**Human Rights Council Advisory Committee**

**Questionnaire on the impact of new technologies for climate protection on the enjoyment of human rights [[1]](#footnote-2)**

*Please answer core questions as well as specific questions addressed to your category of stakeholder (UN agency, State, NHRI, civil society, technical community and academia or private sector). The questionnaire is distributed to you in its entirety for the purpose of transparency.*

*Please respond as concretely and concisely as possible, listing factors and giving relevant examples.*

*Please note the definition of “new technologies for climate protection” (hereafter NTCP) in the footnote. There is no need to answer all questions if some are irrelevant to your work.*

***Any views expressed are the views of the German Environment Agency and may not under any circumstances be regarded as stating an official position of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection or the Federal Republic of Germany.***

**Core questions (for all stakeholders)**

1. Which new technologies for climate protection (NTCP) are of particular importance when it comes to impact on human rights? List three most relevant and explain your choice.

Note: The definitions of NTCP suggested are not completely convincing. We will therefore refrain from using this broad umbrella term.

1. **Solar Radiation Management (SRM):**

Detrimental impacts on human development and natural ecosystems could be caused by the deployment of Solar Radiation Management.

Many forms of SRM deployment, such as stratospheric aerosol injections (SAI), can cause a regionally and globally unpredictable alteration of global weather systems and precipitation patterns. Together with the potential effect of sinking particles and the reduced photosynthesis, associated with the shading effect which is inherent in SRM, the natural basis of human life could be put at risk; crop failures and natural disasters could take place. Additionally, SRM can cause considerable potential for conflicts within the community of states because neighboring states could be affected by measures taken by one state and there are great regional differences between environmental risks.

Since the atmospheric greenhouse gas concentration is not changed by SRM, these approaches would have to be maintained or permanently repeated. Sudden termination of any SRM deployment could cause a disruptive change in the climate and a sudden global temperature increase that would have potentially massive detrimental impacts on human life and development and natural ecosystems.

1. **Carbon Dioxide Removal (CDR)**

**Technological CDR**

When it comes to approaches that seek to remove CO2 from the atmosphere (CDR) there is limited experience regarding negative impacts due to the low number of CDR deployment. However, all technological CDR options involve additional and in many cases extensive consumption of resources (e.g. land, energy) or pressure on environmental media or environmental protection goals (biodiversity and ecosystem services, water consumption, zero pollution).

When it comes to direct impacts on human rights special consideration should be given to land-related CDR that does not qualify as a nature-based solution, esp. biomass-reliant CDR at large scale such as Bioenergy with Carbon Capture and Storage. Those approaches can increase land usage conflicts and lead to a reduction of food supply and loss of biodiversity and ecosystem services thereby increasing global injustice and inequality and creating resource based civil conflict potential. Unsustainable production and transport of biomass could even result in additional net emissions instead of carbon dioxide removal.

**Nature-based solutions**

Nature-based solutions have been defined at the Fifth Session of the UN Environment Assembly as “actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits”. Typically, they do not involve huge technological efforts, nor can they be characterized as “intervention in the Earth’s natural system”. Thus, nature-based solutions should not be discussed under the suggested umbrella term “new technologies for climate protection”.

1. **Technologies helping to reduce emissions**

New technologies and practices that help to reduce GHG emissions, i.e. the integration of artificial intelligence (AI) in the production of renewable energy, address the root causes of the climate crisis and are expected to contribute best to the pursuit of SDGs and the fulfillment of human rights. The further integration and development of AI however require a refined legal framework which considers the emissions and risks created by the use of supporting artificial intelligence. Digital technology and procedures are especially during their development very energy-intensive. Especially AI, which is characterized through its learning may for example emit 5 times the amount of carbon dioxide of a car during its entire lifetime during the training of its neural network. A fact which easily fades into the background when the benefits of such technology for the climate crisis are discussed.

1. What kind of NTCP may contribute to human rights promotion and protection? Please, explain how.

Nature-based solutions and new techniques reducing emissions do not fall under the suggested definition of NTCP. They have the highest potential to contribute to human rights promotion and protection. Nature-based solutions do have various co-benefits. Techniques that help to reduce GHG emissions address the root causes of climate crisis.

The impacts of technological CDR will be highly dependent on the exact policy design and local conditions. Deployment of technological CDR at large scale would be a major challenge for the pursuit of SDGs and the promotion of human rights (see above). However, they might become essential to supplement natural carbon sinks in order to balance residual emissions. Sustainable deployment of CDR technologies might be one component in the portfolio of instruments necessary to tackle the climate crisis.

