

FEBRUARY 2023

**JOINT SUBMISSION ON THE DRAFT CENTRAL
ELECTRICITY AUTHORITY (CONSTRUCTION OF
ELECTRIC LINES IN GREAT INDIAN BUSTARD
AREA) REGULATIONS, 2023**

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SUBMITTED TO

CENTRAL ELECTRICITY AUTHORITY


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This is a joint submission by Centre for Energy, Environment & People (CEEP, formerly “Bask Research Foundation”) in consultation with Dr. Dharendra Devarshi (Rajasthan University, Jaipur), Dr. Sumit Dookia (GGS IPU, New Delhi and The ERDS Foundation), Mr. Aman Singh (Krishi Avam Paristhitiki Vikas Sansthan – KRAPAVIS, Alwar), and Mr. Sumer Singh Bhati (Environmentalist, Degrai Oran, Jaisalmer), and other experts and practitioners.

This submission is in response to the Public Notice inviting comments on the Draft Central Electricity Authority (Construction of Electric Lines in Great Indian Bustard Area) Regulations, 2023. The comments and suggestions are prepared in consultation with experts having experience in bird conservation, environment and energy governance, and communities in Western Rajasthan, and based on scientific literature including reports by the Wildlife Institute of India, Ministry of Environment and Forests, Government of India.

The comments and suggestions are based on the foundational logic of recognizing the environment as a key stakeholder in questions of development, deserving of justice and dignity in the process of energy transition. From this perspective, the draft regulations appear to take a narrow view of bird mortality mitigation interventions, and do not aim for zero GIB mortality. Despite the identification of potential and priority habitat of the critically endangered¹ Great Indian Bustard (GIB) by the WII (Wildlife Institute of India, 2019), draft regulations lack a graded mitigation approach with greater intensity of interventions for priority habitat relative to the potential habitat. The Asian Development Bank has also classified transmission lines in Western Rajasthan are posing a major collision threat to the Great Indian Bustard, Asian Houbara and many other avian species (Lopez & Allinson, 2022).² Enabling provisions for innovations in line configuration and route planning to mitigate bird mortality are missing in the draft regulations, and the mandate for underground cables is severely limited for lines up to 33 kV. This constrained approach to mandating underground cables is adopted despite almost two times higher per kilometre bird mortality of and 5.97/km/month for lines over 33 kV estimated by the WII (Uddin, et al., 2021).

The draft regulations envisage the installation of bird flight diverters (BFDs)³ as the only bulwark to protect the GIB from mortality and extinction due to power transmission in their last remaining habitats. However, studies find that BFDs not only have limited efficacy in reducing bird mortality, they are significantly less effective for heavy species of birds, such as bustards (Shaw, et al., 2021). A large-scale experiment on the impact of line markings in reducing mortality in large terrestrial birds conducted over 8 years in Eastern Karoo, South Africa found that line markings had “no discernible benefits for bustards” (Shaw, et al., 2021; Jenkins, Smallie, & Diamond, 2010). Regulatory interventions mandating BFDs also suffer from a severe accountability gap, given the problem of detecting non-compliance due to the vast spread and low population density of Western Rajasthan.

The issue of high bird mortality in Western Rajasthan’s Thar Desert due to the dense network of transmission lines developed to evacuate power from India’s major RE hub has been heard by the National Green Tribunal and the Supreme Court. The apex court noted that

¹ “Listed in Schedule I of the Indian Wildlife (Protection) Act, 1972, in the CMS Convention and in Appendix I of CITES, as Critically Endangered on the IUCN Red List and the National Wildlife Action Plan (2002-2016). It has also been identified as one of the species for the Recovery Programme under the Integrated Development of Wildlife Habitats of the Ministry of Environment and Forests, Government of India” (World Wildlife Fund, India, n.d.).

² Birdlife International in association with Asian Development Bank has developed a detailed, interactive map which has classified the regions of India, Nepal, Thailand, and Vietnam based on the sensitivity of different bird species in relation to the different aspects of energy infrastructure which includes wind power plants, solar PV plants, and transmission lines.

³ Regulation 4(2), Draft Central Electricity Authority (Construction of Electric Lines in Great Indian Bustard Area) Regulations, 2023.

“Irrespective of the cost factor the priority shall be to save the near extinct birds” (M.K. Ranjitsinh & Ors. vs. Union of India, 2021). The Wildlife Institute of India issued a caveat in conclusion of its study on impact of power lines on GIB, that “unless power line mortality is mitigated urgently, extinction of GIBs is certain” (Wildlife Institute of India, 2018). In addition to the GIB, this translates to added risk to 14 threatened and 65 migratory species of the Central Asian Flyway supported by the Thar desert (Uddin, et al., 2021).

