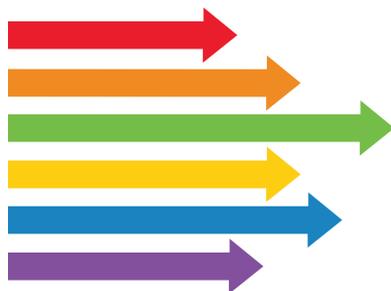


REPORT



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Rio+20: From Outcome to Implementation

New Awareness of and Opportunities for UNEP to Address Climate Change in the Arctic

A Background Paper for the Arctic Side Event at The Governing Council/Global Environmental Ministerial Forum

Nairobi, Kenya, 18 February, 2013



What future for the Arctic?



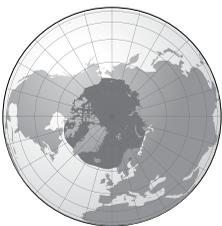
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What future for the Arctic?

Background

The Arctic is experiencing a profound transformation that will have important impacts on the region and the world as a whole. Driven largely by interacting forces of climate change and increased human activities, the Arctic region is changing rapidly. Warming in the Arctic has increased at twice the global average since 1980. As the region warms, melting sea ice will allow greater human access to the region with the potential for increased maritime transport, greater exploitation of natural resources such as oil and gas, minerals, fisheries, and increased tourism. While this may provide some new economic opportunities for the region, it also presents significant challenges to a once remote area.

As one of the first areas of the world to experience the impacts of climate change, the Arctic region serves as a barometer for change in the rest of the world. Beyond impacts to the region itself, changes in the Arctic are accelerating the pace of global warming. A warming Arctic will have significant environmental and health consequences for the entire world, including sea level rise, release of stored chemicals and greenhouse gasses into the environment, and impacts on biodiversity including migratory species for which the Arctic provides essential habitat at key parts of their life cycles.

UNEP's Governing Council has adopted two decisions related specifically to work on Arctic environmental issues. In 2003, it requested that the Executive Director increase the organization's engagement in Arctic issues by requesting him "to provide continuous assessments and early warning of emerging issues related to the Arctic environment, in particular the impacts on the global environment," working in close cooperation with the Arctic Council, Arctic parliamentarians, Arctic Indigenous Peoples and the private sector. In 2008, the Governing Council adopted a decision on sustainable development of the Arctic region and encouraged UNEP "to cooperate, as requested, with the Arctic Council, relevant MEAs and other relevant regional and international bodies, as appropriate," and to "join with other relevant organizations and programmes to seek means to sustain and enhance Arctic observing networks."

This background paper was prepared to provide a short summary of some of the major recent scientific findings about changes in the Arctic, steps being taken by the Arctic Council – the main governing body to address Arctic issues--and how UNEP has been working to support scientific assessments and policies to address Arctic change.

The Rapidly Changing Arctic

Defining the Arctic

The Arctic is generally defined as the region within the Arctic Circle, the line of latitude that runs 66 degrees, 33' 44" (or 66.5622 degrees) north of the Equator. Geographically, the Arctic Circle includes the Arctic Ocean and land areas in parts of Canada, Finland, Greenland (as part of Denmark), Iceland, Norway, the Russian Federation, Sweden and the United States (Alaska). Several other definitions of the geographic boundaries of the Arctic exist, including those defining the area with a July isotherm below 10 degrees Celsius, vegetation distribution (tundra) or political boundaries, such as defined by Arctic Council working groups.

Only five countries: Russia, Norway, the United States, Canada and Denmark (through its jurisdiction over Greenland) have a right to territorial claims in the Arctic Ocean pursuant to the UN Convention on the Law of the Sea (UNCLOS). Much of the area in the Arctic Ocean has been claimed as territorial seas. Under UNCLOS the territorial seas of nations extend 12 nautical miles (nm) from shore and are considered to be sovereign territory of the controlling nation. The exclusive economic zone (EEZ) extends from the country's baseline up to 200 nm and gives nations control of natural resources, primarily fisheries and seabed resources, such as oil and gas. Furthermore, UNCLOS allows a nation to extend its economic zone beyond 200 nm if it can prove that the underwater ridges of the seafloor are a geological extension of the country's own continental shelf.

