Environmental Degradation

Causes and Remediation Strategies

Volume 1

Editor

Vinod Kumar

Co-editor(s)

Jogendra Singh Pankaj Kumar

© 2020



AGRO ENVIRON MEDIA

IMPRINTS

No part of this publication may be reproduced in any form or by any means, electronically, mechanically, by photocopying, recording, or otherwise, without the prior permission of the owner. Trade or brand names used in this book is solely for the purpose of providing specific information. Mention of a trade name, propriety product, or specific equipment does not constitute a guarantee or warranty by the author(s) and editor(s) and does not imply approval of the named product to the exclusion of other similar products. The views published in the articles are those of authors and not of the editors or publisher.

COVER IMAGE(s) CREDIT

https://unsplash.com/

PUBLISHED BY

Agro Environ Media,

Publication Cell

Agriculture and Environmental Science Academy (AESA),

86, Gurubaksh Vihar (East),

Kankhal, Haridwar-249408, (Uttarakhand), INDIA

Email: agroenvironmedia.aesa@gmail.com

Website: https://www.aesacademy.org

ISBN: 978-81-942017-1-7 (Print)

ISBN: 978-81-942017-2-4 (Online)

DOI: 10.26832/aesa-2020-edcrs

This eBook is published under Creative Commons Attribution 4.0 International License.

Copyright © 2020 All rights reserved by AEM - AESA

Environmental Degradation

Causes and Remediation Strategies Volume 1

Editors

Dr. Vinod Kumar
Assistant Professor (Senior Grade)
Department of Zoology and Environmental Science,
Gurukula Kangri University, Haridwar, India

Co-editor(s)

Mr. Jogendra Singh
Research Scholar,
Department of Zoology and Environmental Science,
Gurukula Kangri University, Haridwar, India

Mr. Pankaj Kumar
Research Scholar,
Department of Zoology and Environmental Science,
Gurukula Kangri University, Haridwar, India



© 2020 | Agro Environ Media | AESA



Dr. Vinod Kumar (M.Sc., Ph.D., F.A.N.S.F.) is working as Assistant Professor of Environmental Science in the Department of Zoology and Environmental Science, Gurukula Kangri University, Haridwar (Uttarakhand), India. He has an academic experience of about 10 years and research experience of about 14 years. His interests of research area are Agro-ecology, Environmental Pollution and Bioremediation Research and Wastewater Management. He has published more than 100 research papers in national and international journals of repute. He is the founder President of Agriculture and Environmental Science Academy and Editor-in-Chief of the Journal of Archives of Agriculture and Environmental Science. He is serving as Editorial Board member and reviewer of about 10 reputed international journals. The Google citation: 900; h-index: 19; Scopus Citation: 220; h-index: 10 is in his credit.

Mr. Jogendra Singh works in the fields of water pollution, wastewater management, phytoremediation, agro-ecology, and bioenergy production. He received his master degree in the subject of Environmental Science from Gurukula Kangri Vishwavidyalaya, Haridwar, India. He has qualified Indian Council of Agricultural Research (ICAR-NET) National Eligibility Test in the year of 2014. He has also awarded Rajiv Gandhi National Fellowship (RGNF) funded by the University Grants Commission (UGC), New Delhi, India. He has been working as Editorial secretary of the international journal Archives of Agricultural and Environmental Science and Journal Applied and Natural Science, Haridwar India. He has published 27 research articles (cumulative impact factor 28.47 in the national and international peer-reviewed journals.





Mr. Pankaj Kumar is a young researcher working in the field of environmental pollution, bioremediation and bioenergy. He received his master degree in Environmental Science from Gurukula Kangri Vishwavidyalaya, Haridwar with gold medal. He has qualified NTA-UGC NET (June 2019). He has published 14 research papers in national and international peer reviewed journals with a cumulative impact factor of 21.71. He has 1 edited book, 11 conferences abstracts, and 2 book chapters in his credit. He has been working as Editorial secretary of the international journal Archives of Agricultural and Environmental Science.

