

# Twinning Agreement

## Modelling applications for IWRM

IVL (Norrström, Sweden)  
DNH (Cuareim, Uruguay/Brazil)  
CIEMA (Nicaragua Lake, Nicaragua)  
UNIGECC (Catamayo-Chira, Perú/Ecuador)

### **Organisations involved:**

1. IVL, Swedish Environmental Research Institute, Sweden
2. DNH, Dirección Nacional de Hidrografía, Uruguay
3. CIEMA, Centro de Investigación y Estudios del Medio Ambiente, Nicaragua
4. UNIGECC, Unidad de Gestión de Proyecto Binacional Catamayo-Chira, Perú/Ecuador

#### **1. IVL, Swedish Environmental Research Institute, Sweden**



#### **IVL in Brief**

The Swedish Environmental Research Institute (IVL) is Sweden's largest environmental research organisation. IVL is an SME with focus on applied research. IVL receives financial support from both the government and the industry. IVL has participated in several EU projects in the areas of river basin management and implementation of the WFD (e.g TWINBAS, EUROHARP, LIFE-projects, PHARE-projects). Additionally, IVL has lead a large number of national water related projects as well as international river basin management projects in e.g China, Russia and the Baltic States. IVL provide expertise on eutrophication, pollutant fate and flow in river basins including metals and POPs, emission inventories, abatement measures for point sources and diffuse sources, GIS-based area-covering hydrological modelling, the Water Framework Directive, remote sensing and stakeholder involvement.

#### **IVL representative:**

**Sam Ekstrand**, Ph. D., is the Department Manager for the Water Resources and GIS Department at IVL. Besides a long and wide experience in monitoring and modelling of pollutants and pollution effects he has specific experience in GIS-based river basin management, system development, emission inventories, source distribution and scenario analyses of actions aiming at improving water quality. Ekstrand has experience of co-ordinating EU-projects (TWINBAS, 505287, SEMEFOR, ENV4-CT97-0398), and has been the IVL team leader in several EU-projects.

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**2. DNH, Dirección Nacional de  
Hidrografía, Uruguay****DNH in brief**

The DNH is the organization in Uruguay responsible for the management of the water resources (quantity) promoting their maximum benefit use and, through that, helping to improve the quality of life of its inhabitants. DNH is also responsible for collecting and maintaining the hydrological database and for granting the water-right permits as well as the permits for the construction of hydraulic works and for the extraction of materials from the river beds. In addition, the DNH is also in charge of the management of the non-commercial ports and the development of the Uruguayan navigable waters. The DNH is a member of the National Committee for the International Hydrological Programme of UNESCO.

**DNH representative:**

Alejandro Arcelus, MSc. and civil engineer in Hydrology is the person responsible for the technical assistance at DNH. Mr. Arcelus has coordinated a number of water resources management projects (ex. Pilot project for Floods management, the Guaraní Aquifer Project) having a specific expertise in hydraulic modelling and hydrology as well as in other related activities to hydrology prediction.

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**3. CIEMA, Centro de Investigación y  
Estudios del Medio Ambiente, Nicaragua****CIEMA in brief**

The CIEMA-UNI Center (Environment Research and Studies Center of the National Engineering University of Nicaragua), was initiated in 1987 as an Environmental Engineering Master Program that was expanding its activities and infrastructure through the Environmental Sciences Master Program and its Water Quality, Air Quality, Potable Water Laboratories, being officially accepted as a Center in 2002. Important actors in this development have been the Pan-American Health Organisation, the National Engineering University, the Nicaraguan Ministry for the Environment and the Government of Holland (laboratories provision).

The mission of CIEMA is to generate, transfer and disseminate environmental knowledge and technology, as a way to contribute to the sustainable human development in Nicaragua and the Central American region.

The main research lines are: management and treatment of solid waste, residual water treatment, air quality and water quality. Furthermore, other important areas are also sustainable water resources uses, groundwater modelling, and greenhouse gases inventory. CIEMA receive financial support from the annual budget of the national public universities covering the staff salaries. The operational cost, maintenance and research supports are financed through the services and consultant activities.

