Private Sector & Development

A blog coordinated by Proparco

Recommendations for integrating biodiversity into the wind energy sector in emerging market countries

SIMON HULKA *Biodiversity consultant – IFC*
LORI ANNA CONZO *Global Biodiversity Lead and Senior Environmental Specialist – IFC*

June 15 2021

Renewable energy is essential to achieving sustainable development, and wind energy can provide competitively priced electricity, while helping to reduce climate change impacts. Yet its impacts on biodiversity especially in emerging market countries is poorly understood. Specifically, the risks and effects of turbine and associated powerline collisions on bird and bat populations, as well as those on habitats and ecosystems represent key knowledge gaps. In response, the authors propose a set of recommendations that could help safeguard at-risk bird and bat populations in emerging market countries, especially where regulations are lacking.

Access to reliable, sustainable and affordable energy is a prerequisite for alleviating poverty, boosting shared prosperity and safeguarding environments, with the development of renewable energy being essential to achieving this goal (World Bank, 2017[1]). Globally, an estimated 840 million people, largely concentrated in the Global South, are without access to electricity (IEA et al. 2019[2]). Wind energy can provide competitively priced electricity, while helping to reduce climate change impacts. At the same time, impacts on biodiversity from wind energy developments in emerging market countries is poorly understood. Specifically, the risks and effects of turbine and associated powerline collisions on bird and bat populations, as well as the effects of wind energy developments on habitats and ecosystems represent key knowledge gaps.

With wind energy predicted to grow in emerging market countries (GWEC 2020a; GWEC 2020b[3]), it

is vital that species sensitivities be identified, and that measures be developed to mitigate the effects at the site and landscape levels. This is amplified by the high incidence of globally threatened species likely to be at risk from wind energy projects in emerging market countries. For example, of the 100 globally threatened bird and bat species predicted to be at the highest risk of collision with wind turbines, 82 and 88 percent respectively occur in the countries of the Global South (based on data in Thaxter et al. 2017[4]). While the theoretical modelling on which these studies is based provides provisional guidance on species potentially at risk, there is a paucity of field-based data to corroborate these findings.

Compounding this, wind power is often seen as "green energy", and regulatory planning in some emerging market countries does not require rigorous baseline biodiversity studies. Even where baseline data is available to planners, energy policies are often developed without reference to it (Gasparatos et al. 2017[5]). Furthermore, as the sector develops, the potential for cumulative effects on susceptible species is likely to increase. This risk is particularly high along major bird migration corridors and in countries where there are clusters of wind projects located near to areas of importance for threatened (migratory or resident) bird and bat populations.

Safeguarding biodiversity and optimizing power output from wind energy should be viewed as being mutually beneficial, but this cannot be achieved without a coordinated approach to wind energy planning that places biodiversity on a par with other aspects. Given this backdrop, we offer five recommendations that could help safeguard at-risk bird and bat populations in emerging market countries, especially those where regulations are lacking.

RECOMMENDATIONS

1. ***Strategic landscape planning:*** Sectoral planning for wind energy often focuses on resource potential and other technical At the International Finance Corporation (IFC), we are piloting approaches to integrate environ- mental and social (E&S) aspects into sectoral planning alongside technical considerations. This approach aims to identify the least risk and highest potential wind power projects before competitive Independent Power Producer (IPP) auctions take place. For biodiversity, this includes consideration of occurrences of threatened bird and bat species in addition to other factors. An integrated technical, environ- mental and social landscape planning approach would allow governments to focus wind energy development in areas away from the highest E&S risk sites, so that more bankable projects could be brought to the market, subject to on-site environmental and social assessments. Such an approach also facilitates communi- cation and understanding between technical and E&S professionals within government, private sector, financiers and consultancy firms.
2. ***Integrating biodiversity into tendering packages and power purchase agreements:*** The power purchase agreement (PPA) negotiated by the wind power producer and the government (or other offtaker) stipulates, among other things, how much electricity will be produced and its cost, or 'tariff'. As developers typically secure financing after a PPA has been signed, the E&S policies of private sector financiers are generally not factored into the Embedding E&S requirements, including for biodiversity, within the PPA itself and within government tendering packages would mean that to be competitive, those participating in a tender would need to demonstrate their commitment to good biodiversity management practices. Importantly, it also means that the IPP would cost their tariff considering E&S (and biodiversity) management, rather than it being an add-on required by financiers, after the tariff is already set. Embedding strong biodiversity requirements into PPAs

may be the most effective way to transform a market, other than changes to the regulatory framework itself.

