SECTOR D

MODULE NO.4: DISSEMINATION, EDUCATION AND PUBLIC PARTICIPATION

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1. CURRENT ACTIVITIES OF DISSEMINATION, EDUCATION AND PUBLIC PARTICIPATION

1.1 Background

Overview

In Uruguay there is a number of accumulated environmental impacts and other environmental problems generated on a regular basis, due to the effects of human activities. There is, however, no national system of the proper environmental management in Uruguay. DINAMA is in charge of identifying the most critical environmental problems, prioritizing and selecting them.

There is no sufficient management system for industrial discharge. An appropriate disposal system for solid waste is also not provided in Uruguay and, thus, in many cities household residues are the main problem. The main problems dealt by some NGOs are pesticide overuse in soils, forest cultivation using species that use large volume of water, increasing water contamination and overuse of fertilizers.

Environmental Conflicts and Solution Practice

The research done by Santandreu and Gudynas on Environmental Conflicts says that in Uruguay these related to water quality reflects the general concept; the most of the conflicts with relation to water would be diluted along the time without any solution. For example, MVOTMA formed a commission with the basin management features for the Carrasco River's management under wide-range participation, but it has functioned no more since 2001.

Nevertheless, there were so many formulations of communities seeking participatory approaches. In 2000, several community organizations formed the Water and Sanitation Protection Commission of Costa de Oro and Pando, worried about the contamination of groundwater caused by malfunctioning of wastewater treatment plant in Costa de Oro and Pando (Canelones). Meanwhile, the National Water and Life Protection Commission (CNDAV) was formed in 2002 by the participation of diverse organizations: neighborhood councils, user groups, environmental NGOs like Redes, OSE trade union (FFOSE), Joanico Promotion Association (Canelones), Wine Producers Center of Uruguay, Agriculture Movement of Uruguay, Nationalist Commission on Water Protection, Manantiales Promotion League and Science Faculty and Engineering Faculty academics. The CNDAV promoted a ballot on water issues that was voted by Uruguayans on November 2004. The ballot proposed the integrated and sustainable basin management with basin authorities and civil society involvement. The result of the ballot was positive for the proposal.

The problems in water resources resulted from the prolonged drought in Uruguay caused many conflicts in different natures involving many actors, namely:

- Availability of water resources is not enough to cope the needs of users with registration. Thus, the intervention by the Irrigation Councils is inevitable, and

- Some groups utilize the water for livestock but their registration is not obligatory. This generates conflicts difficult to be solved and should be studied deeply for ultimate solution, promptly.

Another problem related to the priority in water allocation arose between hydropower generation and irrigation uses in the Rio Negro basin. In this case, the problems was faced and solved at basin planning method.

Recently, a great dispute between Uruguay and Argentina for the installation of two pulp milt plants in Uruguay has emerged. The said two plants got the approval from Uruguayan authorities for the construction in Fray Bentos city. The operation of these plants will generate wastewater that will be discharged to Uruguay River, which is an international river of common use by Argentina and Uruguay. In this sense, the Argentine side community of Gualeguaychu located in front of Fray Bentos city, have claimed against the plants and push to the government of Argentine to bring the case to the international judgment court The Hague in order to stop the construction. This court concluded that Argentine did not demonstrated that the plants could give negative impacts on the Uruguay River during their construction. Also the International Financial Corporation of the World Bank is evaluating the projects with a view to determine its environmental impacts.

National Policies and DINAMA's Task

The national policy on environment in Uruguay states that DINAMA should actively participate in environmental education processes. Since 1997, however, DINAMA has not had directorate or division in charge of the development for actions on environmental education on regular basis. One of DINAMA's essential duties (according to the Decree 257/979) is to formulate, supervise and evaluate plans to prevent the environmental impacts of human activities or projects. They include the promotion of environmental awareness, prioritizing planning and execution of education, capacity building, information and dissemination activities that lead the adoption of behaviors consistent with the environmental protection and the sustainable development.

At present, there is not yet a national policy on environmental education, as a programmatic proposal of environmental education promotion in all sectors of society that establish responsibilities and duties. A national policy on environmental education should give an institutional framework of environmental education, establishes their principles and be the basis for public policies.

Although DINAMA has produced some public campaigns on environmental issues, they are in a very limited extent for the elaboration and production of public campaigns on water quality problems. Also it has not been involved so much in the prevention of conflicts related to water quality problems.

Into the present JICA Project, it was organized a water quality environmental education group in order to achieve activities of education and public participation, especially for the implementation of the Pilot Project 5/6.

1.2 Activities of Dissemination

DINAMA during 2002 and 2003 year developed a bimonthly magazine named "Ambiente Uruguay" and its website. Some articles in these media have focused on underground water, the evaluation of industrial wastewater toxicity and industrial water pollution control.

Meanwhile the OSE's website presents information on drinking water quality protection and water saving (http://www.ose.com.uy/pe_portaleducativo.htm).

GEA (Environmental Education Group – renamed Technical Team on Environmental Education in 2005) of the Municipal Government of Montevideo has developed two websites: one for community environmental monitoring system (http://www.monitoreoambiental.org.uy) and other for Montevideo' community education and public participation on environmental issues (http://www.gam.org.uy/). GEA has published various kinds of printed materials, videos, radio spots, CD-ROM, etc. on water quality issues. DINAMA had no activities in participating in these campaigns and activities. Though other municipal governments (in Canelones, Florida, Lavalleja and San José) have websites, special sections devoted to environmental issues are not provided.

While one of DINAMA's functions is to operate the Environmental Information System (including the Annual Environmental Report) related to air, water, soils and biota, the annual report has been not published in recent years. As an initial step, DINAMA had prepared a Santa Lucía River Basin' Annual Water Quality Report for 2005 year using data resulted from the pilot monitoring campaign conducted in the frame of the present JICA Project.

OSE basically directs their information dissemination mainly to drinking water protection and appropriate use, not to water resource protection and recover. GEA directs the information dissemination mainly focusing on water contamination and watercourses monitoring and protection.

1.3 Activities of Environmental Education

DINAMA had not developed strong programs on environmental education in the past years. However, in the frame of this project, some technicians of DINAMA performed many activities of environmental education with the collaboration of the JICA Project Team. From 2005, DINAMA had recognized the necessity of dealing with the environmental education and public participation and had established a working group.

OSE uses its website as a platform for an educative campaign directed to schoolchildren (http://www.ose.com.uy/pe_portaleducativo.htm). Educative programs of the Government of Montevideo are: "Water for Life (Agua para la Vida)", "Montevideo Limpia", and AQUATOX. These programs are realized with the authorization of the National Public Education Administration. DINAMA is not involved in these programs.

At primary education level some kind of educative work on water issues existed through MECAEP (Improvement of Quality of Primary Education) program with elaboration and distribution of educative materials, development of capacity building activities for

teachers, an electronic bulletin, and promotion of projects on health and environment (PME). DINAMA is not involved in these programs.

OSE educative activities focuses on drinking water quality protection and water saving. The Government of Montevideo's educative programs on water quality are directed to involve communities on water quality problems of local rivers and apply a basin-based approach. MECAEP projects focuses on water saving and rational use.

1.4 Current Status of Public Participation in Water Quality Matters

The Government of Montevideo has established two commissions for public participation as follows: a) COMMAC and; b) GAM

Montevideo Citizen Environmental Monitoring Commission, COMMAC

It is an institutional space for public participation on environmental monitoring activities, including water quality monitoring. Officers of the Municipality of Montevideo integrate the Technical Secretariat of this Commission and the members are representatives of NGOs, citizens and local environmental community commissions. In addition, the Government of Montevideo has set the phone numbers that receives complaints and questions on environmental issues.

Montevideo Environmental Group, GAM

This Group was created by Municipal Resolution Nº 1888/00. The Group to the date is composed by several public and private institutions and organizations and the representatives of the public of Montevideo. The technical secretariat of the GAM is the Technical Team on Environmental Education. It's functions are, inter alia: assess, evaluate and follow-up of the objectives and proposals in the Montevideo' Environmental Agenda, to promote public participation and access to environmental information, to impulse cooperation projects related to objectives of Environmental Agenda, generate workshops and seminars.

GAM has the following structure: Plenary Conference that meets under a wide and diverse participation, Executive Board (consisting of the Government of Montevideo, DINAMA and one representative from NGOs); and five open-ended working groups (one on water resources) that allow the participation of experts and delegates of different organizations, neighborhood commissions, etc. GAM organizes thematic workshops (water, air, residues, economic and social dimensions, environmental education, and natural and rural areas) open to the public. GAM publishes every year the Annual Environmental Report for Montevideo. In the last two years GAM is using the UNEP' GEO methodology for the elaboration of the Environmental Report.

Other instances of public participation

COTAMA has organized a working group that focuses on a proposal of updating the Decree 253/979 with the participation of the relevant stakeholders. DNH and RENARE set up a basin-based commission called Regional Irrigation Councils along with main objective to avoid the waste in water utilization.

1.5 Basic Direction for Dissemination, Education and Public Participation of the Master Plan for Capacity Development for Water Quality Management

Due to the long-lasting economic stagnation in Uruguay, the budget and manpower have been reduced in DINAMA and other organizations related to water quality management, and thus they have hardly conducted systematic water quality management. DINAMA has conducted some particle work, e.g. water quality monitoring for limited purposes through so called campaigns with the international assistance, and industrial wastewater management, it was, however, not sustainable. In order to realize sustainable water quality management system, reestablishment of the system that can be managed by DINAMA and relevant organizations by themselves is indispensable.

To enhance the improvement of their management capacity in such situations, it is important to employ an approach of the promotion of public participation with their raised awareness on water quality management (people's comprehension and spontaneous cooperation) as well as the improvement of the capacity of staffs in charge and related organizations.

On the other hand, the PCM workshops and discussions with participatory approach of the local workshops held in the related five Municipalities have collected the following comments from the participants:

- Communities and their residents are ones of the important stakeholders on water quality management;
- Residents should be given proper information on water quality;
- Opportunities of environmental education to the residents are inadequate; and
- Each resident group, however, has its own stakes in water quality, which means that some coordination is required in pursuing the promotion of public participation.

Further, "Education" was selected one of the projects in the project selection based on the problem analysis and the objective analysis of the PCM workshop.

The Study of the Team had clarified, however, that there was no adequate mechanism actually working for absorbing compelling opinions of the people on water quality and coordinating them except Department of Montevideo. Additionally, education and dissemination activities for water quality conservation necessary for raising the community's awareness was being performed not by schools nor Departmental Governments on a regular basis but by NGOs on a project basis, except Montevideo. The most significant obstacle to the former education and dissemination activities is the scarcity of adequate materials for environmental education, to which the allotment of the governmental budget should be deemed very difficult, considering the recent severe financial situation of Uruguay.

On the basis of the above background, the basic direction of the dissemination, education and public participation is proposed as follows:

- The dissemination and education is to be conducted to raise the awareness of the local citizens on environmental water quality, and to motivate for the water quality conservation.

- To formulate a basis for the wider understanding for the establishment of the policy for water quality management.
- To promote the participation of the local citizens for the implementation of policies on the water quality management, and to promote the integration of the stakeholders for the effective implementation of the activities, and realize reduction in the load to the governmental organization through the spontaneous cooperation of the people.
- To motivate the relevant government agencies for the effective implementation of water quality management policy through the watching of the government by the residents.

These basic directions were used for designing and implementing activities for the Pilot Project 5/6 and after pilot stage related to dissemination, education and public participation. For details of the Pilot Project 5/6 refer to Sector E.

2. ENVIRONMENTAL EDUCATION ACTIONS

2.1 General

This Section states concrete actions that have been taken in the sector of environmental education after the implementation of the Pilot Project stage conducted in the period April 2004-March 2005.

For activities of education implemented during the pilot stage refer to Sector E.

2.2 Promotion of a Working Group for Environmental Education and Public Participation

2.2.1 Background

Nor current Department nor Unit exists at DINAMA to deal with Environmental Education. However, from June 2005, the National Director has promoted the creation of a Working Group to work on ac hoc basis on environmental education and public participation.

Each Project that is being implemented by DINAMA has a component of environmental education. The designated officer of each project for environmental education was appointed to integrate the Working Group. The composition is shown in the bellow **Table 2.2.1**

Table 2.2.1 Composition of the Working Group for Environmental Education and Public Participation

Item	Name	Project Name or Position
1	Mr. José Pedro Díaz, Ms.Laura Bonomi	Advisor of National Director
2	Ms. Lujan Jara, Mr. Agustín Gianoni, Ms. Andrea Ventoso, Ms. Natalia Petrone	Officers of DINAMA
3	Ms.Laura Modernell, Ms. Erika Hotfman, Ms.Laura Garcia, Ms. Soledad Davila	National System of Protected Areas
4	Ms. Mariana Vilaró	Biodiversity Protection and Sustainable Development Project
5	Ms. Mónica Guchin	FREPLATA
6	Ms. Mónica Gómez	ECOPLATA
7	Ms. Gabriela Glisenti	NIP
8	Ms. Sandra Bazzani	PNUD
9	Ms. Magdalena Preve	Climate Change Project
10	Mr. Xxx	Ozone Project

In spite that the present Working Group is moving on, it is necessary an official resolution of DINAMA to formalize its creation, structure and functions.

2.2.2 Function

The main function of the working group is to support the establishment of DINAMA' environmental education policy and programs.

2.2.3 Activities

This Ad Hoc group initiated its works during the second quarter of 2005. After several meetings (during around three months) trying to develop a draft proposal for environmental education policy, the group interrupted its activities and reinitiated its activities during the second half of 2006. The main lines to develop the policies are in principle the followings:

- Insertion of the environmental education in the permanent formal education curricula
- Technical capacity for environmental management
- Environmental education for public participation
- Public dissemination
- Environmental awareness raising for relevant stakeholders and decision taking leaders

2.3 Capacity Building Workshops on Use of Educative Materials

2.3.1 General

In Lavalleja, San Jose and Canelones were realized capacity building workshops for awareness and training of teachers and principals of public schools on how to use the educative materials elaborated into the project framework: a kit containing one kamishibai, one video and one manual.