In this context, the regulation-wise comments by Centre for Energy, Environment & People (CEEP) are presented in the following section. In addition, the comments are also annexed in the format specified by the CEA as Annexure 1. We request the CEA to kindly consider the comments and suggestions on record.

1. Definition of “Great Indian Bustard Area”

Regulation 2(1)(a) of the draft regulations define GIB area as follows:

“Great Indian Bustard Area” means Great Indian Bustard habitat in priority and potential areas as identified by Wildlife Institute of India, an Autonomous Institution of the Ministry of Environment, Forest and Climate Change, Government of India.”

The WII mapped the potential habitat of GIB spanning across 79,221 sq. km in Rajasthan, out of which 13,106 sq. km is identified as the priority habitat (Wildlife Institute of India, 2019).⁴ However, the definition of “Great Indian Bustard Area” in the draft regulation combines both, the potential and priority GIB areas. Such a framing of GIB area in the definition clause of the draft regulations compromises the intent of differentiating the priority area, with a higher density of GIB, from the potential area. For instance, the WII suggests creation of “no power line zones” in priority areas with mandatory underground lines or their diversion up to 66kV, while recommends the installation of BFDs on lines passing through the larger potential habitat area of the GIB.

Consequently, we submit that Regulation 2(1)(a) of the draft regulations should individually define the *potential* and *priority* area as distinct classes of GIB habitat, to allow for a higher degree of interventions to mitigate bird mortality in the *priority* area.

2. Limited scope of underground transmission lines

Regulation 4(1) of the draft regulations reproduced below specifies how electric lines shall be laid in both, potential and priority GIB habitat as identified by WII, and mandates underground cables for high voltage electric lines (up to 33kV; refer Table 1) passing through the potential and priority GIB area.

⁴ Appendix 2

“Electric lines of 33 kV and below voltage level passing through Great Indian Bustard area shall be underground cable.”

Classification	Voltage Level
Low Tension	Up to 250 V
Medium Tension	250 V - 650 V
High Tension	650 V - 33,000 V
Extra High Tension	Over 33,000 V

Table 1: Voltage Classification

Following submissions are made in this regard:

i. Lines over 33 kV pose a serious risk of bird mortality

The draft regulations mandate underground cables for lines at 33 kV or below. However, lines at higher voltage levels are also a significant mortality factor for the GIB and other endangered bird species. The WII’s study notes a significantly higher mortality rate of 6 birds/km/month on HT lines as compared to 3 birds/km/month on LT lines in the GIB area, which leads to over 16 GIB deaths each year – a rate which is unsustainably high for the critically endangered GIB. The study recommends underground cables for up to 66 kV (Wildlife Institute of India, 2018). Excluding the electric lines operating at voltages higher than 33 kV from the mandate to underground thus goes against the spirit of the present draft regulations which are intended to protect the GIB from extinction.

ii. Domestic experience of laying underground lines up to 400 kV

While the Supreme Court in M.K. Ranjitsinh & Ors. vs. Union of India did not envisage a voltage cap on undergrounding, it noted the Respondent’s submission that underground cables were technically not possible for transmission at very high voltages, such as 765 kV (M.K. Ranjitsinh & Ors. vs. Union of India, 2021). However, over 200km of high voltage underground transmission lines up to 400 kV have been laid in across the country, mostly in urban spaces, according to a question raised to the Power Ministry in the Parliament (Unstarred Question no. 2377, 2020). This indicates that underground cables are technologically feasible for voltages at least up to 400 kV. Considering this experience, the mandate to underground electric lines should be expanded to the maximum possible voltage of 400 kV, at least in the priority area of GIB habitat.

iii. Underground lines up to 33 kV may have a limited impact on bird mortality

Data on the voltage-wise spread of electric lines in the potential and priority GIB areas is not readily available in the public domain. It is important to map the voltage-wise spread of electric lines in GIB potential and priority area to design an optimal voltage ceiling for underground cables to balance the interests of economic feasibility, and the broader

stations situated near the generators. Beyond the pooling stations, electricity is transmitted at higher voltages between 66 kV – 765 kV. This indicates that a significant spread of transmission lines rated over 33 kV is left out of the scope of the draft regulations for undergrounding, even in the priority GIB habitat, diluting the overall objective of mitigating the risk of bird mortality due to transmission lines. A more reliable estimate can be calculated based on precise data on the voltage-wise spread of transmission lines in the GIB area.

