

AMAZON WATERS

YEAR 3 – NUMBER 10
JULY TO DECEMBER 2016



The Secretary General of ACTO analyzes the results of the GEF Amazon Project

Her knowledge about the Amazon along with her diplomatic background at international level has enabled the Ambassador Maria Jacqueline Mendoza Ortega, Secretary General of the Amazon Cooperation Treaty Organization (ACTO), to give a new projection to this intergovernmental body composed by the 8 Amazonian countries, that promotes the preservation of the Amazon Basin through the principles of sustainable development that guide the process of regional cooperation under which the Project ACTO/UNEP/GEF Amazon – Water Resources and Climate Change was implemented.

Ambassador, how do the Member Countries of ACTO define the water resources of the Amazon Basin, the largest basin in the world?

Water resources are considered by the Member Countries of ACTO as strategic and priority resources not only for the life of natural ecosystems but for the Sustainable Development and Quality of Life of local and national populations in each of the ACTO Member Countries, whose conservation and sustainable management is under the full sovereignty of each country. However, due to the transboundary nature of the Amazon Basin's water resources, regional and international cooperation is required for the implementation of joint actions for the conservation and integrat-



Source: OTCA

The Secretary General of ACTO Ambassador M. Jacqueline Mendoza Ortega explained that regional cooperation is key to the conservation and integrated management of water resources in the basin

ed management of these resources, and therefore this is an important issue of the ACTO's Amazonian Strategic Cooperation Agenda adopted by the Ministers of Foreign Affairs of the Member Countries of the Organization, in 2010.

An effort that has brought together the Member Countries of ACTO has been the joint work performed through the GEF Amazon Project - Water Resources and Climate Change. What is the balance of this regional initiative after 4 years of work in

the Amazon Basin?

The balance is very positive, since it has enabled, among other things: i) the enrichment and deepening of knowledge on the subject of Amazonian transboundary water resources through the analysis and joint identification of the main problems affecting their conservation and integrated management, which has positively resulted in the formulation of a shared regional vision for conservation, management, and sustainable use of the resources; ii) the strengthening of national capacities



ACTO orientates regional cooperation under the principles of sustainable development through ACTO/UNEP/GEF Amazon Project

through training and capacity building actions of technical staff of the national institutions responsible for water resources in each country; iii) the implementation of pilot projects aimed to support monitoring of water resources with emphasis on the establishment and improvement of technological platforms for the collection and data processing in the countries, early warning systems, hydro-meteorological stations, vulnerability maps: the Hydro-Climatic Vulnerability Atlas and the strengthening of regional networks of technical and scientific exchange among the most important results.

Could you explain to us, which are the main verifiable results of the GEF Amazon Project considering the Sustainable Development Goals?

In addition to deepening knowledge

regarding the Amazon Basin's transboundary water resources and the development of a regional strategy for the Integrated Management of Water Resources in the Amazon basin, within the context of the GEF Amazon Project, it can be tangibly identified the improvement of tools and technologies for the permanent monitoring of water resources, especially those technological platforms mentioned and listed in the previous question as well as the training and capacity building programs in the framework of South-South Cooperation of ANA (Agência Nacional de Aguas for its acronym in Portuguese) Brazil. Moreover, the Project strengthened the adaptation capacity and response of local governments to extreme climate events through: i) the implementation of risk management models, ii) tri-national early warning system in border areas, iii) reloca-

tion policies of vulnerable populations, iv) productive alternatives in flooded areas, benefiting a total of 475 thousand people. There is no doubt that these achievements will support the implementation, both at the regional and local levels, of several Sustainable Development Goals of the United Nations 2030 Agenda, especially the Goals: 3, 6, 11, 13, 15 and 17.

How have the Governments reacted to the Strategic Action Program (SAP) for the Amazon Basin, which is the main agreement reached by the GEF Amazon Project?

There is a very high expectation, since the SAP reflects the consented regional vision on the priority issues for the conservation and the Integrated Management of the Amazonian transboundary water resources and the joint strategic actions to

undertake at the regional level to solve the problems and/or mitigate their negative effects. In addition, the countries consider that the implementation of the SAP would allow the articulation of national and regional initiatives. In other words, it is a complementary mechanism to the national policies related to water resources, allowing to direct part of countries' GEF STAR resources for the implementation of Amazonian projects in this matter as well as to identify national counterpart resources, considering and adding to the contribution of the cooperation of the GEF Amazon Project, other initiatives on water resources executed with national and international cooperation funds in each country.

