

Biodiversity finance for a just energy transition

Martin Sprott

Executive Summary

1. South Africa has one of the highest levels of biodiversity richness in the world.
2. It is one of seventeen megadiverse countries, in company with several tropical countries including: Brazil, India, Indonesia, the Philippines, Malaysia and Mexico.
3. Biodiversity is under threat and under-resourced.
4. 30% of South Africa's ecosystem types are endangered. Only 10% of landmass is reserve protected and the spend to manage biodiversity resources is a mere 0.3% of GDP.
5. With limited finance for biodiversity available, the risks are not sufficiently addressed while the economic development and job-creation opportunities are being missed.
6. Where electricity grids cannot expand quickly enough to meet demand, they create a bottleneck to both economic growth and renewable energy development.
7. 2,500 GW of generation projects are delayed worldwide due to grid constraints. State balance sheets are a factor with high debt levels giving limited room to extend debt guarantees.
8. A solution building on the logic of debt-for-nature swaps can help solve this, using the scale of utility finance as a lever at a time of finance constraint instead of distressed debt restructuring.
9. Development Finance Institutions and re-insurers can require an allocation of part of the debt cost to biodiversity protection, below 1%, in exchange for providing credit guarantees.
10. The state will achieve its goals of building grid capacity and protecting biodiversity.
11. DFIs will achieve their goals of supporting economic development and contributing to the Kunming Montreal Framework commitment to protect 30% of land and marine areas by 2030.
12. Every country has its own social and political requirements when protecting land. In South Africa the mixed use biosphere model is well suited for landscape management and governance.
13. A utility infrastructure finance model linked to biodiversity could contribute to balanced growth across the megadiverse countries, especially tropical, middle-income countries.
14. By combining finance for economic development with protection for the biodiversity resources that support it, a positive loop can be created to enable a just transition.

About Scaled Impact

Scaled Impact is a project development and advisory company. Founded in 2016, it has offices in Johannesburg and Berlin and operates across Africa.

A not-for-profit social enterprise, Scaled Impact combines strategy development, finance and analytics to carry out research and convert this to action and implementation. Addressing full value chains, Scaled Impact's mandate is to promote inclusive socio-economic development.

Scaled Impact on biodiversity

Biodiversity is collapsing worldwide because of combinations of habitat loss, pollution, climate change and unsustainable farming and management practices. Interventions to date have not been sufficient to address this collapse and have served only to slow it down.

Scaled Impact is developing economic approaches for defining biodiversity economic value, managing landscapes and restoring and protecting ecosystems with and for the people in them.



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Biodiversity is under threat and under-resourced

Biodiversity is one of South Africa's greatest resources and one of its most undervalued. It is under threat and overlooked even as relative value rises fast.

Measured by species richness, South Africa has the highest plant diversity in the world. Across all species it has one of the highest levels of endemic species in the world¹. It is one of seventeen so-called megadiverse countries in company with, among others: Brazil, Ecuador (including the Galapagos Islands), India, the Philippines, Malaysia and Mexico. With biodiversity in decline worldwide²³, the value of the genetic diversity maintained in those countries and of the integrity of the ecosystems that support it rises.

Biodiversity value is an elusive concept. It has value in and of itself⁴. It underpins economic activity from agriculture to construction⁵, it helps minimize risks to invested assets, it is a source of innovation in materials and products⁶. The very act of managing and protecting biodiversity creates jobs, raises incomes and drives scientific advancement; all at the same time.

Biodiversity is under-resourced compared to this value. Public sector and NGO spending on biodiversity in South Africa has not grown in real terms for the past ten years and held at around 0.3% of GDP in 2024⁷.

Putting a monetary figure on a funding gap is not particularly useful, however, since calculations of the spend required can vary greatly depending upon the assumptions about the effects of species protection and the approaches to conservation management adopted. Against both high biodiversity stocks and threats, it is hard to say where the protection value of the marginal Rand spent on biodiversity will start to decline.