1. What are the key human rights challenges and risks arising from NTCP and from which in particular? Do NTCP create unique and unprecedented challenges or risks, or are there earlier precedents that help us understand the issue area?

Solar Radiation Management could have detrimental and unforeseen impacts, posing major risks to the natural basis of life and the promotion of human rights (see above).

There are no precedents with Solar Radiation Management. In some regions there are experiences with weather modification. However, small scale interventions limited in time that are intended to modify the weather or to test a specific SRM technique do not help to understand systemic effects of SRM deployment on the regional or global climate and hydrological cycles.

1. What specific human rights may be affected by the use of NTCP? Please, explain how. Who are the rights-holders that potentially would be the most affected by the use of NTCP? Are they also the most affected by climate change? How could they and the society at large be engaged in the decision-making process?

The implications and impacts described above can have various forms and the distribution of severe effects on individual human rights-holders may be very uneven. Impairments already caused by the climate crisis might be aggravated. Attributing impacts that result in a deterioration of livelihoods to a specific human intervention in the Earth’s natural system would be a huge challenge. Notwithstanding these difficulties, human rights that would be affected are the right to life (Art. 3 of the Universal Declaration of Human Rights) and the right to a standard of living adequate for the health and well-being, including food, clothing, housing” (Art. 25 of the Universal Declaration of Human Rights).

Regarding the decision-making process and public involvement on Solar Radiation Management proposals, one main objective should be to ensure that there is adequate information on the options available and communicated. Transparency of interests and utmost objectiveness should be required. In case there should be any funding for SRM approaches, funding should not only be directed to research questions and teams having a technical deployment perspective, instead one share of funding should be directed to the question why societies should refrain from SRM deployment.

Regarding decision making on technological CDR the improvement of decision-making processes should include all levels of governance. Local communities should be consulted and national and regional discourses should be supported by independent and transdisciplinary assessments.

1. Is the existing international and your national human rights framework adequate to safeguarding human rights of those affected by the use of NTCP? Why or why not? If not, what principles may be identified in order to address the gaps? List them according to priority.

Due to the various impacts and inherent challenges in attributing interventions to specific negative effects, human rights frameworks can hardly be sufficiently adequate. Beyond mechanisms to address possible violations of human rights, human rights should be elaborated and taken as guidance for prudent and inclusive decision-making processes and due diligence obligations. They should include standards regarding objectiveness and availability of information, the quality of impact assessments, public participation and consultation. Adherence to procedural safeguards should be seen as a part of the human rights framework.

A rights-based approach should be supported and supplemented by Sustainable Development policies. Due to the aggregated and delayed effects of interventions, the impact on human rights may not always be immediately at hand and a clear line of causation ex post hard to establish. Moreover, future generations are not protected by human rights frameworks.

1. Given that NTCP may present potential risks for the enjoyment of human rights, to what extent do human rights legal obligations require the States to pursue other climate protection policies presenting less risks of harm, including mitigation and adaptation measures?

Human rights obligations require the States to take action without further delay to reduce emissions and to increase adaptive capacities. Delaying actions that address the root causes of the climate crisis may constitute a violation of human rights.

In 2021 the German Constitutional Court found that in case sufficient action to reduce greenhouse gas emission is not taken in the present and thus even more burdensome limitations of fundamental rights will become necessary in the future, this could in principle lead to a finding that fundamental rights and human rights are violated at the present.

1. As opposed to focusing on selected few technologies, do you think a holistic and inclusive approach will help reduce any gaps in the existing system for addressing human rights challenges from NTCP?

A transdisciplinary approach will help reduce governance gaps, improve the science-policy dialogue and overcome fragmented decision-making structures. However, involvement must be transparent and conflicts of interest must be disclosed.

1. What should be the responsibilities of key stakeholders (UN agencies, states, NHRIs, civil society, technical community and academia, private sector) in mitigating the risks of NTCP to human rights and/or fostering its protection?

Mitigating the risks of technological CDR primarily means to stress and to put into practice the priority of emission reduction, adaptation and the enhancement of natural carbon sinks.

Insofar technological CDR will be necessary to supplement these approaches human rights should be elaborated and taken as guidance for prudent and inclusive decision-making processes and due diligence obligations. They should include standards regarding objectiveness of information, the quality of impact assessments, public participation and consultation. Adherence to procedural safeguards should be seen as a part of the human rights framework.

