

A history of the UNESCO Man and the Biosphere Programme in South Africa

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The historical happenings in relation to the implementation of UNESCO's Man and the Biosphere (MAB) Programme in South Africa have never been officially documented. The MAB Programme is a much undervalued framework in South Africa; the biosphere reserves have huge potential as landscapes where socio-ecological land management can be practised towards a more sustainable future for all. The global origin of the MAB Programme, its implementation in South Africa over the past few decades, and its challenges and benefits are discussed here.

Origin and early development of the programme

The MAB Programme originated with the Biosphere Conference held in 1968 in Paris and was formally launched by UNESCO in 1970.^{1,2} The MAB Programme promotes the establishment of biosphere reserves throughout all biogeographical provinces of the world. Biosphere reserves are therefore designated by UNESCO and form part of the World Network of Biosphere Reserves (WNBR), which was launched in 1976³ and is organised into a support structure of regional and sub-regional networks. At present the WNBR consists of 621 sites in 117 countries.⁴ The Biosphere Conference firmly declared that the utilisation and the conservation of our land and water resources should go hand-in-hand rather than in opposition, and that interdisciplinary approaches should be promoted to achieve this aim.²

The first international biosphere reserve congress was held in Minsk, Belarus in 1983.² The congress gave result to an 'Action Plan for Biosphere Reserves' that was adopted by the International Co-ordinating Council of MAB in December 1984.^{2,5} In March 1995, the second world congress, an International Conference for Biosphere Reserves, was convened by UNESCO in Seville, Spain. The tangible results of the Seville Conference were the Seville Strategy for Biosphere Reserves and the Statutory Framework of the WNBR.³ Since then, these documents have provided a common platform for the development of biosphere reserves, and define the principles, criteria and procedure for their designation.⁶ The Seville Strategy specifically notes that 'biosphere reserves are established to promote and demonstrate a balanced relationship between humans and the biosphere'³.

The essence of the biosphere reserve concept is about the combination of three complementary functions: conservation (of landscapes, ecosystems, species and genetic variation), sustainable development (fostering economic development which is ecologically and culturally sustainable), and logistical support (research, monitoring, education and training).³ These functions need to be implemented within a defined landscape and delimited according to a zonation system along a progression from preservation to sustainable resource use in the form of an inner core area, buffer zones and an outer transition zone. The functions support the notion of sustainable development as it is widely used today. As the term 'sustainable development' was only defined during the Brundlandt Commission in 1987, biosphere reserves were quite progressive at the time and pre-dated formal recognitions of sustainable development.

The Vision for Biosphere Reserves into the Twenty-first Century, which also emerged from the Seville Conference, emphasised that biosphere reserves could become models for sustainable development and theatres for reconciling people and nature. Although biosphere reserves are not recognised as formal protected areas, the concept offers a landscape-scale management framework that supports and demonstrates sustainable development.⁷⁻¹⁰

The 5-year follow-up to the Seville Conference, the Seville +5 International Meeting of Experts, was held in Pamplona, Spain, in November 2000. Since Seville +5, biosphere reserves have entered a new phase with greater emphasis on their contribution to socio-economic development.

The third World Congress of Biosphere Reserves was held in February 2008 in Madrid, Spain. The congress adopted the Madrid Action Plan which plotted the strategy of the MAB Programme for 2008 to 2013 at the levels of the MAB Bureau and Secretariat, regional networks, national MAB committees, and individual biosphere reserves. The Madrid Action Plan promoted biosphere reserves as 'the principal internationally designated areas dedicated to sustainable development in the 21st century'¹¹.

The Man and the Biosphere Programme in South Africa

The era 1990 to 1999

The MAB Programme was introduced to South Africa in the early 1990s coinciding with the country re-entering the international arena. The year 1990 proved to be the start of major change in South Africa. On 11 February 1990 Nelson Mandela was released from prison and the country was slowly starting to prepare for a democracy. In 1990 the Chief Directorate of Nature and Environmental Conservation drafted a document on a potential holistic conservation strategy for the entire Fynbos Biome.¹² Although it was drafted 20 years ago, the document emphasised the looming transformation and destruction of natural habitats that would result in a loss of environmental quality and a degraded quality of life. The involvement of local communities in conservation and development issues was highlighted in the document as being critically important. The UNESCO MAB Programme was singled out as the most appropriate for a holistic approach to conservation.¹² It was intended that a Fynbos Biome biosphere reserve would offer a colligative framework toward the optimal integration of conservation and development in the Biome.¹²

The document by Burgers et al.¹² initiated wide deliberations with regard to the use of the MAB Programme and the implementation of biosphere reserves. Early discussions at first focused only on the Western Cape Province,

in particular the Fynbos Biome. A proposed cluster system of Fynbos Biome biosphere reserves was depicted on a map dated 1991.

