

UNOFFICIAL ENGLISH TRANSLATION

To Norges Bank

24 February 2022

Recommendation to exclude NHPC Ltd from investment by the Norwegian Government Pension Fund Global

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Summary

The Council on Ethics recommends that NHPC Ltd (NHPC) be excluded from investment by the Norwegian Government Pension Fund Global (GPF) due to an unacceptable risk that NHPC is responsible for or contributes to severe environmental damage.

NHPC (previously the National Hydroelectric Power Corporation Limited) is an Indian company that is majority-owned by the Indian government. NHPC is listed on stock exchanges in Mumbai (BSE and NSE) in India. As of 31 December 2020, the GPF owned 0.19 per cent of NHPC's shares, worth a total of NOK 50 million. NHPC develops, owns and operates a range of hydropower projects, including the Lower Subansiri Hydropower Project (the Project) currently under construction. When completed, the Project will be the largest hydropower scheme in India, with an installed capacity of 2,000 MW.

The Project has been controversial for more than 20 years. The agreement with the construction contractor was signed in 2003 but due to conflicts and challenges related to licensing and land acquisition, construction works did not start until 2005. At that stage, the scheme was scheduled enter operation in 2010. Various issues have resulted in further delays with multiple stops in construction. At present, the Project is expected to become operational in 2022–2023.

The Project's size, location and proposed operational regime have resulted in protests and allegations of harm to local people's livelihoods and important biodiversity. The reservoir will inundate 33.5 km² that mainly consist of forest areas in a region known as the Eastern Himalaya Biodiversity Hotspot, one of 36 global biodiversity hotspots. Areas that will be lost are partly located in international Key Biodiversity Areas, where species new to science have recently been found in the forests to the west of the project area. There are endemic and threatened species in the project area, which will be adversely affected by the Project.

The Project is planned for hydro-peaking operations. This means that the power plant will be run at full or near full capacity during parts of the day when demand for power is high (typically in the morning and/or in the evening), and with very low capacity at other times of the day. The hydro-peaking operations appear planned with variation from 240 m³/s (very low capacity) to 2,579 m³/s (full capacity). This will result in very high river flow variations downstream of the dam, which will have destructive environmental impacts, including for the endangered Ganges River Dolphin. The large fluctuations in river flow also represents a safety hazard to the many people living along a 126 km section of the river.

NHPC has neither replied to the Council on Ethics' questions nor commented on a draft recommendation for the company's exclusion.

The Council considers that NHPC is responsible for the project impacts because the company controls planning and construction and will, as the owner, be responsible for operating the completed power plant. The Council considers that the risk of severe environmental damage is unacceptable, due to inundation of a large forest area containing internationally important biodiversity. The hydro-peaking operations will result in long-term and wide-ranging environmental damage downstream of the power plant, including harm to threatened species. It also poses a substantial risk to local people living along the river. The Council also emphasises the fact that the environmental studies that informed project decision-making appear to be inadequate, and that NHPC has not provided information about meaningful measures to avoid, minimise and mitigate adverse impacts.

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1 Introduction

The Council on Ethics has assessed the investment by the Norwegian Government Pension Fund Global (GPF) in NHPC Ltd (NHPC)¹ against the Guidelines for Observation and Exclusion from the GPF (the ethical guidelines).² The Council has considered NHPC's Lower Subansiri Hydropower Project in northeastern India and the environmental damage and risks to people's lives, health, and safety that will probably result from completion and operation of the power plant.

NHPC Ltd is listed on stock exchanges in Mumbai, India (BSE and NSE). As of 31 December 2020, the GPF owned 0.19 per cent of the company's shares, worth a total of NOK 50.3 million. The Company builds, owns and operates hydropower projects.

1.1 Matters considered by the Council

The Council has considered whether there is an unacceptable risk that, by constructing and operating the Lower Subansiri Hydropower Project, NHPC is contributing to or is itself responsible for severe environmental damage, pursuant to section 4(e) of the ethical guidelines. In particular, the Council has considered the environmental damage due to inundation of biodiversity-rich forest areas and the risks to biodiversity and local people due to hydro-peaking operations.

When considering potentially severe environmental damage, the Council normally assesses the extent to which:

- the damage is substantial,
- the damage has irreversible or long-term effects,
- the damage has a considerable negative impact on human health and lives,
- the damage is a result of violations of national legislation or international norms,
- the company has failed to implement measures to avoid damage,
- the company has implemented adequate corrective measures, and
- it is likely that the company's unacceptable practice will continue.