Which actions will ACTO carry out to identify the required funding for the Strategic Action Program in the Amazon Basin?

The ACTO, through its Permanent Secretariat (PS/ACTO), will continue supporting the countries in the process of identification and allocation of international cooperation funds, including GEF resources, to projects on transboundary

water resources, as well as the national counterparts. The PS/ACTO will also support the Member Countries in the process of formulation and presentation of projects, within the framework of the strategic actions of the SAP, to other agencies and sources of international cooperation, as well as to the national authorities in each country responsible for funding projects in the Amazon region.

Given that the ACTO aims to increase scientific research and exchange of information among the countries, we are interested in knowing how this purpose is fulfilled in the tasks undertaken within the GEF Amazon Project, particularly in which demonstrable activities?

This issue was partially covered in questions number 2 and 3, but we could highlight specifically, the facilitating role of the training and capacity building activities and the exchange of experience and information on water resources developed under the GEF Amazon Project: especially, the initiatives being implemented through the ANA Brazil, for the establishment and

strengthening of regional networks for the exchange of technical and scientific experts from the ACTO Member Countries.

A demonstrable and remarkable example in the area of research and exchange of scientific and technical experiences is the pilot project being jointly implemented by the most important Amazonian research institutes in the region: the IAP of Peru, the SINCHI of Colombia and the INPA Brazil, for the development of a regional information platform in the framework of the Integrated Information System, connecting Biodiversity databases.

What message would you like to convey to the national authorities responsible for water resources in the different countries?

To continue to deepen the Amazonian regional cooperation for the conservation and integrated management of water resources as a medium and long-term strategy for the sustainable development of the ACTO Member Countries, and for the improvement of life quality of the Amazonian populations.

Meeting of the V Steering Committee of the ACTO/UNEP/GEF Amazon Project – Water Resources and Climate Change

The Advisor to the Ministry of Foreign Affairs of Brazil, Natalia Shimada, welcomed the government representatives from Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela to the V Steering Committee meeting of the ACTO/UNEP/GEF Amazon Project - Water Resources and Climate Change, held in Brasilia, Brazil, on June 26, 2015.

Coming up next, the Ambassador Robby Ramlakhan informed that his term as Secretary General of the Amazon Cooperation Treaty Organization (ACTO) was ending and therefore this was his last

meeting. In addition, he referred to the GEF Amazon Project as an example of regional cooperation on integrated and sustainable management of water resources of the basin. He also stressed the importance of the Strategic Action Program (SAP), expressing his expectation for its approval by the countries, as a long-term joint planning and management tool.

The Chairperson of the Meeting, Tibério Magalhães Pinheiro, Representative of the National Water Agency – ANA (for its acronym in Portuguese), Brazil, acknowledged the participation of the delegations

and opened the event.

The objectives of the meeting were: to revise the Activities Report for the first semester of 2015 and the Work Plan for the second semester of 2015, as well as to validate the Shared Vision agreed by the ACTO Member Countries, among other issues. During the meeting the following Shared Vision was agreed:

“Water resources are strategic for the balanced and sustainable development of the peoples of the Amazon River Basin. These resources are subject to the protection and conservation for their multiple uses with the

purpose of improving the quality of life¹ of present and future generations, respecting the ethnic and cultural diversity and the sovereignty of the Member Countries. The integrated management of the water resources is made feasible with the participatory management, the exchange of information, research, the implementation of actions of adaptation to variability and climate change, through the regional cooperation and the support of adequate institutions.”

Likewise, the Regional Transboundary Diagnostic Analysis (TDA) with the inputs from the countries, was also approved. Similarly, the Representatives welcomed the First Draft of the Strategic Action Program (SAP), on which a workshop was held previously, where numerous contributions arose to be included for its presentation to the VI Project Steering Committee, to be held in January 2016.

After the approval of the Activities Report and the Work Plan, the delegations of Ecuador, Guyana, Suriname and Venezuela presented their Pilot Projects, which were well received by the participants.

The results of the consultancy on the Integrated Information System (IIS) were also presented. On this issue, a technical workshop will be held with the partici-



Source: GEF Amazon Project

At the meeting, the Shared Vision agreed by the Member Countries of ACTO was validated

pation of experts from the national institutions responsible for managing water resources information.

In the same way, after the presentation of the Hydro-climatic Vulnerability Atlas, the delegations committed to submit the required information on this study and ex-

pressed their appreciation of the Project’s achievements.

