10. AMAZONIAN CO-OPERATION FOR KNOWLEDGE ON WATER RESOURCES AND FOR THE SUSTAINABLE USE OF THESE RESOURCES IN THE REGION

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1. INTRODUCTION

This paper presents the combined viewpoints of two Latin American specialists. The two specialists, from Brazil and Colombia, have vast experience in the area of university co-operation, both nationally and internationally. In addition to this experience, they also know how to deal with matters of global interest. These matters concern the ethical and political aspects of environmental issues in modern times and the relevance of international co-operation in order to overcome the important obstacles that surround these issues.

The objective of this paper is not to discuss technical issues related to water, but to raise current issues that are crucial for the survival of the planet and to discuss how higher education and international co-operation can be included as part of these discussions. Based on basic information about issues related to water, and aware of the importance of this resource for humanity, questions related to the threat to humanity due to finite water re-

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sources are discussed. Water has been polluted and watercourses degraded by the careless use of this resource by human beings. There is already a water shortage in many regions of the world. This situation can cause large-scale catastrophes unless corrective measures are taken immediately. As regards these measures, higher education and international co-operation may and should play a dominant role. Therefore, the intention is to raise the most critical and controversial issues of the moment, so that the situation can be fully discussed and hopefully resolved fairly.

2. FACTS CONCERNING THE ISSUE OF WATER IN THE WORLD

The situation of the world’s water resources has been discussed at various levels, and attention has been called to the problem covering a range of fields. Here are some facts:

* On May 21, 2002, a note from a French-Brazilian employee with the European Commission, Leda Guillemette, alerted under the headline, “Brazil: Great Exporter of Water!”. The United Nations had already called attention to the subject and warned that if countries continued to treat water as a limitless resource, then about 2.7 billion people will encounter problems of water shortages by 2025. The note continues that there is an extraordinary increase in the demand for water in the world and points out that it is a “market whose dimension has not yet been calculated”. The Amazon alone holds about 15% of the world’s freshwater resources. Countries like Brazil, with large natural fresh-water reservoirs, are considered potential suppliers.

* On May 15, 2002, UNESCO distributed the “Bulletin on the Valorization of Water in the World”, informing of the convening of the World Program for the Evaluation of Water Resources high-level working group in Paris. Their task was the preparation of a report to be presented at the World Summit on Sustainable Development, in Johannesburg, August 2002 (UNESCO, 2002). The bulletin also mentioned that the Third World Water Forum would be held in March 2003. The bulletin stated that UNESCO believes it is necessary to facilitate integrated views at regional and international levels that maintain the need for co-operation by countries in order to tackle the situation of freshwater resources.

* In the brochure, “Energy: If You Know How to Use It, You Will Always Have It”, which was distributed through Brazilian newspapers during the electricity crisis in 2001, was reported that 92% of all Brazilian electricity is produced by hydroelectric power plants.

* The basic principles in current Brazilian legislation, based on the National Water Resources Policy, are as follows:
- Water is a public good
- Water is a limited natural resource which has economic value
- When there is a shortage of water resources, priority is given to human consumption and the provision of water to animals
- The management of water resources must always allow for the multiple uses of water
- The water basin is the territorial unit for the implementation of policies and management
- Water resource management must be decentralized and should involve the participation of the government and that of users and communities

* The UNESCO Newsletter of February 1999 dedicated an extensive dossier to water-related issues. It contained useful information on these issues (UNESCO, 1999). For instance:

- Until recently, hydrologists and engineers had ready-made answers to water-related issues. The solution was to build gigantic dams, to desalinize water and to channel water from humid zones to dry regions through aqueducts. These solutions are no longer acceptable. They are expensive in economical and ecological terms. Nowadays, the objective is to reduce the demand for water. There are those who defend the idea that to achieve this water users should be charged for the water they use. The idea of an international water market, making it possible for countries with water shortages to buy water from countries where this resource is abundant, has been discussed.

- It is estimated that in the most vulnerable regions, there are about 460 million people who have no access to water. This accounts for 8% of the world’s population. This situation therefore threatens one fourth of the world’s inhabitants. If urgent measures are not taken, two thirds of humanity will suffer from moderate or severe water shortages by the year 2025. In reality, the situation is already very serious. In another UNESCO publication, Lord Selborne (2002) stated that currently 1.5 billion people do not have access to freshwater.