2.3.2 Workshop at Lavalleja

(1) General

The workshop was carried out on June 14, 2005. 2 persons from Lavalleja Municipality and 2 persons from DINAMA/JICA education working group composed the staff that organized this workshop. The workshop was realized in the Teacher Training School of Lavalleja with 25 participants including teachers, principals and future teachers. In the workshop were presented: the video for schoolchildren; the picture storytelling (kamishibai), and the manual elaborated by DINAMA/JICA Project on watercourses quality protection. After the initial introduction of educative materials, the second part of the workshop was devoted to discussion between participants on the best ways to use the materials in the classroom.

(2) Distribution of Educative Materials

Prior to the workshops, education materials kits were distributed as follows:

- 100 kits among public schools

- 3 kit for teachers' training school
- 3 kits were delivered to the Education Office of Lavalleja

Lavalleja Municipaly made the transportation of the materials from Montevideo to San Jose while the local Education Office implemented the distribution.

2.3.3 Workshop at Canelones

A couple of workshops were realized in West Canelones. In the workshops were presented: the video for schoolchildren; the picture storytelling (kamishibai), and the manual elaborated by DINAMA/JICA Project on watercourses quality protection. 2 persons from Canelones Municipality, 3 from DINAMA/JICA education working group, and 1 from regional DINAMA office composed the staff that organized these workshops. Details of the workshops are described here under.

(1) Workshop in Santa Lucía City

This workshop was carried out by July 21 of 2005. Attendants were teachers, principals and future teachers. Number of attendants was 61. The workshop was divided into two parts, the first one consisted of the introduction of the educative materials, and the second part consisted of discussion with participants on how to make the best use of them.

(2) Workshop in Canelones City

This workshop was carried out by July 26 of 2005. Attendants were teachers, principals and future teachers. Number of attendants was 45. The workshop was divided into two parts, the first one consisted of the introduction of the educative materials, and the second part consisted of discussion with participants on how to make the best use of them.

(3) Distribution of Educative Materials

Prior to the workshops, education materials kits were distributed as follows:

- 127 kits to cover the 124 schools of the west part of the Department
- 1 kit for Canelones Municipality
- 1 kit for West Canelones Education Office, and
- 1 kit for DINAMA Regional Office.

The said distribution was proposed by Canelones Delegate to the Steering Committee, taking into account the bit area that Canelones covers, and the difficulties to reach all the schools with the materials. The transportation of the materials from Montevideo to San Jose and its posterior distribution was implemented by the Municipality of Canelones delivering the materials to all the schools of the west part each by one.

2.3.4 Workshop at San Jose

(1) General

The workshop was carried out on October 25, 2005. Attendants were teachers, principals and future teachers. Number of attendants was 93. 1 person from San Jose Municipality, 3 from DINAMA/JICA education working group, and 1 from regional DINAMA office composed the staff that organized this workshop.

(2) Distribution of Educative Materials

Prior to the workshops, education materials kits were distributed as follows:

- 119 kits to cover the 116 schools
- 1 kit for San Jose Municipality
- 1 kit for DINAMA Regional Office.

The transportation of the materials from Montevideo to San Jose was made by DINAMA education working group, while the local Education Office implemented the distribution.

2.3.5 Workshop at Montevideo

(1) General

Teachers and schoolchildren of Montevideo had received several capacity building activities through a wide variety of projects on water quality protection coordinated mainly by IMM, being Aquatox (http://www.monitoreoambiental.org.uy/aproyecto.htm) and Globe the most known. For this reason, teachers of primary education has already sufficient capability in the field of water quality and can manage by themselves the educative materials provided by the JICA Project. Consequently, it was considered not necessary to conduct the workshop for the case of Montevideo considering their actual capability. In fact teachers in Montevideo already had applied the educative materials in the classroom.

In addition, DINAMA is working in an Environmental Education Programme for Santa Lucía wetland, which fall partially in Montevideo jurisdiction. In this sense, DINAMA will include capacity building activities in primary schools using JICA educative materials in the framework of this programme, which evaluation could permit the expansion of the activities in other areas of Montevideo.

(2) Distribution of Educative Materials

Between June and July 2006 the educative kits were distributed in Montevideo, through the three administrative divisions of Public Primary Education Sector in Montevideo. DINAMA gave 82 kits to Montevideo Centre Education Office, 89 kits to East Montevideo Education Office and 80 kits to West Montevideo Education Office.

2.4 Technical Team on Environmental Education at Montevideo Municipality (former Montevideo Environmental Group, GEA)

2.4.1 Background

The Environmental Education Group, GEA, was created by Resolution Nº 73 of February 25, 1997 of Montevideo Municipality for implementing environmental education activities aiming to rise up the awareness of the population in order to promote changes of attitudes and their involving in the searching of solutions and prevention of environmental problems.

GEA worked as advisory unit under the Department of Environmental Development of IMM. By year 2005, GEA changed its structure and was renamed to "Technical Team on Environmental Education".

2.4.2 Function

The main functions are: (a) to foment the diffusion of environmental campaigns; (b) to promote the public participation in the search of solutions and in the development of actions that permits the improvement of the environment; (c) to produce educative materials to be used on environmental campaign; (d) to advice the Department of Environmental Development on environmental education issues.

2.4.3 Activities

The Montevideo' Municipal Resolution 5777/05 states an agreement between IMM and MVOTMA, where are defined two key actions: the creation of the Metropolitan Area Environmental Group, and the development of an Environmental Education Program for schools of Montevideo, Canelones and San Jose, surrounding Santa Lucía wetland. This last action would be coordinated with the Environmental Education National Network, with the Protected Areas National System, and the Metropolitan Agenda Programme. These actions are now ongoing.

2.5 Agreement on Wetlands of Santa Lucía River

In the last years the municipal governments of Montevideo, San Jose and Canelones were coordinating works for Santa Lucía' wetland management, with a view to include this area under the National System of Protected Areas.

By Resolution Nº611/06, the Municipality of Montevideo approved the text of the Agreement to be signed by IMM, IMC, IMJS and the MVOTMA for the management of the Wetlands of Santa Lucía River.

Currently the three municipalities want to deepen the coordination with a view of establishing a metropolitan environmental area.

2.6 Establishment of the Environmental Education National Network

2.6.1 Background

By August 12, 2005 was signed by Education and Culture Minister, MVOTMA Minister, University of Uruguay' Republic Rector, and the President of National Administration of Public Education, the agreement for the creation of the Environmental Education National Network for the Sustainable Human Development.

2.6.2 Function

The network has the main functions: (a) to promote programmes and actions on community environmental education and especially for young people in all educative levels; (b) to promote capacity building activities for facilitators; (c) to promote the elaboration of educative materials; (d) to coordinate and cooperate with public and private institutions as well as international organizations; (e) to create a public information system on projects and activities related to environmental education; and (f) the promotion of a Fund for environmental education projects.

2.6.3 Structure

The network is coordinated by a Coordination Group with: one member from the Education and Culture Ministry; one member from MVOTMA; one member from University of Uruguay' Republic; one member from National Administration of Public Education; one member from private educative institutions; one member from Industry Chamber; one member from NGOs; one member from trade association; and one member from Municipalities' Congress.

2.6.4 Activities

During April 27-29, 2006 took place the First National Conference on Environmental Education. This Conference was organized by DINAMA and the Ministry of Education and Culture. A lot of experiences were presented in the Conference, including the presentation of the planning and methodology of the Module on Environmental Education and Public Participation of the DINAMA/JICA Project.

3. DISSEMINATION AND PUBLIC PARTICIPATION ACTIONS

3.1 General

This Section states actions that have been taken in the sector of dissemination and public participation after the implementation of the Pilot Project stage conducted in the period April 2004-March 2005.

For activities of dissemination and public participation implemented during the pilot stage refer to **Sector E**.

3.2 Water Quality Forum of Florida

3.2.1 Activities and Schedule

The Coordination Body of the Forum in its session of March 2005 had decided to organize many activities which basic design are presented as follows:

(1) Celebration of World Environmental Day

Activities: To organize a ceremony for celebration of the world environmental day consisting of the followings: (a) Theatrical presentation based on the Kamishibai elaborated in the framework of DINAMA/JICA Project; (b) Plantation of native trees and; (c) Wall painting

Schedule: June 5, 2005

(2) Workshop on Effluent Management in Fray Marcos City

Activities: Presentation of wastewater treatment facilities used by industries in Fray Marcos City

Schedule: August 2005

(3) Workshop on Effluent of Tambos

Activities: Presentation of wastewater treatment facilities used by Tambos in Florida Department

Schedule: October 2005

3.2.2 Implementation and Results

The Coordination Body of the Forum had organized many activities in order to raise the awareness of the population as described hereunder:

(1) Celebration of World Environmental Day

In the School Nº33, in Florencio Sanchez neighborhood, was celebrated the World Environmental Day. The schoolchildren of the 3rd degree level made a theatrical

performance based on the kamishibai elaborated in the framework of DINAMA/JICA Project. In the same event was planted a native tree by schoolchildren as a symbol for nature conservation.

In addition, for the day commemoration, was painted a wall to make awareness campaign on water quality protection. A wall of School Nº33 was selected for painting, and the schoolchildren painted the wall, with the support of a master on arts and its parents.

The Program of the Celebration is in **Annex 3.2.1**

(2) Workshop on Effluent Management in Fray Marcos City

This workshop could not be implemented.

(3) Workshop on Effluent of Tambos

This activity was finally discharged because another project that focus on the issue was started. The name of the said project is "Responsible Production" funded by the World Bank.

3.2.3 Revitalization of the Water Quality Forum

The Water Quality Forum of Florida was stopped after June 5, 2005. It was mainly due to the election of new municipal authorities carried out on May of 2005 year. By July 2005, the new authorities were in place. From there was a transition and adaptation period to allow them to be familiar with their responsibilities and the execution of activities including the supporting the Water Quality Forum.

By July 2006, with the support of the DINAMA/JICA Project Team, the Florida Municipality reinitiated the activities of the Forum. In this sense, several meetings were carried out to introduce the new authorities in the main lines of the project, and to define how to improve the public participation in activities aiming for the well management of watercourses in Florida Department.

Finally, the Coordination Body Meeting of the Forum was held on August 2, 2006, with the following agenda: (a) presentation of the 2005 annual report on water quality for Florida by Florida Hygiene Department Staff; (b) presentation of the new Water and Sanitation National Direction, DINASA; (c) presentation of a summary of Florida Sustainable Development Department' projects that cover water quality protection, such as the Project for the Sustainable Management of Natural Resources and Biodiversity of Santa Lucía River Basin and Paso Severino Lake, a Project with Florida Milk Producers that includes the acquisition of machinery aimed to construct wastewater treatment plants at the tambos, a Project for the Plan management of Paso Severino Lake, an so on.

3.3 Creation of Others Water Quality Forums in Santa Lucía River Basin

3.3.1 Water Quality Forum in Lavalleja Municipality

(1) Activities and Schedule

The basic design is described as follows:

(a) Establishment of the Water Quality Forum

Activities: Establishment of the Water Quality Forum in Lavalleja Department

Schedule: September 30, 2005

(b) Workshop on Chemical Products Management in Forestry, Farm and Agricultural Production

Activities: Presentation of current status on chemical products used in forestry, farm and agriculture

Schedule: August 18, 2006

(c) Mini-Workshop on Effluent Management

Activities: Presentation of wastewater treatment facilities used by industries of Lavalleja Department

Schedule: December 13, 2005

(2) Implementation and Results

(a) Establishment of the Water Quality Forum

DINAMA, the WQ Forum of Florida with the close participation of the Municipality of Lavalleja had promoted the establishment of the Water Quality Forum of Lavalleja Department on September 30, 2005. The JICA Project supported this activity. The Act of the Constitution is presented in the Annex 3.3.1.

The first meeting of its coordination body was held on October 18, 2005. After that, the following meetings were realized in November 15, 2005 and December 13, 2005. During 2006 the meetings were realized in March 6 and July 11.

(b) Workshop on Chemical Products Management in Forestry, Farm and Agricultural Production

On August 18, 2006 was realized a workshop in the Farm Producers Society of Lavalleja on “Chemical products management in forestry, farm and agricultural production”. Members from Uruguayan Agrochemical Products Chamber, Agriculture Safety General Direction, Forestry General Direction, and

DINAMA, presented issues related to: use of pesticides in Uruguay, appropriate use of pesticides, appropriate management of pesticide packaging, pesticides use in forestry production, and use of veterinary drugs in cleaning water for cattle.

The public objectives were agricultural producers, and technicians linked to farm safety and animal health. The Program of the Workshop is presented in **Annex 3.3.2.**

(c) Mini-Workshop on Effluent Management

By December 13, 2005, the Coordination Body of the Forum held a meeting. During that meeting a mini workshop was organized in order to hear the presentation of wastewater treatment facilities used by beverage industry and OSE of Lavalleja Department. Technicians of Salus Soft drink Company, and OSE manager of domestic wastewater treatment plant at Lavalleja carried out the presentation.

On the other hand, in the same mini-workshop, was presented the new organization " Water and Sanitation National Direction, DINASA".

3.3.2 Preparation for the Establishment of Water Quality Forum in Montevideo Municipality

On May 18, 2006, DINAMA and JICA Project Team had presented a proposal of joint work to Montevideo Environmental Group (GAM). As mention before, the creation of GAM, was promoted by IMM.

After a carefully explanation of the main lines of the project, was proposed to GAM to joint to the project as Montevideo Water Quality Forum, taking into account that GAM is a well-developed commission that has a working group dealing with water resources.

The issue is under discussion now by GAM, which accepted the proposal preliminarily.

It is opportune to mention here that DINAMA is member of the Coordination Body of GAM.

