Agroforestry in Europe

Current Status and Future Prospects
Advances in Agroforestry

Volume 6

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Aims and Scope

Agroforestry, the purposeful growing of trees and crops in interacting combinations, began to attain prominence in the late 1970s, when the international scientific community embraced its potentials in the tropics and recognized it as a practice in search of science. During the 1990s, the relevance of agroforestry for solving problems related to deterioration of family farms, increased soil erosion, surface and ground water pollution, and decreased biodiversity was recognized in the industrialized nations too. Thus, agroforestry is now receiving increasing attention as a sustainable land-management option the world over because of its ecological, economic, and social attributes. Consequently, the knowledge-base of agroforestry is being expanded at a rapid rate as illustrated by the increasing number and quality of scientific publications of various forms on different aspects of agroforestry.

Making full and efficient use of this upsurge in scientific agroforestry is both a challenge and an opportunity to the agroforestry scientific community. In order to help prepare themselves better for facing the challenge and seizing the opportunity, agroforestry scientists need access to synthesized information on multi-dimensional aspects of scientific agroforestry.

The aim of this new book-series, Advances in Agroforestry, is to offer state-of-the art synthesis of research results and evaluations relating to different aspects of agroforestry. Its scope is broad enough to encompass any and all aspects of agroforestry research and development. Contributions are welcome as well as solicited from competent authors on any aspect of agroforestry. Volumes in the series will consist of reference books, subject-specific monographs, peer-reviewed publications out of conferences, comprehensive evaluations of specific projects, and other book-length compilations of scientific and professional merit and relevance to the science and practice of agroforestry worldwide.

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Editors

Agroforestry in Europe

Current Status and Future Prospects
Foreword

Agroforestry has come of age during the past three decades. The age-old practice of growing trees and crops and sometimes animals in interacting combinations – that has been ignored in the single-commodity-oriented agricultural and forestry development paradigms – has been brought into the realm of modern land-use. Today agroforestry is well on its way to becoming a specialized science at a level similar to those of crop science and forestry science.

To most land-use experts, however, agroforestry has a tropical connotation. They consider agroforestry as something that can and can only be identified with the tropics. That is a wrong perception. While it is true that the tropics, compared to the temperate regions, have a wider array of agroforestry systems and hold greater promise for potential agroforestry interventions, it is also true that agroforestry has several opportunities in the temperate regions too. Indeed, the role of agroforestry is now recognized in Europe as exemplified by this book, North America, and elsewhere in the temperate zone. Current interest in ecosystem management in industrialized countries strongly suggests that there is a need to embrace and apply agroforestry principles to help mitigate the environmental problems caused or exacerbated by commercial agricultural and forestry production enterprises. If we are to meet the society’s needs and aspirations for forest-derived goods and services, we must find ways of augmenting traditional forestry by gleaning some portion of these benefits from agricultural lands where agroforestry can be practiced. In many places, the only opportunity to provide increased forest-based benefits, such as wildlife habitat or forested riparian systems, is through the increased use of agroforestry on agricultural lands. The publication of this book is very timely. As the editors say, the European Union has recognized the economic, ecological, and social advantages of agroforestry in its rural development policy; but the implementation of the policy is adversely affected by the lack of adequate information on the subject. The need for such a book is obvious.

I want to say how much I appreciate the enormous amount of work involved in bringing together such a volume. The state of agroforestry in Europe and literature on it being at early stages of development, it must have been a daunting task for the authors to piece together the information they have so painstakingly gathered for their chapters. I congratulate all the authors and the editors for such a
wonderful job. Undoubtedly, this is a significant contribution to agroforestry literature worldwide and a great service to the fledgling field of European agroforestry.

Distinguished Professor  P. K. Ramachandran Nair
University of Florida  September 2008
Gainesville, Florida, USA
(Editor, Advances in Agroforestry Book-Series)
Preface

While recent EU Rural Development policy clearly recognizes the economic, ecological, and social advantages of agroforestry systems, to date the implementation of such systems has been poor so far throughout most of Europe. In light of this, this collection of peer-reviewed papers brings together some of the most important current research in European agroforestry, and evaluates the current scope and future potential of agroforestry across the EU.

This volume contains a selection of papers covering the most recent research, embracing the wide range of geographical zones and crops and livestock systems found in Europe. While the majority of Europe’s agroforestry practices are currently focused in the Mediterranean, this volume draws together examples from a wide range of countries – including France, Germany, Greece, Hungary, Ireland, Italy, Portugal, Slovenia, Spain, Switzerland, the Netherlands and the UK. The book also covers a range of agroforestry types, including silvopasture – Europe’s predominant form of agroforestry – silvoarable, forest farming and multipurpose trees, but also explains some other practices like improved fallow and riparian buffer strips. Through these examples the book also discusses the potential roles for these traditional land management systems in addressing both environmental issues such as carbon sequestration, water quality, biodiversity conservation, desertification, soil preservation ecosystem services and socioeconomic issues such as rural population stabilization.

Augmented by detailed reviews of the main elements of European agroforestry and the issues that face it, this timely collection of research papers provides a valuable reference for advanced students and researchers, administrators and policy makers interested in a wide range of issues around land use, rural development, natural resource management, landscape ecology and conservation across Europe, and for those interested in agroforestry – including practitioners, researchers and extension organizations – worldwide.

This book is structured in four main parts: the Introduction, the European Mediterranean Agroforestry systems, the European Atlantic Agroforestry systems and the European Continental, Pannonian and Alpine Agroforestry systems. At the end of the book a chapter related to future directions is provided.