- Inequalities are also evident regarding water consumption: an individual living in a rural area in Madagascar has access to 10 liters of water a day, in France he has access to 150 liters and a North American has access to 450 liters. The lack of water is further aggravated by pollution. In many regions, the quality of water has become so poor that water cannot even be used for industrial purposes.
- For the first time in history, there will be more people living in cities than in rural areas. Consequently, water consumption will increase. Today, 69% of all water consumed in the world is used in agriculture, 23% is used by the industrial sector and 8% is attributed to domestic consumption.

- More than 40% of riverine waters, rock-reservoir and lake waters are found in six countries: Brazil, Russia, Canada, the United States, China and India.

3. WATER COMMERCIALIZATION

The points outlined above are very clear: water is not a renewable resource, it is finite. With the increase in the number of people and the damage caused by pollution, water has become increasingly rare. Moreover, 97.5% of the earth’s water is saline and freshwater, which accounts for only 2.5% of the total amount of water available, is mostly inexploitable. Only 1% of the total amount of freshwater available on earth can be easily accessed.

With this in mind, it is easy to understand why the most important current issue is whether such a rare resource should be treated as a public good, as belonging to humanity, or should it be subjected to commercial rules?

Riccardo Petrella highlights the core issue:

“...in the end of January, 2000, the oldest of Switzerland’s banks, Pictet, decided to create an international investment fund. This fund should invest 80% of its net assets in the securities of companies specializing in the water sector. This was the first time this happened in the history of finance. The bank states that current expenses for the capture and treatment of water account for only 35% to 45% of the amount necessary in the world over the next ten years” (Petrella, 2000).

The decision of the Swiss bank to invest in the water industry illustrates the economic importance of this issue. It also highlights the current thinking within the World Trade Organization. After all, the Swiss bank would not have taken this initiative if there incurred an element of risk.

There is a tendency to privatize water supply services around the world. Many justify this trend because of the limited supply of this natural resource. It is thought that individuals are more inclined to save water if they are made to pay for it. Although this idea is open to debate as concerns irrigation, the argument may be valid with regards to the commercial and industrial use of water. However, it is contentious to argue about the utilization of potable water, which is essential for the survival of mankind. After all, an individual can survive for a month with no food but less than a week without water. Proportionally, households consume only 8% of the total amount of freshwater used world-
wide. For ethical reasons, access to water must be guaranteed to all, particularly the poor. It is unacceptable in the 21st century that millions of people do not have access to drinking water and that so many children die due to a lack of water or as a result of having consumed contaminated water.

In reality, access to good quality drinking water is considered more than just a need, it is our right. However, in declarations made by governments, the word “right” is frequently replaced with “necessity” as commercial restrictions often apply. The term “right” is avoided because it restricts the action of those that defend the commercialization of all aspects of life. For these, water is a merchandise and nobody can reivindicate rights over a merchandise, except the owners, the industrialists or the businessmen. For the consumers rest to pay the price fixed for the product.

The big water companies are becoming increasingly well known. They are listed on stock markets and present in every water-related sector. Vivendi, Suez-Lyonnaise, Biwater, Thames Water and Bouygues are commercial water treatment companies. On the other hand, companies such as Nestlé and Danone commercialize bottled mineral water. Companies like Coca-Cola, Pepsi and others sell bottled purified water. They claim that bottled water is better and safer than tap water. According to Ricardo Petrella (2002), the Swiss Bank, Pictet predict that over 1.6 billion people will have their water supply provided by the private sector in 2020. This translates by an increase of more than 500%, compared to the current situation.

4. THE WORLD TRADE ORGANIZATION (WHO)

The World Trade Organization also plays a part in the new ethos. However, before we begin analyzing its role, it is important to keep in mind that the objective of the General Agreement on Trade in Services, GATS, which was approved in April 1994, was to set in motion a progressive liberation of services, including educational and environment related services.

In terms of education, we had the opportunity to analyze this issue (Dias, 2002). The World Trade Organization, as well as countries that export “educational services”, believe that when a country accepts to provide educational services via private institutions then these services can be qualified as commercial services and are thus subject to the general rules that regulate commercial services.