Subject to UNCLOS, ships of all States, whether coastal or landlocked, enjoy the right of innocent passage through the territorial sea and freedom of navigation through the EEZ. Beyond national EEZs are the "high seas," for which all states have a right to navigate, overfly, fish and undertake other activities specified in UNCLOS, subject to additional restrictions in treaties to which such States are party, such as fisheries agreements.

Increasing Human Access and Economic Activity in the Region

Warming and melting of the sea ice and land snow offers greater human access to the Arctic region. Limited offshore oil, gas and mineral exploitation is already underway and will certainly increase in coming years, bringing new opportunities as well as increased risks of oil spills and pollution. Summer shipping through the Northern Sea Route along the Russian northern coast is beginning to increase, and traffic through the Northwest Passage is expected to grow, as is tourism and marine transport of goods. Some Arctic marine fisheries will become more accessible to regional and foreign fishing fleets. While offering new opportunities, the mounting human activities in the region introduce new risks, which have led to calls for new governance and management approaches for the region.

Short-Lived Climate Pollutants

Warming in the Arctic is also influenced by a cluster of pollutants known as "short-term climate pollutants," so-called because, unlike carbon dioxide which remains in the atmosphere for centuries, they remain for days or weeks and are more powerful short term climate forcers than CO₂. They include black carbon, methane and tropospheric ozone. UNEP has played a key role in identifying and providing heightened awareness of

these sources of warming. *The UNEP/World Meteorological Organization (WMO) Integrated Assessment of Black Carbon and Tropospheric Ozone*, released in Bonn in June 2011, reviewed the sources and ways to limit the pollutant releases. It said that fast action on the pollutants would help limit near term global temperature rise, reduce projected warming in the Arctic over the coming decade by two-thirds and help to keep global temperature rise below 2 degrees Celsius, and perhaps even 1.5 degrees C. At the same time, reducing these pollutants by 2030 can prevent millions of premature deaths from respiratory problems and avoid the annual loss of more than 30 million tons of crops, the report estimated.

A study, *Bounding the role of black carbon in the climate system* published in the *Journal of Geophysical Research: Atmospheres* on January 15, 2013, concludes that black carbon is the second largest human contributor to climate change, exerts twice as much climate forcing impact as earlier thought and has two-thirds the climate impact as carbon dioxide. The report said that black carbon has an even more powerful effect in some regions, including the Arctic, where deposition on snow and ice speeds up melting and warming. It calls for urgent efforts to control sources of black carbon, including diesel engines, wood-fired stoves, brick kilns, forest burning and others. The report also found that such controls could avoid nearly one degree Fahrenheit temperature rise in the near term, would reduce pollution related deaths by 2.4 million a year and give governments more time to address the less tractable ways to reduce carbon dioxide emissions.

Supporting action to address these sources, UNEP participated as a founding member of the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC), a broad-ranging international initiative designed to cut these climate-damaging pollutants that also have health and agricultural impacts. Launched in February 2012, the initiative now has approximately 50 country and non-governmental partners

Regional Impacts of Climate Change

The Arctic is extremely vulnerable to climate change. It is in fact already experiencing some of the most rapid and severe climate change on earth. Warming in the Arctic has been occurring faster than anywhere else on the planet – at twice the global average since 1980.

The regional effects of these changes are already serious. Many Arctic coastal communities and facilities face increasing threats of storms and shore erosion. Many communities have already been disrupted, and entire villages are seeking to relocate. Once frozen and now thawing ground is disrupting transportation and the construction of infrastructure such as roads and buildings. There is also evidence of change in the diversity, range and distribution of animal species and of Arctic vegetation zones beginning to shift with potentially wide-ranging disruptive effects.

Of increasing concern is the recognition that climate-related changes in the Arctic are occurring more rapidly and profoundly than scientists had predicted. For instance, the accelerating loss of sea ice in the Arctic Ocean and adjoining seas has declined by more than 30 percent since 1979 when satellite records began. While previous models predicted that the Arctic will be ice-free during the summer by 2100, recent studies predict that this will occur as early as 2035.