However, it seems possible to conclude that since South Africa's biodiversity resource is under threat, with 30% of all ecosystem types endangered and 14% of species already threatened with

¹ K. A. Tolley, J. M. da Silva, and B. Jansen van Vuuren, *South African National Biodiversity Assessment 2018 Technical Report*, vol. 7, *Genetic Diversity* (Pretoria: South African National Biodiversity Institute, 2019).

² C. Paterson and R. Trueman, "Biodiversity in 2026: Global Decline, Emerging Recoveries, and the Need for Coordinated Action," *Biodiversity* 27, no. 2 (2026): 149–50.

³ International Union for Conservation of Nature (IUCN), "The IUCN Red List of Threatened Species: Background & History," version 2025-2 (2025).

⁴ Robert H. MacArthur and Edward O. Wilson, "An Equilibrium Theory of Insular Zoogeography," *Evolution* 17, no. 4.

⁵ D. W. Pearce, "Economics, Equity and Sustainable Development," *Futures* 20, no. 6 (1988): 598–605.

⁶ Convention on Biological Diversity, *Kunming-Montreal Global Biodiversity Framework* (2022).

⁷ The Biodiversity Finance Initiative (BIOFIN) South Africa, *Biodiversity Expenditure Review April 2026*.

extinction⁸, 0.3% percent of the value of the economic activities that depend upon that resource has not been sufficient to protect it. Nor has it been enough to realise the economic production and job creating opportunity.

Biodiversity finance solutions at scale are missing

Innovative approaches to generating finance at scale to protect and manage biodiversity are widely sought.⁹ In other regions sovereign debt refinance has been used as a mechanism to combine state finance with biodiversity protection and related community interventions and outcomes.¹⁰ Ecuador (twice), Gabon, Indonesia and the Philippines, the Maldives and more.¹¹

In each of these cases a portion of sovereign debt was restructured. An existing debt with generally high interest rates was replaced with another with lower interest rates. The rate reduction was achieved with loan guarantees, giving lenders the effective risk of an investment grade national balance sheet. The interest rate reduction in some cases was from 25% to 5%.

The benefit for biodiversity management and to the communities living in the regions was through allocating a portion of the reduced percentage to biodiversity protection. If a 25% rate reduced to 5%, the effective rate became 6% and 1% was secured for programmes in fisheries management and deforestation prevention.

So far so uncontroversial. The mechanism is well established. However, the countries involved were far from investment grade. The state was the unit for refinance. The medium for refinance was sovereign debt. The benefits to the refinanced state as well as to biodiversity protection were substantial because the starting interest rates were so high.¹²

In South Africa the opposite is the case. With a recent Fitch credit upgrade to BB¹³, state debt is not distressed and interest rates are relatively low. This means to achieve meaningful scale, the

⁸ IUCN, “IUCN Red List.”

⁹ Dasgupta, *The Economics of Biodiversity: The Dasgupta Review* (London: HM Treasury, 2021).

¹⁰ Nedopil, Christoph, Mengdi Yue, and Alice C. Hughes. “Are Debt-for-Nature Swaps Scalable: Which Nature, How Much Debt, and Who Pays?” *Ambio* 53 (2024): 63–78.

¹¹ Georgieva, K., M. Chamon, and V. Thakoor. 2022, December 14. Swapping debt for climate or nature pledges can help fund resilience. IMF.

¹² This has been a barrier to the scalability of Debt for Nature Swaps. When building on very high interest rates, they are a restructuring mechanism for moderately or very distressed debt. Their applicability is limited to situations meeting those conditions, requiring negotiating parties prepared to accept this conditionality.

¹³ Fitch Ratings, “Fitch Upgrades South Africa to ‘BB’; Outlook Stable,” June 5, 2026.

opportunity for biodiversity finance lies in volume. The major debt carrying entities in the country are usefully concentrated in the form of State Owned Enterprises (SOEs).

With the right match of assets and biodiversity, the mechanism can be applied below the level of the state. The unit for refinance can be the SOE and their projects.