Currently, GATS comprises 134 countries whose mandate covers all services, and everything that can be defined as a service. Education is no exception, on the contrary, the WHO defines four kinds of services that are linked to education: (1) services provided across borders, (2) services consumed abroad, (3) commercial presence (which takes place, for instance, when a foreigner becomes a property owner in a country that is not his own, i.e. a hotel) and (4) the movement of natural persons across borders.
World Trade Organization regulations set out general commitments and obligations that directly and systematically apply to all members and to all sectorial commitments as a result of negotiations. Article II of GATS declares that member-states must accord “services and service suppliers from other member countries treatment no less favorable than that accorded to any other country”. This should take immediate effect and with no restrictions. In other words, an agreement concerning someone or a company from one country must be equally applicable to individuals and companies from other member states. However, derogations can be made, and the states must present a list of the exceptions they wish to submit before the agreements come into force. However, these derogations are only valid for a limited period of time.

This situation is not always clearly defined in WTO documentation. All analysts, even those who fiercely defend WTO procedures, recognize that developing countries were marginalized because they did not participate in the discussions that lead or led to the decisions made by the WTO. However, it is true that commitments are mandatory at the date on which an agreement comes into force. This remains the case unless the state presents any restrictions to its enforcement. Three years after the agreement comes into force, a state can request modifications. If another country feels that as a result of the modifications it has been wronged in some way, the country in question may claim compensation.

An integrated work program was adopted by GATS following the Uruguay Round completed in 1994, as not all negotiations were finalized. Member-states confirmed the commitment to engage in a series of successive negotiations to facilitate liberalization. Today, we are at the phase of opening markets for “educational services” and for environment related services and is thus an important issue.

According to a 1999 document pertaining to GATS, the WTO will encompass twelve service areas. They are as follows (WTO, 1999):

* Services companies (including professional services and computer science services)
* Communication
* Construction and related engineering services
* Distribution
* Education
* Services related to the environment
* Financial services (insurance and banking)
* Health and social services
* Services related to tourism and travel
* Entertainment, culture and sports
5. CONSEQUENCES OF THE WTO REGULATION

In 2002, there were presidential elections in Ecuador, Colombia, France and Brazil. One can reasonably question the reasons behind electing a president and forming a government when large multinational companies make unilateral decisions that only take into account their own financial interests. This is a time when all government functions are influenced by organizations such as the World Bank, the International Monetary Fund, and more recently, the WTO, whose power to pass regulations is unquestionable. Decisions are often taken that depend on the expectations of these organizations. It is worth recalling Lionel Jospin’s bitterness when, in September 1999, Michelin announced 7,500 job cuts. On television, he said that he believed it was no longer possible to manage the economy in such a situation.

It is evident that there is a need to tackle environmental issues in much the same way as higher education, and the implications of GATS in this matter must be analyzed. The initial objective must include every aspect related to the protection of landscapes, ecotoxicology research and above all, water catchment. Furthermore, large European companies expected to be granted the right to exploit underground water sources without the imposition of limits or restrictions. The European Commission has already analyzed probable obstacles to the activities of private water companies in order to defend the interests of European groups. According to established rules of the WTO, these obstacles must be eliminated. These include the existence of monopolies or exclusive suppliers, restrictions to legal economic activities, norms related to granting licenses or authorizations for operation and exploitation as well as restrictions concerning staff turnover.

The European delegation to the WTO elaborated a list of services related to the environment, which should be open to competition. These include the following themes: water catchment, nature, forest and landscape protection, environmental impact assessments, research-development services, public awareness programs and the support of long-term forest management.

When GATS was approved in 1994, potable water services was not an issue and was therefore not discussed. Most countries considered this matter to be the responsibility of the government. Conversely, the utilization of underground water tables was considered to be a delicate issue and understandably subjected to strict control. These issues are now being discussed in Geneva and attempts are being made to include them in the GATS framework for action.