With respect to international norms, the Council on Ethics has placed particular emphasis on international standards such as those of the World Bank. Multiple standards relevant to hydropower development were in place during the 1980s, 1990s and 2000s when the Lower Subansiri Project was planned. These standards include the World Bank's Operational Policy (OP) 4.01 on Environmental Assessments (first version in 1989) and later OP 4.04 on Natural Habitats, which defined clear requirements for projects such as the Lower Subansiri Hydropower Project. Requirements included commissioning studies and assessments by recognised experts, consideration of project alternatives to prevent and minimise adverse impacts, and particularly stringent requirements where there are risks to natural or critical habitats.

The Project has also triggered involuntary resettlement in the reservoir area. However, this aspect has not been assessed, partly due to limited available

¹ Issuer ID: 7621683.

² [Guidelines for Observation and Exclusion GPF 29 November 2021 \(regjeringen.no\)](#)

information about the resettlement and partly due to the reportedly moderate extent of physical displacement.

Experts have also criticised dam safety, since the project area is seismically active and construction of a large dam represents a risk of dam breach and flooding downstream. Limited available information on dam safety has meant this issue is not discussed further in this recommendation.

The Company is also constructing and planning additional large hydropower projects that have attracted fierce criticism. The Council on Ethics has not assessed these projects.

The Council's assessment of future risk is also affected by available information about the company's conduct. In this context, the Council attaches importance to several government reports (white papers) to the Norwegian parliament (Storting) stating that a lack of information, particularly when a company is unwilling to share information, could contribute to the risk being considered unacceptable.

1.2 Sources

This recommendation is mainly based on articles obtained through searches of scientific journal databases, assessments commissioned by Indian authorities available online and, to a lesser extent, information on NHPC's website.

The company has not responded to the Council's requests for information concerning the Project, nor commented on a draft recommendation to exclude it. NHPC has indicated that what information it is able to share is available on its website and that of the Indian Ministry of Energy. On its English-language website, however, NHPC publishes limited information concerning the Lower Subansiri project's impacts on the environment and the safety of local communities. The Council has reviewed available information in English, including Environmental and Social Impact Assessments for the Project.

2 Background

2.1 NHPC Ltd

The Indian company NHPC (previously the National Hydroelectric Power Corporation Limited) is majority-owned by the Indian government. Over the past ten years, the Indian state has gradually reduced its ownership interest from approximately 80 per cent to approximately 71 per cent of the shares at present.³ The remaining 29 per cent of the shares are traded on stock exchanges in India.

The company operates a range of hydropower projects with a cumulative installed generating capacity of more than 6,000 MW and plans a major increase in this capacity in the coming years.

For a number of years, the company has received substantial criticism related to projects in India, where most of its projects are located. However, it has also been criticised for a project on the border between India and Pakistan that has been completed, and for its engagement in potential projects in Myanmar.

³ NHPC (2021). *Annual report 2020-21*. p. 68.

The company develops projects with assistance from consultants and contractors. NHPC typically owns the projects and operates them after their completion.

2.2 Lower Subansiri Hydropower Project

2.2.1 Key project data

The Lower Subansiri Hydropower Project is on the Subansiri River in Arunachal Pradesh State on the border with Assam State in northeastern India. The river, which originates in the Himalayas, is the largest tributary of the upper Brahmaputra. The Subansiri River contributes approximately 10 per cent of the water flow in the Brahmaputra. The Lower Subansiri dam, which is currently under construction, is 126 km upstream of the confluence between the Subansiri River and the Brahmaputra (see Figure 1).

When complete, the Project will be largest hydropower scheme in India, measured by installed capacity (2,000 MW). The reservoir created upstream of the dam will cover an area of 33.5 km² at completion, with the upper end of the reservoir 47 km upstream of the dam.⁴ Table 1 summarises key project data.

