Biodiversity and Natural Resources of Tropical Zones

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Edited by

Bilassé Zongo

Cambridge
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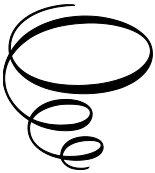

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This book first published 2026

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-0364-6551-3
ISBN (Ebook): 978-1-0364-6552-0

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ACKNOWLEDGEMENTS

The successful organization and scientific achievements of the 2nd Burkina Faso-Senegal International Conference would not have been possible without the unwavering support and contributions of numerous individuals and institutions. We are deeply grateful to all who played a role in making this event a resounding success.

We express our profound gratitude to Professor Hassan Bismarck NACRO, President of Nazi BONI University and Chair of the ceremony. His visionary leadership and steadfast commitment to academic excellence have provided a fertile environment for meaningful scientific exchanges, underscoring the importance of collaboration and innovation.

Our heartfelt thanks extend to Professor Adjima THIOMBIANO, Minister of Higher Education, Research, and Innovation, and Patron of the conference. His enlightened vision for advancing research and education inspired this initiative, and his institutional support greatly enhanced the reach and impact of the event.

We warmly acknowledge the invaluable support of Mr. Roger BARO, Minister of Environment, Water, and Sanitation, and Co-Patron of the conference. His dedication to environmental sustainability, a core theme of this conference, has been a guiding beacon for the discussions held.

We are equally grateful to Professor Irénée SOMDA, Regional Director of Higher Education, Research, and Innovation for the Hauts-Bassins region, and Patron of the ceremony, for his unwavering encouragement and instrumental guidance. Special thanks also go to Mr. Aziz BARRO, CEO of Yelemani Baa SARL, for his collaboration and indispensable support, which added immense value to the event.

Our sincerest appreciation goes to the President and members of the Scientific Committee, whose rigorous evaluation of submissions and dedication to scientific integrity ensured the high quality of the Abstracts and debates presented in this volume.

We also recognize the vital contributions of our institutional partners, including the Regional Council of Hauts-Bassins, the Municipalities of Sya, PlantVillage Burkina, the French National Research Institute for Sustainable Development (IRD), the National Fund for Research and Innovation for Development, the National Council for Sustainable Development, the Ministry of Environment, Water, and Sanitation, and TreeAid. Their support significantly bolstered the scientific and logistical capacities of the conference.

To the members of the Organizing Committee, we extend our heartfelt thanks for their relentless dedication and meticulous efforts, ensuring the seamless execution of every aspect of this event.

Finally, we express our gratitude to all invited institutions and participants who honored this conference with their active presence and insightful contributions. Their engagement enriched the discussions and fostered collaborations, enabling us to collectively address the pressing challenges of sustainable ecosystem management in the context of climate change.

This publication is a testament to the collective efforts and shared vision of advancing scientific research for the benefit of humanity and our planet.

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INTRODUCTION

Aquatic and terrestrial ecosystems host an extraordinary diversity of animal, plant, and microbial species. However, this biodiversity, alongside vital natural resources, is under increasing pressure from both climatic and anthropogenic factors. These pressures jeopardize species survival and lead to significant ecological degradation. Unregulated and intensive exploitation of resources underscores the urgency of preserving species and their habitats to ensure the sustainability of ecosystems and the invaluable services they provide.

The Convention on Biological Diversity (CBD) seeks to address these challenges by emphasizing the conservation of biodiversity, the sustainable use of its components, and the equitable sharing of benefits derived from genetic resources.

In sub-Saharan Africa, the awareness of conservation challenges remains limited, and sectors such as agriculture and tourism often fail to adequately integrate biodiversity considerations. It is essential to bolster scientific knowledge and promote the use of renewable technologies to safeguard natural resources and mitigate the effects of climate change. Achieving this goal requires a concerted effort involving researchers, policymakers, and local stakeholders, alongside robust investments in education and research to foster sustainable resource management practices.

The second edition of the Burkina Faso-Senegal International Conference emerges as a platform for scientific exchange and collaboration in this context. Organized by Nazi BONI University (Burkina Faso) and Alioune Diop University of Bambey (Senegal), this event provides an invaluable opportunity for researchers, students, and decision-makers to address the pressing challenges of biodiversity conservation in the face of climate change.

