

# SADONG JAYA

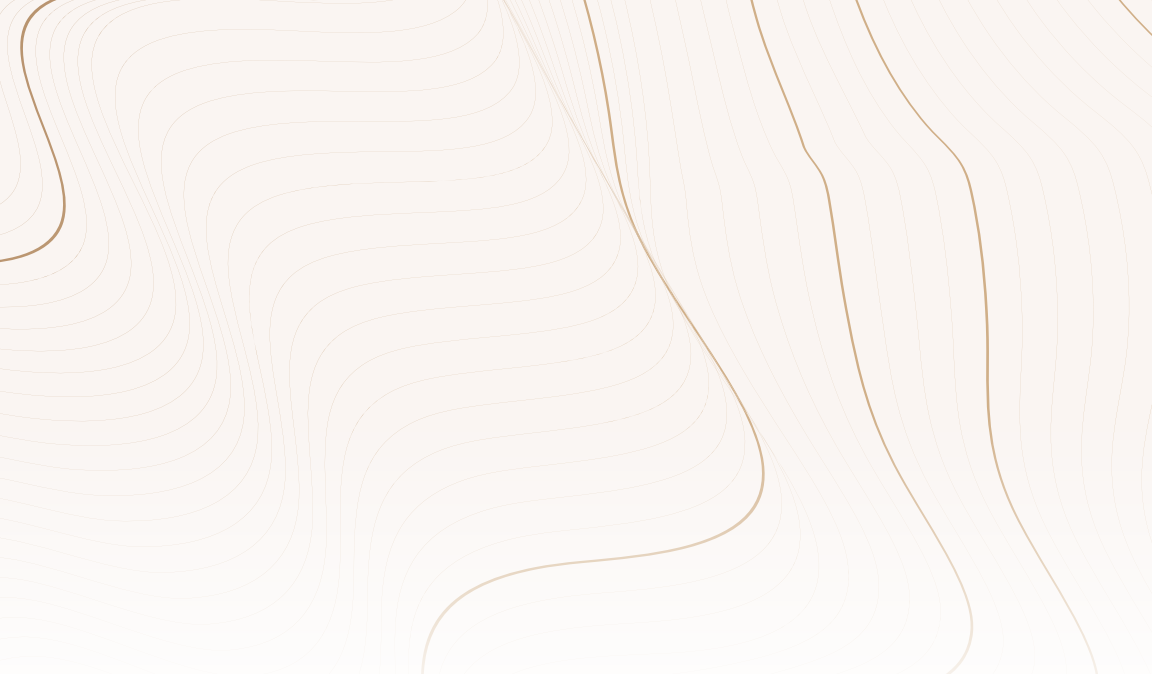
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## A WILDERNESS UNVEILED

EDITORS

JAYASILAN MOHD-AZLAN  
ABANG ARABI ABANG AIMRAN  
INDRANEIL DAS





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UNVEILED





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INDRANEIL DAS

UNIVERSITI MALAYSIA SARAWAK

**SADONG  
JAYA**  
A WILDERNESS  
UNVEILED

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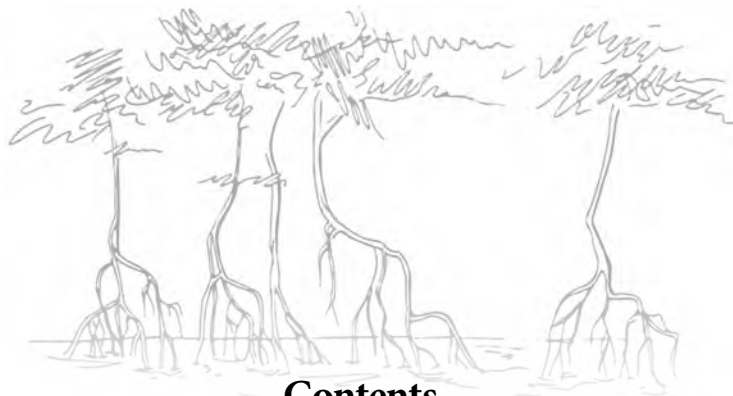
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## Foreword