In the past, water was considered a public good. Today, the reverse is true as people realize now the economic value of water. This tendency suggests that water is becoming an exclusively commercial commodity. What are the implications of this?
Here are two examples:

In Argentina in 1995, a branch of Vivendi Environment was granted a thirty-year concession to operate water services in Tucumán province. Substantial investments were envisaged to modernize the system and as result, the company was authorized to charge twice as much from users. In the following months, no improvements had been made. Worse still, the water turned brown. The population demonstrated their anger and the two concerned parties broke off the contract. However, in 1997, according to information issued in Paris, Vivendi Environment filed a formal accusation against the Argentinian government. The company claimed 100 million dollars as compensation for their losses. The situation was submitted for analysis to the World Bank’s International Center for the Settlement of Investment Disputes.

A similar situation occurred in Cochabamba, Bolivia when Bechtel, a large San Francisco based firm, was granted a concession to operate water services. In December 1999, the firm doubled the price charged for water. The population demonstrated, which led to the death of certain demonstrators. The government revoked its water privatization legislation and Bechtel is now suing the Bolivian government for 40 million dollars.

Another example of a situation that might occur as a consequence of WTO’s control of water services occurred in the Canadian province of Vancouver. Water was exported from Canada to the United States by tanker ships. However, in order to defend Canadian interests, the Canadian government ceased water exportation. Today, based on NAFTA regulations, the North American Company, Sun Belt, is suing the Canadian government for a total of 500 million dollars.

The above examples demonstrate both the economic and ethical dimensions of the water issue. In 1977, during the United Nations Water Conference, participants established that “all peoples (...) have the right to have access to drinking water in quantities and of a quality equal to their basic needs”. In fact, this is a matter of human dignity: after all, there is no life without water. Thus, this precious sought-after resource must be managed, bearing in mind humanitarian solidarity, so that everyone can benefit and lead an honorable life.

6. THE AMAZON CO-OPERATION TREATY

Discussing issues related to the use of water in the Amazon demands that the role played by the Amazon Co-operation Treaty (ACT) be analyzed. It would act as an instrument for regional integration and provide a mechanism for the creation of public policies that might serve to lead development initiatives that would involve all the Amazon countries.

The ACT was signed in Brasília on July 3 1978, by the republics of Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam and Venezuela. However, various analysts
have considered its activities over the past 25 years as being very limited with regard to the challenges defined in Article 1.¹

“The Contracting Parties agree to undertake joint actions and efforts to promote the harmonious development of their respective Amazonian territories in such way that these joint actions produce equitable and mutually beneficial results and also achieve the preservation of the environment and the conservation and rational utilization of the natural resources of these territories.” (Ministry of Foreign Affairs)

Following the United Nations Environment and Development Conference in 1992, the ACT implemented a few projects in the Amazon. However, little progress was made; the factors that limited the implementation of ACT projects were numerous and varied. The institutional weakness of the Treaty can be identified as one of these factors.

As its name suggests, the Treaty is simply a document signed by the Foreign Affairs Ministers of the eight Amazon countries. It is not a legally bound entity and therefore does not exist as an organization. Moreover, the Secretariat headquarters changes periodically of country.

Once those limitations were recognized, the ACT focused its efforts on strengthening the institutional nature of the Treaty, which began in 1992. During the management of the Pro-Tempore Secretariat in Peru, which immediately followed that of Ecuador, a proposal was elaborated and approved at the Ministers Council Meeting. This proposal satisfied the long-time request made by various countries: the establishment of a permanent Secretariat for the Treaty (Botto, 1999). The result of this proposal was the creation of the Amazon Co-operation Treaty Organization (ACTO), which is permanently based in Brazil. The process was presented to the parliaments of the eight countries concerned. In 2002, the last Amazonian country (Colombia) confirmed the Amendment Protocol to the Amazon Co-operation Treaty, which was approved in 1998. This Protocol established the “Amazon Co-operation Treaty Organization”, which from that point on was a legally binding entity. This gave the Treaty the power to sign agreements with Contracting Parties, non-member States and other international agencies.

“The Permanent Secretariat of the Amazon Co-operation Treaty Organization will be based in Brasília. This Secretariat will be responsible for implementing the foreseen objectives in compliance with the resolutions made during the Meetings of Ministers of the Foreign Affairs and those of the Amazon Co-operation Council” (Ministry of Foreign Affairs, s/d: 13).