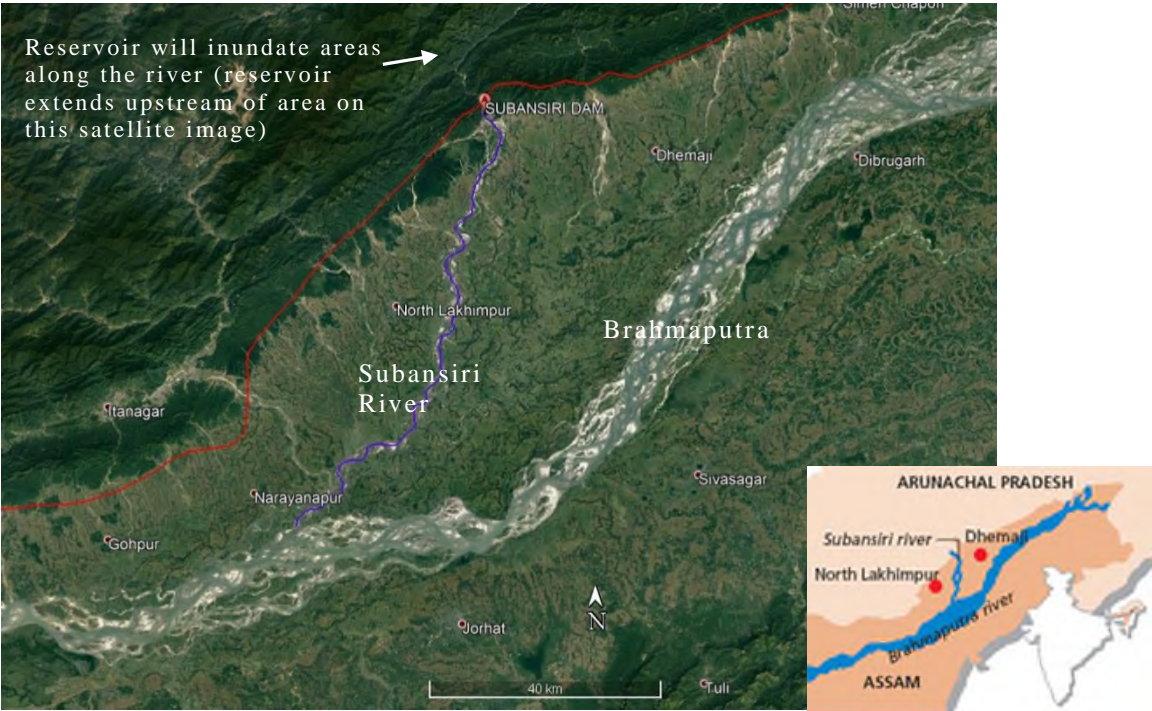


Figure 1: Illustration of the Subansiri River between the dam and the confluence with the Brahmaputra (the 126 km long river section is indicated by the purple line).

⁴ NHPC refers to 47 km. Other sources refer to the reservoir reaching 75 km upstream, see Key Biodiversity Areas Partnership (2020a). *Key Biodiversity Areas factsheet: Subansiri*. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Global Wildlife Conservation, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Available from: <http://www.keybiodiversityareas.org/>

Table 1: Key project data for the Lower Subansiri Hydropower Project, India.⁵

Key Data	Description
Developer	NHPC Ltd
Construction start	2005
Commissioning	2022-2023 (planned)
Installed capacity	2,000 MW (8 x 250 MW Francis turbines in a surface power station)
Annual production	7,400 GWh (estimated)
Dam	Width: 284 m. Height: 130 m.
Headrace tunnels and penstock	8 headrace tunnels with 9.5 m diameter and length from 608 m to 1,168 m. 8 surge tunnels with 9.5 m diameter and length from 400 m to 485 m. 8 penstocks with diameter 7-9.5 m and length from 400 m to 485 m.
Tailrace canal	Length: 35 m. Width: 206 m.
Regulation	24 m (between 181 m and 205 m).
Reservoir	Total volume: 1,365 mill. m ³ . Active storage: 645 mill. m ³ (between 181 m and 205 m). Active storage corresponds to 69 hrs operation at 2,579 m ³ /s.

Available documentation indicates there are relatively few people living in the future reservoir area. Since the start of the Project, NHPC has reported that involuntary resettlement is limited to 77 families.⁶

The Project is planned for hydro-peaking operations, which means the power station will run at full or near full capacity at times of the day and/or night when demand for power is high (typically morning and/or evening), and with very low capacity during the rest of the day/night. Hydro-peaking is normally practised during periods of the year when the river flow is relatively low, when there is not sufficient water to run the plant at full capacity all the time. There is limited information about how the hydro-peaking operations will be undertaken and which preventive and mitigation measures will be implemented.

