and case studies. The intention is that you can move from reading to doing, from understanding a hydrograph to shaping one, from measuring water quality to acting on it, from identifying risk to building systems that absorb it.

The structure of the book reflects this progression:

- *We begin with foundations - soils, hydrology, and water quality.*
- *We move into design - wetlands, channels, and aquaculture systems.*
- *We then address operations, markets, and governance - because systems only work if they can be run and sustained.*
- *Finally, we bring everything together in playbooks, methods, and capstone applications.*

Throughout, we have tried to keep two principles in focus. First, simplicity with rigor: use methods that are strong enough to be credible, but simple enough to be applied. Second, integration over perfection: a set of well-coordinated actions often outperforms a single "perfect" solution.

This book is written for multiple audiences; students, practitioners, engineers, and policymakers, but with a common expectation: that you are willing to think across boundaries. You do not need to be an expert in every field, but you do need to be open to connecting them.

Many of the ideas presented here have been shaped by field experiences, collaborations, and the growing recognition that sustainable systems must be both technically sound and socially grounded. We are grateful to colleagues, students, and communities whose insights and questions have helped refine these approaches.

In the end, this book is not meant to be definitive. It is meant to be useful. The real test of its value lies not in how it is read, but in how it is applied, on farms, in watersheds, in estuaries, and in aquaculture systems.

If it helps you see connections more clearly, design more effectively, and act more confidently, then it has served its purpose.

Dr. S. N. Obasi
Dr. Samuel Awolumate

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SOIL SCIENCE DEPARTMENT

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Memo

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Subject: .....

To: Prof. Nda 2. Mundi

Date: 2nd July, 2026

Dear Sir,

RE: REQUEST TO REVIEW A SCHOLARLY MANUSCRIPT

I write to appreciate a singular honoured accorded to me to undertake an independent review of the manuscript and provide constructive comments that will further enrich the academic quality, technical content and overall contribution to the body of knowledge.

The authors exhibited a deepen scholarly technical and practical experience to come up with this manuscript title: **"From Soil to Sea" Integrating Land, Water and Aquaculture for a Resilient Food Future.** The manuscript is divided into four (4) parts:

1. Part I Foundation: Soil, Water & Flow Dynamics: Understanding the systems which has fourteen chapters
2. Part II Design: Building Integrated Systems: Turning science into physical interventions contain six (6) chapters.
3. Part III Operations, Markets & Governance: Making systems work in reality has three (3) chapters.
4. Part IV Practice: Playbooks, Methods & Capstone (Application, tools and synthesis) contain three (3) chapters.

By and large, the organizational and clarity of the presentation were almost good and fine, though, there were few comments in the manuscript as to its originality or adaptability of some diagrams and data which they thought to answer. I strongly recommend it for teaching, research and professional practice and its suitability for publication after effecting observations pointed out in the manuscript.

1. Sir, below is the bank account detail:
   *Account **Name**: Hassan Alhaji Muhammad*
   Account Number: 3091968320
   Bank Sort code: 011-031149
   First Bank Plc Bauchi Branch

Thank you.

Yours faithfully,



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BOOK REVIEW

Title: From Soil to Sea: Integrating Land, Water and Aquaculture for a Resilient Food Future -

Suggested Title: From Soil to Sea: Integrating Soil, Water and Aquaculture for a Resilient Food Future

Prologue: Book cover is adequate as it aptly showed symbols of soil, water and aquaculture for future with photographs indicating spatial reality. Legitimacy is conferred on the page following title page. Appropriate dedication comes next with a befitting Foreword by an erudite scholar. Acknowledgements to appropriate groups were given. Authors gave a Preface to the book putting it into easily understandable content and context.

Body of the Book: The book was divided into parts and chapters and this was logically presented. Part I with chapters one(1) to fourteen(14)showed deep knowledge about the resources in question while Part II with chapters fifteen(15) to twenty(20) showcased design emphasizing on how to build integrated systems thereby turning the body of knowledge of science into action(physical interventions).Part III with chapters twenty one (21) and twenty two(22) dwells on operations, markets and governance thereby translating into workable realities. Finally, Part IV with chapters twenty three(23) to twenty five(25) hinges on practice exhibiting playbooks, procedures/methods as well as capstones revolving on applications, tools and general synthesis.

Epilogue: This gave a synthesis and a call for action following a availability of aforesaid rich knowledge by the authors.

Federal University of Technology, Owerri, (FUTO)
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Date: _____/2026 _____

ADDENDUM

I. Improve legibility of figures on pages 7,23,47,48, 83,92,111,135,181,196,199,213, 236 ,271, 289,323, 342,360, 362 380,402,404,424, 457 and 467.

