

Contents

<i>Preface</i>	v
1. Introduction	1
2. Agroforestry	4
• Definitions of Agroforestry	4
• Concept of Agroforestry	5
• Scope of Agroforestry	6
• Objectives of Agroforestry	6
• Components of Agroforestry	7
• Hierarchy of Agroforestry: System, Sub-system and Practice	8
• Differences among Agroforestry, Farm Forestry and Social Forestry	9
3. History of Agroforestry	11
4. Advantages and Disadvantages of Agroforestry	16
• Advantages of Agroforestry	16
• Disadvantages of Agroforestry	30
• Major Challenges for Agroforestry	32
5. Classification of Agroforestry Systems	37
• Classification Based on Structure	37
• Classification Based on Function	39
• Classification Based on Socioeconomic Factors	40
• Classification Based on Ecological Factors	40
• Classification Based on Climate	41
• Classification Based on Physiognomy	41
6. Agrisilvicultural System	42
• Alley Cropping	42
• Hedgerow Intercropping	46
• Multipurpose Trees and Shrubs on Farmlands	47
• Crop Combinations with Plantation Crops	48
• Multispecies Tree Gardens	48
• Fallow Improvement Systems	50
• Windbreak and Shelterbelt	52
• Taungya System	54
• Agroforestry for Fuelwood Production	56
• Soil Conservation Hedges	56
• Intercropping under Scattered Trees (Parkland/Tiered System)	57
7. Silvipastoral System	58
• Protein Bank/Cut-and-Carry System	59
• Trees and Shrubs on Pastures	60
• Forest Grazing	61
• Living Fence of Fodder Trees and Hedges	62

8. Agrisilvipastoral System	65
• Homegardens 65	
• Integrated Farming System with Woody Plants 67	
• Woody Hedgerows for Soil Conservation, Livestock Browse and Mulch 69	
9. Miscellaneous Systems	71
• Apisilviculture System 71	
• Aquasilviculture System 73	
• Lac Cultivation in Tree/Lacsilviculture System 77	
• Sericulture in Tree/Serisilviculture System 78	
• Mushroom Production in Agroforestry System 82	
• Poultry Farming in Agroforestry System 82	
10. Agroforestry in Major Ecological Zones of the World	87
• Agroforestry in Humid and Subhumid Tropics 87	
• Agroforestry in Semiarid and Arid Tropics 107	
• Agroforestry in Tropical Highland Zone 112	
• Agroforestry in Subtropical Zone 119	
• Agroforestry in Subtropical Highland Zone 123	
• Agroforestry in Mediterranean Zone 124	
• Agroforestry in Temperate Zone 127	
11. Agroforestry for Food Production	138
• Agroforestry Systems/Practices for Food Production 138	
• Trees and Shrubs for Food Production in Agroforestry 139	
• Intercrops for Food Production in Agroforestry 141	
• Fishes for Food Production in Agroforestry 145	
• Poultry Birds for Food Production in Agroforestry 146	
• Honey Bee for Food Production in Agroforestry 146	
• Food Production in Some Agroforestry Systems 146	
12. Agroforestry for Timber, Industrial Raw Material and Fuel Production	149
• Agroforestry Approaches for Timber, Industrial Raw Material and Fuel Production 149	
• Woody Plants for Timber, Industrial Raw Material, Energy and Biomass Production 150	
• Intercrops 152	
13. Agroforestry for Non-timber Forest Products Production	153
• Agroforestry Systems/Practices for NTFPs Production 153	
• Woody Plants for NTFPs Production in Agroforestry 154	
• Herbaceous Plants for NTFPs Production in Agroforestry 154	
14. Agroforestry for Wasteland Reclamation	162
• Agroforestry Systems/Practices for Wasteland Reclamation 162	
• Reclamation of Different Wastelands 163	
15. Agroforestry for Soil Improvement and Water Conservation	182
• Mechanism of Agroforestry for Soil Improvement and Water Conservation 182	
• Agroforestry Systems and Practices for Soil Improvement and Water Conservation 183	

16. Land Classification and Agroforestry in Different Land Classes	186
• Land Capability Classification 187	
• Sub-classification 188	
• Land Suitability Classification 188	
• Importance of Land Capability Classification 190	
• Agroforestry in Different Land Classes 191	
17. Nitrogen-fixing Trees in Agroforestry	201
• Types of Biological Nitrogen Fixation 201	
• Families and Genera of Nitrogen-fixing Trees 204	
• Role of Nitrogen-fixing Trees in Agroforestry 204	
• Nitrogen-fixing Trees in Different Agroforestry Systems 205	
18. Tree–Crop Interaction in Agroforestry	209
• Object of Knowing Tree–Crop Interaction 209	
• Types of Tree–Crop Interaction in Agroforestry 210	
• Factors Affecting Tree–Crop Interaction 213	
• Evaluation of Tree–Crop Interaction 214	
19. Principles of Species Selection in Agroforestry	216
• Principles of Tree Species Selection in Agroforestry 216	
• Principles of Non-tree Species Selection in Agroforestry 223	
20. Management of Trees and Crops in Agroforestry	227
• Management of Trees in Agroforestry 227	
• Management of Crops in Agroforestry 238	
21. Diagnosis and Design in Agroforestry	242
• Characteristics of Diagnosis and Design 242	
• Features of Diagnosis and Design 242	
• Criteria of Good Agroforestry Design 243	
• Levels of Agroforestry Diagnosis and Design 244	
• Information Required for Agroforestry Diagnosis and Design 246	
• Basic Procedure of Diagnosis and Design 247	
22. Agroforestry Extension	249
• Agricultural Extension 249	
• Agroforestry Extension 250	
• Agroforestry Extension versus Agricultural Extension 251	
• Constraints in Adoption of Agroforestry Technology 251	
• Strategies for Enhancing Adoption of Agroforestry Technology 253	
• Organization on Agroforestry Extension 254	
23. Socioeconomic Aspects of Agroforestry	256
• Social Aspects of Agroforestry 256	
• Economic Aspects of Agroforestry 258	
• Variables in Economic Analysis of Agroforestry 260	
• Valuation of Inputs 261	
• Valuation of Outputs 262	
• Common Economic Indicators for Valuation of Agroforestry Practices 263	