Electricity grid capacity is a bottleneck to development

Total SOE debt was around 500 billion Rand in mid 2026.¹⁴ Around 300 billion of that is Eskom and another 150 billion Transnet. This gives two large blocks to address. Restructuring SOE debt is not straight forward. Stakeholders and debt providers have to agree on the need and the mechanisms. The timing and to be right and the incentives strong; a window needs to be open in with stakeholders prepared to support a restructuring. Lastly, the collateral obligations between the parties need to be mapped and potentially unwound. It can be done though, but it takes time.

A potentially faster route to implementation could be applying the method to new programmes with sufficient scale.

2,500 GW of projects are stalled worldwide due to grid bottlenecks.¹⁵ This global grid capacity shortage is capping renewable energy build up as well as economic growth. Grid projects are accelerating, however, with transmission line spend expected to rise by half to USD 600 billion¹⁶ by 2030. South Africa is no exception to this trend.

The Independent Transmission Projects programme (ITP) is in the early stages of a 440 billion Rand grid infrastructure build programme.¹⁷ It is intended to link renewable generation sites in remote locations, mainly the Karoo, the Kalahari and the Eastern Cape, with cities and industrial consumers. ITP providers are not SOE entities, but following the principle of the Renewable Energy Independent Power Producer Programme (REIPPP), they are private sector players operating within carved out regulatory space to provide additional capacity to an SOE, Eskom.

The ITP is an answer to grid bottlenecks, but it is also delayed. It is a critical enabler of national growth, especially industrial development, but its progress is not as fast as it could be, in part due to a lack of debt guarantees. Credit guarantees are an essential requirement of the

¹⁴ Company annual reports and investor presentations.

¹⁵ IEA, "Electricity 2026: Analysis and Forecasts to 2030," Paris (2026).

¹⁶ IBID (46 – 63).

¹⁷ ITP Project Office, National Treasury.

programme. The debt providers require the coverage generally and particularly in the context of Eskom unbundling to create a new grid management agency, its new balance sheet and regulations untested.

In the absence of financial constraints, the solution would be for the South African government to extend guarantees against its own balance sheet. The scope to do this, however, is limited since, in the past ten years, sovereign guarantees have been given to Eskom, Transnet, Independent Power Producers and other public enterprises to cover their investment and operational needs. The level of credit guarantees open in February 2026 was 450 billion Rand, 76% of which is extended to Eskom.¹⁸ National Treasury considers this a ‘significant financial risk;’¹⁹ it is not in a position to increase, certainly not to double. This constrained public finance position means an alternative solution is needed.

Linking biodiversity to credit guarantees can address the bottleneck

A credit guarantee solution for the ITP separate to the state does exist. A Credit Guarantee Vehicle (CGV) was created with the support of the World Bank in August 2026.²⁰ The World Bank extended a core fund of USD 500 million to enable its creation, and setting a potential first round of USD 2.5 billion debt guarantee cover.²¹ Each dollar committed by a guarantor to the vehicle can be multiplied four times through re-insurance. This leaves 90% of the total USD 25 billion still to be sourced. While some revolving capacity may reduce the total need,²² there is still a large credit guarantee gap.

Linking credit guarantees for the ITP programme to biodiversity protection can help close that gap, enable grid build out and generate wider social and environmental benefits.

The mechanism is to add biodiversity protection requirements to the credit guarantees structure. By providing credit guarantees from Development Finance Institutions and re-insurers with investment grade balance sheets, the effective interest rates on debt raised to build the grid should be lower than would be the case for infrastructure built against the South African

¹⁸ National Treasury, ‘Chapter 7: Government debt and contingent liabilities’, in “Budget Review 2026.” Pretoria: National Treasury, Republic of South Africa, (25th February 2026), pp. 67–78.

¹⁹ IBID, page 76.

²⁰ National Treasury, “Update on Independent Transmission Projects programme,” (Friday, October 2, 2026).