3.4 Creation of the Metropolitan Area Environmental Group (GAAM)

3.4.1 Background

With the support of San Jose and Canelones Municipalities, MVOTMA and Montevideo Municipality signed an agreement to create the Metropolitan Area Environmental Group (GAAM) and to develop an Environmental Education Program in schools near the Santa Lucía wetland in the three Departments.

3.4.2 Activities

The Environmental Education Program in school is now in process, by developing environmental education activities with 4 schools in San Jose and 4 schools in Canelones.

The schools were selected considering their vicinity to the Santa Lucía River environment. A working group is preparing an environmental education manual for schools taking as a focus the Santa Lucía wetland. Also a facilitator was selected to improve the public participation in the advisory committee of the Santa Lucía wetland.

3.5 Establishment of the Advisory Commission for Water and Sanitation (COASAS)

DINASA, which belong to MVOTMA, was created by Law Nº17.930 of December 2005 to formulate the national policies on water and sanitation. The amendment of the Constitutional Act Article 47 proposes the creation of the Advisory Commission for Water and Sanitation. In this sense, on March 2006, was created by MVOTMA a preliminary advisory commission with the objective of incorporating the views of the stakeholders in the elaboration of the national policies. Representatives of relevant public and private institutions, users and civil society associations, etc, integrate it. The Chairman of this Commission is the National Director of DINASA.

3.6 Metropolitan Agenda Programme

Metropolitan Agenda Programme was launched in July 29, 2005 with the main objective of promoting the synergic management of human and material resources in the metropolitan area. The Programme is dealing with aspects related to solid wastes management, transportation, etc. in the metropolitan area. Besides, this Programme seek to protect the environment and promote the sustainable use of natural resources of the Santa Lucía river basin, with an emphasis on water quality improvement by promoting actions to minimize the impacts of pollution sources. This programme coordinate a Working Group to create the Santa Lucía' wetland protected area. The working group is creating an Advisory Commission with the relevant stakeholders in the three Departments that involve the Santa Lucía' wetland (Montevideo, Canelones and San Jose).

The Board of Directors of the Programme are integrated by the Mayors of San Jose, Canelones and Montevideo.

3.7 Issue of Newsletters by DINAMA

After the pilot project stage, not newsletters was produced by DINAMA

3.8 Creation of JICA Project Website

From May 2005 was possible to access the webpage of the JICA Project from DINAMA website. The webpage of the Project include several sections:

- Organization – Issues on policies and strategies, legal framework, relevant institutions, pollution sources management, water quality monitoring, and watercourses classification.
- Master Plan – include a future vision on water quality, problem analysis, and formulation of the master plan

- Public participation – recovers the public participation activities in all the departments, mainly in Florida and Lavalleja, where the forum is already working.
- Environmental education – include a general description and the materials developed under this project
- SISICA – Give access to the water quality information system of the project
- Glossary – Includes main terms on water quality issues.

Through the present JICA Project, it was established an information system on water quality named SISICA. This system is accessible by the relevant agencies through the webpage http://sisica.dinama.gub.uy.

On the other hand, also in the frame of the JICA project, a joint-work for water and sediment monitoring & analysis was established between DINAMA and the 5 involved municipalities into the project. All data generated into the said joint-work is inserted into the SISICA by each involved institution.

In SISICA, the page related to water quality, presents the initial water quality evaluation made with data collected during the pilot monitoring campaign conducted in the period December 2004 to April 2005. This information is available for the general public through SISICA website. Within this year, the general evaluation of the water quality, utilizing data of after pilot stage until June 2006, is expected to be elaborated which will show the status of the water quality condition in Santa Lucía River Basin and in each involved municipality.

4. CONCLUSIONS

4.1 Environmental Education

(1) There is not a Department nor Unit for Environmental Education at DINAMA. The National Director of DINAMA formed a Working Group recently, which works on ad hoc basic. It needs to be formalized through an official resolution.

(2) There are not policies on environmental education at national and local levels, except the approaches of Montevideo Environmental Agenda

(3) The educative materials elaborated under the JICA Project covers a necessity of having a qualified tool to be used by teachers in the primary education for the sector of water quality management. The educative materials were well received by the education community.

(4) The Educative Manual introduce a proposal for water quality project implementation at the school' local level which may allows its utilization for a long time.

(5) Although was a time-consuming activity, the elaboration of educative materials in discussions and prior validation between DINAMA education working group and education officers and teachers was an essential step for a good appropriation of the materials by the targeted users and applicators.

(6) In the workshops organized for teachers training, the involved teachers highlighted that the local concerns and interests were taken into account in the elaboration of the educative materials.

(7) In a non-systematic follow-up done during June 2006 by DINAMA/JICA project Team, teachers and principals highlighted the utility of the educative materials when used in the classroom activities.

(8) It was noted that in all the Municipalities of the Project Area, there are people with educative skills that are involved with variable extent in capacity building activities in coordination with DINAMA education officers.

(9) The collaboration between DINAMA (central and regional offices), municipalities and national and local educative officers had demonstrated to be the best way for organizing workshops addressed to primary teachers, principal and future teachers.

(10) The establishment of the Environmental Education National Network is a good signal of willingness of national authorities in dealing with the environmental protection.

4.2 Dissemination and Public Participation

(1) Water Quality Forum in Florida related to Santa Lucía river basin was established in 2004. Many activities were done under the coordination of the Forum. However, in 2005, activities were suspended due to the arrival of new Municipal authorities that needed a transition period to understand the multiple projects to deal with. By August 2006, the Forum had re-started their activities with the formal support of the current Mayor.

(2) Water Quality Forum in Lavalleja related to Santa Lucía river basin was established during 2005 and has a regular activity from the beginning.

(3) The proposal of DINAMA/JICA Project team made in May 2006 to Montevideo Environmental Group (GAM) to operate as Montevideo Water Quality Forum in the framework of this project is now under their evaluation.

(4) The initiative between MVOTMA and the Municipality of Montevideo, with the support of San Jose, and Canelones Municipalities, to develop the Metropolitan Area Environmental Group is well seen by the JICA Project Team since it may articulate actions towards the complete installation of the Water Quality Global Forum for Santa Lucía River Basin.

(5) The establishment of Water Quality Forum in Canelones and San Jose could not be realized so far.

(6) There was a very good community participation in the Forums of Florida and Lavalleja. A lot and variety of issues were addressed in the framework of the Forums that highlight the interest of the community to participate in the development of watercourse quality management plans.

(7) The increased awareness of the local community of Florida on watercourse contamination had originated a pressure on the local authorities to include additional monitoring points in order to know the effects of discharging of industrial pollution sources.

(8) The Municipalities (except Montevideo) lack in some extent of trained people to manage public participation, for example, to help to create action plans, to avoid prejudices, to moderate interventions, to manage multi-sectoral working groups. There are not specialists on public participation officially assigned to manage the Forums.

(9) The Website allows all the public to access to the information about the progress of the Project on water quality management.

(10) The Water Quality Annual Report 2005 for Santa Lucía River Basin is accessible by all the people.

(11) Although was always interesting for the community to know the available information on water quality at local level, it’s not possible for the general public

so far to access the data generated for water quality parameters in Santa Lucía River Basin.

(12) It was not possible for DINAMA to publish Newsletters on regular basis to inform to the public about environmental issues.

(13) Several workshops were developed in Florida and Lavalleja to address public interest on industrial wastewater management and pesticides contamination and water quality protection.

(14) It was not possible to integrate to the public participation activities other institutions related to water management as the Regional Irrigation Councils managed by DNH and RENARE.

5. RECOMMENDATIONS

5.1 Environmental Education

(1) The Unit for Environmental Education at DINAMA should be created by an official resolution of the National Director, and an environmental education liaison officer for water quality management should be defined.

(2) The finalization of the elaboration of policies on environmental education is deemed very important for DINAMA to address their own program and activities in the sector.

(3) The elaboration of new educative approaches and materials on water quality should be conducted by a working group composed by all relevant institutions dealing with training on water quality management.

(4) The draft of new educative approaches and materials should be discussed with the education officers and teachers prior to its final production.

(5) The new educative approaches and materials should follow the direction on presenting the local concerns and interest to assure the application of them in the classroom.

(6) Programs of evaluation and management plan of the water quality by students of primary and secondary levels should be promoted. These evaluations and management plans could be good inputs for local Water Quality Forums.

(7) It should be developed an approach with secondary education level in order to do the best use of current laboratory materials and equipment and human resources to monitor and analyze water quality parameters.

(8) DINAMA should continue in the development of capacity building activities for municipalities on environmental education for water quality management, taking in account that all the municipalities in the basin have people with skills to develop environmental education actions.

(9) DINAMA (central and regional offices) should maintain a collaboration system with municipalities and national and local educative officers for organizing workshops in the sector of environmental management addressed to primary teachers, principal and future teachers.

(10) DINAMA should coordinate with national and local education authorities the follow up, recording and systematization of the classroom activities and experiences related to water quality protection. Based on the follow up of the activities cited will be possible to evaluate, amend and improve the environmental education approach on water quality protection.

(11) It should be developed a programme to conduct training on environmental education addressed to the civil society organizations and other non-governmental associations on water quality protection.

5.2 Dissemination and Public Participation

(1) DINAMA should continue supporting Florida and Lavalleja Water Quality Forums to maintain its function' continuity.

(2) The establishment of Water Quality Forums in Montevideo, San Jose and Canelones should be promoted by DINAMA.

(3) DINAMA should follow the evaluation of GAM on the proposal made to them by the DINAMA/JICA Project Team for acting as Montevideo Water Quality Forum.

(4) As for the Water Quality Forums in Canelones and San Jose, DINAMA should coordinate the activities of their creations with the recently established GAAM (Environmental Group for the Metropolitan Area). The Metropolitan Agenda Programme could support this issue.

(5) After the establishment of the five Water Quality Forums, it is recommended to create the Global Water Quality Forum for Santa Lucía River Basin in order to integrate common programs and to assess priorities for the well management of the water quality in the whole Basin.

(6) DINAMA should train Municipal Officers to manage public participation activities on water quality protection.

(7) The Municipalities should consider the assignment of public participation specialists to manage the public participation on water quality protection activities.

(8) DINAMA and the Municipalities should coordinate for the information maintenance and the update of the Website on water quality management.

(9) The Water Quality Annual Report should be prepared by DINAMA on yearly basis and it should be accessible by all the people.

(10) DINAMA should evaluate the community needs to allow them to access to the data stored in the water quality information system (SISICA).

(11) The publication of Newsletters on regular basis should be implemented by DINAMA to inform to the public periodically about environmental issues.

(12) Dissemination and training activities on water quality protection and pollution sources prevention as workshops and seminar were always well received and should be promoted.

(13) DINAMA and the Municipalities should coordinate with DNH and RENARE to integrate the Regional Irrigation Councils in the water quality management.

ANNEXES

ANNEX (3.2.1)

ANNEX 3.2.1

WATER QUALITY FORUM OF FLORIDA

DESIGN OF THE ACTIVITY ON

"ENVIRONMENT DAY COMMEMORATION"

1. Objective

To arise the awareness of the people of Florida to protect the environment

2. Output

Through commemorating the environment day is expected to increase the awareness of the general people in order to change attitudes that can damage the environment and to get their compromise towards the well use and protection of the natural resources.

3. Methodology

This activity will be carried out in the location called "Barrio Florencio Sanchez" of Florida Department. The Water Quality Forum of Florida will coordinate with the related neighborhood regarding this activity.

In advance to the commemoration day, allusive spots will be provided to the local media such as newspaper and radio to promote the activity and to raise the awareness of the people on environment protection. Likewise, the School of Arts of Florida will make a wall painting in places to be selected into the city of Florida.

On the commemoration day, people of Barrio Florencio Sanchez, will plant a tree in front of their houses. After plantation, all people will assemble at the Community Center "Florencio Sanchez" for the central ceremony.

4. Activities

4.1 Informative Session

Members of the Water Quality Forum on May 12 and 26, 2005, 18:00 hs, will carried out preparatory meetings with the neighborhood of Barrio Florencio Sanchez in order to inform them about the activity and to receive ideas for its smooth implementation. The place for these meetings is the community center of Florencio Sanchez.

4.2 Wall Painting

By May 27, 2005, the School of Arts of Florida through their students and teachers will make a wall painting subjecting the environment protection. Three selected places by the Water Quality Forum and the School of Arts of Florida will be allocated for the painting.

4.3 Commemoration Day

By June 5, 2005, all the participants of the Barrio Florencio Sanchez will receive in the early morning a tree for its plantation. The trees will be planted in front of the houses and will be protected and cared by the houses 'owners.

Then, all the people will assemble at the Community Center of "Florencio Sanchez" where will be carried out the central ceremony composed by speeches and festival. In annex is attached a detailed program of the commemoration day.

5. Necessary Materials for the Commemoration Day

5.1 Provision of Trees

The Municipality of Florida will provide the trees for its plantation. The person who receives the tree will plant and make a protector fence around the tree and will care it properly.

5.2 Allusive Spots

The Water Quality Forum will prepare allusive spots and will ask the cooperation of the local media to spread them. These spots shall be spread to the public through newspaper and radio from May 27 to June 5.

5.3 Provision of Paints

Municipality of Florida will provide the paints and other elements for wall paintings.

5.4 Provision of Installation for the Central Ceremony

The Community Center of "Florencio Sanchez" shall provide the installations including audio and necessary elements for the ceremony.