Among the master students of CIEMA in environmental engineering and environmental sciences usually are personnel of the Environmental and Natural Resources Ministry (MARENA), Nicaraguan Institute of Territorial Studies (INETER) and the Nicaraguan Institute of Drinking Water and Sewers (INAA) the main institutions related to water issues in Nicaragua. From time to time CIEMA organize short postgraduate training courses related to water, environment and human health to this institutions.

#### **CIEMA representative**

Sergio Gámez is the Director of CIEMA **Sergio Gámez**, MSc in Water Resources-Water Quality with a specialization in residual water treatment. Mr. Gámez is the CIEMA Director and has experience in managing and treatment of domestic residual water as well as agro industrial sources, projects and technology evaluation, greenhouse gases inventory, and others. Mr. Gámez has participated in a number of projects related with sustainable use of water resources.

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#### **4. UNIGECC, Unidad de Gestión del proyecto Catamayo-Chira, Perú/Ecuador**



#### **UNIGECC in brief**

UNIGECC (Catamayo Chira Management Unit) manages a development programme which comes from the peace agreements signed by Ecuador and Peru in 1998. This Project called in its full form "Project for the Planning, Management and Development of the Catamayo Chira River Basin" has been agreed and signed by Peruvian and Ecuadorian authorities and AECI (Spanish Agency of International Cooperation).

The Institutions promoting the Project are the “Binational Plan for the Border Region development“ (Plan Binacional de desarrollo de la Región Fronteriza) through both chapters, Peruvian and Ecuadorian and the Spanish Agency for International Cooperation AECI (Agencia Española de Cooperación Internacional). It counts additionally with a wide range of collaborations with public institutions and private ones at local, regional and national level.

The organizational structure of the Management Unit for the Catamayo-Chira Project (UNIGECC) clearly reflects the bi-national nature of this river basin: Ecuador and Peru are both represented by their respective Foreign Ministries. Under this structure, UNIGECC has 3 co-directors: 1 from Ecuador, 1 from Peru and 1 from AECI. UNIGECC can be subdivided in 2 technical units (one in each side of the basin), with a group of professionals responsible for planning, and for following up and evaluating the project activities.

The main objective of the Project is the promotion of an integrated management of the Catamayo Chira river basin, including measures for overcoming socio economical and environmental problems, which are directly or indirectly consequence of the actual occupation model and use of the territory.

For the implementation of the management plan for the river basin one of the Project goals is to create a Binational Body for the Basin management, body which will be formed by the different organisations competent in natural resources management.

Additionally the Project promotes activities oriented to socioeconomic development which include production and technical education of the population, (coherent with the area potentials and limitations) in the context of the IWRM in the basin.

#### **UNIGECC representative**

Mercedes Alonso, MSc and Agricultural Engineer, is the co-director from the AECI side of the UNIGECC. She has extensive experience in co-ordinating and managing international projects.

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# Definition and Length of Twinning Agreement

## **Background**

IVL Sweden is coordinating an EU project called TWINLATIN “Twinning European and Latin-American River Basins for Research Enabling Sustainable Water Resources Management”, which has the following objectives:

1. To fill gaps in knowledge and methods in order to enable implementation of a harmonised IWRM approach in Latin American river basins, addressing the European Water Initiative and using the European Water Framework Directive as a guiding reference approach
2. To enable and perform assessment of climate change effects on the hydrological regime, water availability and water quality of seven river basins. Additionally, to identify and analyse actions addressing the EU WI, specifically improvement of water quality and availability as well as sanitation conditions for poor communities as a means to reduce poverty.
3. To enable proposition of actions that have been thoroughly analyzed from all perspectives; surface water availability, surface water quality, groundwater availability and quality, sustainability criteria, domestic, agricultural, industrial and hydropower stakeholder interests.