At full capacity, the plant will release approximately 2,579 m³/s to the river downstream of the power station. Information about the environmental minimum flow release is inconsistent. The company refers partly to 6 m³/s and partly to 240 m³/s as the environmental minimum flow release downstream.⁷

Two additional projects are planned upstream, which will nearly triple the installed capacity on the river if they are constructed. NHPC is no longer responsible for planning these other projects, since privately owned entities appear to have taken over the rights to develop them.

2.2.2 Status of the Project

Controversies associated with the Lower Subansiri Hydropower Project have

⁵ Based on different sources including <https://www.power-technology.com/projects/lower-subansiri-hydroelectric-power-project/> and <http://www.nhpcindia.com/projectdetail.htm?CatId=2&ProjectId=29>.

⁶ See e.g.: NPHC (2011). *Six monthly progress report on environmental aspects for the period ending November 2011*, and, NHPC (2021). *Six monthly progress report on environmental aspects for the period ending March 2021*.

⁷ See for instance references in footnote 6.

materially affected its progress. Following various conflicts lasting several years, an agreement with the construction contractor was signed in December 2003. Due to conflicts and problems obtaining licences and acquiring the necessary land, construction did not start until 2005. Planned completion was at that stage 2010. Further delays and stops in construction due to conflicts, poor rock conditions during tunnelling and the collapse of project infrastructure due to floods, landslides, etc. resulted in the completion date being put back multiple times. The Project was approximately 50 per cent complete in 2013, when construction was halted for a prolonged period due to the strong opposition to it.

In July 2019, the National Green Tribunal gave the green light for restarting construction. The authorities in Assam State and NHPC signed a Memorandum of Understanding concerning the Project in August 2019, which resulted in approval for further construction. Completion is currently scheduled for 2023, with the first generating units due for commissioning in the second half of 2022. NHPC has reported that 72 per cent of the work had been completed by June 2021.⁸

2.3 Biodiversity in the project area

The project area lies within one of the 36 global biodiversity hotspots (*Eastern Himalaya Biodiversity Hotspot*). Species new to science are regularly discovered there, including the recent finding of new species in forest areas in the Lower Subansiri District west of the Project. Within the areas affected by the Project, there are protected areas and areas characterised as *Key Biodiversity Areas* (see Figure 2). The Project will also affect rare and threatened species. Section 3 below includes further information on the biodiversity in the project area.

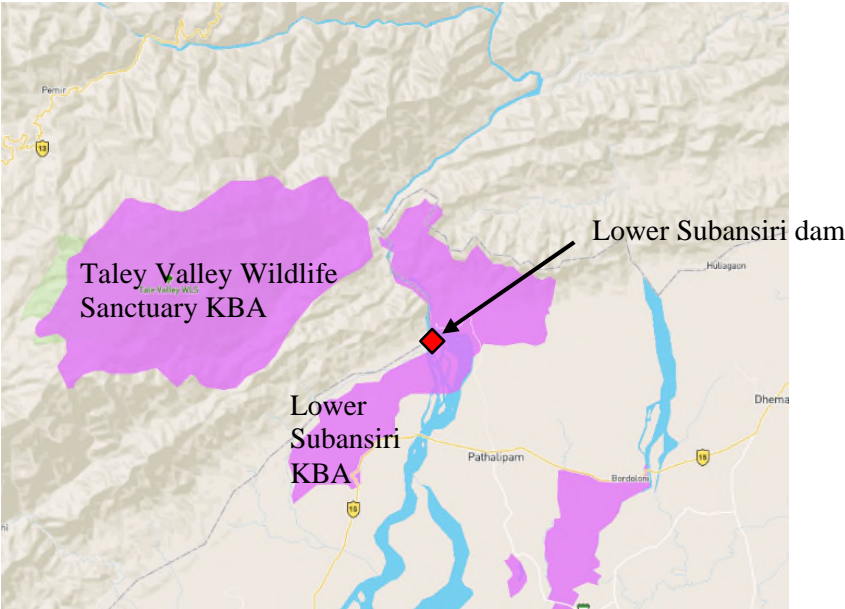


Figure 2: Location of the Taley Valley Wildlife Sanctuary Key Biodiversity Area (KBA), the Subansiri Key Biodiversity Area and the Lower Subansiri dam. Note: Neither Reserved Forests nor the inundated area upstream of the dam are indicated on the map.

