

ANNA BJERDE  
Managing Director, Operations

February 16, 2026

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Mr. Eugene Simonov  
Rivers without Boundaries

Mr. Andrey Ralev  
CEE Bankwatch

Dear Messrs Kolotov, Simonov and Ralev,

*Rogun Hydro vs Biodiversity*

Thank you for your letter to President Banga dated December 2, 2025, detailing your concerns regarding the adherence of the Rogun Hydropower Project (Rogun HPP) to the requirements of the World Bank's Environmental and Social Standard 6 (ESS6) on Biodiversity Conservation and Sustainable Management of Living Natural Resources.

We take biodiversity conservation seriously and appreciate the time and effort you have taken to raise these matters. We welcome your views on assessing the environmental and social impacts of this complex project as well as your suggestions for technically and financially feasible mitigation measures.

Attached, please find a detailed response to your comments. We value the constructive and ongoing engagement with you to date and consider this dialogue an important part of the project's development. The World Bank Rogun HPP team, under the leadership of Charles Cormier, remains committed to continued, open engagement as implementation progresses.

Please note that the Rogun Project Management Group (PMG) is planning a series of consultations on the operationalization of the environmental and social instruments, including the Environmental and Social Management Plan (ESMP) and Biodiversity Management Plan (BMP) in the summer and fall. Other consultations are also planned on the Second Resettlement Action Plan (RAP), the livelihood measures, and benefit sharing program – among other instruments. You will be informed of venues and modalities as the calendar firms up.

Mr. Alexander Kolotov  
Mr. Eugene Simonov  
Mr. Andrey Ralev

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February 16, 2026

We look forward to sustaining this collaborative approach in the period ahead.

Sincerely,

A handwritten signature in black ink, appearing to read 'Anna Bjerde', with a stylized flourish at the end.

Anna Bjerde  
Managing Director, Operations  
The World Bank

Mr. Alexander Kolotov  
Mr. Eugene Simonov  
Mr. Andrey Ralev

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February 16, 2026

To: alex.kolotov@gmail.com

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Mr. Alexander Kolotov  
Mr. Eugene Simonov  
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February 16, 2026

bcc: Antonella Bassani; Gallina Andronova Vincelette; Charles J. Cormier; Maninder S. Gill

Ref: EXC-2025-001285-LOG

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**Executive Summary of Responses to  
The November 2025 “Rogun Hydro vs Biodiversity” Review Note**

Thank you for your review detailing your concerns regarding the adherence of the Rogun Hydropower Project (Rogun HPP) to the requirements of the World Bank’s Environmental and Social Standard 6 (ESS6) on Biodiversity Conservation and Sustainable Management of Living Natural Resources.

We take biodiversity conservation seriously and appreciate the time taken to raise these matters. We welcome views on assessing the environmental and social impacts of this complex project as well as suggestions for technically and financially feasible mitigation measures.

We would like to emphasize a few **broad observations** at the outset that help frame the answers to the questions raised. As you know, the Rogun HPP is being built upstream of a cascade of seven existing HPPs on the Vakhsh River, which have been developed over the past 50 years. Many of the concerns you have raised are related to the construction and operation of this cascade of hydropower projects which may have resulted in substantive water abstraction that cannot be attributed to the Rogun HPP, based on extensive studies conducted over the last decade on environmental and social impacts, including biodiversity conservation.

The Rogun HPP has been subject to substantive analysis for more than a decade, beginning in 2014 with the issuance of a Techno-Economic Assessment Study (TEAS) financed by the World Bank between 2011 and 2014. This included an Environmental and Social Impact Assessment (ESIA), which incorporated mitigation measures following good international practice, under the guidance of an independent panel of experts. As part of the World Bank technical assistance, the Government of Tajikistan contracted an international consulting firm, WSP, to conduct an independent ESIA, which was widely consulted with stakeholders, and disclosed on December 22, 2023. The ESIA was updated and re-disclosed on October 8, 2025, considering comments received after public consultation and further data collection. The updates of the ESIA of 2023 and 2025 were conducted under the guidance of the independent Environmental and Social Panel of Experts (ESPoE).

As per the World Bank Environment and Social Framework (ESF), Tajikistan is also required to prepare a Biodiversity Management Plan (BMP) for the project. The BMP is a condition of disbursement for the civil works under the Rogun Multiphase Program Approach (MPA) approved by the World Bank Board on December 17, 2024. While the Bank’s earlier Safeguard Policies focused on an ex-ante assessment, the ESF adopted in 2018, introduced

greater focus on continuous monitoring and implementation of biodiversity conservation. Accordingly, the compliance of the Rogun HPP with the World Bank Environment and Social Standard 6 (ESS 6) explicitly requires:

- a) Ongoing monitoring of biodiversity impacts and mitigation measures throughout project implementation;
- b) Adaptive management where monitoring indicates unanticipated or higher-than-acceptable impacts; and
- c) Clear allocation of responsibilities, timelines and resources for biodiversity management over the full project lifecycle.

This shift embeds biodiversity conservation as a continuous implementation obligation, rather than a one-off exercise. It is a welcome shift in the case of Rogun, where the World Bank and other International Financial Institutions (IFIs) are participating in the project when construction is already over 40 percent complete. In addition, ESS6 recognizes that in some cases, habitats may have already been fragmented and modified prior to the Bank financing, which is the case here, given the cascade of existing hydropower projects, some in operation for half a century. Consequently, certain ecological impacts leading to habitat fragmentation have already occurred and these conditions should be recognized as the new baseline for the assessment of the incremental environmental impacts of Rogun HPP.

As the Rogun HPP is being built upstream of seven HPPs, it will also help with flood protection for the entire cascade. During the reservoir filling stage, the project will not use more than the average of 1.2 billion cubic meters (bcm) per year that is currently unused under the agreed international water sharing agreements to which Tajikistan is a party. In addition, Tajikistan has agreed to keep the Vakhsh river flow regime unchanged even after Rogun HPP is complete; that is, it will maintain the summer to winter shift in flow at no more than 4.2 bcm/year, as has been the case for the operation of the existing Nurek HPP. These existing agreements on water use will significantly minimize environmental impacts of Rogun HPP and are included in the legal covenants for the Financing Agreement of the Rogun HPP. We also note that, historically, Tajikistan has respected the water sharing agreement with other riparian countries.

Consequently, the main aquatic impacts will be in the 15-km stretch of the Vakhsh river between the Rogun and Nurek HPPs (the 2 HPPs are 70 km apart, but 55 km of river is already subsumed under the existing Nurek reservoir). The impact of Rogun HPP will be managed and monitored under the Environmental and Social Management Plan (ESMP), including the BMP. It is assessed that Rogun HPP will not change the impacts on downstream habitats (e.g., Amu Darya wetlands) that have been affected in the past by the Nurek HPP.

Since Rogun will not alter the flow regime downstream of the Nurek HPP, no significant additional ecological impacts for riparian countries are expected to occur because of it. This is relevant for the Tigrovaya Balka nature reserve, which is located downstream of the Nurek HPP and has experienced ecological impacts in the past due to the construction and operation of Nurek.

The Cumulative Impact Assessment (CIA) concluded that there are no significant cumulative effects due to Rogun and therefore no mitigation measures required to reduce past impacts from the Vakhsh Cascade projects that were already constructed. For other projects already under construction or planned, deemed to be associated facilities as per paragraphs 10 and 11 in the World Bank Environmental and Social Policy for Investment Project Financing, the Government of Tajikistan may need to undertake an ex-post audit as referred to in the project Environmental and Social Commitment Plan (ESCP).

The Vakhsh river is considered neither a "pristine" nor a free-flowing river due to the existence of several HPPs in the cascade downstream of the Rogun HPP. Various past and current environmental studies confirm that the Vakhsh river, where the HPP cascade exists, is not a critical habitat. According to ESS6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources, "critical habitat" is defined as areas with high biodiversity importance or value, including: (a) habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches; (b) habitat of significant importance to endemic or restricted-range species; (c) habitat supporting globally or nationally significant concentrations of migratory or congregatory species; (d) highly threatened or unique ecosystems; (e) ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d). None of these conditions are met by the Vakhsh River, or areas influenced by the project, as per the assessment carried out under the ESIA. A limited number of discrete areas in the Vakhsh river, upstream of the Rogun HPP, within the Project's Area of Influence, (Aol) are, however, identified by the ESIA as a natural habitat. Accordingly, a robust biodiversity monitoring plan will be prepared to inform the no net-loss framework (for the floodplain habitat limited to two remnant areas) and the BMP which will be operationalized as a condition of disbursement on civil works.

The Aol of the 2025 project-level ESIA was determined based on the spatial and temporal extent of the anticipated impact. However, the Aol for the Transboundary Cumulative Impact Assessment (TCIA, also referred to as CIA) was informed by public consultation and agreed by the Environmental and Social Independent Panel of Experts (ESPOE) to include the Amu Darya basin, with the Vakhsh catchment and the area downstream of the Pyanj-Vakhsh confluence, i.e., the Amu Darya, as the central parts. The

CIA also extended the Valued Components (VCs) to include the following wider biodiversity receptors: the Aral Sea, fish migrations, and floodplain habitats, including Tigrovaya Balka.

Additional data to complement the ESIA analysis and to supplement any missing baseline data will be gathered through the monitoring program as part of the ESMP update and the operationalization of the BMP (see table below). This monitoring will update the baseline and identify if any additional areas within the AoI could qualify as Natural Habitat from the currently identified areas of floodplain and riverine zone. The update will inform any necessary modifications to the BMP and *No Net Loss Framework* (NNLF) as appropriate, following adaptive management principles, and consistent with World Bank ESS6.

The extent of the terrestrial natural habitat was determined using various resources including: Integrated Biodiversity Assessment Tool (IBAT) Report; 2014 EIA; 2023 desk study; 2023 field survey report – spring; 2023 field survey report – autumn; 2025 Project level ESIA; literature review; e-bird resources; IUCN Red List; and stakeholder consultations with organizations involved in conservation initiatives across Tajikistan. For the aquatic habitats, the same resources were used, in addition to eDNA.

Recognizing that the mitigation hierarchy couldn't be followed for the pre-existing cascade in the case of Rogun HPP, steps to minimize, mitigate, restore, or offset are followed whenever technically and financially feasible. Examples include access control of fauna to the site, air quality measures to prevent habitat degradation, restricting the introduction of non-native fish species, the preparation of an invasive species management plan as part of the BMP operationalization, and the activities to compensate for losses to floodplain and juniper woodland habitats, ensuring No Net Loss for these habitats.

Alternatives to the Rogun HPP, including different dam heights and other technical considerations, were thoroughly assessed as part of the 2014 TEAS and updated in the context of the financing options study. Three different dam heights were assessed, and the Government of Tajikistan found the highest dam alternative preferable based on its superior economic and environmental performance. Updated analysis performed in 2024 confirmed that the Rogun HPP remains the least-cost solution for providing clean and affordable base load electricity, supporting the region's transition to a low-carbon future. It is important to recognize that the Rogun HPP provides affordable baseload energy at scale which will enable the absorption of larger quantities of intermittent renewable energy such as wind and solar in Tajikistan and, specially, in Kazakhstan and Uzbekistan.

Further stakeholder consultations are expected to operationalize the no-net-loss plan, pursuant to the BMP. The no-net-loss framework will seek agreement on the most

appropriate plan that meets the concept of like-for-like or better for natural habitat. The adoption of the BMP is a condition of disbursement.

The updated ESMP includes the following expanded frameworks:

- Air Quality Management Plan Framework
- Asbestos Management Plan Framework
- Blasting and Explosives Management Plan Framework
- Erosion Management Plan Framework
- Excavation Spoil and Fill Storage Management Plan Framework
- Hazardous Materials Management Plan Framework
- Noise and Vibration Management Plan Framework
- Retrenchment Management Plan Framework
- Site Management Plan Framework
- Wastewater Management Plan Framework
- Worker Accommodation Management Plan Framework

These frameworks will be the basis for the contractor’s construction management plans.

For the Biodiversity Management Plan, the following monitoring program will be implemented:

<b>Monitoring Action</b>	<b>Frequency</b>	<b>Key Metrics</b>	<b>Adaptive Management Options</b>
Monitoring of translocated flora	Years 1, 2, 3 & 5	Successful establishment of the translocated plants after 5 years	Planting of nursery-propagated seedlings.
Monitoring of identified invasive species presence and identification of new stands	Annually throughout ongoing construction and until reservoir at FSL. Surveys should be completed during growing season for Bathurst burr (i.e. September).	No further spread of invasive species, or new occurrence outside the current extent of these species	Targeted and specialist invasive species management such as removal and treatment of remaining stands.

<b>Monitoring Action</b>	<b>Frequency</b>	<b>Key Metrics</b>	<b>Adaptive Management Options</b>
Monitoring of translocated bats (to current or new artificial roost sites) – as required	Years 1, 2 & 3	Successful/continued use of the new roost sites by translocated bats. Artificial roosts in good state of repair	Provision of new roost sites if it is decided that the artificial roosts provided have become damaged, or otherwise unsuitable.
Aquatic ecology monitoring	Initially in years 1 and 2. Collection of eDNA samples every 5 years until FSL. Comprehensive sampling in Rogun and Nurek 2 – 3 years after the reservoir reaches 1290m asl. As needed, stock assessments to inform any management objectives related to the fishery.	Community composition.	Once FSL has been reached, monitoring approach and techniques should be adapted for stock assessment. If eDNA data does not show any trends, frequency to be reduced.

During the regular meetings that the World Bank holds with the International CSOs, we will continue to discuss, among other things, the current project status, the findings of the monitoring program, and any unresolved concerns that the stakeholders may have. Any gaps identified would be communicated to and discussed with, the Project Management Group and the Environmental and Social Independent Panel of Experts.

## Detailed Responses to Comments in the Note's Summary

No.	Comment	Response
<b>Limitations According to the Note</b>		
1.	<p><i>The habitat assessment relies heavily on broad categories (e.g., "pasture/degraded grassland") that obscure the value of smaller important habitats and does not meet basic requirements of the ESS6 or the EIB's standards. Many endangered and endemic species which may trigger critical habitat threshold and, in any case, require mitigation measures are discarded from proper assessment based on insufficient and inaccurate information (e.g. Amu Darya trout, Turkestan catfish, Eurasian Otter, Egyptian Vulture, etc.) As a result, the impacts on at least 6000 hectares of natural habitats to be degraded by reservoir inundation are not included into the NNL framework. Suggested mitigation measures are insufficient and inefficient.</i></p>	<p>The Critical Habitat Assessment carried out as a part of the 2023 and 2025 project ESIA has addressed the cited species (the Amu Darya trout, Turkestan catfish, Egyptian vulture, Eurasian Otter, etc.) <i>The team did not</i> identify any areas within the AoI showing evidence of critical habitats or presence of any threatened, rare or endangered species.</p>
2.	<p><b>Narrow and Inconsistent Application of ESS6:</b> <i>The ESS6 framework is applied almost exclusively to two terrestrial habitat types occupying less than 2% of the inundation zone. The Vakhsh River itself, a vast aquatic ecosystem to be fundamentally altered, is explicitly not classified as a Natural Habitat and is thus excluded from the comprehensive mitigation and offsetting requirements of ESS6. This represents a critical inconsistency in the application of the standard.</i></p>	<p>A large portion of Vakhsh river, particularly downstream of the Rogun Dam, has been heavily modified over the decades as a result of the cascade of HPPs that have been in operation for over 40 years and has been fundamentally altered already ecologically and hydrologically. The ESIA has confirmed that only small areas of the Vakhsh River that will be affected by Rogun are natural habitat, and these areas do not meet the defined criteria to be characterized as a critical habitat. Rogun HPP biodiversity impacts were assessed as part of the 2025 project-level ESIA's AoI. The 2025 ESIA has identified, evaluated and addressed the potential impact of converting the riverine environment within the inundation area to a lacustrine environment. Accordingly, a no net-loss plan was prepared and will be operationalized as a condition of disbursement.</p>