ANNEX (3.3.1)

Annex 3.3.1

Establishment of the Water Quality Forum of Lavalleja

Date: September 30, 2005
Time: 15:00 hs
Place: Casa de la Cultura, Minas, Lavalleja

Agenda

1. Opening speech of the Mayor of Lavalleja
2. Public participation in the management of quality of water resources, Ms. Lujan Jara, DINAMA
3. Advances of the Project on Capacity Development for Water Quality Management in the Basin of Santa Lucia River, Mr. Keiji Sasabe, JICA
4. Current Status of Water Quality in Lavalleja, Dra. Beatriz Píriz, IML
5. Water Quality Forum of Florida, Ms. Yanet Hagopian, IMF
6. Environmental Management and Public Participation, Ms. Gabriela Feola and Mr. Leonardo Herou, IMM
7. Presentation of the Act of Constitution of the Forum, Mr. Agustín Giannoni, DINAMA
8. Questions, answers, comments
9. Election of representatives for the sectors: government, production and civil society
10. Signature of the Act of Constitution of the Forum

ANNEX (3.3.2)

Annex 3.3.2

Workshop
"Environmental Management of Chemical Products used in the Forestry, Farm and Agricultural Production"

Place: Society of Agriculture/Livestock in Lavalleja
Date: August 18, 2006
Time: 9 - 12 hs.

Program

- Opening speech, Dr. Beatriz Píriz –Technical Secretariat of the Water Quality Forum – IML
- Speech of Mr. Francisco Ferber. President in Society of Agriculture/Livestock in Lavalleja
- "Use of pesticides in Uruguay". Mr. Marcelo Bonilla - DGSA/MGAP
- "Secure Use of pesticides". Mr. Marcelo Bonilla - DGSA/MGAP
- "Triple washing of pesticides containers". Ms. Victoria Carballo – Commercial Chamber of Agro/Chemical Products
- "Appropriate Use of pesticides in the forestry". Mr. Juan Porcile - DGF/MGAP
- "Environmental Management of veterinarian medicines applied on livestock bathing". Mr. Pablo Gristo - DINAMA

SECTOR E

SECTOR E: IMPLEMENTATION OF PILOT PROJECTS

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1. SUMMARY OF EVALUATION

Final evaluation of pilot projects has been conducted in this chapter. The summary of the final evaluation is shown in a table for each pilot project (refer to **Table 1.1**).

Table 2.1.1 Evaluation of Pilot Project (PLP 1a)

PLP 1a: Development of Capacity for Strategic Part of Water Quality Management

Background and necessity

DINAMA is prescribed a comprehensive mandate of planning, implementation, supervision and coordination with relevant agencies for water quality management by Decree No.257. Principles of water quality management in Uruguay are proposed in the present Project as i) water quality management for river basins, ii) systematic water quality management, and, iii) integrated water quality management. In order to realize the systematic water quality management, it is important to establish a cycle consisting of; establishment of policies and strategies; pollution source management; ambient water quality monitoring; and, dissemination, education and public participation. Establishment of policies and strategies are in the most upstream part of the water quality management.

In order to implement the Module No. 1: Strengthening of Strategic Part, establishment of a basic system and strengthening of the capacity are deemed important.

Objective

The objective of PLP 1a is to realize the capacity development for the strategic part of the systematic water quality management, namely, "Establishment of Policy and Strategies".

Originally expected output

- Capacity is developed for the establishment of strategies and specific action plans of respective water quality approach.
- Amendment to Decree No.253 proceeds accordingly.
- Water bodies' specific use is declared based on the amended Decree No.253

Achieved output

- Capacity is developed for the establishment of strategies and specific action plans of respective water quality approach.
- Amendment to Decree No.253 has not proceeded.
- Declaration of water bodies' specific use has not proceeded.

Originally proposed activities

- Create a system for the integrated water quality management (incl. council for water quality management in river basins) and conduct capacity development for the personnel.
- Give technical support for the amendment to Decree No.253
- DINAMA under the collaboration with the relevant organizations declares "Water Bodies' Specific Use".

Implemented activities

- Water Quality Management Committee (WQMC) was created.
- Council for the water quality management in the Santa Lucía River Basin was not created, but Steering Committee is providing the same function to that of the Council.
- Conducted training in Japan for personnel capacity development.
- Technical referential document introducing Japan's practice was provided for the amendment of Decree No.253.

Evaluation of the achieved output (Note: 3: good / 2: normal / 1: poor)

- Relevancy: 2 Strengthening of strategic part is relevant for the implementation of systematic water quality management.
- Effectiveness: 2 Establishment of WQMC is effective if it is fully utilized. Though effectiveness of C/P training in Japan is difficult to evaluate, it is deemed effective for the personnel to know about the practice in Japan.
- Efficiency: 3 Not much expenditure is needed for the strategic part, and it is efficient if the strategic part is strengthened with the improvement of a system in DINAMA.
- Impact: 1 Impact is not very clear.
- Sustainability 2 Sustainability of WQMC depends on the awareness of the members of the Council.

Faced issue during the implementation of the activities

- Lack of human resources in DINAMA for the amendment of Decree No.253 (not directly related to the Project)

Issues to be considered in the future

- Necessity of Council for water quality management in the Santa Lucía River Basin should be discussed under the authorities of the new government before the end of the Project.

Table 2.1.2 Evaluation of Pilot Project (PLP 1b)

PLP 1b: Development of Capacity for Pollution Source Management

Background and necessity

Pollution source management is one of the components of the systematic water quality management cycle. DINAMA is prescribed by Decree No.257 the responsibility for the establishment of a system including pollution source management as a part of the water quality management. Pollution sources in the Basin include industrial and domestic wastewater, solid waste, and agriculture activity. Actual implementation of the measures for pollution source is executed by various organizations, namely, industrial wastewater is covered by DINAMA and municipalities, domestic wastewater is by OSE and IMM, solid waste is by municipalities, and agricultural activities are by municipalities and MGAP.

In order to implement the Module No. 1: Strengthening of Strategic Part, development of the capacity for pollution source management is deemed important.

Objective

The objective of PLP 1b is to realize the capacity development for the pollution source management of the systematic water quality management.

Originally expected output

- Capacity is developed for the industrial wastewater management and domestic wastewater management, and analysis and assessment of pollution source to river water environment.

Achieved output

- Capacity was developed for the industrial wastewater management and domestic wastewater management, and analysis and assessment of pollution source to river water environment.

Originally proposed activities

- Conduct C/P training in Japan.
- Hold a workshop for the presentation of the outcome of the training in Japan by the C/P training participants.

Implemented activities

- A C/P from IMC attended to a group course “Industrial wastewater treatment technique II”.
- A C/P from OSE attended to a group course “Domestic wastewater treatment technique”.
- A workshop for the presentation of the outcome of the training in Japan was held on March 11, 2005.

Evaluation of the achieved output (Note: 3: good / 2: normal / 1: poor)

• Relevancy:	2	Capacity development of personnel is a basic method for the strengthening of the system.
• Effectiveness:	2	Though effectiveness of C/P training in Japan is difficult to evaluate, it is deemed effective for personnel to know about the practice in Japan. Effectiveness was raised through the implementation of the workshop for the sharing of knowledge.
• Efficiency:	2	Expenditure in Uruguay side is for the support of the work in the absence of the C/P during the training. Efficiency including with the Japan’s expenditure is difficult to evaluate.
• Impact:	1	Impact is not very clear.
• Sustainability	2	Sustainability depends on the awareness of the C/P who joined to the training for the effective utilization of the training results.

Faced issue during the implementation of the activities

- N.A.

Issues to be considered in the future

- N.A.

Table 2.1.3 Evaluation of Pilot Project (PLP 1c)

PLP 1c: Development of Capacity for Ambient Water Quality Monitoring and Strengthening of Coordination with Relevant Agencies

Background and necessity

DINAMA is declared the leading role for the ambient water quality monitoring by Decree No.253. The ambient water quality monitoring consists of a series of work, namely, i) monitoring network designing; ii) sampling, field testing, sample transportation; iii) sample preservation and laboratory analysis; iv) data management; and, v) data processing and evaluation. The processed and evaluated data are provided to the policy maker and are publicized as the status of ambient water quality. Presently, appropriate ambient water quality monitoring is absent due to the low capacity of the organization and personnel. Besides DINAMA, municipalities also have responsibility for the maintenance and improvement of hygiene environment in their territory, and conduct water quality monitoring for this purpose. Capacity of the municipalities for water quality monitoring is not sufficient except IMM.

In order to implement the Module No. 3: Strengthening of Ambient Water Quality Monitoring, development of capacity for ambient water quality monitoring and strengthening of coordination with relevant agencies is deemed necessary.

Objective

The objective of PLP 1c is to build the implementing regime for periodical and systematic water quality monitoring, initiating the trial water quality monitoring.

Originally expected output

- Capacity of Water Quality Dep. (WQD) is reinforced.
- Capacity of relevant laboratories is strengthened.
- Joint work agreement for water quality monitoring between DINAMA and municipalities is concluded.
- Trial monitoring is started and lessons learned are reflected to the subsequent monitoring.

Achieved output

- Capacity of WQD was reinforced.
- Capacity of relevant laboratories was strengthened.
- Contents of joint work agreement for water quality monitoring between DINAMA and municipalities were generally accepted.
- Trial monitoring was conducted and lessons learned were reflected to the subsequent monitoring.

Evaluation of the achieved output (Note: 3: good / 2: normal / 1: poor)

- Relevancy: 3 Strengthening for ambient water quality monitoring is relevant in the systematic water quality management
- Effectiveness: 3 Establishment of the collaborated system and the strengthening of the capacity is effective to the water quality management.
- Efficiency: 3 Output was achieved with less cost and is considered efficient.
- Impact: 3 Relevant personnel shared awareness of the necessity of ambient water quality monitoring and it was a good impact.
- Sustainability 3 The established system is considered sustainable.

Originally proposed activities

- Reinforcement of WQD
- Capacity strengthening of laboratories
- Conclusion of joint work agreement on water quality monitoring and information sharing
- Execution of trial water quality monitoring

Implemented activities

- Staff in WQD was increased.
- Equipment supply and technical transfer to laboratories were done.
- Pesticide analysis ability at DINAMA laboratory was checked.
- Draft joint work agreement was prepared and discussions were held.
- Trial monitoring was conducted and the lessons learned were reflected to the subsequent monitoring.

Faced issue during the implementation of the activities

- The cost for the equipment supply was limited and the strengthening of laboratories was limited.
- Availability of personnel and equipment resources in both DINAMA and municipalities were limited.

Issues to be considered in the future

- When the ambient water quality monitoring is conducted in a sustainable manner under the established system, further strengthening of the capacity for both equipment and personnel should be considered in the future.
- Discussion should be continued for joint work agreement with the new municipal governments to be elected in May 2005.

Table 2.1.4 Evaluation of Pilot Project (PLP 2)

PLP 2: Establishment of Water Quality Information System

Background and necessity

DINAMA is declared the leading role for the ambient water quality monitoring by Decree No.253. The ambient water quality monitoring consists of a series of work, namely, i) monitoring network designing; ii) sampling, field testing, sample transportation; iii) sample preservation and laboratory analysis; iv) data management; and, v) data processing and evaluation. The processed and evaluated data are provided to the policy maker and are publicized as the status of ambient water quality. Presently, items iv) and v) above are hardly executed and the existing water quality information is not utilized for any aspect.

In order to implement the Module No. 3: Strengthening of Ambient Water Quality Monitoring, establishment of a basic system for water quality data storage and effective utilization is necessary.

Objective

The objective of PLP 2 is to realize sharing and effective utilization of water quality data obtained in the ambient water quality monitoring.

Originally expected output

- Water quality information system is established.
- Annual Report on Water Quality is publicized.

Achieved output

- Water Quality Information System in DINAMA (SISICA DINAMA) is established.
- A draft of the Annual Report on Water Quality is prepared.

Originally proposed activities

- DINAMA and JICA Team jointly establish a computerized Water Quality Information System in DINAMA considering the full use of the Internet environment for the use of various kinds of users.
- Relevant agencies will join to discussions for the system development held in technical committee level.
- DINAMA and JICA Team jointly prepare Annual Report on Water Quality and publicize it.

Implemented activities

- DINAMA and JICA Team jointly established a computerized Water Quality Information System in DINAMA (SISICA DINAMA) considering the full use of the Internet environment for the use of various kinds of users.
- Relevant agencies joined to discussions for the system development held in technical committee level.
- DINAMA and JICA Team jointly prepared a draft of Annual Report on Water Quality.

Evaluation of the achieved output (Note: 3: good / 2: normal / 1: poor)

• Relevancy:	3	Effective utilization of water quality data is an important part of the ambient water quality monitoring, and thus PLP 2 is considered relevant enough.
• Effectiveness:	3	Water quality information system is very effective in the ambient water quality monitoring
• Efficiency:	3	SISICA consists of public domain software (free of charge) and designed for a standard Internet environment, and the development was implemented just with the employment of system engineers, and thus SISICA is very efficient.
• Impact:	3	It is the first system in Uruguay for water quality information, and the impact is high.
• Sustainability	2	The system requires less cost for maintenance and it is sustainable. Introduction of the system to the other key agencies of water quality and development of Integrated SISICA is important to realize sustainable use of the system.

Faced issue during the implementation of the activities

- Lack in hardware (computers) for the system development

Issues to be considered in the future

- Introduction of SISICA in the other agencies is deemed important.
- Development of Integrated SISICA after the introduction of SISICA in the other agencies is necessary.

Table 2.1.5 Evaluation of Pilot Project (PLP 3)

PLP 3: Establishment of Industrial Wastewater Management Manual and Strengthening of Coordination

Background and necessity

Pollution source management is one of the components of the systematic water quality management cycle. DINAMA is prescribed by Decree No.257 the responsibility for the establishment of the system including pollution source management as a part of the water quality management. Of the various kinds of pollution sources, industrial wastewater is the one DINAMA directly manage. The results of the problem analysis revealed absence of the unified work for the industrial wastewater management due to the lack of various kinds of manuals. Establishment of a system for the collaborated work between DINAMA and municipalities for the industrial wastewater management also has identified.

In order to implement the Module No.2: Strengthening of Pollution Source Management, development of manual and strengthening of coordination are deemed necessary.

Objective

The objectives of PLP 3 are to realize industrial wastewater regulations under unified standards and practices, and to build a basis for coordination between DINAMA and municipalities.

