

March 7, 2017

To Board Members and Advisors:

We write to express our concern regarding the use of GCF resources to support large hydropower in general, and in particular the following proposals in the GCF pipeline:

1. Qairokkum Hydropower Rehabilitation, Tajikistan
2. Upper Trishuli-1, Nepal
3. Tina River Hydro Project, Solomon Islands

Large hydropower is a non-innovative, last-century technology with dubious climate mitigation benefits and a long track record of exceedingly high financial, environmental, and social costs. Supporting such proposals would not be consistent with the Fund's goal, to promote a paradigm shift toward low-emission, climate resilient development, in the context of sustainable development. Further, large hydropower projects would not meet the GCF's selection criteria related to impact, paradigm shift potential, sustainable development, and efficiency and effectiveness. The reasons why the GCF should not support large hydropower are described in the annex, and briefly summarized here:

- Large dams are vulnerable to climate change: more frequent droughts make them inefficient and increased rainfall reduces their lifespan.
- Large dams exacerbate climate change: considerable amounts of greenhouse gasses, notably methane (30 times more potent than CO₂), are emitted from reservoirs; and their construction damages carbon sinks, including forests and rivers.
- Large dams harm biodiversity, which in turn impairs communities' capacity to adapt to a changing climate.
- Large dams can negatively affect local communities by impoverishing them, breaking social networks, and negatively affecting livelihoods and cultures.
- Large dams can become dangerous: climate change-related extreme weather events and earthquakes can cause dams to fail, jeopardizing lives and property downstream.
- Large dams are not economical and are ill suited to address urgent energy needs: recent studies clearly demonstrate that large dams typically suffer significant cost and time overruns.
- Better energy options are widely available and the GCF should play a fundamental role in promoting them.

Below, we illustrate our concerns regarding each of the three hydropower projects with publicly disclosed environmental and social assessments in the GCF project pipeline.

1. Qairokkum Hydropower Rehabilitation

We request that this project be rejected. The proposed financing is for the rehabilitation and safety improvements of the Soviet-era Qairokkum hydropower plant in northern Tajikistan, which began in 2014 with EBRD funds. It is a non-innovative project with no rationale for GCF support. The fact that the dam needs major works done to guarantee its safety reinforces our arguments on the unsuitability of large dams in a changing climate, where extreme weather events add more risks to already dangerous infrastructure. We wish to highlight a series of deficiencies with the project:

- Non-innovative project: The project aims to extend the life of a Soviet-era dam, built in the 1950s. Furthermore, the EBRD already provided a \$50 million loan to finance the first phase of the modernization and rehabilitation of the plant in 2014. Apart from upgrading the dam's spillway to cope with the possibility of increased flows into the reservoir because of climate change, the rationale for GCF support is entirely unclear. A climate change vulnerability modeling exercise was conducted, using funds provided by the Climate Investment Fund PPCR, but that is wholly insufficient to justify financing from the GCF, much less that it be eligible for consideration as a cross-cutting project.
- Deepens Tajikistan's already alarming overdependence on hydro: The PPCR's case study for Qairokkum¹ notes that 98% of electricity in Tajikistan is produced by hydropower, and dam productivity is already severely affected by climate change. Tajikistan's hydropower depends on river basins fed by glacial melt, and as the climate warms, models predict significant long-term reduction in flows as glaciers recede. Meanwhile, studies carried out by the IPCC indicate that rainfall in the region has decreased 20% since the 1950s. While the rehabilitation of the Qairokkum Dam claims to aim to protect against vulnerability to climate change, it instead reinforces the country's dependence on hydropower technology whose output will dwindle significantly over time in the face of climate change.
- Missed opportunity for transformational impact: According to the PPCR case study, hydropower generation in Tajikistan is lowest during the winter months, when energy demand is at its highest and approximately 70% of the population suffers from repeated electricity blackouts, generating annual financial losses of \$200 million. According to a World Bank study, frequent power cuts are considered the main obstacle to doing business in Tajikistan. Furthermore, the social impacts associated with electricity shortages in winter are severe, as people resort to burning coal and wood inside their homes. Allocating scarce GCF funds to Qairokkum would do nothing to address Tajikistan's most urgent energy need, which is the diversification of its renewable energy sources that complement the existing energy mix. Meanwhile, Tajikistan's renewable energy potential has not been studied in detail. GCF funds should instead be used to support those studies and projects aimed at implementing alternative renewable energy in the country.
- Fails to address critical environmental problems of the original dam: The project's ESIA² indicates that fish populations have been decreasing in the reservoir and in the Syr Darya River in recent years, in part because of the dam. The hydropower plant affects fish species because it cuts migration and because fish are killed when passing through the turbines. The irrigation component of the dam lacks protective measures in some of the water intake structures, which has resulted in more than 19 million fish being sucked in per year. Also, because of the changing water levels of the reservoir, spawning grounds are being dried and then flooded, destroying the eggs. The rehabilitation project was considered a clear opportunity to reduce fish mortality; however it did not consider the project (irrigation and hydropower) as a whole, failing to properly address the problem. The ESIA states that fish-friendly turbines could reduce the killing of fish passing through turbines by up to 90%, but does not clarify if these will be applied, and the project is being considered without identifying measures to sustain fish populations.