II. Change cascade of effects and replace with cascade of negative effects

III. See blank pages between pages 19 and 21, 41 and 43, 225 and 226, 269 and 271, 291 and 293, 297 and 299, 377 and 379.

IV. Delete colon on Box 1.1 pages 16 and 17

V. I Suggest you replace Notes with Remarks on Table 1.1.

In conclusion, I strongly recommend this book to academics, professionals, students for sustainable soil and water resources utilization in order to achieve healthy living of all life-forms including humans.

Professor Emmanuel Uzoma Onweremadu

AHMADU BELLO UNIVERSITY

National Agricultural Extension and Research Liaison Services,
Ahmadu Bello University, Zaria

Professor P. I. Bolorunduro – B.Sc. M.Sc. PhD (Ibadan), MBA (ABU), MA (WACU), Ffs, FISM, FCIGCD
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+234-8037226220, pimo03@yahoo.com; Date: 15/06/2026

The Vice-Chancellor,
National Open University of Nigeria,
Pot 91, Cadastral Zone,
Nnamdi Azikiwe Express Way,
Jabi, Abuja.

The Vice-Chancellor, Sir,

Report on Review of the Book Manuscript – 'FROM SOILTO SEA: Integrating Land, Water, and Aquaculture for a Resilient Food Future'.

i. I have diligently reviewed the manuscript and found it very valuable in advancing knowledge of the circular-integrated agroecology value chain, with benefits including increased food production, environmental sustainability, and healthy product outputs.

ii. Upon implementing the stipulated corrections (aimed at adding value to the scripts), the book will become a masterpiece in disseminating knowledge of agroecological dynamics and their benefits for mankind, and it should be supported for publication.

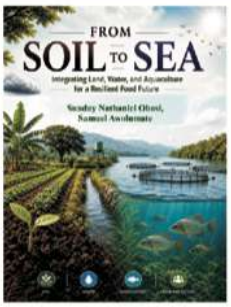
iii. In conclusion, the book's structural logic is well articulated, striking a practical-academic balance and featuring illustrations that are easy for readers to understand.

iv. The publication of the manuscript into a standard textbook is recommended for your support.

A detailed report on the review of the manuscript is attached for further action.
I thank the Vice-Chancellor for giving me this opportunity to contribute to scholarship.

Prof. P. I. Bolorunduro
Reviewer

15/06/2026



This book examines how problems in agriculture, water quality, fisheries, and aquaculture are interconnected and rarely solved in isolation. Using the concept of movement, the flow of water, nutrients, sediments, and oxygen. It argues that managing the timing and pathways of these flows, not just totals, boosts productivity and reduces risk. It blends theory with practical tools like equations, SOPs, dashboards, and case studies to move readers from analysis to action. Covering foundations, design, operations, and governance, the book follows two principles: simplicity with rigor and integration over perfection. Aimed at students, practitioners, engineers, and policymakers, it's designed to help users design better systems and act confidently in real-world settings.



Dr. Sunday Nathaniel Obasi is a seasoned academic, researcher, and soil scientist with over a decade of experience at the National Open University of Nigeria, where he serves as Senior Lecturer in Crop and Soil Sciences. He holds a Ph.D., M.Sc., and B.Sc. in Soil Science from the Federal University of Technology Owerri, specializing in Soil Survey and Land Use Planning. His research focuses on soil characterization, land suitability, and integrating GIS and AI in agriculture. He has led funded projects on soil productivity and climate-resilient systems, authored peer-reviewed articles and textbooks, and held key administrative roles. Recognized with awards in AI and grant writing, he holds certifications in AI, Cybersecurity, and Grant Writing, and is an active member of several professional bodies committed to advancing food security and sustainable development.



Dr. Samuel Awolumate is a distinguished academic, researcher, and aquaculture specialist with over a decade of experience at the National Open University of Nigeria, where he serves as Reader in Animal Science and Fisheries. He holds a Ph.D. in Aquaculture and Fisheries Management from the University of Ibadan, an M.Sc. in Fisheries Management, and a Bachelor of Agriculture from Ahmadu Bello University. His research focuses on sustainable aquaculture, fisheries resource management, climate resilience, and entrepreneurship across Nigeria and West Africa. He has led funded projects on alternative feed, business models, and climate-resilient fisheries, and authored peer-reviewed works and course materials. He has held leadership roles and participated in initiatives with the World Bank, Commonwealth of Learning, and iDICE, advancing sustainable aquaculture and open learning.

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