



Prof. Saba Siddiqui, is a Professor and Head of the Department of Agriculture at the Integral Institute of Agricultural Science & Technology (IIAST), Integral University, Lucknow. She obtained her M.Sc. in Agricultural Microbiology from Aligarh Muslim University, Aligarh, and her Ph.D. in Botany from Dr. Ram Manohar Lohia Avadh University, Ayodhya. Her research interests encompass agricultural microbiology, nanotechnology, plant-microbe interactions, biofertilizers, bioremediation etc. She has successfully guided more than 10 postgraduate students and is currently handling various government-funded research projects. Dr. Siddiqui has published over 35 research articles and reviews in national and international reputed journals and has authored more than 20 book chapters. She has received several academic honors and continues to contribute actively to interdisciplinary research, postgraduate education, academic leadership, and scientific collaborations aimed at advancing sustainable and climate-resilient agriculture.



Dr. Deepti Srivastava completed her M.Sc. and Ph.D. in Agricultural Biotechnology from Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Ayodhya, India. She worked as a researcher at CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow, before joining the Department of Agriculture, Integral Institute of Agricultural Science & Technology (IIAST), Integral University, Lucknow, where she currently serves as an Associate Professor. Her research interests include plant biotechnology, molecular breeding, functional genomics, climate-resilient agriculture, crop improvement, and abiotic stress tolerance. Dr. Srivastava has successfully guided 7 M.Sc. and 1 Ph.D. scholars and has published over 30 research articles, 31 book chapters, and 2 books, has successfully guided 7 M.Sc. and 1 Ph.D. scholars, and has received numerous awards and recognitions from reputed national scientific and academic organizations for her outstanding contributions to research, teaching, and academic excellence.



Dr. Md. Abu Nayyer completed his Ph.D. in Horticulture from Bihar Agricultural University, Sabour. He currently serves as an Assistant Professor-cum-Junior Scientist specializing in Horticulture with a focus on fruits. His expertise encompasses Integrated Nutrient Management, Post-harvest Physiology of Horticultural Crops, Precision Farming and Artificial Intelligence. Dr. Nayyer has successfully guided more than 10 M.Sc. students and has made significant contributions to academic research, with over 20 research papers published in national and international peer-reviewed journals, along with several book chapters.



Dr. Usman Sayeed is an academician, researcher, and educator specializing in Agricultural Informatics (Agriinformatics), with expertise in integrating information and communication technologies (ICT), artificial intelligence (AI), bioinformatics, geospatial technologies, and data analytics into modern agricultural systems. His work focuses on harnessing digital technologies to enhance agricultural productivity, sustainability and evidence-based decision-making. His research interests encompass Artificial Intelligence and Machine Learning in Agriculture, Precision Agriculture, Bioinformatics, Remote Sensing and GIS, Internet of Things (IoT), Decision Support Systems (DSS), Agricultural Databases, Climate-Smart Agriculture, Crop Modeling, and Digital Agriculture. He is particularly interested in developing data-driven approaches for crop monitoring, resource optimization, disease prediction, and sustainable farm management.



Sustainable Agriculture:

An Update

Sustainable Agriculture: An Update

Prof. Saba Siddiqui
Dr. Deepti Srivastava



BOOK RIVERS

BOOK AVAILABLE

Fliptkart



amazon



P: ₹490/-

SUSTAINABLE AGRICULTURE: AN UPDATE

Prof. Saba Siddiqui

Department of Agriculture, Integral Institute of
Agricultural Science and Technology, Integral
University, Lucknow

Dr Deepti Srivastava

Department of Agriculture, Integral Institute of
Agricultural Science and Technology, Integral
University, Lucknow

Dr Md Abu Nayyer

Department of Horticulture, Bihar Agricultural
University, Sabour, Bihar

Dr Usman Sayeed

Department of Agriculture, Integral Institute of
Agricultural Science and Technology, Integral
University, Lucknow



No part of this publication may be reproduced, transmitted or stored in a retrieval system, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the author.

Published by: - Book Rivers

Website: - <https://www.bookrivers.com>

Email: publish@bookrivers.com

First Print Edition - 2026

Copyright©: Editors

Title: Sustainable Agriculture: An Update

Editors: Prof. Saba Siddiqui, Dr Deepti Srivastava, Dr Md Abu Nayyer, Dr Usman Sayeed

All Rights Reserved

ISBN: 978-93-7837-258-2

MRP: 490 /-INR

(Printed in India)

TABLE OF CONTENTS

S. NO.	TOPIC	PAGE NO.
1.	Introduction to Sustainable Agriculture: Economic and Environmental Impact <i>Ruqaiya Bano</i>	1 - 18
2.	Propagation and Nursery Management for Sustainability <i>Muzeev Ahmad</i>	19 - 28
3.	Role of Biofertilizer in Sustainable Agriculture <i>Dr Pallavi Srivastava</i>	30 - 42
4.	Integrated Nutrient Management for Sustainable Agriculture <i>Khalid Habib and P. Smriti Rao</i>	43 - 55
5.	Integrated Pest Management for Sustainable Agriculture <i>Kalpana Bisht and Sunil Kumar Yadav</i>	56 - 75
6.	Organic farming of field crops for sustainability <i>Dr Abhineet</i>	76 - 137
7.	Organic farming of Horticultural crops for sustainability <i>Sanket Kumar</i>	138 - 171
8.	Precision Agriculture: An update <i>Ambreesh Singh Yadav</i>	172 - 190
9.	Role of Agroforestry for Sustainability <i>Dr Ayush Bhushan</i>	191 - 254

10. The role of Extension Education in Sustainable Agriculture 255 - 269
Akanksha Singh and Sunil Kumar
11. Soil microbial diversity and agricultural sustainability 270 - 288
Faria Fatima, Saba Siddiqui
12. Sustainable Agriculture and Climate Change 289 - 304
Nitish Kumar
13. Innovations and Future Directions in Sustainable Agriculture 305 - 233
Sunil Kumar, Mustafa Hussain

CHAPTER -9

Role of Agroforestry for Sustainability

Dr Ayush Bhushan

Department of Agriculture, Integral Institute of Agricultural Science &
Technology,

Integral University, Lucknow-226026

Email: bayush@iul.ac.in

Introduction

The pursuit of sustainable agriculture has never been more urgent, as the world faces mounting challenges of soil degradation, biodiversity loss, and the escalating impacts of climate change. Within this context, agroforestry—the intentional integration of trees with crops or livestock on the same land management unit—has emerged as a transformative approach capable of reconciling agricultural productivity with ecological resilience. While agroforestry draws from ancient land-use traditions, it has been continually refined through scientific research and practical innovation, positioning it as a paradigm shift away from conventional monoculture systems. By harnessing synergistic relationships between woody perennials, annual crops, and livestock, agroforestry systems offer a holistic framework that addresses the three pillars of sustainability: environmental conservation, economic viability, and social equity.

Recent studies have demonstrated that agroforestry systems, by creating biodiverse agroecosystems that mimic natural forests, can enhance soil organic carbon by up to 34% compared to conventional agriculture, while also improving water retention and nutrient cycling (Udawatta & Jose, 2012; Cardinael *et al.*, 2017). The strategic incorporation of nitrogen-fixing trees and multi-layered vegetation structures not only boosts crop yields but also enables