The founding of the ACTO Secretariat was set for the year 2002. The seminars carried out at both national and international levels and the consultancy services requested, in order to establish a work program for the ACTO, make it possible to envisage the challenges ahead. Furthermore, they allow us to anticipate the great opportunities ahead and to make meaningful progress in the pursuit of sustainable development in the region. ACTO represents a significant step in terms of quality and the consolidation of the Treaty. This is true because of the multilateral nature of the organization and its status as a legally bound entity, with the power to coordinate co-operation efforts and to implement projects and programs in the eight countries. Thus, ACTO is the best attempt for sub-regional integration in the history of the Amazon. It makes it possible for countries to agree on the principles that will guide the development of the region.

In 2002, preparatory meetings were held in order to identify priorities for the establishment of the ACTO Secretariat. One of the priorities identified was the water issue (Costa-Filho, 2002a). There is even a proposal for the creation of a Special Commission for Hydrology, Climatology and Water Resource Management in the Amazon (Setti, 2004). The need to strengthen regional capacity in all areas is equally important, as is the mapping of the region at a continental level by systematically updating data using modern technologies.

Nobody knows exactly how many people live in the Amazon or its demographic structure. It is therefore urgent to carry out a detailed survey of the Amazon in order to identify the actual problems facing the population. This survey would also help determine the regions where activities are to take place. This request was proposed by various specialists who were invited to take part in the last preparatory meeting for the establishment of the ACTO, which took place in Manaus (Costa-Filho, 2002 b).

ACTO shall implement programs in order to become acquainted with environmental legislation in the eight Amazon countries, particularly as concerns water-related legislation. This will guarantee that regulations are consistent in every country and that laws in one country are not annulled in another. Likewise, joint actions related to the transportation of goods and passengers shall be established. ACTO is the ideal instrument for identifying the true potential of the region and to formulate and implement programs and actions that serves the entire Amazon, and that lead to sustainable development. This can be achieved mainly through partnerships with NGOs, universities, research institutes and government organizations at all levels.

7. INTERUNIVERSITY CO-OPERATION

Universities play an important role in this field. They objectively study and analyze these issues and they develop multidisciplinary programs in the fields of environmental education and communication. Nevertheless, universities cannot act alone. It is essential to widen the co-operation among higher education institutions. Firstly, we need
to identify the institutions with the means, as is the case with universities, to critically and objectively analyze the social implications of environmental issues and, in this specific case, to analyze the inclusion of environmental services, particularly water related issues, at the WTO. Which institutions would be capable of analyzing all the technological and social implications of the problems in the region?

According to the Tbilissi Conference, in 1977, environmental education should be targeted at:

* the general public (communication is essential);

* specific groups of professionals, particularly in areas of activity that directly influences the environment. These include engineers, architects, administrators and planners, industrialists, union leaders, decision-makers in political, economical and financial sectors, rural workers, teachers and journalists, and professionals in the area of communication.

Most of these professionals are university-educated. Thus, the university is a privileged institution that guarantees that all these categories of individuals receive an environmental education. Furthermore, information specific to these categories should also be acknowledged.

Which path should universities follow if they are interested in this issue?

Firstly, coordination efforts between all individuals and entities working in this field should be sought, and any actions must be undertaken in a coherent fashion. In some instances, the formation of a specific course on the environment or ecology is the objective (interdisciplinarity). Many universities are beginning to take measures to create an environmental pedagogy. This could be achieved by incorporating an environmental aspect to traditional programs and subjects that are related to the issue via the principle of multidisciplinarity. This will make it possible for a great number of issues, ranging from natural habitats to themes linked to culture, to focus on the analysis of social and economic realities.

In an effort to provide the community with services, communication is often the essential factor. There are regions where actions may be isolated, but since the theme of environment is wide-ranging, universities increasingly feel that there is a need for them to be part of a network. Occasionally, and in order for these networks to operate, complex communication systems have to be installed.
8. THE CONTRIBUTION MADE BY THE UNITED NATIONS UNIVERSITY

In the international arena, the United Nations University (www.unu.edu), based in Tokyo, seeks to develop cooperative efforts in two basic areas: a) governance, which entails actions in the fields of human rights, democracy and peace and b) sustainable development, which includes issues related to the environment, science and technology as well as issues related to hydrological systems. Water is always an integral part of these issues. A Canadian-based program is dedicated to this issue.