The conference contributions are structured around four thematic axes:

1. Biodiversity and Species Conservation Strategies

This axis focuses on the inventory and preservation of terrestrial and aquatic biodiversity, with particular attention to endemic and endangered species in

tropical zones. It explores sustainable conservation strategies, emphasizing the role of protected areas and ecological corridors in maintaining species diversity.

2. Sustainable Exploitation and Management of Natural Resources

This theme promotes sustainable practices in resource-intensive sectors such as agriculture and forestry. It highlights the integration of renewable energy sources and provides examples of integrated management approaches that balance human needs with resource conservation.

3. Tropical Ecosystems and Adaptation to Climate Change

This axis examines the impacts of climate change on tropical ecosystems and proposes adaptive strategies for ecosystems and human communities. It underscores the role of biodiversity in mitigating climate impacts and enhancing ecological resilience.

4. Participatory Governance and Policies for Biodiversity and Tropical Ecosystem Management

This theme emphasizes the value of traditional knowledge in sustainable management, fosters local community participation in governance, and analyzes policy frameworks to strengthen conservation efforts. It also explores international cooperation to harmonize policies for tropical ecosystem protection.

A total of 107 Abstracts were selected for inclusion in this volume, reflecting the breadth and depth of the research presented during the conference. These contributions highlight the diversity of perspectives and innovative approaches required to address the multifaceted challenges of biodiversity conservation and sustainable resource management.

Through these thematic areas, the conference facilitates an interdisciplinary dialogue that bridges science, policy, and practice, enabling participants to collectively address the complex interplay between biodiversity conservation and sustainable development in the context of climate change.

CHAPTER ONE:

BIODIVERSITY AND SPECIES CONSERVATION STRATEGIES

1

THE ROLE OF ECONOMIC SOVEREIGNTY IN THE CONSERVATION OF NATURAL RESOURCES IN AFRICA

AFELU BAREREMNA, BAKABIMA DITORGUE, GATONNOU KOMLA & DOURMA MARRA

Abstract

Biodiversity conservation depends on the relative value given and recognized to this resource by the beneficiary populations and resource managers. Based on forestry and timber statistics, it is noted that African countries are mainly exporters of raw timber (more than 90% of timber exploitation) while industrialized countries, first importers of raw wood in Africa (more than 99%), are those who earn more than 95% of the profits derived from the added value of the industrial wood processing sector. The monetary benefits of the exploitation of raw wood are insufficient to offset the cost of the negative externalities caused on biodiversity and the associated sensitive ecosystems. Environmental and social impact assessment efforts initiated at the beginning of the projects can only correct this deficit if the economic value (market and non-market) environmental goods and services provided by this biodiversity are valued and compensated at fair local value. The international standards of lobbies prove to be out of step with the relative local value attached to an environmental good and service. A new evaluation grid based on local cultural value, externalities caused by its exploitation and the costs of its replacement is proposed. From trees of various diameters and heights of *Khaya senegalensis, Pterocarpus erinaceus and Milicia excelsa*, the average market value is estimated at 6,341±705 XOF/m^3 against a revised value of 220,500±21707 XOF due to a revaluation rate of 35±0.64. Faced with a market economy based on competition, the lack of control over the economic value of natural resources and inherent speculation constitutes a

handicap in the arguments in defending environmental protection in sustainable development approach.

Keywords: Environmental goods and services, economic value, sovereignty, development, sovereignty.

2

PRELIMINARY RESULT ON GASTROINTESTINAL PARASITES OF PIGS IN THE TONKPI REGION, CÔTE D'IVOIRE

BLE YATANAN CASIMIR
& DIOMANDÉ MACHIAMY

Abstract

Pig farms in the Tonkpi region are faced with various difficulties, such as the lack of control over breeding and the parasitic diseases that hamper its development. The aim of this study was to characterize the farms and take stock of the parasitic diseases. The research method consisted of a survey of 22 farmers in the departments of Man and Biankouma, followed by a parasite analysis of 60 faecal samples from apparently healthy pigs. Two coprology methods were used to search for parasite eggs. These were the qualitative sedimentation and flotation methods. The results of the survey showed that pig farming in the departments is dominated by men (86.4%) compared with 13.6% for women. The majority of livestock buildings are of traditional construction (68.2%), with foot baths found on only 4.5% of farms. In terms of the general state of health of the farms visited, disinfection was practiced by 72.7%. Disease symptoms reported by farmers were dominated by diarrhea (63.6%), scabies (54.5%) and mastitis (31.8%). Analysis of the samples showed an overall parasite infection rate of 85%, with three parasite species identified: *Ascaris suum* (58,3%), *Strongyloides* spp (41,7%) et *Oesophagostomum* spp (28,3%). Pig farms in the Biankouma department were the most infected, with 80% contaminated with *Ascaris suum*, while on farms in Man, pigs were more contaminated with Strongyloides spp. (40%). However, statistical expression showed that pig contamination was not related to the sampling area ($p = 0.73$). In view of the results, particular attention needs to be paid to the pig sector in order to improve farms for better productivity.

