

## Book review

PADOCH, C., AYRES, J.M., PINEDO-VASQUEZ, M. & A. HENDERSON (eds.): *Várzea - Diversity, development, and conservation of Amazonia's whitewater floodplains. Advances in Economic Botany, Vol. 13. The New York Botanical Garden Press. 1999. 407 p. US\$ 39.50. ISBN 0-89327-419-4 (pbk).*

This book is an outcome of the first international conference held in Macapá, Brazil (December 1994), which was devoted entirely to floodplains of the Amazon River, called várzea. Due to annual inundation by whitewater rivers (up to 12 m for half of the year on average), alluvial soils are deposited that are highly fertile. This results in an extensive use of várzea floodplains by man, an area representing merely 2% of the Amazon basin. On the other hand, floral as well as faunal natural resources are highly adapted to the monomodal flooding and to a great extent endemic, thus vulnerable to intense human impact.

The book is organized in five principal sections, each beginning with an introduction to the respective topic by a guest author. In 25 chapters fifty-six researchers and policy makers present both needs for conservation of the várzea's valuable species, habitats, processes and landscapes, and the imperative of enhancing the livelihoods of floodplain farmers, fishers, and forest managers, i.e. a sustainable use of natural resources.

The first section on **fish and fisheries** comprises six chapters with contributions on structural complexity and fish diversity, fisheries and its development, community management of floodplain lakes and the impact of the ornamental fish trade. The articles discuss not only particular fish species and their habitats, but also various types of human exploitation, their effects on várzea fish populations, their outlook for the future, and the uncertainties and successes of an assortment of conservation efforts. One major problem pointed out is that too much attention is being given to managing local social conflicts rather than finding ways to protect habitats.

The second section on **forests and forestry** contains three chapters that relate to the logging of timber. They comprise impacts and alternatives regarding particular species, selective logging in general as well as the economic and social significance of both logging operations and the wood industry. Two chapters refer to the ecology, use (e.g. of palm heart, edible fruits) and management of important várzea palms. Some general conclusions drawn are that várzea forests contain valuable resources of which exploitation is often being conducted in a nonsustainable manner. As a result, forestry industries will be forced to look elsewhere for raw material once the local supply has been exhausted. However, forest resources can be managed, as shown for palm species, if there is sufficient motivation to do so.

The third section on **conservation** comprises four chapters with examples on how the traditional "caboclo" and "ribeirinho" communities depend for their subsistence on a mixture of floodplain agriculture and resource extraction from the surrounding forest and water, generally compatible with maintaining forest cover. Ecological partnerships of man and natural resources with respect to conservation of biodiversity, the improvement of livelihoods and management considerations are discussed. One general conclusion is that extractivism as a conservation strategy remains a hypothesis. Yet, extractivism offers one of the few ways of supporting local development at relatively low population densities in generally productive natural

systems like the Amazonian várzea while maintaining the integrity of the biological community.

The fourth section on **soils and river dynamics** comprises four chapters with contributions on fluvial dynamics, on spatial heterogeneity, temporal variability and changes in the formation of floodplain soils as well as vegetation. Emphasis is given to várzea fragility versus fertility. It is recommended that both the analysis of existing forms of várzea land use and the design of future uses should integrate knowledge of spatio-temporal variability in the physical and chemical environment with the social and economic characteristics of várzea regions.

The fifth section on **land resource management** comprises four chapters with contributions on the use of tidal energy as a traditional technology for rural development, farming above the flood during high-water, estuarine landscape transformation by man and historical human-environment interaction in the Amazon floodplain. One of the given policy considerations stresses that várzea habitats are highly heterogeneous, and development strategies need to be fine-tuned to the nuances in elevation and drainage conditions. The Amazon floodplain is a complex mosaic of different soils, vegetation communities, and flooding regimes. An agricultural development must be tailored to local ecological and socioeconomic conditions.

The sixth section comprises one chapter only with an alert on **vanishing stingless bees** in the várzea and in Brazil in general. In Amazonian floodplains, honey collectors who remove and destroy nests are considered their principle enemies. Existing long-term adaptations between plants and bees are pointed out to be crucial, in particular for pollination of many várzea plant species. The economic importance of both pollination and honey production by meliponid bees is stressed. The creation of a local mini-industry of honey production and special sections about bees in education books are suggested.

In conclusion, the several recent studies on whitewater floodplains in this book are derived to a great extent from sustainable development projects. The location of study sites range from the upper Amazon and its tributaries (including Peru) and the middle Solimões-Amazon River to the tidal forests of the Amazon estuary. The articles not only present a heterogeneity of research concerns among várzea scientists but also the great variety of approaches to conservation and the development that are being proposed and implemented in Amazonia. Two alternatives are currently faced for dealing with natural resources in the várzea (according to M. Peters, one of the introducers): they are being used up, as explicitly documented by several examples, or they are being used wisely, which would help preserve many of the economic, social, and ecological benefits currently derived from Amazonian floodplains. Policymakers should adopt (at least some) recommendations given in this timely book which is available at a decent price.

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