At the UNU, the water issue is treated in its entirety. This means that all components of the hydrological cycle are included: surface waters, underground water reservoirs, mangrove swamps and sea water. Problems involving water and border disputes have become increasingly important. Water shortages, the destruction of water springs and pollution are issues that demand to be analyzed. A few of the projects being developed within the framework of the UNU are listed below; revealing the scope of the problem:

* Water Pollution Monitoring and Governance in Coastal Areas (Asia-Pacific region),

* Governance of Transboundary Water Resources (studies are being carried out in the following river basins: Danube, Ganges, Indus, Mekong, Nile and Zambezi),

* Technological and Policy Dimensions of Arsenic Contamination in the Asian Region (an equally serious problem with arsenic contamination occurring in the Amazon) and the Cooperative International Research Project on Marine and Coastal Environment.

In addition to this, the UNU has sought to develop a project for a “Global Water” Library. The objective of this virtual library is to provide the developing world with global knowledge on fresh water ecosystems and their management.

Finally, the UNU has developed an international network on “Water, Environment and Health”, based in Canada. All these programs can assist institutions in the Amazon. They can also strengthen the South-South Co-operation Program, developed by UNESCO, the United Nations University and the Third World Academy of Science. In addition, there is intense participation of the Association of Amazonian Universities (UNAMAZ). This program should be encouraged by the prioritization of the water issue in the Amazon and in other humid tropical areas, moreover, Amazonian institutions should be included in the above mentioned projects. Incidentally, during the World Conference on Higher Education, held in October 1998, UNU was responsible for the organization of a discussion on
the theme of higher education and sustainable human development. At the Conference, the Rector of UNU, Professor Van Ginkel, presented a document, which served as the basis for the discussion theme, in which he suggested that in order to make the necessary changes concerning activities of universities, it was necessary to do the following:

- Foster research programs and interdisciplinary education programs involving co-operation;
- form interdisciplinary networks of environment specialists on the local, national and international level;
- foster an environmental perspective among staff members and students, regardless of their field of study;
- insist on the enforcement of ethical obligations.

9. EXAMPLES OF INTERUNIVERSITARY CO-OPERATION

The word “network” means being united. It implies collaboration and communication. One of the greatest obstacles of the development of international co-operation is the fact that many participants have difficulty communicating (Aragón, 1997). An idea to be reconsidered is the one that was presented in UNESCO’s framework for the development of a network called GOUTTE, which stands for Global Organization of Universities for Teaching, Training and Ethics in the Field of Water.

It is very important to support the project coordinated by the Federal University of Amazonas, which established an Amazonian Center for Distance Education and Telemedicine Technology (Núcleo Amazônico para Tecnologia em Educação a Distância e Telemedicina - NATESD). The Center is the basis of a network that includes six Brazilian Federal Universities, all of which are located in the Amazon. Their objective is to gather human and material resources for collaborative action in the “virtual” field, starting with actions in the field of health. In addition to developing specific activities, this project will establish the basic conditions for the development of a comprehensive databank on the Amazon.

Among the institutions that joined the project, and whose goal is to train people in the area of human resources to use new technologies in the Amazon, are: the Federal University of Rondônia, the Federal University of Amazonas, the Federal University of Acre, the Federal University of Amapá, the Federal University of Roraima and the Federal University of Pará. These new technologies will be used to solve the health problems of people in the Amazon. Another objective is to democratize access to education. There is no doubt that such programs are necessary in order to embark on an organized fight against such serious problems as malnutrition and endemic diseases (malaria, cholera, verminosis, leprosy, tuberculosis and elephantiasis), as well as diseases brought over by western civilization. These diseases include the flu, which was fatal for the Indians, syphilis and
AIDS, among others. There is an international network (the GUS - Global University System) that provides international support to this project. The network was created in 1999 in Tampere, Finland.