Following, the Brazilian delegate presented the status of implementation of the Amazon Project: Regional Action in the Field of Water Resources (ACTO/ANA/ABC) highlighting the training and technical meetings conducted, as well as the pilot initiative among three countries for the installation of hydrometeorological monitoring sites, and the follow up phase of the Project.

Finally, the delegates and participants paid a tribute to express their appreciation for the work of the Executive Director of ACTO, Amb. Mauricio Dorfler and the Environment Coordinator, Antonio Matamoros, who ended their mandates at ACTO.

¹ Good living/wellbeing in harmony with Mother Earth, concept recognized by some Amazon countries.



The Regional Transboundary Diagnosis Analysis document was approved at the event.

IN BRAZIL

Regional Workshop: Strategic Action Program (SAP)

The Representatives of the 8 Member Countries of ACTO: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela attended the Regional Workshop: Strategic Action Program (SAP), in order to consider some issues about the Regional Transboundary Diagnostic Analysis (TDA) and jointly review the first version of the SAP, which was the main subject of the meeting, held in Brasilia, Brazil, on June 25, 2015.

The Permanent Secretariat of ACTO started the event with two presentations. The first one, by the Coordinator of Environment, Antonio Matamoros, who among other things, explained the focus of the workshop on the Vision, the TDA and the SAP. Also, Amb. Mauricio Dorfler, Executive Director of the PS/ACTO, made an institutional presentation stressing the importance of the political mandates and technical cooperation of the Organization, and highlighting the national processes



Source: GEF Amazon Project

The Workshop focused on the Shared Vision, the TDA and SAP



Source: GEF Amazon Project

Presentation of the First Draft Strategic Action Program (SAP)

that emerged in each Member Country to build the Vision, the TDA and the SAP.

In the review of the Regional TDA, the Delegates expressed their interest in safeguarding the valuable national experiences of the TDA, in analyzing the influence of sedimentation in coastal areas, in observing the coherence between the identified problems and their root causes and in the formulation of the problem of Governance to be considered within the Integrated Water Resources Management (IWRM). Venezuela’s Delegate reported the realization of its National TDA Workshop, attended by more than 45 stakeholders, and the coincidence in the identification of 6 problems contained in the Regional TDA. Likewise, the Delegates also concluded that it was important to approve the TDA, as an input for the SAP.



Source: GEF Amazon Project

The SAP plays a catalytic role in raising funds from multiple sources

Following, the First Draft of the Strategic Action Program (SAP) was presented, on which the Member Countries (MCs) made several observations and contributions. The importance of identifying national and regional initiatives and projects related to the topic of strategic actions that are being developed by the Countries was also considered. For this purpose, a guide was distributed to be filled and forwarded to the PS/ACTO. It was also suggested to look for mechanisms to integrate civil so-

ciety in the process of development and implementation of the SAP.

The Member Countries (MCs) agreed to pursue the following actions to advance and guarantee the development of the SAP: i) The MCs should send their comments. ii) The PS/ACTO will send the adjusted version of the SAP with the inputs from the MCs. iii) Conduct a Technical Workshop on the SAP in October 2015, in Santa Cruz, Bolivia, and iv) Hold the VI Project Steering Committee (CDP) in November 2015.

Financing Options for the SAP

The representative of UNEP, Isabelle Van der Beck informed on the opportunities and financing alternatives for the SAP and about the process to be followed in order to apply for funds from the Global Environment Facility, or GEF.

She explained that the SAP plays a catalytic role in raising funds from multiple sources, including private sector and foreign investors. In the context of the GEF, a contribution of up to US\$15 million is estimated, including STAR and non-STAR resources, for which she requested the Countries to coordinate with their respective GEF Focal Points, in order to ensure those funds and to identify possibilities for national co-financing.

She also mentioned the GEF's Small Grants Program for local communities.

The representative of UNEP also informed about the timeframe for formulating a project concept (PIF) to be submitted to the GEF until March 2016, as target date. This presentation led the Member Countries to commit to consult with the National GEF's Focal Points and to look for funding alternatives from national and international cooperation for the SAP.

It was also stressed that the SP/OTCA needs to explore other funding options with an emphasis on South-South cooperation.

in cages in the flooded areas of Marañón River in Peru, which is one of the main tributaries of the Amazon River running through most of this National Reserve.

This activity was conducted in February 2015 by the GEF Amazon Project-Water Resources and Climate Change under the Pilot Project Sustainable Management of Transboundary Floodplain Forests in the Amazon Basin, that is part



Source: GEF Amazon Project

Raising gamitana in cages, for a better control of the species, its food, and for an increase in productivity

of the Component III - Strategic Action Program (SAP).