¹ [Case Study Qairokkum Hydropower: Planning Ahead For A Changing Climate](#)

² [Qairokkum Rehabilitation Environmental and Social Action Plan](#)

2. Upper Trishuli-1

Upper Trishuli-1 (UT-1) is not suitable for consideration at the Green Climate Fund and should be removed from the GCF project pipeline. It would have no transformational impact, it faces severe climate and disaster risks, and it would have significant impacts on indigenous communities and the environment that have not been adequately studied nor mitigation plans prepared. We wish to highlight the following deficiencies:

- No transformational impact: UT-1 is proposed as a conventional river diversion hydropower project, and would be one of about twenty such hydro projects currently planned on the river, in addition to 5 existing projects and 9 currently under construction both upstream and downstream. As such, there would be no demonstrable transformational impact or value added through the GCF's participation.
- Vulnerable to climate change: Climate change models predict that changing precipitation patterns will negatively impact hydropower generation in Nepal,³ and run-of-river hydro projects like UT-1 are particularly vulnerable to changes in river flows.⁴ Despite recognizing that increased climate variability, which can affect frequency and intensity of flooding and droughts, could affect Nepal's hydroelectric production, the project's environmental flows assessment notes that potential effects of climate change on flows in the Trishuli River have not been considered in the design of the project.⁵
- Deepens overdependence on hydro: Despite over 90% of its power coming from hydropower,⁶ Nepal's energy plans are almost exclusively focused on hydropower. Rather than deepen that overdependence, the GCF, with its transformative mandate, should be helping Nepal diversify its energy mix. Indeed, the World Bank notes that solar power in Nepal is the ideal complement to existing hydropower generation, which experiences severe load-shedding during the dry winter months.⁷ 86% of Nepal's population live in rural areas and would be better served by micro-hydro and solar power.
- Impacts on indigenous communities: The project is proposed in an area where the population is predominantly indigenous. Despite the ESIA identifying a series of impacts, including appropriation of community-held lands, no Indigenous Peoples Plan has been prepared and free, prior and informed consent (FPIC) has not been obtained. Attempting to approve Upper Trishuli-1 without FPIC would violate the rights of local indigenous communities and constitute a violation of the IFC Performance Standards, which serve as the GCF's interim environmental and social safeguards.
- Impacts on fish species not assessed: The project proposes to divert up to 90% of the river's flows,⁸ dewatering an 11 km stretch of the river for several months of the year. The environmental flows assessment lacks even basic data about the migration and spawning patterns of endemic fish species, but notes that more generous releases to sustain fish migration "would have a significant impact on the economic viability of the project."⁹

³ [Developing Nepal's Hydroelectric Resources: Policy Alternatives](#), University of Virginia, p. 17

⁴ [International Rivers Fact Sheet on Run-of-River Hydropower](#)

⁵ [Environmental Flows Assessment](#) p. 9

⁶ [Nepal Hydropower Development Program](#), USAID

⁷ [World Bank Nepal Grid Solar and Energy Efficiency Project Document](#) p. 4

⁸ [Environmental Flows Assessment](#) p. 43

⁹ *ibid*, p. 8

- Vulnerable to earthquakes: The project would be located roughly 55 km from the epicenter of the earthquake that struck in April 2015. The Upper Trishuli-3 hydroelectric project, under construction downstream of UT-1, was severely affected by that earthquake and construction has not yet resumed.¹⁰ The World Bank noted the need to review the design of UT-1 to assess its resilience to earthquakes,¹¹ but no such study is available.

3. Tina River Hydro Project

The 15 MW Tina River project is intended to reduce the Solomon Islands' reliance on imported diesel. We have strong reservations about the project's justification as a GCF project, the scope of its assessments, and the plans to mitigate the project's significant impacts. We wish to highlight a series of deficiencies with the project.