No.	Comment	Response
3.	<p><b>Dismissal of Ecological Impacts Based on Non-Ecological Arguments:</b> <i>The TCIA and ESIA Vol. 1 repeatedly assert that the project will have no negative downstream impacts on biodiversity below the Vakhsh hydropower cascade. This conclusion is based on a vague political commitment to adhere to existing water allocation agreements, which is not supported by any feasibility analysis. Consequently, the ESIA does not document the baseline conditions of the most valuable ecosystems of the Lower Vakhsh (e.g. Tigrovaya Balka World Heritage site) and fails to assess potential biodiversity impacts from different possible water regulation regimes and periods of climatic and hydrological extremes. Such an argument ignores the profound ecological consequences of water and sediment flow, and water temperature altered by the large hydropower cascade in which the Rogun HPP will become the main regulator, extending the recurring impacts by at least 60 years. This is inconsistent with the precautionary and science-based approach required by ESS6. Similar politicized arguments are used to dismiss a need to assess impacts of reservoir filling on the Ramsar wetlands of the Amu Darya Delta.</i></p>	<p>Tajikistan respects the international water sharing agreements: the Rogun HPP will not use more than 1.2 bcm during the reservoir filling stage. Tajikistan also will maintain the 4.2 bcm summer to winter shifts as it has done for the Nurek HPP. This commitment is reflected in project legal covenants associated with both aspects.</p> <p>Consequently, the main aquatic impacts from the Rogun HPP are anticipated in the 15-km stretch of the Vakhsh river between the Rogun and Nurek HPPs (the 2 hydro power plants are 70 km apart, but 55 km of that is taken up by the Nurek reservoir). No significant ecological impacts are anticipated downstream of the Nurek HPP since the current water flow regime will remain largely unchanged consistent with the historical flows for last several decades. Accordingly, the ESIA assesses that the adverse environmental impact due to Rogun dam will be insignificant on Tigrovaya Balka nature reserve, which is downstream of the Nurek HPP. This is also consistent with the findings of the CIA.</p>
4.	<p><b>Fragmented Impact Accounting:</b> <i>Not only downstream impacts are omitted. Impacts from associated facilities (resettlement sites, quarries, new roads) are acknowledged, but their biodiversity footprint is not quantified or integrated into the core biodiversity impact assessment or the compensation framework of the NNLP. The impact assessment focuses on direct impacts of inundation and road construction but largely omits indirect and cumulative impacts in areas surrounding the future reservoir.</i></p>	<p>The CIA concluded that there are no significant cumulative effects downstream of Nurek that will be caused by Rogun and therefore no mitigation measures are required for the projects that were already constructed on the Vakhsh Cascade. For projects that meet the criteria of associated facilities, however, as per paragraphs 10 and 11 in the World Bank Environmental and Social Policy for Investment Project Financing, an ex-post audit will be carried out as referred to in the ESCP.</p>

No.	Comment	Response
	<i>These omissions are significant gaps under ESS6, which requires assessment of all project-related impacts.</i>	
5.	<i>This ESIA applies the requirements of ESS6 to a small, pre-selected subset of impacts while failing to apply its principles consistently across the full scope of the project's ecological footprint. The result is an assessment that underestimates the project's true biodiversity risk and fails to propose adequate mitigation for its most significant impacts, particularly on the freshwater ecosystems.</i>	Freshwater ecosystems, as explained above, and as explained in the previous responses above, were duly assessed. The project Aol has already been extended to include the entire Amu Darya basin in the CIA, with the Vakhsh catchment and the area downstream of the Pyanj-Vakhsh confluence, i.e., the Amu Darya, as the central parts. The CIA also extends the Valued Components (VCs) to include the following wider biodiversity receptors: the Aral Sea, fish migrations, and floodplain habitats, including Tigrovaya Balka.
No.	Comments	Response
<b>Summary of Proposed Actions by Rogun Alert Coalition</b>		
6.	<b>Re-evaluate the Area of Influence (AOI):</b> <i>Revise the AOI for biodiversity assessments to be ecologically meaningful and receptor-specific. The downstream aquatic AOI for operation period must extend to at least the Panj confluence, while for filling period it must include Amu Darya Delta wetlands. Terrestrial and freshwater AOIs must be based on the ecology of indicator species (e.g., home ranges) rather than arbitrary buffers.</i>	The Aol was identified recognizing that Rogun HPP will not have significant impact downstream of Nurek. The impacts are likely to be confined to the 15 km stretch of river downstream of Rogun HPP and is not expected to contribute to adverse impacts on downstream ecosystems, such as the Amu Darya Delta, in addition to those already in place as a result of the Nurek and the cascade downstream.
7.	<b>Strengthen Baseline Data:</b> <i>Conduct detailed baseline biodiversity study of the ecosystems of Lower Vakhsh River with specific attention to World Heritage site and endangered aquatic fauna. Conduct and integrate full biodiversity baseline and impact assessments for all resettlement areas, quarries, and material extraction sites. For the whole Aol commission supplementary, targeted, multi-season baseline surveys to fill data gaps, particularly for bats, otter, invertebrates, fish populations (quantitative data), and river-dependent</i>	Baseline data collection will be further strengthened through a monitoring program as part of the ESMP update and BMP operationalization. It is important to note that as part of ESIA, the aquatic assessment in the Aol and VCs, supported by eDNA, revealed absence of endangered endemic species. Furthermore, as noted earlier, the ecological impacts on Tigrovaya Balka occurred as a result of the Nurek HPP and no additional impacts are expected from Rogun HPP. Updates of Mitigation measures related to soil and land cover in resettlement areas are provided in the ESIA. The second phase

No.	Comment	Response
	<p><i>species. These surveys must aim to establish population baselines, not just presence/absence. Carry out targeted surveys for the Central Asian Otter, Amu Darya Trout (Salmo oxianus), Turkestan Catfish, and endangered raptors to determine if they trigger Critical Habitat or Priority Biodiversity Feature thresholds.</i></p>	<p>Resettlement Action Plan (RAP 2) and Livelihood Restoration Plan (LRP 2) updates will include, where relevant, additional details regarding the project affected persons (PAPs) access to other natural and cultural resources in the resettlement areas.</p>
8.	<p><b>Refine Habitat Mapping and Classification:</b> <i>Conduct a finer-scale habitat mapping exercise that identifies, maps, and assesses specific habitat sub-types of ecological importance (e.g., different grassland communities, riparian scrub, gorges, cliffs, ravines). Re-classify the Vakhsh River within the main impoundment zone and most of its floodplain as a Natural Habitat under ESS6, recognizing that the project will fundamentally and permanently alter its primary ecological functions and composition.</i></p>	<p>Baseline data in the impoundment zone will be further strengthened through a monitoring program as part of ESMP and BMP operationalization to provide finer scale mapping/identification and assessment of aquatic habitats.</p>
9.	<p><b>Conduct Comprehensive Downstream Impact Studies:</b> <i>Assess impacts of the 16-year reservoir filling period on the Amu Darya Delta including the Ramsar wetlands. Perform a dedicated study on the impacts on biodiversity of altered flow, thermal regimes, and sediment starvation on the Lower Vakhsh River aquatic life and floodplain ecosystems, considering different operation regimes of the Rogun HPP, recurring nature and cumulative temporal impacts during its 100-year service. Conduct World Heritage Impact Assessment as required by the World Heritage Convention rules and present its draft results to UNESCO for review.</i></p>	<p>Please refer to Chapter 15 of Volume A, Annex 13.3 in Volume 2 of the ESIA, the CIA for consideration of the reservoir filling modeling and impacts. There should be no change in the flow regime downstream of the Nurek HPP. Other than the Tugay site in Tigrovaya Balka, which was discussed above and is not expected to be affected by the Rogun HPP, there are no RAMSAR sites within 50 Km of the Rogun HPP that could be impacted by the project.</p> <p>The Cultural Heritage Management Plan includes measures to record tangible and intangible cultural heritage and ensure that PAPs and local communities can participate in discussions on preserving such heritage and developing cultural centers or opportunities for commercial development of such heritage.</p>

No.	Comment	Response
10.	<p><b>Strengthen the Mitigation Hierarchy Framework:</b> Provide a transparent and robust justification that explicitly demonstrates how biodiversity impacts were considered in project design (e.g., dam height). Systematically document the application of the "avoid-minimize-restore-offset" hierarchy for all identified impacts, especially for freshwater ecosystems, to demonstrate that all preceding steps have been exhausted before accepting an impact as a residual one.</p>	<p>In the 2025 ESIA Vol.1, Chapter 4 presents the alternatives considered for the Rogun HPP, including different dam heights and other renewable technologies, that were thoroughly assessed as part of the 2014 TEAS and updated in the context of the financing options study. Three different dam heights were assessed, and the Government of Tajikistan found the highest dam alternative preferable based on its superior economic and environmental performance. The 2024 ESIA confirmed that the Rogun HPP remains the least-cost solution considering anticipated environment and social risks and impacts, for providing clean and affordable base load electricity, supporting the region's transition to a low-carbon future. It is important to recognize that Rogun HPP provides affordable baseload energy at scale, which will enable the absorption of larger quantities of intermittent renewable energy such as wind and solar in Tajikistan and, especially, in Kazakhstan and Uzbekistan. Furthermore, the selected height improves the structural sustainability of the Nurek HPP (refer to Chapter 15) by reducing sedimentation rates and providing enhanced flood protection downstream (thus providing enhanced protection to Tajikistan and riparian countries from increased flood risks resulting from climate change impacts).</p>
11.	<p><b>Improve Legal Agreements to Avoid Impacts:</b> Assess effectiveness and long-term viability of existing water-sharing agreements and institutions to design and adopt additional improved legal and monitoring mechanisms to safeguard biodiversity during Rogun reservoir filling and hydropower cascade operation.</p>	<p>There is already a water-sharing agreement between the riparian countries, except for Afghanistan, which also included a scheme for water saving and protection measures, aimed at optimizing the use of water resources (Protocol No. 566 ICWC/BVO). In accordance with the water-sharing agreements, the Rogun HPP will not increase its use more than the 1.2 bcm that it has historically not used during the reservoir filling stage. Furthermore, Tajikistan will maintain the 4.2 bcm summer to winter shifts as it has been doing under Nurek. There are legal covenants associated with both of these aspects.</p>

No.	Comment	Response
12.	<b>Manage Reservoir Filling:</b> <i>Develop a specific plan to minimize ecological shock to the Amu Darya Delta during the 16-year filling period, ensuring strict adherence to environmental flow requirements for downstream wetlands.</i>	Please see responses 3 and 5 above.
13.	<b>Expand the No Net Loss Plan:</b> <i>Based on the re-classification, develop a specific compensation strategy within the NNLP for the irreversible loss of over 170 km of lotic (riverine) habitat and its associated biodiversity, pursuing a "like-for-like or better" offset.</i>	See response under comment 2
14.	<b>Include Technical Minimization Measures:</b> <i>Installation of fish-friendly turbines and/or behavioral barriers, design of multi-level outlets in Rogun dam for mimicking natural thermal regimes essential for aquatic life cycles. Application of robust collision risk modelling for new power lines and implement underground or bird diverters in high- risk zones for migratory birds and raptors.</i>	<p>The ESIA did not indicate any evidence of fish migration in the Vakhsh river around the Rogun HPP project site, due to construction and operation of the Nurek HPP. Therefore, fish-friendly turbines would not be of material benefit.</p> <p>On the collision risks of birds with Transmission lines, the ESIA did not identify any adverse risks to local or migrating birds in the project's AoI, considering the Vakhsh river valley's topographical relevance. No barrier effects are predicted given the heights at which birds are known to fly (i.e., generally above 1,500m), especially within mountainous regions, where studies have shown birds migrating above 6,500m, and for long distances above 3,500m.</p>
15.	<b>Develop a Robust Environmental Flow (E-flow) Regime</b> <i>based on the biological requirements of aquatic species and floodplain ecosystems of areas downstream of Vakhsh Cascade and prioritize release of artificial floods for Tigrovaya Balka. Incorporate the e-flow requirements into Operation Rules for Rogun HPP/Vakhsh Cascade and Management plan for the World Heritage.</i>	Please refer to the 2025 ESIA, Chapter 15 in Volume 1, Biodiversity; Annex 13.1 in Volume 2, Minimum Environmental Flows; Annex 13.3 in Volume 2, Water Resources Modeling; the CIA; and the explanation in response 7 on Tigrovaya Balka for explanation. The Operation Rules for the Vakhsh cascade will be developed during project implementation and aspects such as the role of different reservoir operations to mimic natural floods for ecosystem health will be taken into account during the development of that work.

No.	Comment	Response
16.	<p><b>Implement "Like-for-Like or Better" Offsets:</b>  <i>Implement "Like-for-Like or Better" Offsets: To compensate for the fragmentation and loss of the Vakhsh River, designate and legally protect the Panj River (and adjacent Upper Amu Darya reaches) as a "free-flowing river," protecting it in perpetuity from future damming or diversion.</i></p>	Please refer to comments under comment 2 above
17.	<p><b>Restore Ecosystem Services for Communities:</b>  <i>Implement restoration programs at resettlement sites to compensate for the loss of access to natural resources (pastures, water, wild plants). Develop and implement ecosystem conservation and restoration plan for the Upper Vakhsh subbasin to improve natural ecosystem resilience.</i></p>	<p>Volume 1 Chapter 16 of the 2025 ESIA assesses the potential impact of Rogun HPP on ecosystem services. This informed the second phase Resettlement Action Plan (RAP 2) and Livelihood Restoration Plan (LRP 2), which include measures to provide pastures and water to project-affected persons (PAPs). Based on consultations with the PAPs, the RAP and LRP also include measures for PAPs to use other natural resources, such as hay or timber. In addition, the Cultural Heritage Management Plan includes measures to record tangible and intangible cultural heritage and ensure that PAPs and local communities can participate in discussions on preserving such heritage and developing cultural centers or opportunities for commercial development of such heritage. The RAP 2 and LRP 2 updates will include, where relevant, additional details regarding the PAPs' access to other natural and cultural resources in the resettlement areas. In addition, a benefit sharing program is being developed for the project to support the PAPs and communities near the dam site and beyond. One of the issues raised in consultations on livelihood restoration around the reservoir is opportunities to support conservation and restoration of natural resources, including ecosystems and biodiversity. This is being developed further through the World Bank-financed Social and Economic Resilience Support project (SERSP).</p>
18.	<p><b>Integrate Findings Across Documents:</b> <i>Ensure that findings, impacts, and commitments are</i></p>	The environmental and social assessments are consistent across the various ESIA chapters and Annexes. However, this

No.	Comment	Response
	<i>consistent and fully integrated across all volumes of the ESIA, ESMP, CHA, NNLP, BMP and TCIA to form a single, coherent assessment.</i>	aspect will be examined again as data are collected and the adaptive management program is implemented, drawing on the input received from stakeholders.

## Responses to Comments in the Main Report

No.	Comment	Response
19.	<i>The area of impact considered in the documentation is largely confined to the area of the future reservoir and a 100-500 meter buffer zone. For the freshwater ecosystem the Aol (Area of influence) also includes lower reaches of tributaries of the future reservoir and a stretch of Vakhsh river downstream of Rogun dam to the Nurek dam wall, only 17 km of which is the remaining riverine habitat and the rest - Nurek reservoir.</i>	As explained above, impacts on the aquatic ecosystem are expected to occur in the reach of the Vakhsh river downstream of the Rogun HPP to the Nurek HPP. Due to the water flow arrangements during filling and operation explained in response 3 above, no significant aquatic impacts are expected downstream of the Nurek HPP. This is the rationale for selection of the aquatic Aol. Nonetheless, the project Aol was extended in the CIA to include the entire Amu Darya basin, with the Vakhsh catchment and the area downstream of the Pyanj-Vakhsh confluence, i.e. the Amu Darya, as the central parts. The CIA extends the VCs to include the following wider biodiversity receptors: the Aral Sea, fish migrations, and floodplain habitats, including Tigrovaya Balka.
20.	<i>Impacts on Aquatic Biodiversity: According to the ESIA the dam will create an insurmountable barrier to fish migration, further fragmenting the Vakhsh River ecosystem, which has already been impacted by the downstream Nurek dam. The ESIA notes that "long-range fish migrations...have already been interrupted" by other hydropower dams of the cascade downstream and that the Rogun dam will exacerbate this. Entrainment and impingement of fish in the turbines are also identified as impacts during both construction and operation.</i>	The assessment for the 2025 ESIA noted that long-distance migration was permanently interrupted by Nurek, and did not find evidence that shorter-distance migration may have continued to occur upstream, although there could be some species that migrate into major tributaries for spawning. As noted in the ESIA, the fish species in Nurek changed significantly over time, as is likely to occur in the Rogun reservoir. Thus, if there is short-distance migration, that would likely resume as the Rogun reservoir matures and the fish population stabilizes (as it has taken decades to do in Nurek). Baseline data will be further strengthened through a monitoring program as part of the ESMP and BMP operationalization.
21.	<i>Habitat Loss and Degradation: The Project will result in the permanent and irreversible loss of terrestrial habitats within the flooding zone (its covers at least 16500 ha). The ESIA specifically identifies the loss of Natural Habitats as defined by ESS6, including approximately 77 ha of floodplain habitat and 185 ha</i>	Agreed. The no net-loss framework and Biodiversity Management Plan address mitigation measures for the stated loss of terrestrial habitats.