Impacts on Arctic Peoples

Almost four million people live in the Arctic today, with the precise number depending on where boundaries are drawn. They include Indigenous Peoples and more recent arrivals, hunters and herders living on the land as well as city dwellers. Indigenous Peoples currently make up roughly 10 percent of the total Arctic population. In Russia, the country which holds the largest human population in the Arctic, Indigenous Peoples represent a small proportion of total inhabitants. In Canada, they represent about half of that country's Arctic population, and in Greenland they are the majority.

Many Arctic Indigenous Peoples continue to depend on the harvesting from the land and sea for a major source of their daily food intake. For northern peoples the ability to hunt, fish and gather food is an important

element of cultural stability. In order to continue harvesting from the land, Northern peoples also need access to a cash economy to allow them to buy the equipment needed to carry out these practices. These activities are interconnected, and both are affected by climate change. The warming climate is likely to negatively affect important animal populations, and may disrupt or even destroy Inuit hunting and their food sharing culture. However, as the Arctic warms it also gives rise to new economic opportunities, namely in areas of industrial development which may benefit Indigenous Peoples. (See *UNEP Year Book 2013 – Emerging Environmental Issues “Rapid change in the Arctic.”*)

Global Impacts of Climate Change

Climate change and its impacts on countries around the world have been documented in reports of the IPCC as well as a number of recent reports by other institutions, including the World Bank and UNEP. The Arctic is already known to play a key role in the earth's climate systems. A more rapidly changing Arctic will increasingly have profound impacts on other regions of the world and the planet as a whole.

Arctic Climate Feedback Mechanisms: There are a number of major mechanisms at play that are affecting global systems —so-called “feedbacks” by which Arctic change impacts the planet. (See *the Arctic Climate Impact Assessment—Impacts of a Warming Arctic*, pp. 33-45) One involves changes in the reflectivity of the earth's surface. Snow and ice reflect approximately 80 percent of the sun's rays, while exposed ground and open ocean absorb an equal amount of heat. As the snow and ice melt accelerates, their reflectivity declines proportionally, thus hastening the Earth's warming. The second Arctic feedback mechanism involves the rise of sea level and alteration of ocean circulation as Arctic ice melts. The third is the increase of greenhouse gases released from the ocean and land and emitted to the atmosphere. As the Arctic warms, these Arctic “feedback mechanisms” will accelerate, thereby hastening and magnifying the effects of global warming not only in the region but also throughout the entire planet.

Sea Level Rise: As warming melts glaciers and the Greenland and Antarctic ice sheets, it raises sea levels beyond the IPCC's conservative projections in its 2007 report of 18-59 centimeters during the century to possibly as much as 0.5 to 1 meter and even more by 2100, according to The World Bank report *Turn Down the Heat: Why a 4 Degree C Warmer World Must be Avoided* issued in November 2012. This would put a number of the world's major ports and urban areas in jeopardy. Sea level rise will challenge highly vulnerable small island states, river delta regions, and cities as well as countries with low-lying coastal areas such as in Bangladesh, India, Indonesia, Madagascar, Mexico, Mozambique, the Philippines, Venezuela and Vietnam, the report says. The report states that sea level rise could also impact world food supplies by inundating the rice-growing river deltas of Asia, especially Bangladesh and large parts of the Mekong delta and low-lying delta areas in Egypt, Vietnam and parts of the African coast.

The Arctic's influence on the rest of the world extends beyond its contribution to rising sea levels, as noted in UNEP's Year Book report on the Arctic. The loss of Greenland ice along with ocean runoff from other sources contribute to changing the global thermohaline water circulation system, which could affect the movement of the Atlantic Ocean Gulf Stream. Increasing evidence indicates that rapid Arctic warming may be responsible for changing weather patterns and altering the frequency and intensity of extreme weather events at lower latitudes.