⁸ NHPC (2021). *Annual Report 2020-21*. p. 21.

2.4 Other large hydropower projects along the Subansiri

Further large hydropower projects are being planned upstream. The Middle Subansiri Hydropower Project (1,600 MW) is planned 75 km upstream, while the Upper Subansiri Hydropower Project (2,000 MW) is planned 90 km upstream of the Lower Subansiri project (see Figure 3).



Figure 3: Location of three large hydropower projects along the Subansiri River, where the Lower Subansiri project is under construction and the two other projects are being planned.

3 Environmental damage

Hydropower projects supply important renewable energy, but it is well-documented that such projects can have highly adverse impacts on people and the natural environment. The magnitude of the impacts varies immensely from project to project. Hydropower projects must therefore be considered on the basis of project-specific characteristics and site-specific conditions. Site selection and project design are typically the most important factors that influence the magnitude of their impacts. Well-informed considerations of different project alternatives and measures that can be taken to avoid, minimise and mitigate adverse impacts are therefore crucial.

This recommendation focuses on long-term impacts during the project operation phase, particularly the impacts on biodiversity in areas to be inundated and along sections of the river downstream of the dam that are affected by hydro-peaking operations. Impacts during construction and impacts caused by involuntary resettlement, both of which are important, have not been considered.

3.1 Reservoir and inundated area

Considerable expanses of forest and a total area of approximately 33.5 km² (3,350 ha) will be inundated by the reservoir. The inundated area is partly within the valley

that the river has eroded over time and partly in side-valleys on both sides of the river. The areas are dominated by natural vegetation and natural habitats for plants and animals (see Figure 4). The forest area lies within one of the world's most biodiversity-rich areas (*Eastern Himalaya Biodiversity Hotspot*) and overlaps with multiple protected areas. The future reservoir will inundate 42 hectares of the Taley Valley Wildlife Sanctuary, which is also categorised as a *Key Biodiversity Area* internationally, and parts of the Taley Valley Reserved Forest, which covers a larger area than that encompassed by the more stringent protection designation of 'wildlife sanctuary'.⁹ The Lower Subansiri Hydropower Project is highlighted as the most direct threat to these important biodiversity areas.¹⁰



Figure 4: Forest areas upstream of the dam that will be affected by inundation.

⁹ "Reserved Forest" is a protected area at state rather than national level. "Wildlife Sanctuary" is a stricter form of protection that corresponds to IUCN protected area management category IV.

¹⁰ Key Biodiversity Areas Partnership (2020b). *Key Biodiversity Areas factsheet: Taley Valley Wildlife Sanctuary*. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Global Wildlife Conservation, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Tilgjengeleg frå: <http://www.keybiodiversityareas.org/>. Key Biodiversity Areas Partnership (2020a). See above for full reference.

Endemic and threatened species have been found in the region's forests, species new to science area regularly discovered in these forest areas,¹¹ and it is likely that additional species new to science will be found here in future.

This is also highlighted in the cumulative impact assessment for the Subansiri River and catchment undertaken after start of project construction.¹² The cumulative assessment also highlights that the Lower Subansiri Project is located in the richest part of a very biodiversity-rich catchment.¹³

In addition to the area required for the reservoir, the hydro-peaking operations will result in substantial daily variations in the reservoir's water level (a difference of 24 m between 181 m and 205 m). Such frequent variations in the reservoir's water level will result in erosion and small landslides along the shorelines. The affected areas will therefore be larger than the reservoir area itself. The extent of erosion and landslides beyond the planned inundation area depends on topography and soils around the reservoir, which appear to have been studied only to a small extent or not at all.

In addition to the large forest areas upstream of the dam, there are some forest areas surrounding the power station area that will be affected by the Project. These areas include parts of the Subansiri Key Biodiversity Area and the Subansiri Reserved Forest (see Figure 2 above).

The studies that were the basis for the decision to construct the Project in the early 2000s do not appear to be based on surveys and analysis of the biodiversity values in the affected area to any significant extent. The region's abundant biodiversity value has been known and documented for a long time, also prior to construction start,¹⁴ but this information does not appear to have been taken into account in the decision to construct the Project. The project studies have subsequently been characterised as highly deficient. For instance, in relation to the assessment of areas that may qualify as Key Biodiversity Areas, the project studies were described thus: "*The Environmental Impact Assessment Report that has been submitted by the project authorities has glaring errors in the biodiversity and wildlife components.*"¹⁵

¹¹ See e.g.: Behera, M.D., Kushwaha, S.P.S. & Roy, P.S. (2002). High plant endemism in an Indian hotspot – eastern Himalaya. *Biodiversity and Conservation*, 11: 669-682.

