

## Case Study Transboundary Dispute Resolution: Lake Titicaca

Author: Joshua T. Newton<sup>1</sup>

### 1 Case summary

<i>River basin:</i>	TDPS System: Lake Titicaca, Desaguadero River, Lake Poopó, Coipasa Salt Lake (Figure 1)
<i>Dates of negotiation:</i>	1955 to 1996
<i>Relevant parties:</i>	Bolivia, Peru
<i>Flashpoint:</i>	None
<i>Issues:</i>	Stated objectives: Management, protection and control of the basin's water resources
<i>Additional issues:</i>	Water-related: extreme weather conditions, infrastructure projects, Pollution; Non-water: poverty, environmental degradation
<i>Excluded issues:</i>	Public participation
<i>Criteria for water allocations:</i>	None determined, Desaguadero River flow established by the maintenance of lake level dependent on weather conditions
<i>Incentives/linkage:</i>	Mutual economic development in the region
<i>Breakthroughs:</i>	None
<i>Status:</i>	Autonomous Binational Authority working efficiently moving toward development goals.



Figure 1: Map of Lake Titicaca (size: 111,800 km<sup>2</sup> (TFDD, 2007)).

<sup>1</sup> Mr. Newton is currently at Tufts University and can be reached at [joshua.newton@tufts.edu](mailto:joshua.newton@tufts.edu).

## **2 Background**

Populations have been living around Lake Titicaca for 10,000 years, dating back to the Archaic period. The first communities appeared around Titicaca in 1,200 BC and since then have increased in population and have become more dependent on its water for their livelihood for agriculture and navigation.

A series of natural occurring events took place in the 1980s which pushed the countries of Peru and Bolivia to manage the waters of Lake Titicaca in a more sustainable manner as the vulnerability of the inhabitants of the region was very high in extremely poor conditions that did not need to be exacerbated further. In the rainy seasons of 1982-3 and 1989-90, extreme droughts caused hundreds of millions of dollars in damage to the agricultural industry, both crop and animal. The years in between experienced a higher than average rainfall and culminated in the severe floods of 1986-7 causing, again, over a hundred million dollars of damage to not only the agricultural industry, but to infrastructure as well.

## **3 The problem**

Relations between Peru and Bolivia have always been good dating back to when they became independent nations in the 1800s. Lake Titicaca has not been a source of contention between the two states, but rather a reinforcement of their willing to cooperate with one another when their interests are mutual.

The major problem; therefore, is not about conflict between Bolivia and Peru but how to develop and improve the living conditions of the extremely poor populations who live with the Titicaca basin. Mario Revollo (2001) of the Autonomous Bi-national Authority of Lake Titicaca gives four explanations of the principle problems the lake region suffers.

### ***3.1 Extreme weather events***

As mentioned above, the Lake Titicaca region experiences a high variability in terms of its weather patterns. With such fluctuations in rainfall, the well-being of the inhabitants of the basin is controlled by how much water falls from the sky. And this, from year-to-year, can change from too much to too little. There is a high level of uncertainty, and risk, living under such conditions.

### ***3.2 Insufficient regulatory works***

Even though the Lake Titicaca is very large and has significant volume, the hydrological balance of the entire TDPS system is very delicate due to the inflow vulnerability as a result of high evaporation. The regulation of the lake's water is deficient in that it does not prioritize sectors of water use and there are insufficient works in place to do so.

### ***3.3 Environmental degradation***

Living beside such a large body of water, people sometimes take for granted the effects of pollution can have. While pollution has never been a regional concern for the two countries, as the volume of the lake is so large, there are several examples of punctual cases of pollution near major population centers such as Puno, Peru, and Copacabana, Bolivia. The lack of sewage treatment plants around the lake causes most waste to be put directly into Titicaca and, as a result, pollution levels have been rising over the decades, thereby contaminating water.

Other sources of degradation come from the cattle industry that surrounds the lake and the loss of soil due to their impact and, with regards to the fishing industry, the introduction of exotic species and the over-fishing of both those and indigenous species has left the lake with smaller and smaller fish.

### ***3.4 Socioeconomics***

Extreme levels of poverty have existed within the Lake Titicaca basin for several decades now. This has been

intensified by the two nations' negative economic growth rate over the last ten years. Because most of the people who reside around the lake are subsistence farmers, the negative effects of Bolivia and Peru's economic decline have been acute. With ever-diminishing and abused natural resources as a result of lack of education in the region, the stress under which the people live does not create an environment conducive to awareness regarding pollution and sustainability.