In April 1994, the first democratic elections took place in South Africa. This major event resulted in South Africa's acceptance in the international arena and the country embarked upon liaisons with a number of international conventions, the first of which were the Convention on Biological Diversity and the World Heritage Convention of UNESCO. A UNESCO National Commission was established by the Departments of Foreign Affairs and Education which gave rise to a country agreement between UNESCO and South Africa, signed in 1995, and subsequently to South Africa being introduced to the MAB Programme (Naude K 2009, oral communication, August 05). The Department of Environmental Affairs and Tourism (presently named Environmental Affairs) became the line function department for the MAB Programme and the World Heritage Convention.

South Africa was represented by one person at the UNESCO Seville Conference in 1995. Personal discussions with UNESCO resulted in their official visit to the Western Cape subsequent to the conference. This visit furthered negotiations that were taken up by the Western Cape Nature Conservation Board in collaboration with local communities and led to support for biosphere reserve processes.

In 1995, the Western Cape provincial cabinet approved a submission on the implementation of bioregional planning as a basis for spatial planning in the province. Bioregional planning is framed as a management system to promote sustainable development practices that are implemented through biosphere reserves.¹³

Around the country a number of sites were identified for biosphere reserve status. Some provincial governments (specifically the Western Cape, Limpopo and Mpumalanga) became more interested in the MAB Programme. Negotiations and collaborations with relevant stakeholders and role players eventually led to the designation of South Africa's first official biosphere reserve in 1998: the Kogelberg Biosphere Reserve.¹⁴

The era 2000 to 2007

The year 2000 marked the final adoption of bioregional planning as a framework for the Western Cape Province.¹⁵ The bioregional planning framework provides guidelines for all planning documentation and biosphere reserves are identified as a spatial model for the implementation of the principles. Bioregional planning makes use of a system of Spatial Planning Categories that was based on the three-tiered zonation system of biosphere reserves.

The biosphere reserve fraternity in South Africa has had a number of 'get-togethers' to discuss issues of joint importance and to muster up government support for biosphere reserves in the country. The first official meeting was the First Southern African Biosphere Reserve Learning Seminar that was strongly supported by UNESCO and took place at the Southern African Wildlife College in the Kruger National Park in May 2000. In May 2003 a South African biosphere reserve workshop was held at Ganzekraal in the Cape West Coast Biosphere Reserve. A presentation on the experience of South African biosphere reserves was delivered during the Vth IUCN World Parks Congress in Durban in September 2003.

Following an identified need for biosphere reserve guidelines for South Africa, a manual providing background and guidelines for the implementation of the biosphere reserve concept was completed in 2004 and widely distributed through the national Department of Environmental Affairs and Tourism.¹⁴

The era since 2008

The 3rd World Congress of Biosphere Reserves in Madrid in 2008 was attended by a number of delegates from South Africa. In response to the Madrid Action Plan, South Africa drafted a Position Paper for Biosphere Reserves that includes a detailed list of actions to implement the Madrid Action Plan in a South African context.¹⁶ This South African Position Paper was jointly drafted by the delegates of the National Biosphere Reserve Workshop that was held in the Limpopo Province in May 2008.

It is stated in the Position Paper for Biosphere Reserves that the MAB Programme could play a more prominent role in current government strategies related to poverty alleviation, environmental sustainability, social upliftment, transformation and economic development. Within the South African context the biosphere reserve concept should be realised as a valuable land management tool with which to integrate people and the environment in a manner that supports the country's natural and cultural conservation and sustainable development objectives while improving human well-being. Thus the vision for South African biosphere reserves is stated as follows¹⁶: 'South African biospheres are special landscapes where socio-ecological land management is practised towards a more sustainable future for all'.