Through the installation of the cages, the species *Colossoma macropomun* or gamitana, one of the most appreciated species in the Amazon, was introduced to the ecosystem. This fish is more than one-meter-long and weighs 30 kilograms; and in the 70's it was intensively commercialized until the species declined, also suffering a reduction in size. When reaching 5 years old the gamitana is sexually mature and begins to reproduce. Throughout its life, this fish lives in different water bodies and when it exceeds 60 cm long, it becomes part of shoals migrating upstream.

This GEF Amazon Project's proposal to provide cages offers a sustainable method for the production of fish, as fishing is the main economic activity of these communities and their families' basic commodity. Also, many benefits are achieved by raising gamitana in cages, as it offers a better control of the species, the rational use of the food, and an increase in productivity.

Initially, it was considered to build the cages with local material from the region, but this idea was discharged, so the fish-

ermen and their families could learn in detail about the aquaculture cycle to be followed, in a technological innovation scheme that allowed them to learn how to install the cages and take care of the whole process. The cages and their implements were brought from Brazil, from Sao Paulo to Manaus and from Manaus by boat to the Iquitos' port terminal. The cages were stored in the warehouses of the Peruvian Amazon Research Institute (IIAP for its



Source: GEF Amazon Project

The GEF Amazon Project installed 25 cages in Igarape do Tapará Large Costa in the Amazon River (Brazil)

acronym in Spanish), in Quistochoa, and then taken to the city of Nauta where the members of the communities of San Jacinto and San Regis took them to their final destination.

The cages are enclosures preventing fish from swimming out. They are 2x2x2 cubic meters (8m³) aluminum prefabricated floating structures, coated with different size meshes made of different materials to allow for water and fish waste to pass freely.

The communities learned to recognize the importance of water quality, water level variation, water and wind flows for fish raising. They also became involved in the permanent monitoring of water temperature, dissolved oxygen, among other essential parameters for fish survival.

Thereby, 300 fingerlings per cage were seeded with fish 3 to 5 cm long, each weighing 40 to 50 grams. Only 8 cages were used for cultivation and the remaining two were used to store the fish caught from the shoals, which is another advantage of this system.

The GEF Amazon Project provided balanced powdered fish food for the first six months of fish raising, -beginning, growth and fattening stages-. Then, the fish will be moving from the cages according to their size. Fishermen were trained in food supply and biometry in order to weigh and mea-

NEWS FROM COMPONENT III

From the cage to the pot and from the cage to the market

"I want to start by thanking the ACTO for its effort to have the cages delivered. It is very important for us to raise and feed our fish to cover some of our needs ... You have done so much by carrying the cages from so far away and place them in our community ... we will have fish in the cages and we will be able to take it, and whenever we need fish we do not have to go far to find it. They're here, you just grab the fishes

either for your breakfast or for selling purposes", said Alejandro Taminchi Ahuanari, who is a member of the Natural Resources Management Organization (ORMARENA for its acronym in Spanish) "Black Tigers" of the community of San Jacinto, located in the Pacaya Samiria National Reserve in Peru.

Many other participants joined this testimony during the training on fish farming

sure the fish every 30 days, to observe their weight gain and growth and thus, adjust the rations, learning how to feed them with supplementary food, such as papaya, guava, banana and food scraps.

Thereby, with the active participation of the Peruvian communities of San Jacinto and San Regis along with the technical assistance of the Project, this activity is de-

veloped allowing the fish farming during flood seasons of the floodplains achieving a final density of 250-300 fish per cubic meter.

Similarly, the GEF Amazon Project initially installed 25 cages in Tapar Grande and Igarap do Costa in the Amazon River (Brazil) through a training process similar to that used in Peru.



Tanks nets for cultivating fish allow to face hydroclimate events in the basin

Source: GEF Amazon Project

Results from the Evaluation of the Aquifer Systems in the region of Leticia, Colombia

One of the tasks of the GEF Amazon Project - Water Resources and Climate Change is to conduct groundwater studies in the Three Borders area (Colombia, Brazil, Peru) between the towns of Leticia and Tabatinga, and the river island of Santa Rosa, a region which is characterized by the abundance of water, both at atmospheric level, and surface and underground level.

In Leticia, Colombia, water for human consumption comes from rainwater, and surface and ground waters, being the latter its main supply source.