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	<i>of juniper woodland (Volume 3, No Net Loss Framework, p. 7).</i>	
22.	<i>The assessment points to potential total loss within the Aol of the Tajik Red Data Book (TRB) Critically Endangered plant species Vitex agnus-castus, for which the impact is assessed as major (significant).</i>	The IUCN status of <i>Vitex agnus-castus</i> is “Data Deficient Unknown,” although despite being listed as Endangered (EN) within the TRB, it was classified as Least Concern (LC) in Nowak & Nobis (2020), <sup>1</sup> and has a mapped distribution across Tajikistan. It is only sparsely recorded per the literature review, with a single small population recorded during 2023 surveys. Given its relatively large size and conspicuous nature, it is considered likely to be absent across much of the Aol, with those present comprising widely scattered individual plants/small groups of plants whose loss would not affect the wider species population.
23.	<i>The assessment predicts direct mortality and displacement of fauna due to habitat clearance and inundation. Special attention is given to several species listed in the Red Book of Tajikistan (TRB), though the ESIA concludes that no Critical Habitat (as defined by ESS6) will be affected by the Project. The assessment of impacts on fauna appears to conclude that most effects will be minor or negligible, on the basis that sensitive species will be "readily displaced" to other habitats (ESIA, Vol.1, para 15.6.16 and 15.6.19). (Our comment: This assumption may be overly optimistic and not valid without a more detailed analysis of the carrying capacity, the adjacent populations and the existing pressures in adjacent habitats.) Chapter 15 (Biodiversity) states that “the cumulative impact assessment concluded that Rogun may have added to a small extent to a further reduction in short-range fish migration from Nurek</i>	See response to comment 2

<sup>1</sup> Nowak, A. & Nobis, M. (eds.) (2020). Illustrated Flora of Tajikistan and adjacent areas 2: 367-766. PAN, Polish Academy of Sciences.

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	<i>reservoir upstream” (an assumption not supported by any research or monitoring data).</i>	
24.	<i>The Transboundary Cumulative Impact Assessment Annexes (TCIA, Volume 1, Chapter 23) broadens the geographic scope significantly, focusing primarily on hydrological changes and their effects on downstream riparian countries and ecosystems, such as Tigrovaya Balka World Heritage site. Its central argument is that the re-operation of the Vakhsh cascade, with Rogun HPP in place, will not alter the seasonal water distribution downstream of Nurek dam, and therefore, cumulative impacts on downstream biodiversity are considered negligible.</i>	This is correct.
25.	<i>The ESIA concludes that "No transboundary effects upon terrestrial biodiversity have been identified" and that impacts on aquatic biodiversity will be absent or very limited. This conclusion appears to be based on the commitment of the Government of Tajikistan to operate Rogun HPP in a way that does not alter the seasonal flow pattern downstream of the Nurek dam (similar commitments previously made by other governments and companies, without turning those in a firm legal agreement/regulation enforceable by international bodies, have been violated soon after the projects were built as in cases of Bujagali Hydro offsets in Uganda or Ulog HPP in Bosnia-Herzegovina. But in the case of Tajikistan the alleged “commitment” has no enforcement mechanism or any relation to biodiversity considerations).</i>	See response to comments 3 and 11
26.	<i>The primary mitigation measure for the loss of Natural Habitats is a No Net Loss Project Framework (NNLP) (Volume 3 document). Key elements of this framework include:</i>	This is correct.

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	<p><i>Applying an area-based 3:1 compensation multiplier to account for uncertainty and delivery risks, aiming at a total restoration requirement of 555 ha of juniper woodland and 231 ha of floodplain (NNLP, p. 15). Prioritizing like-for-like or like-for-better habitat restoration, with a focus on "Restoration and protection of juniper woodland" and "Restoration and protection of native riparian woodland" (NNLP, p. 5). Developing a long list of potential restoration sites in collaboration with the State Forestry Agency (SFA), totalling 7,599 ha, to demonstrate that suitable areas can be secured.</i></p> <p><i>Describing a tentative timeline for a "Phase-2" of the NNL project dedicated to planning and restoration efforts at specific sites, which are yet to be selected. This further planning and implementation process is aimed at producing and implementing a "NNL Plan" by end-2030 (the date of dam completion) as described in a very general way in the Biodiversity Management Plan. For sensitive flora, the primary mitigation measure proposed is translocation of affected plants in advance of clearance activities. The ESIA commendably acknowledges that this intervention has an "inherently variable success rate" (ESIA, Vol.1. para 15.6.36). The <b>Biodiversity Management Plan (BMP)</b> is a brief 40 page document (44 pages), the first half of which is largely repeating information from other biodiversity-related chapters with significant unjustified variations from the original sources. Beyond repetition of the No Net Loss Framework NNLF action points, it includes the following measures:</i></p> <ul style="list-style-type: none"> <li><i>• Development of a "Biodiversity Conservation Tracker" to identify biodiversity issues during project</i></li> </ul>	

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	<p><i>implementation, plan and implement biodiversity mitigation “on the go”.</i></p> <ul style="list-style-type: none"> <li>• <i>Hiring a single botanist (in 2025) to be responsible for identifying rare plants and suitable places for their translocation as well as identifying invasive species in the inundation zone.</i></li> <li>• <i>Hiring a herpetologist to undertake ad-hoc relocation of reptiles in advance of clearance activities in 2025-26</i></li> <li>• <i>Hiring a bat-mammal specialist to identify location with presence of bats, acquire artificial bat-roosts on-line, remove bats prior to construction works and clearance, etc.</i></li> <li>• <i>Maintain good practice: 1) biodiversity precaution measures during construction; 2) competing pre-clearance checks; 3) avoiding clearance in nesting season; 4) Deliver “toolbox-talks” to project workers.</i></li> <li>• <i>Developing and implementing “Invasive species management plan” with main focus on a single species Xanthium_spinosum.</i></li> <li>• <i>Manage biodiversity risks with new project infrastructure outside of inundation zone (no further detail provided)</i></li> <li>• <i>Inform planting plants both for landscaping and soil stabilization (should be implemented in the Site Rehabilitation Plan -which is absent from ESIA documentation)</i></li> </ul> <p><i>The BMP also has a monitoring section, which proposes to develop an “aquatic ecology monitoring program” (para 4.2.8 - 4.2.9.) geared towards understanding the new reservoir fishery and tracking</i></p>	

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	<i>changes, rather than mitigating impacts on the original riverine biodiversity.</i>	
27.	<p><i>According to that ToR “Among the major environmental and social issues identified in the (2014) ESIA and RPF were impacts on downstream riparian countries from filling of the reservoir and operation of the HPP,...impacts on aquatic biodiversity, impacts on natural habitats in the future reservoir area, increase in landslides and sedimentation in the reservoir area, etc. Following the disclosure and Tajikistan’s acceptance of the 2014 ESIA, Rogun JSC <b>committed to implementing the mitigation measures specified in the 2014 ESMP and to meeting international environmental and social standards during construction and operation.”</b></i></p> <p><i>In 2021, the World Bank reviewed the ongoing construction to evaluate the adequacy of the mitigation measures in the ESMP but has not released publicly the result of that assessment. the 2024 CSO comments on the Rogun ESIA pointed to lack of implementation of numerous agreed essential monitoring programs and other ESMP commitments (e.g. not implemented feasibility study on artificial floods) Cessation of monitoring and information analysis after 2014 was one of reasons why the 2023 draft ESIA contained no reliable basin-specific up-to-date information on climate change, hydrology, sedimentation, etc. The Terms of Reference of the “ESIA Update” (which is a very questionable approach given immense time lapse) only partially addressed this problem, which then caused the project to order five new studies to account for the changes in the natural conditions after the draft ESIA was released</i></p>	<p>The 2023 and 2025 ESIA reports, along with the TCIA, focused on updating the 2014 ESIA in terms of missing/outdated data and to reflect the status of construction progress on the ground. A draft version of the ESMP was disclosed on the project’s website on October 11, 2025. All construction contracts are being modified to include the updated requirements that are reflected in the ESMP, which may be updated further as the monitoring program is implemented.</p>

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	<i>and heavily criticized (most of those not finalized yet and results absent in the ESIA).</i>	
28.	<p><i>Even more worrying is our finding that even the limited scope of “updates” prescribed in the 2022 ESIA ToR has not been implemented in full. The following tasks related to biodiversity and habitat dynamics were listed in the 2022 ESIA TOR but are not found in the 2025</i></p> <p><b><i>ESIA: Feasibility study on artificial floods below the cascade:</i></b> <i>The ESIA has not implemented the ToR consistent request to “assess the feasibility of having Rogun (reservoir) release water in a pattern and amount that at least partially mimics previously naturally occurring floods, which ended with the construction of Nurek HPP” (to ensure viability of Tugai Forests of Tigrovaya Balka World Heritage). The NNL in Volume 3 has a Table 5-3 and a short paragraph refuting this task as “a comprehensive hydrological and feasibility study would be required” and the task “would require significant political will at the highest level” (NNL page 54-57). This means that the project proponents refused to implement this most crucial study based on assumptions that it is too complicated and time- consuming.</i></p>	<p>Please refer to the response to comment 3.</p> <p>It is not accurate to say there was a “refusal” to implement due to concerns about complexity or effort. While such a study was indeed suggested in the 2014 ESIA and initially called for in the 2022 TOR for the update (and then discussed in the NNLF), it was determined that Rogun will not affect the downstream flows and thus will have no effect on Tigrovaya Balka.</p>
29.	<i>Fish Stock, Habitat, and Fisheries Study and Plan (as described in the 2014 ESIA and ESMP) -- Absent from documentation, the BMP contains a vague wish to develop a very limited aquatic monitoring program.</i>	Baseline data will be further strengthened through a monitoring program as part of ESMP and BMP operationalization.
30.	<i>Watershed Management Plan (“with the intent of reducing erosion upstream of the dam in the watershed basin that drains to the reservoir area, ... developing improved habitat, revegetating barren erosion features with native species...”)-- Absent from</i>	Rather than a full watershed plan, the updated ESMP includes a site-wide erosion management framework, which will be used by the contractors to develop their respective erosion management plans. See also the response to the following comment.

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	<i>documentation, while the term “watershed management” mentioned once in the ESMP as a possible planning task during the reservoir operation phase.</i>	
31.	<i>“Equivalent to an Integrated Water Resources Management Plan .... The Plan should evaluate and include appropriate mitigation of significant impacts on river flows, quality, and morphology at the scale of the basin in order to protect ecological flows and water users.” - Absent from the ESIA documentation</i>	The ESIA includes Annex 13.1 on Minimum Environmental Flows, and Annex 13.3 on Water Resources Modeling. Also kindly refer to previous comments regarding the maintenance of historical seasonal flow regimes below the cascade. In order to minimize hydrological risks, the Ministry of Energy and Water Resources is developing Vakhsh River Basin Management Plan following integrated water resources management (IWRM) principles.
32.	<i>“Assessment of transboundary impacts that would result from changes in river flow that would result from operation of Rogun HPP”. This task was substituted with a superficial TCIA (Transboundary Cumulative Impact Assessment). The TCIA largely denies any such impacts based on political arguments, and without any baseline survey or detailed assessment studies.</i>	The TCIA is considered a robust assessment and is based on data and scientific analysis. The conclusion is based on hydrological arguments that assume continued adherence to the international agreements, which as noted is a condition in the financing agreement.
33.	<i>Evaluation whether “environmental flow rate established in the ESIA is sufficient to maintain aquatic biodiversity and to support downstream uses in Tajikistan and riparian countries”. E-flow study is substandard, confined to a short 15-km stretch between Rogun dam and Nurek reservoir. It does not properly consider aquatic biodiversity requirements, nor potential impacts in riparian countries.</i>	The E-flow study covered the 15 km between Rogun dam and Nurek reservoir because this is the only stretch in which the Rogun dam will have control over river flows and thus impacts. Beyond Nurek, the flow regime would continue to be aligned to meet the requirement of operating the existing Vakhsh cascade ending at Golovnaya HPP.
34.	<i>However, where appropriate, additional monitoring could be rolled out to supplement crucial missing data and to update the monitoring program in the ESMP and Residual Flow Monitoring Plan, and Vakhsh/Amu Darya Hydrologic Monitoring program, so</i>	Component 4 of the Rogun project includes support for downstream monitoring of flows and water uses; as well as technical assistance for the Tajikistan branch of the Basin Water Organization Amudarya (including Uzbekistan, Tajikistan, and Turkmenistan), which is the entity responsible for enforcing and

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	<p><i>they are consistent with recommendations of the 2014 ESIA and ESMP. - Absent from documentation despite being crucial for assessing biodiversity impacts and habitat dynamics.</i></p>	<p>monitoring water use allocations between the countries and within the countries. Thus, these aspects are well covered and have been central to the project discussions. In addition, as part of the project’s legal covenants, the Ministry of Energy and Water Resources is now publishing its flow and water diversion data on its external website for the public (riparian Afghanistan also has access). The website can be accessed here: <a href="https://www.mewr.tj/?page_id=5923">https://www.mewr.tj/?page_id=5923</a></p> <p>This is an achievement of the Rogun project and its associated efforts to promote water resources cooperation and data sharing in the Amudarya Basin.</p>
35.	<p><i>“Landslide Management and Monitoring system as described in the 2014 ESIA and ESMP”. Volume 3 includes the “Reservoir Landslide Management Plan” section – reduced to generic 10-page outline (Vol 3. Section 36, pp 169-178). It is not specific to Rogun HPP project circumstances, but just briefly lists a generic approach to landslide management planning. Here or in the BMP there we found no discussion on mitigating landslide impacts on natural habitats, species and ecosystem processes. The plan does not have a specific budget, while the overall ESMP generalized budget allocates to its implementation just USD 0.5 million clearly insufficient for any engineering works or real-time monitoring system development.</i></p>	<p>The landslide management plan is a framework to be updated periodically, and in the first instance after ongoing studies are completed, before the reservoir water level is raised. These studies will cover communities, infrastructure, and sensitive environmental receptors, as briefly mentioned on page 177. The eventual significance of the impact on any identified receptors/ from any large event will be assessed once the report is available and corresponding mitigation measures consistent with requirements of the BMP will be undertaken.</p>

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36.	<p><b>Objective 1: Protect and conserve biodiversity and habitats.</b> This objective [of ESS6] is only partially fulfilled. The ESIA identifies less than 2% of reservoir inundated area as terrestrial Natural Habitats, representing juniper woodland (185 ha) and floodplain (77 ha) and commits to compensating for their unavoidable loss through a No Net Loss Plan (NNL). (However, the actual plan is yet to be developed in “Phase-2” in the future). The ESIA fundamentally fails to protect the biodiversity of the Vakhsh River itself. By not classifying the river as a Natural Habitat (or Critical Habitat), the ESIA avoids the requirement to mitigate or offset the project's single largest ecological impact: the permanent transformation of over 170 km of a lotic (river) ecosystem into a lentic (lake) one. For example these natural river [sic] at around 1100 masl:</p>	<p>The assessment determined that the areas of the Vakhsh River affected by the project do not qualify as critical habitat. Two limited areas were identified as natural habitat, particularly juniper woodland and floodplain habitat. Baseline data will be augmented by the monitoring program, which will allow adaptive management as needed.</p>
37.	<p>The ESIA also fails to analyze, assess threats to and design mitigation measures for many endemic and endangered species (e.g. endemic salmonids, sturgeons, etc.) excluding those from the detailed analysis based on biased reasoning not supported by reliable data.</p>	<p>The Small Amu-Darya shovelnose sturgeon species is not known to be present within the Project Aol or upper Vakhsh River, nor does its “possibly extinct” range overlap these areas. (If it previously reached into the Vakhsh, its migration would have ended when Nurek and other HPPs were constructed.) The species is only found in the middle Amu Darya and has disappeared from the Aral Sea and lower Amu Darya (as per Sheraliev. et.al., 2021 and Mogue, 2022)<sup>2</sup>. The species is rheophilic, occurs exclusively in fast-running, turbulent current, turbid waters and was not detected in eDNA samples collected in October 2023.</p> <p>Based on the weight of evidence, <i>Salmo trutta aralensis</i> is considered absent from the Amu Darya drainage as a</p>

<sup>2</sup> Sheraliev B, Rozimov A, Ludwig A, Peng Z. Rediscovery of rare shovelnose sturgeons in the Amu Darya River, Uzbekistan. *Oryx*. 2021;55(3):332-332. doi:10.1017/S0030605321000211

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		<p>consequence of the disappearance of the Aral Sea and habitat alterations (overfishing, damming and channel management, extraction of water for irrigation, and water pollution). Therefore, no Critical Habitat for <i>Salmo trutta aralensis</i> has been identified within the Project Ecologically Appropriate Area of Analysis (EAAA).</p>
38.	<p><b>Objective 2: Apply the mitigation hierarchy.</b> <i>The hierarchy is acknowledged but applied inconsistently and inflexibly. For the most significant impacts, particularly the transformation of the Vakhsh River, the "avoid" and "minimize" steps are not robustly demonstrated, and the "restore" and "offset" steps are entirely absent. The discussion on alternatives, such as a lower dam height, is dismissed primarily on economic grounds without a balanced assessment of the significant biodiversity impacts that could have been avoided). This suggests the <b>hierarchy was used as a justification exercise</b> rather than a guiding principle for project design. This is addressed further in part 4. of the Detailed Analysis.</i></p>	<p>Recognizing that the mitigation hierarchy couldn't be followed for the pre-existing cascade, in the case of Rogun HPP, steps to minimize, mitigate, restore, or offset are followed whenever technically and financially feasible. Examples include access control of fauna to the site, air quality measures to prevent habitat degradation, restricting the introduction of non-native fish species, the preparation of an invasive species management plan, as part of the BMP operationalization, and the activities to compensate for losses to floodplain and juniper woodland habitats, ensuring No Net Loss for these habitats.</p>

