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# Tree health in South Africa: Retrospect and prospect

South Africa is a country with very limited natural forest cover. Consequently, the timber and fibre needs of the country cannot be provided for from indigenous forest. It is largely for this reason that South Africa initially developed a highly productive plantation forest industry, which today makes a substantial contribution to the local economy. These plantations are based on non-native species of *Eucalyptus*, *Pinus* and Australian *Acacia*. In the early years of establishment, South African plantations were relatively free of pest and pathogen problems. But, over time, an increasing number of insects, fungi and bacteria have emerged as serious threats to the sustainability of the forestry industry. Numerous native pests and pathogens, especially insects, have adapted to these introduced tree species to cause damage or disease. The problem is compounded by the accidental introduction of non-native pests and pathogens, and this has been at a rapidly increasing rate over the past three decades. Some of these introduced pests and pathogens also threaten the fitness and even the survival of many indigenous South African tree species. Fortunately, South Africa has developed an impressive knowledge base and range of integrated management options to deal with these problems. This development was first driven by government programmes, and in more recent years by public-private partnerships between industry, universities and government. It is clear from the pattern of emergence of pests and pathogens in recent years that South Africa will deal with an increasing number of these problems and a continuously changing tree health environment. This requires robust investment in both quarantine and mitigation mechanisms to protect the country's biodiversity as well as to ensure the sustainability of its wood and fibre industries.

## Significance:

- This review about tree health in South Africa was in part inspired by the 2020 International Year of Plant Health. Plant health, and particularly tree health, is an important topic in regard to the sustainability of our forestry industry and conservation of our native forests. South Africa has been a leader in the field and this review highlights some of the achievements that researchers in the country, both past and present, have attained.

## Introduction

South Africa is an arid country and consequently has very limited resources of natural forest in the western part of the country. This is the primary reason why South Africa was one of the first countries in the world to establish commercial plantation forestry based on non-native tree species. These plantations were able to accommodate local demand for wood products, especially for construction and fuelwood. In the process, this allowed small tracts of natural forest and woody ecosystems to be spared from destruction.<sup>1</sup>

The first commercial plantations established in South Africa were those of *Pinus pinaster* (around 1825), soon overtaken by *P. radiata* and much later by *P. patula*. Likewise, *Eucalyptus* was an early addition to the exotic tree resource with the first planting of *Eucalyptus globulus* in 1887. Subsequently, commercial forestry has grown considerably in South Africa based mainly on *Pinus* and *Eucalyptus*, but also including Australian *Acacia* species, mainly *Acacia melanoxylon*. According to Forestry South Africa, as of February 2020, the current landholding representing commercial plantation forestry in South Africa is approximately 1.2 million hectares.

Many factors affect the health of trees. These factors include damage by insect and nematode pests and pathogens such as bacteria, fungi and viruses. Climatic factors such as rainfall, temperature and wind, as well as edaphic factors including soil structure and quality, are all important contributors to the overall health and vigour of trees. For the purpose of this review, we deal exclusively with pests and pathogens – thus broadly the fields of forest entomology and forest pathology as they relate to the health of forest trees in South Africa.

When considering forest tree health in South Africa, it is important to clearly distinguish between trees in natural woody ecosystems and those that are planted commercially. These are very different situations, both in terms of the impact and the management of insect pests and pathogens. Plantations, especially in the southern hemisphere, typically comprise non-native tree species often planted in high-density monocultures that are intensively managed. The choice of species, provenance or genotype is carefully controlled, and typically tailored to particular regions and sites based on numerous biotic and abiotic conditions as well as risk factors. Natural forest and woody ecosystems in South Africa are biodiverse and composed of large numbers of native trees and other plants in a complex matrix, and are typically protected from logging. In contrast, plantations are managed mainly by commercial enterprises and are of high value. Among other factors, this dichotomy leads to different approaches to managing pests and pathogens, although significant tree health challenges exist in both commercial and non-commercial woody ecosystems.

In plantations, serious damage due to pests and pathogens is usually very obvious and is considered important and worthy of intervention. In contrast, disease and pest problems in natural forests have been afforded very little attention in South Africa in the past. The value of understanding and managing health risks in natural forests has changed in recent years, due in part to the recognition of bidirectional transfer of pests and pathogens between native and non-native plantation systems, and the resulting substantial impacts on trees grown as non-natives in plantations.<sup>2,3</sup> Thus, the establishment of the South African Department of Science and Innovation (DSI) and

# South Africa Retrospect And Prospect

**Shimon Shetreet**



## **South Africa Retrospect And Prospect:**

*The Migration Experience in Africa* Jonathan Baker, Tade Akin Aina, 1995 South Africa by Christian M Rogerson

