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Review

People and rangelands: a review of the contribution of the *African Journal of Range and Forage Science* to advancing knowledge on the human dimensions of African rangelands

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The social dimensions of rangeland systems are increasingly highlighted in international rangelands literature. This paper presents a systematic review of the *African Journal of Range and Forage Science* from 1966 to 2023 to evaluate its contributions to this scholarship. The review involved analysing socially relevant papers for their frequency, author keywords, themes, geographical focus and tenure context. A qualitative assessment of the journal's special issues and a synthesis of recurring themes across all papers were conducted, utilising both ChatGPT-4 AI and manual review of paper conclusions. Out of the screened papers, 73 included social context terms. Notably, the number of these papers has increased significantly, particularly from 2003 onwards, with peaks aligning with special issues. Thematic focuses include management, practices, behaviour, knowledge and livelihoods in communal regions, primarily centring on South Africa despite a broader African focus emerging over time. The journal has been instrumental in deepening the understanding of African rangelands as socio-ecological systems and advocating for the integration of social dimensions into rangeland management, research and policy in Africa. Suggested future research directions build on the existing work as well as addressing understudied themes.

Keywords: AI-assisted literature review, rangeland management, social, socio-ecological

Introduction

There is widespread agreement in the international literature that while substantial advances have been made in understanding ecological dimensions of rangeland management, the social dimensions are understudied (Homewood 2004; Bruno et al. 2020; Matarrita-Cascante et al. 2023). Although the number of social studies in rangelands have increased steadily over the past four decades, the involvement of social science research in rangeland management remains limited (Bruno et al. 2020; Matarrita-Cascante et al. 2023). This is despite recognition that sustainable rangeland management is as much a social process as an ecological one (Huntsinger and Hopkinson 1996). There is a gap not only between the natural and social sciences, but also between western and local understandings (Homewood 2004). Brunson et al. (2022) thus call for social research that focuses on perceptions, practices and experiences of understudied rangeland stakeholders such as indigenous land users, including women. Understanding both the ecological and social nature of rangeland systems is important for strengthening rangeland management, monitoring, and policy formulation for improved resource management and human welfare in rangelands (Homewood 2004; Ngugi and Conant 2008; Plieninger and Huntsinger 2018). Matarrita-Cascante et al. (2023) assert that the goal of social science in

rangeland management research should be to 'understand the many interrelated factors informing the decisions and behaviors of rangeland managers'. This, in turn, can provide nuanced insights on the drivers of observed landscape patterns (Unks 2023).

Rangelands are complex multifunctional systems, supporting multiple uses and diversified livelihoods (Cousins 1999; Plieninger and Huntsinger 2018). The past two decades have thus seen growing recognition of rangelands as coupled socio-ecological systems (SES) in which social and ecological actors and processes influence each other in complex ways (Gross et al. 2006; Brunson 2012; Hruska et al. 2017; Matarrita-Cascante et al. 2023). They are dynamic systems in which future trajectories are shaped by emergent properties such as resilience, adaptability and transformability (Gross et al. 2006; Hruska et al. 2017). As such, they typify complex adaptive systems (CAS) (Walker and Janssen 2002; Gross et al. 2006).

Applying the SES conceptual framework to rangelands brings into focus the dynamic interactions and trade-offs between ecosystem and social system components (Plieninger and Huntsinger 2018). It promotes 'resilience thinking' in rangeland policy and management, which shifts the focus from optimal solutions using 'command and control' approaches, to building the capacity to adapt

and transform (Walker and Janssen 2002; Brunson 2012). Applying a SES lens also enables the identification of drivers of both desirable and undesirable ecological and social outcomes, which is important for preventing or correcting unforeseen negative consequences of socio-economic and resource management policies (Hruska et al. 2017). Social research, drawing on disciplines such as anthropology, sociology, economics, political sciences and sustainability science, is thus critical to supporting sustainable management of rangelands.

For almost 60 years, the Grassland Society of Southern Africa (GSSA) has been contributing to scholarship in range and pasture science through its journal, the *African Journal of Range and Forage Science* (AJRFS) (1993 to the present), the *Journal of the Grassland Society of Southern Africa* (1984–1992) and the *Proceedings of the Annual Congresses of the Grassland Society of Southern Africa* (1966–1983). (From here on, AJRFS is used as shorthand for the current journal and its two predecessors.) As stated in the journal scope and aim, it is 'the leading rangeland and pastoral journal in Africa', publishing peer-reviewed articles on rangeland and pasture ecology and management. While the main focus is on biophysical sciences, the journal does encourage articles that highlight 'transdisciplinary linkages among biophysical and social sciences that support management, policy and societal values'. This paper assesses the contribution of the GSSA journal to advancing knowledge on the human dimensions of African rangelands, and to scholarship in the field.

Methods

A systematic review approach was used in this study. A list of 17 words or terms applicable to the topic of enquiry was developed based on my prior knowledge and experience as a researcher in this field, and as a long-standing associate editor of the journal. A colleague with relevant expertise (Dr A Fry) then reviewed the list, resulting in a final list of 25 search terms (see the Appendix, listing 17 preliminary and 25 final search terms). An advanced document search using SCOPUS (1984–2023) and Taylor and Francis Online (1966–1983) was conducted using the 25 search terms present in either the article title or author keywords. Document type was limited to articles, review papers and published conference papers. The abstract of each of the resultant papers was read to remove irrelevant papers, and to categorise those remaining according to (a) geographical focus (South Africa, African regions, or other regions), (b) the focal land tenure system (communal, private, both, or unknown/not stated), and (c) the primary focus of the paper.