The goal of the GEF Amazon Project was to improve the technical and scientific knowledge in this triple border. Therefore, a study of the aquifer systems in the region of Leticia in Colombia was performed, coordinated by the Ministry of Environment and Sustainable Development. The consulting company *Servicios Hidrogeolgicos Integrales SHI* from Medelln, Colombia, was in charge of the study execution.

The objectives of this research were: to conduct a characterization of the aquifers in the region, to analyze the interaction between surface water and groundwater, to identify the problems related to the current and future water supply for the population, considering the impact of climate variability and climate change, in order to propose strate-



Water for human consumption comes mainly from groundwater in Leticia

Source: ciudadinternacionalblog/offzcolombia.com.co

gies and adaptation measures.

Leticia is located in the southern part of Colombia. The city is the capital of the Amazonas Department, covering 5,968 km² and situated on the left bank of the Amazon River. In this area of study three field campaigns were held, allowing for the preparation of the inventory of underground water points, the identification of their potential sources of contamination of those points and also the testing of water quality by physical-chemical sampling.

A three-days field work with stakeholders in the area was organized in order to perform the research and promote its results.

The Amazon Aquifer System

The Aquifer systems in the region of Leticia are part of the so-called Amazon Aquifer System. Its origin comes from the combination of the Cretaceous and Cenozoic sediments of the Amazon basin covering an estimated area of 3,950,000 km². A summary of the available knowledge regarding this aquifer system shared by Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela was published in 2007 as part of the book *"Preliminary Assessment: Transboundary Aquifer Systems in the Americas."* However, to confirm the existence of an aquifer system of continental dimensions, several studies are

required to determine the hydraulic performance and interconnections between regional geological formations, as well as a better understanding of the stratigraphy and structure of the region.

The basis of this study was the Alluvial Aquifer of Leticia. Due to the wide use of groundwater in the region of Leticia, under this research 226 water points were recorded reaching a total of 1.055 water points after crossing with other data.

According to the National Institute of Health of Colombia (2012), the aqueduct of Leticia does not entirely meet the needs of water for human consumption, supplying less than 50% of the population. As a result, many people prefer the use of groundwater and rainwater as second option. This occurs both at urban and rural levels. When the groundwater points were analyzed, several pollution threats were identified, including: the open pit waste dump at the Leticia-Tarapaca road, the landfill site, the cemetery, two fuel stations, the fuel storage plant in the Alfredo Vasquez Cobo Airport, the municipal slaughterhouse and the polluted streams such as San Antonio (border area with Tabatinga) and Simon Bolivar.

The study shows the poor sanitary conditions of the groundwater catchments that do not receive any form of treatment. In addition, due to the absence of sewage system, many users dump their wastewater into septic tanks, which are near the groundwater wells.

Given the trend of increasing extreme climate events in the area and based on a 2040 projection of water supply and demand, the social stakeholders were advised of the need to deepen the wells in order to cope with future droughts.

The community was also made aware of the need to improve the infrastructure of the municipal water supply system and to exercise environmental control over potential pollution sources.

The results of the study "Evaluation of



Extraction well with motor pump (left) and manual extraction well (right) in Leticia

Source: SHI/GEF Amazon Project



Elevated storage tanks of groundwater

Source: SHI/GEF Amazon Project



Sanitaries characteristics of catchments – groundwater points

Source: SHI/GEF Amazon Project

the Aquifer Systems in the region of Leticia, Colombia” will be considered in the Master Plan of Water Supply and Sewerage of Leticia. These results are inputs to continue studying the aquifer formation shared with Tabatinga.



Simon Bolivar Brook: threat of groundwater pollution

Source: SHI/GEF Amazon Project

X MAP Forum: New ways for the adaptation and resilience to extreme weather events in the MAP region

Almost 500 participants from Bolivia, Brazil, Peru, United States, Germany, Chile and Argentina, representing more than 150 institutions (government, universities, NGOs, indigenous organizations, among others) gathered at the X MAP Forum: New ways for the adaptation and resilience to extreme weather events in the MAP region, held in the city of Rio Branco, State of Acre, Brazil, on November 9-11, 2015.

The MAP region is located in the heart of the Amazon, at the triple border between the Peruvian Department of Madre de Dios, the Brazilian State of Acre and the Bolivian Department of Pando. This is a vulnerable territory to extreme climate events, with high rates of poverty and continuous degradation of ecosystems, issues of great concern at the regional level.