#### **4 Attempts at conflict management**

With great vision, Peru and Bolivia have been trying to address the development of the Lake Titicaca region since the 1950s. In 1957, after preliminary declarations by the presidents and foreign ministers, Bolivia and Peru signed the first-ever agreement concerning the waters of Lake Titicaca. It was called the Preliminary Convention for the Study of the Use of the Waters of Lake Titicaca and provided for the "indivisible and exclusive joint ownership of both countries of the waters of the lake" while at the same time creating a joint management entity known as the Joint Sub-commission (Sub-Comisión mixta). The purpose of the Convention was to promote development within the basin of Lake Titicaca in a manner that would not disrupt the flow and volume as to affect the navigational uses of the body of water.

Peru immediately ratified the Convention in 1957, but it took almost thirty years and several severe weather occurrences before, at the end of 1986, Bolivia also ratified the agreement. The economic losses incurred during the drought of 1982-3 and the floods of 1986-87, pressured the Bolivian government to ratify in order to improve the management situation of the lake. During the period before the ratification, both countries conducted its own research concerning Lake Titicaca, but did so in a coordinated way. After ratification occurred, the Joint Sub-commission became SUBICOMILAGO, the Joint Sub-commission for the Development of the Integrated Region of Lake Titicaca. Entities within each country were formed during this same time period, PELT (Lake Titicaca Special Projects) on the Peruvian side and the UOB (Bolivian Operating Unit) on the Bolivian side.

From 1991 to 1993, Peru and Bolivia solicited the cooperation of the European Community in order to help develop a framework for a Binational Master Plan. By 1995, the Binational Master Plan for the Control and Prevention of Floods and for the Use of Resources of the TDPS System (Lake Titicaca, Desaguadero River, Lake Poopo and Coipasa Salt Lake) had been approved by both countries and, in April of 1996, signed and put into effect by June 1.

During the process of the creation of the Master Plan, diplomatic notes were exchanged between the governments of Peru and Bolivia, which led to the establishment of the Binational Autonomous Authority of Lake Titicaca (ALT).

#### **5 Outcome**

The Autonomous Binational Authority of Lake Titicaca (ALT) was created with the objective to implement and enforce the management, control and protection of the Lake Titicaca system's water resources as laid out in the Master Plan. Each country has administrative entities that coordinate with the Ministries of Foreign Affairs of both nations and with one another. The technically oriented units of Peru and Bolivia, PELT and UOB, respectively, coordinate the actions of the governments and centralize information (Figure 2).

Since its inauguration in 1996, ALT has been able to achieve some considerable advancement in the area of regulatory works within the basin. A series of projects was initiated and the first major dam was finished in 2001, near the mouth of the Desaguadero River. These "doors" will attempt to control flood situations when the level of the lake rises above 3,810 meters above sea level. In creating this dam, irrigation yields have increased on both sides of the border as Peruvians and Bolivians are better able to utilize the lakes water resources.

Although ALT, a concept, has been considered a success story, because of its ability to prevent