The Department of Environmental Affairs (DEA), being the focal point for implementing the MAB Programme, had the responsibility of establishing a national MAB committee. This task was completed in 2010 and the committee had its first meeting in November of that year. The roles and responsibilities of the National MAB Committee is defined in an approved terms of reference. The DEA provides the secretariat. Members of the Committee include representatives of national and provincial government, as well as all designated biosphere reserves and biosphere reserve initiatives throughout the country. The Committee has regular biannual meetings and workshops.

At present the MAB Programme is active in five provinces. In the Western Cape, the Department of Environmental Affairs and Development Planning gave prominence to the UNESCO MAB principles and the implementation of biosphere reserves in their operational plan (Smith W 2009, oral communication, July 29). The establishment of biosphere reserves is listed as a key performance area of the department. The department funds individual biosphere reserves in the province within a limited budget, mainly for logistical support such as operational expenses.

In the Limpopo Province, the responsibility for the MAB Programme falls under the Department of Economic Development, Environment and Tourism. The MAB Programme and biosphere reserves are also a performance area of the department. Funding support to biosphere reserves is provided by the department in the form of limited logistical support and funds towards the compilation of management plans. The Mpumalanga Province provides support to the MAB Programme through the Mpumalanga Tourism and Parks Agency.

The MAB Programme should be seen as a vehicle for implementing provincial policies as well as a strategic partner in support of provincial agendas such as sustainable development, climate change adaptation, environmental education and training.

The biosphere reserve concept in landscape management in South Africa

Within the South African context, agencies are using a series of seemingly different instruments to practise landscape-scale management. Of these, the most prominent are World Heritage Sites, biodiversity initiatives, transfrontier conservation areas and biosphere reserves. It is sometimes difficult for the UNESCO biosphere reserve concept to obtain prominence amongst these different landscape initiatives.

The basic aims and objectives of most of these instruments and mechanisms are generally quite similar. However, the biosphere reserve concept embraces most of the important inherent principles of the major landscape-scale management initiatives. The concept has sustainable development as one of its points of departure. The two ideas operate within the same conceptual framework, namely to promote socio-environmentally compatible living practices, thus it offers practical solutions to the many challenges facing landscape managers today.¹⁷

It is, however, important to investigate the added value of using the biosphere reserve concept, as indicated in the Seville Strategy. One of the added values of the biosphere reserve concept lies in its international designation – the UNESCO stamp of approval. In 2007, Stoll-Kleemann¹⁸ observed that 'the values and advantages of biosphere reserves must, in future, be more convincingly put over to decision-makers and their consultants'.

Today, the support for biosphere reserves from South Africa's national government is still very limited. Dedicated funding support to biosphere reserves is almost impossible because of certain financial management systems. The *National Environmental Management Act No. 107 of 1998* (NEMA) gave rise to two further acts: the *Protected Areas Act No. 57 of 2003* (NEM:PAA) and the *Biodiversity Act No. 10 of 2004* (NEM:BA). The *Protected Areas Act* had the objective of rationalising the different kinds of protected areas. The final act describes four types of protected areas – special nature reserves, nature reserves, national parks and protected environments. Biosphere reserves were not identified as an individual kind of protected area in the *Protected Areas Act* because a biosphere reserve could make use of many of the different kinds of protected areas within its boundaries. It could also make use of the category 'Protected Environment' to legislate for certain areas such as buffer zones.

The legal standing of biosphere reserves remains a challenge. The Western Cape is the only province that has promulgated a *Biosphere Reserve Act* (in 2011). It is a regulatory act to support the establishment, management and funding of biosphere reserves in the province.

South African biosphere reserves: Existing and proposed

South Africa has six UNESCO designated biosphere reserves and one biosphere reserve which is currently in the planning phase (Figure 1, Table 1). Each one was established for very specific reasons and the processes differed dramatically. At present, all biosphere reserves have non-profit organisations as management entities and each is responsible for its own implementation and funding.