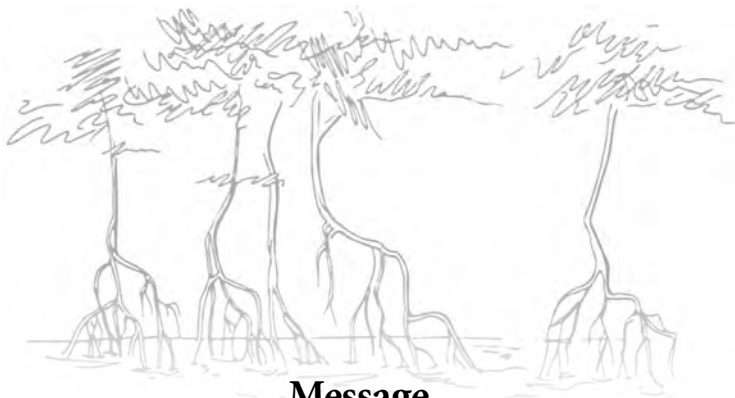


Sarawak's mangrove forests are some of the most endangered habitats, and their continued exploitation for a variety of purposes raises the need for substantial research. Many of us here in Universiti Malaysia Sarawak wade into such forests, in the hopes of generating new, critical knowledge. I would like to commend the efforts by Sarawak Forestry Corporation Sdn. Bhd. for their support in collecting data on the biodiversity of Sadong Jaya Mangroves, which forms the material for the book. The work is also expected to be important for local communities, to aid them better understand, appreciate and perhaps use their resources sustainably, such as an interpretation tool to guide ecotourists and others to the Sadong Jaya Mangroves.

As will be evident to the readership, a variety of approaches have been taken by the authors of this volume. The volume's Editors, J. Mohd-Azlan, Abang Arabi and Indraneil Das emphasize the unusual conservation importance of mangrove forests. Ismail Jusoh present a brief description of the plant diversity. Within the zoological sciences, separate contributions lead by a specialist include investigations on insects by Wan Nuraine; ichthyological communities by Fatimah A'tirah; description of the bird diversity by Mohamad Fizzl Sidq Ramji; a description of the frogs and reptiles by Indraneil Das; and the small mammal community by Faisal Ali. The book wraps up with chapters on related social elements, such as use of natural resources by Mohamad Suhaidi, and finally, the ecotourism potential of Sadong Jaya by Dayang Affizah.

I hope, in some small way, this volume will be useful to stakeholders, be it the business sector or the wider public, to whom we remain connected through our common thoughts on biodiversity protection and appreciation for nature.

**Prof. Datuk Dr Mohamad Kadim Suaidi**  
Vice Chancellor, Universiti Malaysia Sarawak



## Message

Sarawak is located within one of the world's biodiversity hotspots, and home to a variety of landscapes, that include mangrove forests. Mangrove ecosystems are among the most threatened habitats in the world. An important source of primary productivity, its ecosystem functions and refuge to a diverse biota, the value of such forest types have remained underappreciated in terms of being brought under the formal protected areas system.

Biodiversity is one of the top state agendas, whereby the State of Sarawak, with the establishment of Sarawak Forestry Corporation (Park and Wildlife) is determined to conserve and protect its biodiversity. This project sits in line with the University's niche area of biodiversity and environmental conservation and sustainable community transformation. This book, based on new research by the staff of our two institutions, brings together information on species, their habitats and other aspects of natural history, and the human community's perception on conservation and sustainable use.

Identifying the distribution, densities and habitat use of plant and animal species in mangrove forests are often seen as a challenge. Nevertheless, these data are essential for understanding their ecology, and in facilitating management of such critical ecosystems.

The faunal studies include, insects, fishes, frogs, reptiles, birds, bats, rodents, shrews and primates. Information on how anthropological activities interrelate with biodiversity is highlighted, and is shown to be a component of biodiversity function whereby the dependence of humans on natural resources and mangrove landscapes remain entwined.

This book is intended for local stakeholders, management authorities, naturalists, researchers and for the general public. It is hoped that nature enthusiasts and those who are interested in tropical biodiversity will find this book beneficial. Finally, we hope that this book will contribute to increasing the knowledge and awareness of our national heritage.