Increasing Greenhouse Gas Emissions from Land and Ocean: A report by UNEP, *Policy Implications of Warming Permafrost*, released at Doha in November 2012, discussed the growing problem of melting permafrost in the Arctic. Carbon is currently trapped as organic matter in permafrost that underlies much of the region. The permafrost, Arctic tundra and forests contain some of the world's largest land-based stores of carbon. The report found that regions covering a quarter of the northern hemisphere contain 1,700 gigatonnes of carbon and methane, twice that currently in the atmosphere. As warming increases, organic matter in permafrost decomposes and is released into the atmosphere as carbon dioxide and methane gas that further hastens warming. Likewise, vast amounts of methane in a solid icy form called methane hydrates or clathrates, trapped in permafrost and at shallow depths in the cold Arctic Ocean sediment, will be released into the atmosphere as the land and ocean warms.

The UNEP report found that potential hazards from these emissions are only now being investigated and are not expected to be included in the climate-prediction modeling done for the IPCC's upcoming Fifth Assessment Report. UNEP's report recommended creation of a special IPCC study on permafrost and the development of national monitoring networks and adaptation plans as key steps to deal with potential impacts of this significant source of emissions that could become a major contributor to global warming.

Impacts on global species: Many migratory species, such as whales and birds, from many regions of the world that depend on summer breeding and feeding grounds in the Arctic will be threatened as their habitats, nesting and feeding grounds are altered. Several hundred million birds migrate to the Arctic each summer from wintering locations around the world. Their livelihoods are and will be seriously disrupted.

The Framework for International Cooperation in the Arctic

The Arctic Council: The eight countries with territory in the Arctic have been addressing Arctic issues either bilaterally or collectively largely through the Arctic Council, an intergovernmental forum that provides means for promoting cooperation, coordination and interaction among the eight Arctic states and their respective indigenous people and communities on common Arctic issues. The Council has focused on scientific and environmental and policy recommendations to governments. With heightened interest and concern about development opportunities in the Arctic, its governments have taken steps to strengthen the Council's structure and activities. The Council is unique in the role it provides to Indigenous Peoples, who under Council rules have the same rights of full representation and participation in meetings as governments.

A great deal of the Council's focus is on environmental protection and sustainable development in the region. The bulk of the Council's cooperative work is conducted by six scientific and technical Working Groups, each with its own mandate and secretariat. Historically, the Council has worked through consensus, but in 2011 it adopted its first legally binding agreement, on search and rescue.

Traditionally, the Arctic Council also has also had a number of Observers, including six non-Arctic Permanent Observer States, one intergovernmental and Inter-Parliamentary Organization and eleven Non-Governmental Organizations. UNEP has long been an Observer at the Council. A growing number of non-Arctic states have begun to voice their interest in the Arctic region, expressing interest in exploiting resources and engaging in other economic activity. Many of these countries are seeking permanent observer status at the Arctic Council as a means to establishing a presence in the region. Recently, the Council has decided to re-visit its selection of observers. It has revised its observer provisions and is re-considering its selection of observers.

Current Efforts to Strengthen the Arctic Council: As interest and concern for the Arctic has grown in recent years, the Council's member states have moved to strengthen the Council. At the May 2011 Ministerial meeting in Greenland, they agreed to establish a permanent secretariat for the Council in Tromsø, Norway and to seek permanent funding for it. The secretariat began operations in January 2012.

At the Ministerial meeting in May 2011, the Council adopted a legally-binding agreement on search and rescue cooperation. They also agreed at the Ministerial meeting to create a task group on Arctic marine oil pollution preparedness and response, called for working group recommendations on the prevention of marine oil pollution, urged the International Maritime Organization to complete a mandatory Polar Code for ships, supported participation in the UNEP-led mercury negotiations and decided to establish an expert group on ecosystem-based management.

The Council is currently chaired and program directed by Sweden. In May 2013 the chair will be passed for two years to Canada. In 2015, the United States will assume the chair and program leadership.