Table 1: UNESCO designated biosphere reserves in South Africa

Biosphere reserve	Province(s)	Year of designation	Total size	Management entity
Kogelberg	Western Cape	1998	100 000 ha	Non-profit organisation
Cape West Coast	Western Cape	2000	378 000 ha	Non-profit organisation
Kruger to Canyons	Limpopo and Mpumalanga	2001	2 474 700 ha	Non-profit organisation
Waterberg	Limpopo	2001	417 000 ha	Non-profit organisation
Cape Winelands	Western Cape	2007	322 000 ha	Non-profit organisation
Vhembe	Limpopo	2009	3 070 000 ha	Non-profit organisation

The Kogelberg Biosphere Reserve was the first to be designated in South Africa. The process preceding the decision to nominate the site as a biosphere reserve was a bottom-up approach resulting from the threat to build a dam in the Kogelberg Valley. The proposed dam was of great concern amongst environmentalists and this sensitive issue was showcased in the March 1982 issue of *Veld & Flora*.¹⁹⁻²¹ A Kogelberg Biosphere Reserve Forum (later renamed the Kogelberg Biosphere Association) was established in 1991, and had the realisation of the

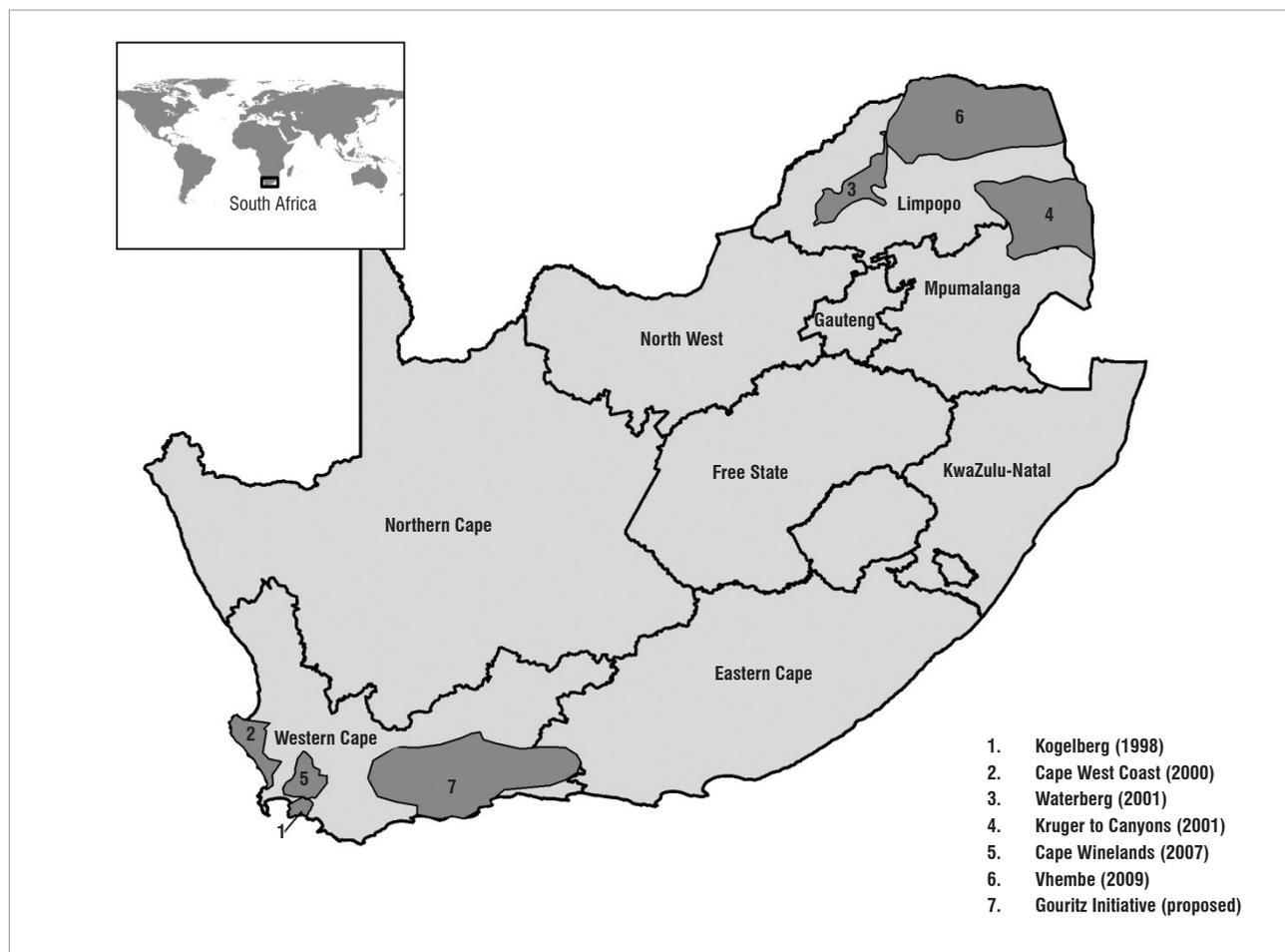


Figure 1: Location of biosphere reserves in South Africa

biosphere reserve as its main objective. All their effort eventually led to the designation of the Kogelberg Biosphere Reserve (100 000 ha including both terrestrial and marine areas) in December 1998.²² The Kogelberg Nature Reserve, forming the core area of the biosphere reserve, is widely regarded as a botanical hotspot²³ and a centre of endemism within the Cape Floristic Region.²⁴⁻²⁹ Their objective having been realised, the Kogelberg Biosphere Association eventually merged with the biosphere reserve management entity.

In contrast to the conservation focus of the Kogelberg, the Cape West Coast Biosphere Reserve followed on a spatial-planning process by the local municipality. The establishment of the biosphere reserve was very much a top-down approach (De Witt B 2009, oral communication, July 28) with a strong element of spatial planning and development. The Cape West Coast Biosphere Reserve, designated in 2000, is 378 000 ha including both terrestrial and marine areas.

Both the Kruger to Canyons and the Waterberg Biosphere Reserves were designated by UNESCO in 2001. The Waterberg is an area of 417 000 ha and was the first biosphere reserve in the northern reaches of South Africa. It is located in the Bushveld district in the northern Limpopo Province and is a sparsely populated area. The Waterberg escarpment of massive sandstone forms the core wilderness area of the biosphere reserve. The economy of the biosphere reserve is largely driven by nature-oriented activities. Environmental education is a focus area of the biosphere reserve. The biosphere reserve process started in 1996 and it took 7 years of negotiations between the rural African communities and private landowners before consensus could be reached.³⁰ The Waterberg Biosphere Reserve was finally designated in March 2001.