To address the region’s current conditions, several innovative initiatives on environment and development were integrated in five strategic lines of action, which were widely discussed at the X MAP Forum. The topics were: Environmental Risks Management; Forests, Land and Water; Economy-Infrastructure; Regional Planning and Land Use; Environmental

and Human Rights. Consequently, the Rio Blanco Declaration was adopted under the slogan “New ways for the adaptation and resilience to extreme climate events in the MAP region, South-Western Amazon”.

The Amazon Cooperation Treaty Organization (ACTO) excelled in organizing the

plenary session on “Integrated Management of Natural/Water Resources in the border region of MAP”. The meeting was attended by government Representatives from Bolivia, Brazil and Peru, which are the focal points of the ACTO/UNEP/GEF Amazon Project - Water Resources and Climate Change.



More than 150 institutions (government, universities, NGOs, indigenous organizations) met at the MAP - Forum X

Source: MAP- Forum X-Facebook



ACTO organized the plenary session on Integrated Management of Natural / Water Resources in MAP transboundary region

The ACTO also organized the roundtable “Trinational database, Challenges and Strengths: Socializing the experience of the ACTO/UNEP/GEF Amazon Project and the Activity III.2.2. Adapting to Climate Change in the MAP region”.

Through this initiative, the aforementioned Project led the study on vulnerability and adaptation to climate change in the Acre River Basin and regional communities, and developed an Early Warning System for the region. These activities provided for improving governance capacity in the departments of Madre de Dios, Pando and in the state of Acre, as well as subsidized the formulation and implementation of local adaptation strategies to climate variability. Also, a trinational geographic database was built, consolidating information on land use in the region of MAP. The roundtable sought to socialize, discuss and validate the database developed by the Project in this activity, with the intention of finding new ways for consolidation, compiling and updating the information provided by the institutions and local Governments.

At the occasion, 23 conferences were held and 36 proposed trinational lines of action were agreed, containing specific



In the Map Forum X: Exhibition of scientific works

recommendations for each line of action, which were essential for the integration and long-term collaboration in the region.

The GEF Amazon Project’s contribution to the region consisted in the exe-

cution of the Pilot Project Adaptation to Climate Change in the border MAP region. The main result of this activity was the implementation of a trinational Early Warning System in the MAP region.

Source: MAP- Forum X-Facebook

Source: MAP- Forum X-Facebook

Pilot Projects Ecuador, Guyana, Suriname and Venezuela

Four pilot projects will be implemented in Ecuador, Guyana, Suriname and Venezuela through the GEF Amazon Project - Water Resources and Climate Change, to prepare the conditions in those Countries for the implementation of the Strategic Action Program (SAP), which is the main objective of this regional initiative.

Ecuador: Biomonitoring of macroinvertebrates and ichthyofauna in the Napo River basin

To continue the GEF Amazon Project in Ecuador, the Water Secretariat, within the framework of the community biological monitoring, will carry out the Project: Community Biomonitoring with Aquatic Macroinvertebrates aimed to the control and surveillance of water quality, fostering a sense of ownership by the communities with the use of aquatic macroinvertebrates as bioindicators of water quality.

As known, a method to assess the status of surface water is through the use of biological indicators, such as fish and plankton, among others. Nevertheless, the aquatic or benthonic macroinvertebrates, i.e. insects, crustaceans, etc. that remain at the bottom of water bodies, are the species most commonly used to assess the functioning of aquatic ecosystems, according to Hellowell, 1986, especially when their life cycle is linked to the physical and chemical environmental conditions (Segnini, 2013).

Hence, Ecuador will conduct two studies, the first on aquatic macroinvertebrates with biological index of water quality, in the basin of the Napo River (a tributary to the Amazonian river Solimões), and the second one, on the fish fauna in the same river, from secondary information. The Reports and the Manual on the Biomonitoring Study of Macroinvertebrate and Secondary Information Processing of

Ichthyofauna in the Napo River basin will be submitted to the Water Secretariat, for review and approval.

Guyana: Updating the National Water Information System

The current National Water Information System (NWIS) of Guyana is administered by the Hydrometeorological Service (Hydromet), and provides real-time access to all hydrological, meteorological and climatological data of government sectors in Guyana.

This system allows users to produce reports, extract data, view charts and graphs, and store and retrieve, for example, videos, audio files, images, etc. The reports generated from the database allow the authorities to identify critical information. The database also includes a Geographic Information System (GIS) showing the spatial representation of the data and a display section of reports and data that users can view and analyze in real-time. Thus, the rainfall patterns or other hydrometeoro-

logical data representation for particular areas are displayed.

The pilot project submitted by Guyana relates to the "Upgrade of the National Water Information System" hosted at the Hydrometeorological Service, in order to achieve better data collection, monitoring, analysis and reporting.