iv. Cost

Arguments were made by Respondents in the Supreme Court in *M.K. Ranjitsinh & Ors. vs. Union of India* regarding the poor economic feasibility of undergrounding power lines operating at very high voltages. Industry sources suggest that the cost of laying underground cables can be significantly higher, up to two to six times the cost of overhead lines. However, it is important to note that the additional cost is not attributable to the entire transmission network, but only to the specific sections falling within the GIB priority and potential area which cannot be diverted. Analysis of the data provided by the WII mapping the GIB habitat in Rajasthan spanning over 79,221 sq. km indicates that the longest possible diagonal in the GIB potential area is between 300 – 400 km. In other words, the longest possible line that may need to be taken underground would not exceed 300 – 400 km (Annexure 2). Simply extrapolating the additional cost of undergrounding to the entire transmission system does not provide a realistic estimate of the costs of laying underground lines over the useful life of the transmission network.

v. Excessive reliance on low efficacy Bird Flight Diverters (BFDs)

Data on the voltage-wise spread of electric lines in the potential and priority GIB areas is not readily available in the public domain. It is important to map the voltage-wise spread of electric lines in GIB potential and priority area to design an optimal voltage ceiling for underground cables to balance the interests of economic feasibility, and the broader regulatory objective of mitigating bird mortality due to power lines.

However, generally, the 33 kV system is used to connect generators to the pooling stations situated near the generators. Beyond the pooling stations, electricity is transmitted at higher voltages between 66 kV – 765 kV. This indicates that a significant spread of transmission lines rated over 33 kV is left out of the scope of the draft regulations for undergrounding, even in the priority GIB habitat, diluting the overall objective of mitigating the risk of bird mortality due to transmission lines. A more reliable estimate can be calculated based on precise data on the voltage-wise spread of transmission lines in the GIB area.

3. Power to relax

Regulation 7 of the draft regulations reads:

“The Authority may, by order and for reasons to be recorded in writing, relax any of the provisions of these regulations in respect of the matters referred to the Authority on a case-to-case basis.”

Indian administrative law recognizes the sub-delegation of rulemaking powers to administrative bodies, exercisable through administrative discretion. However, the constitutional courts of the country firmly establish that in a constitutional democracy, no power can be absolute or unrestrained.⁵ Indian administrative law recognizes the sub-delegation of rulemaking powers to administrative bodies, exercisable through administrative discretion. However, the constitutional courts of the country firmly establish that in a constitutional democracy, no power can be absolute or unrestrained (R.R. Verma vs. Union of India, 1980; Shubash Chandra vs. State of Uttar Pradesh, 2019; State of Punjab vs. Gurdial Singh & Ors., 1979; Accountant General & Anr. vs. S. Doraiswamy & Ors., 1980).

To ensure check on the delegation and exercise of administrative discretion, the courts lay down the following considerations:

- A body exercising discretion shall ensure the exercise of discretion is not arbitrary (State of Punjab v Khan Chand 1974 I SCC.
- The exercise of discretion should not be opposed to the aims and objectives of the parent statute. (Shri Rama Sugar Industries Ltd. V State of A.P. (1974) I SCC 534).
- The exercise of discretion shall not be “improper”. Exercise of administrative discretion is considered “improper” when it “takes into account irrelevant consideration,” “neglects to take into consideration relevant factors,” acts for “improper” purpose, acts in “bad faith,” or “acts unreasonably.” (M.A. Rasheed v State of Kerala (1974) 2 SCC 687, RD Shetty v International Airport Authority of India (1979) 3 SCC 489.)
- While subjective satisfaction may feature in the exercise of administrative discretion, the same ought to be done on objective criteria (Bharat Petroleum Corporation Limited v Madulla Ratnavalli (2007) 6 SCC 81.

Based on judicial precedent of the exercise of administrative discretion in India, it may be submitted that the Power to Relax clause of the draft regulations confers wide discretionary power on the Authority. The wide powers thus conferred may neglect the relevant consideration of safeguarding the endangered Great Indian Bustard and other migratory birds, highlighted as imperative by the Supreme Court (M.K. Ranjitsinh & Ors. vs. Union of India, 2021).

⁵ R.R. Verma v. UoI 1980 3 SCC 402, Ramakanyadevi v State AIR 1980 Kar 182, Shubash Chandra v. State of U.P. (1980) 2 SCC 324, State of Punjab v Gurdial Singh, (1980) 2 SCC 471; Accountant General v. S. Doraiswamy (1981) 4 SCC 93.

4. No measures for existing lines

The draft regulations do not provide for any mitigation measures for the lines already commissioned or under construction in the GIB priority and potential areas. We submit that existing transmission lines are also a high risk to the existing GIB population in Rajasthan.