Saikia, B., Sinha, B. & Kharkongor, I.J. (2017). A second record of the Eastern Spadefoot Toad (Amphibia: Anura: Megophryidae: *Leptobrachium bompu* Sondhi & Ohler, 2011) with a note on its morphological variations and natural history. *Journal of Threatened Taxa*, 9(9): 10692-10696.

<http://doi.org/10.11609/jott.3300.9.9.10692-10696>

Sondhi, S., Basu, D.N., Sondhi, Y. & Kunte, K. (2020). A new species of *Metallophilia* Warren, 1895 (Lepidoptera: Geometridae: Geometrinae), and notes on *M. opalina* (Warren, 1893), from eastern Himalaya, India. *Zootaxa*, 4838(2): 289-297. <https://doi.org/10.11646/zootaxa.4838.2.9>

Akhil, M.K., Krishna, N., Amrutha, A. & Nampy, S. (2021). A new species of *Lysionotus* (Gesneriaceae) from Arunachal Pradesh, India. *Journal of Asia-Pacific Biodiversity*, 14: 116-120.

<https://doi.org/10.1016/j.japb.2020.09.009>

Borah, D. & Joe, A. (2018). A new species of *Lysionotus* (Gesneriaceae) from Northeastern India. *Taiwania*, 63(3): 232-234. DOI: 10.6165/tai.2018.63.232

¹² Central Water Commission (2014). See full reference above.

¹³ Central Water Commission (2014). p. 400. See full reference above.

¹⁴ See e.g.: Behera, M.D., Kushwaha, S.P.S. & Roy, P.S. (2002). High plant endemism in an Indian hotspot – eastern Himalaya. *Biodiversity and Conservation*, 11: 669-682.

Critical Ecosystem Partnership Fund (2005). *Ecosystem Profile Eastern Himalayas Region*.

¹⁵ Key Biodiversity Areas Partnership (2020a, 2020b). See above for full references.

3.2 Areas downstream of the dam and hydro-peaking operations

3.2.1 Risks to local people

The operational regime for the power plant does not appear to be clearly defined or communicated to affected people. This probably means that a large number of people along the downstream river section have no access to important information about future risks associated with hydro-peaking, such as rapid changes in water level and flow, including flood waves that can overwhelm people and livestock and represent a threat to life, health and safety along the river (see Figure 5).

Hydro-peaking operations will inevitably result in major adverse impacts to local people living along the river and those using the river. There will be substantial erosion both in the river and on the riverbanks, which will also result in loss of usable land along the river. This may result in the need for substantial compensation and resettlement of people after project operations commence. The Council has not found any documentation to indicate that these issues have been adequately considered or that preventive or mitigation measures have been implemented.



Figure 5: Illustration of land use downstream of the dam, where hydro-peaking will result in substantial impacts (between the dam and the Brahmaputra).

3.2.2 Impact on important biodiversity

Most of the land downstream of the dam appears converted to agriculture, grazing and various human activities. As a result, it probably has little or no value with respect to biodiversity. Yet even though important biodiversity has been lost along the river's banks, the river itself is of great biological importance.

The river section between the dam and Brahmaputra (126 km) does not appear to have been well surveyed for aquatic life as part of the Project. Nevertheless, this part of the Subansiri River is, among other things, known to be important for the

endangered Ganges River Dolphin (*Platanista gangetica gangetica*).¹⁶ This species is also listed in Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which is the category for the most threatened species for which international trade is prohibited. Nationally, the species is listed in Schedule 1 of the legislation protecting wild plants and animals, which is the most stringent category of protection (Wildlife Protection Act, 1972). Earlier studies have indicated that approximately nine per cent of the entire dolphin population in the Brahmaputra River system live in the Subansiri.¹⁷

A cumulative assessment of hydropower development along the Subansiri River (2014) characterised the Subansiri catchment as "extremely rich in fishery resources".¹⁸ The Lower Subansiri was the project area where most species had been identified (more than 90 fish species), species that are partly economically important and partly of biodiversity concern (endemic or threatened species).