- Climate impacts not assessed: The project's environmental and social impact assessment (ESIA) recognizes that the project's efficiency will be affected if droughts occur,¹² and that the project area is also prone to heavy rains, flooding, and cyclones.¹³ Despite local weather patterns being particularly sensitive to warming seas,¹⁴ no assessment of the project's climate vulnerability has been conducted. Meanwhile, the project's ESIA recognizes that its reservoir will generate methane emissions by submerging vegetation and forests, yet fails to propose mitigation measures to reduce these emissions.¹⁵
- Threatens critical biodiversity: The catchment of the Tina River is a world-class biodiversity hotspot that is on UNESCO's Tentative List of World Heritage Sites for its unique biodiversity.¹⁶ While project construction would facilitate access to and increase pressures upon this remote and largely untouched area, these impacts are not adequately assessed. Mitigation plans should include designating the catchment as a protected area. Meanwhile, although the ESIA proposes an environmental flows regime to sustain fish species, the 55m-high dam itself will impede migratory fish. The ESIA acknowledges that it lacks sufficient biodiversity baseline data on which to prepare a mitigation plan.¹⁷
- Impacts on indigenous communities: Engagement with predominantly indigenous local communities began early on because of the area's recent history of conflict, and in recognition that the project would impact the river and adjoining ecosystems that serve as the basis for local livelihoods.¹⁸ Still, some community members have expressed reservations about the project's impacts and shown a lack of understanding about what changes the project will bring to the area.¹⁹
- High costs, likely underestimated: The Tina River project is estimated to cost \$140 million, with possibly \$60 million more required to meet financing costs and contingencies. Without subsidies,

¹⁰ [Nepal's Hydropower Battered but not Beaten by the Quake](#), IEEE Spectrum

¹¹ [World Bank Upper Trishuli-1 Aide Memoire](#) p. 1

¹² [Tina River ESIA](#), p. 540

¹³ *ibid* p. 321

¹⁴ [Current and Future Climate of the Solomon Islands](#)

¹⁵ [Tina River ESIA](#), p. 340

¹⁶ [UNESCO website](#)

¹⁷ [Tina River ESIA](#), p. 156, 224, 233

¹⁸ *ibid* p. 123

¹⁹ Tina River Affirmative Investigation Report, USAID, p. 2

these costs would result in prohibitive energy tariffs supplied by the dam.²⁰ Still, these costs are most likely underestimated, as recent studies show that large dams routinely end up costing double their initial budget.²¹ This risk is particularly acute in the Solomon Islands, as all materials will have to be imported and will most likely face additional logistical challenges. Beyond the construction costs, the Solomon Islands could be liable to pay for power, whether or not it is provided, as the consortium that will build and operate the dam for the first 30 years will reportedly charge a fixed annual rate, independent of the energy produced.²² This could entail significant financial risk for the borrower.

- Alternatives not properly assessed: The project's alternatives assessment briefly describes other energy options, but fails to demonstrate why the large dam project was preferred. There is considerable sustainable renewable energy potential in the Solomon Islands, such as solar, wind, mini-hydro, and geothermal energy, though its potential has not been mapped in detail.²³ The responsible use of an energy mix with all these sources would provide a more flexible, quicker, and likely cheaper solution to address the critical energy needs of the island state. The GCF should support efforts to assess sustainable energy options for the Solomon Islands.

Thank you for your kind consideration of our concerns, and we look forward to discussing these proposals with you in greater detail.

Sincerely,

Inter-American Association for Environmental Defense (AIDA)
International Rivers
Heinrich Böll Stiftung-North America
Friends of the Earth-US
BothENDS, The Netherlands
Beyond Copenhagen Collective, India,
Institute for Agriculture and Trade Policy
Institute for Policy Studies
Center for International Environmental Law (CIEL)

²⁰ *ibid* p. 79

²¹ [Should We Build More Large Dams? The Actual Costs of Hydropower Megaproject Development](#), Ansar et al

²² Tina River Affirmative Investigation Report, USAID, p. 12

²³ [Renewable energy opportunities and challenges in the Pacific Islands region: Solomon Islands](#), IRENA, p. 6

Annex: Reasons why GCF should not finance large hydropower

Large hydropower is vulnerable to climate change.²⁴ Large dams have always been designed based on the assumption that future stream-flow patterns will mirror those of the past, but with a changing climate, this is no longer true. On the one hand, extreme rainfall increases siltation of dams (reducing their useful lifetimes) and the risk of dam failures and catastrophic flood releases.²⁵ On the other, more frequent droughts are already making hydropower projects uneconomic all around the world, adding the burden of energy vulnerability to those countries that are overly dependent on hydropower, such as Nepal (more than 90% dependent on hydropower) and Tajikistan (98% dependent on hydropower).