For analysis, the frequency of the papers published per year, and the total and annual frequency of each of the search terms, author keywords, geographic focus, land tenure category and category of focus were calculated over the 57 years. Annual frequencies were tallied and then aggregated into five-year pentads for easier detection of patterns over time, given the relatively low sample size of papers over years. All quantification of absolute and relative frequencies and the creation of graphs was done in Excel. WordClouds.com was used to generate a word cloud of author keyword frequencies.

The knowledge contributions of journal special issues were assessed qualitatively with the help of ChatGPT-4 (<https://chatpro.ai-pro.org>), which was used to derive a short summary of the combined conclusions of the papers in each special issue. These were reviewed and revised as needed, after reviewing the conclusions of the papers in the special issue. A synthesis of recurring themes and emerging insights across all papers was then conducted. ChatGPT-4 was used to summarise the conclusion of each paper with the instruction 'Precis in as few sentences as possible' for the conclusion text, which was copied and pasted from the paper. For papers without a conclusion section, the concluding paragraphs of the discussion were used. In cases where the discussion lacked a clear summary of conclusions, relevant text from the abstract was entered. Each precis was compared with the authors' conclusions to verify the accuracy of the AI summaries. In a few cases, the precis summarised findings in many sentences with little emphasis on insights or implications, in which case the analysis was rerun using the instruction 'Precis in three sentences,' yielding more consistent results. The summaries of all conclusions were compiled into a single document. Common themes were extracted from the compiled text in ChatGPT-4 using the instruction 'Summarise recurring themes.' The instruction 'Precis' was then used to summarise the insights from the compilation of conclusion summaries. The summarised meta-themes and insights from the conclusions of the papers formed a general framework that was subsequently evaluated and refined or embellished after comparison with a manual review of the conclusions. This involved deleting, merging or renaming some of the themes, and revising the wording of the associated explanations and insights. A brief reflection on each of the themes was added, with reference to pertinent papers.

Results and discussion

The emergence and evolution of social dimensions over time

The first paper with a clearly identified social dimension was by Broom (1975), which examined the economic aspects of beef intensification in the 'Natal midlands' region of South Africa, focusing on factors such as capital, labour, management time and organisational capacity of farmers. Since 1975, a total of 73 papers addressing social aspects have been published in the society journal. This averages to 1.52 papers a year, which is somewhat disappointing. However, a limitation of this study is the reliance on search terms in the titles and keywords of the papers, potentially leading to the omission of relevant studies in which social dimensions may have been inadequately expressed in these fields. Papers were not evenly distributed across years, with the period 1974–2003 being characterised by a gradual increase in papers before the surge in numbers in 2004–2023 (Figure 1). Spikes in 2003 (6), 2004 (9) and 2013 (11) are largely due to papers from the proceedings of the *VIIIth International Rangeland Congress* hosted in South Africa in 2003 (vol. 20(2); vol. 21(2–3)), and the special issue on *Aligning policy with the socio-ecological dynamics of rangeland commons* (vol. 30(1–2)), respectively. Additionally, all four papers in 2018 were from the *Karoo* (vol. 35 (3–4))