The Introduction part give the reader a general perspective on the development of agroforestry practices and systems in Europe in fourth chapters. It is important
to highlight that there has been no previous attempt in describing agroforestry in pan-European level although there are some books and other publications dealing with specific aspects of the main agroforestry practices implemented, e.g. silvopasture. The first chapter of the book introduces the reader to the description of the main agroforestry practices found in Europe: silvoarable, forest farming, riparian buffer strips, silvopasture, improved fallow and multipurpose trees. The current situation of the main components of agroforestry systems, i.e. tree and agricultural (including pasture and livestock), are briefly described to give the reader an initial balanced perspective on the status of European agroforestry systems and practices at a farm level. The second chapter reviews different types of classifications and functions of current agroforestry systems in Europe according to their components, spatial and temporal arrangements, functions, agroecological zone and socio-economic aspects, focusing on silvopastoral and silvoarable practices, the main types of agroforestry practiced in Europe. The third chapter of this part of the book is related to the future perspective for the use of these agroforestry systems at a farm level, based on their productive and ecological advantages. The fourth and final chapter of this part of the book deals with a social study conducted at 14 locations in seven countries within the European Union, to evaluate the degree of knowledge about agroforestry practices and the potential benefits and disadvantages that they can bring to farmers.

Part II dealing European Mediterranean Agroforestry systems has 10 chapters (Chapters 5 to 14). These chapters provide descriptions and development of agroforestry systems in the densely populated countries of the Mediterranean areas and examine how the economics of agroforestry systems in Europe has changed over time due to the different social conditions of the farmers. The countries/regions to which the chapters relate include Greece (Chapter 5), the transitional Atlantic-Mediterranean area of Western Europe (Chapter 6) and the four autonomous regions of the Mediterranean part of Spain: Cataluña, Murcia, Extremadura and Andalusia (Chapters 7 to 10). These have very different rural social structure, physical mountain geography and Mediterranean climate sub-classification types. While dehesa, the most widespread agroforestry system of southern Europe is the focus of Chapter 7. Chapter 8 deals with the forest grazing type of agroforestry practice in Cataluña. Chapter 9 presents studies on agroforestry practices in a river basin and along an altitudinal and precipitation gradient from 0 to 2,000 m asl and from 300 to 1,000 mm year⁻¹, respectively, in southern Spain. Various aspects of silvopasture are included in detail in the next two chapters (10 and 11). Chapter 12 deals with the main types of agroforestry practices in the Mediterranean and Alpine biogeographic regions of Italy. This chapter also evaluates the connection between them through traditional and current management. A socioeconomic study of cork oak agroforestry systems is the subject of Chapter 13. The part concludes with Chapter 14 that deals with forest farming, explaining the history of truffle production within the main European countries and presenting a synthesis of the best practices to reach high truffle productivity.

The next book part (Part III) deals with the European Atlantic Agroforestry systems in three chapters. This biogeographic region is characterized by having a
history of clear-cut separation between forest and agricultural land, at all levels including education, farming systems and policy. Allocation of the most productive areas to agricultural production, often at the expense of forest, has been an important feature of the land-use policy in the region. Thus, agroforestry systems are neither widespread nor properly implemented in this part of Europe. In the recent years, some important afforestation schemes have been carried out in this zone, even though some parts have the lowest proportion of forestland in Europe. The first paper of this part of the book (Chapter 15) describes a methodology used to locate the dominant trees distributed throughout Europe and demonstrates the advantages of applying stratification to estimate a complex land use resource, using the different ecological conditions found in the region. Chapter 16 deals with the development over time and description of current agroforestry practices in the Netherlands, while the opportunities for introducing silvopastoral and silvoarable systems in Ireland, one of the least forested areas of Europe, is the focus of Chapter 17. The chapters in this part clearly bring out the point that the main driving force behind the introduction of such systems in the region is the promotion of floral and faunal biodiversity and other aspects of environmental sustainability that are adversely impacted by agriculture.

The final part of the book deals with European Continental, Pannonian and Alpine Agroforestry systems in four chapters and explains that the main aims of implementing agroforestry systems in these areas are to exploit the environmental and crop protection functions offered by trees. The implementation of agroforestry practices in Germany is described in Chapter 18, whereas Chapter 19 describes the Alpine regions silvopastoral systems in Switzerland, where, unlike in the Mediterranean areas, supplementary food for livestock is obtained during summer time. Chapter 20 presents the Slovenian perspectives on agroforestry covering not only Alpine and Continental areas, but also Mediterranean areas and even some areas with Atlantic climatic characteristics. The final chapter of this part (Chapter 21) describes the specific characteristics of silvopastoral and silvoarable agroforestry practiced in the Pannonian region and explains how implementation practices such as hedgerows is very important in dealing with the special climatic characteristics of wind and snow in the region.

This book concludes with a synthesis (Chapter 22) of the information presented in the various chapters emphasizing the major challenges as well as opportunities of agroforestry in Europe.

We hope that this collection of research papers, augmented by detailed reviews of the main elements of European agroforestry and the issues facing it, will be a valuable reference source for advanced students and researchers, administrators and policy makers interested in a wide range of issues around land use, rural development, natural resource management, landscape ecology, and conservation across Europe, and for those interested in agroforestry – including practitioners, researchers and extension organizations – worldwide.

We thank all authors of individual chapters for their excellent contributions as well as splendid cooperation in dealing with repeated revisions of their manuscripts. Each chapter was peer-reviewed; the reviewers did a superb job in enhancing the
content and presentation quality of the respective chapters. Finally, a special word of appreciation to Professor P.K. Nair, the book-series editor, for suggesting the idea for such a book, and following it through its completion with consistent encouragement and valuable directives thought the process.

Rigueiro-Rodríguez A
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