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39.	<p><b>Objective 3: Promote sustainable management of living natural resources.</b> <i>This objective has not been pursued beyond the&gt;NNLF. Management of biological resources, like fisheries, is not analysed in sufficient detail. To this end, the history of filling and operating Nurek Reservoir shows the absence of consistent effort to sustain stable fisheries in the reservoir or downstream (Vol.1 :15.7.25). The ToR for this ESIA prescribed development of a “Fish Stock, Habitat, and Fisheries Study and Plan” (ToR ESIA, 2022) but those are not mentioned in Vol.1 and have not been disclosed as a part of documentation. Management of grasslands/pastures reduced and reconfigured due to river valley inundation is also left completely out of the scope of assessment.</i></p>	<p>Please refer to the responses above on fish stock, habitat, and fisheries study.</p>

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40.	<p><b>Objective 4: To support livelihoods of local communities through the adoption of practices that integrate conservation needs and development priorities.</b> <i>The assessment of impacts on ecosystem services lacks any site-specific detail, qualitative, and retrospective. While it identifies services like the provision of wild plants and fisheries, the analysis is not fully integrated into the mitigation framework. It is not clear how the quantitative loss of these services for affected communities will be mitigated or compensated beyond general resettlement frameworks, especially for services provided by the riverine ecosystem. Meanwhile the Resettlement Action Plan (RAP-2) presents clear evidence that at resettlement sites project-affected people lack access to water, pastures and many natural resources their traditional livelihoods rely on in the Vakhsh river valley. RAP-2 contains no detailed, credible measures to fully restore or compensate the ecosystem services that local people utilized before resettlement.</i></p>	<p>RAP 2 clearly states that, in addition to household and agricultural land, PAPs wanted pasture lands for grazing, haymaking and timber, and access to water for irrigation and consumption. In some consultations, PAPs mentioned that they do recreational hunting and fishing, and they hoped to be able to continue to do so in the new settlement areas, where permissible and feasible.</p> <p>It is important to clarify that most PAPs have access to water, which is directly piped to their homes and fields. The RAP acknowledges, however, that there are challenges in water supply to some of the PAPs' homes and fields; the government has been working with those communities to resolve those issues. Similarly, in a few cases, provision of pasture lands adjacent to the resettlement communities has been challenging due to geography, and so the government is providing pasture lands further from the communities. The Directorate of the Flooding Zone (DFZ), Project Management Group (PMG), other ministries and the local jamoat authorities are continuously consulting the PAPs on workable solutions to benefit local livelihoods and recreation.</p> <p>Most of the resettlement areas are adjacent to or close to other towns and villages where PAPs can continue to have access to ecosystem services. The point about more granular information on access to ecosystem services and natural resources (e.g. plants for foraging), is well taken, and the updated RAP will include more information on this.</p>
41.	<p><b>Terrestrial:</b> <i>ESIA combines historical data, remote sensing, and targeted 2023 field surveys only at 16 locations. For the two tiny habitats identified as "Natural," a quantitative loss assessment was conducted, and an offset framework focused on</i></p>	<p>Additional data to complement the ESIA will be gathered through the monitoring program as part of the adaptive measures of the ESMP and the operationalization of the BMP.</p>

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	<p>revegetation (NNL) was developed to achieve No Net Loss. While limitations in survey effort are noted (e.g., for bats, grassland types), there is at least some traditional habitat assessment (its diverse flaws will be discussed in other sections). <b>Freshwater:</b> The approach is substantially weaker and heavily constrained</p>	
42.	<p><b>Critically Weak Baseline:</b> The baseline is critically weak due to alleged access constraints and an over-reliance on eDNA methods. There is a lack of robust, quantitative data on fish and invertebrate populations, spawning grounds, and community structure. The baseline assessment, citing dangerous river conditions, relies heavily on Environmental DNA (eDNA) analysis. For the absence of basin-specific DNA libraries, the eDNA also fails to identify many species (Vol.2, para 9.4.69 and 9.4.78). Likely example of that is misidentification of the non-native Common Bleak (<i>Alburnus alburnus</i>), a species, likely, never registered in this river, which is far more likely to be a native <i>Alburnus</i> species, a sample for which was absent in the eDNA library. While, as long as reference libraries are available, eDNA may serve as a valid modern supplement tool for detecting species presence, it provides no quantitative data on population size, structure, health, or habitat use, which is essential for a credible impact assessment.</p>	<p>Baseline data was informed through various resources, including: IBAT Report; 2014 EIA; 2023 desk study; 2023 field survey report – spring; 2023 field survey report – autumn; project ESIA; literature review; e-bird resources; IUCN Red List; and stakeholder consultation with organizations involved in conservation initiatives across Tajikistan. Baseline data on biodiversity will be strengthened through the monitoring program as part of the adaptive measures of the ESMP and the operationalization of the BMP. Internationally experienced biodiversity experts under ESPOE will be consulted along with additional baseline data to inform any further monitoring or analyses.</p>
43.	<p><b>Neglect of Dependent Species:</b> Even for correctly identified species the wrong taxonomic status is reported. For example, it has been established by recent research that the Amu Darya Trout, is a stand-alone valid species of migratory trout endemic to Amu-Darya basin- <i>Salmo oxianus</i> However, the ESIA treats it</p>	<p>Please refer to response 1 above regarding these species.</p>

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	<p><i>as a subspecies of Brown Trout (Salmo trutta oxianus), which downplays its endemism, and does not contain any additional information on current range, status of populations, their migration habits and specific mitigation measures. Meanwhile, because of rampant hydropower dam development on mountain tributaries in Uzbekistan and Kyrgyzstan, the Upper Vakhsh river system may well be the best remaining stronghold for this endemic species. Similar lack of analysis is typical for descriptions of all other fish species.</i></p> <p><i>No systemic characteristic of invertebrates is found in the ESIA.</i></p>	
44.	<p><i>For river-dependent mammals like the Central Asian Eurasian Otter (Lutra lutra seistanica), presence is noted but its population status, habitat use within the AOI, and key feeding/denning areas are not properly analysed. According to the latest review, Eurasian otters are rare in Central Asia and their populations may be declining toward extinction in parts of the region. Eurasian otter is listed in the Red Lists of all adjacent countries “endangered” in China, Uzbekistan, Turkmenistan, Tajikistan, “vulnerable” in Afghanistan<sup>11</sup>. Mitigation measures are essential because of the intended destruction of the large natural habitat of the otter. Due to lack of recent data on the otter in Tajikistan, a nation-wide assessment to determine what % of the overall national otter population may be impacted had to be carried out before making any judgments. The ESIA’s conclusion that the impact is “beneficial” because a greater number of otters will be able to thrive in the fluctuating</i></p>	Please refer to response 1 above regarding these species.

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	<p><i>Rogun reservoir (Volume 1. Biodiversity 15.7.45) seems to be counter-factual and without very detailed scientific justification likely belongs to the domain of science fiction</i></p>	
45.	<p><i>For birds, the ESIA fails to adequately consider specialists that depend on riverine features (e.g., Ibisbill13), and the loss of more than 70km of braided channel, island, and bank habitats is not assessed in terms of its impact on such species. Judging from the ESIA there was not enough effort to find nests, the methodology, effort and season were inappropriate or insufficient.</i></p>	<p>Please refer to response 1 above regarding these species</p>
46.	<p><i>Undescribed Ecosystem Function: The assessment focuses on compilation of species lists but lacks a deep analysis of ecosystem functions, such as nutrient cycling, primary productivity, and the specific habitat requirements (e.g., flow velocity, substrate) for key native species. Assessment of importance of the riverine ecosystem services for humans lacks quantification, while those resettled are dwellers of a Vakhsh river valley.</i></p>	<p>Planned baseline monitoring of biodiversity and ESMP would inform any need for additional studies or mitigation actions necessary to minimize adverse environment or ecological impacts of Rogun HPP.</p>
47.	<p><b>Gaps in the impact analysis:</b></p> <p><b>Focus on Inundation:</b> <i>The analysis focuses on direct habitat loss via inundation but fails to analyze the profound ecological consequences of converting a high-energy, turbid lotic system into a deep, stratified, clear-water lentic system.</i></p> <p><b>Altered Regimes:</b> <i>The impacts of altered thermal regimes ("thermal pollution") and flow patterns on aquatic life between Rogun and Nurek are not adequately assessed for invertebrates and fish</i></p>	<p>Inundation results in two important and different impacts: (i) loss of terrestrial habitats; and (ii) conversion of a stretch of riverine ecosystem into a lake ecosystem. The ESIA acknowledges this impact and the ESIA assesses the riverine-to-lacustrine conversion aspect.</p> <p>The increase to the current levels of thermal pollution has been identified as a risk to fish, relative to the current conditions. As the turbine intake structures are located below the surface,</p>

No.	Comment	Response
	<p><i>spawning cues.</i></p> <p><b>Sediment Blockage:</b> <i>The long-term effects of the complete blockage of sediment transport on downstream channel morphology, habitat complexity, and the Nurek reservoir ecosystem are not analyzed.</i></p> <p><b>Fragmentation and Entrainment:</b> <i>The impact of the Rogun dam as a new barrier to fish migration is understated in cumulative impact assessment (TCIA) and not assessed at all in actual biodiversity assessment (where it should have been addressed in detail14). Meanwhile, this relates to a number species of concern, for example, the Aral salmon (Salmo (trutta) aralensis) was last registered in Nurek Reservoir (TRB 2017) from which it had to migrate in upstream tributaries of Vakhsh</i></p>	<p>cooler water is likely to be released into the river downstream of the power plant (section of river between Rogun and Nurek). This impact has already been realized with the pre-existing turbines but is expected to continue periodically as discharges from Rogun HPP change seasonally. During the low flow winter months, discharge will be higher than the natural flows. During the summer months flows will be reduced as water is stored in the reservoir to maintain the winter flows. The impact will decrease in magnitude as the thermal pollution dissipates into the Nurek Reservoir. The magnitude of this impact for aquatic biodiversity is assessed to be insignificant. The effect of pollutants impacting aquatic biodiversity during operation is considered to be negligible (not significant).</p> <p>Rogun HPP will only shift the existing trapping of sediment from the Nurek HPP reservoir to the Rogun HPP reservoir (i.e., no change in the current situation that sediment doesn't continue downstream).</p> <p>Please refer to the discussion of Salmonid species and response to comment 20 above.</p>

No.	Comment	Response
	<p>for spawning. While Aral salmon may have already disappeared, as it has not been registered by scientists since the 1990s (but its extinction has not been proven yet), this, likely, was a migration route for its closest relative, Amudarya trout, as well as one or several native snow trout (<i>Schizothorax</i>) species. The risk of fish entrainment through turbines is also deemed "minor" based on a weak assumption of low fish diversity in the future reservoir, without quantitative analysis or consideration of mitigation (e.g., fish-friendly turbines, fish barriers repelling devices).</p>	
48.	<p><b>Gaps in Mitigation:</b> Mitigation for freshwater ecosystems is generally vague, relying on unspecified "general good practice environmental management" rather than specific, measurable actions. No such "good practice" specific to dam impacts beyond avoiding pollution is prescribed in the BMP. There are no proposals for using multi-level dam outlets to manage water temperature, or enhancing habitat elsewhere to compensate for lost main-channel habitat. The aquatic ecosystem monitoring program suggested for development in the BMP does not aim to mitigate impacts from reservoir creation, but rather to consider fisheries management conditions in the new water-body.</p>	<p>The conversion of riverine habitats to lacustrine habitats is inherent in most storage type hydropower projects. Nonetheless, in the process of BMP update and operationalization, any additional steps needed will be further considered.</p>
49.	<p><b>No Mitigation for River Loss:</b> The most significant gap is the complete lack of specific mitigation measures, restoration proposals, or offsets for the loss and alteration of the more than 170 kilometers of riverine freshwater ecosystem itself. The ESMP and NNLP are silent on this massive impact. See sections 4.3 and 4.5. for in depth analysis of this gap and suggestions how to fill it.</p>	<p>The impact on the river is limited to the small reach between Rogun HPP and Nurek HPP as explained in response 3. It is not expected to extend downstream of Nurek. Please refer to previous responses on the water releases during Rogun HPP reservoir filling and operation and concerning additional monitoring.</p>

No.	Comment	Response
50.	<p><b>Free-flowing Vakhsh River – Denied the Natural Habitat Status.</b> <i>The ESIA explicitly excludes the Vakhsh River (even within the inundation zone) from the "Natural Habitat" classification and, therefore, from any No Net Loss obligation. Consequently, the ESIA acknowledges the profound ecological transformation of the river by the Rogun HPP Project but proposes no specific mitigation, restoration, or offset for this permanent impact. The existing Rogun dam built around 2016 floods 9 km of the Vakhsh River, whilst the proposed dam at 1290 masl would additionally flood approx. 60 km of the main stem of Vakhsh-Surkhob River and 100-140 km of its tributaries (e.g. Obikhingou river and 40 smaller tributaries).</i></p>	<p>The conversion of the river reach to a reservoir is an inherent and unavoidable impact of Rogun HPP, and any hydropower project. The assessment determined that in view of the pre-existing cascade of 7 HPPs, most stretches of the Vaksh river, particularly within Rogun Aol, are fragmented and modified habitat, and do not meet the threshold of Natural habitat. As noted, the baseline will be augmented by the monitoring program.</p>
51.	<p><i>The ESIA states that "Vakhsh River within the Aol is therefore not considered to be Natural Habitat as per ESS6" (ESIA Vol. 1, Table 15-4 – Receptor Evaluation). The justifications provided for "modified character" of the river is the existing fragmentation from dams, the presence of non-native species, "absence of IUCN-listed invertebrates" (sic!), and past construction activities. Such conclusion is a gross misapplication of the ESS6 definition of "natural habitat" and is inconsistent with that WB standard or the EIB standards. The discussion in the rest of this section will narrowly apply to the river ecosystems affected by the planned inundation and those which are connected to them upstream<sup>15</sup>, while other affected segments of Vakhsh River downstream from Rogun dam not properly analyzed by the ESIA will be discussed in subsequent sections.</i></p>	<p>See responses to comments above concerning impacts downstream of Nurek and natural habitat upstream of Rogun.</p>
52.	<p><b>Vakhsh River Satisfies the Definition of Natural</b></p>	<p>See responses to comment 2 and other related comments</p>

No.	Comment	Response
	<p><b>Habitat:</b> ESS6 defines Natural Habitats as areas where human activity has not “essentially modified” the area's primary ecological functions and species composition. While altered downstream by the Nurek Dam, and lately by the existing small Rogun reservoir (as of 2025 it modifies only 9 km of the river upstream of the Rogun dam), the Vakhsh River in the planned Rogun HPP reservoir inundation area is connected to extensive free-flowing river reaches upstream and still performs the primary ecological functions of a large river (e.g., conveying water, transporting sediment, providing aquatic habitat for an array of typical species). This is what the project will completely and irreversibly transform.</p>	
53.	<p>The Baseline biodiversity assessment is not based on a complete inventory of habitats and even fails to give quantitative characterization and map different types of river habitats. Meanwhile, just the inundation area (at the level 1290 masl) includes up to 90 km of large river channels (Vakhsh, Surkhob, Obikhingou) and 80-120 km of their tributaries fully interconnected with extensive upstream ecosystems and preserving a natural character not affected by any sizable water infrastructure. The EAAA failed to include the whole free-flowing river complex upstream of Rogun, which exceeds 600 km of large rivers (not considering smaller tributaries). In the inundation area those rivers with floodplains occupy more than 4850 hectares (Volume 2, Table 9-3,). As noted in the ESIA's Geomorphology section of the Baseline assessment (Vol 2. para 7.6.7.) braided channels that are free of anthropogenic influences are found along 54 kilometres of the river length, representing a diverse</p>	See responses to comments 2, 3, and other related comments.