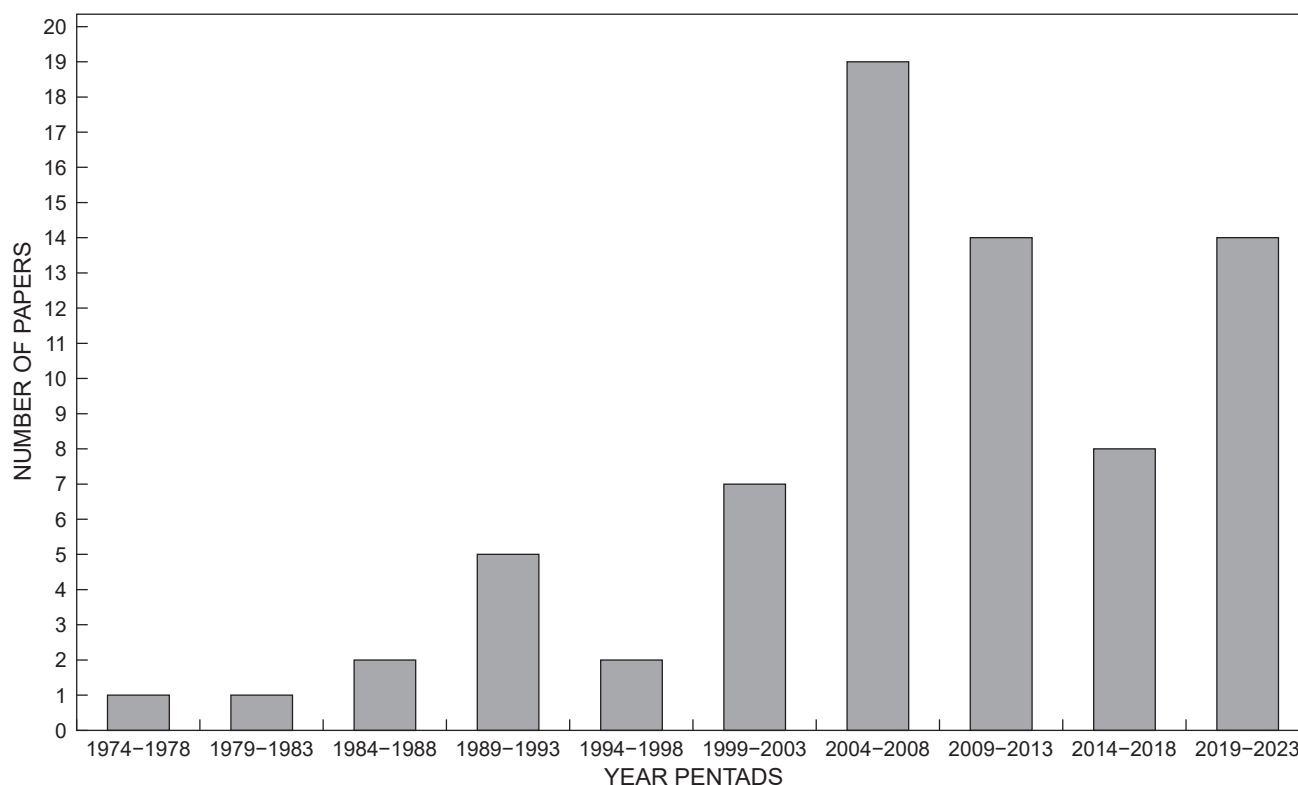


Figure 1: Frequency distribution of socially related papers over time

special issue, two of the three papers in 2022 were from the *Friend or foe? Lessons from a century of evidence-based fire management in grassy ecosystems* (vol. 39 (1)) special issue, while three of the four papers published in 2023 appeared in the special issue on *African rangelands and pastoralism in a changing continent: perspectives and opportunities* (vol. 40(1)). The numbers of published papers varied widely between the years 2001 and 2016, while the last seven years had a modest but more consistent flow of papers, accounting for the 14 papers published in 2019–2013. This bodes well for the future.

The most common search term in paper titles or keywords was 'communal' (28), with the most counts coinciding with year pentads incorporating the proceedings and special issues mentioned above. This was followed by 'livelihood' in a distant second place with 11 papers, and 'pastoral' in third with 10. Other terms appearing in five or more papers were 'perception', 'human', 'social', 'knowledge', 'conflict', 'institution' and 'socio-ecological' (or 'social-ecological'). Terms including 'human' and 'social' appeared consistently across the pentads spanning 2004 to 2023 (Figure 2). Papers mentioning livelihoods first appeared in 2003 and are present in the remaining four pentads. We also see the emergence of 'socio-ecological' in the mid-2000s. The term appeared consistently but very infrequently across the last four pentads of the review. Both 'knowledge' and 'institutions' also feature in three of the last four pentads, the exception being 2014 to 2018, which saw a lull in papers (Figure 1). The relative frequencies of author keywords are summarised in a word cloud in Figure 3. The most common were 'livestock' (20), 'management' (19), and 'communal' (16).

The most common primary focus of papers was management of rangelands (9), followed by practices or behaviour (6), knowledge (6), human impacts (including degradation) (5), understanding rangelands as SES or CAS (5), monitoring (4), livelihoods (4) and governance (4). It should be noted that assigning a single focus per paper likely resulted in some loss of nuance where papers had more than one important focus. For example, while 'livelihood' was the second most common search term appearing in paper titles and keywords, it was judged to be the primary focus of only four papers, which is probably an under-estimation. Nevertheless, the analysis reveals some interesting patterns over time (Figure 4). Firstly, while management was the main focus in the 1980s and early 1990s, the emphasis of papers started diversifying into themes such as knowledge and livelihoods in the late 1990s and early 2000s, so that by 2004–2008 the primary focus of papers also included practices and behaviour, human impacts, SES/CAS, monitoring and governance. Secondly, SES or CAS was the focus of at least one paper in each of the four most recent pentads. Thirdly, the emergence of papers focussing on rangeland governance since the mid-2000s is notable. The absence over the last decade of papers with livelihoods as the main focus is also important to note, notwithstanding the caveat outlined earlier.

The observed waves of research and popularity of terms and themes over time highlight the reality that progress is not linear, which suggests the need to potentially 'ride the waves' as they emerge. The results suggest that deepening the understanding of social dimensions requires reminders and conscious efforts, such as special issues. However, impact is not only a function of the number of papers, but also of the

