It is usually the case that scientists examine either ecological systems or social systems, yet the need for an interdisciplinary approach to the problems of environmental management and sustainable development is becoming increasingly obvious. Developed under the auspices of the Beijer Institute in Stockholm, this new book analyses social and ecological linkages in selected ecosystems using an international and interdisciplinary case-study approach. The chapters provide detailed information on a variety of management practices for dealing with environmental change. Taken as a whole, the book will contribute to the greater understanding of essential social responses to changes in ecosystems, including the generation, accumulation and transmission of ecological knowledge, structure and dynamics of institutions, and the cultural values underlying these responses. A set of new (or rediscovered) principles for sustainable ecosystem management is also presented.

*Linking Social and Ecological Systems* will be of value to natural and social scientists interested in sustainability.
LINKING SOCIAL AND ECOLOGICAL SYSTEMS: MANAGEMENT PRACTICES AND SOCIAL MECHANISMS FOR BUILDING RESILIENCE
LINKING SOCIAL AND ECOLOGICAL SYSTEMS

Management practices and social mechanisms
for building resilience

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Preface

The Beijer Institute of the Royal Swedish Academy of Sciences is an international institute of ecological economics. Its major objectives are to carry out research and to stimulate collaboration and training between scientists, university departments, and institutes working at the interface of natural and human systems.

In 1993 the Beijer Institute initiated a major research programme on Property Rights and the Performance of Natural Resource Systems, in recognition of the crucial importance of property rights issues in resource management. Within this programme, we co-ordinated a subproject on Linking Social and Ecological Systems for Resilience and Sustainability. This book is the main product of that subproject. It is an edited volume, but it is different from most edited volumes. We have used a common framework; each chapter, written by scholars from a diversity of disciplines, has been developed on the basis of that framework. The authors were also invited to participate in a series of three workshops of the Beijer Institute at which the framework and progress of cases were discussed. The introductory chapter describes the framework, and the objectives and content of the book.

It is more the rule than the exception that scientists examine either ecological systems or social systems. In this volume, social and ecological systems are analysed as one system. The volume is deliberately interdisciplinary because the problems addressed do not fit into any one discipline such as ecology, anthropology, economics or political science.

The focus of the book is on social and ecological linkages in selected ecosystems, and there is a systematic treatment of the mechanisms behind these linkages. The overall purpose has been to learn from cases which show successful adaptations or learning, and to try to unravel management practices and social mechanisms that can cope with resource and ecosystem change. Such mechanisms are scarce in modern society, and hence we can
Preface

hope to learn from some traditional systems, and also some recently evolved common-property systems in contemporary society. Many of these social–ecological linkages represent a range of historical human experience with environmental management, and provide a reservoir of active adaptations which may be of universal importance in designing for sustainability. This is not to romanticize about traditional societies and the commons being the best solution; that is not at all the purpose of the book. Many of the chapters certainly show both successes and failures, and they focus on the dynamics of change and the evolution of adaptations through learning. The research questions posed in the book explicitly link ecology, economics and social science. They are analysed through an interdisciplinary, international, case-study approach. The case studies provide lessons to be learned from resource management in environments such as northern coastal ecosystems, arid/semi-arid land and temperate land ecosystems, mountain ecosystems, temperate and tropical forest ecosystems, and subarctic ecosystems.

The framework of the book provides a checklist of a number of factors which we hypothesize as being important, and individual chapters do not necessarily address every issue raised in it. Each chapter analyses key aspects of the framework and provides important information on essential social responses to changes in ecological systems, contributing to an understanding of social mechanisms for dealing with resource and environmental fluctuations. For example, several chapters indicate the importance of mechanisms which contribute to enhancing the buffering capacity, the resilience of social and ecological systems to stress. All chapters deal with both social and ecological resilience, but vary in their degree of emphasis on each.

In the last chapter we summarize lessons that can be learned to assist in the designing of more sustainable resource management systems, and we discuss how adaptiveness and flexibility can be built into institutions so that they are capable of responding to processes that contribute to the resilience of ecosystems. Drawing on the insights from the case studies, a list of working hypotheses or ‘rediscovered’ principles for resource and environmental management is also presented.

It is our hope that the book Linking Social and Ecological Systems will stimulate collaborative research and policy on how to improve management and build resilience in interdependent social–ecological systems, so urgently needed in modern society.

Stockholm, October 1996

Fikret Berkes

Carl Folke
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