No.	Comment	Response
	<p><i>valuable riverine habitat. At the same time, this subbasin upstream the Nurek/Rogun dams represents the second-largest unmodified natural mountain river complex in Amu-Darya River basin after the Panj River. The area to be inundated represents the downstream part of the Upper Vakhsh river complex which, following the general pattern of all mountain rivers, most likely, has significantly higher freshwater biodiversity value than the upstream reaches. None of these important facts is properly discussed in the ESIA.</i></p>	
54.	<p><i>The ESIA claims about interruption of long migration of native fish by Vakhsh Hydropower Cascade located 70 km downstream are potentially relevant only for 1-3 species inhabiting lower reaches of Panj and Vakhsh and capable of long-range migration (we found relevant evidence only for the Aral salmon), but cannot justify the characterization of the upstream habitat as “not natural”. Regrettably, the ESIA does not present any review of ichthyological studies for this area apart from the project surveys, therefore even the claim about interrupted migration is unsubstantiated. The ESIA also makes a completely scientifically unjustified claim that naturally turbid waters of Vakhsh make it less valuable as a natural habitat, completely ignoring the fact that sediment transfer is a natural ecosystem process to which local biota has been adapting for millennia</i></p>	<p>The ESIA determined that there are no species with long term migration. Furthermore, the quality and “naturalness” and biodiversity/ecological value of the Vakhsh River as a whole, aside from the aspect of long distance fish migration, were addressed in the ESIA. The baseline will be augmented by the monitoring program implemented to operationalize the BMP and NNLF.</p>
55.	<p><b>Prevalence of Native Species:</b> <i>The presence of viable assemblages of largely native species must trigger river recognition as natural habitat. The ESIA falsely claims that the mountainous river has low diversity of native fish. Meanwhile Table 1-33 “Fish</i></p>	<p>The ESIA determined that the part of the Vakhsh River that will be affected by the project is not notable for its native fish diversity. As noted previously, the baseline will be augmented by the monitoring program.</p>

No.	Comment	Response
	<p><i>species expected and recorded within the Rogun HPP Aol” shows potential and actual presence of 8 native species, which compared with other rivers in mountainous regions of Central Asia (e.g. Naryn) should be considered a very high native fish species diversity ( See GIS Key Freshwater Habitats in the Mountain regions of Central Asia)18. According to the ESIA, at least 5 native species were identified with high certainty through direct catch and eDNA methods. The BMP does not identify any introduced fish species as “invasive” (i.e. potentially causing irreparable damage to local biota) and does not suggest any specific measures to mitigate their impacts.</i></p> <p><i>As for other aquatic fauna, eDNA from water samples collected within the project area, confirmed the presence of 483 species of freshwater animals, but only 16 of those could be identified to species level(!). “No invasive species identified among those”. Given that 95% of species could not be identified at species level, the statement on “absence of IUCN-listed invertebrates” is hardly justifiable.</i></p> <p><i>Therefore, according to the baseline study, the composition of aquatic fauna in the Aol is largely dominated by native species in all groups assessed. The same largely holds for species composition of water-dependent birds and mammals</i></p>	
56.	<p><i>Presence of nationally threatened fish like the Amu Darya Trout (Salmo trutta oxianus*20) and Turkestan Catfish (Glyptosternon oschanini*), as well as endangered major piscivorous carnivore Eurasian</i></p>	<p>Please refer to response 1 on the referenced species.</p>

No.	Comment	Response
	<i>otter (Lutra lutra seistanica) also confirms that the river still qualifies as a Natural Habitat.</i>	
57.	<i>The ESIA also denies the presence of migratory species in the Aol and fails to analyze seasonal migrations of several native species such as Amu Darya Trout and Snow Trout (Schizothorax intermedius*). Meanwhile, for the vulnerable Amu Darya Trout (Salmo oxianus) Upper Vakhsh basin now is the second largest remaining contiguous river ecosystem suitable for habitation and migration after the Panj-Amu Darya (However, Panj, has much smaller number of historic records for this species).</i>	Please refer to response 1 on the referenced species.
58.	<i>The clause that Vakhsh River is “not considered to be Natural Habitat” is unjustifiable : The Guidance Note for ESS6 (GN19.1) clarifies that “Modified habitats are areas that may contain a large proportion of plant and/or animal species of nonnative origin, and/or where human activity has substantially modified an area’s primary ecological functions and species composition”. Habitats affected by human activities are still considered natural if “those activities have had a limited impact on the species composition or ecological function”, or “despite human impacts habitat supports a mature and diverse community of predominantly native species”, or “human activities have not profoundly affected the habitats ability to recover its former ecological characteristics”. The Vakhsh river and tributaries upstream of Rogun dam largely satisfy all those requirements and must be recognized as natural habitat.</i>	Please refer to previous discussions on the rationale for not considering the Vakhsh river as a critical habitat or free-flowing river.

No.	Comment	Response
59.	<p><i>Neither presence of several introduced species, nor river blockage by Nurek dam far downstream, nor traditional use of some floodplains for agriculture by local populations could justify calling large still free-flowing river ecosystem with robust assemblage of native species of invertebrates, fishes and birds a “non natural” or “modified habitat”. This judgment equally applies to the dynamic floodplains, which are an intrinsic part of the river ecosystem and are capable of very quick recovery from local human disturbance unless natural processes are constrained by water infrastructure (e.g. dams, dykes).</i></p>	<p>Please refer to previous discussions.</p>
60.	<p><i>Although we have demonstrated relatively high fish species diversity and presence of several endangered river-dependent species of vertebrates, those are add-on values to the “natural” state of the river ecosystem. The very definition of “natural ecosystem” does not include as necessary a requirement for a presence of threatened/vulnerable “IUCN-listed species”. Besides, many species of fish in this region, like the Amu Darya trout, lack IUCN assessments, while assessments of the status made for others happened to be overoptimistic. Neither the diversity of species as such can be used as a proof of the habitat “naturalness”, which can be demonstrated by natural increase of diversity of fish species from mountain river sources to foothills in a large river system, while the degree of human impacts, usually, has the opposite gradient.</i></p>	<p>Please refer to previous discussions on species and on the monitoring program.</p>
61.	<p><i>The ESIA also uses as “habitat modification” argument the Rogun HPP construction works</i></p>	<p>Please refer to previous discussions, such as response to comment 2.</p>

No.	Comment	Response
	<p><i>eventually leading to intended transforming of more than 90km of river length into a deep lake. However, claims that such impacts are already part of the biodiversity baseline as the initial dam has already been built, and a small-scale inundation is already in place are illegitimate in the light of the World Bank's ESF. For such cases ESS6 Footnote 11 clearly explains that "A habitat will not be deemed to be a modified habitat where it has been converted in anticipation of the project."22 But even if taken into consideration, the current inundation by Rogun reservoir modified less about 9 kilometers of river length, while the remaining 81 kilometers of large rivers and even more of tributaries remain a part of large free-flowing river ecosystem (containing more than 600 km of large river courses). By classifying the river as merely "modified habitat" of low value, the ESIA sidesteps the rigorous "no net loss" requirements for Natural Habitats, leading to a failure to mitigate or offset the project's largest ecological impact.</i></p>	
62.	<p><i>Necessary Corrective Measures - Apply Full Mitigation Hierarchy: - The ESIA must re-classify the 170km of river segments and most of the 4850 ha of floodplain to be affected by inundations as Natural Habitats, acknowledging its existing very limited modifications and recognizing its high value as a major river ecosystem supporting natural process, native biodiversity (including vulnerable endemic species) and ecosystem services.</i></p>	<p>Please refer to response 1 and other responses related to inundation and the monitoring program.</p>
63.	<p><i>- The ESIA must quantify the significant residual impact of losing over 90 km of major riverine habitat</i></p>	<p>Please refer to previous discussions under comment 2.</p>

No.	Comment	Response
	<p><i>with floodplains and its complete, permanent conversion into a lentic system. The ESIA still considers the impact as large, the adverse effect as significant (moderate), but states that “No additional mitigation measures are possible given that habitat change will be a permanent component of the Project” (Volume 1. Biodiversity para 15.7.55). This is not consistent with the ESS6 or EIB policies.</i></p>	
64.	<p><i>- The ESIA must use precautionary approach and reassess the status of the <i>Salmo oxianus</i> and <i>Glyptosternon cf. akhtari</i> Silas, 1952, which were described based on outdated taxonomic status. Now both species must be assessed as endemics of the Amudarya river basin with ranges gradually reduced by dam development. Given increasing fragmentation of other documented habitats, the <i>Salmo oxianus</i> may trigger critical habitat threshold, lest it follows its closest relative, Aral salmon, on the path to extinction. Even if they don't trigger Critical Habitat, both species should trigger Natural Habitat/Priority Biodiversity Features (as per different bank policies</i></p>	<p>Please refer to responses above on species and on the monitoring program.</p>
65.	<p><i>- Approach to Central Asian Otter listed endangered in the TRB (and likely to several other highly vulnerable species) should be revised. Mistakenly, the otter was not included even into critical habitat screening (Volume 2. Critical Habitat Assessment. Table 3-2) after it was registered with footprint photographs provided in ESIA Vol II. Given its shrinking range, decreasing numbers and vast natural habitat to be converted by the Project, the otter is likely to trigger Critical Habitat threshold, and even if not, it still requires special mitigation</i></p>	<p>Please refer to responses above on species and on the monitoring program.</p>

No.	Comment	Response
	<p><i>measures as an important biodiversity feature and should be included into NNL planning. The BMP\NNLP does not address that.</i></p>	
66.	<p><i>- Mitigation hierarchy must be properly used, analyzing possibilities for avoidance, and then minimization of impacts on biodiversity. If it is proven that avoidance and minimization of all impacts are not possible (for example, through reducing the dam/reservoir size), mitigation of residual impacts must be included in the No Net Loss Plan. As a last resort, the ESIA must propose compensation measures aimed at creating or improving riverine habitats elsewhere (a "like-for-like or better" approach). The most adequate "like-for-like-or better" measure for mitigating fragmentation and destruction of aquatic habitat would be designing legal protection of Panj River (and adjacent stretch of Upper Amu Darya) as a "free-flowing river" protected in perpetuity from damming, large water diversions and other major intrusions.</i></p> <p><i>This also could involve other mitigation measures, such as restoring other degraded river stretches/ecosystem processes in the same river basin, e.g. instituting artificial floods as part of environmental flow regime downstream of Vakhsh Hydropower Cascade to support floodplain forests of Tigrovaya Balka World Heritage site and the most valuable aquatic biodiversity of Lower Vakhsh River ecosystems.</i></p>	<p>Please see response above regarding the application of mitigation hierarchy.</p> <p>See previous responses to comments regarding natural habitat and the monitoring program that will allow adaptive management.</p>
67.	<p><b>Flaws in delineation of the Area of Influence (AOI):</b> <i>The delineation of the Area of Influence (AOI) and the Ecologically Area of Analysis (EAAA) is</i></p>	<p>Please refer to previous discussion on the selection of the Aol for the 2025 ESIA</p>

No.	Comment	Response
	<p><i>insufficiently justified, inconsistent, and not ecologically meaningful for all receptors. According to Table 4-4 (Volume 1. Analysis of alternatives) the AOI occupies 282 km<sup>2</sup>, which covers only 112 km<sup>2</sup> above inundation line<sup>23</sup>. Specific information on locations and acreage of affected habitats in resettlement sites is not found in the Aol description. No coherent map of the Aol related to biodiversity impacts was found in Volumes 1 and 2. Therefore, there is no clear delineation of the Aol in the ESIA.</i></p>	
68.	<p><i>Terrestrial AOI and EAAA: The terrestrial AOI is primarily defined by the project footprint and an arbitrary, fixed-distance "disturbance zone" of 100m, extended to 500m for invasive species (ESIA Vol. 1, para 15.4.4.-15.4.5.). This buffer-based approach is ecologically meaningless for wide-ranging and mobile species. It fails to consider impacts on the foraging ranges, home ranges, dispersal corridors, or territories of species like the brown bear, snow leopard, or raptors that extend far beyond the immediate footprint. For example, the ESIA excludes the Snow Leopard from consideration in the critical habitat assessment, noting "Desk study records obtained from c. 2.5km south-east of the Aol". Obviously, this is immediate proximity to the project impact area for such wide-ranging species as the snow leopard. The EAAA is not explicitly defined for most species, and when defined tends not to cover the full "continuous habitat within which the ecology (of species) is functionally linked.</i></p>	<p>These species were not identified. We assess that the presence of such species is considered to be unlikely in the Vakhsh River valley, with its sizable human population, and certainly not sufficient to justify the habitat as critical.</p>

No.	Comment	Response
69.	<p><i>Freshwater AOI: The aquatic AOI is defined as the Vakhsh River upstream of the Nurek Reservoir. Its effective termination at the Nurek dam is a major weakness of the whole ESIA. It is based on the unsubstantiated assertion that the re-operation of the cascade will have no impact on the downstream environment, as Tajikistan committed to not introducing any changes to seasonal redistribution of flow. The potential downstream impacts resulting from annual withdrawal of more than one cubic kilometer during 16 years of Rogun reservoir filling were also dismissed on an irrelevant excuse that Tajikistan will use its water quota in full in any case. This approach is inconsistent with the precautionary principle and fails to assess the hydropower cascade impacts on sensitive downstream ecosystems (See dedicated section 3.5. on potentially affected World Heritage and other ecosystems below Vakhsh Hydropower Cascade).</i></p>	<p>Please refer to the discussions above regarding the classification of the Vakhsh river as a fragmented habitat, and the rationale for focusing the aquatic ecological assessment on the reach between the Rogun HPP and the Nurek HPP.</p>
70.	<p><i>Current delineation of the Aol, as presented in the ESIA, directly contradicts the adjustment announced by the World Bank in 2024 in official correspondence with the CSOs: “The ESIA that is currently being finalized acknowledges that this scope was too limited and has expanded the Area of Influence (AOI) to include the downstream sections of the Vakhsh and Amu Darya rivers.”(WB Response to CSOs. October 28, 2024)</i></p>	<p>As noted above, the project Aol was extended in the CIA to include the entire Amu Darya basin, with the Vakhsh catchment and the area downstream of the Pyanj-Vakhsh confluence, i.e., the Amu Darya, as the central parts. The CIA extends the VCs to include the following wider biodiversity receptors: the Aral Sea, fish migrations, and floodplain habitats, including Tigrovaya Balka.</p>
71.	<p><i>Inclusion of the downstream (and upstream) areas into the Aol delineated for the Transboundary Cumulative Impact Analysis (TCIA volume 1, Chapter 23) does not help the assessment, as the TCIA</i></p>	<p>Please refer to the discussions above on the water release arrangement downstream of Nurek HPP, the expanded Aol presented in the CIA, and the discussion on the role of Rogun HPP vis-a-vis the Tigrovaya Balka nature reserve.</p>

No.	Comment	Response
	<p><i>analysis is far more shallow than the ESIA and discussing the biodiversity impacts it is based on a false assumption that nothing will change in comparison with current operation of Nurek dam. It does not have any appropriate detail on biodiversity baseline situation, misidentifies biodiversity receptors (talks about abstract “fish migration” instead impacts on full life-cycle of specific species) and fails to analyze threats even for critically endangered species of fish. The whole TCIA is based on trust in political commitments rather than on rigorous analysis of impacts under different possible scenarios. It is an absolutely inappropriate substitute for the proper biodiversity impact analysis in the ESIA. The TCIA recognizes, though, that the current operation regime of the Nurek dam has the most detrimental impacts on the downstream freshwater biodiversity and floodplain ecosystems, including Tigrovaya Balka World Heritage site.</i></p>	
72.	<p><i>The fact that those areas were fully excluded from the Aol for biodiversity-related chapters in ESIA results in several detrimental consequences:</i></p> <ul style="list-style-type: none"> <li><i>- Globally most important biodiversity downstream of Vakhsh HPP Cascade potentially affected by the Project is excluded from the baseline assessment;</i></li> <li><i>- Environmental flow regime necessary to sustain that biodiversity was not assessed in the ESIA</i></li> <li><i>- Recurring negative impacts resulting from reoperation of the hydropower cascade, when Rogun Reservoir becomes the leading regulator of</i></li> </ul>	<p>Please refer to the discussions above on the water release arrangement downstream of Nurek HPP during Rogun HPP reservoir filling and dam operation. Furthermore, please refer to the discussion on the lack of impact of the Rogun HPP on the Tigrovaya Balka nature reserve.</p>

No.	Comment	Response
	<p><i>water regime have not been taken into consideration;</i></p> <ul style="list-style-type: none"> <li>- <i>Negative consequences of extending the Rogun/Nurek reservoir system lifetime from 30-40 to 100–120 years have not been assessed, while prolonged impacts may have a decisive influence on the World Heritage site survival;</i></li> <li>- <i>Whether the policy commitment by Tajikistan to maintain status quo is feasible and sufficient for long-term biodiversity preservation has never been analyzed in the ESIA;</i></li> </ul> <p><i>The Tugai Forests of Tigrovaya Balka Nature Reserve was screened out of the Critical Habitat Assessment on the basis that “impact of Rogun HPP... can be excluded” (Volume 2. CHA, Table 3-2, p.30), while the freshwater ecosystem downstream of hydropower cascade has not even been mentioned in the CHA.</i></p>	
73.	<p><b>Possible Alternatives:</b></p> <ul style="list-style-type: none"> <li>- <i>The AOI and EAAA must be receptor-specific and delineated based on scientific evidence and ecological principles.</i></li> <li>- <i>For Terrestrial Fauna: The AOI for wide-ranging mammals should encompass the typical home range or territory size of the species, centred on the project area. For migratory birds, the AOI should consider the entire Vakhsh valley as a critical migratory corridor. For large mammals, the AOI should consider the surrounding mountains.</i></li> <li>- <i>For Aquatic Ecosystems and Floodplains: The aquatic AOI/EAAA must be defined as a series of continuous units encompassing the entire river reach subject to altered hydrology, sediment, and</i></li> </ul>	<p>Please refer to responses above on the AOI and related comments.</p>