Originally expected output

- Procedural and management manuals for industrial wastewater regulations are developed.
- Technical guidance related with wastewater treatment technologies is developed.
- Joint work agreement for the coordination in industrial wastewater management between DINAMA and municipalities is prepared and concluded.

Achieved output

- Procedural and management manuals for industrial wastewater regulations were developed.
- Technical guidance related with wastewater treatment technologies was developed.
- Draft of joint work agreement for the coordination in industrial wastewater management between DINAMA and municipalities was prepared.

Originally proposed activities

- DINAMA and JICA Team jointly develop a series of manuals for industrial wastewater regulations.
- DINAMA and JICA Team jointly develop technical guidance.
- Formulate the draft of joint work agreement and make the agreement.

Implemented activities

- Manuals for: industrial user inspection; industrial wastewater sampling; industrial wastewater flow rate measurement; sampling, preservation and transportation of underground water; were developed.
- Technical guidance was developed.
- Draft of joint work agreement was formulated and general agreement was reached.

Evaluation of the achieved output (Note: 3: good / 2: normal / 1: poor)

- Relevancy: 3 Development of manuals is relevant to raise the quality of the work and those for the industrial wastewater is deemed relevant in the water quality management.
- Effectiveness: 2 Effectiveness should be confirmed through real application of the manuals to the actual work.
- Efficiency: 3 Manuals were prepared with less cost and thus it is considered efficient.
- Impact: 2 Impact is not clear.
- Sustainability 2 Sustainability should be confirmed through real application of the manuals to the actual work.

Faced issue during the implementation of the activities

- There was a severe lack of human resources in Environmental Control Division (EnCD) for the development of the manuals.

Issues to be considered in the future

- Manuals development has not been completed and it should be continued.
- Careful check of necessary human and other resources in EnCD should be considered for future work.
- Discussion should be continued for joint work agreement with the new municipal governments to be elected in May 2005.

Table 2.1.6 Evaluation of Pilot Project (PLP 4)

PLP 4: Establishment of Manuals for Monitoring Network Designing and Sampling

Background and necessity

DINAMA is declared the leading role for the ambient water quality monitoring by Decree No.253. The ambient water quality monitoring consists of a series of work, namely, i) monitoring network designing; ii) sampling, field testing, sample transportation; iii) sample preservation and laboratory analysis; iv) data management; and, v) data processing and evaluation. The processed and evaluated data are provided to the policy maker and are publicized as the status of ambient water quality. Presently, items i) to iii) above are executed by DINAMA and municipalities. One of the issues identified is the fact that unified standards and practices for water quality monitoring have not been in place without needed manuals.

In order to implement the Module No. 3: Strengthening of Ambient Water Quality Monitoring, establishment of manuals is thus deemed necessary.

Objective

The objectives of PLP 4 are to establish manual covering a series of monitoring activities and to formulate an executive plan of trial water quality monitoring.

Originally expected output

- Executive plan of trial water quality monitoring is furnished.
- Manuals necessary for the series of monitoring activities are established.
- Existing manuals for laboratory measurement and analysis are updated.

Achieved output

- Executive plan of trial water quality monitoring was furnished and updated for the output of PLP 1c.
- Manuals necessary for the series of monitoring activities were established.
- Existing manuals for laboratory measurement and analysis were updated.

Originally proposed activities

- DINAMA and JICA Team jointly prepare the executive plan of the trial water quality monitoring.
- DINAMA and JICA Team jointly prepare manuals for monitoring activities.
- DINAMA updates existing manuals for laboratory measurement and analysis

Implemented activities

- DINAMA and JICA Team jointly prepared the executive plan of the trial water quality monitoring.
- DINAMA and JICA Team jointly prepared manuals for monitoring activities.
- DINAMA updates existing manuals for laboratory measurement and analysis (independent work of DINAMA and not proposed by JICA Project)

Evaluation of the achieved output (Note: 3: good / 2: normal / 1: poor)

- Relevancy: 3 Start of the periodical ambient water quality monitoring for a river basin is relevant for the water quality management in Uruguay.
- Effectiveness: 2 Manual and the experience for the preparation of the executive plan of trial monitoring would be used for the other basins, and it is considered effective.
- Efficiency: 3 The work has been conducted with less cost and it was efficient.
- Impact: 2 Start of the periodical ambient water quality monitoring for a river basin has an impact to the water quality management in the country.
- Sustainability 2 Sustainability should be confirmed through real application of the manuals to the actual work.

Faced issue during the implementation of the activities

- There was a lack of human resources in Water Quality Dep. (WQD) for the preparation of the manual.

Issues to be considered in the future

- Executive plan of trial water quality monitoring has been reviewed on the basis of the outcome of the PLP 1c and water quality monitoring plan for the Santa Lucía River Basin has been formulated. The plan should further be reviewed for the DINAMA's national water quality monitoring program, which covers six major river basins in the country, suspended since 1995 and is likely to resume in June or July of 2005.

Table 2.1.7 Evaluation of Pilot Project (PLP 5/6)

PLP 5/6: Promotion of Education, Dissemination and Public Participation

Background and necessity

In order to strengthen the capacity for the water quality management in a sustainable manner, not only the level of government organization and government personnel but also the higher level, namely, the level of local society should be included for this purpose. Also needed is the introduction of participatory approach, and it is necessary, i) to realize participation of all the stakeholders from the initial stage of the formulation of the master plan for the strengthening of capacity for water quality management, ii) to raise the awareness of the stakeholders and realize actual participation to the strengthening of the capacity, iii) to assure transparency in the plan formulation stage through the periodical report to stakeholders, and iv) to formulate a plan acceptable for the local community.

In order to implement the Module No. 4: Promotion of Education, Dissemination and Public Participation, implementation of various actual activities for this purpose is deemed important to start the concrete work.

Objective

The objectives of PLP 5&6 are; to improve awareness of the people and their motivation to conserve water quality; to formulate wider basis for the consensus of the people on drawing up water quality policies; to promote public participation in the contribution of water quality policies as well as integrate the community for the effective implementation of them; and, to improve the motivation of related agencies in charge of water quality to implement the water quality policies efficiently (surveillance of the public sector by the people).

Originally expected output	**Achieved output**	**Evaluation of the achieved output** (Note: 3: good / 2: normal / 1: poor)
• Water Quality Forum is established in Florida. • Education materials are produced and distributed • Education and training for water quality conservation are performed in Florida with utilizing education materials. • Campaign activities for water quality conservation are performed in Florida with utilizing education materials • Newsletters on water quality are published. • Web pages on water quality project are located in DINAMA site and updated periodically. • Activities of all pilot projects are documented with videotapes.	• Water Quality Forum was established in Florida. • Education materials were produced. • Education and training for water quality conservation were performed in Florida with utilizing education materials. • Campaign activities for water quality conservation were performed in Florida with utilizing education materials • Newsletters on water quality were published once. • Web pages on water quality project are going to be located in DINAMA site. • Activities of all pilot projects were documented with videotapes.	• Relevancy: 3 Education, dissemination and public participation is deemed important for the proper water quality management and the PLP 5&6 was considered relevant. • Effectiveness: 3 PLP 5&6 was effective to realize the purpose in the Municipality of Florida. • Efficiency: 3 Materials prepared and activities conducted are considered cost effective. • Impact: 3 All the activities in Florida gave great impact to the local society. Various activities were introduced to the society by media and gave good impact. It would give a great impact for the water quality management in Uruguay, if videos be broadcasted by central media. • Sustainability 2 Continuance of the activities in Florida should be monitored and supported by the Project. In order to realize the sustainability, expansion of the activities to the other municipalities is deemed important.

(to be continued)

Originally proposed activities	Implemented activities	
• Preparation work for education material is conducted through the participation of teachers and person who use the materials. • Training of teachers is conducted and education materials are evaluated. • Design of educative activities for children is conducted. • Education of primary students on water quality by trained teachers is conducted. • Establishment work for the Water Quality Forum is conducted in Florida. • Preparation work for campaign materials for public awareness is conducted. • Public participation activities are conducted.	• Preparation of video for stakeholders, video for children, illustrated story, and booklet was conducted through participation of various stakeholders. • Training of teachers was conducted and education materials were evaluated. • Design of educative activities for children was conducted. • Education of primary students on water quality by trained teachers was conducted. • Establishment work for the Water Quality Forum was conducted in Florida through the participation of various stakeholders. • Preparation work for campaign materials for public awareness was conducted and the following are developed. - Posters - Triptychs - Stickers • Public participation activities were conducted. - Flora preservation campaign - Santa Lucía Chico River cleaning campaign - Workshop on effluent management - Workshop on pesticide management	**Faced issue during the implementation of the activities** • Lack in human resources in DINAMA for this purpose. **Issues to be considered in the future** • Continuance of the activities in Florida should be monitored and supported by the Project. • In order to realize the sustainability, expansion of the activities to the other municipalities is deemed important. • Developed materials should be used for the whole country.

2. PLP 1A: DEVELOPMENT OF CAPACITY FOR STRATEGIC PART OF WATER QUALITY MANAGEMENT

2.1 Background

In order to implement the **Module No.1: Strengthening of Strategic Part**, establishment of a basic system and strengthening of the capacity have been targeted, and PLP 1a has been formulated.

2.2 Objectives and Expected Output

The objective of PLP 1a is to realize the capacity development for the strategic part of the systematic water quality management, namely, "Establishment of Policy and Strategies".

Expected output is the following:

- Capacity is developed for the establishment of strategies and specific action plans of respective water quality approach
- Amendment to Decree No. 253 proceeds accordingly
- Water bodies' specific use is declared based on the amended Decree No. 253

2.3 Activities and Schedule

(1) Capacity Development for Strategic Part

Activities: Create a system for the integrated water quality management and conduct capacity development for the personnel

Schedule: The beginning of July in 2004 to the middle of March in 2005

(2) Amendment to Decree No. 253

Activities: Give technical support for the amendment of Decree No. 253

Schedule: The beginning of July in 2004 to the middle of March in 2005

(3) Declaration of Water Bodies' Specific Use

Activities: DINAMA under the collaboration with the relevant organizations declares "Water Bodies Specific Use"

Schedule: To be started after the amendment to Decree No. 253 has been completed.

2.4 Implementation and Results

(1) Capacity Development of Strategic Part

(a) Establishment of Water Quality Management Committee in DINAMA

Since there was no system for the horizontal coordination inside DINAMA for the implementation of systematic water quality management, Water Quality Management Committee (WQMC) has been established in DINAMA and a notification letter was issued on November 1st, 2004 by the National Director. The structure of WQMC is as follows:

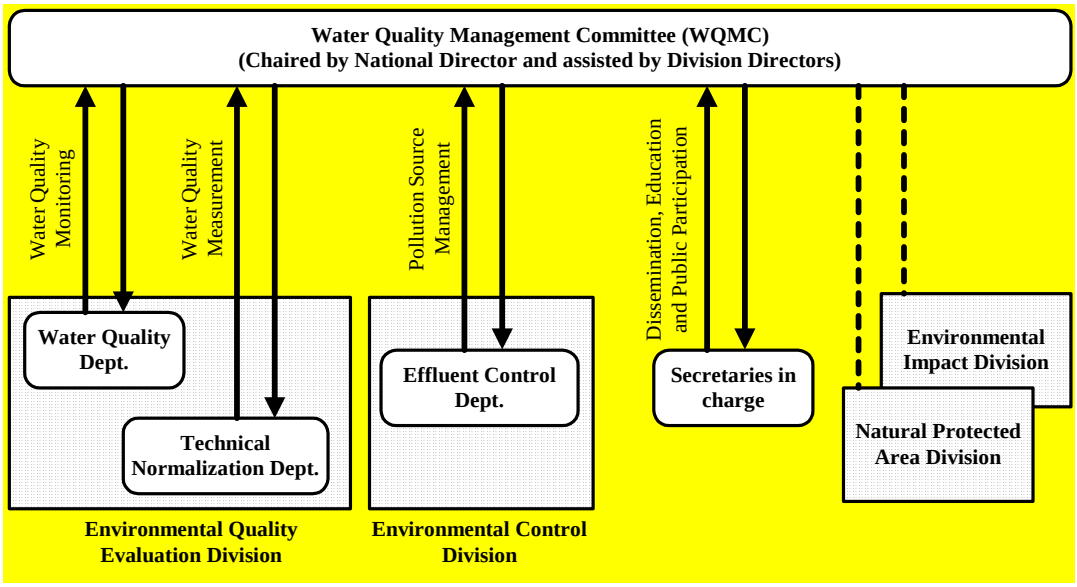


Figure 2.2.1 Water Quality Management Committee

Meeting was held three times in Phase II of the Project; 1st meeting on July 30, 2nd meeting on November 4 and 3rd meeting on March 9, 2005.

The Water Quality Management Committee shall work as the headquarters in DINAMA for the strategic part of water quality management.

(b) Establishment of Council for the Water Quality Management in the Santa Lucía River Basin

Necessity, method of creation, etc. for the Council for the Water Quality Management in the Santa Lucía River Basin have been discussed in the meeting with the Steering Committee in December 2004. It was concluded that the Steering Committee for the present Project was providing the same function to that of the Council and thus the Council would not be established when the JICA Project is on-going. Discussion on the establishment of the Council for the water quality management in river basins should be conducted in Phase IV of the Project, the last phase of the Project.

(c) Capacity Development of Personnel

The following counterpart training in Japan has been conducted for the purpose of strengthening for the strategic part of water quality management.

- Group Course "Environmental Management of Regional Drainage Basin II, May 9 to July 25, 2004", Mr. Gabriel Yorda, Water and Air Quality Department, Environmental Quality Evaluation Division, DINAMA attended.
- Individual Course "Strengthening of Water Quality Management System (1), August 27 to September 11, 2004", Mr. Esteban Garino, Professional Director, Environmental Development Department, IMM attended.
- Individual Course "Strengthening of Water Quality Management System (2), August 27 to September 19, 2004", Ms. Yanet Hagopian, Bromathology Department, IMF attended.