The Kruger to Canyons Biosphere Reserve is a vast area of 2 474 700 ha and South Africa's second largest biosphere reserve. It is a community-driven initiative, bridging the Limpopo and Mpumalanga Provinces and includes large sections of the world famous Kruger National Park as well as the Blyde River Canyon. It aims to acknowledge and protect the greater Kruger National Park bioregion, the eastern savannah and the Eastern Escarpment of South Africa. About 1.5 million people live on communal land in the transition zone.³¹ The Kruger to Canyons Biosphere Reserve was designated in September 2001. Sections of the biosphere reserve are included in the Great Limpopo Transfrontier Park.

The Cape Winelands Biosphere Reserve was designated in September 2007. The Cape Winelands District Municipality is the driving force behind the biosphere reserve and it views the biosphere reserve as an innovative strategy to foster a spirit of cooperation between various role players.³² The biosphere reserve encompasses an area of 322 000 ha, comprising sections of the Cape Floral Region Protected Areas World Heritage Site as core areas. The biosphere reserve was motivated through the Integrated Development Plans of the relevant municipalities and was thus integrated into a spatial-planning initiative.

South Africa's newest biosphere reserve, the Vhembe Biosphere Reserve, was designated in 2009. This biosphere reserve is by far the largest in the country with a size of 3 070 000 ha. Vhembe is located in the far northernmost reaches of South Africa and includes the Soutpansberg. It covers the entire Vhembe District of Limpopo Province, Blouberg Local Municipality and the northern part of the Kruger National Park. The indigenous people in Vhembe have a rich history of Indigenous Knowledge Systems and the aim of the biosphere reserve is to pro-actively conserve and promote these systems. Vhembe forms part of two transfrontier conservation parks – Great Limpopo and Greater Mapungubwe.

The Gouritz Initiative in the Western Cape is another landscape that opted for biosphere reserve status. The process of nominating the area as a type of cluster biosphere reserve started toward the end of 2008.³³⁻³⁵ The nomination document was submitted to DEA in 2011. UNESCO subsequently requested additional information and the nomination is currently being reviewed for designation in 2014. The area comprising the proposed Gouritz Cluster Biosphere Reserve covers approximately 3 269 000 ha. The proposed biosphere reserve will contribute significantly to biodiversity conservation in the Klein Karoo.

Current sites for potential biosphere reserves are Magaliesberg and the Marico area.