UNEP's Arctic-Related Activities

Over the years, UNEP has undertaken a number of activities related to the Arctic, often in cooperation with the Arctic Council. As an active Observer on the Arctic Council, UNEP, largely through its collaboration

with its Polar Centre at GRID-Arendal, has participated in the efforts of most of the Council's scientific and technical working groups, including those on the Conservation of Arctic Flora and Fauna (CAFF), Protection of the Arctic Marine Environment (PAME), Arctic Monitoring and Assessment Programme (AMAP) and Arctic Council Contaminants Action Programme (ACAP).

UNEP's Chemicals Programme has worked actively with the Arctic Council Contaminants Action Programme (ACAP) on hazardous chemicals and reduction of releases of toxic chemicals and mercury. UNEP's World Conservation Monitoring Centre (WCMC) contributes to the Arctic Council work on Arctic Biodiversity indicators, Arctic peatlands, protected areas, sea birds and wilderness protection, and biodiversity gap analysis.

Recent UNEP work related to the Arctic: UNEP has enhanced its Arctic work in recent years. Among the significant recent initiatives are the following:

- (1) *The Arctic Agenda 2020 Programme* designed to develop and implement a long-term, multi-purpose Programme on Sustainable Environmental Management in the Russian Arctic under a Rapidly Changing Climate. It aims to facilitate implementation of the "Strategic Action Programme for Protection of Environment in the Arctic Zone of the Russian Federation" (SAP-Arctic) adopted by the Russian Government in 2009. The Programme will be addressing international waters, climate change mitigation and biodiversity issues. It was approved by the GEF Council for funding over five years with a total budget of more than US\$ 335 million (US\$ 25 million from the GEF Trust Fund and US\$ 310 million of co-financing from different sources.) UNEP is expected to secure US\$ 11 million for implementing three projects within the overall project and for serving as the Coordinator. A wide number of governmental, intergovernmental, private firms, NGOs and Arctic indigenous peoples are engaged in the partnership. The project will be implemented by four GEF agencies—UNEP, UNDP, The World Bank and the European Bank for Reconstruction and Development (EBRD).
- (2) UNEP is a founding member of *The Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC)*, launched in February 2012 as the first global effort to address short-lived climate pollutants, such as black carbon, methane and tropospheric ozone. It is an important effort to slow down near-term global warming and addressing long-term climate change. It is complementary to the global efforts to reduce carbon dioxide emissions, in particular through the UNFCCC. The CCAC's membership has grown from seven Partners to 49, including 26 states and the EU and 23 non-State Partners.
- (3) **UNEP's Assessment Work on the Arctic:** UNEP has undertaken a number of assessment activities in or related to the Arctic, including the following:
 - The UNEP mercury assessment which helped spur international negotiations for a global legally binding instrument on mercury—The Minamata Convention on Mercury—which successfully concluded in Geneva on 19 January 2013;
 - The assessment of black carbon and tropospheric ozone with WMO focusing on Arctic and Himalayan regional impacts;
 - The 5th Global Environment Outlook, which includes Arctic concerns; and
 - The 10th edition of UNEP's yearly publication on emerging environmental issues, the UNEP Year Book 2013, which focuses on rapid change in the Arctic.
- (4) UNEP's Collaborating Centre GRID-Arendal has continued to play an active role in Arctic work. Its *Many Strong Voices (MSV)* program has undertaken the following:
 - Promoting the well-being, security and sustainability of coastal communities in the Arctic and Small Island Developing States (SIDS) by bringing these regions together to take action on climate change mitigation and adaptation and to tell their stories to the world;

- Launching an *Ecosystem Based Adaptation* initiative in Belize and the Seychelles and is conducting a Forced Migration, Human Rights and Climate Change project linking communities in Alaska, the Cateret Islands, Papua and New Guinea; and
- Implementing the *Sustainable Energy in the Arctic and Small Island Developing States* program by training school children in regions most affected by climate change in a *Portraits of Resilience Photography Project*.