No.	Comment	Response
	<p><i>thermal regimes. The EAAA must be extended from the upstream extent of the reservoir to the headwaters of Upper Vakhsh river system to account for ecosystem process and fish migration.</i></p> <p><i>- As for the Lower Vakhsh the AOI itself should end at a scientifically justified point far downstream of the cascade, which is likely the Ramsar wetlands in the Amu Darya Delta, while the EAAA may also include Panj as interconnected river ecosystem which processes define the ecological dynamics of Amu-Darya River.</i></p> <p><i>- Ecological impacts on tributaries upstream of inundations zones should be reflected not by uniform 2km buffer, but by river stretches of varying length as justified by ecosystem process such as fish population structure and migrations, including such migration changes induced by inundation (e.g. Amu Darya trout <i>Salmo oxianus</i>).</i></p>	
74.	<p><b><i>Refusal to assess the impacts on the World Heritage site and or her ecosystems below Vakhsh Hydropower Cascade:</i></b></p> <p><i>The ESIA, particularly in the TCIA, explains the perceived absence of downstream impacts by stating that Tajikistan is committed to operating the cascade in line with existing outdated water allocation agreements, ensuring the overall seasonal water flow pattern will not change. This explanation is inconsistent with ESS6 requirements because it substitutes a robust ecological impact assessment with political or legal commitment (which is actually not directly related to biodiversity conservation). It also contradicts other “commitments” listed in the same ESIA, such as</i></p>	<p>Tajikistan respects the international water sharing agreements: the Rogun HPP will not use more than the currently unused 1.2 bcm during the reservoir filling stage, and the 4.2 bcm summer to winter shifts will be maintained as they have been under Nurek. There are project legal covenants associated with both these aspects. Historically, Tajikistan has not deviated from the requirements of the water sharing agreement.</p> <p>It is important to note that “perceived absence of downstream impacts” is relevant only to the impacts of Rogun, which will indeed be absent. There have indeed been downstream impacts from pre-existing structures, but they will not be changed by Rogun.</p>

No.	Comment	Response
	<p><i>promise to improve flood control and promise to consider alleviation of droughts in low flow years. Meanwhile, fulfillment of such promises would result in the modification of the water flow downstream from Nurek dam.</i></p>	
75.	<p><i>The exclusion of the Lower Vakhsh and World Heritage site from biodiversity baseline study and its dismissal at early stages of CHA allowed the ESIA to avoid naming it a critical habitat, which would require development of solid safeguard measures (e.g. development of feasible legal guarantees of sufficient environmental flow release throughout the Rogun HPP lifetime). The ESIA's argument is flawed and completely fails the precautionary principle required by ESS6. While the total annual or seasonal water volume may remain the same, the “pattern” of water release (operation regime), sediments flow and temperature regime may change, altering key ecological drivers. The assessment ignores or dismisses several critical factors:</i></p>	Please refer to response 74.
76.	<p><i>The Highest Biodiversity Value omitted: Despite negative pressures from hydropower and agriculture, Lower Vakhsh River below the hydropower cascade remains among the most important biodiversity hotspots in the Vakhsh-Amudarya basin. It has the best remaining natural floodplains centered at “Tugai forest of Tigrovaya Balka Nature Reserve” World Heritage site with a viable population of Burkhara Deer and hosts several critically endangered endemic fish species, such as shovelnose sturgeons<sup>27</sup>. The ToR for this ESIA rightfully requested to ensure that</i></p>	Please refer to response 74 and previous comments relevant to Tigrovaya Balka.

No.	Comment	Response
	<p><i>“environmental flow rate established in the ESIA sufficient to maintain aquatic biodiversity” and prescribed to explore feasibility of releasing “artificial floods” to Tigrovaya Balka as the first priority among mitigation measures.</i></p>	
77.	<p><i>Narrow Framing of Impact: The argument focuses only on preventing “additional” negative impacts beyond the existing degraded baseline. It fails to assess how the Rogun HPP project would have cumulative impacts with the rest of the Vakhsh Cascade and solidifies and makes this degradation permanent, foreclosing any future possibility of ecological restoration (unless such measures are incorporated in the project itself). It also misses the opportunity to use Vakhsh Cascade growing storage volume to enhance downstream conditions (e.g., through managed flood pulses), which is a key part of the mitigation hierarchy and top priority in terms of addressing threatened biodiversity values.</i></p>	<p>Please refer to response 74 and other related responses.</p>
78.	<p><i>The Rogun HPP project envisions major reoperation of the whole Vakhsh hydropower cascade. The Rogun reservoir would become the primary regulator, introducing new short-term (daily and hourly) flow fluctuations. Nurek would act as a counter-regulating reservoir, and detailed assessment is needed of how this new operational regime would alter the downstream environment, affecting aquatic life and floodplains downstream of the Vakhsh hydropower cascade, where the key biodiversity values found in Amu-Darya basin are still present</i></p>	<p>When Rogun HPP is operational, there will be no major change in the downstream flow from Nurek HPP.</p>
79.	<p><b>Flood Control not analyzed:</b> <i>The ESIA recognizes the potential (and even desirability) of the Rogun</i></p>	<p>The Rogun HPP will effectively extend the operational life of Nurek for another 105 years. It will not change the historical</p>

No.	Comment	Response
	<p><i>HPP's decisive impact on flood regulation downstream: "The construction of the Project will improve flood routing capacity for the area downstream of the Vakhsh cascade. This positive effect could be increased by appropriate flood management. The inclusion of Rogun HPP in the cascade would also reduce risks of floods of lower magnitude, but with a higher probability of occurrence." (ESIA Volume 1, para 4.6.13., p.109)</i></p> <p><i>Floods are necessary to sustain river and floodplain ecosystems. It was the flood control by Nurek HPP that previously led to the deterioration of the Tigrovaya Balka ecosystems, and the ESIA says that now it may be further exacerbated/perpetuated by the functioning of the Rogun reservoir during the next 105 years. There are multiple other points in the ESIA testifying that the flow regime downstream of the Vakhsh Hydropower cascade may be changed, including in the interest of riparian countries.</i></p>	<p>impacts of the existing Vakhsh cascade, and the historical seasonal flow regime under Nurek operations is not expected to change. However, on the positive side, the construction and the development of new reservoir operating rules for the cascade offer the possibility to integrate controlled artificial flood events into the operation of the cascade (as is being done in many other reservoir cascades, such as those on the Colorado river). As noted in previous responses, however, it is not considered this should be part of the ESIA for the Rogun HPP but something that is undertaken separately.</p>
80.	<p><i>The ESIA and TCIA also fail to take into consideration recurring and lasting impact of flood control by the Vakhsh Cascade which occurs each year, when a large flood is expected, but it does not happen. Once Rogun assumes the role of main regulator in this hydropower cascade, it will become the main source of this major negative impact leading to floodplain ecosystem degradation.</i></p>	<p>As already noted, these are historical impacts related to the construction of the Nurek HPP and are not attributable to Rogun. The Rogun HPP is designed to protect the cascade from the Probable Maximum Flood and extend the operational life of Nurek by another 105 years, producing much needed green energy.</p>
81.	<p><i>Reservoir filling effects neglected: Despite the 2022 ToR requirement the ESIA downplays and does not properly assess potential impact on biodiversity from approximately 1.2 -2 cubic kilometres being used annually during 16 years to fill the giant</i></p>	<p>As the TCIA notes, these temporary impacts during Rogun impoundment have been assessed and are not likely to change the flow downstream of Nurek beyond the agreed water sharing agreement and are also not expected to significantly alter the situation in the Aral Sea Delta. It is important to note here that</p>

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	<p><i>reservoir. Meanwhile the water modelling annex of the ESIA demonstrates that it could take 5-20% of annual flow (Volume 2. Table 5-8. P.427). At the same time 1.2 cubic kilometres constitutes 25% of current inflow into the Aral Sea Delta.</i></p>	<p>Tajikistan water use will always remain within its regional water allocation. It is important to note that the Nurek dam does not have a surface spillway that can pass extreme floodwaters once the reservoir is filled with sediment. Rogun will extend this period by over 100 years, thus giving time to develop and implement a solution, and in the meantime will protect against the Probable Maximum Flood.</p>
82.	<p><i>The TCIA shows a contradictory and inaccurate approach to this problem. On one hand, it completely misidentifies current water management institutions and objectives as well as fails to name Ramsar sites and other wetlands to which this water is currently delivered in the Amu Darya Delta. It conceals the fact that the legal regime which enables the Delta to receive this water is enshrined in the same old water-sharing agreements and mechanisms to which it refers as the basis for future water resources management. Then the TCIA argues that the “amount (reaching Delta) is too small to have kept the Aral Sea from shrinking further”, not only implying it is not any longer important to sustain this legally agreed environmental flow, but also misrepresenting current management objectives for the release of this e-flow. Meanwhile, this small amount of water is used to sustain wetlands and plant forest to mitigate the immense negative impacts of the Aral sea drying on the population of the Karakalpakstan Republic.</i></p>	<p>Other than Tigrovaya Balka, no other RAMSAR sites are identified. The concerns about Tigrovaya Balka are discussed in several other responses. Similarly, there will be no additional impact from the Rogun HPP on the Aral Sea, as explained in the CIA. Please refer to response 74.</p>
83.	<p><i>Finally, the TCIA misleadingly hints that “there is no direct relationship between the amount of unused water and inflow into the Aral Sea” and dismisses the impact even without analyzing it. Contradicting</i></p>	<p>The scenarios in the TCIA are considered in relationship to their impact on the water sharing agreement. If they do not have an impact, a clear statement is made to that effect.</p>

No.	Comment	Response
	<p><i>itself, in its last chapter devoted to water management the TCIA shows both the significant impact of different scenarios of Rogun reservoir filling and operation on the residual flow into Amu Darya Delta, and discusses the use of greater amounts of water in water-abundant years to fill Rogun. Meanwhile, it conceals the fact, that according to current water-sharing agreements, this is exactly the “extra water” in water-abundant years that is supposed to be used for replenishing Ramsar wetlands and other water bodies of Amu Darya Delta.</i></p>	
84.	<p><i>Sediment Trapping Impacts Unassessed: The ESIA acknowledges that Rogun HPP will trap nearly all remaining sediment. This means the water released from Nurek will be even more sediment-starved, possibly creating “hungry water” that will cause riverbed and bank erosion far downstream, altering habitats and infrastructure. Besides, the Vakhsh River turbidity is a very important ecological factor to which its endangered endemic fishes are adapted<sup>29</sup>. Further reducing sediment content in river flow may negatively affect the sturgeons and other endemic aquatic fauna. Besides, Nurek reservoir without Rogun will be filled with sediments and lose capacity to block their flow in 30-40 years, while Rogun will extend that negative effect to 100-120 years.</i></p>	<p>It is important to note that without Rogun, Nurek dam would be filled with sediment after a certain period of time and then the sediment flow in the Vakhsh river would be restored. With Rogun, the sediment trapping effect in the Vakhsh river will be extended for 60 or more years. Rogun will intercept and the reservoir will store this sediment in lieu of its being stored in Nurek. The Nurek reservoir will remain in a relatively steady-state status, so water will remain in the reservoir only a short period of time. As a result, there should not be significant reduction in the already “sediment-starved” releases from Nurek.</p>
85.	<p><i>Thermal Regime Not Analysed: The ESIA does not adequately assess how the release of cold, deep water from the massive Rogun reservoir will alter thermal regimes downstream, impacting spawning cues and invertebrate life cycles.</i></p>	<p>The thermal regime will only change in the 15-km stretch (refer to response 3) of the river between the Rogun and Nurek HPPs, and the impacts will be very similar to those downstream of Nurek; this will not alter the habitats downstream of the Vakhsh cascade.</p>

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86.	<p><i>Environmental flow assessment is falsified. E-flow assessment starts with a false assumption that “biological value of this part (of the river between Rogun and Nurek resevoir) was low already without Rogun dam in place”(Volume 1. Impact on water. para 4.4.7.). In section 4.3. we have shown that this statement is false, as before Rogun dam it was part of almost 700 km long free-flowing river system. The main flaw in the e-flow assessment - it was not applied to the overall downstream length of Vakhsh-Amu Darya river system, but only to 15-kilometer stretch between Rogun and Nurek reservoirs (which is planned to be fully modified by a new Shurob HPP in near future). The assessment is done on the most simplistic level possible, based on an excuse that this Impact on water. para 4.4.7.). In section 4.3. we have shown that this statement is false, as before Rogun dam it was part of almost 700 km long free-flowing river system. The main flaw in the e-flow assessment - it was not applied to the overall downstream length of Vakhsh-Amu Darya river system, but only to 15-kilometer stretch between Rogun and Nurek reservoirs (which is planned to be fully modified by a new Shurob HPP in near future). The assessment is done on the most simplistic level possible, based on an excuse that this is just 15 kilometers of river gorges between two giant reservoirs. It still does not satisfy the requirements of either World Bank E-flow guidance, not the EIB’s’s requirements. It has no explanation how recommended “minimal flow” will guarantee well-being of habitats and species downstream. The assessment is largely treated as an awkward</i></p>	<p>Annex 13-1 in Volume 2 of the ESIA establishes a robust minimum environmental flow for the river reach that will be affected by Rogun, which is only the 15km river reach between Rogun dam and the upper end of the Nurek reservoir. As noted in previous responses, Rogun HPP will not affect flows downstream of Nurek.</p>

No.	Comment	Response
	<p><i>formality devoid of any practical value, as the planned release from one turbine of Rogun HPP exceeds the volume of recommended minimal e-flow. Little attention is devoted to hydropeaking, which is likely the main source of impacts at this stretch.</i></p> <p><i>Still, the main flaw of this approach to E-flows is refusal to assess other much more ecologically significant and biodiversity rich areas downstream of Vakhsh cascade. The first area of particular concern for which environmental flow should be defined with use of a much more comprehensive methodology is the Lower Vakhsh downstream of Vakhsh Hydropower cascade where the main biodiversity features are subjected to the greatest impact from hydropower. A second obvious area in need of e-flow assessment is the Amu-Darya Delta below Nukus City during the reservoir filling period, which may deprive its Ramsar wetlands of necessary water allocations.</i></p>	
87.	<p><b>A. An Ecological Cascade Operation Model:</b> <i>A detailed hydrological model is needed to show the expected daily and hourly flow fluctuations, temperature changes, and sediment transport downstream of Nurek under several possible operational regimes of the Vakhsh Cascade. The ESIA openly talks about three different possible regimes but does not assess and compare their impacts. Even continuation of the "current operation pattern of flow regulation by hydropower cascade" proposed in the ESIA as the only possible option will have a negative impact on the World Heritage Site. Feasibility of maintaining it in the</i></p>	<p>What is described is not a hydrologic model, but rather a coupled energy-water model integrating hourly demands from the energy sector through the energy dispatch center with the operation of the reservoirs. The development of such a model, or a more practical approach of decision-making, would be informed by the ongoing consultancy services to develop the reservoir operation rules for the cascade.</p>

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	<p><i>foreseeable future is in question due to climate change, competition for water and lack of binding international agreements. On the other hand proposed regime, even if feasible, is not optimal for Tajikistan or other riparian countries, and therefore is likely to be challenged. In order to justify this regime, the ESIA must include a study of these impacts on the outstanding universal values of the UNESCO World Natural Heritage property, as well as a study of impacts under other alternative operation pattern regimes.</i></p>	
88.	<p><i>B. A Downstream Impact Assessments and E-Flow Planning: A dedicated biodiversity study is required to assess the impacts of these altered regimes on the aquatic and riparian habitats of the lower Vakhsh River, including its food web, fish populations, floodplain ecosystems and geomorphology. Another study is needed for the ecological impacts in the Amu-Darya Delta. Wider environmental flow study for this and other selected stretches down to the Amu Darya delta should highlight ecological requirements of other key riverine ecosystems and ways to satisfy them by water management measures</i></p>	<p>Please refer to responses to comment 74 and response on downstream impacts.</p>
89.	<p><i>C. An Evidence-Based Assessment for Tigrovaya Balka and Feasibility Study for Artificial Floods: A revised assessment of potential impacts on the Tigrovaya Balka Nature Reserve is crucial, as this reserve is highly dependent on the flood and sediment dynamics that the Rogun-Nurek system will now almost completely control. Detailed feasibility study for artificial flood releases must be carried out and become the base for management</i></p>	<p>Please refer to responses to comment 74 and other comments on downstream impacts and on artificial floods.</p>