Another important program to be mentioned and encouraged is the Interdisciplinary Graduate Program on Sustainable Development in the Humid Tropics (Programa de Pós-Graduação Interdisciplinar em Desenvolvimento Sustentável do Trópico Úmido - PDTU). This program integrates specialization courses and masters and doctorate degrees from the Center for Advanced Amazonian Studies of the Federal University of Pará. The UNU, UNESCO and the Organization of American States have supported specialization courses that are part of this program. Furthermore, the UNU has already begun to grant scholarships to students from other Amazonian countries so that they will have the opportunity to obtain their masters degree in Belém, Brazil. At some point, it will be important to establish a doctorate degree program that combines virtual learning and class attendance, employing the methodology developed by the Open University of Catalunya (www.uoc.edu). Several higher education institutions would participate both in the Amazon and in Ibero-America benefitting both the Brazilian states and the Amazon countries. In fact, this program can only be implemented through international co-operation.

It is also important to emphasize that the number of graduate programs comprising the environmental aspects of the Amazon, especially those of the Brazilian Amazon, has increased over the last years. Among these, the masters and doctorate degree programs on Fresh Water Biology and Interior Fishing offer great potential for expansion to all of the Brazilian Amazon and other Amazon countries. These courses are held in the National Institute for Amazonian Research in co-operation with the Federal University of Amazonas. Another example is the Masters course on Coastal Ecosystems offered at the Federal University of Pará at Bragança. This course is already consolidated and it is expected to achieve a Pan-Amazonian level. The National University of Colombia recently established a Masters course on Amazonian Studies at its campus, located in Letícia. Also, the Center for Development Studies of the Central University of Venezuela established a Masters course on health and environment based on Amazonian issues as the result of a UNAMAZ program.

It is important to acknowledge that there are certain places in the Amazon that are especially suited for the development of university transboundary co-operation. Leticia, in Colombia, borders both Peru and Brazil, it can therefore serve the population of the three countries. The Federal University of Acre developed a program called the MAP Initiative, within the sphere of the Sustainable Development in the Tri-National Frontier Program, formed as an international triangle whose vertices are the Municipality of Madre de Dios (Peru), the State of Acre (Brazil) and the Department of Pando (Bolivia). The initiative was developed through co-operation agreements with local City Halls and with the objective of implementing actions leading to the development of the region in accordance with the principles of sustainability (Costa-Filho, 2002 b). There are however other
places where transboundary programs can be implemented, such as in Roraima where the Federal University of Roraima could strengthen its co-operation with institutions in Guyana and Venezuela.

In terms of research, there is the Program for Tropical Coastal Ecosystem Studies (ECOLAB), led by the Emilio Goeldi Museum in Pará. This Program gathers researchers from institutions in Surinam, French Guyana, Amapá, Pará and Maranhão. The researchers develop integrated research programs according to the ecosystems found in the Amazonian coast. Other relevant examples linked to research are: the Program “Processes of Change in the Amazon Estuary due to Anthropic Activities and Environmental Management” (MEGAM), coordinated by the Center for Advanced Amazonian Studies; the program “Management and Dynamics in Mangrove Swamp Areas in Northeastern Pará” (MADAM), developed by the Federal University of Pará at Bragança, and the Program “Natural Resources and Anthropology of Maritime, Riverbank and Estuarine Societies - Social Organization, Development and Sustainability in Fishing Communities in the Amazon” (RENAS), coordinated by the Goeldi Museum.

10. CONCLUSIONS

The commitment to a world organization that is selfless and not based on the control of some over others is absolutely critical. It is unimaginable to live in a world whose organization is solely based on commercial interests, particularly as regards such issues as water. Environmental and sustainable development objectives cannot be dissociated, as Marie Bernard-Meunier, president of the UNESCO Executive Board said in Paris ten years ago (May 1992) “if the state of extreme poverty remains unchanged in one place, it will end up becoming universal.”

As regards the water issue, inter-university co-operation in the Amazon is fundamental. One of the myths concerning this region is that the Amazon are the lungs of the Earth. This is not true according to Albert Setzer, a researcher for the National Institute for Space Research (INPE). However, he says that if the Amazon Forest is destroyed then we would face many serious problems, especially with water (Setzer, 1989). Emanuel Soares de Almeida, a researcher for the Goeldi Museum, agrees with Setzer. According to him, “the springs that feed forty percent of our large and medium rivers are located outside our borders. Therefore, if our neighbors pollute these springs with mercury and practice indiscriminate clearings in the areas where these springs are located, we will be drastically affected” (Almeida, 1989).

