authors clearly point out the importance of maintaining biodiversity for crop improvement and for the well being of our planet. They also offer guidelines for collecting germplasm for ex situ conservation. They stress the need to maintain the genetic composition of each accession in ex situ conservation. The application of molecular methods, DNA fingerprinting, and genetic mapping and the new opportunities these techniques offer in assessing genomic relationships and utilizing broad-based hybrids and germplasm are discussed in Chapter 4. The authors conclude that molecular analysis must be seen as complementary to the analysis of phenotypes in well described germplasm collections, and not as a replacement.

Chapter 5 covers molecular markers and the management of genetic resources in seed genebanks and shows evidences in the rice plant (used here as a case study) that support the superiority of molecular characterization compared with traditional analyses of phenotypes. The accurate identification, maintenance, selection for germplasm storage, and utilization are cited as examples in which molecular markers may be suitably employed to assist genebank management. The identification of duplicates and the development of core collections with the use of molecular markers are accorded due importance as an aid to genebank management strategy.

In vitro conservation and cryopreservation methods in relation to both orthodox and recalcitrant seeds are treated in Chapter 6. The advantage that in vitro collection offers in germplasm exchange are cautiously presented with regards to plant quarantine requirements and limitations. This subject is separately addressed in Chapter 10 and is entitled, “Importance of Biotechnology for Germplasm Health and Quarantine”. However, this chapter is limited to virus problems. An interesting and comprehensive list of plant species and specimens for which cryopreservation techniques have been developed is presented in a table. Conservation of DNA (DNA banking) and its global network is presented in Chapter 7. Molecular identification, gene mapping, manipulation of simple and complex traits, gene cloning and transfer of alien genes in genetic resources, and plant breeding are discussed in Chapter 8. However, the author has concluded that conventional selection procedures, if applied efficiently, still have enormous potential in a wide range of breeding situations.

Gene identification, isolation, and transfer through genetic engineering, transformation, and cloning technologies and systems are covered in Chapter 9. Readers will be fascinated to note the author’s concluding statement which reads “Your species of interest can now be considered as having all other plant species (and indeed all life) as its tertiary gene pool, which serves as a powerful illustration of the importance of conserving the earth’s biodiversity”.

The overall and long-term benefits of biodiversity for biotechnology is discussed in Chapter 11. It also highlights the values of conservation of biodiversity for sustainable development. Chapter 12 is about Internet resources for the biologist which includes a comprehensive appendix of Internet addresses.

The strengths of the book are many. The subject matter is comprehensively treated by a team of distinguished and competent scientists in 12 dynamic chapters that are presented in a logical, effective, and reader-friendly manner. The conclusions made are reasonable, realistic, and futuristic. Each chapter includes a rich and exhaustive list of references.

Melak H. Mengesha
Consultant,
Plant Genetic Resources and Agro-biodiversity,
1626 E. Crocus Drive,
Phoenix, AZ 85022
(melakhm@aol.com)


Pearson and Ison wrote this book as a text for courses on grassland management. They wanted to produce something different from most books on grassland agronomy. The difference is their commitment to a systems perspective and the inclusion of subjects seldom found in conventional agronomy texts. They believe agronomists can no longer be concerned solely with technical issues. Traditional methods of research and development are not adequate to meet the current problems facing grasslands of the world. They successfully weave these underlying themes into the overall fabric of the book.

The book is organized into nine chapters. The first is an overview of grassland systems. This is not a biological overview but rather a proposal for how we might approach grassland systems. The authors make a strong case for the integration of local context into the study and management of grassland systems. They also discuss systems thinking and modeling.

Chapter 2 is concerned with the origins of grassland systems and management. After a brief review of the development of agriculture, the authors discuss several examples of contemporary problems in grassland management, such as soil acidification and ‘pastoral development’. They explain how many of these problems are rooted in the social context and origins of the grassland managers. The chapter closes with a discussion of the phases of grassland plant domestication.

The next six chapters are devoted to the biology of grassland systems. Chapter 3 discusses the generation of grassland plant communities from seed. Attention is given to seed biology, seeding practices, and dynamics of soil seed banks. Chapter 4 covers vegetative growth of forage plants including morphology, physiology, environmental factors, and effects of grazing. The subject of Chapter 5 is flowering and seed production. Topics include environmental and management factors affecting floral initiation and seed production. Chapter 6 addresses mineral nutrition. Mineral nutrition is couched squarely in an ecosystem context with a contrast made between closed and open nutrient cycles. Considerable coverage is given to legume-bacteria symbiosis in the nitrogen cycle. The link between plants and grazing animals is made in Chapter 7 with coverage of herbage quality and forage intake. Emphasis is placed on manipulating both plants and animals to maintain high quality forage. Chapter 8 discusses grassland-animal interactions including the impact of grazing animals on grasslands, grazing management, and efficiency of livestock production. The production of stored feeds is also included.

Throughout these six chapters, the authors emphasize their systems perspective. This is done with flow diagrams, mathematical functions, and discussions. The functions are not complex but are examples of attempts at quantifying and modeling grassland systems. Each chapter ends with a brief section on systems perspectives for the particular chapter topic. These closing sections were rather brief and not as effective in advancing the systems perspective as the main body of each chapter.

Chapter 9, Grassland System Design, makes this book different from most pasture management texts. This is where the authors make their strongest attempt to fuse social and economic factors with biological factors. They champion a movement from reductionist science to participative research, qualitative models, and soft systems. In this paradigm, grasslands management becomes much more of a collaboration between managers, extension specialists, and scientists rather than a one-way transfer of technology from scientists to exten-