ANTARCTIC SUB-GLACIAL LAKES AND WATERS
THE CHALLENGE TO PROTECT A HIDDEN RESOURCE

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Description

- Subglacial waters and lakes, underlying the Antarctic ice sheet, have been detected by means of different measurements from air and surface over the last decades. More than 145 lakes have been identified so far, connected by streams as part of large watersheds. The challenges that this new resource poses are of an environmental, a jurisdictional and a legal character.

Antarctic System

- The Antarctic continent is governed by the Antarctic Treaty of 1959, other conventions for the Antarctic living resources, and the Protocol on Environmental Protection of 1991, in force since 1998. From this last instrument stems the Committee for Environmental Protection (CEP) which has dealt with subglacial lakes and waters since it was set up in 1998, taking special account of the environmental protection of the resource, while the Operational Matters Working Group, established by the Antarctic Treaty Consultative Meetings (ATCM), has focused on the scientific data of the subject.

- The 1991 Protocol on Environmental Protection establishes the general guidelines for the protection of the Antarctic Environment, while Annex V of the Protocol deals with area protection and management, and it is in charge of the establishment of Antarctic Specially Protected Areas and Antarctic Specially Managed Areas (ASMAs) such as McMurdo Dry Valleys ASMA). Special standards for the protection of the environment of subglacial waters have not been established, although the living microbial organisms living in this environment could be significantly affected by the intrusion of devices for exploration of subglacial lakes, which includes drilling and sampling. The adoption of such specific guidelines and the establishment of ASMAs seem highly necessary.

- Under the 1959 Antarctic Treaty and Protocols, the 28 Consultative Parties to the Antarctic Treaty are able to participate in the decision-making process, and although there are seven States parties that claim territorial sectors of Antarctica and consider those sectors as national territories, they can neither exercise exclusive rights over the resources nor exclude other member States' activities in those sectors.

- The 1991 Antarctic Protocol on Environmental Protection has banned the exploitation of Antarctic mineral resources for 50 years. However, whether subglacial water is a mineral resource remains uncertain, since underground water is not considered a mineral resource. The Protocol establishes that in the event a dispute arises regarding the interpretation of its provisions, there is the possibility to submit the issue to an arbitral tribunal or to the International Court of Justice.

- Taking into account that the Continent has a specific legal framework, there is an exclusive competence of Antarctic Treaty Parties and bodies to deal with the regime of renewable and non-renewable Antarctic resources under the 60º S, a special competence entailing a special responsibility.

The Vostok Sub-glacial Lakes

- One of the most important subglacial lakes is the Vostok Lake, which stretches over an area which is approximately 250 km long and 50 km wide, lying beneath the Russian Vostok research Station. In between 1989 and 1998 Russian scientists carried out explorations including deep drilling of the ice sheet, under the Russian Antarctic Program. Yet, these explorations are carried out in a legal vacuum regarding the proper devices and prevention measures for the protection of the untouched environment lying beneath the Antarctic ice cover.

- In 1996, the XX(a) Antarctic Treaty Consultative Meeting (ATCM) 'urged Russia to take the necessary steps to ensure that the planned ice coring is stopped at a safe distance above the reported lake so that there is no risk of polluting it' (para. 108). The Subglacial Antarctic Lake Exploration Group of Specialists (SALEGOS), a special working group set up by the Scientific Committee on Antarctic Research (SCAR), expressed the interest of the scientific community in Lake Vostok and in the activities that Russia had under implementation. In its Information Paper (XXV ATCM/IP55), 2002, the SCAR stated that 'there is as yet no international consensus among the scientific community on appropriate lake sampling or on drilling methods to penetrate into the lake' and 'recommended that additional studies should be carried out before further drilling towards Lake Vostok is undertaken using the existing Russian drill hole.' In 2003 Russia circulated its revised draft Comprehensive Environmental Evaluation (CEE) for Water Sampling of the subglacial Lake Vostok (ATCM XXVI/WP01) which was reviewed by the CEP. In its comments, the CEP VI meeting (2003) Final Report expressed that the draft CEE was incomplete, *i.e.,* the possibility of spilling of drilling fluid (60 m3 of kerosene) was not envisaged.

- In the 2006 meeting of the Committee on Environmental Protection (CEP) the SCAR 'noted that it was aware of recent scientific literature which suggested that if one subglacial lake was contaminated, contamination may spread downstream to connected lakes' as a result of the possible interconnection between the different Antarctic lakes. In the Kyiv meeting, in June 2008, Russia recalled a number of incidents that occurred in borehole 5G- 1 during 2007 that delayed progress with further drilling of the ice core and penetration of the sub-glacial Lake Vostok. However, the Antarctic advisory scientific bodies, or the other consultative members of the Treaty, cannot prevent the continuation of the drilling even if the proposed conditions are not met.

Other Sub-glacial Lakes and Waters

- The basic standards for the exploration of subglacial Antarctic Lakes were agreed upon by the ad hoc group of experts, SALEGOS, and were included in its 2001 Report (http://salegos-scar.montana.edu/). These activities should be developed in compliance with the Environmental Impact Assessment (EIA) requirement established in Annex I of the Protocol on Environmental Protection.

- The physical and biological characteristics of those waters are as yet not known, and the protection of such a particular environment is the responsibility of the Antarctic Treaty system member States. In 2004 the SCAR launched a programme for subglacial lakes research, SALE_UNITED (http://scarsale.tamu.edu) Within the Treaty system, member States are entitled to carry out research and scientific activities in the Antarctic continent and in the surrounding Southern Ocean, and they are also accountable for the protection of the Continent's environment.

- At present, the States and the scientific community are only discussing the development of research programmes. In the case that benefits could be derived from these sub-glacial resources, their equitable apportionment should be agreed upon by means of special agreements according to the overall rules of the Antarctic Treaty, the ATCM Recommendations, the Protocol on Environmental Protection and its Annexes.