International Groundwater Management in the Amazon Transboundary Aquifer System:
An Analysis to the Implementation of the United Nations International Law Commission Draft Articles on the Law of Transboundary Aquifers

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ABSTRACT

Introduction. In South America, based on United Nations estimates, 50 to 60 percent of the total domestic and industrial water supply comes from groundwater resources. Recently, the UNESCO/OAS ISARM Americas Programme has identified a large regional aquifer system called "Amazon Transboundary Aquifer System (ATAS)," appearing to involve six countries: Bolivia, Brazil, Colombia, Ecuador, Perú and Venezuela. Initial data collected indicate the principal use of the ATAS is for human consumption, and for many communities where surface waters are polluted it may be the only source of clean water. Currently, there are no established mechanisms for ATAS regional governance and management, and there remains much uncertainty regarding not only its physical characteristics but also its socioeconomic impact on riparian communities. ***Purpose.*** The intent of this project was to identify and analyze opportunities and challenges the ATAS States face in developing a collaborative framework to govern and manage the ATAS. Additionally, an analysis was conducted for how the principles and mechanisms advanced by the International Law Commission (ILC) draft articles on the Law of Transboundary Aquifers could be employed in order to enhance and address the opportunities and challenges identified. And finally, recommendations for improving the applicability of the ILC draft articles were developed. ***Conclusions.*** Before the ILC draft articles can be successfully implemented for achieving governance and management of the ATAS, the ATAS States must reach a certain level of action, cooperation, knowledge and understanding. The ILC draft articles, thus, should provide further guidance or be complemented with guidelines to aquifer States with insufficient knowledge basis. This guidance should include information on how to undertake joint fact-finding approaches, how to develop appropriate monitoring and assessment frameworks, and emphasize the importance of coordinating surface water regimes with groundwater regimes.

Key words: Amazon, Aquifer, Draft articles, Transboundary, Management

1. INTRODUCTION

In 2007, the UNESCO/OAS ISARM Americas Programme published an inventory, which identified 29 transboundary aquifers across 12 countries (UNESCO, 2007). This inventory indicated the existence of the Amazon Transboundary Aquifer System (ATAS). The ATAS appears to be one of the largest transboundary aquifers in South America, shared by six countries: Bolivia, Brazil, Colombia, Ecuador, Perú and Venezuela. Preliminary data indicates the ATAS has good water quality; its principal use is for human supply; and it is the only source of clean water in many communities where surface waters are naturally or anthropogenically polluted (UNESCO, 2007).

Currently, international arrangements to govern the ATAS do not exist, thus, its management still remains within a splintered domestic scope. The latest development in international transboundary groundwater policy has been the United Nations International Law Commission (ILC) draft articles on the Law of Transboundary Aquifers. The ILC draft articles provide principles, tools and mechanisms that could offer important guidance to ATAS States for developing a coordinated transboundary aquifer management framework.

2. OBJECTIVE

The principal objective of this independent research graduate project was to identify current opportunities and challenges for the regional sustainable management of the ATAS. And, to

determine strengths and limitations in the ILC draft articles for enhancing and addressing the opportunities and challenges identified, when implemented toward developing a coordinated framework for governing and managing the ATAS.

3. RESULTS AND DISCUSSION

3.1. Opportunities and Challenges for a Coordinated Framework for the ATAS

The ATAS States present two major opportunities for justifying the need, and facilitating the development of a regional governance and management framework for the ATAS. Initially, *the ATAS appears to be one of the largest groundwater aquifers in South America, and the source of water supply for many riparian communities* (UNESCO, 2007). *The ATAS also appears to have high water table, thus, significant vulnerability to water pollution and probabilities of connections with surface water bodies* (UNESCO, 2007). These characteristics meaningfully validate the need for a regional governance framework for the ATAS. A second opportunity that might help facilitate the development of a regional framework for the ATAS is that *there is a Treaty for the sustainable management of the Amazon River Basin in place* (UNESCO, 2007). The Amazon Cooperation Treaty (ACT) and its implementing agency, the Amazon Cooperation Treaty Organization (ACTO), are legal and institutional tools already adopted by the six ATAS countries. Thus, this existing legal and institutional infrastructure could be leveraged for any future international agreement for the ATAS. Furthermore, by coordinating the new ATAS regime with the ACT, interdependent regimes for surface waters and groundwaters in the Amazon Region could be developed, promoting an integrated management of water resources.