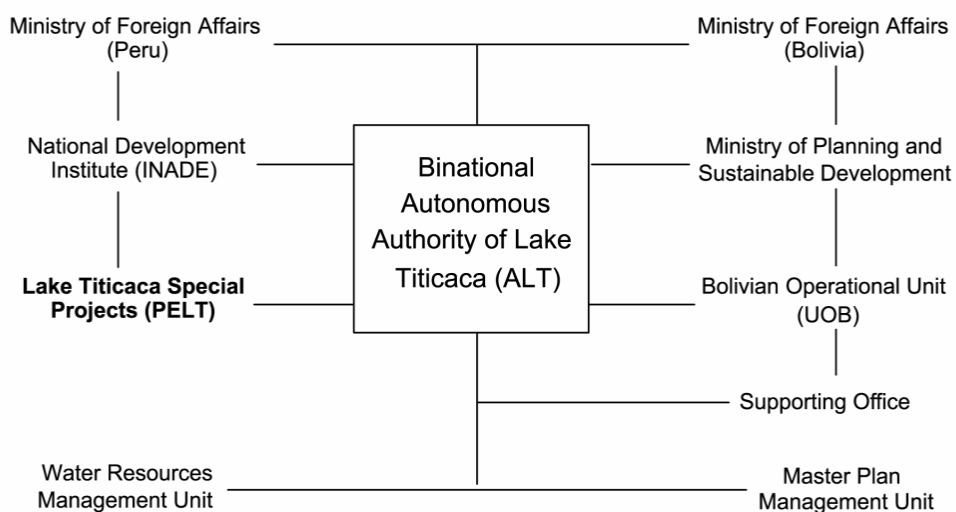


Figure 2: Lake Titicaca organizational chart

natural disasters from having large impacts on the local populations around Lake Titicaca and how smoothly the entity operates, there still has been only minimal progress in terms of achieving its goals that it set out to do in the Master Plan. ALT has only been in existence for less than ten years, so it is a very young entity and, at times, is working in a climate of civil unrest on both sides of the border, which has an influence on its effectiveness.

The major concern, and the central reason and why ALT has not been very effective in the basin, is their lack of programs to include the public in a participatory process in the management of the lake. Without such mechanism in place, there is only so much that ALT can accomplish in an area that is so struck by poverty. A lack of stakeholder participation is hurting the success of the Binational Authority.

ALT has advanced a great degree in a short time and it must be said that the organization has great potential for being one of the model international water basin management institutions in the world.

## 6 Lessons learned

- *Without stakeholder participation in the management of water resources, efficiency and effectiveness are limited.*

With little or no stakeholder participation in the management of the Lake Titicaca basin, ALT has only been minimally effective at producing results. It is clear that a more comprehensive system of inclusion of the public is needed to take place in order for the Authority to complete its goals. If three out of the four problems identified by the institution deal with the people's actions on the water and land in the basin, then they must be included for optimal functioning of the initiative. Otherwise, gaps and resentment are created by an organization acting above those who most use the lake.

- *By viewing the basin as a joint body of water shared equally between countries, much conflict is avoided.* By signing an agreement in 1957, Peru and Bolivia bound themselves into considering Lake Titicaca as a shared body of water, owned by neither country, but both. As a result, there are few, if any, "upstream versus downstream" issues (even though the Desaguadero River does flow into Bolivia from the lake). The countries have worked very well in a cooperative way to manage the lake, both doing their parts. This can largely be attributed to the lake being "owned" by both nations.

## **7 Creative outcomes resulting from resolution process**

The development of a master plan in conjunction with a joint autonomous management entity which oversees the development of the lake has allowed the two nations move forward with relative ease once funding has been secured for joint ventures.

## **8 Timeline**

- 1955 Declarations by Presidents and Ministers of State of Bolivia and Peru to begin diagnostic studies of the Lake Titicaca basin.
- 1957 Both countries signed the “Preliminary Convention for the Study of the Use of the Waters of Lake Titicaca,” an agreement establishing the adoption of a plan to develop the economic uses of Lake Titicaca without altering the navigation and volume of the lake and creating a joint management entity known as SUBCOMILAGO, the Joint Sub-commission for the Development of the Integrated Region of Lake Titicaca.
- 1982-3 Severe drought causes hundreds of millions of dollars of damage to agricultural industry.
- 1986-7 Severe floods cause hundreds of millions of dollars of damage to agricultural industry and infrastructure.
- 1987 Natural disasters of the previous years promote the ratification of the Preliminary Convention of 1957 and initiates the first meeting of SUBCOMILAGO.
- Sep 1987 With the aid of the European Community, Peru and Bolivia formulate both a plan for the regulation of the waters of Lake Titicaca and a management use plan called “Global Bi-national Master Plan for the Development of the Integrated Region of Lake Titicaca”.
- 1991-3 Peruvian and Bolivian governments work in cooperation with the European Community to develop a Binational Master Plan for the development of Lake Titicaca.
- 1995 Binational Master Plan for the Control and Prevention of Floods and for the Use of Resources of the TDPS System (Lake Titicaca, Desaguadero River, Lake Poopo and Coipasa Salt Lake) approved by both nations.
- 1996 By public international law, the Autonomous Binational Authority of Lake Titicaca (ALT) is created by the governments of Peru and Bolivia.

## ***Acknowledgements***

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**Reference**

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