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Sinopsis

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Ecology is primarily a science of observation that mobilizes a large number of disciplines including zoology, botany, geology, climatology, and hydrogeology. It can be divided into two complementary fields of study: population biology and ecosystem ecology.

This book synthesizes the present understanding of ecosystem ecology. It is organized in four major parts. The first presents the research study methods, which are based on observation, experimentation and modelling. It is followed by an introduction to the concept of ecosystem. The various themes of present research are then tackled, including ecological hierarchies, homogeneity and heterogeneity, the role of biological diversity, and spatial and temporal scales. Finally, the work ends with a presentation of the overall functioning of the biosphere in a historical perspective.

This book is designed for university students as well as researchers and instructors who wish to learn the modern concepts of ecosystem ecology.

Contents:
. The "natures" of ecology

Part I: Elaboration of the Scientific Approach in Ecosystem Ecology
. Origin and evolution of the ecosystem concept
. Approaches and paradigms in ecosystem ecology
. Methods of studying ecosystems

Part II: Structure and Organization of Ecosystems
. The system concept and attempts to apply physical principles to ecosystem ecology
. Abiotic factors and structure of ecosystems
. Hierarchies, levels of organization and typology of ecological systems
. Spatial and temporal scales and their consequences

. Spatial heterogeneity and temporal variability

Part III: Functioning of Ecosystems
. Dynamics of communities and ecosystems: from the balance of nature to self-regulated systems
. Matter and energy flows in ecosystems
. Biological diversity and ecosystem functioning
. The biogeochemical cycles

Part IV: Global Ecology
. Global ecology: dynamics of the biosphere
. The climatic system and its variability
. Biosphere-atmosphere interactions and their consequences for global equilibrium
. Responses of ecosystems to climatic changes: knowing the past to understand the future