²¹ World Bank, “Project Information Document: Blended Finance Platform for Resilient Infrastructure,” (21st January, 20026).

²² IBID.

government's BB rated balance sheet.²³ The rate comparison is, however, somewhat artificial since the alternative is less likely to be an extension of the state balance sheet than a very delayed programme or none at all.

In exchange for providing high quality debt guarantees, credit guarantee providers can require debt takers, the ITP project developers, to secure a portion of the implied saving to fund biodiversity protection programmes. With a twenty to thirty year programme horizon, this will provide a stable form of biodiversity finance, well matched to the management needs of ecosystems that measure changes in decades.

The benefits of this approach to the credit guarantee providers, DFIs and re-insurers are in lowering the barrier to their participation, maximising the social, economic and environmental benefits. In addition to the direct contribution to infrastructure and economic development in the context of the just transition to renewable energy generation, it helps them achieve their biodiversity protection and management goals, going beyond the normal Equator Principle linked social investment commitments. Financing biodiversity through infrastructure at scale would make a large contribution to implementing DFI's Kunming Montreal Global Biodiversity Framework commitments. Biodiversity investments are also strongly community led, with benefits accruing within the landscape, investing in and employing local capacity.

The benefit to the South Africa state is across multiple levels. Infrastructure development goals are achieved, grid bottlenecks are removed and overall economic development can accelerate. The rural communities that are often under-considered in this form of development are taken into fuller consideration in this model. The value of biodiversity as an unacknowledged resource is leveraged for strong economic effect, while protecting it for present and future generations' benefit. Funds from this structure can be directed to ecosystems that are harder to attract finance for. Grasslands and rangelands are sometimes hard to make a biodiversity investment case for, when compared to watersheds and wetlands that contribute to both water supply and flood protection.

Further, there is signalling value to the state in structuring a transaction in this way. With the risks of biodiversity rising worldwide, central banks and ratings agencies are running stress tests on their exposure.²⁴²⁵ Explicitly linking economic development actions to protecting the

²³ In October 2026 the spread between the European Central Bank main rate and the SA Reserve Bank rep rate was 4.6%.

²⁴ Arlt, S., Berg, T., Hut, X., & Streitz, D. "A Biodiversity Stress Test of the Financial System." (2024), Preprint.

²⁵ Johnson et. al. "The Economic Case for Nature: A Global Earth-Economy Model to Assess Development Policy Pathways." (2021), World Bank.

biodiversity base of the country, especially where it is a core national resource indicates to investors combinations of long-term thinking, reduced biodiversity and climate risk exposure. This can further lower the cost of debt finance.

The mechanism should not add dependency or complexity

There are concerns relating to this type of structure that need to be addressed. The first relates to the leverage of the parties providing the debt guarantee cover. If the state is raising its dependence on third countries, what is to say this dependence cannot be taken advantage of? Can such a guarantee be used for diplomatic leverage or worse should the political winds change?

If the goal is to maximize biodiversity and community impact through leveraging more stable balance sheets, a way to minimize the political risk of that may be to take a more strongly insurance approach.