5. Alternative mitigation measures not considered

The draft regulations have not considered the impact of transmission planning and the design of transmission lines on bird mortality. Considering bird mortality risk in the planning stage itself allows a priori recognition of risks to endangered species of birds, and provides scope to divert the lines away from identified hotspots of bird species.

Research on mapping transmission lines in flamingo habitats in Gujarat to assess mortality due to power lines notes that “it is necessary to understand where the collisions take place more frequently” for effective remedial measures (Tere & Parasharya, 2011). Study conducted by German Society for Nature Conservation notes that “lines in the flight approach of important staging and feeding areas, in particular close to water, are critical” (Haas, et al., 2003). This was evident in Kutch, Gujarat, where a single transmission line passing close to wetlands is attributed to hundreds of bird deaths (Times News Network, 2011).

Comprehensive planning for new lines and diversion of existing lines from high risk areas is an important measure to reduce bird mortality due to transmission lines. Interventions similar to reducing risk of aviation accidents by clearing electric lines from the approach path to airports can be emulated for birds by diversion and undergrounding of such lines (Warrick, 1989).

The configuration of lines may also have an impact on bird mortality. For instance, certain studies attribute higher bird deaths with the number of vertical levels in the line, and note that reduction in the number of vertical levels leads to lower deaths, as birds are unable navigate the vertical stack of conductors to avoid collision with the lines even if they are able to see them (Bernardino, et al., 2018). Further, increased mortality is attributed to the presence of optical ground wire (Haas, et al., 2003). While further research and India-specific studies must be conducted to estimate the precise impact, design changes in the arrangement of conductors can provide effective bird mortality mitigation for new and existing lines at a lower cost than taking the lines underground.

The two-pronged approach in the draft regulations to mitigate bird mortality on transmission lines in both priority and potential GIB habitat include underground cables for lines up to 33 kV, and BFDs for the remaining lines. However, limited scope of underground cables, and questionable efficacy of BFDs especially for bustards limit the overall goal of GIB conservation (Janss & Ferrer, 1998).

We recommend that the CEA considers and incorporates alternative measures to reduce bird mortality of power lines, specifically, consideration of bird mortality risk in the planning

stages itself for cost-effective diversion, and the design and configuration of transmission lines and poles to reduce risk for birds.

6. Need to expand to other biodiversity hotspots

The issue of bird mortality on power lines is prevalent in all areas where bird species encounter transmission lines. The expansion of power generation from renewable sources requires the commissioning of large-scale transmission infrastructure, which may intersect a range of critical habitats for endangered bird species.

We submit that the scope of regulations must be expanded from only the GIB area to other biodiversity hotspots, to achieve the goals of conservation and mitigation of bird mortality due to power lines on a wider scale.

7. Need for minimum specifications for Bird Flight Diverters (BFDs)

Field experience indicates instances of transmission lines not complying with BFD mandates, and the presence of broken, poor quality BFDs near the lines. In context of the draft regulation, where BFD installation is the primary mitigation measure for new and existing lines, the CEA should take a serious note of the questionable efficacy of relying on BFDs as a regulatory intervention to reduce bird mortality, especially in area identified as priority habitat for the critically endangered GIB.

We submit that CEA is the competent authority to specify technical specifications for BFDs, where exceptions be made only for proven better technology.

Annexure 1 - Regulation-wise comments and justifications in the format specified by the CEA

Sr. No.	Regulation/Clause no. of the Draft Regulations	Comments on the Draft Regulation/Proposed Draft	Justification for the Comments
1	Regulation 2(1)(a): “Great Indian Bustard Area” means Great Indian Bustard habitat in priority and potential areas as identified by Wildlife Institute of India, an Autonomous Institution of the Ministry of Environment, Forest and Climate Change, Government of India.”	Regulation 2(1)(a) of the draft regulations should separately define the <i>potential</i> and <i>priority</i> habitats as distinct classes of GIB area, instead of a combined representation in the term "GIB area".	The WII mapped the potential habitat of GIB spanning across 79,221 sq. km in Rajasthan, out of which 13,106 sq. km is identified as the priority habitat (Wildlife Institute of India, 2019). ¹ However, the definition of “Great Indian Bustard Area” in the draft regulation combines both, the potential and priority GIB areas. Such a framing of GIB area in the definition clause of the draft regulations compromises the intent of differentiating the priority area, with a higher density of GIB, from the potential area. For instance, the WII suggests creation of “no power line zones” in priority areas with mandatory underground lines or their diversion up to 66kV, while recommends the installation of BFDs on lines passing through the larger potential habitat area of the GIB.
2	Regulation 4(1): “Electric lines of 33 kV and below voltage level passing through Great Indian Bustard	The scope of laying underground cables must be expanded to electric lines over 33 kV, considering the voltage-wise distribution of transmission lines in GIB priority and potential	<u>i. Lines over 33 kV pose a serious risk of bird mortality</u> The draft regulations mandate underground cables for lines at 33 kV or below. However, lines at higher voltage levels are also a significant mortality factor for the GIB and other endangered bird species. The WII’s study notes a significantly higher mortality rate