The river basins included in the project are: Baker (Chile-Argentina), Catamayo-Chira (Peru-Ecuador), Cauca (Colombia), Lago de Nicaragua (Nicaragua), and Quarai/Cuareim (Brazil-Uruguay). The European river basins are Thames (UK) and Norrström (Sweden).

TWINLATIN has been in operation since September 2005 with a three-year duration. During the first year efforts have focused on defining prioritised needs from each of the basins, the stakeholder involvement, the data availability, and the construction of a harmonised database. The current relationships are aimed at filling knowledge gaps and providing the basis for the establishment and improvement of integrated water resources management plans (IWRP).

The main training needs have been identified in each of the partners in TWINLATIN and some twinning activities have already taken place. These actions have gone smoothly and all the partners have learned from this twinning process. However, the current funding is limited compared to the gaps in knowledge identified. The partners have decided to look for additional sources of financing a more concrete training program where the central issues are: Database construction and Modelling applications.

IVL (Sweden), UNIGECC (Peru/Ecuador), CIEMA (Nicaragua) and DNH (Uruguay) agreed in that the knowledge, expertise and experience that IVL has in-house can help them to establish a more sustainable IWRM in the respective Latin American basins.

## **General objective of the twinning agreement**

This general objective will be reached by encouraging the exchange of expertise, knowledge and technical personnel. The main expected result is the strengthening of the effectiveness for integrated water management within the national network of the agreement members.

### Specific Objectives:

- a) To start a training program held by IVL having as central topics database construction and Modelling Applications (simulation models for IWRM). More specifically, to develop a harmonised Database and its connections to different model tools (SWAT, PCRaster, MODSIM, Watshman, other).
- b) To strengthen technical capacities in the use and management of different models, supporting a more effective Integrated Water Resources Management.
- c) To implement innovative communication tools in the basins: Nicaragua Lake (Nicaragua), Catamayo-Chira (Perú/Ecuador) and Cuareim (Uruguay) and to create links to the other basins in the Region.

### Number of Exchanges

This twinning agreement is proposing two exchanges for each of the parties involved. In the first one, the exchange would consist of one or two people per partner and would last three weeks. The goals of these proposed exchanges consist of teaching database management, exploring different tools and modelling software, and receiving training in the construction of scenarios. Another exchange is also considered where two experts from IVL will follow up the knowledge and the applications of each partner in its respective basin.

The training activities under the first exchange will be carried out at IVL in Stockholm, where the professionals from the participating partners will stay during three weeks.

To reach these goals, the best people for the exchanges would include those professionals in charge of the database construction and maintenance as well as the modelling application aspects.

The second exchange (a follow up exchange) will be agreed between all the participants but it is meant to be carried out within the four months following the first exchange.

Ultimately, the most important measure of success will be the willingness of the stakeholders in each river basin to accept and use the results of the project and to use the methods and tools developed. These additional exchanges will ensure that UNIGECC, CIEMA and DNH have the skills to implement and maintain the newly created IWRPs.

### Number of people involved directly in the training program

Partner	Number of Persons	Position/level	
UNIGECC, Perú/Ecuador	2	Technician/engineers	These people are those who will be in charge of implementing and maintaining the database and the modelling aspects in the basins
DNH, Uruguay	2		
CIEMA, Nicaragua	2		
IVL	4	Technician/engineers	These professionals

			will be the experts who will conduct the training topics
Total	10		

**Duration of the agreement:**

The agreement under Twinbasin will last up to the end of the second exchange of experts.

**About the cost**

All costs over the Twinbasin financial contribution have to be covered by each of the participant members of this agreement. The Twinbasin financial contribution is as follows:

International Travels: € 1.000 (maximum)

Per diem : € 70/day

MEMBER	NAME and DATE	SIGNATURE
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IVL representative Björn Lundberg, Stockholm  
15 December 2006

DNH representative

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CIEMA representative

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UNIGECC representative

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