CONTRIBUTORS

Contributor	Affiliation
Aditi Bisht	Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Akanksha Bisht	Department of Medicinal and Aromatic Plants, Uttarakhand Altitude Plant Physiology Research Centre, Hemvati Nandan Bahuguna Garhwal University, Birla Campus , Srinagar-249161 (Uttarakhand), India
Alok Kumar Sahoo	Subject Matter Specialist (Agricultural Extension), KVK, Bargarh, OUAT, Gambharipali-768102, India
Aman Verma	Insect Biodiversity Laboratory, Department of Zoology, D.S.B. Campus, Kumaun University, Nainital – 263002, Uttarakhand, India
Amit Kumar Sharma	Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Ardeep Kumar	Department of Agronomy, College of Agriculture, G.B. Pant University of Agriculture and Technology, Pantnagar - 263153 (Uttarakhand), India
Ateeque Ahmad	Department of Geography, Faculty of Science, Aligarh Muslim University, Aligarh (Uttar Pradesh), India
Bashir Adelodun	Department of Agricultural Civil Engineering, Kyungpook National University, Daegu, Korea; Department of Agricultural and Biosystems Engineering, University of Ilorin, PMB 1515, Ilorin, Nigeria
Elango K.	Department of Entomology, Tamil Nadu Agricultural University, Coimbatore-641003, India
Ettammal Sreenivasan	Technical Manager & Head, R&D, The Western India Plywoods Ltd, Mill Road, Baliapatam P.O, Kannur, Kerala – 670010, India
Ezzat Khan	Department of Chemistry, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa, Pakistan
Fidelis Odedishemi Ajibade	Department of Civil and Environmental Engineering, Federal University of Technology, Akure, Nigeria; Research Centre for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing 100085, China
Hashim Olalekan Bakare	Department of Chemical Engineering, University of Ilorin, PMB 1515, Ilorin, Nigeria
Hazrat Ali	Department of Chemistry, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa, Pakistan
Jogendra Singh	Agro-ecology and Pollution Research Laboratory, Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India

CONTRIBUTORS CONTINUED ...

Contributor	Affiliation
Jonatas da Silva Castro	Nilton Lins University Manaus, Amazonas Brazil
K. Sankara Rao	Department of Entomology, CCS Haryana Agricultural University (CCSHAU), Hisar-125004, India
Kyung Sook Choi	Department of Agricultural Civil Engineering, Kyungpook National University, Daegu, Korea; 7 Institute of Agricultural Science & Technology, Kyungpook, National University, Daegu, Korea
Madhumita Goala	Nehru College, Assam University, Labocpar Part II, Cachar 788098 (Assam), India
Manoj Kumar Arya	Insect Biodiversity Laboratory, Department of Zoology, D.S.B. Campus, Kumaun University, Nainital – 263002, Uttarakhand, India
Neeraj Pandey	Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Nitin Kamboj	Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Pankaj Kumar	Agro-ecology and Pollution Research Laboratory, Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Piyush Kumar	Agro-ecology and Pollution Research Laboratory, Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Pradip Kumar Maurya	Department of Zoology and Environmental Science Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Qiaoqiao Zhou	College of Resources and Environment, Hunan Agricultural University, Changsha 410128, China
Rajesh Kumar	Rhizosphere Biology Laboratory, Department of Microbiology, Babasaheb Bhimrao Ambedkar University (A Central University), Vidya Vihar Raebareli Road, Lucknow, India
Satinder Pal Kaur Malhotra	ICFAI Tech School, ICFAI University Dehradun, Rajawala Road, Selaqui, 248197, Uttarakhand, India
Shweta Sahni	Department of Microbiology, School of Basic and Applied Sciences, Shri Guru Ram Rai University, Dehradun-248001, Uttarakhand, India
Sk Ajim Ali	Department of Geography, Faculty of Science, Aligarh Muslim University, Aligarh (Uttar Pradesh), India
Sonika Kumari	Agro-ecology and Pollution Research Laboratory, Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Sudhanshu Bala Nayak	Department of Entomology, CCS Haryana Agricultural University (CCSHAU), Hisar-125004, India
Swati Rastogi	Rhizosphere Biology Laboratory, Department of Microbiology, Babasaheb Bhimrao Ambedkar University (A Central University), Vidya Vihar Raebareli Road, Lucknow, India

CONTRIBUTORS CONTINUED ...