**Specific questions for UN Agencies**

1. Please describe the relevant work that your organization/agency/body has done on the issue of NTCP and human rights. What have been the key challenges and accomplishments? What lessons were learned in the process? How and to what extent is the human rights approach included in the design and implementation of the policies undertaken by your organization in this area? How is human-rights impact analyzed and assessed?
2. Could your organization be involved (for instance, in supporting, financing or monitoring role) in the use of the NTCP in the future? If so, how would it contribute to the protection and promotion of human rights?
3. Are there or do you expect any opportunities for your organization to collaborate with other organizations on the issue of NTCP and human rights? What challenges do you anticipate?

**Specific questions for States**

1. In your country, what are the main human rights challenges arising from the implementation of climate change national plans and policies? List and describe them briefly.
2. Is your country involved in or supports in any way the development, implementation or use of NTCP?
3. What measures, if any, (legislative, administrative, institutional, or other) have been put in place to regulate the use of NTCP? Have the human rights challenges arising from such activity been taken into account in their adoption?
4. In your country, which government agency has the initiative in the decision-making related to NTCP policies? If so, to what extent does the agency take the human rights issues into account in its agenda and decisions?

**Specific questions for National Human Rights Institutions**

1. Please describe the relevant work that your organization has done on the issue of NTCP and human rights. What have been the key challenges and accomplishments?
2. How may the use of NTCP impact the enjoyment of human rights in your country? Is there any group that may be disproportionally affected? How should the rights to access information, to participate in environmental decision-making and to access to remedy be applied in the context of NTCP-related research, experimentation, development and deployment?
3. What are the gaps in national policies? What national and international actions would be required to effectively address these challenges?
4. Has your country used or does it consider using NTCP? If so, how does your organization act or intend to act to protect and promote human rights? What methodology do you use or propose to analyze and assess the impact on human rights of NTCP?

**Specific questions for civil society organizations**

1. Please describe the relevant work that your organization has done on the issue of NTCP and human rights. What are the key accomplishments? What challenges has your organization faced?
2. Should your organization be involved in the use of the NTCP (for instance, in a monitoring role) how would it contribute to the assessment of human rights impacts and ensuring its protection?
3. What will be the impact of NTCP on the enjoyment of human rights in the field that your organization covers? What are the main human rights challenges that these technologies pose? Is the international human rights framework well equipped to address them? What are the policy gaps in national policies? What actions at national and international level would be required in order to effectively address these challenges?
4. How should the rights to access information, to participate in environmental decision-making and to access to remedy be applied in the context of NTCP-related research, experimentation, development and deployment?
5. How do you evaluate citizens’ awareness of the potential impact of NTCP on human rights? Does your organization have a roadmap to enhance public awareness of the issue?
6. What are the means to ensure meaningful public participation in the debate and decision-making process over the use and potential risks of NTCP, particularly of those most vulnerable or affected?

**Specific questions for the technical community and academic institutions**

1. How would you differentiate between “new” and “old” technologies for climate protection?

The criteria “new” or “old” will not be helpful in deciding on technologies.

Instead, any technique should in principle be assessed according to the same criteria. Especially, the following criteria should be checked with any technique: 1. climate effectiveness (including assessment of indirect emissions caused due to the deployment of this technique); 2. environmental impact assessment and analysis of additional resource consumption due to the technique 3. Given a specific net climate effect and specific levels of resource consumption: Are there alternative options having the same climate effects but are consuming less resources or will have additional co-benefits? 4. Impacts on human rights and Sustainable Development Goals (what social or local groups will presumably benefit, what groups will suffer from impacts).

1. Which NTCP do you find most important for the global efforts to combat climate change and why?

Technologies that help reduce emissions and adapt to rising temperatures have the highest priority. Residual emissions should be balanced by enhancing natural carbon sinks and nature-based solutions. Technological CDR measures can supplement these efforts. Regarding technological CDR there might not be no “one size fits all” technique. Decentralized approaches that can respond to local circumstances and the different advantages and disadvantages of various CDR techniques might be preferable.

1. What will be the impact of NTCP on the enjoyment of human rights in the short-term and the long-term?

It is hard to predict to what extent technological CDR will be applied and what impacts will take place. Imprudent deployment could deter from emission reduction and lead to extensive resource consumption. Optimal deployment of technical CDR could promote the enjoyment of human rights.

1. How should the impact of the use of NTCP be assessed and attributed given scientific uncertainty? What is the role for the precautionary approach?

Attributing impacts that result in a deterioration of livelihoods to a specific intervention in the Earth’s natural system would be a huge challenge. The implications and impacts described above can have various forms and the distribution of severe effects on individual human rights-holders may be very uneven. Attribution may be impossible in case impairments already existing due to the climate crisis are aggravated.