(2) Amendment to Decree No. 253

According to the information in July 2004, amendment to Decree No. 253 was scheduled for completion at an earliest stage in around September 2004. Updated information as of the beginning of March 2005 is as follows:

- On December 8 2004, GESTA Agua reported to COTAMA the status of amendment work. It was reported that the technical review work should be continued until March 2005. As of the beginning of March 2005, technical review has not been finalized.
- This issue should be discussed with the new National Director of Environment.
- After completing the technical review, it shall be sent to legal process.

The JICA Project Team has rendered the referential document titled "Regulations and Standards on Water Quality in Japan" to DINAMA. This document contains the current regulations and standards in Japan, including their backgrounds and justifications, so that DINAMA may refer to it in raising the reviews of the Decree.

(3) Declaration of Water Bodies' Specific Use

Water bodies' specific use should be started after the completion of the amendment to Decree No. 253. There is no progress so far.

2.5 Evaluation

The evaluation of the results of PLP 1a are as follows:

- Establishment of Water Quality Management Committee (WQMC) in DINAMA is considered very effective if the function is fully utilized. WQMC meeting should not always be the formal one, any meeting for the horizontal collaboration for water quality management in DINAMA could be considered as the activity of WQMC.

- Council for the Water Quality Management in the Santa Lucía River Basin is important to realize "Water Quality Management by River Basin" and "Integrated Water Quality Management". Necessity, method of creation, etc. for the Council have been discussed in the meeting with the Steering Committee in December 2004. It was concluded that the Steering Committee for the present Project was providing the same function to that of the Council and thus the Council would not be established when the JICA Project is on-going. Discussion on the establishment of the Council for the water quality management in river basins should be conducted in Phase IV of the Project, the last phase of the Project.
- Although, the real effect of capacity development by the training in Japan is difficult to evaluate, it appears in the various aspects of the activities in the present Project.

3. PLP 1B: DEVELOPMENT OF CAPACITY FOR POLLUTION SOURCE MANAGEMENT

3.1 Background

In order to implement the **Module No.2: Strengthening of Pollution Source Management**, strengthening of the personnel capacity has been targeted, and PLP 1b has been proposed.

3.2 Objectives and Expected Output

The objective of PLP 1b is to realize the capacity development for the pollution source management of the systematic water quality management.

Expected output is the following: Capacity is developed for the industrial wastewater management and domestic wastewater management, and analysis and assessment of pollution source to river water environment

3.3 Activities and Schedule

Activities: Conduct counterpart training in Japan, and hold a workshop for the presentation of the outcome of the training in Japan by the counterpart training participants

Schedule: In the Phase II of the Project

3.4 Implementation and Results

(1) Training in Japan

The following counterpart training in Japan has been conducted for the purpose of strengthening for the pollution source management of the systematic water quality management.

- Group Course "Industrial Wastewater Treatment Technique II, July 12 to November 14, 2004", Mr. Angel Zeileniec, General Directorate of Health Attention and Environmental Inspectorate, IMC attended.
- Group Course "Domestic Wastewater Treatment Technique, August 16 to November 28, 2004", Mr. Eduardo Liard, Northeastern Regional Office, OSE attended.

(2) Workshop

Workshop for the sharing of the outcome of the training in Japan by the relevant personnel was held in March 2005.

3.5 Evaluation

One of participants in the group training has attended the work of the manual preparation in the PLP 3, aiming to utilize the effect of the training in Japan. From now on it is

expected that the outcomes of the technical training should be utilized in participants' daily activities.

4. PLP 1C: DEVELOPMENT OF CAPACITY FOR AMBIENT WATER QUALITY MONITORING AND STRENGTHENING OF COORDINATION WITH RELEVANT AGENCIES

4.1 Background

In order to implement the **Module No.3: Strengthening of Ambient Water Quality Monitoring**, strengthening of the organizational capacity, personnel capacity and establishment of collaboration system have been targeted, and PLP 1c has been formulated.

The Project has identified a number of issues in water quality monitoring in Uruguay. They are:

- Periodical and systematic water quality monitoring should be established in Uruguay and be continued in a sustainable way.
- While the Water Quality Department (WQD) of DINAMA is in the position to lead and control the whole activities of water quality monitoring, its assigned staff is too few. Thus, the immediate reinforcement of the WQD is essentially required to initiate the water quality monitoring.
- The capacity strengthening of laboratories especially in the municipalities is required to handle more sample and more water quality parameters.
- A good coordination work in water quality monitoring between DINAMA and the municipalities is essential to ensure sustainable activities.

The issues mentioned above require a step-wise capacity building under a long-term scheme. As such, the PLP 1c has been initiated as the first step measure to commence periodical and systematic water quality monitoring.

4.2 Objectives and Expected Outputs

(1) Objectives

The direct objective of the PLP 1c is to build the implementing regime for periodical and systematic water quality monitoring, initiating the trial water quality monitoring.

In the long-term, the PLP 1c aims to establish the capacity enabling the implementation of sustainable monitoring for assessing the water environment.

(2) Expected Outputs

As a result of the PLP 1c, the following specific outputs are expected.

- The organizational capacity of the WQD of DINAMA that leads and controls the monitoring activities is reinforced.
- The capacities of water quality laboratories in the municipalities and DINAMA are strengthened.
- The Joint Work Agreement for water quality monitoring is exchanged between DINAMA and the municipalities concerned.

- The trial water quality monitoring is started actually and the lessons learned from this trial monitoring are reflected in the subsequent monitoring.

4.3 Activities and Schedule

(1) Reinforcement of WQD

Activities: DINAMA takes the action to increase the staff of the WQD.

Schedule: To be completed at the end of October 2004.

(2) Capacity Strengthening of Water Quality Laboratories

Activities: After the survey on the existing municipal laboratories, JICA supplies necessary equipment and materials, and the technology transfer thereon takes place. In addition, the DINAMA laboratory's ability for pesticide analysis is evaluated.

Schedule: To be completed at the end of November 2004.

(3) Joint Work Agreement

Activities: DINAMA and JICA, upon discussion with the Steering Committee, jointly discuss and formulate the "Joint Work Agreement", and DINAMA and the municipalities exchange the Agreement.

Schedule: The draft is to be completed at the end of June 2004 and the exchange at the end of February 2005.

(4) Execution of Trial Water Quality Monitoring

Activities: DINAMA and the municipalities jointly carry out the trial water quality monitoring according to the "Executive Plan of Water Quality Monitoring" established in the PLP 4. Prior to the commencement of the trial monitoring, DINAMA renders the technology transfer to the municipalities, concerning field and laboratory work.

Schedule: The preparatory work (technical training and inter-calibration) is to be completed at the end of November 2004, and the trial monitoring is from December 2004 to March 2005.

4.4 Implementation and Results

(1) Reinforcement of WQD

As a result of the actions made by DINAMA, two new staff have transferred to WQD from the other division of DINAMA, though one of the original two members left. Besides, other 4 staff (interns from the Engineering Faculty of the University of the Oriental Republic of Uruguay) have been contracted to work in WQD, thereby, the WQD expected for reinforcement from 2 staff in the past to 7 staff in terms of assigned staff numbers. It, however, has not been realized by this time due to the suspension of the Governmental approval.

(2) Capacity Strengthening of Water Quality Laboratories

(a) Equipment and Materials for Laboratories

According to the "Execution Plan of Trial Water Quality Monitoring", it has been proposed that general and basic parameters (temperature, pH, electrical conductivity, COD, fecal coliform and total coliform) should be covered by the measurement made by the municipalities. Based on the survey results on the present availability of equipment and materials in the municipal laboratories, equipment and materials necessary for the measurement mentioned above have been provided. These are listed in **Table 2.4.1**.

The technology transfer related with the supplemented equipment and materials has been carried out by DINAMA, before the start of actual sampling and measurement, through the inter-calibration and the technical training of fieldwork.

Meanwhile, it has been identified that the capacity of DINAMA laboratory in the BOD analysis requires the strengthening to handle the sample numbers assumed in the trial monitoring. Thus, component equipment for BOD analysis has been supplied to the DINAMA laboratory.

Table 2.4.1 Provided Equipment and Materials for Laboratories

Items	Quantities	Users
pH meter in Lab.	1	IMSJ
Digester with digital display for COD	1	IML
BOD analysis equipment	1	DINAMA
Field equipment (pH, temp.)	4	IMC, IMSJ, IMF, IML
Field equipment (TDS, EC, salinity)	4	IMC, IMSJ, IMF, IML
Consumables	1 lot	Each Municipality

(b) Evaluation of DINAMA Laboratory's Ability in Pesticide Analysis

In Uruguay, data and information for pesticide pollution are too few to clarify the present situations, because the measurement of pesticides in water has little been carried out. For this reason, the DINAMA laboratory's skill in pesticide analysis is evaluated to clarify the enforcement ability for the monitoring network in the future.

Generally, the DINAMA laboratory is endowed with adequate skills in the equipment analysis but, in the analysis of pesticides, the following points should be verified its proficiency:

- The accurate functions of gas-chromatography (that has not been operated for a long time)
- The detectable limit and quantitative limit of related equipment

Three kinds of standard chemicals (Mirex, methyl parathion and ethyl parathion) necessary for trial measurement and analysis have been ordered. The DINAMA laboratory is still conducting trial measurement and analysis as of now.

(3) Joint Work Agreement

The draft of the Joint Work Agreement (its full name is "Agreement of Joint Work on Ambient Water Quality Monitoring between MVOTMA and Municipal Government") has been prepared as shown in **Annex 2.4.1A**. Its primary purpose is to settle periodical and systematic monitoring in Uruguay.

It contains the articles: objectives of joint work, scope of cooperation, specific scheme of monitoring activities, etc. Respective works in accordance with the Joint Work Agreement are based on the "Executive Plan of Trial Water Quality Monitoring".

The draft of the Joint Work Agreement has already been basically agreed by DINAMA and the municipalities concerned. The exchange of the final agreement is scheduled in the beginning of 2005, after incorporating lessons learned from the trial monitoring and more precise prescriptions, and after the appointment of the new local governments upon the election in May 2005.

(4) Execution of Trial Water Quality Monitoring

The trial water quality monitoring started at the 3rd week of December. The trial monitoring has been carried out in accordance with the "Executive Plan of Trial Water Quality Monitoring" that is the final product of the PLP 4.

The trial monitoring commenced as follows, including the related technology transfer.

- Inter-calibration for 4 municipalities: Held from October 26 to November 16 to secure the accuracies of measurement results.
- Technical training for 4 municipalities: Held from November to December to enhance the skills in sampling and field-testing.
- The first sampling: Started in December, based on the rotation schedule: the Wednesday and Thursday of the 3rd week in IMC, and the Tuesday, Wednesday and Thursday of the 4th week in IMSJ, IMF and IML.

4.5 Evaluation

The PLP 1c is evaluated based on the result and process of the implementation, below:

(1) Strengthening of WQD's Function

The WQD of DINAMA has been reinforced as the outcome of DINAMA's efforts during the period of the PLP 1c with the increase to a total of 3 staff. It is expected that the role of the WQD will become increasingly important, as the network of water quality monitoring is extended in the future. Its task in water quality monitoring includes not only the overall control in monitoring activities but also the management, process and interpretation of collected water quality data. To respond to such increasing tasks, the individual ability of staff, especially the ability of new comers of the WQD should be strengthened in monitoring-related specialty.

(2) Sustainable Execution of Monitoring and Extension of Monitoring Network

It is a significant achievement that the periodical water quality monitoring has been actually commenced in Uruguay. In the subsequent stage, the most important thing is to continue this monitoring activity by maintaining the established collaboration system under the Joint Work Agreement. In the meantime, it is extremely important for the municipal laboratories to develop their capacity with proper budget allocation.

The trial monitoring has taken place at a total of 32 monitoring locations with a total of 26 parameters (as the maximum including sediments). This scheme of network was decided under the consideration for the present maximum capacity of both DINAMA and the municipal laboratories. Because this scheme is still not enough to completely clarify the water quality in the Project Area, the review to extend the network at each stage is necessary. Together, to support the extended network, further efforts are definitely necessary to develop laboratories' capacity for both the municipalities and DINAMA, based on a long-term strategy.

(3) Technology Transfer through PLP 1c

The technology transfer from the JICA Project Team to the staff of DINAMA and the municipalities took place along the implementation of the PLP 1c. This has been conducted through various activities of the PLP 1c based on OJT in terms of the design of monitoring network, the selection of sampling stations, etc. It is expected that the outcomes of this technology transfer be practically used in the subsequent Phase III (Master Plan Trial) in 2005.

5. PLP 2: ESTABLISHMENT OF WATER QUALITY INFORMATION SYSTEM

5.1 Background

In order to implement the **Module No.3: Strengthening of Ambient Water Quality Monitoring**, establishment of a basic system for water quality data storage and effective utilization have been targeted, and PLP 2 has thus been formulated. Water Quality Information System has been designed for the use in the whole Uruguay, not only for the Santa Lucía River Basin.

5.2 Objectives and Expected Output

The objective of PLP 2 is to realize sharing and effective utilization of water quality data obtained in the ambient water quality monitoring.

Expected output is the following:

- Water Quality Information System is established
- Environmental Annual Report is publicized

5.3 Activities and Schedule

(1) Establishment of Water Quality Information System

Activities: DINAMA and JICA Team jointly establish a computerized Water Quality Information System in DINAMA considering the full use of the Internet environment for the use of various kinds of users. Relevant agencies will join to discussions held in technical committee level.

Schedule: The beginning of July in 2004 to the end of December in 2005

(2) Publication of Environmental Annual Report

Activities: Water chapter of Environmental Annual Report is to be publicized.