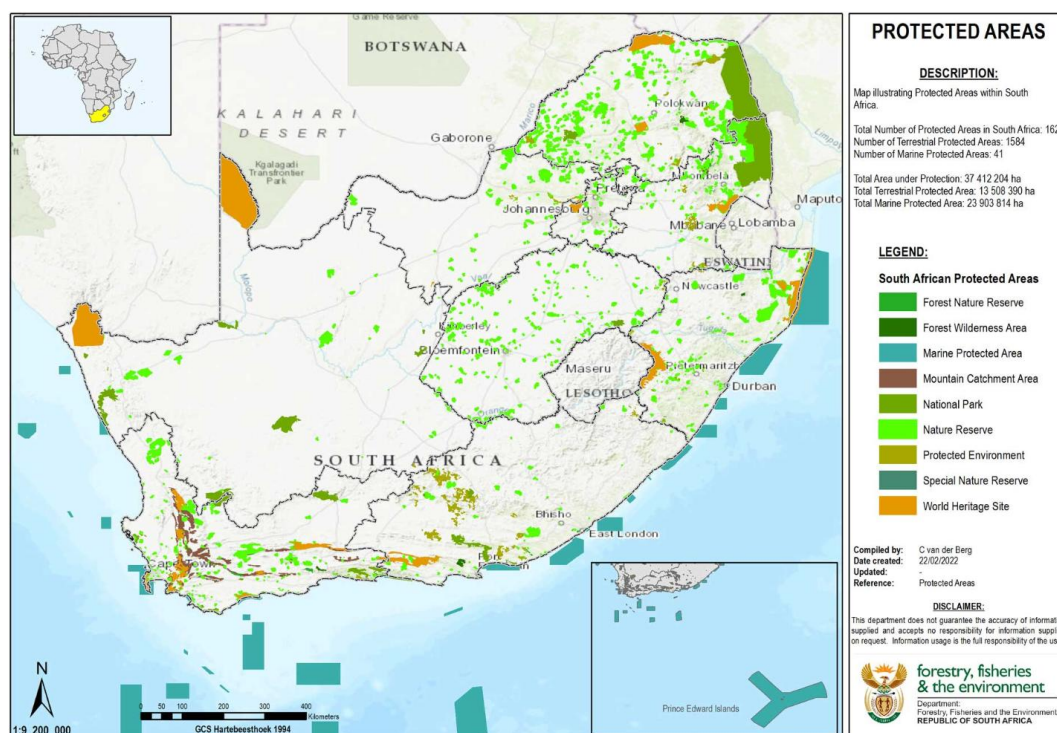
Debt guarantees are, after all, insurance instruments. They are a mechanism to provide insurance to the loan provider in the event of failure of payments by the borrower. Most sovereign guarantees linked to biodiversity requirements either as swaps or directly, have had some level of re-insurance.

The structure of the current ITP CGV lends itself well to this. Pooling sovereign contributions across parties, using a core level of guarantee for leverage and reinsuring the guarantee generalizes the national aspect of the loan and minimizes the long-term risk.

A second concern relates to the scale of the funding potential and the ability of biodiversity protection structures to absorb it. A quarter of a percentage point of the interest on debt covered by a CGV mechanism reserved for biodiversity is a substantial increase in the funding available to ecosystem protection and management at a national level. While welcome, it raises the question, can such funding be absorbed by the existing governance mechanisms and infrastructure. Would new commitments require new layers of governance structures be built and with that add complexity?

There are broadly five forms of landscape protection governance in South Africa. Reserves like the SAN Parks complex; other government owned reserves – usually at the provincial level; private reserves; and biospheres – a multi-land use management model; NGO-led interventions across rangeland or wilderness areas, usually without formal protection status.

Figure 1. protected areas in South Africa



Source: South African Department of Forestry, Fisheries and the Environment, 2023

All of these are currently underfunded relative to the need and the threats to SA's ecosystems. The fourth and fifth mechanisms, biospheres and NGO landscape programmes, cover wide parts of SA. They protect and manage areas that coincide with combinations of biodiversity hotspots and the most threatened ecosystems.

Formally protected areas in SA are a relatively low percentage of the area of the country. 10% of the country is declared protected through reserves, compared to Zambia and Tanzania with 40% and Botswana and Zimbabwe at 30%.²⁶ The biospheres, therefore, play a vital role in South Africa in managing combined human and environmental activities for combined, positive outcomes.