Neoliberalism and Resistance in South Africa Shaukat Ansari, 2021-05-03 This book critically examines the persistence of market orthodoxy in post apartheid South Africa and the civil society resistance such policies have generated over a twenty five year period Each chapter unpacks the key political coalitions and economic dynamics domestic as well as global that have sustained neoliberalism in the country since the transition to liberal democracy in 1994 Chapter 1 analyzes the political economy of segregation and apartheid as well as the factors that drove the democratic reform and the African National Congress ANC subsequent abandonment of redistribution in favor of neoliberal policies Further chapters explore the causes and consequences of South Africa's integration into the global financial markets the limitations of the post apartheid social welfare program the massive labour strikes and protests that have erupted throughout the country and the role of the IMF and World Bank in policymaking The final chapters also examine the political and economic barriers thwarting the emergence of a viable post apartheid developmental state the implications of monopoly capital and foreign investment for democracy and development and the phenomenon of state capture during the Jacob Zuma Presidency

**Narratives of Nation Media, Memory and Representation in the Making of the New South Africa** Charmaine McEachern, 2002  
Narratives of Nation Media Memory Representation in the Making of the New South Africa Quarterly Journal of the Royal Meteorological Society Royal Meteorological Society (Great Britain), Royal Meteorological Society (Gt. Brit.), 1904 Vols 10 11 include Meteorology of England by James Glaisher as separately paged section at end **Governing Complex**

**City-Regions in the Twenty-First Century** Philip Harrison, 2023-11-10 Provides a comparative study of the complex governance challenges confronting city regions in each of the BRICS countries It traces how governance approaches emerge from the disparate intentions actions and practices of multiple collaborating and competing actors working in diverse contexts of political settlement and culture *Africa* Air University (U.S.). Library, 1993 *South Africa* Uma Shankar Jha, 1996 Contributed articles Migration in South and Southern Africa Pieter Kok (Zuid-Afrika.), 2006 Covers three broad areas macro level migration trends in sub Saharan Africa micro level factors in South African migration and a synthesis of current migration theory *African Christian Theology, Volume 1, Number 1, March 2024* Joshua Robert Barron, 2024-07-11

African Studies Centres Around the World Ute Fendler, Doris Löhr, 2022-02-15 The book African Studies Centres Around the World A Network Based Inventory compiles a selection of contributions by the directors of eleven African Studies centres from four continents They comprise Africa's oldest centre on the continent at the University of Cape Town the European centres in Bordeaux Lisbon and Hradec Králové and the two North American Universities of Florida and Indiana Central and South America's contributions to African Studies is represented by the centres in San José Costa Rica Santiago de Cuba and Salvador da Bahia Brazil The Asian centres are located at Jawaharlal University in Mumbai India and at Hankuk University of

Foreign Studies in Seoul South Korea The eleven chapters show the very diverse history of the centres explaining their different structures underpinning the need for more exchange and collaborative research The volume presents some aspects of the ongoing critical reflections on the historical and political development of African Studies in various parts of the world disseminating first hand knowledge while the chapters encourage to open the exchange and collaboration across regional disciplinary and academic boundaries With contributions from Akintunde Akinyemi Carlos Almeida Aparajita Biswas Rina Caceres Yongkyu Chang Marta E Cordies Jackson Ute Fendler John H Hanson Doris L hr Lungisile Ntsebeza Livio Sansone Jose da Silva Horta Petr Skalnik Celine Thiriot

*A Scientific Bibliography of the Far Northern Drakensberg* Rodney Moffett, 2023-04-14 This Scientific Bibliography of the Far Northern Drakensberg is a continuation by the Afrimontane Research Unit of the University of the Free State ARU to document published and other similar works on the mountains of the summer rainfall area of South Africa It follows *A Scientific Bibliography of the Drakensberg Maloti and Adjacent Lowlands* which was published in 2020 Moffett 2020 and which covered the area between the North Eastern Cape and the North Eastern Free State The current work extends this northward by including articles and publications dating back to 1875 E Cohen on the Lydenburg goldfields reaching as far as the Wolkberg and Woodbush near Tzaneen in Limpopo Province Figure 1 shows the boundary of the area covered and although referred to as the Far Northern Drakensberg in this work it is identical to that described as the LMEE Limpopo Mpumalanga Eswatini Escarpment by Clarke et al 2022 Although slightly separate from the lower escarpment the mountainous Barberton and adjacent Eswatini area as well as the Leolo Mountains in eastern Sekhukhuneland are also included Details on how the boundary in figure 1 was determined are given in Clark et al 2022 Bibliographies on two further ranges in the summer rainfall area viz the Magaliesberg in Gauteng province and the Soutpansberg in Limpopo province are to be the subject of future compilations