Having reviewed the methods and equipment used to collect data for the cumulative assessment, the Council concludes that the number of fish species identified would probably have been higher had the studies applied more types of equipment. This would have reduced the studies' selectivity and increased the representativeness of the survey results, thereby providing a more complete picture of the fish fauna in the river. This underlines how rich the river is in terms of biodiversity.

Lack of clarity on the operational regime for hydro-peaking and measures to prevent and mitigate its impacts means that the magnitude of those impacts is uncertain. Nevertheless, available information indicates that there will be highly adverse impacts on aquatic life and important biodiversity between the dam and the Subansiri-Brahmaputra confluence 126 km downstream. The adverse impacts will be greatest in the upper part of this river section and will abate with increasing distance downstream as other, but much smaller, rivers join the Subansiri River.

The hydro-peaking operations will to a large extent destroy the Subansiri River as a habitat for most life in the river between the dam and the Brahmaputra.¹⁹ Hardly any aquatic life will survive in the upper sections, with such extreme variation in water flow and fundamental changes of the habitat on a daily basis during periods of hydro-peaking operations. There will be large-scale erosion of the riverbed and riverbanks due to frequent changes in water flow downstream of the dam as well as the water exiting the reservoir will have increased capacity to carry sediment due to "loss" of sediment in the water caused by sedimentation within the reservoir. Water temperature and water quality will probably vary substantially with the variation in flow downstream of the dam. The habitat characteristics for aquatic life will be extremely variable and transient during hydro-peaking operations. Life in the river will become stranded during low-flow periods (drying out or being caught in pools where organisms will be subject to predation or be caught by people). The Ganges

¹⁶ The Ganges River Dolphin is categorised as "Endangered" in the international Red List (IUCN Red List, <https://www.iucnredlist.org>).

¹⁷ Wakid, A. (2005). *Conservation of Gangetic Dolphin in Brahmaputra River System, India*. Final Technical Report. Gangetic Dolphin Conservation Project, Assam.

¹⁸ Central Water Commission (2014). Cumulative impact and carrying capacity study of Subansiri sub basin including downstream impacts. Volume I. p. 391.

¹⁹ Baruah, D., Hazarika, L.P., Bakalial, B., Borah, S., Dutta, R. & Biswas, S.P. (2012). A grave danger for the Ganges dolphin (*Platanista gangetica* Roxburgh) in the Subansiri River due to a large hydroelectric project. *Environmentalist*, 32: 85-90. DOI 10.1007/s10669-011-9375-0

River Dolphin is particularly vulnerable to a hydropower project that reduces the river flow and water depth, which will happen during hydro-peaking. The dolphin will also be affected by reduced access to food due to the adverse impacts on the fish on which the dolphin depends.

In 2010, a government-appointed expert group that reviewed the Project concluded that a minimum flow of 6 m³/s would destroy aquatic flora and fauna, including the dolphin population, in the Subansiri.²⁰ The expert group recommended 400 m³/s as a minimum flow downstream of the dam during the drier period of the year,²¹ which is closer to the low-flow conditions that can be experienced during natural variation.

According to the cumulative impact assessment from 2014, NHPC has informed that one out of the eight turbines will be in continuous operation (either fully or partially) and will release between 220 and 322 m³/s downstream on a continuous basis.²² The cumulative assessment referred to 240 m³/s as a critical minimum river flow for the Ganges River Dolphin and aquatic biodiversity. The assessment assumed that during the drier part of the year, the power plant would release 240 m³/s downstream for 20–21 hours a day (and at the same time store a portion of the inflowing water in the reservoir), while for 3–4 hours the power plant would run at full capacity and release 2,579 m³/s (and at the same time draw down the reservoir level). NHPC has not responded to the Council's questions about the planned operating regime.

If we assume the above-mentioned daily regime, the water flow downstream of the dam will increase approximately ten times for 3–4 hours before being reduced for 20–21 hours to a level well below the low-flow conditions normally experienced in the dry season. Such a river flow regime is highly unnatural and represents a habitat instability that will be almost impossible for river life to adapt to.