Keywords: Parasites, Pig, Tonkpi Region

3

Diversity and Distribution of Benthic Macroinvertebrates in Comoé National Park, Northeastern Côte D'Ivoire

Diabate Maboridjon,
Aboua Benie Rose Danielle,
Kamelan Tanoh Marius,
Ouattara Amara,
Gnamien Aristide Tonin,
Kouamelan Essetchi Paul,
Cisse Mamadou & Ekissi Dimitri

Abstract

The demands of development centered around the Comoé River have given rise to various human activities (illegal gold panning, poaching, illegal fishing and the use of chemical inputs in cashew nut cultivation) in northeastern Côte d'Ivoire. These illegal activities are increasingly threatening aquatic environments, particularly those of the Comoé National Park. The aim of this study is to determine the ecological quality of the waters of the Comoé National Park. To this end, biological samples were collected using the Van Veen Benne in five field campaigns over the course of one year. The results showed a total of 138 macroinvertebrate taxa belonging to 63 families, 20 orders and 6 classes recorded at all the stations visited. The Insect class is the largest, with 115 taxa, 45 families and 9 orders. The Park is characterized by the presence of Oligochaetes, Chironomidae and Tubificidae, species capable of tolerating conditions altered by human activities or disturbed areas. *Chironomus* sp. (an indicator of anthropized environments and organic pollution) is the most dominant species in the

macroinvertebrate population surveyed, with 31%. On the other hand, certain areas are characterized by a strong presence of *Ephemeroptera* and *Trichoptera*, species that are sensitive to pollutants and environmental alterations. The taxonomic richness of the benthic population varies from station to station and from season to season. Taxonomic richness was highest in the rainy season and lowest in the dry season. This study shows that variations in the richness and abundance of the zoological groups obtained tend to follow a zonation of substrate type and a seasonal evolution.

Keywords: Comoé National Park, Biological diversity, Benthic macroinvertebrates, Water quality, Côte d'Ivoire.

4

Conservation Status and Management of Fish Fauna in A Mining Environment at Zouan-Hounien, West Côte d'Ivoire

Doffou Richard Jean Olive,
Boussou Koffi Charles,
Kouame Kouamé Martin,
Konan Kouakou Séraphin
& Kouassi Kouakou Lazare

Abstract

This study was conducted to assess the fish diversity and conservation status of the Cavally River in an area of intense mining activity. Three sampling zones were defined: upstream of the mining zone, in the mining zone and downstream of the mining zone. Sampling was carried out using experimental and artisanal fisheries (monofilament, multifilament, creel, hawk and seine gillnets). A total of 76 species belonging to 8 orders, 20 families and 37 genera were observed. Twelve (12) species are of conservation interest and merit special attention according to the IUCN (2021). The greatest number of species (72) were encountered upstream and the smallest number (52) in the direct impact area. This area, with low diversity, is characterized by high anthropogenic pressure, such as obstruction of the stream, increase in suspended solids, modification of the hydrological regime and widening of the stream bed. To limit the loss of ichthyological diversity due to the realization of three (3) new meanders, aquatic organism transfer activities were carried out. A hatchery was built to produce species of conservation interest (*Coptodon walteri* and *Micralestes eburneensis*) and to seed the Cavally River. On the other hand, provide the community with Oreochromis niloticus fry for fish farming

activities. This habitat, deeply disturbed by mining, is a danger to endemic species whose distribution is limited. These are of real conservation interest. In addition, risks of bioaccumulation of substances such as mercury and arsenic exist in populations with significant health consequences.

Keywords: Cavally River, Mining area, Endemic species, Conservation, Côte d'Ivoire