The current National Water Information System will be adapted with the WebMap 6.0 application consisting of two parts: one for the client (user) and the other for the server, making it easier to save, view, query and submit data. This application will allow the sharing of all types of data: spreadsheets, text documents, PDF files, videos, audio files, geospatial files, etc.

The WebMap 6.0 tool uses advanced technology, sophisticated mathematical calculations and words processor, allowing users to run queries and generate statistical analysis from a web browser without the need of installing any software by the final customer. The user simply has to have appropriate access credentials. Although



Fish: biological index of water quality in Ecuador

Source: desarrolloamazonico.gub.ec

WebMap 6.0 has some complex functions, the system's design is intuitive, easy to use. This is a feature that encourages the use of the system and therefore minimizes user errors that may occur due to the complexity of the system.

The upgrade of the National Water Information System in Guyana will allow: to achieve a more intuitive design so that more people can use it; to design a system to be used in different devices such as mobile phones, tablets and desktop computers, as the use of mobile internet has increased. It will also have a new database engine (PostgreSQL), different from the current MySQL, for greater performance, reliability, and integration with GIS applications.

Suriname: The Rehabilitation of Mangroves in Weg naar Zee with Sediment Trapping Technique

The Activity III.2. Special Priorities of Adaptation of the GEF Amazon Project is the reference and operational framework under which the Government of Suriname presented the pilot project: "The Rehabilitation of Mangroves in Weg naar Zee with Sediment Trapping Technique". The project will implement an application to promote and improve the recovery and restoration of the mentioned coastal mangroves, located north of Wanica district, that has suffered from continuous degradation of the coastline for 30 years with loss of fertile land and frequent flooding, impacting the local population.

The main goal of this pilot project is to develop adaptation measures to counter sea level rise, and therefore to address climate change in a sustainable way. The adaptation measure includes the construction of two units (tanks) of sediments trapping to mitigate coastal erosion, which in turn will weaken the crash of the waves on the shore.

Due to the low altitude of its coastline, Suriname is affected by alternating geomorphological processes related to



Suriname seeks to retrieve the coastal mangroves

Source: Media Object: United News.Sr

erosion and sediment deposits, which is reinforced by climate change, including the sea level rising and changes in the wind pattern and speed, and, on the other hand, by human action.

The timeline of the pilot project is three months, with the Amazon Cooperation Treaty Organization (ACTO) as the main funder, also with co-funding from the Anton de Kom University of Suriname (Board) and the participation of the National Coordination Center for Disaster Management (NCCR).

Venezuela: Technical and Institutional Strengthening of Integrated Management of Water Resources in the Amazon basin of the Bolivarian Republic of Venezuela

The Ministry of People's Power for Eco-Socialism and Waters (MINEA for its acronym in Spanish) proposed the creation of a hydrometeorological monitoring system to generate information for the evaluation, study and decision making on the integrated management of the Venezuelan Amazon basin. Therefore, the Ministry considered the implementation of an Integrated Management Plan of water resources in the basin.



With the application of WebMap 6.0 technology Guyana updates the National Information System on Water

Source: theamazonforest.blogspot



Source: www.aporrea.org

Venezuela considered to implement an Integrated Management Plan for water resources in its basin

The main objective of this pilot project is: to strengthen the technical and institutional capacities through training of human resources and the acquisition of equipment that will benefit the local population in view of climate change.



The project comprises four components: the first one includes the acquisition of surface hydrometeorological measurement equipment, creating local capacity for operation and maintenance of the Hydrometeorological Observation

System of Amazonas State. The second one concerns the installation of automatic hydrometeorological stations in the study area. The third is devoted to implement a hydrometeorological monitoring system with diagnostic campaigns, inspection, measurement and evaluation. Finally, the fourth component is for institutional strengthening, through specialized seminars and workshops.

The proposed sites to install the hydro-meteorological stations are: The Orinoco River hydrometric stations in Tama-Tama, the Brazo Casiquiare in Tama-Tama, the Brazo Casiquiare in Solano, and Negro in San Carlos de Rio Negro. Also, at the climatological station of San Carlos of Rio Negro.

Within this pilot project, the training of 30 technicians and the participation of over 120 local and national actors in an educational seminar on the integrated management of water resources is expected. Also, two hydrometric stations in operation and with trained staff are expected, as well as a climatological station in the state of Amazonas.