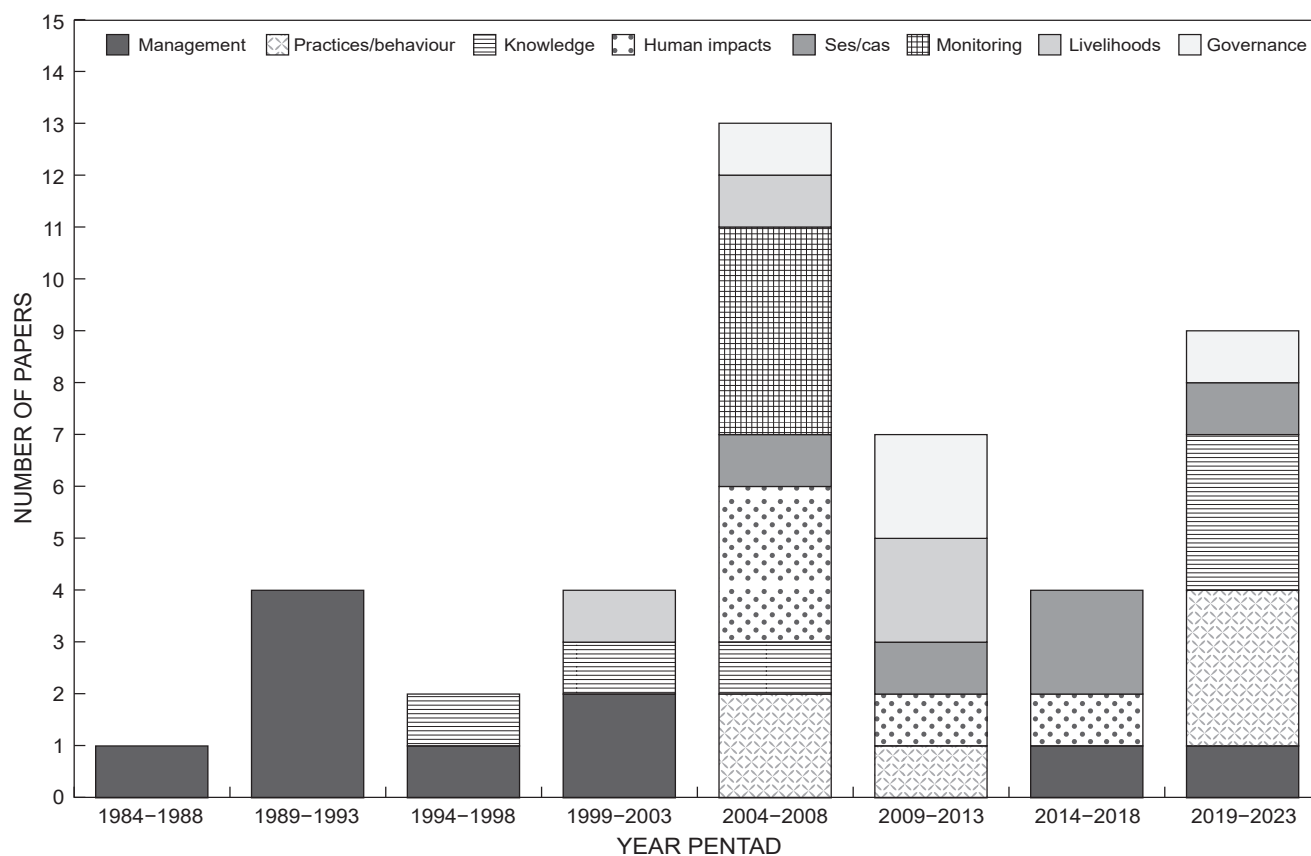


Figure 4: Frequency distribution of the top eight categories of primary focus of papers over time (none of these applied to papers published between 1974 and 1983)