Contributor	Affiliation
Taofeeq Sholagberu	Department of Water Resources and Environmental Engineering,
Abdulkadir	University of Ilorin, PMB 1515, Ilorin, Nigeria
Vinod Kumar	Agro-ecology and Pollution Research Laboratory, Department of
	Zoology and Environmental Science, Gurukula Kangri
	Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India
Vishal Kamboj	Department of Zoology and Environmental Science, Gurukula Kangri
	Vishwavidyalaya, Haridwar-249404 (Uttarakhand), India

PREFACE

Today, environmental degradation is the utmost problem leading to the extinction of several living organisms on the earth. Environmental degradation can be seen in the form of lost living forms due to disturbances in the earth's ecosystem. The recent developments in human civilization are the major reason for the degradation of the environment and its quality. This edited book is the compliance of selected reports destined to provide information regarding causes, effects and mitigation strategies of environmental degradation.

The compliance of this book is helpful for academicians, researchers, students, as well as other people seeking the relevant material in current trends of studies on the topic of environmental degradation. The book starts with an introductory chapter providing background information on the topic covering the necessity of the mitigation measures to be taken in order to ensure the conservation of our mother earth. The second chapter discussed the role of disasters leading to the degradation of environmental composition. The role of pesticides in the degradation of agricultural quality is discussed in the third chapter. Special attention is given to the degradation of river systems with reference to exhausting its resources. The book compliance includes many chapters focusing on environmental degradation by wastewater disposal practices. Certain mitigative measures are provided focusing on sustainable utilization of wastewater for agricultural and horticultural applications. The second half of the book includes sustainable utilization of various solid wastes such as spent mushroom compost, flower wastes, wood wastes, non-conventional plant residues, etc. which may cause deterioration of our environment. The last section of the book provides information regarding the impacts of environmental degradation on biodiversity as well as human economics including agriculture.

Lastly, the editors are thankful to the contributors who submitted their precious findings and views related to the book theme and to make it succeeded. We hope that this book will help the readers in its best to provide them the relevant information.

Fditors

TABLE OF CONTENTS

Chapter	Title and author(s)	Pagination
1	An introduction to environmental degradation: Causes, consequence and mitigation Pradip Kumar Maurya, Sk Ajim Ali, Ateeque Ahmad, Qiaoqiao Zhou, Jonatas da Silva Castro, Ezzat Khane and Hazrat Ali	1-20
2	Role of natural disasters in environmental degradation: An overview Nitin Kamboj, Aditi Bisht, Vishal Kamboj, Neeraj Pandey and Akanksha Bisht	21-35
3	Role of pesticide application in environmental degradation and its remediation strategies Sudhanshu Bala Nayak, Alok Kumar Sahoo, Elango K., and K. Sankara Rao	36-46
4	A review on general characteristics, classification and degradation of river systems Vishal Kamboj, Nitin Kamboj and Amit Kumar Sharma	47-62
5	Integration of treated agro-based wastewaters (TAWs) management with mushroom cultivation Vinod Kumar, Madhumita Goala, Pankaj Kumar, Jogendra Singh, Piyush Kumar and Sonika Kumari	63-75
6	Alkalotolerant consortium as a potential degrader of dioxin-like compounds of pulp and paper mill wastewater Shweta Sahni	76-87
7	SWOT analysis of agro-waste based adsorbents for persistent dye pollutants removal from wastewaters Bashir Adelodun, Fidelis Odedishemi Ajibade, Taofeeq Sholagberu Abdulkadir, Hashim Olalekan Bakare and Kyung Sook Choi	88-103
8	Current status of water pollution by integrated industrial hubs (IIHs) in India Vinod Kumar, Piyush Kumar, Jogendra Singh and Pankaj Kumar	104-119
9	ZnO nanostructures and nanocomposites as promising photocatalysts for the remediation of wastewater pollution Satinder Pal Kaur Malhotra	120-132
10	Remediation of heavy metals using non-conventional adsorbents and biosurfactant-producing bacteria Swati Rastogi and Rajesh Kumar	133-153

TABLE OF CONTENTS CONTINUED ...

Chapter	Title and author(s)	Pagination
11	Management and sustainable energy production using flower waste generated from temples Vinod Kumar, Sonika Kumari and Pankaj Kumar	154-165
12	Solid waste management and its role in mitigating environmental degradation with special reference to recycling of wood wastes Ettammal Sreenivasan	166-182
13	Biodiversity of entomofauna with reference to habitat degradation at Pancheshwar dam site on the River Mahakali, Central Himalaya Aman Verma and Manoj Kumar Arya	183-204
14	Strategies to prevent environmental stresses by silicon fertilization in rice crop Ardeep Kumar	205-214