

Environmental Plant Science

Environmental Plant Science

Dr. Rakesh Kumar

Assistant Professor (Environmental Science)
College of Horticulture & Forestry
Rani Lakshmi Bai Central Agricultural University, Jhansi

Dr. Vipasha Negi

Senior Project Associate
Research & Startup Facilitation Division (PSCST), Sector 26, Chandigarh

Ms. Renu Lamba

Ph.D. Scholar (Environmental Science), Botany and Plant Physiology
College of Basic Science and Humanities
Chaudhary Charan Singh Haryana Agricultural University, Hisar

Dr. Rajeev Dhiman

Assistant Professor (Silviculture and Agroforestry)
College of Horticulture and Forestry, Dr. Y.S. Parmar UHF, Nauni Solan

Dr. Varun Attri

Silviculturist, Regional Research Station, Ballawal Saunkhri
Punjab Agricultural University (PAU), Balachaur, SBS Nagar, Punjab



VITAL BIOTECH PUBLICATION

Kota, Rajasthan, India
<http://www.vitalbiotech.org/bookpublication/>

An International Publishers

VITAL BIOTECH get Accredited by following International organization



<https://www.portico.org/publishers/vital/>

101 Greenwich Street, 18th Floor
New York, NY 10006

Copyright © 2026 VITAL BIOTECH PUBLICATION

Published by Vital Biotech Publication

First Edition: 2026

All Rights Reserved

No part of this book may be reproduced in any form, by photostat, microfilm, xerography, or any other means, or incorporated into any information retrieval system, electronic or mechanical, without the written permission of the publisher.

Product Form:

Digital download, online and hard bound

Edition:

ISBN: 978-81-69356-14-5

Head, Production (Higher Education and Professional) & Publishing Director

Dr. Jitendra Mehta

Product Manager

Aman Saxena

General Manager

Jaya Mehta

Graphic Designer

Avneet Kaur

Information contained in this work has been obtained by Vital Biotech Publication (India), from sources believed to be reliable. However, neither Vital Biotech Publication (India) nor its authors guarantee the accuracy or completeness of any information published herein, and neither Vital Biotech Publication (India) nor its authors shall be responsible for any errors, omissions, or damages arising out of use of this information. This work is published with the understanding that Vital Biotech Publication (India) and its authors are supplying information but are not attempting to render engineering or other professional services. If such services are required, the assistance of an appropriate professional should be required.

Office Address:

VITAL BIOTECH PUBLICATION

772, Basant Vihar, Kota,

Rajasthan-324009 India

Visit us at: <http://www.vitalbiotech.org>

Contact No. +91-9784677044

Printed at: Vital Biotech Publication, Kota

Preface

Environmental Plant Science is an interdisciplinary field that explores the intricate relationships between plants and their environment while addressing some of the most pressing global challenges, including climate change, biodiversity loss, soil degradation, pollution, and food insecurity. Understanding how plants respond to environmental stresses and contribute to ecosystem sustainability is essential for developing resilient agricultural systems and conserving natural resources.

Environmental Plant Science has been prepared to provide students, researchers, academicians, and professionals with a comprehensive understanding of the principles and emerging developments in plant–environment interactions. The book covers key topics such as plant physiology under abiotic and biotic stresses, soil–plant–water relationships, plant nutrition, environmental pollution, climate change adaptation, phytoremediation, biodiversity conservation, sustainable crop production, precision agriculture, and recent advances in molecular and biotechnological approaches for improving environmental resilience.

The editors sincerely acknowledge the valuable contributions of all authors, reviewers, and collaborators whose expertise has enriched this volume. Their collective efforts have ensured that the content is scientifically accurate, relevant, and accessible. We hope this book serves as a valuable academic resource and practical guide, inspiring innovative research, sustainable environmental stewardship, and responsible management of plant resources for the benefit of present and future generations.

Dr. Rakesh Kumar
Dr. Vipasha Negi
Ms. Renu Lamba
Dr. Rajeev Dhiman
Dr. Varun Attri

Dated – 30 July, 2026

CONTENTS

S. NO.		PAGE NO.
1.	Introduction to Environmental Plant Science <i>Renu Lamba, Vinod Kumar, Rakesh Kumar</i>	1-12
2.	Plant Ecology and Ecosystem Dynamics <i>Renu Lamba, Varun Attri, Rakesh Kumar</i>	13-24
3.	Soil-Plant-Water Relationships <i>Vipasha Negi, Rajnish Kumar, Bansuli</i>	25-34
4.	Plant Responses to Climate Change <i>Rajeev Dhiman, Yourmila Kumari, Garima Sharma, Prem Prakash</i>	35-44
5.	Environmental Stress Physiology in Plants <i>Amandeep Kaur, Bansuli, Rajnish Kumar, Vipasha Negi</i>	45-56
6.	Biodiversity Conservation and Sustainable Plant Resources <i>Rajeev Dhiman, Lalit Thakur, Dinesh Kumar</i>	57-66
7.	Plant Adaptation to Abiotic and Biotic Stresses <i>Balwinder Singh Dhillon, Varun Attri</i>	67-78
8.	Phytoremediation and Environmental Pollution Management <i>Uday Bhanu Pratap, Aman Dabral, Rakesh Kumar</i>	79-90
9.	Sustainable Agriculture and Environmental Protection <i>Varun Attri, Balwinder Singh Dhillon</i>	91-100

10. Emerging Trends and Innovations in Environmental Plant Science 101-112

Rakesh Kumar, Pranjali Bhatt, Garima Bhatt, Sakshi Rai