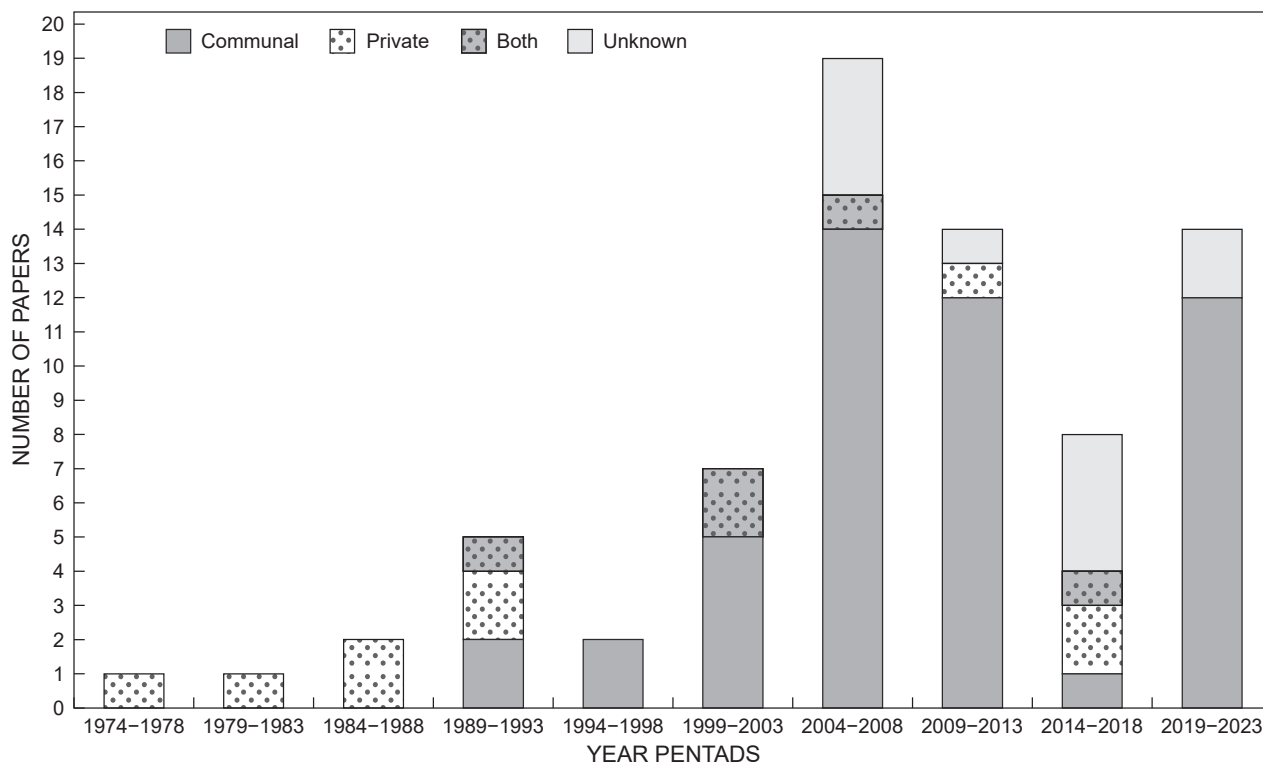


Figure 5: Frequency distribution of land tenure system per paper over time

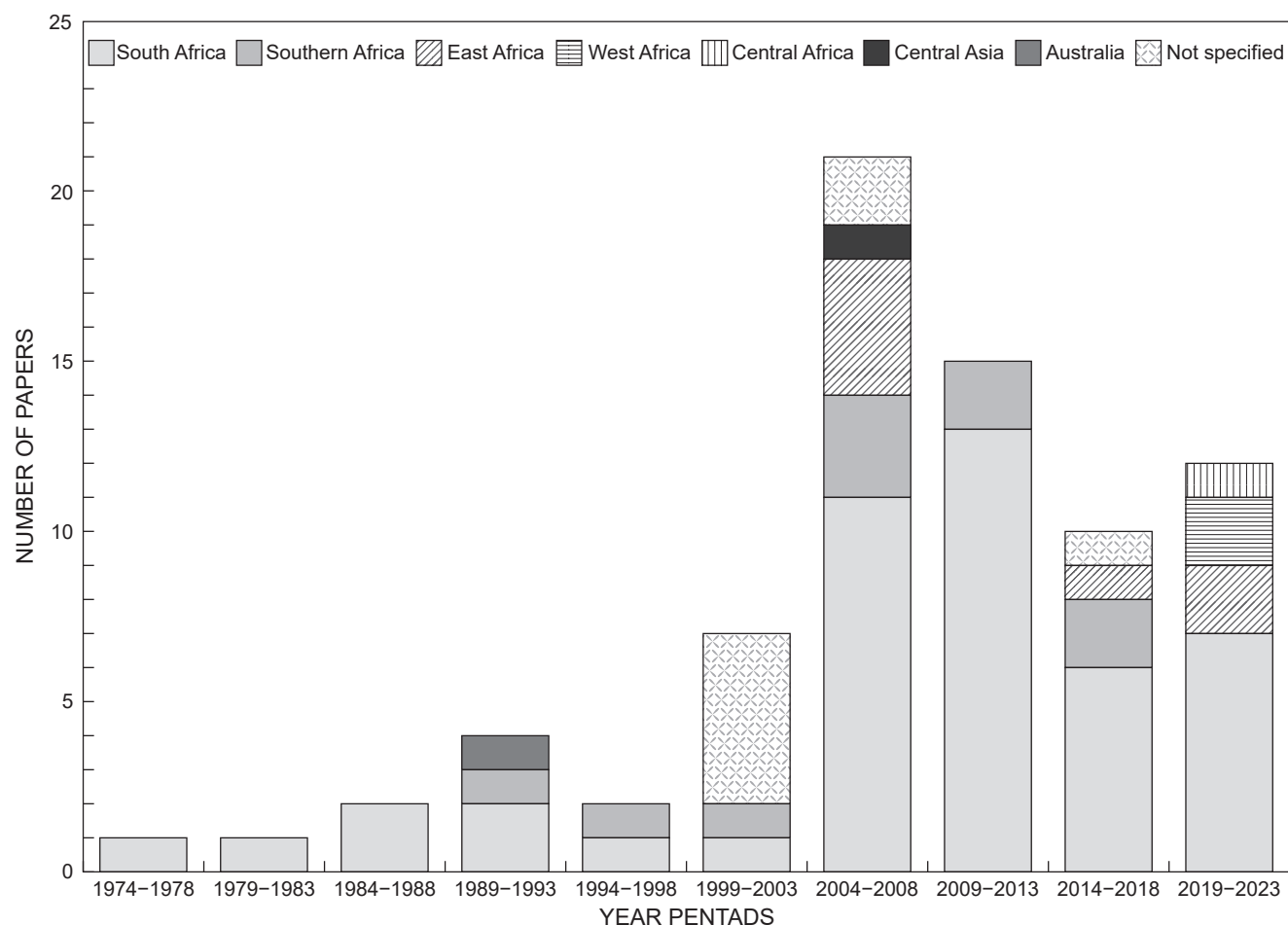


Figure 6: Frequency distribution of geographic focus of papers over time

west and central Africa were represented in addition to South Africa. Nevertheless, the strong South African bias persists, and every effort should be made to elicit submissions from the rest of Africa.