Schedule: The beginning of July in 2004 to the middle of March in 2005

5.4 Implementation and Results

(1) Establishment of Water Quality Information System

Water Quality Information System (SISICA: Sistema de Informacion de Calidad de Agua) has been established as follows:

(a) Subject Data

- Surface water quality data

(b) Major Functions

- Data input and maintenance
- Monitoring and evaluation
- Dissemination of the water quality data to the public by annual report

(c) Users

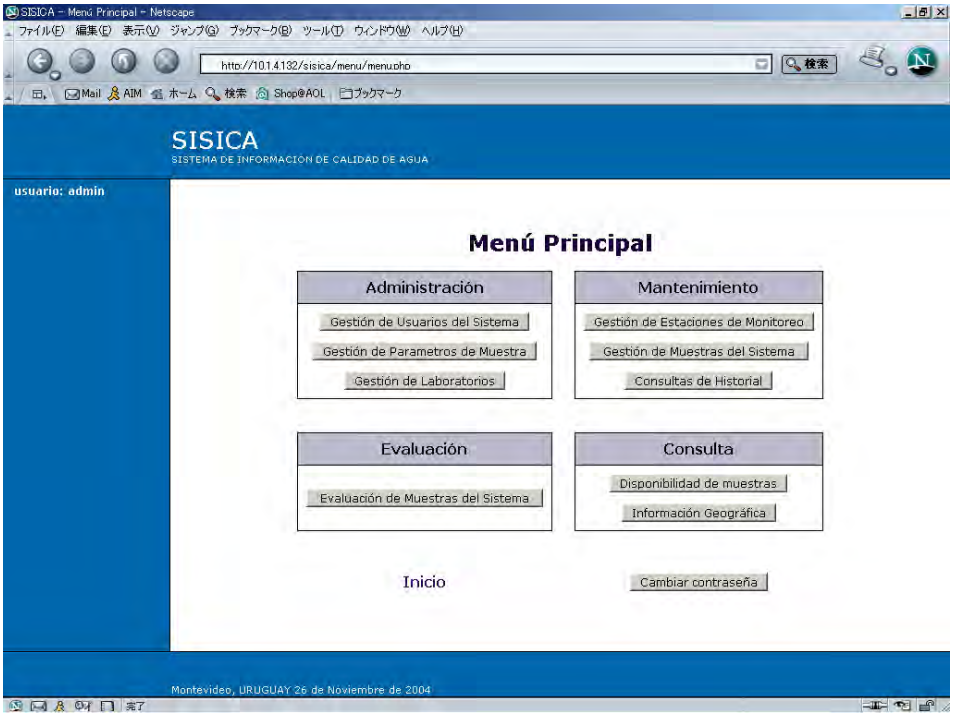
- Level 1: Administration
- Level 2: Data Evaluation
- Level 3: Maintenance
- Level 4: Evaluation in general
- Level 5: General public

(d) Basic Structure

The established information system is the decentralized one. PLP 2 targets to establish SISICA DINAMA and water quality data of DINAMA are firstly be stored and open to use for the above five levels. In the future, the other SISICA, e.g. SISICA OSE, SISICA IMM are established based on the SISICA DINAMA and connected by Internet.

(e) System

- Operating system: Linux
- Database services: Postgre SQL
- Web service: Apache
- Interfaces of entrance access, changes, enquiries: via web navigator
- System of geographical information: PostGIS



(f) Specification

Specification is shown in **Interim Report** as **Annex 9.4.1** "Especificación de Requerimientos de Software para el Sistema, Versión 5.2", **Annex 9.4.2** "Arquitectura del Sistema Versión 1.1", and **Annex 9.4.3** "Especificación de interfaces gráficas de usuario, Versión 2.0".

(2) Publication of Environmental Annual Report

The tentative version of the Annual Report 2005 of Water Quality has been drafted by the JICA Project Team in March 2005. Currently available data and information and water quality data have been used in this draft. This is a prototype of the comprehensive environmental report in Uruguay.

5.5 Evaluation

(1) Establishment of Water Quality Information System

SISICA DINAMA has almost been completed and presented in the Seminar on December 1. The condition before the start of the Project was that DINAMA's historical water quality data is maintained personally and no other person could use them. The establishment of SISICA DINAMA provides a significant change in the system of ambient water quality management. A good system has been developed. From now on, promotion of the effective use of SISICA DINAMA is the important work.

(2) Publication of Environmental Annual Report

The tentative version of the Annual Report is the product as one of components of a comprehensive environmental report to be publicized by DINAMA. It is expected that DINAMA start other parts of the comprehensive environmental report, such as air quality, solid waste, natural environment, etc, in earliest stage.

6. PLP 3: ESTABLISHMENT OF INDUSTRIAL WASTEWATER MANAGEMENT MANUAL AND STRENGTHENING OF COORDINATION

6.1 Background

In order to implement the **Module No.2: Strengthening of Pollution Source Management**, establishment of manuals and strengthening of coordination have been targeted, and PLP 3 has thus been formulated.

As the result of the problem analysis, the following issues for the capacity strengthening of industrial wastewater management in Uruguay have been identified:

- The strengthening of abilities in wastewater management technologies are necessary for both DINAMA and municipal staff;
- The analysis and assessment of the influences caused by industrial wastewater should be started and continue to facilitate the basic scheme planning for industrial wastewater measurement for a long-term;
- Unified standards and practices are necessary to enhance rigorous wastewater regulations; and,
- The establishment of good coordination system between DINAMA and the municipalities are necessary to promote effective industrial wastewater inspection.

For the above-mentioned issues, a long-term scheme of capacity development should be arranged. Among the issues identified, the PLP 3 addresses the upgrading of abilities in wastewater management technologies, the establishment of unified standards and practices, and the establishment of good coordination system.

6.2 Objectives and Expected Outputs

(1) Objectives

The direct objectives of the PLP 3 are to realize industrial wastewater regulations under unified standards and practices, and to build a basis for good coordination between DINAMA and the municipalities by exchanging the Joint Work Agreement.

The long-term objective is to realize rigorous regulation for industrial wastewater by establishing a strong implementation regime.

(2) Expected Outputs

As a result of the PLP 3, the following specific outputs are expected.

- Procedural and management manuals for industrial wastewater regulations are established,
- Technical guidance related with wastewater treatment technologies is established, and

- The Joint Work Agreement for the coordination in industrial wastewater management between DINAMA and the municipalities is prepared and exchanged.

6.3 Activities and Schedule

(1) Procedural and Management Manuals

Activities: DINAMA and the JICA Project Team jointly formulate a series of manuals necessary for industrial wastewater regulations. First, DINAMA prepares the drafts of the following manuals:

- Industrial User Inspection Manual (A1)
- Industrial Wastewater Sampling Manual (A2)
- Guidance for Industrial Wastewater Flow rate measurement (A3)
- Guidance for Sampling, Preservation and Transportation of Underground Water (A4)
- Registration Manual of Competent Professional (A5)
- Self-monitoring Report Manual (A6)

Besides the above-mentioned, the preparation scheme of "Authorization Manual of Industrial Wastewater Discharge (A7)" is discussed.

Schedule: The drafts are completed in the middle of November 2004, and final products at the end of February 2005.

(2) Technical Guideline for Industrial Wastewater Treatment Technologies

Activities: DINAMA and the JICA Project Team jointly formulate this guidance. First, the JICA Project Team prepares the draft.

Schedule: The draft is completed in the middle of January 2005 and the final product at the end of February 2005.

(3) Joint Work Agreement

Activities: DINAMA and the JICA Project Team jointly formulate the draft of the Joint Work Agreement for the coordination and then the Agreement is exchanged between DINAMA and the municipalities.

Schedule: The draft is completed in the middle of July 2004 and the exchange at the end of February 2005.

6.4 Implementation and Results

(1) Procedural and Management Manuals

The drafts of manuals of A1, A2, A3 and A4 have been made, and DINAMA and the JICA Team have jointly discussed the contents of them. Of them, A3 and A4 have been completely finished in both English and Spanish. A1 and A2 have been completed but they need more deep examinations from the legal aspects. Therefore, they are titled "tentative version" and are scheduled to undergo further discussion in the Phase III.

The manual of A5 are now just started by DINAMA but it could not be completed and the manual of A6 has not been started in the phase of the PLP. They will be addressed in the Phase III.

The purposes, contents and detail status of respective manuals are detailed in **Table 2.6.1**.

With respect to the "Authorization Manual of Industrial Wastewater Discharge", basic scheme for the preparation has been discussed. It has been confirmed that this manual should be furnished in an early stage because unified criteria for the processing of SADI (application for authorization of industrial discharge) and ADI (authorization of industrial discharge) system need to be examined carefully. At the same time, referential documents being used by US-EPA are being studied. As a result, it has become clear that this manual preparation requires much of work including the examination on related standards and specifications. Thus, it has been concluded that this manual will be addressed in the Phase III.

Table 2.6.1 Progress Status of Industrial Wastewater Manuals

Line No.	Titles	Purposes of Manuals	Forms of Products	Contents	Progress Status as of Now
1	Industrial User Inspection Manual	This is a guideline to be used for DINAMA inspectors (and possibly municipal inspectors) to enforce the inspection of industrial wastewater.	Paper document (total about 115 pages)	• General instructive document describing on how to carry out the inspection of industrial wastewater facilities.	The tentative versions in Spanish and English have been completed, referring to EPA manual. Further examination from the legal viewpoint has been raised by the legal adviser.
2	Industrial Wastewater Sampling Manual	This is a guideline to be used for DINAMA inspectors (and possibly municipal inspectors) to carry out the sampling of industrial wastewater.	Paper document (total about 80 pages)	• Instructive document describing on how to carry out sampling of industrial wastewater.	The tentative versions in Spanish and English have been completed, referring to EPA manual. Further examination from the legal viewpoint has been raised by the legal adviser.
3	Guidance for Industrial Wastewater Flow Rate Measurement	This is a technical guideline to enforce the resolution of the effluent measurement (to be issued October 2004)	Paper document (total 26 pages)	• Technical descriptions of flow rate measurement (methodologies, constructions, calculations, etc.) by means of open channel weir, • Detail explanation of triangular, rectangular, and other type.	The documents (both in Spanish and English) have been completed in the middle of November 2004.
4	Guidance for Sampling, Preservation and Transportation of Underground Water	This is a technical guideline to be used for sampling underground water.	Paper document (total 21 pages)	• Instructive document describing on how to preserve and transport underground water.	The documents (both in Spanish and English) have been completed in the middle of November 2004.
5	Registration Manual of Competent Professional	This is a program to be used for registering the competent professional with digitized information, aiming to realize a computerized registration procedure.	Programmed input format and paper document	• Programmed electric format for the input of information on the competent professional, • Instructive documents on how to use the input format.	This work has been not started yet.
6	Self-Monitoring Report Manual	This is a program to be used for receiving the self-monitoring report from industries with digitized information, aiming to realize a computerized procedure.	Programmed input format and paper document	• Programmed electric format for the input of information on the self-reporting, • Instructive documents on how to use the input format, • Instruction on the selection of water quality laboratory, etc.	This work has been started by DINAMA but is just at the beginning stage.

(2) Guidance for Industrial Wastewater Treatment Technologies

DINAMA and the JICA Project Team discussed what data and information should be contained in this guidance, considering actual activities of industrial wastewater management. As a result, the following items were extracted:

- Water pollution sources,
- Wastewater volume,
- Water quality parameters and their significances,
- General description of industrial wastewater treatment technologies, and
- Actual application of wastewater treatment technologies for selected industries.

First, the draft has been prepared by the JICA Project Team. After the discussion between DINAMA and the JICA Project Team, both English and Spanish version comprised of about 250 pages have been completed, including additional data and information available in Uruguay.

(3) Joint Work Agreement

DINAMA has the overall competence for industrial wastewater management in Uruguay according to the Decree 253, and meanwhile, municipalities are in a position to supervise the wastewater discharge in their territories. It has been confirmed through the interview that the municipalities harbor strong expectations for some coordinated activities with DINAMA regarding industrial wastewater management. In light of such situation, the JICA Project Team has suggested that a good coordination between DINAMA and the municipalities be furnished under the Joint Work Agreement.

Main objective of the coordination is to strengthen the capacity in the municipalities for realizing secure inspections by municipalities. To do so, DINAMA will provide the technology transfer in terms of industrial wastewater management to the municipalities. Under the planned coordination system, DINAMA stays at the authorization unit as it is, and the municipalities work as so-called a “Liaison Office” which can be mobilized rapidly in contacting industrial users. As the result of the municipalities’ strengthened capacity, the implementation regime of industrial wastewater management by DINAMA is enhanced.

To substantiate this, the Joint Work Agreement includes the following actions:

- MVOTMA (the upper ministry of DINAMA) provides the municipalities with technology transfer with industrial wastewater management,
- MVOTMA discloses administrative and technical data/information related with the authorization of industrial discharge to the municipalities,
- MVOTMA and the municipalities mutually share data/information of the inspection results, and
- Close cooperation is made between MVOTMA and the municipalities in carrying out industrial user inspections.

The draft of the Joint Work Agreement, as shown in **Annex 2.4.1B**, has been prepared. This has been already discussed and largely approved by the Steering Committee.

The actual Joint Work will take place in 2006, as proposed in the Action Plan, considering some delays in the manual preparation work in the PLP 3. Consequently, it is suggested that the Agreement be exchanged at the beginning of 2006, after being added by some more detail prescription (if necessary).

6.5 Evaluation

The PLP 3 is evaluated based on the result and process of the implementation, below:

(1) Practical Use of Established Manuals and Guidance

The completion of a series of manuals and guidelines is a significant outcome, considering the conventional and current situation that many practices are depending on mainly individual knowledge of staff. It is important that these documents be practically used through actual jobs and utilized as useful tools of the technology transfer in DINAMA and the municipalities.

Among the completed documents, the industrial user inspection manual is of the nature to instruct mainly basic conceptions and things in inspections. Therefore, it is expected that supplemental manuals that are more practical and specific for actual inspection be produced based on this manual in the future.