3. ***Considering biodiversity in the energy yield assessment:*** An energy yield assessment (EYA) calculates the predicted energy output for a wind power project. EYAs, an element of financial models, are used by developers and financiers to structure projects and to calculate their return on investment (ROI). Impacts on birds and bats in emerging market countries, which are often data-poor, can be difficult to predict, and curtailment of turbines may be needed to reduce collision impacts on birds and bats. Often, the degree of curtailment necessary is not fully understood until the project is operational. If curtailment is needed, and the resulting power loss was not factored into the EYA, expected output may not be realized, impacting the owner's ability to service debt and realize an acceptable ROI. In extreme cases, low output may even jeopardize the PPA. When working in data-poor countries, it is prudent to assume a level of energy loss attributable to bird and bat curtailment (the 'environmental curtailment loss factor') and build this into the EYA, regardless of ESIA (Environmental and Social Impact Assessment) predictions. By doing so, financial models are made more conservative, and project financials are less likely to be adversely impacted in the event of unexpected curtailment. This simple measure could make an enormous difference in the ability of developers to (more easily) adaptively manage and use curtailment as an option, if it is needed.
4. ***Requirements for post-construction fatality monitoring:*** Some emerging market countries may require a baseline survey as a part of ESIAs, but few require post-construction fatality data on birds and bats. Without systematically collected fatality data, the actual impacts on birds and bats will remain largely unknown in developing countries and may be limited to extrapolated effects from studies in more developed countries, where species and areas are only partly comparable. Post-construction bird and bat fatality programs, aligned with good international industry practice, are regarded by wind-wildlife science as being key to understanding the actual impacts of a wind energy project and informing operational phase mitigation measures and adaptive management. It is thus recommended that private sector financiers require post-construction fatality monitoring on every project, regardless of risk. Generating statistically defensible, unbiased bird and bat fatality estimates is dependent on a robust monitoring design that must be informed by wind-wildlife scientists that have a detailed understanding of applying these methods in specific field situations. The science for estimating bird and bat fatalities has advanced substantially in countries with a well-developed wind energy sector, but the latest techniques are still to be adopted by ecologists working in many emerging market countries. Partnering international wind- wildlife specialists with local ornithologists is key to building capacity and to developing a cohort of national wind-wildlife scientists to work on wind power projects in their own regions.
5. ***Coordinated approaches for biodiversity*** To adequately address cumulative effects on biodiversity from wind power projects, a coordinated approach at the national level represents good practice. This might take the form of, for example, a centralized body to advise on the planning and management of biodiversity aspects of individual wind power projects and those at the landscape level and the collation and analysis of post- construction fatality monitoring data. There are some good examples from emerging market countries. A flagship effort globally is the Active Turbine Management Program (ATMP) in the Gulf of Suez in Egypt which is

undertaken through a joint protocol between the Egyptian Environmental Affairs Agency (EEAA), the New and Renewable Energy Authority (NREA), the Egyptian Electricity Transmission Company (EETC), and the Regional Center for Renewable Energy and Energy Efficiency (RCREEE[6]). Jordan has also been making strides on this topic. While kick- started by IFC in 2017, national stakeholders have taken matters into their own hands and are developing country-specific approaches to implementing standardized requirements and collating fatality monitoring data.

> *We propose the above five measures for integrating biodiversity in the wind energy sector as they are sometimes overlooked by conservation scientists and/or government agencies in emerging market countries.*

To ensure that the expansion of the wind energy sector does not compromise priority biodiversity values, practitioners, regulators and lenders will need to extend the management of biodiversity risk beyond ESIA application at the site level; develop strategies to effectively mitigate cumulative effects at the national and international levels; and adaptively manage risk throughout the project lifecycle. We propose the above five measures for integrating biodiversity in the wind energy sector as they are sometimes overlooked by conservation scientists and/ or government agencies in emerging market countries, yet they have the potential to transform our knowledge of the scale of risks and to substantially improve the safeguarding of susceptible species.

1. Gasparatos, , Doll, C.N.H., Esteban, M., Ahmed, A. & Olang, T.A. (2017) Renewable energy and biodiversity: Implications for transitioning to a Green Economy. Renewable and Sustainable Energy Reviews, 70, 161-184.
2. IEA, IRENA, UNSD, WB & WHO (2019) Tracking The Energy Progress Report.
3. GWEC (2020a) Africa Wind Energy Global Wind Energy Council. GWEC (2020b) Global Wind Report 2019. Global Wind Energy Council.
4. Thaxter, B., Buchanan, G.M., Carr, J., Butchart, S.H.M., Newbold, T., Green, R.E., Tobias, J.A., Foden, W.B., O'Brien, S. & Pearce-Higgins, J.W. (2017) Bird and bat species' global vulnerability to collision mortality at wind farms revealed through a trait-based assessment. Proceedings of the Royal Society B: Biological Sciences, 284.
5. World Bank (2017) The state of electricity access
6. https://www.rcreee.org/content/rcreee-launches-first-strategic-and-operational-framework-protocol-evaluation-environmental