No.	Comment	Response
	<i>of environmental flows from the hydropower cascade below Nurek Reservoir.</i>	
90.	<i>World Heritage Impact Assessment Process: In accordance with requirements of the World Heritage Convention and following its Guidance on impact assessment, implement and consolidate in a single document all impact studies relevant to the Tugay Forests of Tigrovaya Balka Nature Reserve World Heritage property and present to the UNESCO World Heritage Centre/IUCN for review as a part of the ESIA.</i>	See previous comments on the AOI for the ESIA and the extended AOI considered in the TCIA, and specifically on the lack of impact by Rogun on Tigrovaya Balka.
91.	<i>Baseline Data Insufficient and Unreliable The baseline data collection was not sufficient for a project of this scale and risk profile, falling short of the Good International Industry Practice (GIIP) referenced in ESS6. The ESIA itself acknowledges several critical weaknesses: Reliance on Outdated and Highly Fragmented Data: The assessment continues to rely heavily on findings from the 2014 ESIA, which is a decade old and may not reflect current ecological conditions or species distributions in a dynamic landscape. Both 2014 and 2023-4 field inventories have very limited scope and do not cover significant part of potentially impacted features (e.g. Tigrovaya Balka World Heritage site, critically endangered fishes of Lower Vakhsh, most natural habitats to be transformed and their importance for endangered biota, ecologically meaningful analysis of local populations of endangered species, fish migrations etc.).</i>	See previous responses to comments concerning baseline data, and on the AOI.
92.	<i>Insufficient Aquatic Data: As detailed previously, the ESIA notes "significant constraints" to traditional</i>	The extent of the natural habitat that would be affected was determined and triangulated using various resources, including:

No.	Comment	Response
	<p><i>aquatic surveys. The heavy reliance on eDNA is a valid adaptation, but is not a substitute for a comprehensive baseline. It provides only presence data, is limited by the completeness of reference databases, and offers no quantitative data on population size, biomass, health, or structure, which are essential for impact assessment</i></p>	<p>IBAT Report; 2014 EIA; 2023 desk study; 2023 field survey report–spring; 2023 field survey report–autumn; project ESIA; literature review; e-bird resources; IUCN Red List; and stakeholder consultation with organizations involved in conservation initiatives across Tajikistan. Additional baseline data will be gathered through the monitoring program as part of the adaptive measures of the ESMP and the operationalization of the BMP.</p>
93.	<p><i>Insufficient Terrestrial Species Data: The ESIA explicitly states that for some species, "most notably bats, the level of survey effort has been lower than would be expected to fully align with Good International Industry Practice (GIIP)". For many species considered for Critical Habitat status, the screening relies on superficial qualitative assessments of potential presence rather than robust population data from within the project's EAAA</i></p>	<p>Please refer to responses above on species and on the monitoring program.</p>
94.	<p><i>Lack of Seasonal Data: The 2023 surveys were conducted in late spring and autumn. This limited timeframe may miss critical life-cycle periods for various species (e.g., wintering birds, migratory passage, breeding amphibians), leading to an incomplete understanding of the area's biodiversity importance.</i></p>	<p>Please refer to responses above on species and on the monitoring program.</p>
95.	<p><i>Lack of credible inventory results: Documentation is incomplete as it lacks unified presentation of data collection results for each taxa and habitat type. Selection of sample data collection sites is not justified, and it is not fully clear what habitats and species were observed in each such area. If those sample areas were supposed to represent certain typical habitats\ecosystems, there is still no</i></p>	<p>Please refer to responses above on species and on the monitoring program.</p>

No.	Comment	Response
	<p><i>attempt to explain how results obtained there could be extrapolated to much wider areas within the Aol and EAAA. Baseline biodiversity surveys not reported for areas downstream of Vakhsh Hydropower Cascade, road/infrastructure construction areas, remote resettlement areas, etc.</i></p>	
96.	<p><i>Botanical surveys were done in too few sampling sites (15 locations for a very large area) and in very limited time of the year (BMP 2.2.3). Very insufficient fauna surveys, not using GIIP. For example, camera traps should have been used for large mammal surveys, vantage points during breeding and nest surveys for birds, electrofishing for fish (BMP 2.2.10). Survey of floodplain habitat was very limited and, likely, done in the inappropriate season (October).</i></p>	<p>Please refer to responses above on species and on the monitoring program.</p>
97.	<p>Botanical surveys were done in too few sampling sites (15 locations for a very large area) and in very limited time of the year (BMP 2.2.3). Very insufficient fauna surveys, not using GIIP. For example, camera traps should have been used for large mammal surveys, vantage points during breeding and nest surveys for birds, electrofishing for fish (BMP 2.2.10). Survey of floodplain habitat was very limited and, likely, done in the inappropriate season (October)</p>	<p>Please refer to responses above on the monitoring program.</p>
98.	<p><i>Possible Supplementary Data Collection to Fill the Gaps:</i></p> <ul style="list-style-type: none"> <li><i>- Systematic Seasonal Surveys: Conduct multi-season surveys for flora and fauna to capture a full annual cycle of biodiversity use.</i></li> <li><i>- Targeted Quantitative Surveys: Conduct targeted surveys to estimate population densities for all</i></li> </ul>	<p>Please refer to responses above on species and on the monitoring program.</p>

No.	Comment	Response
	<p><i>species that trigger, or are close to triggering Critical Habitat thresholds, as well as for other key species of concern (e.g., otter, large mammals, important birds, native fish).</i></p> <p><i>- Advanced Aquatic Monitoring: Supplement eDNA with innovative and safe methods for quantitative sampling, such as stationary nets, sonar, hydroacoustic surveys, or advanced remote sensing, to build a more robust aquatic baseline.</i></p> <p><i>- Specialist Surveys: Commission a comprehensive bat survey using modern acoustic detectors and roost identification techniques to address the acknowledged GIIP gap. Conduct systematic surveys of aquatic and terrestrial invertebrates, which are key indicators of ecosystem health. Conduct extensive botanical surveys in all habitats to ensure possible endangered or endemic flora is assessed.</i></p> <p><i>As there were found several very rare raptors - Egyptian, bearded, cinereous and Himalayan vultures, golden eagle, saker falcon, etc. and additional survey efforts are needed especially during breeding season to ascertain importance of the area for each local population of these species.</i></p> <p><i>- Full baseline survey of Lower Vakhsh: To enable impact assessment for most globally important biodiversity and habitats in the Lower Vakhsh river below the hydropower cascade (e.g. Tigrovaya Balka World Heritage property) a full baseline assessment with identification of current negative impacts and prospects for their mitigation should be carried out. IUCN critically endangered and endangered species should be paid particular attention.</i></p>	

No.	Comment	Response
	<p><i>- Full baseline survey of Amu Darya Delta Wetlands: To ensure implementation of water-sharing agreements and preservation of wetlands of international importance a baseline assessment of the wetlands in Amu Darya Delta must be carried out to be used in impact assessment, especially for impacts during the Rogun reservoir filling period.</i></p>	
99.	<p><i>Improper Identification of Natural, Modified and Critical Habitat at:</i></p> <p><i>- The ESIA's data is barely sufficient only to support its own preliminary and overly broad classifications, but the rough habitat classification scheme (woodland, grassland, river and floodplain, agriculture, settlement) does not meet the full intent of ESS6 for a thorough biodiversity assessment. It also, likely, does not satisfy the EIB requirements</i></p>	<p>Please refer to responses above on the assessment and identification of critical and natural habitat.</p>
100.	<p><i>- Critical Habitat: The screening process against IFC PS6 criteria arrives at the conclusion that no Critical Habitat is triggered. However, this conclusion is not robustly justified due to the lack of quantitative population data for several potentially triggering species and denial of possible and already occurring impacts on biodiversity downstream of the Vakhsh HPP cascade. The precautionary principle is fully neglected - critically endangered sturgeons and some other endemic species or floodplain tugay forests downstream of the hydropower cascade are dismissed, along with fish endemics and endangered otter in the reservoir inundation area. The importance of inundated areas for populations of other species is not assessed with sufficient detail. . Meanwhile, even one territory</i></p>	<p>Please refer to responses above on critical habitat.</p>

No.	Comment	Response
	<i>of Egyptian vulture lost would have a significant impact on the local population and the project will not achieve NNL.</i>	
101.	<i>- Natural vs. Modified Habitat: The identification of juniper woodland and specific floodplain areas as Natural Habitat is justified based on limited field surveys confirming their relatively unmodified nature. But the extent of this habitat in the Aol (185 ha) is likely grossly underestimated, judging by the satellite imagery</i>	Indeed, juniper woodland and other floodplain areas were identified as natural habitats. The determination of the modified habitat follows from the definition in ESS6. However, please refer to previous responses on the monitoring program.
102.	<i>The area to be inundated likely contains not 77 ha, but approximately 3000-4000 ha of natural floodplains, as all floodplains not directly modified by settlements and infrastructure retain their key ecological processes, while traditional land-uses (e.g. wood collection, grazing, small-scale farming) are adapted to natural flooding regime and other ecosystem dynamics. Denying them natural habitats' status is an illegitimate violation of the ESS6 and respective requirements of the EU regulations. Moreover, Geomorphology Chapter characterizes them as natural habitats.</i>	Please refer to response 101 and on previous responses concerning natural habitat.
103.	<i>In section 4.3. it was shown that the justification for excluding the Vakhsh River from Natural Habitat status is inconsistent with ESS6 definitions. However, the classification of full area of other "landscapes" as "heavily modified" is also weak and appears to be used as a justification to lower the significance of impacts. Attributing large unsurveyed areas impacted by the project to Modified Habitat is not in line with ESS6 and Guidance Note for Borrowers on ESS6. More specifically, GN19.1 gives clear examples that the</i>	The classification of these landscape areas as heavily modified is in line with the definition in ESS6. Please refer to responses above on the monitoring program.

No.	Comment	Response
	<p><i>river, the pastures and cliffs around it should be considered natural habitat as plants and animals (for example vultures) have adapted to the long-term pattern of traditional use (grazing, fishing, etc.). Speaking of pastures specifically, the rugged terrain and uneven distribution of settlements would inevitably lead to very different degrees of human impacts at different locations, which is not reflected in the ESIA baseline survey and neglected in habitat classification.</i></p>	
104.	<p><i>Insufficiency of Habitat Classification: The broad classification (e.g., "pasture/degraded grassland," "woodland"-essentially land-cover types rather than specific ecosystems/communities) is an oversimplification that does not satisfy ESS6 requirements. ESS6 requires an assessment of "primary ecological functions and species composition," which these coarse categories obscure. No species composition has been described for any particular terrestrial habitat type. This approach risks overlooking smaller patches of high-value habitat and masking significant internal biodiversity variations</i></p> <p><i>Insufficiency of Habitat Classification: The broad classification (e.g., "pasture/degraded grassland," "woodland"-essentially land-cover types rather than specific ecosystems/communities) is an oversimplification that does not satisfy ESS6 requirements. ESS6 requires an assessment of "primary ecological functions and species composition," which these coarse categories obscure. No species composition has been described for any particular terrestrial habitat type. This approach risks overlooking</i></p>	<p>Please refer to responses above on habitat assessments and on the monitoring program.</p>

No.	Comment	Response
	<p><i>smaller patches of high-value habitat and masking significant internal biodiversity variations</i></p>	
105.	<p><i>Gorges, Ravines, Cliffs, and Rocky Habitats: These are mentioned as landscape features and potential habitat for species like Egyptian Vulture, but they are not mapped or assessed as distinct habitat units with unique ecological functions. This is a significant omission, as these features often serve as crucial refugia for raptors, large mammals, bats, and specialized flora</i></p> <p><i>- Other Woody Vegetation: The assessment focuses almost exclusively on juniper woodland. Other woody vegetation, such as riparian scrub, bush thickets or mixed woodlands in tributary valleys, is not distinctly classified or assessed for its specific conservation value for birds and mammals. Brief examination of Google Earth imagery suggests the presence of sizable patches of such vegetation throughout the Aol.</i></p> <p><i>- Grassland Variation: The category "Pasture/degraded grassland" is the largest single habitat type but lumps together everything from heavily overgrazed areas to potentially valuable, less-disturbed native grasslands on steep slopes. It does not differentiate between different grassland communities present in the area. This lack of differentiation makes it impossible to assess the true impact of habitat loss.</i></p> <p><i>- Tributaries: Gorges and tributaries, which provide clearer, cooler refuge areas for aquatic species, are not treated as a distinct habitat type with a specific assessment of impacts.</i></p>	<p>Please refer to responses above on habitat assessments and on the monitoring program.</p>

No.	Comment	Response
106.	<p><i>Uneven analysis of direct, indirect, and cumulative project – related impacts</i></p> <p><i>The ESIA fails to adequately consider and analyze the full scope of relevant impacts. While direct impacts are at least partly covered, the analysis of indirect and cumulative impacts is superficial and largely absent.</i></p> <p><i>The ESIA provides an assessment of some direct impacts, primarily of the "land-take" from habitat inundation and construction.</i></p> <p><i>- Increased Human Pressure: The impacts of improved access to previously remote areas on illegal logging, poaching, and grazing are mentioned but not quantified. For example, the filling of reservoir will necessitate adjustment in land-use practices of the surrounding population, which has not been assessed either in biodiversity or social parts of the ESIA</i></p> <p><i>- Indirect Impacts: The analysis of indirect impacts is weak and fails to systematically assess several key issues:</i></p> <p><i>- Habitat Fragmentation: The ESIA does not quantify the fragmentation effect of the new reservoir and road network as barriers to movement for terrestrial species or assess its impact on population viability.</i></p> <p><i>- Edge Effects: The creation of a large reservoir will change the microclimate along its new shoreline, but these "edge effects" on adjacent terrestrial habitats are not analyzed.</i></p>	<p>The vast majority of PAPs in RAP 2 are being resettled in areas adjacent to or near existing towns and villages, rather than in greenfield areas. This is to ensure better integration into the area and access to crucial government services, such as health, education, and transport facilities. DFZ has undertaken environmental and social due diligence in planning the sites where PAPs are resettling, taking into account impacts on land use, natural resources, and cultural heritage. They have also conducted consultations with host and nearby communities to discuss the economic, environmental, and social impacts of the resettlement, not just on the local communities, but also the landscape. To date, DFZ has received few complaints or adverse feedback on the PAPs’ socio-economic impacts on the local communities, including land use. Most of the feedback has been positive about their contributions to local economies, though there are periodic efforts in some places to ensure that water supply systems are functioning adequately throughout the year.</p> <p>Pasture lands for the PAPs and host communities have been established through a formal process, which includes regulations on logging, hunting, and fishing, not only in pasture areas, but on other state lands that are not used for housing, commerce, or agriculture. The independent RAP monitor will examine land use issues related to resettlement to help DFZ address any adverse impacts on land due to the resettlement process.</p> <p>The ESIA notes that the area to be inundated by the reservoir is heavily used for agriculture and grazing. The reservoir itself converts some terrestrial habitat to lacustrine but will not increase fragmentation that already results from the river and its</p>

No.	Comment	Response
		characteristic gorge. It is not clear what “road network” is mentioned.
107.	<p><i>Transboundary Cumulative Impacts Assessment Gaps: The Transboundary Cumulative Impact Assessment (TCIA) is the primary chapter for this analysis, but its scope and degree of detail is highly problematic. It lumps together domestic and transboundary issues, some of which (like impact on World Heritage of critically endangered fishes of Vakhsh River) should have been addressed in specialized biodiversity assessments. It dismisses obvious impacts without assessment based on unfounded political assumptions unrelated to biodiversity matters. Finally, it is prepared by a single consultant, whose views are predetermined by being the team leader for 2014 ESIA on the same project. Despite direct requests of CSOs and the WB officials making promises, no meaningful consultation has been conducted on the draft TCIA, neither with international CSOs nor with civil society in affected regions of riparian countries.</i></p>	<p>The draft TCIA was discussed at two riparian consultations (a national consultation in Uzbekistan in October 2024 and a Multi-Country consultation in Istanbul in August 2025). It was also a part of the ESIA consultations throughout Tajikistan in September 2025.</p>
108.	<p><i>TCIA focus is overwhelmingly on hydrology and transboundary water allocation, with biodiversity impacts addressed in a cursory manner with use of anecdotal evidence instead of detailed data. TCIA acknowledges that future upstream dams will cause "floodplain submersion" but does not assess the ecological significance of this cumulative loss. The conclusion that cumulative impacts on biodiversity will be "neutral" or "negative" without detailed analysis is unsubstantiated. It delays</i></p>	<p>Hydrology is the main driving factor regarding potential impacts on biodiversity. This is reflected in the assessment. Please refer to responses to other comments regarding the water regime downstream of the Rogun HPP and downstream of Nurek HPP</p>

No.	Comment	Response
	<i>assessment of cumulative impact to the point in time they become practically irreversible.</i>	
109.	<i>The assessment fails to adequately assess the significant cumulative fragmentation of the Vakhsh river system and the combined effect on migratory fish and other aquatic species in the context of the entire basin, as required by ESS6. It adopts the "death by a thousand cuts" approach in which none of consecutive hydropower projects is held responsible for increasing loss of biodiversity and no strategic measures are proposed to prevent such loss in the development process</i>	Please refer to previous discussion of the nature of the Vakhsh river as having pre-existing heavily modifications and that is not free flowing
110.	<i>Selective use of mitigation hierarchy: The mitigation hierarchy is applied selectively and, as a result, ineffectively. Its application is evident for small areas of two terrestrial habitats, but is almost entirely absent for the project's most significant impact on the freshwater ecosystem.</i>	Please see responses above regarding the application of the mitigation hierarchy.
111.	<i>Selective Application: The hierarchy is explicitly and most clearly applied only to the two terrestrial Natural Habitats, which together constitute only 262 ha (under 2% of the 16,500 ha of inundation zone). Even here, the process appears to jump from acknowledging the impact directly to the "Offset" stage (the NNLF). For the rest 98% of narrowly identified Aol no systemic mitigation hierarchy has been applied.</i>	See previous impacts on the assessment and identification of natural habitats and on the application of the mitigation hierarchy.
112.	<i>Ineffectiveness for Major Impacts: For the transformation of the Vakhsh River, impacts on habitats, and impacts at ancillary sites, the hierarchy is not systematically applied or documented.</i>	See previous comments on the assessment of the river and on the monitoring program.