**Prof. Dr Wan Hashim Wan Ibrahim**  
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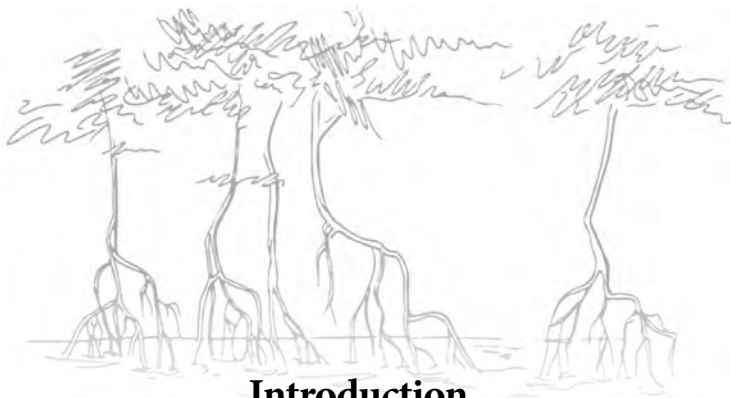
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## Introduction

Jayasilan Mohd-Azlan, Lisa Lok Choy Hong and Indraneil Das

Littoral and alluvial forests are primarily formed along coastlines or riversides that stretch along shores and riverbanks in south-east Asia. The depauperate biodiversity in littoral and alluvial forests, with lower species richness counts compared to other forest types (Ashton *et al.*, 2003) have been of considerable interest, given the vital role played by wetlands as well as their impacts on global warming and flash flood (Yule, 2010). Mangrove forests constitute some of the most threatened habitat in the world, besides being areas of important primary productivity and demonstrate important ecosystem functions, also harbouring a specialised biota. Generally, mangroves characterise sheltered tropical and subtropical coastlines, and mangrove forests contribute 1% of the landscape in Sarawak, with an area 0.09 million hectares. Mangroves, as wetland ecosystems are of substantial economic significance due to their nutrient productivity, as well as ecological function (Ashton and Macintosh, 2002). Nutrient dynamics in the ecosystem are associated with tidal sea water, that transmit to coastal areas and surrounding estuaries (Das 2017; Osland *et al.*, 2017). Mangroves have unique function and structure characteristics. The ecosystem characteristics include relatively simple food webs containing a combination of marine and terrestrial species; nursery grounds and breeding sites for mammals, reptiles and birds; and accumulation sites for sediment, some contaminants, carbon and nutrients. Mangroves also support diversity of unique flora, and fauna as well as serving as breeding and a feeding ground for fish and shellfish (Hwanhlem *et al.*, 2014; Lee *et al.*, 2014). Furthermore, food chains within such ecosystems contribute significantly to the recruitment of adult marine fishes (Sandilyan and Katherisan, 2012).



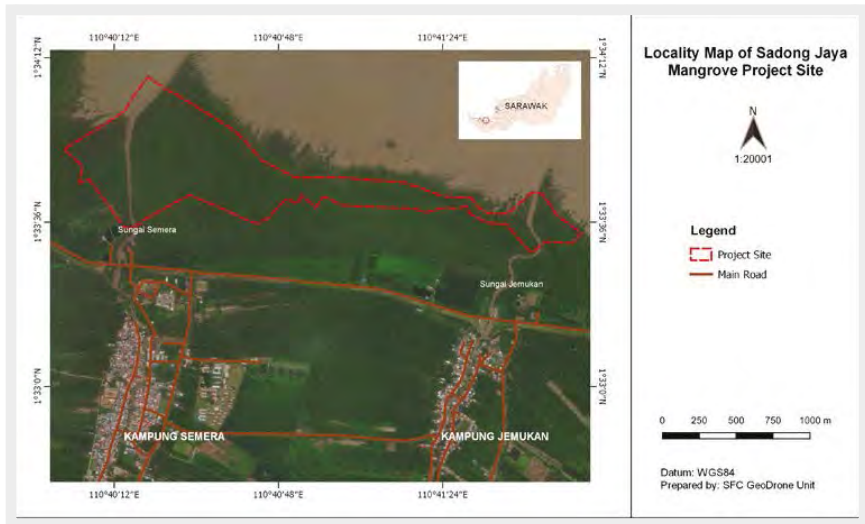
Diverse forces may act synergistically on human livelihoods (Brodie *et al.*, 2012) and mangrove forests function as the nursery for shrimps, fishes and maintain marine food web which include endemic and threatened species (Ashton and Macintosh, 2002; Sodhi *et al.*, 2004). Timber resources harvested from mangrove forests fulfill requirements for materials used in building, fuel and remedy (Ashton and Macintosh, 2002). Nonetheless, mangrove forests remain underappreciated as wasteland, for often wrongly assumed to be not sustain high biological diversity, and continue to receive less attention from conservation planners, and consequently, have become the prime choice for land conversion (Posa *et al.*, 2011; Yule, 2010). Further, these habitats tend to provide refugia for innumerable generalist species (Ashton *et al.*, 2003; Hoffmann *et al.*, 2010; Posa *et al.*, 2011).