Challenges with implementation of the Programme in South Africa

The MAB Programme has been active in South Africa for almost two decades, and has resulted in six designated biosphere reserves and a few proposed sites. Despite stern efforts by a group of biosphere reserve practitioners, the concept is still not well known and sufficiently supported in the country.

The biosphere reserve concept is very much in line with modern thinking of landscape management because it seeks to balance ecological requirements with the economic needs of people living in these particular areas. For this reason it is potentially one of the greatest instruments to promote collaboration across administrative and political boundaries, especially in sub-Saharan Africa, while demonstrating a practical implementation of sustainable development.

In South Africa, however, biosphere reserves are often wrongfully perceived as a conservation instrument with which to block unwanted development. The benefits of implementing the MAB framework through biosphere reserves must be made very clear. In UNESCO's *Biosphere Reserves: Special Places for People and Nature* it is pertinently stated: 'Conservation-sustainable development policies are fine on paper. The challenges are with their implementation.'²

It must be emphasised that biosphere reserves are not just another type of protected natural space, but that they correspond to a broader and much more ambitious concept. It is accepted that protected areas, separated from the larger biogeographical landscape of which they form part, have less chance of fulfilling their conservation function than a protected area that is treated as a component of the wider landscape. Methods benefitting the latter include innovative tools such as biosphere reserves that are implemented towards promoting sustainable development across political boundaries.

Benefits of biosphere reserves

Biosphere reserves truly are 'special places for people and nature'.^{2,9} The biosphere reserve concept is inclusive by nature, thereby addressing not only biodiversity conservation, but also the social, ecological and cultural aspects of a given region.^{36,37} Biosphere reserves offer models of 'sustainable development in action' and are the embodiment of the Ecosystem Approach, as adopted under the Convention of Biological Diversity.³⁸

The most important value of implementing the biosphere reserve concept lies in its international affiliation with UNESCO. The MAB WNBR is one of only two international networks that are based on regional sites.³⁹ Being part of the WNBR carries a wealth of international recognition and access to expertise, thereby facilitating funding from a variety of international institutions.

Biosphere reserves foster collaborative thinking about the future management of a defined space. They promote decentralisation of decision-making whilst promoting collaboration and co-management practices between all stakeholders. Some of the benefits of a biosphere reserve are noted by Stoll-Kleemann and Welp¹⁰: joint decision-making by a broad range of players; more effective implementation of management practices because of wide support for the biosphere reserve; pooling of expertise and knowledge that results in high-quality decision-making; and the ability to act as a coordinating unit between different organisations.

The future of the MAB Programme in South Africa would be more secure if it were recognised that it addresses the focus areas of national government, namely climate change mitigation and adaptation, and social development including poverty alleviation and job creation. The DEA has adopted a strategy for the expansion of protected areas based on ecological information; 94% of the focus areas are in private ownership. Therefore an urgent need exists for innovative ways with which to implement biodiversity conservation. Biosphere reserves offer such an

option and play an integration role towards ensuring complementarity and harmonisation of all existing designations, schemes, policies and initiatives within a specific defined space. Although biosphere reserves are not included in the National Protected Areas Expansion Strategy, the MAB Programme is a valuable tool in this regard.

Concluding comments

It is a well-known fact that the future of our world as we know it is in jeopardy. According to the Convention on Biological Diversity, the loss of biodiversity worldwide was supposed to be greatly reduced by the year 2010.^{40,41} Today biodiversity is still disappearing at an alarming rate. In the future, land-use change, especially in terrestrial areas, will have the greatest negative impact on biodiversity.⁴² In addition, population growth and changes in consumption patterns will also have a large impact on the natural environment.⁴³ Maybe we need to act a little differently. The human species desperately needs to find ways of living more sustainably on Earth and to be more connected to the plight of our planet. An important outcome of a biosphere reserve is the interconnectedness between people and nature.

The potential of the MAB Programme in South Africa is coupled to the value of a biosphere reserve as demonstration sites for sustainable land management. However, it is a fact that other pressing issues currently at play in South Africa – such as overpopulation, poverty, job creation and poor service delivery – sometimes need attention before the influence of a biosphere reserve can be recognised and understood. If carefully executed, the biosphere reserve concept does have a future with socio-ecological land-management strategies in South Africa and biosphere reserves could indeed live up to their reputation as 'special places for people and nature'.