3.3 Other impacts

There is very little, if any, discussion in the available information about the reservoir's potential impacts on water quality. The risk of stratification of the water column in the reservoir (lighter and warmer water above, with heavier and cooler water below) does not appear to have been considered, even in the cumulative impact assessment in 2014. Such stratification of the water column due to differences in water temperature is relatively common in large reservoirs around the world and can result in water with little or no oxygen in the deeper areas, changes in water quality and temperature and, at times, the accumulation of toxic substances in the deep water. If the water released downstream (through the turbines or bottom gates in the dam) is taken from the lower part of the water column, poor quality water (e.g. a low oxygen level or toxic substances) may result in substantial adverse impacts downstream, both for local people using the water and particularly for aquatic life. This risk does not appear to have been considered and mitigation measures are not described.

The dam and power station represent a barrier to upstream fish migration and potentially other migrating aquatic species. There are multiple fish species in the

²⁰ Expert Group (2010). *Report on downstream impact study of the ongoing Subansiri Lower Hydroelectric Power Project at Gerukamukh of National Hydroelectric Power Corporation Limited*. Expert Group of Gauhati University, IIT Guwahati, & Dibrugarh University.

²¹ Expert Group Report 2010. See above for full reference.

²² Central Water Commission (2014). p. 311. See above for full reference.

river known to migrate seasonally with increasing river flow. The dam blocks upstream fish migration and the height of the dam in practice makes it very challenging if not impossible to establish an upstream fish passage. As most of the water will pass through the turbines under high pressure, any organisms migrating downstream will likely not survive downstream migration. The Project will therefore act as a barrier to both upstream and downstream migration and contribute further to loss of habitat and fish populations.

4 Information from the company

The Council on Ethics has sent a letter with questions to NHPC Ltd. but has not received any response. Nor has the Council received comments from the company on a draft recommendation to exclude it. Similarly, the company did not respond to questions from the Council in 2012–2013 concerning the Lower Subansiri Hydropower Project and two potential hydropower projects in Myanmar (Tamanthi and Shwezaye). The company has stated that such information as can be shared is already publicly available.

5 The Council on Ethics' assessment

Based on available information, the Council on Ethics has considered whether there is an unacceptable risk that NHPC is responsible for or is itself contributing to severe environmental damage.

NHPC is responsible for the construction of the Lower Subansiri Hydropower Project and will also own and operate the power plant once it has been completed. The company is therefore directly responsible for the environmental damage caused by the Project.

The Council considers that the company will inundate a substantial forest area containing internationally important biodiversity. Available information suggests that these forest areas were not sufficiently studied and assessed during site selection and project design, even though their value and importance were known at the time of project planning. This is contrary to national regulations and international standards, such as those of the World Bank, which require a project to commission appropriate field studies by competent experts, analyse risks and impacts as well as consider alternatives to avoid, minimise and mitigate adverse impacts. For areas important to biodiversity, there are particularly stringent requirements to avoid and minimise risks.

The company plans to operate the Project as a hydro-peaking plant during the drier periods of the year. This will result in large daily fluctuations in river flow and in water levels downstream of the dam along a 126 km long section between the dam and the confluence of the Subansiri River and the Brahmaputra. The Council considers that such flow variations will have severe negative impacts on life in the river, including threatened species.

The Council also considers that the flow variations represent a substantial risk to local people's lives and safety, and that people living along the river may have to be resettled due to loss of land from erosion and collapsing riverbanks. The operational regime does not appear to be clearly defined or communicated to local people along

the river. The Council considers this in itself to be highly unfortunate, since it probably means that a large number of people downstream of the dam do not have access to important information about future risks associated with hydro-peaking, and that their concerns may not be incorporated into plans for the operational regime.

Despite protests and stops in project construction, the company has not made substantial changes to the Project or implemented specific measures to materially reduce project risks.

NHPC has not responded to the Council's questions and has therefore provided no information about important measures to prevent and/or mitigate the impact of habitat inundation or hydro-peaking. Given the sensitive nature of the location and the adverse impacts deriving from the Project, this uncertainty also represents a risk.

The Council therefore concludes that there is an unacceptable risk that NHPC Ltd, through the Lower Subansiri Hydropower Project, is responsible for or is contributing to severe environmental damage.

6 Recommendation

The Council on Ethics recommends that NHPC Ltd be excluded from investment by the Norwegian Government Pension Fund Global.

Johan H.
Andresen
Chair

(Sign.)

Svein Richard
Brandtzæg

(Sign.)

Cecilie
Hellestveit

(Sign.)

Trude
Myklebust

(Sign.)

Siv Helen Rygh
Torstensen

(Sign.)