Approaches and research methods

A common methodological approach of empirical papers was either to do surveys only (e.g. Kunene et al. 2003) or to employ a mixed-methods strategy, typically consisting of various combinations of surveys, focus group discussions, key informant interviews and environmental data collection (e.g. Moyo et al. 2008; Nanfuka et al. 2020; Uzayisenga et al. 2021). Both empirical and review papers were commonly underpinned by a socio-ecological systems approach (e.g. Shackleton et al. 2017; Walker et al. 2018). Less common were ethnographic (Mwamidi et al. 2023), historical (Samuels et al. 2021), archaeological (Morris 2018) and political ecology approaches (Samuels et al. 2021). Most papers assessed either the influence of people on rangelands (including knowledge, perceptions, practices, tenure and governance) or the influence of rangelands on people (including cultural values and livelihood contribution). Relatively few considered bi-directional relationships between society and rangelands (e.g. Twine 2005; Walker et al. 2018). An important observation is that very few authors

explicitly grounded their work in social theory or reflected on their reflexivity and positionality in the research. This may be because in many, if not most, cases the researchers came from an environmental sciences or multidisciplinary background, learning social research methods without necessarily having an adequate theoretical foundation. This highlights the value of including social scientists in multidisciplinary teams.

The contribution of journal special issues

The quantitative contribution of journal special issues was highlighted earlier, and their qualitative contribution is assessed here. Papers from the *Proceedings of the VIIIth International Rangeland Congress: 26 July – 1 August 2003* (vol. 20(2) and vol. 21(2–3)) represent congress sessions on enabling frameworks; tenure, livelihoods and sustainable development; management for sustainable use; economic implications of rangeland degradation; and rangeland auditing and monitoring. Key scholarly contributions from this diverse set of themes include:

- Advocating for the integration of indigenous knowledge for more effective rangeland management
- Underscoring that rangelands provide multiple natural resources, in addition to fodder, that support diversified livelihoods

- Arguing that agricultural landscapes must transform from solely farming-focussed environments to diverse ecosystems that sustain a wide array of human necessities
- Highlighting the need for clearer understanding and assessment of habitat change, degradation, fragmentation, and their consequences for both ecological and human systems, with a focus on integrating ecological, social and economic studies for effective policy making and impact
- Emphasising the need for monitoring systems to reflect and adapt to stakeholders' mental models, political and social contexts, and the inherent complexities of ecological systems, particularly at scales beyond individual management units.

The special issue on *Aligning policy with the socio-ecological dynamics of rangeland commons* (vol. 30 (1–2)) provides a valuable consolidation of then current insights and scholarly thought on intertwined issues such as sustainable livelihoods, traditional governance systems, land reform, and the diverse and dynamic nature of communal rangelands. This important body of work advocates for a multifaceted and integrated rangeland policy in South Africa, emphasising the importance of securing multiple livelihoods, strengthening common property management and tenure security, and developing institutional capacity for participatory land-use planning and management to tackle the complex challenges of rural poverty, land rights and sustainable development. The core of the special issue, a position paper by Vetter (2013), has been cited 69 times (SCOPUS), which is second only to Teague and Barnes (2017) (104) among human-linked papers, and is the 18th most highly cited paper published by the AFRFS.

The special issue on the Karoo (vol. 35 (3–4)) provides a synthesis of knowledge on the ecological and social dimensions of the Karoo. Collectively, the papers highlight the need for collaborative efforts between social and natural scientists to address contemporary challenges in the Karoo's social-ecological systems. The focus of special issue *Friend or foe? Lessons from a century of evidence-based fire management in grassy ecosystems* (vol. 39 (1)) is self-explanatory. Acknowledging fire-prone landscapes as social-ecological systems is advocated in aiding the development of policies and resilient communities that balance the ecological benefits of fire with the need to protect lives and property. Responsible journalism and well-informed citizens are pivotal in achieving this goal. The special issue on *African rangelands and pastoralism in a changing continent: perspectives and opportunities* (vol. 40 (1)) offers a continental view on the evolving dynamics influencing how rangelands across Africa are perceived, valued, developed and managed. A common theme across the studies is the recognition of traditional knowledge and customary practices as essential, yet underleveraged, assets for the sustainable management of communal rangelands.

Qualitative thematic review

The final synthesis is of key themes and insights that emerge from the full body of work. These are presented below with some reflections using selected papers:

Socio-ecological relationships

This theme is characterised by a strong emphasis on the interconnectedness of rangelands, herbivores and human

wellbeing, and the challenges of balancing ecological concerns with socio-economic needs and cultural practices. This scholarship calls for system-oriented approaches to management and an appreciation of the importance of socio-ecological resilience. A good example is a study by Samuels et al. (2021) who used the SES framework to examine how pastoral mobility in semi-arid montane communal rangeland in South Africa has adapted to the changing socio-political landscape. Allsopp (2013) points out that reductionist thinking that ignores the complexity of rural socio-ecological systems is one of the reasons that deterministic interventions aimed at improving rangeland condition and livelihoods have generally had no impact. The extent to which this message has influenced policy is unclear.

Community involvement and empowerment

This theme focuses on the importance of involving local communities in developing and implementing rangeland management strategies. Calls for community participation are not new (see Boonzaier et al. 1990), but authors such as Davis et al. (2008) and Goqwana et al. (2008) illustrate practical challenges with this, such as dealing with variable levels of local capacity and agency, and divergent aims and aspirations of participants. This requires participatory approaches that empower communities to take an active role in managing their resources, but successful case studies are lacking.