**Second International Handbook of Lifelong Learning** David N. Aspin, Judith Chapman, Karen Evans, Richard Bagnall, 2012-01-18 The second edition of the *International Handbook of Lifelong Learning* is extensive innovative and international in scope remit and vision inviting its readers to engage in a critical re appraisal of the theme of lifelong learning It is a thorough going rigorous and scholarly work with profound and wide ranging implications for the future of educating institutions and agencies of all kinds in the conception planning and delivery of lifelong learning initiatives Lifelong learning requires a wholly new philosophy of learning education and training one that aims to facilitate a coherent set of links and pathways between work school and education and recognises the necessity for government to give incentives to industry and their employees so they can truly invest in lifelong learning It is also a concept that is premised on the understanding of a learning society in which everyone independent of race creed or gender is entitled to quality learning that is truly excellent This book recognises the need for profound changes in education and for goals that are critically important to education economic advancement and social involvement To those concerned about the future of our society our economy and educational provision this book provides a

richly illuminating basis for powerful debate Drawing extensively on policy analyses conceptual thinking and examples of informed and world standard practice in lifelong learning endeavours in the field both editors and authors seek to focus readers attention on the many issues and decisions that must be addressed if lifelong learning is to become a reality for us all

**The Role of Courts in Society** Shimon Shetreet,1988-01-01 *Region-Building in Southern Africa* Chris

Saunders,Gwinyayi Albert Dzinesa,Dawn Nagar,2013-07-04 How successful have Southern African states been in dealing with the major issues that have faced the region in recent years What could be done to produce more cohesive and effective region building in Southern Africa In this original and wide ranging volume which draws on an interdisciplinary team of mainly African and African based specialists the key political socio economic and security challenges facing Southern Africa today are addressed These include the various issues confronting the Southern African Development Community SADC and its institutions such as HIV AIDS migration and xenophobia land grabbing and climate change and the role of the main external actors involved with the region including the United Nations the European Union the United States and China The book also looks at the Southern African Customs Union and Southern African Development Finance Institutions including the Development Bank of Southern Africa and Industrial Development Corporation and issues of gender and peacebuilding In doing so the book goes to the heart of analyzing the effectiveness of SADC and other regional organisation suggesting how region building in Southern Africa may be compared with similar attempts elsewhere in Africa and other parts of the world

**Erasing Invisibility, Inequity and Social Injustice of Africans in the Diaspora and the Continent** Peter Otiato

Ojiambo,Omiunota N. Ukpokodu,2017-11-06 This volume engages the reader in understanding past and contemporary critical issues in African scholarship both in the diaspora and on the continent that have been marginalized unexamined and under researched and proposes ways to make them visible The book is timely as it imagines and reimagines scholarship on Africans in the diaspora and on the continent It is bold and authentically unpacks African immigrants individual and collective cultural educational social and institutional experiences especially in the context of US Pk 12 schools as they navigate and negotiate transnational spaces regarding identity and shifting positionalities The editors and contributors who are themselves African immigrants exemplify their spirits of Sankofa as they look back to their roots in order to give back to their Motherland by fighting for the visibility equity and social justice of Africans in the diaspora and on the continent The book proposes critical and insightful ideas that educators researchers policy makers social and human services and community leaders will find valuable

**Science** John Michels (Journalist),1903 Vols for 1911 13 contain the Proceedings of the Helminthological Society of Washington ISSN 0018 0120 1st 15th meeting **Africa** Army Library (U.S.),1973

*Africa: a Bibliographic Survey of Literature* Army Library (U.S.),1974 **The Pursuit of a Brave New World in**

**International Law** Tiyanjana Maluwa,Max du Plessis,Dire Tladi,2017-01-09 The Pursuit of a Brave New World in International Law presents critical perspectives on various inter related themes in the areas of human rights international

law terrorism and international criminal justice The discussions reflect the wide ranging subjects that John Dugard has engaged with over the last five decades as an international law scholar teacher and judge The essays pay homage to Professor Dugard s impressive body of work as both a theorist and practitioner of international law and international human rights law While some of the discussions in the volume critically examine his views as expressed in his academic writings judicial opinions and official United Nations reports others deal with subjects that have been inspired by or are related to Dugard s work Contributors are Neil Boister Trevor P Chimimba James Crawford David Dyzenhaus Christopher Greenwood Larissa van den Herik Christof Heyns Maurice Kamto Tiyanjana Maluwa Max du Plessis Thomas Probert Arnold Pronto Philippe Sands William A Schabas Ivan Shearer Hennie Strydom Mia Swart Dire Tladi Annemarieke Vermeer K nzli and Abdulqawi Yusuf

**Value Added Tax and Direct Taxation** Michael Lang, Peter Melz, Eleonor Kristoffersson, Thomas Ecker, 2009 This book provides a comprehensive in depth analysis of the similarities and differences between consumption taxes and direct taxes Fifty contributions are included written by academics practitioners and representatives from several international tax administrations and institutions

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