¹ Appendix 2

	<p>area shall be underground cable.”</p>	<p>areas individually. A more realistic estimation of costs based on this data should be taken to compute at the per unit tariff impact of taking lines underground specifically for the lines in priority area, spread over the useful life of the transmission lines. Further, all possible lines in the GIB priority area must either be diverted or taken underground, and reliance on BFDs should be limited to lines which cannot be diverted or taken underground.</p>	<p>of 6 birds/km/month on HT lines as compared to 3 birds/km/month on LT lines in the GIB area, which leads to over 16 GIB deaths each year – a rate which is unsustainably high for the critically endangered GIB. The study recommends underground cables for up to 66 kV (Wildlife Institute of India, 2018).</p> <p>Excluding the electric lines operating at voltages higher than 33 kV from the mandate to underground thus goes against the spirit of the present draft regulations which are intended to protect the GIB from extinction.</p> <p><u>ii. Domestic experience of laying underground lines up to 400 kV</u></p> <p>While the Supreme Court in M.K. Ranjitsinh & Ors. vs. Union of India did not envisage a voltage cap on undergrounding, it noted the Respondent’s submission that underground cables were technically not possible for transmission at very high voltages, such as 765 kV (M.K. Ranjitsinh & Ors. vs. Union of India, 2021). However, over 200km of high voltage underground transmission lines up to 400 kV have been laid in across the country, mostly in urban spaces, according to a question raised to the Power Ministry in the Parliament (Unstarred Question no. 2377, 2020). This indicates that underground cables are technologically feasible for voltages at least up to 400 kV. Considering this experience, the mandate to underground electric lines should be expanded to the maximum possible voltage of 400 kV, at least in the priority area of GIB habitat.</p>
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			<p><u>iii. Underground lines up to 33 kV may have a limited impact on bird mortality</u></p> <p>Data on the voltage-wise spread of electric lines in the potential and priority GIB areas is not readily available in the public domain. It is important to map the voltage-wise spread of electric lines in GIB potential and priority area to design an optimal voltage ceiling for underground cables to balance the interests of economic feasibility, and the broader regulatory objective of mitigating bird mortality due to power lines.</p> <p>However, generally, the 33 kV system is used to connect generators to the pooling stations situated near the generators. Beyond the pooling stations, electricity is transmitted at higher voltages between 66 kV – 765 kV. This indicates that a significant spread of transmission lines rated over 33 kV is left out of the scope of the draft regulations for undergrounding, even in the priority GIB habitat, diluting the overall objective of mitigating the risk of bird mortality due to transmission lines. A more reliable estimate can be calculated based on precise data on the voltage-wise spread of transmission lines in the GIB area.</p> <p><u>iv. Cost</u></p> <p>Arguments were made by Respondents in the Supreme Court in M.K. Ranjitsinh & Ors. vs. Union of India regarding the poor economic feasibility of undergrounding power lines operating at very high voltages. Industry sources suggest that the cost of laying</p>
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			<p>underground cables can be significantly higher, up to two to six times the cost of overhead lines. However, it is important to note that the additional cost is not attributable to the entire transmission network, but only to the specific sections falling within the GIB priority and potential area which cannot be diverted. Analysis of the data provided by the WII mapping the GIB habitat in Rajasthan spanning over 79,221 sq. km indicates that the longest possible diagonal in the GIB potential area is between 300 – 400 km. In other words, the longest possible line that may need to be taken underground would not exceed 300 – 400 km (Annexure 2). Simply extrapolating the additional cost of undergrounding to the entire transmission system does not provide a realistic estimate of the costs of laying underground lines over the useful life of the transmission network.</p> <p><u>v. Excessive reliance on low efficacy Bird Flight Diverters (BFDs)</u></p> <p>BFDs are envisaged as the only mitigation intervention to reduce bird mortality on transmission lines of voltage over 33 kV, even in the priority habitat of the GIB. Literature on the impact of BFDs on bird mortality indicates different efficacy for various species of birds, ranging between 50-60%; however, very low efficacy was noted for bustards (Jenkins, Smallie, & Diamond, 2010). A study on the effect of marking electric lines with flight diverters in Spain found the highest number of deaths for bustards across 26 species of birds, with a combined 49 out of a total 150 deaths of great and little bustards (Janss & Ferrer, 1998). An experiment spanning 8 years in South Africa also found that while line markings may</p>
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			reduce mortality for other bird species, it has no effect on bustards (Shaw, et al., 2021). The excessive reliance on low efficacy BFDs for lines in the priority habitat of the critically endangered GIB imperils the larger goal of protecting the species from extinction.
3	<p>Regulation 7:</p> <p>“The Authority may, by order and for reasons to be recorded in writing, relax any of the provisions of these regulations in respect of the matters referred to the Authority on a case-to-case basis.”</p>	<p>We submit that the power to relax provisions shall be detailed to lay out the objective criteria based on which the provisions of the regulations may be relaxed. Further, we submit that the Authority shall invite and consider the concerns put forth by the local conservationists and community members of the area involved in safeguarding the habitat and existence of the endangered birds of the region.</p>	<p>Indian administrative law recognizes the sub-delegation of rulemaking powers to administrative bodies, exercisable through administrative discretion. However, the constitutional courts of the country firmly establish that in a constitutional democracy, no power can be absolute or unrestrained (R.R. Verma vs. Union of India, 1980; Shubash Chandra vs. State of Uttar Pradesh, 2019; State of Punjab vs. Gurdial Singh & Ors., 1979; Accountant General & Anr. vs. S. Doraiswamy & Ors., 1980).</p> <p>To ensure check on the delegation and exercise of administrative discretion, the courts lay down the following necessary considerations:</p> <ul style="list-style-type: none"> - A body exercising discretion shall ensure the exercise of discretion is not arbitrary (State of Punjab v Khan Chand 1974 I SCC. - The exercise of discretion should not be opposed to the aims and objectives of the parent statute. (Shri Rama Sugar Industries Ltd. V State of A.P. (1974) I SCC 534). - The exercise of discretion shall not be “improper”. Exercise of administrative discretion is considered “improper” when it “takes into account irrelevant consideration,” “neglects to take into consideration relevant factors,” acts for “improper” purpose, acts in “bad faith,” or “acts unreasonably.” (M.A. Rasheed v State of