Economics and livelihoods

This is a quite a broad theme, addressing the economic aspects of rangeland management, including economic incentives, the viability of commercial pastoralism and the diverse roles of rangelands in supporting livelihoods. Hendricks et al. (2004) and Shackleton et al. (2005) et al. shed light on the varied economic contributions of livestock to diversified livelihoods in communal areas, where farming is but one of multiple livelihood sources, which also include secondary natural resources harvested from rangelands (Kiringe and Okello 2005; Twine 2013). More current economic quantification of rural livelihoods is lacking, which is problematic in light of rapid socio-economic transitions under way in rural areas.

Adaptive management

This theme highlights the need for flexible and adaptive management systems that can accommodate changing environmental conditions, population pressures and socio-economic dynamics. A point of concern is that the tenure and governance arrangements for communal rangelands might limit the adaptation options for rangeland users. However, effective local grazing management systems have emerged in certain commons following the cessation of top-down control (Allsopp 2013).

Indigenous knowledge, perceptions and practices

This is centred on the value of integrating indigenous knowledge and traditional practices and scientific knowledge and methods to guide rangeland management, recognising the role of perceptions in shaping behaviours and the value of local insights in sustainable practices. Success in rangeland management relies on collaboration across disciplines and

integrating diverse professional skills and knowledge areas, including indigenous knowledge. However, while effective customary resource management systems do still exist (e.g. in south-west Kenya (Mwamidi et al. 2023)), evidence reveals widespread erosion of indigenous knowledge and practices, and a disconnect between local ecological knowledge and both local rangeland management practices and scientific ecological data (Hendricks and van der Heyden 1998; Moyo et al. 2008; Tefera and Kwaza 2019; Finca et al. 2023).

Climate change impacts and adaptation

This increasingly important theme focuses on farmer experiences and awareness of the impacts of climate change on rangelands and livelihoods, and the importance of developing adaptive strategies to cope with these changes, which are likely to exacerbate existing challenges such as degradation. Studies by Clarke et al. (2012) and Muller and Shackleton (2014) show that while commercial farmers have the knowledge and resources to adopt various coping mechanisms, communal farmers have very rudimentary understandings of global climate change and are particularly vulnerable to its future impacts. While not unexpected, this underscores the pressing necessity for increased governmental assistance and enhanced access to information for communal farmers, empowering them to better adapt to changing conditions.

Monitoring

This theme emphasises the role of monitoring systems in informing management decisions and policies, with involvement from land managers in the monitoring process to increase effectiveness. This links strongly to the theme of adaptive management. Importantly, Brown and Havstad (2004) point out that monitoring should transcend ecological assessments to include the political, social and economic drivers of ecological outcomes. These include the mental models of land users, which constitute a 'slow variable' that underlies the risk of major changes in the system state (Lynam and Stafford Smith 2004).

Extension

The core of this theme is the value of extension efforts that are tailored to local conditions, with participatory approaches to integrate farmer knowledge and facilitate adoption of management practices. Emerging insights include that extension services should target economic and educational aspects that align with farmers' interests, while non-economic incentives can bolster community participation in rangeland management. Unsurprisingly, efforts to improve communal grazing lands by the transfer of foreign technologies without participation of farmers have failed (Tavirimirwa et al. 2019).

Land tenure, property rights and governance

Concerns about land tenure systems, property rights, weak institutions and their influence on rangeland management, including issues of access, security and traditional land arrangements are captured in this theme. Governance systems in South African communal areas are generally characterised by ineffective local-level institutions (Moyo et al. 2008) and disputes among traditional, civic and local government institutions regarding their authority to manage

and allocate communal land (Bennett 2013). This has prompted Bennett (2013) to advocate for a tenure reform approach that places all authority over local land management in the hands of civil society institutions that are elected and held accountable by the people. However, because administration of communal land is one of the last remaining vestiges of power left in the hands of traditional authorities in South Africa (Moyo et al. 2008), they are unlikely to relinquish such powers.

Policy

This is a cross-cutting theme highlighting the need for comprehensive, multifaceted policies and government commitment to combat land degradation, support sustainable management involving local communities, and ensure equitable resource distribution. The emerging consensus is that policies tackling rangeland degradation should combine government action with incentives and legislation, tailored to local conditions and socio-ecological realities. Vetter (2013) provided a good review of the status of government policy on the management of communal rangelands in South Africa, but a more current review is needed to assess progress made with appropriate policy development for these rangelands. Timpong-Jones et al.'s (2023) review of the Economic Community of West African States (ECOWAS) Protocol for Transhumance highlights the benefits of regional co-operation in policy development and implementation, to the benefit of both the rangelands and their users. An observation from this review is that many papers published in the journal vaguely refer to implications of their research findings for policy without stating how and for which policy. Researchers are encouraged to familiarise themselves with the relevant policy before their study, for more specific and appropriate policy recommendations from their findings.

In summary, research published by the AJRFS over the last five decades demonstrates how rangeland management faces complex challenges that interweave ecological, socio-economic and cultural dynamics. The insights from this research can be summed up in the statement that:

Effective rangeland management hinges on the integration of scientific research, local knowledge, adaptive and participatory approaches and supportive government policies that recognise the multifaceted nature of rangelands as social-ecological systems.