Large dams exacerbate climate change. Hydropower reservoirs emit significant amounts of greenhouse gases, notably methane, a greenhouse gas 30 times more potent than CO₂.²⁶ Methane emissions from dams are particularly intense in tropical regions, as is the case for the Solomon Islands. A recent study by researchers at Washington State University confirmed that methane emissions released from dam reservoirs are far greater than previously believed, accounting for 1.3% of all human-caused climate change - more than all emissions from Canada.²⁷ In some cases, hydropower projects emit more greenhouse gases than coal-fired power plants generating the same amount of electricity.²⁸

Large dams harm biodiversity. Large dams harm biological diversity by flooding land, cutting off migration routes, reducing flows to downstream habitat and changing the nature of a river's estuary, where many of the world's fish species spawn. In 2016, WWF's Living Planet report found that the world had lost 81% of its freshwater populations since 1970 due to dams and other factors.²⁹

Dams can cause severe negative impacts on local communities. Large dams often result in large-scale displacement that seriously impacts local communities by impoverishing them, breaking social networks, and negatively affecting livelihoods and cultures.³⁰ By the year 2000, dams around the world had forced the displacement of between 40 and 80 million people,³¹ and negatively affected an estimated 472 million people living downstream.³² They have disproportionately affected indigenous peoples, violating their rights to their lands, territories, resources, governance, cultural integrity, and free, prior and informed consent (FPIC).³³ Dam reservoirs are also known to increase the proliferation of mosquitoes, and has led to significant increases in mosquito-borne diseases such as malaria.³⁴

²⁴ Read more in International Rivers' [Hydropower and Climate Change Fact Sheet](#)

²⁵ There have been multiple dam disasters linked to heavy weather events, such as the Ukai Dam in India; Yaciretá in Argentina; Baixo Iguazú in Brazil; San Francisco and South Fork in the United States; and Malpasset in France, among others.

²⁶ [A more potent greenhouse gas than carbon dioxide, methane emissions will leap as Earth warms](#), Princeton University

²⁷ [Reservoirs are underappreciated source of greenhouse gases](#), Washington State University

²⁸ [Methane release below a tropical hydroelectric dam](#), Kamenes et al

²⁹ [Living Planet Report 2016](#), World Wildlife Fund

³⁰ PUENTES Riaño Astrid, KOPAS Jacob. Grandes Represas en América: [¿Peor el remedio que la enfermedad?](#) Asociación Interamericana Para La Defensa Del Ambiente (AIDA) (2009)

³¹ [World Commission on Dams Report](#) p. xxx

³² [The World Commission on Dams + 10: Revisiting the Large Dam Controversy](#), Water Alternatives, p. 5

³³ [World Commission on Dams Report](#) p. 110

³⁴ [Malaria impact of large dams in sub-Saharan Africa: maps, estimates and predictions](#), KIBRET, Solomon et al. Malaria Journal. (2015)

Dam safety concerns make large dams dangerous. Given the lifespan of dams, their safety remains a serious issue. The recent crisis of the Oroville Dam in California has put the issue of dam safety in the news, demonstrating how dangerous dams can be. The combination of record high rainfall and a damaged spillway led to the evacuation of 200,000 residents located downstream of the dam for several days.

Large dams are not economical and take too long to solve urgent energy needs. A recent study from the University of Oxford concluded that “even before accounting for negative impacts in human society and the environment, the actual construction costs of large dams are too high to yield a positive return.” The study found overwhelming evidence that large dam budgets are systematically biased below actual costs and that, on average, their costs were double the budgeted costs.³⁵ Other technologies, such as wind and solar, are significantly less financially risky.³⁶ Furthermore, experience has shown that dams rarely take the time initially envisioned to be operationalized.³⁷ As such, large dams are not effective to solve immediate energy needs, such as those currently experienced in the Solomon Islands and Nepal.

Better energy options exist, and the GCF could play a fundamental role in promoting them. In 2015, the world added 63 GW of wind and 47 GW of solar power compared to only 22 GW of large hydropower capacity, which declined two years in a row.³⁸ Wind and solar technologies are readily available and financially competitive, quicker to deploy, and less vulnerable to a changing climate. Innovations in smart grids and the dropping prices of battery storage offer ways of dealing with the intermittency of these technologies without the need for additional hydropower reservoirs.

A recent report elaborated by the independent Dutch Sustainability Unit of the Netherlands Commission on Environmental Assessment, in request by the Dutch Ministry of Foreign Affairs on the sustainability of large dams, demonstrated that often options more sustainable than dams are not transparently considered, largely through an underestimation of the risks. These risks include “resettlements and human rights, negative effects on ecosystem values, operational and economic performance risks including time overruns.” They advise putting more emphasis on the rigorous consideration of alternatives before choosing large dam options and shifting attention to the development of a transformative change, away from large dams.³⁹

³⁵ [Should We Build More Large Dams? The Actual Costs of Hydropower Megaproject Development](#), Ansar et al

³⁶ [An international comparative assessment of construction cost overruns for electricity infrastructure](#), Sovacool et

al

³⁷ Ansar, et al

³⁸ [2016 Renewable Capacity Statistics](#), IRENA

³⁹ [2016 Better Decision-Making about Large Dams with a View to Sustainable Development](#), Dutch Sustainability Unit of Netherlands Commission on Environmental Assessment.