References

1. Batisse M. Developing and focusing the biosphere reserve concept. *Nature Resour.* 1986;22(3):2–11.
2. UNESCO. Biosphere reserves: Special places for people and nature. Paris: UNESCO; 2002.
3. UNESCO. Biosphere reserves: The Seville Strategy and the statutory framework of the World Network. Paris: UNESCO; 1996.
4. UNESCO. World Network of Biosphere Reserves [homepage on the Internet]. c2013 [cited 2013 May 08]. Available from: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/world-network-wnbr/wnbr/>
5. UNESCO. The action plan for biosphere reserves. *Nature Resour.* 1984;20(4):11–22.
6. Robertson Vernhes J. The biosphere reserve handbook: Guidance to implementing the Seville Strategy and the statutory framework. Paris: UNESCO; 2007.
7. Afsen-Norodom C, Lane B. Global knowledge networking for site specific strategies: The International Conference on Biodiversity and Society. *Environ Sci Policy.* 2002;5:3–8. [http://dx.doi.org/10.1016/S1462-9011\(02\)00025-4](http://dx.doi.org/10.1016/S1462-9011(02)00025-4)
8. Bridgewater P, Phillips A, Green M, Amos B. Biosphere reserves and the IUCN system of protected area management categories. Canberra: Australian Nature Conservation Agency, World Conservation Union and UNESCO; 1996. [http://dx.doi.org/10.1016/S1462-9011\(02\)00018-7](http://dx.doi.org/10.1016/S1462-9011(02)00018-7)
9. Bridgewater PB. Biosphere reserves: Special places for people and nature. *Environ Sci Policy.* 2002;5:9–12.
10. Stoll-Kleemann S, Welp M. Participatory and integrated management of biosphere reserves. Lessons from case studies and a global survey. *GAIA.* 2008;17/S1:161–168.
11. UNESCO. Madrid Action Plan for Biosphere Reserves (2008–2013) [document on the Internet]. c2009 [cited 2010 May 23]. Available from: <http://unesdoc.unesco.org/images/0016/001633/163301e.pdf>
12. Burgers CJ, Fairall N, Andrag RH. Raamwerk vir 'n holistiese bewaringstrategie in die Fynbosbiom: Die biosfeerreservaatkonsep? [Framework for a holistic conservation strategy in the Fynbos Biome: The biosphere reserve concept?]. Cape Town: Cape Provincial Administration; 1990 [unpublished document]. Afrikaans.
13. Canca A. The application of bioregional planning methodology to promote sustainable development as applied by the provincial government of the Western Cape. Planning Africa 2002 Conference, 2002 September 18–20; Durban, South Africa.
14. Stanvliet R, Gilder A, Naude K. UNESCO MAB: Background and guidelines for implementation of the biosphere reserve concept in South Africa. Pretoria: Department of Environmental Affairs and Tourism; 2004 [unpublished report].
15. Department of Planning, Local Government and Housing. Bioregional planning framework for the Western Cape Province. Cape Town: Provincial Government of the Western Cape; 2000 [unpublished report].
16. South African Biosphere Reserve Working Group. South African Biosphere Reserve Position Paper. National Biosphere Reserve Workshop; 2008 May 28–29; Bela Bela, South Africa.
17. Stanvliet R, Jackson J, Davis G, De Swardt J, Mokhoele J, Thom Q, et al. The UNESCO biosphere reserve concept as a tool for urban sustainability: The CUBES Cape Town case study. *Ann NY Acad Sci.* 2004;1023:80–104. <http://dx.doi.org/10.1196/annals.1319.003>
18. Stoll-Kleemann S. Success factors for biosphere reserve management. *UNESCO Today.* 2007;2/2007:37–39.
19. Boucher C. The Kogelberg state forest and environs – A paradise for Cape flora. *Veld & Flora.* 1982;68(1):9–11.
20. Lückhoff HA. Early history of the Kogelberg and Cape Hangklip areas and management of the state forest. *Veld & Flora.* 1982;68(1):12–13.
21. Roberts CPR. Environmental implications of the proposed Palmiet River water and power development projects. *Veld & Flora.* 1982;68(1):4–6.
22. Cape Nature Conservation. Motivation for the establishment of the Kogelberg Biosphere Reserve, Western Cape Province, South Africa. Stellenbosch: Western Cape Nature Conservation Board; 1998 [unpublished document].
23. Van Wyk AE, Smith GF. Regions of floristic endemism in southern Africa. A review with emphasis on succulents. Pretoria: Umदाus Press; 2001.
24. Cowling RM. Diversity components in a species-rich area of the Cape Floristic Region. *J Veg Sci.* 1990;1:699–710. <http://dx.doi.org/10.2307/3235578>
25. Cowling RM, Holmes PM, Rebelo AG. Plant diversity and endemism. In: Cowling RM, ed. The ecology of fynbos: Nutrients, fire, and diversity. Cape Town: Oxford University Press; 1992. p. 62–112.
26. Cowling RM, Procheş Ş. Patterns and evolution of plant diversity in the Cape Floristic Region. *Biol Skr.* 2005;55:273–288.
27. Oliver EGH, Linder HP, Rourke JP. Geographical distribution of present-day Cape taxa and their phytogeographical significance. *Bothalia.* 1983;14:427–440.
28. Rebelo AG, Siegfried WR. Protection of fynbos vegetation: Ideal and real world options. *Biol Conserv.* 1990;54:15–31. [http://dx.doi.org/10.1016/0006-3207\(90\)90039-R](http://dx.doi.org/10.1016/0006-3207(90)90039-R)
29. Weimarck H. Phytogeographical groups, centres and intervals within the Cape flora. *Lunds University, Arssk Avd. 2.* 1941;37:1–143.
30. Baber R, De Klerk A, Walker C. Environmental education and its role in the Waterberg Biosphere Reserve, South Africa. *Prospects.* 2003;33(3):283–291. <http://dx.doi.org/10.1023/A:1025583627717>
31. Kruger to Canyons Biosphere Reserve [homepage on the Internet]. c2009 [cited 2011 Sep 05]. Available from: http://www.kruger2canyons.com/learningcentre/kruger_to_canyons_biosphere.php
32. Cape Winelands District Municipality. Application for nomination of Cape Winelands Biosphere Reserve. Stellenbosch: Cape Winelands District Municipality; 2007 [unpublished document].
33. Joseph G. A guideline for the formation and initiation of a biosphere reserve for the Klein Karoo [document on the Internet]. c2008 [cited 2011 Jul 04]. Available from: http://www.gouritz.com/index.php?option=com_docman&task=cat_view&gid=34&Itemid=54
34. Lombard & Wolf CC. GIS specialist services. Gouritz Initiative final report. George: Western Cape Nature Conservation; 2004.
35. Pasquini L. Assessing the suitability and feasibility of implementing a biosphere reserve in the Gouritz Initiative domain; 2008 [unpublished report].