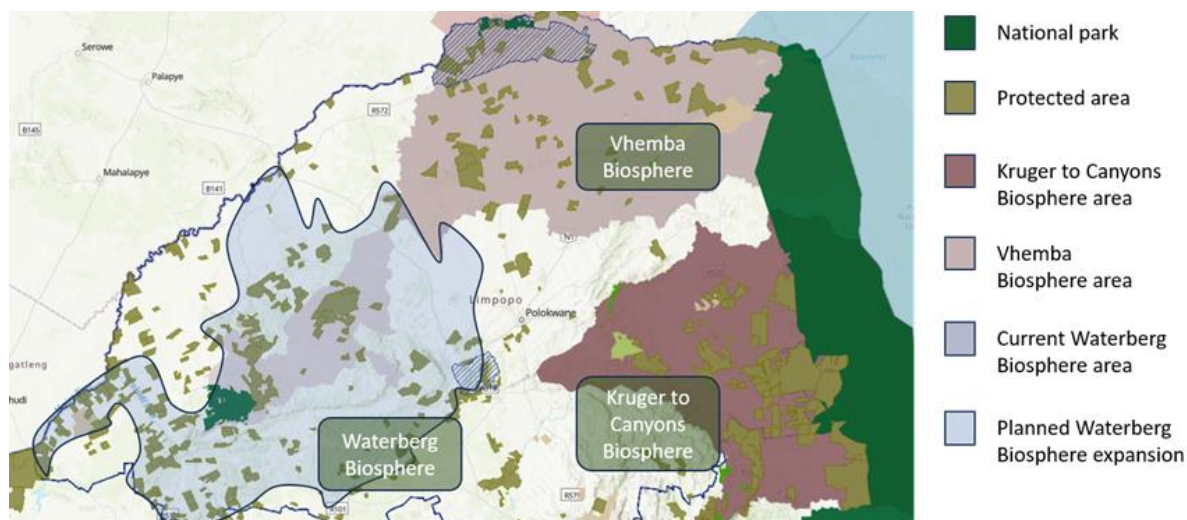
The non-reserve areas of the biospheres cover a further 8% of South Africa's landmass as shown in figure 2 below. They provide buffer zones to reserves, coordinate relations with communities, private reserves and guide actions to maintain wilderness and rangeland areas. The biospheres bring the total protected area of SA's landmass to around 18%. In Limpopo alone they cover more than 40% of the total province.

The biospheres as areas around reserves fit into a layered policy and regulatory structure. They are gazetted at the provincial level and overseen by provincial environmental agencies. They are

²⁶ World Bank, "Terrestrial Protected Areas, % of Total Land Area," (2026).

governed by national legislation that in turn incorporates international treaty obligations within UNESCO’s Man and Biosphere Programme linking each individual biosphere ultimately to the Kunming Montreal Framework.²⁷

Figure 2. Limpopo biospheres overlaid on protected areas



Source: Biosphere management offices, Scaled Impact analysis

This is not to make an argument in favour of any one mechanism. It is to show that biodiversity finance mobilised by a debt for biodiversity structure linked to infrastructure finance in South Africa would have entities and governance mechanisms sufficient to absorb that funding in a way that meets national priorities for biodiversity protection and management and aligns to the international interests of potential credit guarantee providers.

Balanced development finance can help deliver a just transition

A means to move beyond ‘debt for nature’ restructuring swaps has been sought. Utilities offer the scale of finance and the stability of transaction to provide a solution. The ITP programme is a short term, highly feasible programme with sufficient volume to be able to involve biodiversity finance. It also avoids some of the complexity associated with SOE finance in aligning the interests of existing debt providers.

The South African biodiversity management system is sufficiently mature to be able to absorb the finance at scale. That same maturity means that biodiversity protection process and

²⁷ “The South African Strategy for the Biosphere Reserve Programme (2016 – 2020), Department of Environmental Affairs.”