Binational Workshop on Groundwater in Leticia (Colombia) and Tabatinga (Brazil)

The first Binational Workshop on Groundwater was held in Leticia, on September 2, 2015, to present the final results of the study "Evaluation of Aquifer Systems in the region of Leticia" and the progress in the research carried out by Brazil on the "Evaluation of the Aquifers of the Sedimentary Basins of the Hydrogeological Province of Amazonas in Brazil (1:1.000.000), and Pilot Cities (1:50.000)", one of which is Tabatinga.

The event was attended by the Director of CORPOAMAZONIA, the Director of Integrated Management of Water Resources of the Ministry of Environment and Sustainable Development, the Representative of the National Water Agency of Brazil, the

Environment Coordinator of ACTO, officials of the Government of Amazonas, Mayor's Office, Ombudsman's Office, the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), delegates of the SINCHI Research Institute, several Universities, Colleges, teachers, students and indigenous communities, among others.

The workshop was jointly organized by the Amazon Cooperation Treaty Organization (ACTO) and the GEF Amazon Project - Water Resources and Climate Change, under which the activity "Conjunctive Use of Surface and Groundwater in the *Tres Fronteras* region (Colombia, Brazil and Peru)" was carried out. In this context, the study: Evaluation of Aquifer Systems in the region

of Leticia, was conducted in coordination with the Department of Integrated Water Resource Management of the Ministry of Environment and Sustainable Development of Colombia.

In the presentation of the study of the aquifers of Leticia, in charge of Engineer María Victoria Velez, from the Colombian company *Servicios Hidrogeológicos Integrales* (SHI.S.A.S) a description was made of its hydrogeological aspects, the inventory of the areas' water points, the aquifer-river interaction, potential sources of pollution and vulnerability to water pollution, future water demand, among other matters of interest to the community and the authorities involved.

By the Brazilian National Water Agency, ANA (for its acronym in Portuguese), Fabricio Bueno reported on the progress regarding some specific features and findings related to the Tabatinga Aquifer. His intervention preceded reviews of common aspects of both cities regarding quality of groundwater, its physical-chemical characteristics and the vulnerability to contamination of the aquifer, among others.

The workshop allowed the debate on groundwater in this border area, and the presentation of a successful case of supply of groundwater for human consumption in the community of San Sebastian de Los Lagos, Leticia. This community has a local aqueduct, which is supplied by the alluvial aquifer of Leticia; and the community is in charge of its operation. This experience may be replicable in other regions of the basin.

Among the main conclusions of the event are the following: technical and scientific knowledge of groundwater in the



Source: SHI/GEF Amazon Project

The Binational Workshop allowed the debate on groundwater shared by Leticia and Tabatinga

region of the triple border (Leticia, Tabatinga and Santa Rosa) should be articulated among the countries involved in a prompt and timely manner for the joint manage-

ment of resources. Similarly, the study of the aquifers of Leticia showed that groundwater is cheaper and of better quality water supply alternative in the region.



Source: SHI/GEF Amazon Project

An Inventory of groundwater points was presented in Leticia

IN BOLIVIA

Regional Technical Meeting: Strategic Action Program (SAP)

Governmental Representatives from Bolivia, Brazil, Ecuador, Guyana, Peru, Suriname and Venezuela attended the Regional Technical Meeting: Strategic Action Program (SAP) held in Santa Cruz de la Sierra, Bolivia, on October 21-22, 2015.

This meeting allowed revising the Second Draft of the SAP, to agree on regional strategic actions and to analyze the funding prospects with GEF Funds.

The event was attended by Juan Carlos Seguro, Director General of Limits, Borders and International Transboundary Waters from the Bolivian Ministry of Foreign Affairs and by Antonio Matamoros, Coordinator of Environment of the Permanent Secretariat of ACTO.

The Scientific Coordinator of the GEF Amazon Project, Norbert Fenzl, was in charge of the presentation of the Second Draft of the SAP. He presented the most important issues of the proposal including the need for its implementation in ACTO's Member Countries.

On his part, the PS/ACTO presented an alternative of GEF funds to finance the SAP.

Finally, the delegations agreed to send their contributions to the SAP Second Draft. Once received, the PS/ACTO will compile the information and send to the



SAP's Second Draft was revised at the Workshop



Countries agreed Regional Strategic Actions

Countries the revised Third Draft. Subsequently, through a video conference meeting the Member Countries will review and adjust this Third version to be then analyzed in a face-to-face regional meeting,

in January 2016.

Likewise, the delegations agreed to have a consultancy service on the preparation of a SAP Financial Strategy, including South-South cooperation.



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