36. Stanvliet R, Parnell S. The contribution of the UNESCO biosphere reserve concept to urban resilience. *Management of Environmental Quality*. 2006;17(4):437–449. <http://dx.doi.org/10.1108/14777830610670517>
37. Batisse M. Biosphere reserves: A personal appraisal. In: *Proceedings of Seville + 5 International Meeting of Experts, 2000 October 23–27*; Pamplona, Spain. MAB Report Series No. 69. Paris: UNESCO; 2001. p. 11–17.
38. UNESCO. *Solving the puzzle: The ecosystem approach and biosphere reserves*. Paris: UNESCO; 2000.
39. Lotze-Campen H, Reusswig F, Stoll-Kleemann S. Socio-ecological monitoring of biodiversity change: Building upon the World Network of Biosphere Reserves. *GAIA*. 2008;17/S1:107–115.
40. Haber W. Biological diversity – A concept going astray? *GAIA*. 2008;17/S1:91–96.
41. UNEP. Report on the 6th meeting of the Conference of the Parties to the Convention on Biological Diversity (UNEP/CBD/COP/6/20/Part 2) Strategic Plan Decision VI/26 [homepage on the Internet]. c2002 [cited 2011 Feb 21]. Available from: <http://www.cbd.int/decision/cop/?id=7200>
42. Sala OE, Stuart Chapin III F, Armesto JJ, Berlow E, Bloomfield J, Dirzo R, et al. Global biodiversity scenarios for the year 2100. *Science*. 2000;287:1770–1774. <http://dx.doi.org/10.1126/science.287.5459.1770>
43. Cincotta RP, Wisniewski J, Engelman R. Human population in the biodiversity hotspots. *Nature*. 2000;404:990–992. <http://dx.doi.org/10.1038/35010105>