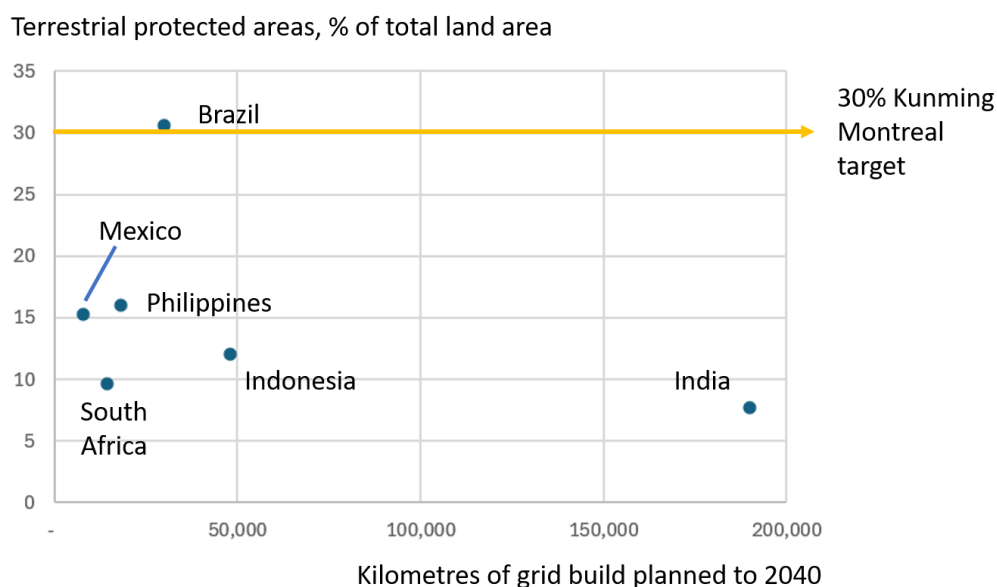
measurement conditions added to credit guarantees can build on existing infrastructure and reporting, reducing design complexity.

This form of finance is particularly valuable since it may enable high-value forms of biodiversity that otherwise have difficulty attracting finance to protect them due to remoteness, a lack of connection to large metropolitan areas or photogenic animals.

Here is the crux. An infrastructure finance guarantee based on biodiversity enables balanced development. It makes delivering high value economic investments both possible and faster by leveraging biodiversity that is usually overlooked as a source of value generation. In so doing it drives wider social and economic growth, creating jobs and developing resources with and for rural communities. In the case of the ITP programme, it does so in the cause of promoting renewable energy and reducing reliance on fossil fuel generation. It is a holistic contribution to a just energy transition.

This finance model does not have to stop at energy or South Africa. Beyond grid connections and renewable energy within South Africa, funding is also needed for water, port and rail expansions. Beyond South Africa, the same pattern of biodiversity threat, infrastructure needs, fiscal constraints and the potential to unlock infrastructure finance can be seen across larger developing nations. Figure 3 below shows a selection of megadiverse middle income countries together with their planned kilometres of electricity grid expansion to around 2040. They are almost all located in the biodiversity-rich tropics.

Figure 3. Selected ‘megadiverse’ middle income²⁸ countries with planned grid kilometres



Source: World Bank, National electrical power strategy publications

This is a mechanism matched to their needs. It helps deliver essential services to large populations and if used to extend and expand biodiversity protection, can support increasing protected areas from the average of 12% today (excluding Brazil) to closer to the 30% target. Protecting biodiversity in tropical regions has outsize impact since that is where the majority of species are.

To achieve the potential implied in this finance concept, a change is required in the way we think about biodiversity finance. Rather than seeing biodiversity and infrastructure or growth investments as competitors, it the players who address both of them can and should start to see them as compatible with one another. Biodiversity resources can be mobilised to enable and de-risk infrastructure projects, while infrastructure projects can be used to secure those same biodiversity resources. It is a positive loop that can accelerate growth, unlock wide economic and social development, reaching both city and rural populations and securing the underlying environmental resources they rely upon. With balanced outcomes and inclusive growth, it is a mechanism to deliver a just transition.

²⁸ Based on the World Bank definition of middle-income. Most of these are upper-middle income countries with a Gross National Income (GNI) of more than USD 4,495 in 2025. The exception is India which had a 2025 GNI per capita of 2,760, but by dint of size has many of the characteristics of a higher income country.



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