			<p>Kerala (1974) 2 SCC 687, RD Shetty v International Airport Authority of India (1979) 3 SCC 489.) - While subjective satisfaction may feature in the exercise of administrative discretion, the same ought to be done on objective criteria (Bharat Petroleum Corporation Limited v Madulla Ratnavalli (2007) 6 SCC 81.</p> <p>Based on judicial precedent of the exercise of administrative discretion in India, it may be submitted that the Power to Relax clause of the draft regulations confers wide discretionary power on the Authority. The wide powers thus conferred may neglect the relevant consideration of safeguarding the endangered Great Indian Bustard and other migratory birds, highlighted as imperative by the Supreme Court (M.K. Ranjitsinh & Ors. vs. Union of India, 2021).</p>
4	No Measures for existing lines	Appropriate mitigation interventions should be designed for the existing lines to protect GIB and other endangered bird species.	The draft regulations do not provide for any mitigation measures for the lines already commissioned or under construction in the GIB priority and potential areas. We submit that existing transmission lines are also a high risk to the existing GIB population in Rajasthan.
5	Alternative mitigation measures not considered	we recommend that the CEA considers and incorporates alternative measures to reduce bird mortality of power lines, specifically, consideration of bird mortality risk in the planning stages itself for cost-effective diversion, and the design and	<p>The draft regulations have not considered the impact of transmission planning and the design of transmission lines on bird mortality. Considering bird mortality risk in the planning stage itself allows a priori recognition of risks to endangered species of birds, and provides scope to divert the lines away from identified hotspots of bird species.</p> <p>Research on mapping transmission lines in flamingo habitats in</p>