The precautionary approach or principle has different implications in different circumstances. Understanding the nuances will help determining the role of the approach for techniques that are intended to protect or to alter the climate. The precautionary approach is sometimes seen as a very strict principle. Indeed, in some situations the precautionary approach has strict consequences. For example, the legislator may have decided to shift the burden of proof, in those cases scientific uncertainty will lead to a prohibition. Examples for such a manifestation of the precautionary approach can be found in case there is scientific uncertainty on specific human health impacts of a commercial product. However, the precautionary approach as such does not imply that no action can be taken under no circumstances in case of scientific uncertainty. This is because assessing, balancing and managing risks that involve scientific uncertainty are an integral part of the precautionary approach. Sometimes this balancing exercise is already done by the legislator who may decide for a strict prohibition; sometimes the assessing, balancing and management exercise has to be conducted on a case-by-case basis.

However, the precautionary approach goes beyond a mere risk balancing exercise. The precautionary principle states that the emergence of possible environmental hazards and environmental damage should already be prevented and that the ecological foundations of human existence must be secured in the long term through a careful use of the available resources. Thus, in case the assessment and balancing of risks does not lead to the conclusion that one option unambiguously prevails, the precautionary approach suggests to refrain from further interventions that will consume additional resources and to decide for those actions that address the root causes.

SRM does not mitigate the root causes of climate change. At this stage of decision-making there are different categories of risks and a mere “risk-risk” assessment framework that puts the risks caused by SRM in the “weighing pan” to balance the risks of climate change is not possible.

Since SRM does neither aim at reducing GHG emissions nor removing atmospheric CO2, it does not qualify as “mitigation” under the UNFCCC and the Paris Agreement. Precautionary measures to mitigate climate change would aim at preventing the causes of climate change (the concentration of atmospheric GHG), not at remediating its adverse effects. Accordingly, defining SRM as a precautionary measure to address climate change would confuse the causes and effects of the climate crisis as well as the intention and content of the precautionary approach. Given the lacking potential of SRM to address the root causes of climate change, SRM itself cannot be qualified a precautionary measure in order to address the risks of climate change.

1. Will the current international human rights framework and standards as well as national policies be effective in addressing human rights challenges from NTCP? If not, how can they be improved?

Due to the various impacts and inherent challenges in attributing interventions to specific negative effects, human rights frameworks can hardly be sufficiently adequate. Beyond mechanisms to address possible violations of human rights, human rights should be elaborated and taken as guidance for prudent and inclusive decision-making processes and due diligence obligations. They should include standards regarding objectiveness of information, the quality of impact assessments, public participation and consultation. Adherence to procedural safeguards should be seen as a part of the human rights framework.

A rights-based approach should be supported and supplemented by Sustainable Development policies. Due to the aggregated and delayed effects of interventions, the impact on human rights may not always be immediately at hand and a clear line of causation ex post hard to establish. Moreover, future generations are not protected by human rights frameworks.

1. Do you think that policy efforts to address human rights challenges in NTCP will promote their use or deter it? How to strike a balance between the need to employ technology with the goal of reaching net zero CO2 emissions and the need to protect human rights?

The debate whether and how far there is a need for “technology” continues. Debates on technological CDR should not be mixed with the discourses on SRM. In some cases the protection of human rights may lead to the conclusion that a technique must not be applied or that it shall be applied. To decide which option is best for the pursuit of human rights and the Sustainable Development Goals, improving criteria for the quality of impact assessments and public participation processes will be essential. Moreover, the balancing should include all options, i.e. strengthening efforts for emission reduction, enhancing natural carbon sink, and improving adaptive capacities.

**Specific questions for the private sector**

1. Is your company or sector involved or will it be involved in the use of NTCP? How? Does your company take into account human considerations while assessing the risks and potential impact of the use of these technologies?
2. What would you identify as the key benefits and risks for human rights associated with these technologies in the short-term and the long-term? What needs to be done (at the company, state or global level) to avoid or mitigate possible risks?
3. How can human rights due diligence be enhanced in the private sector in response to the existing human rights concerns that arise in relation to the use of NTCP?
4. What is the policy of your company or sector vis-a-vis public involvement in decision-making process on the development and use of NTCP?

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1. The term *new technologies for climate protection* for the purpose of this questionnaire broadly refers to techniques of deliberate intervention in the Earth’s natural system in order to prevent further climate change or reverse it. The two main kinds are (1) Solar Radiation Management SRM (i.e. stratospheric aerosols) and (2) Carbon Dioxide Removal CDR. CDR solutions can be nature-based (forestation, soil carbon sequestration, biochar, etc.) or technological (enhanced weathering, bioenergy with carbon capture and storage, direct air capture and storage, etc.). [↑](#footnote-ref-2)