In December 2001, the United Nations University Council approved a program for research and training (RTP - Research and Training Program), whose objective was to carry out research and provide training in the area of human resources in the Pantanal, one of the largest humid areas on the planet. Most of the Pantanal is located in Brazil (Mato Grosso and Mato Grosso do Sul), but its area extends to the territories of Bolivia and
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Paraguay. The UNU program will be implemented with the collaboration of federal government agencies and state government organizations, as well as federal and state universities of both states. In the medium term, the program should depend on the participation of institutions from Bolivia and Paraguay. It should also cooperate with organizations in other regions of the world that present a situation similar to the one in Pantanal.

Co-operation between this program and the South-South Co-operation Program is of course desirable. Water is the essential element of this program. It is believed to affect regional equilibrium as well as ensuring the presence of extraordinary fauna. Human activities can destroy the ecological balance in both these instances. The historical discussion regarding the construction of a waterway that, according to many people, would keep seasonal floods from occurring in a great part of the territory would be the key element for maintaining this balance and the survival of various species.

Finally, to recall the analyses of Professor Armando Dias Mendes, who for over thirty years defended the idea that there should be training in the area of human resources to ensure human development in the Amazon; according to Professor Mendes, the inhabitants should receive better treatment from the government and from the international agencies that operate in the region. Furthermore, the professor indicated the importance that the people living in the region should decide their own future.

With the objective of creating a university network in the region, a study was elaborated upon the request of UNESCO’s Higher Education Division and of the Regional Center for the Development of Higher Education in Latin America and the Caribbean (CRESALC) based in Caracas. During the mid 1980s, Prof. Armando Mendes said, “it is necessary to warn about a possible comeback of what can be called the Hyleia Syndrome”. Prof. Mendes was referring to the International Institute of the Amazonian Hyleia. In 1946, there was an attempt to create such Institute with links to UNESCO. The Brazilian Congress never approved the diplomatic instrument needed to establish the institute, nor did the Congresses of the other Amazonian countries approve it.

The creation of the institute was thus considered unworkable. The major reason for the project’s failure was due to the fact that the Amazonian countries began to consider the institute as an instrument for the internationalization of the Hyleia or Pan-Amazon. In fact, the creation of an international agency, among other things to coordinate the institute jointly with a few European countries such as Great Britain, France and the Netherlands (supposedly because of the Guyanas, which were their own colonies) was proposed within UNESCO. Furthermore, according to Prof. Armando Mendes, “although these countries were not part of the region, the importance and the role they were to take outweighed the importance and the role of the Amazon countries” (Mendes, 1988).

The document elaborated by Prof. Armando Mendes was presented at the meeting that established the Association of Amazonian Universities - UNAMAZ. This document highlighted a series of basic principles for the operation of this Association. These principles are still valid, not only for UNAMAZ but also for all those who are interested in
contributing to the development of the region. These principles are as follows (Mendes, 1988):

a) the principle of “amazoneidade” - this is the guarantee that the beneficiaries of any co-operative program will be Amazonian institutions by location, vocation and action;

b) the principle of “continentalidade” - the idea is to include all Amazonian countries, without the exclusion of any (therefore incorporating Guyana and Surinam to this project and its outcomes);

c) the principle of individuality - through which respect is shown for national, regional and institutional distinction in each national Amazon;

d) the principle of equality - the Centers for Amazonian Studies (CEAMs - Centros de Estudos Amazônicos) and Amazonian Universities (UNAMs) should receive equal and equitable treatment, according to their needs and possibilities. This should not depend on the national magnitude of Amazon countries, nor should it depend on how much of the Amazon is located within each country.

e) the principle of spontaneity - so that no Amazonian University or Center for Amazonian Studies should feel forced to join or not to join the Program;

f) The principle of uniqueness - this means “no duplicity”. Through this principle the repetition of initiatives previously taken at Centers for Amazonian Studies or Amazonian Universities will be avoided.

The Amazon Co-operation Treaty Organization can coordinate fundamental programs for the development of the Amazon at a continental level. Certainly, the Amazon today is not the same Amazon of 1978 when the ACT was signed (Lourenço, 2001). The world has changed, as has the Amazon. Today, conditions seem ripe to forge true cooperation in the Amazon. This would involve interpreting borders as links between countries rather than boundaries that separate them.

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