		<p>configuration of transmission lines and poles to reduce risk for birds.</p>	<p>Gujarat to assess mortality due to power lines notes that “it is necessary to understand where the collisions take place more frequently” for effective remedial measures (Tere & Parasharya, 2011). Study conducted by German Society for Nature Conservation notes that “lines in the flight approach of important staging and feeding areas, in particular close to water, are critical” (Haas, et al., 2003). This was evident in Kutch, Gujarat, where a single transmission line passing close to wetlands is attributed to hundreds of bird deaths (Times News Network, 2011). Comprehensive planning for new lines and diversion of existing lines from high risk areas is an important measure to reduce bird mortality due to transmission lines. Interventions similar to reducing risk of aviation accidents by clearing electric lines from the approach path to airports can be emulated for birds by diversion and undergrounding of such lines (Warrick, 1989).</p> <p>The configuration of lines may also have an impact on bird mortality. For instance, certain studies attribute higher bird deaths with the number of vertical levels in the line, and note that reduction in the number of vertical levels leads to lower deaths, as birds are unable navigate the vertical stack of conductors to avoid collision with the lines even if they are able to see them (Bernardino, et al., 2018). Further, increased mortality is attributed to the presence of optical ground wire (Haas, et al., 2003). While further research and India-specific studies must be conducted to estimate the precise impact, design changes in the arrangement of conductors can provide effective bird mortality mitigation for new and existing lines at a lower cost than taking the lines</p>
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			<p>underground.</p> <p>The two-pronged approach in the draft regulations to mitigate bird mortality on transmission lines in both priority and potential GIB habitat include underground cables for lines up to 33 kV, and BFDs for the remaining lines. However, limited scope of underground cables, and questionable efficacy of BFDs especially for bustards limit the overall goal of GIB conservation (Janss & Ferrer, 1998).</p>
6	Need to expand to other biodiversity hotspots	We submit that the scope of regulations must be expanded from only the GIB area to other biodiversity hotspots, to achieve the goals of conservation and mitigation of bird mortality due to power lines on a wider scale.	The issue of bird mortality on power lines is prevalent in all areas where bird species encounter transmission lines. The expansion of power generation from renewable sources requires the commissioning of large-scale transmission infrastructure, which may intersect a range of critical habitats for endangered bird species.
7	Need for minimum specifications for Bird Flight Diverters (BFDs)	We submit that CEA is the competent authority to specify technical specifications for BFDs, where exceptions be made only for proven better technology.	Field experience indicates instances of transmission lines not complying with BFD mandates, and the presence of broken, poor quality BFDs near the lines. In context of the draft regulation, where BFD installation is the primary mitigation measure for new and existing lines, the CEA should take a serious note of the questionable efficacy of relying on BFDs as a regulatory intervention to reduce bird mortality, especially in area identified as priority habitat for the critically endangered GIB.

Annexure 2 - Analysis of the GIB potential and priority areas provided by the WII

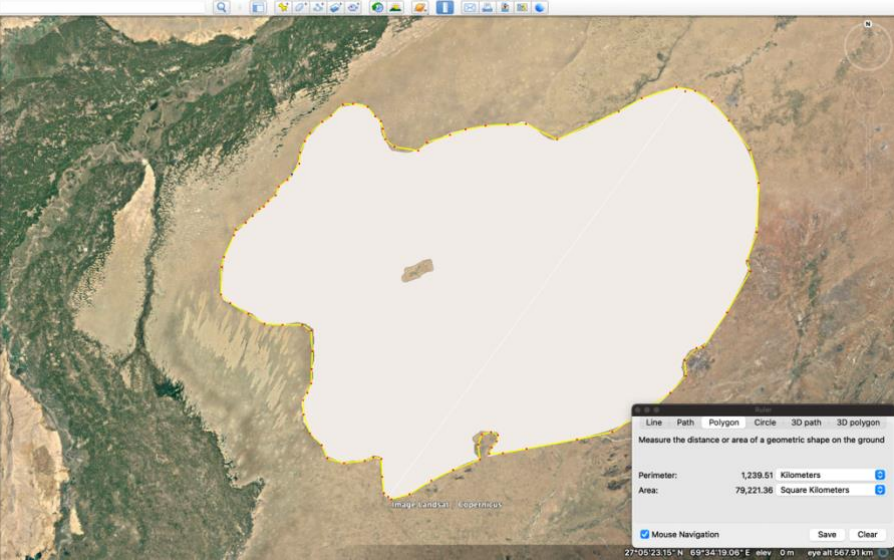


Figure 1: Area and perimeter of GIB potential area as per maps provided by WII, available at https://wii.gov.in/gib_powerline_maps