No.	Comment	Response
113.	<p><i>Weak Avoidance: The analysis of alternatives (e.g., a lower dam height) is dismissed primarily on economic grounds without a balanced assessment of the significant biodiversity impacts that would be avoided. Only 2% of the AoI (limited to inundation zone) are considered as biodiversity-relevant in the analysis of alternatives. Under ESS6, avoiding impacts on Natural Habitat should be a primary driver of design, not just an economic trade-off.</i></p>	<p>Alternatives to the Rogun HPP, including different dam heights and other renewable technologies, were thoroughly assessed during the TEAS for the Rogun HPP financed by the World Bank between 2011 and 2014, and during the financing options study in 2021. The highest dam alternative was selected by the Government of Tajikistan based on its superior economic, dam safety, and environmental performance. Updated analysis performed during project appraisal confirmed that the Rogun HPP remains the least-cost solution for providing clean and affordable electricity, supporting the region's transition to a low-carbon future.</p> <p>The TEAS studies evaluated various dam height alternatives to determine the most suitable option for the project. Three FSLs were considered, corresponding to dam heights of 335 meters – FSL of 1290 meters above sea level (masl); 300 meters – FSL of 1255 masl); and 265 meters - FSL of 1220 masl. Each height was analyzed for different installed generation capacities, ranging from 3,600 MW to 2,000 MW, resulting in a total of nine alternatives studied.</p> <p>The TEAS concluded that all three dam height alternatives could be built and operated within international safety norms, provided that specified design modifications and mitigation measures were implemented. The highest dam alternative, at 1,290 masl, was found to offer the greatest benefits across most economic and environmental sensitivities. The TEAS recommended the highest option due to its superior performance in terms of energy generation and overall beneficial impact on the Tajikistan electricity system. The government's choice of a higher dam height was justified despite the higher resettlement impact due to several key factors:</p>

No.	Comment	Response
		<ul style="list-style-type: none"> <li data-bbox="1060 142 1942 370">- <b>Economic Benefits:</b> The highest dam option (335 meters) was found to provide the largest system cost savings and overall economic benefits. The economic analysis showed that this option would have a significant positive impact on Tajikistan's electricity system, making it the most beneficial in terms of energy generation and cost efficiency.</li> <li data-bbox="1060 414 1942 678">- <b>Technical and Dam Safety considerations:</b> The TEAS concluded that the highest dam option could be built and operated within international safety norms, provided that specified design modifications and mitigation measures were implemented. This option was technically justified considering the long-term safety and operational efficiency of the dam.</li> <li data-bbox="1060 722 1942 1144">- <b>Environmental and Social Impact Mitigation:</b> 2025 ESIA confirmed that the terrestrial habitat that would be lost with this largest reservoir was considered to be already heavily modified by agriculture and grazing. Although the highest dam height would result in a larger number of people to be resettled, the ESIA identified measures to mitigate the impacts of involuntary resettlement. The resettlement plans included compensation for lost assets, construction of replacement houses, and livelihood restoration measures to help affected households rebuild their lives in the new locations.</li> <li data-bbox="1060 1188 1942 1377">- <b>Sustainable life of investment:</b> The highest dam option was also considered the most sustainable in terms of the long-term life of the investment. The sedimentation study estimated that the Rogun reservoir would have a lifespan of around 115 years, significantly reducing the sediment filling</li> </ul>

No.	Comment	Response
		<p>rate of the Nurek reservoir and ensuring continued river regulation for an extended period.</p> <p>- <b>Trade-offs and sensitivities:</b> The TEAS considered various trade-offs between the different dam height options, including financing risks, macro-economic implications, social and environmental impacts, and opportunities for institutional arrangements and mutual benefits among countries. The highest dam option generally showed the greatest benefit across most sensitivities, making it the preferred choice despite the higher resettlement impact.</p>
114.	<p><i>Ineffectiveness for Major Impacts: For the transformation of the Vakhsh River, impacts on habitats, and impacts at ancillary sites, the hierarchy is not systematically applied or documented. Weak Avoidance: The analysis of alternatives (e.g., a lower dam height) is dismissed primarily on economic grounds without a balanced assessment of the significant biodiversity impacts that would be avoided. Only 2% of the Aol (limited to inundation zone) are considered as biodiversity-relevant in the analysis of alternatives. Under ESS6, avoiding impacts on Natural Habitat should be a primary driver of design, not just an economic trade-off.</i></p>	<p>Please refer to previous discussion on Aol and the assessment and identification of natural habitats.</p>
115.	<p><i>Insufficient Minimization: Instead of minimizing impacts, the ESIA minimized recognized “natural habitats”, which in case of self-regenerating floodplains and free- flowing river itself is not justifiable. Mitigation of impacts on biodiversity features is extremely weak if present at all beyond the NNLP. The standard construction best practices</i></p>	<p>Please refer to previous responses to comments on the Aol of the 2025 project-level ESIA and on the assessment of impacts and identification of mitigation measures. Also as noted previously, the ongoing monitoring program will expand knowledge of baseline conditions even further and allow an adaptive management approach to biodiversity protection. The no-net-loss framework and BMP will be operationalized.</p>

No.	Comment	Response
	<p><i>listed in the ESMP are not framed as a strategic effort to minimize impacts on specific, high-value biodiversity features. There is no intention of modifying dam design or adjusting other operations to minimize already significant downstream ecological disruption. A program minimizing reservoir-filling impacts on biota and ensuring formation of new productive aquatic habitats is fully absent. Physical collection of individual animals is insufficient and hardly feasible. Minimization of negative impacts on biodiversity from periodically inundated reservoir wide margins is not discussed in the ESIA</i></p>	<p>The adoption of the BMP is a condition of disbursement.</p>
116.	<p><i>Questionable Restoration and Offset: The NNL Framework to reforest 786 ha to compensate for the loss of 262 ha of existing woodland carries a high risk of failure. While the 3:1 multiplier acknowledges this, the NNL framework lacks detail on how the long- term ecological functionality of the offset sites will be guaranteed. Most importantly this scheme is false from the outset, because the scale of natural habitat conversion has been underestimated by at least an order of magnitude and natural habitats in need of NNL action likely occupy at least 6000-10000 hectares.</i></p>	<p>The BMP and no-net-loss framework will be informed and operationalized in consultation with the stakeholders. The adoption of the BMP in form and substance acceptable to the World Bank is a condition of disbursement.</p> <p>See previous comments on the assessment and identification of natural habitats.</p>
117.	<p><b>Areas for Improvement:</b>  <i>A. Scope: The application of the full mitigation hierarchy must be explicitly documented for *all* significant biodiversity impacts, including: (1) The loss of the Vakhsh River ecosystem; (2) Downstream ecological changes; (3) Loss of other natural habitats in inundation zone (4) Habitat loss at all ancillary sites; and (5) Impacts on all species</i></p>	<p>See previous comments on each of these topics. Also see previous comments on the monitoring program, which will allow continued identification of measures that may be needed to protect biodiversity.</p>

No.	Comment	Response
	<p><i>of conservation concern (e.g. Central Asian Otter, Egyptian Vulture and other endangered raptors, Central Asian Tortoise and other endangered reptiles, Turkestan Catfish, Amu Darya Trout, etc.).</i></p> <p><i>B. Freshwater Ecosystem: The approach to the river transformation must be revised. The impact must be recognized as the conversion of a Natural Habitat, and the ESIA must demonstrate that no viable alternatives existed before moving to compensation.</i></p> <p><i>C. Specific Fauna: The approach to mitigating impacts on bats and migratory birds needs improvement. Given the baseline data gaps, reliance on pre-clearance checks is insufficient. Proactive measures, such as creating alternative roosts for bats and robust collision risk modelling for isolating or undergrounding new power lines, are needed.</i></p>	
118.	<p><i>Impacts beyond the inundation zone unaddressed. The ESIA does not adequately address biodiversity impacts at resettlement sites, areas for extraction of material (e.g. for concrete manufacturing), or other "associated facilities" in a manner consistent with ESS6. The biodiversity impacts are fragmented, not systematically assessed, and excluded from the central impact accounting and compensation framework.</i></p> <p><i>ESS6 requires that the assessment cover all direct, indirect, and cumulative impacts from the project, which explicitly includes associated facilities necessary for its construction and operation. The ESIA fails this requirement due to:</i></p>	<p>The ESIA and ESMP provide adequate assessment and management of environmental and social risks and impacts, including at the resettlement sites. The vast percentage of land in the resettlement sites for RAP 2 has previously been developed or used for other purposes. DFZ, with support from the National Committee of Environmental Protection, has undertaken environmental and social due diligence at the resettlement sites, as well as extensive consultations with PAPs and host communities. Guided by the ESMP, they are consolidating the due diligence reports and working to strengthen the environmental management at the resettlement sites.</p>

No.	Comment	Response
	<p><i>- Fragmented Assessment: The main biodiversity impact assessment and the NNL Chapter focus almost exclusively on habitat loss within the inundation zone. Impacts at other sites are either ignored or handled in separate, unconsolidated assessments.</i></p>	
119.	<p><i>Unaddressed Resettlement Sites: The ESIA focuses on the socio-economic project impact. It also fails to assess needs for and ensure restoration and compensation of ecosystem services, which local populations enjoyed before resettlement.</i></p>	<p>As mentioned in response 41 above, most of the resettlement areas are adjacent to or close to other towns and villages where PAPs can continue to have access to ecosystem services. However, the point about more granular information on access to ecosystem services and natural resources (e.g. plants for foraging), is well taken, and the updated RAP will include more information on this.</p>
120.	<p><i>Material Extraction Areas (Quarries, Borrow Pits): The ESIA mentions quarries but lacks a specific biodiversity assessment for these major project activities. Impacts such as habitat destruction, dust, noise, and potential water pollution from these sites and from the transportation of the materials are not evaluated in the biodiversity chapter. The identification of material sources in Dushanbe and Yavan (ESIA Vol. 1, p. 87) does not absolve the project of responsibility for assessing the impacts at these critical linked facilities. The loss of habitat—whether Natural, Critical, or Modified with significant value—at quarries, new road alignments, construction camps, and resettlement sites is not quantified or compensated for. This is a major accounting and mitigation gap.</i></p>	<p>Volume 3 of the ESIA includes frameworks that establish requirements for contractor management programs for dust, noise, excavation spoil, blasting and explosives; and site rehabilitation applying equally to contractor activities at the main site and on quarries and other areas that may be affected. Adoption of these management programs is required by the project ESCP.</p>
121.	<p><b>Concluding Remarks and Recommendations</b>  <i>The ESIA documentation for the Rogun HPP represents a substantial effort to address a complex project.</i></p>	<p>We appreciate your acknowledgment of the complex nature of the project and recognition of the challenges it has posed regarding assessment of the environmental and social impacts and development of technically and financially feasible</p>

No.	Comment	Response
	<p><i>However, our review identifies significant and systemic inconsistencies and gaps that compromise a full and robust assessment of biodiversity risks. The assessment suffers from an over-reliance on a heavily modified baseline to downplay impacts, insufficient and outdated data (especially for aquatic ecosystems), an inadequately justified Area of Influence, and a superficial analysis of indirect, cumulative, and downstream impacts. The application of the mitigation hierarchy is selective, appearing to prioritize economic outcomes over the avoidance of biodiversity impacts, particularly concerning the Vakhsh River. The conclusion of no impacts downstream of the Vakhsh cascade is not credible from an ecological perspective and is inconsistent with the precautionary principle central to ESS6.</i></p> <p><i>To strengthen the ESIA and ensure full compliance with World Bank ESS6, the following key actions are recommended:</i></p> <p><i>The ESIA documentation for the Rogun HPP represents a substantial effort to address a complex project.</i></p> <p><i>However, our review identifies significant and systemic inconsistencies and gaps that compromise a full and robust assessment of biodiversity risks. The assessment suffers from an over-reliance on a heavily modified baseline to downplay impacts, insufficient and outdated data (especially for aquatic ecosystems), an inadequately justified Area of Influence, and a</i></p>	<p>mitigation measures. We look forward to continuing our dialogue to enhance the robustness of the project ESMP.</p>

No.	Comment	Response
	<i>superficial analysis of indirect, cumulative, and downstream impacts. The application of the mitigation hierarchy is selective, appearing to prioritize economic</i>	



ШЕКАРАСЫЗ  
ӨЗЕНДЕР

«Шекарасыз өзендер» Коғамдық қоры

Rivers without Boundaries Public Fund

БИН 230440031982

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RIVERS WITHOUT  
BOUNDARIES

Ref.# *RwBK-251202-1*  
Date: *December, 2 2025*

**To: World Bank Group**

**Ajay Banga**, President  
**Antonella Bassani**, Vice President, Europe and Central Asia  
**Axel van Trotsenburg**, Senior Managing Director  
**Anna Bjerde**, Managing Director of Operations

## **Re: Rogun HPP Project fails to comply with Biodiversity Conservation Standards**

Dear President Banga,

We are writing to warn you about the deeply flawed Environmental and Social Impact Assessment (ESIA) prepared for the Rogun HPP Project in Central Asia. Enclosed is an [independent review](#) ("Rogun Hydro vs Biodiversity") highlighting how this assessment fails to meet the World Bank's Environmental and Social Framework (ESF), specifically ESS6 (Biodiversity).

The Rogun HPP ESIA is based on the denial of obvious downstream impacts. It also substitutes the necessary scientific assessment of biodiversity impacts in different scenarios with vague political commitments.

The exclusion of downstream biodiversity from the baseline assessment is a critical failure. The Tigrovaya Balka World Heritage property—located downstream of the Vakhsh Hydropower Cascade—has also been omitted from environmental flow design and mitigation planning. Furthermore, the ESIA cancels the feasibility study for artificial floods, which was mandated by the terms of reference as a vital measure for the World Heritage site. Without these measures, the Rogun HPP will act as a death sentence for the Tigrovaya Balka floodplain forest and its critically endangered sturgeon. The ESIA similarly dismisses the possible drying out of Ramsar wetlands in Amu-Darya Delta during the reservoir's 16-year filling period.

Upstream, the application of ESS6 is alarmingly narrow, covering less than 2% of the inundation zone. A 90-kilometer stretch of the Vakhsh River and its valley are excluded from "Natural Habitat" classification, thereby bypassing ESS6 mitigation requirements. This negligence leaves endangered species—including the Central Asian Otter, Amu Darya Trout, Turkestan Catfish, and Egyptian Vulture—without protection.

At a time when freshwater ecosystems are disappearing faster than terrestrial ones, the Rogun HPP project represents a blatant disregard for conservation. Such an approach contradicts the Kunming-Montreal Global Biodiversity Framework. The World Bank, as a key guardian of global biodiversity finance, cannot afford to be the top donor for such destruction.

We strongly recommend that the World Bank suspends financing for this project until the ESIA is overhauled to comply with the ESF and ensure no net loss of biodiversity.

Please respond to us to the following email address: alex.kolotov@gmail.com, cc: coalition@riverswithoutboundaries.org



Sincerely,

Alexander Kolotov,

Director of **Rivers without Boundaries Public Fund**

on behalf of the 25 co-signatory CSOs listed below:

**Rivers without Boundaries International Coalition**  
**CEE Bankwatch**  
**International Socio-Ecological Union**  
**Nash Vek Public Fund, Kyrgyzstan**  
**Rivers & Rights**  
**Urgewald**  
**International Rivers**  
**NGO Forum on ADB**  
**Friends of the Earth US**  
**Association of Environmental Journalists, Russia**  
**Bureau for Regional Outreach Campaigns - BROCC**  
**Latinoamérica Sustentable, Regional-Latin America**  
**Jubilee Australia Research Centre**  
**International Indigenous Fund for development and solidarity "Batani"**  
**Centre for Financial Accountability, India**  
**Oyu Tolgoi Watch**  
**ECOSERVICE S Ltd., Kazakhstan**  
**Centre for Human Rights and Development (CHRD), Mongolia**  
**Gender Action**  
**Brics Policy Center**  
**Balkanka Association Sofia, Bulgaria**  
**Recourse**  
**Eco-TIRAS, Moldova**  
**World Heritage Watch**