Little is known on the biodiversity of many mangrove habitats and how local human communities perceive and are dependent on these valuable resources. Ellison and Farnsworth (1996) classified anthropogenic disturbances to mangrove forest into four broad categories with a hierarchy of increasing spatial extent and temporal intensity on biological impacts and recovery: 1) disturbances due to extraction of mangrove flora and fauna, 2) pollution, 3) habitat destruction due to land reclamation, and 4) climate change.

A rapid assessment of the biodiversity and social elements was conducted at the Sadong Jaya Mangroves. Sadong Jaya itself is a small village, located within the Asajaya District in (Fig. 1.1) Kota Samarahan Division, Sarawak. The relative distance is approximately 25 km (60 minutes-drive) and 68 km (about 90 minutes-drive) from Kota Samarahan and Kuching, respectively. The Sadong Jaya area is predominantly covered by mangrove forest patches, that edge the coastal rivers and open water. Small-scale agricultural lands (including oil palm plantations, orchard and paddy field) fence the outer forest edge. An extensive mudflat borders the coastal shoreline, between Sungai Semera and Sungai Jemukan, Sadong Jaya.

The total area of the mangrove forest is approximately 111 ha, with Sungai Semera and Sungai Jemukan being the natural drainage outlets. This work comprises the findings from eight specific projects conducted using rapid-assessment techniques to collect information on selected floral and faunal components of Sadong Jaya's biodiversity, with the purpose of developing management plans for the mangrove area and their use of Sadong Jaya.





**Figure 1.1** Map of the Sadong Jaya Nature Reserve and adjacent areas, in western Sarawak

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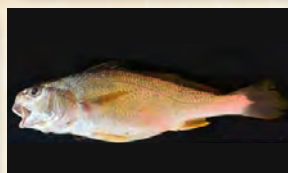
## A WILDERNESS UNVEILED

Mangrove forests are globally threatened ecosystems, yet, these fragile environments remain poorly-known in terms of their biodiversity and potential for sustainable use. Despite the ease of access from major city centres of Sarawak, the Sadong Jaya Mangroves have remained unknown to naturalists and the general public. The area harbours extensive mudflats and mangrove forests, and is home to an interesting biota, many endemic or are listed as species of conservation importance. Sadong Jaya also presents potential for ecotourism.

This book aims to inspire, enlighten and motivate stakeholders and nature enthusiasts, drawing material from recent research and experience. The images depicted show the potential of this area for natural history, tourism as well as for future research.

The introductory chapter presents an insight into the importance of mangroves and set the scene for the book. The plant component chapter showcases the unique structure and adaptations of the area's flora. The faunal component covers an array of taxa that includes both invertebrates (butterflies and fireflies) and vertebrates (fishes, frogs, reptiles, birds and mammals). The work does not ignore the human element- critical for conservation planning, and includes chapters on resource use and ecotourism potential.

The research in Sadong Jaya Mangroves that formed the basis of the book was possible through a grant from the Sarawak Forestry Corporation Sdn. Bhd., Government of Sarawak to Universiti Malaysia Sarawak. The primary objective of the project was to assess its biotic diversity, including selected groups of mangrove plants, invertebrates and vertebrates, and to examine human use of natural resources, in order to develop an applicable environmental model for ecotourism practice in the region.



  
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