The Centre's other Arctic activities include the following:

- A *Nomadic Herders project* that seeks to enhance the resilience of reindeer herder's ecosystems and livelihoods in northern Mongolia, Sakha-Yakutia and Chukotka (Russian Federation);
- Film production for the Arctic Council's Conservation of Arctic Flora and Fauna (CAFF) Working Group placing a strong emphasis on personal stories about the changes occurring to the Arctic's biodiversity;
- Coordination of the Arctic NGO Forum, which helps non-governmental organizations concerned with Arctic environmental issues to exchange ideas and perspectives and give advice to the global Arctic community; and
- Implementation of the publication *Guidelines, UNEP and Indigenous Peoples: A Partnership for Caring for the Environment*, which complements the on-going work in its Many Strong Voices program, linking Arctic and Small Island Developing States (SIDS) communities in addressing the impacts of climate change.

Potential Areas for Additional UNEP Contributions in the Arctic

The rapid pace of change and the prospects of social and economic development in the Arctic present challenges that require the international community, including countries currently outside the Arctic Council, to work collectively to provide for sustainable development and shape governance structures that will protect the region and global environments. While Arctic governments are addressing many of the challenges in the region, many others, such as those related to maritime trade and shipping, tourism, commercial fisheries and oil, gas and minerals development, will require the involvement of non-Arctic countries if proper and enduring governance structures are to be put in place.

UNEP's global environmental mandate and its longstanding and successful convening authority provide vehicles for contributing to international measure to that end. UNEP's past and current activities, its areas of program concentration, science-policy and international organizational links, and the international MEAs that it houses provide a number of opportunities for UNEP to help address environmental challenges in the Arctic.

Broad Areas of UNEP's Arctic Activities: Based on UNEP's mandate and the global environmental changes and impacts outlined above, a number of areas where UNEP can contribute to environmental sustainability in the Arctic are described below

- *Scientific assessment and outreach on global environmental issues.*

UNEP could (1) take action to follow up on its Permafrost Report which called for special reporting on permafrost emissions, creating national permafrost monitoring networks and planning for adaptation, and (2) extending work on short-term climate forcers—black carbon, methane and stratospheric ozone—building on the work of the Climate Change and Clean Air Coalition (CCAC).

- *Developing initiatives to ensure the sustainability of human activities in the Arctic.*

UNEP could use its unique convening authority to develop best practices for sustainable development in the Arctic region, including, for example, those for oil and gas exploration, mineral extraction, tourism and other anticipated economic development sectors.

Actions could also be taken within the framework of the 10 YFP on Sustainable Consumption and Production that are relevant to Arctic development.

- *Convene policy dialogues.* UNEP could convene regional and/or global discussions related to policies to address Arctic issues, e.g., on options for resource development, governance mechanisms for exchange of information and management approaches with the broader global community, and leveraging additional global scientific forums and tools to monitor Arctic change.
- *Promoting cooperation on ocean issues.* Existing UNEP ecosystem activities could be extended to the Arctic, for example, the Life Web Project on marine spatial planning to protect marine mammals and promoting ecosystem-based spatial management. The PAME effort under the Arctic Council might also become more closely aligned with the Regional Seas Programme.
- *Strengthening consultation with indigenous peoples to identify areas of potential scientific, policy and local knowledge related to the Arctic.*

This could include initiating additional activities to promote awareness and steps to address Short-Lived Climate Pollutants (SLCP) impacts and engagement in the Climate Change and Clean Air Coalition (CCAC).

Take additional steps within GRID-Arendal's Many Strong Voices Program to enhance Arctic Indigenous Peoples' and in Small Island Developing States' traditional knowledge, adaptation measures and cooperation on climate-related issues.

- *Helping to evaluate and identify ways to improve the effectiveness of relevant MEAs and other environmental initiatives in the Arctic.*

Explore collaboration with the Convention on Migratory Species, the Convention on Biological Diversity, and other relevant MEAs the possibility of joint work on Arctic biodiversity and linkages with management practices outside the Arctic.

Explore collaboration with the POPs and Basel Conventions for joint work on harmful substances that might be released in the Arctic and have global impacts.

- *Seeking ways to incorporate Green Economy measures into Arctic cooperative activities.*

Undertake a study on the ecosystem benefits of Arctic biodiversity, possibly as part of the IPBES activities.

Consider ways in which Green Economy components related to the Arctic can be introduced in the development of the UN's Sustainable Development Goals.

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