Conversely, there is a major challenge that the region would need to overcome for achieving a regional approach for the sustainable management of the ATAS. *The ATAS States lack a fundamental understanding of the ATAS attributes and needs* (UNESCO, 2007), which is essential information for guiding the development of a sound governance framework. Before governing, it must be clearly understood what exactly is to be governed. However, the fact that water resources appear to be abundant in the Amazon region has seemingly hindered the realization of the importance of the region's groundwater resources, and therefore, the interest in further understanding the ATAS.

3.2. Implementation of the ILC Draft Articles in the ATAS: Strengths and Limitations

The ILC draft articles are important policy instruments that could guide the ATAS States toward achieving a collaborative framework to manage the ATAS. The draft articles provide some *standard definitions* that help facilitate the understanding among the ATAS States. Also, the draft articles promote a *comprehensive scope*, encouraging ATAS States to focus efforts not only in the uses of the transboundary aquifer, but also the utilization which includes other activities that could have impacts on the aquifer. Lastly, the draft articles *support principles* essential for a sound coordinated framework *such as cooperation, and collection and exchange of information*.

However, the ILC draft articles also present two fundamental limitations in trying to guide the development of a regional management framework for the ATAS. First, *the draft articles do not provide sufficient guidance to aquifer States on how to achieve the required level of action and knowledge about their transboundary aquifer*. If the ATAS States want to develop a multilateral framework that involves the principles, tools and mechanisms embraced by the ILC draft articles, they first must reach a benchmark level of cooperative action and understanding regarding the transboundary aquifer. Thus, the ILC should also consider providing guidance on joint fact-finding initiatives, and developing or adapting monitoring and assessment guidelines.

Second, the ILC draft articles *do not underscore the importance of coordinating groundwater and surface waters management*. In many cases, groundwaters are interconnected with, and provide the source of recharge to surface waters or vice versa (Dellapenna, J. & Rocha, F., 2010 forthcoming). Therefore, both regimes should be interrelated to ensure integrated protection of water resources (Eckstein, G. & Eckstein, Y., 1998). Furthermore, the ATAS has not received significant attention, in part because it is located in a humid and surface water-rich region, and connections between surface waters and the ATAS are not well understood yet. Thus, if the draft articles were to promote the conjunctive management of waters, the ATAS would likely have more opportunities of not only promoting an integrated water resources management approach, but also reaching public awareness and political will for a regional governance framework.

4. CONCLUSIONS

In summary, ATAS States have important opportunities for developing a regional management framework for the ATAS. For example, the ATAS appears to be one of the biggest groundwater aquifers in South America, and the source of water supply for many riparian communities. Therefore, effective governance of the ATAS across geopolitical boundaries is paramount for its long-term sustainability, in supporting dependent human consumption. Additionally, there is a Treaty for the sustainable management of the Amazon River Basin in place (the Amazon Cooperation Treaty –ACT) that could be used as a foundation to promote the integrated management of waters. However, a major challenge ATAS States will have to face is the lack of appropriate understanding regarding the ATAS' attributes and needs. The ILC draft articles are important instruments for guiding ATAS States toward addressing this challenge. Yet, they do not provide sufficient guidance on how to achieve the appropriate and required level of action and knowledge about the transboundary aquifer. Lastly, the ILC draft articles do not underscore the importance of coordinating groundwater and surface water management.

The period of time before the UN General Assembly decides the final form of the draft articles in 2011 is important for the future of the draft articles (Yamada C., 2009). It provides the opportunity to re-evaluate any gaps or limitations of the draft articles, in order to ensure that adequate principles and tools are provided to guide aquifer States in overcoming the challenges associated with the sustainable management of transboundary aquifers (Eckstein G., 2007).

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