These are not unique insights, but they resonate with the state of knowledge on the social dimensions of rangelands internationally (Briske 2017), with the research published in the society journal providing an African perspective on these issues. This is important, given the North American bias in the international rangelands literature.

Comparison with international trends

The trends identified in the AJRFS are reflective of broader trends in the international literature, with a few context-specific differences. In their systematic review of publications incorporating a social science perspective on North American rangelands from 1970 to 2017, Bruno et al. (2020) noted a rising trend in the number of papers published, with particularly low numbers until the 1990s. As with the AJRFS, the increase over time was not smooth, and included a

number of dips along the way. However, unlike in the AJRFS, most of the North American papers focussed on commercial ranchers, with very little attention to indigenous rangeland users. This difference reflects the very different social-political and demographic contexts of the two continents. The limited consideration of gender in the North American literature (Bruno et al. 2020) is echoed in the AJRFS, with Kleinbooi (2013) observing that studies of communal rangelands, including those with a social dimension, 'are devoid of critical gender analysis'. Matarrita-Cascante et al. (2023) frame understudied groups in North American rangeland research as the 'new faces' in rangeland management, which are growing in number. These include women, young ranchers who inherit land, first-time landowners and seasonal lifestyle migrants from urban areas. In the African context, the 'new faces' include black emerging farmers, who remain under-studied (MacLeod et al. 2008; Atkinson and Ingle 2018).

Southern African researchers were among the earliest to publish on the contribution of rangelands to livelihoods, in both the AJRFS (Shackleton and Campbell 2003) and other journals (Cousins 1999; Chanda et al. 2003). Livelihoods research in rangelands in other parts of Africa and the rest of the world started appearing in the international literature in the late 2000s (e.g. Kassahun et al. 2008; Hererro et al. 2009; Homewood and Thompson 2010). The emergence of AJRFS papers considering rangelands as socio-ecological systems in the mid 2000s mirrors the trend in the international literature (Walker and Janssen 2002; Gross et al. 2006; Kabubo-Mariara 2006; Muñoz-Erickson et al. 2007). Similarly, rangeland governance started appearing in the AJRFS and the international literature at about the same time, in the mid-to-late 2000s (Moyo et al. 2008; Dong et al. 2009; Mwangi 2009). In summary, the AJRFS has remained current, keeping in step with international trends in paradigms and themes in rangeland research.

Conclusions

The AJRFS has made a useful contribution to advancing knowledge on the human dimensions of African rangelands, especially in communal areas. This research has contributed to a shift from a purely technical focus in rangeland management to a more holistic approach that also addresses socio-economic issues. While not being a leader in this domain internationally, the journal does provide African examples and perspectives, which are under-represented in the international rangelands literature. The journal has not necessarily made substantial novel contributions to theory, but it has played a role in promoting consideration of social dimensions in rangeland management research, practice and policy in Africa, and in promoting socio-ecological thinking in this space. Looking to the future, there is every indication that the journal will continue contributing to scholarship on the human dimensions of rangelands and their management. The findings of this review underscore the significance of journal special issues in this context, even when the theme of the issue is not solely or mainly social. Therefore, the ongoing release of special issues is recommended. This, combined with the need for greater representation from the rest of the African continent, suggests the opportunity

for special issues focussing on other countries, regions or trans-boundary socio-ecological systems.

Final reflections focus on potentially fruitful avenues for future socio-ecological research published by the journal, informed by both the international trends and local context. Firstly, social dimensions of rangeland use and management by commercial and emerging farmers in Africa have been understudied, and warrant more attention. Secondly, while the importance of indigenous knowledge is a common theme, further research is required to thoroughly define and differentiate indigenous, traditional, local and experiential knowledge, and explore how they can be effectively integrated with scientific knowledge in rangeland management. Thirdly, although valuable work has been done on livelihoods, more research is still needed on dynamic relationships between rangeland resources, livelihoods and human wellbeing. This includes incorporating disciplines not historically involved in such research, such as psychology, mental health and human demography. Fourthly, further investigation is needed on how to build adaptive capacity of communal rangeland users and institutions to respond to changing ecological and social conditions and the threat of climate change. Fifthly, there is a need for a heightened focus on social dynamics within rangeland contexts in relation to current international policies and initiatives that intersect with rangelands and pastoralism. This includes approaches such as nature-based solutions for climate change and Other Effective Area-Based Conservation Measures (OECMs). Finally, much of the socially relevant research published in the journal has been descriptive, leaving scope for more action research that uses a transdisciplinary approach to co-developing solutions to problems such as rangeland degradation and weak governance with local farmers. This is also fertile ground for implementation science.

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The Appendix follows after the References.

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Appendix: Search terms used for screening titles of papers and author keywords

Search term	Draft list	Final list	Search term	Draft list	Final list
anthropo*	✓	✓	livelihood*	✓	✓
communal	✓	✓	natural resource management		✓
community-based	✓	✓	natural resource use		✓
complex adaptive systems	✓	✓	pastoral*		✓
conflict		✓	perception*	✓	✓
cultural*	✓	✓	resilience		✓
customary	✓	✓	resilient		✓
decision-making		✓	social*	✓	✓
governance	✓	✓	soci*-ecological	✓	✓
household*	✓	✓	society		✓
human*	✓	✓	socio*	✓	
institution*	✓	✓	socio-economic		✓
knowledge	✓	✓	tradition*	✓	✓