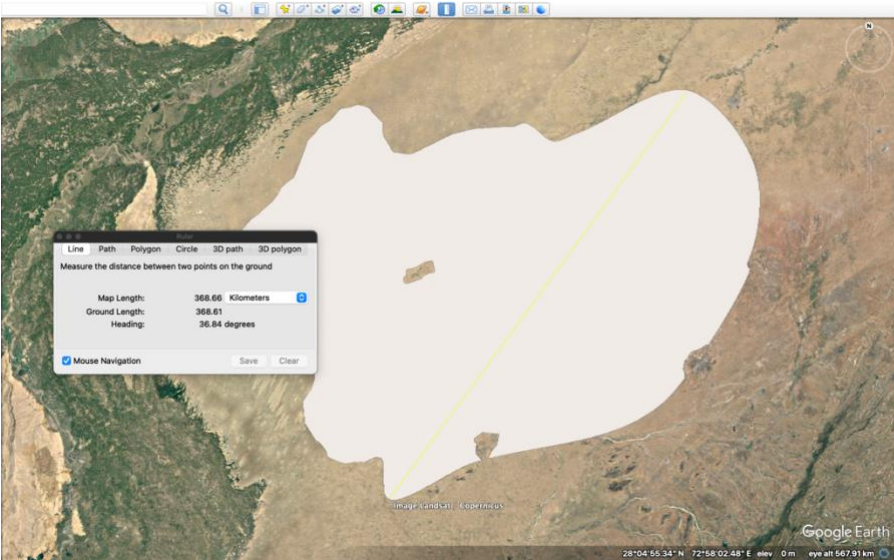


Figure 2: Length of potential diagonal 1

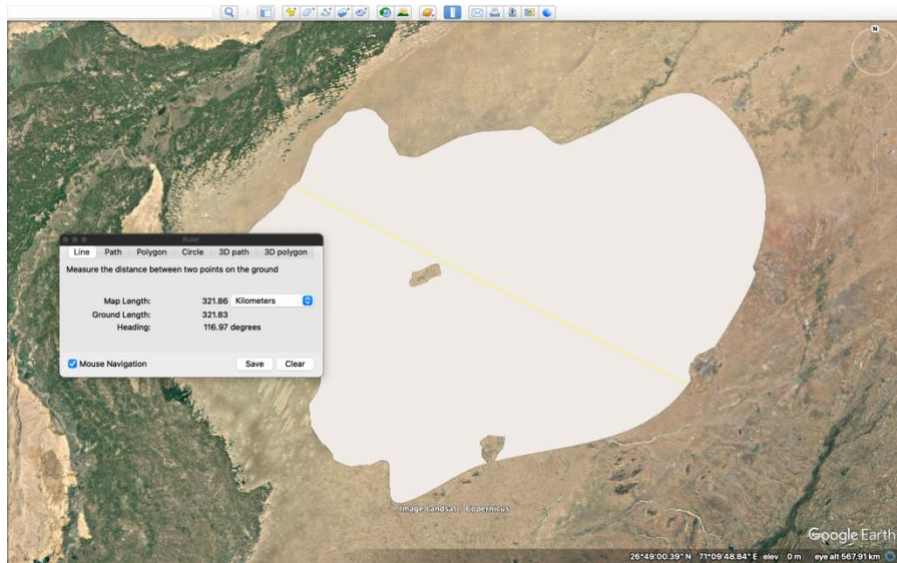


Figure 3: Length of potential diagonal 2

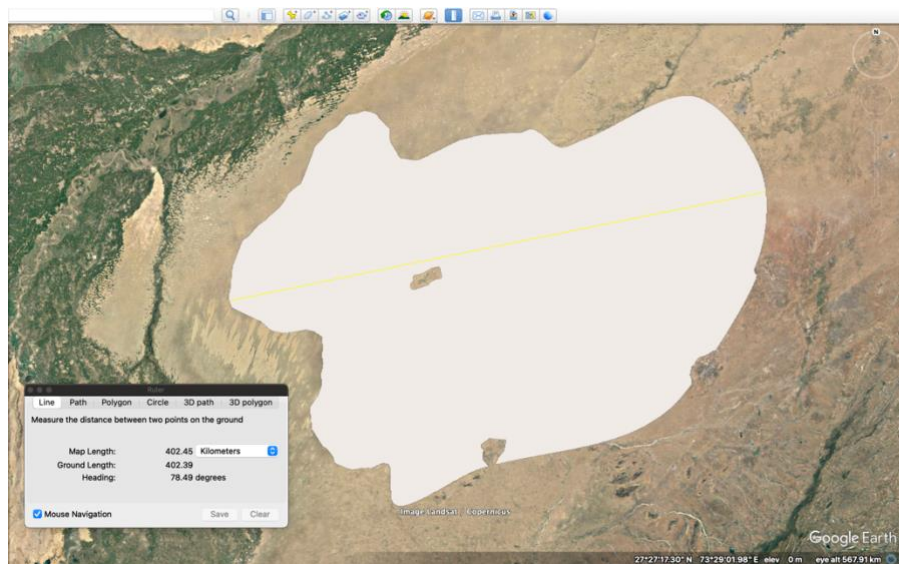


Figure 4: Length of potential diagonal 3

Works Cited

M.K. Ranjitsinh & Ors. vs. Union of India, I.A. No. 85618 of 2020 in Writ Petition (Civil) No. 838 of 2019 (Supreme Court of India April 19, 2021).

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