(2) Continuing of Manual Preparation

Of the manuals scheduled in the PLP 3, some of them need more continuing works. They are:

- Industrial User Inspection Manual (A1) (The tentative version is finished)
- Industrial Wastewater Sampling Manual (A2) (The tentative version is finished)
- Registration Manual of Competent Professional (A5)
- Self-monitoring Report Manual (A6)

These manuals are important for the strengthening of industrial wastewater management. Besides, they are supposed to utilize as material documents for the technology transfer from DINAMA to municipalities. Therefore, it is proposed that these manual works be continued in the Phase III.

(3) Continuous Work for Preparation of Authorization Manuals

With respect to the authorization manual, referential documents being used by US-EPA are being studied in the PLP 3. As a result, it has become clear that this manual preparation requires much of works including the examination on related standards and specifications in connection with the present SADI and ADI system. For that reason, the preparation of this manual is conceived to take a long time, requiring the comprehensive review of SADI and ADI system.

Therefore, it has been confirmed that this manual preparation will be carried out by DINAMA, as one of components in the period of the Phase III.

(4) Implementation of Joint Work

The Joint Work Agreement is supposed to exchange in the beginning of 2006. Following the essence of this Agreement, actual joint work between DINAMA and the municipalities will take place in 2005.

Along the context of this Agreement, the following coordination activities will take place during this period:

- Opening of the workshop for industrial wastewater management in the four municipalities (IMC, IMSJ, IMF and IML),
- Providing of administrative and technical data/information concerned with the authorization to the four municipalities, (Remark : Parts of this work have already started in the period of the PLP3.)
- Mutually exchanging of inspection results, and
- Actual coordinated activities along the Agreement in industrial user inspection.

Detail contents and their procedures should be discussed between DINAMA and municipalities prior to the actual implementation.

(5) Technology Transfer throughout PLP 3

The technology transfer from the JICA Project Team to the staff of DINAMA and the municipalities concerned took place along the implementation of the PLP 3. This has been conducted through various activities of the PLP 3 based on on-the-job training in terms of the design of administrative procedures, law-enforcement procedures, wastewater treatment technologies, etc. It is expected that the outcomes of this technology transfer be practically used in the subsequent Phase III.

(6) DINAMA Members' Involvement in PLP 3

Among a total of 8 members currently engaged in industrial wastewater management in the Environmental Control Division, only 3 members have been involved in the activities of the PLP 3. Besides, the responsible persons of industrial discharge matters did not participate in the last part of the PLP 3

To ensure the quality of manuals and to diffuse widely the outcomes of the PLP 3, it is requested that more staff be involved in various kinds of activities under the firm commitment of responsible persons.

7. PLP 4: ESTABLISHMENT OF MANUALS FOR MONITORING NETWORK DESIGNING AND SAMPLING

7.1 Background

In order to implement the **Module No.3: Strengthening of Ambient Water Quality Monitoring**, establishment of manuals has been targeted, and PLP 4 has thus been formulated.

One of issues identified is the fact that unified standards and practices for water quality monitoring have not been in place without necessary manuals. The PLP 4 is concerned with planning of trial monitoring to start periodical and systematic monitoring and furnishing of manuals necessary for secure QA/QC (quality assurance and quality control) in monitoring planning and actual monitoring activities.

7.2 Objectives and Expected Outputs

(1) Objectives

Direct objectives of the PLP 4 are to establish manuals covering a series of monitoring activities and to formulate an executive plan of trial water quality monitoring.

In a long-term, the PLP 4 aims to settle periodical and systematic ambient water quality monitoring in Uruguay, supported by reliable water quality data and information.

(2) Expected Outputs

As the result of the PLP 4, the following specific outputs are expected.

- The executive plan of trial water quality monitoring is furnished,
- Manuals necessary for a series of monitoring activities are established, and
- Existing manuals for laboratory measurement and analysis are updated.

7.3 Activities and Schedule

(1) Executive Plan of Trial Monitoring

Activities: DINAMA and the JICA Project Team jointly prepare the executive plan of the trial water quality monitoring.

Schedule: Draft is to be completed at the end of July 2004 and final products at the end of October 2004.

(2) Monitoring Manuals

Activities: DINAMA and the JICA Project Team jointly prepare manuals for monitoring activities.

Schedule: Tentative version is to be completed at the end of October 2004 and final products at the end of February 2005.

(3) Updating of Laboratory Measurement and Analysis Manual

Activities: DINAMA updates existing manuals for laboratory measurement and analysis (*Manual de Procedimientos Analíticos para Muestras Ambientales*).

Schedule: This is to be completed at the end of November 2004.

7.4 Implementation and Results

(1) Executive Plan of Trial Monitoring

The executive plan has been prepared for the trial water quality monitoring as the first step of periodical and systematic monitoring. This plan covers selected sampling points, measured parameters, sampling frequencies, demarcation of measurement works and preparatory works for monitoring, etc. as shown in **Annex 2.7.1**. The summarized information is as follows:

Selection of Sampling Points

DINAMA and the JICA Project Team have surveyed thoroughly candidate sampling points that have been used in the past. As a result, a total of 32 locations (except for 33 locations in IMM) have been selected as sampling points in the trial monitoring, considering opinions of the municipalities.

Sampling Work and Frequency

Sampling frequency (once a month, as a rule) has been set, taking into account the present capacity of measurement in DINAMA and the municipalities. Together, the demarcation of sampling work between DINAMA and the municipalities has been arranged, based on the accessibility to the respective sampling points and the availability of equipment in the municipalities.

Demarcation of Measurement Work

Based on the evaluation on the present capacity of the laboratories in both DINAMA and the municipalities, the work sharing in water quality measurement has been arranged. This demarcation is subject to the review for the subsequent work after the trial monitoring, depending on the laboratories' capacity.

Preparatory Work

Basic schemes have been arranged in the executive plan to secure QA/QC in monitoring activities. These are comprised of the technical training for sampling work, field-testing and the inter-calibration of laboratory measurement, which are oriented for municipalities' staff.

(2) Monitoring Manuals

QA/QC to secure the accuracy of collected water quality data is the most important throughout a series of monitoring activities. As the result of the discussion to realize so, it has been decided that DINAMA and the JICA Project Team jointly prepare a

series of manuals necessary for water quality monitoring. The contents are summarized in **Table 7.4.1**.

Table 7.4.1 Manuals to be Prepared in PLP 4

No.	Titles	Contents	Remarks
1	Designing of Water Quality Monitoring Network	To design a proper monitoring network, practical approach and ways for selection of sampling stations, parameters to be monitored, sampling schedule, etc. are described.	This is used mainly by the WAQD of DINAMA that leads the whole monitoring activities.
2	Methods of Field Work and Sampling	To secure a good practice and QA/QC in field working and sampling, relevant explanations are given for water containers and samplers to be used, sampling procedures, preservation method, and transportation, etc.	This is used by both the municipalities and the WAQD of DINAMA assigned to field work.
3	Field Testing Methods	To secure a good practice and QA/QC in the field-testing, relevant explanations are given for pH, conductivity, DO and fecal coliform measurement.	This is used mainly by the municipalities assigned to field-testing.
4	Processing and Interpretation of Water Quality Data	Explanations relevant for data processing, interpretation of data, reporting, etc are addressed as guidance along with necessary data and information concerned.	This is used mainly by the WAQD of DINAMA that leads the whole monitoring activities and interprets collected data.

As of the middle of November 2004, these manuals have been completed as tentative versions (in both English and Spanish) and are used as textbooks in the technical training for the municipalities on sampling and fieldwork. Final products of these monitoring manuals will be completed after necessary reviews are made during the trial monitoring period.

(3) Updating of Laboratory Measurement and Analysis Manual

The Technical Normalization Department of DINAMA (shortly called DINAMA Laboratory) is in a position to lead the measurement and analysis related with the environment in Uruguay. One of its tasks is to set up and maintain measurement and analysis manuals that are commonly used in Uruguay.

The existing manual contains a total of 58 items for the measurement and analysis covering water, sludge, soil, air and oil. It is mainly based on the 1995 version of the Standard Methods for the Examination of Water and Waster established by APHA (American Public Health Association). DINAMA Laboratory is updating this manual in response to mainly the 1999 version of APHA and the latest version of EPA.

The Second Version of the manual was completed by December 2004.

7.5 Evaluation

(1) Review and Updating of Water Quality Monitoring Plan

It is a significant outcome that the water quality monitoring plan has been established through a series of site surveys and the mutual agreement between DINAMA and the municipalities. It is important that this plan be continuously reviewed and updated, reflecting lessons learnt from actual implementation and the monitoring network to be extended in the future.

It has been concluded as a result of the implementation of PLP 1c that DINAMA would not be able to follow the originally proposed executive plan of trial monitoring judging from the present capacity of DINAMA Laboratory and the logistic problem in the WQD. In order to alleviate heavy load, the plan has been modified in such a way that sample collections be conducted on bi-monthly basis (two-month intervals) and the number of samples and analysis parameters be as minimum as possible to meet the requirement of the ambient water quality monitoring in the Santa Lucía River Basin. The updated monitoring plan is as attached in **Annex 2.7.1**.

The sampling frequency will further need to be adjusted with DINAMA's national water quality monitoring program, which covers six major river basins of the country. This program has been suspended since 1995, but is likely to resume in June or July of the current year.

(2) Practical Uses of Monitoring Manuals

The data and information in ambient water quality monitoring should be collected and generated in a scientifically justifiable way. Accordingly, all practices should be conducted by means of methodologies secured by QA/QC. For this reason, it is important that a series of monitoring manuals should be used practically throughout every activity and be modified timely, reflecting lessons learnt.

(3) Technology Transfer throughout PLP 4

The technology transfer from the JICA Project Team to the staff of DINAMA took place in the PLP 4. This has been conducted through various activities of the PLP 4 based on on-the-job training in terms of the design of monitoring network, methodologies relevant to QA/QC, etc. It is expected that the outcomes of this technology transfer be practically used in the subsequent Phase III (Master Plan Trial).

8. PLP 5/6: PROMOTION OF EDUCATIOM, DISSEMINATION AND PUBLIC PARTICIPATION

8.1 Background

In order to implement the **Module No.4: Promotion of Education and Public Participation**, various pilot projects are proposed, and PLP 5&6 has thus been formulated.

The necessity of the promotion of education, dissemination and public participation for water quality were confirmed and the Pilot Project 5/6 (PLP 5/6) has been proceeding through the consultations with DINAMA, related organizations (Florida Municipality and Primary Education Supervising Office of Florida) and the Steering Committee as well as related residents.

8.2 Objectives and Expected Output

(1) Objectives

Based on the background mentioned in the previous section, PLP 5/6 are accomplished with the following objectives:

- To improve awareness of the people and their motivation to conserve water quality;
- To formulate wider basis for the consensus of the people on drawing up water quality policies;
- To promote public participation in the contribution of water quality policies as well as integrate the community for the effective implementation of them; and
- To improve the motivation of the related agencies in charge of water quality to implement the water quality policies efficiently (Surveillance of the public sector by the people).

(2) Strategies

In order to attain the above objectives firmly, the following strategies are employed in the course of PLP 5/6 activities:

- To put importance on the establishment of the framework where DINAMA and other related agencies can implement water quality management with independence and sustainability. The Working Group for PLP 5/6 has been established in DINAMA. Activities are decided by the leadership of DINAMA in the periodical meetings of the Working Group;
- To put importance on the public relations in order to improve the public acknowledgement of DINAMA accomplishment and other institutions with Japanese technical cooperation. Publicity specialists of DINAMA are included in the members of the Working Group for effective improvement of communication to the people;

- To input resources (time, manpower and budget) in a concentrated manner as a campaign in order to utilize them effectively and efficiently. So, a model area (Florida Municipality) is selected and such resources are input intensively into a campaign of the model area. (The reasons why Florida Municipality was selected are shown later subsection.) Results of the activities will be publicized to other related Municipalities to encourage them to start such activities;
- To perform environmental education/training mainly for teachers of elementary schools with expecting that they will educate children after the their training; and
- To put importance on the cooperation with other international aid agencies. UNESCO has started the water education program targeted to Latin American countries ("Agua y Educación: Para las Americas") and is carrying out in Argentine and Chile from 2004. The following collaboration is being consulted:
  - To exchange information about programs,
  - To carry out education activities in the areas other than Florida Municipality, and
  - To dispatch DINAMA staffs to the training program held in Argentine by UNESCO.

(3) Expected Output

The following outcomes are expected after the accomplishment of PLP 5/6 activities:

- Water Quality Forum is established in Florida;
- Education materials are produced and distributed. Education materials for the campaign (posters, pamphlets and stickers) are distributed to Florida only and other education materials (video programs, kamishibai and booklets) are distributed to all the schools in the Project Area;
- Education and training for water quality conservation are performed in Florida with utilizing education materials;
- Campaign activities for water quality conservation are performed in Florida with utilizing education materials;
- Newsletters on water quality are published;
- Web pages on water quality project are located in DINAMA site and updated periodically; and
- Activities of all Pilot Projects are documented with videotapes.

The effects of expected outcomes are structured to support and enhance the incentives on the water quality management of the staffs, institutions and communities as follows:

- *Incentive* is the key to the capacity development for the water quality management. Wrong application of incentive would deteriorate the moral all the more;
- *Transparency* supports the *incentive* of the staffs and institutions by exposing their behavior to the community. Government officials have to

keep in mind that their performance is always watched by the communities. On the other hand, releasing government information arouses the people and promotes their *participation* by increasing their *awareness* through **environmental education**;

- The **Web Page** of Water Quality Management can bear multiple functions such as a low cost infrastructure of *public relations*, information collection/supply, and coordinating network for related institutions.
- *Participatory* procedure guarantees the *incentive*. The people can participate in a kind of decision-making process, which checks government activities. At the same time, people have to be provided with enough government information for proper decision-making by *transparency*.
- *Public relations* help *awareness* of the people to the government activities as well as promotion of its *transparency*. The **Web Page** and **Newsletters** provide a proper platform for *public relations* and *transparency*; and
- Establishment of the **Water Quality Forum** is also a platform of promoting *transparency* and *awareness* with *public participation*.

The structure of the effects of expected outcomes is illustrated below.

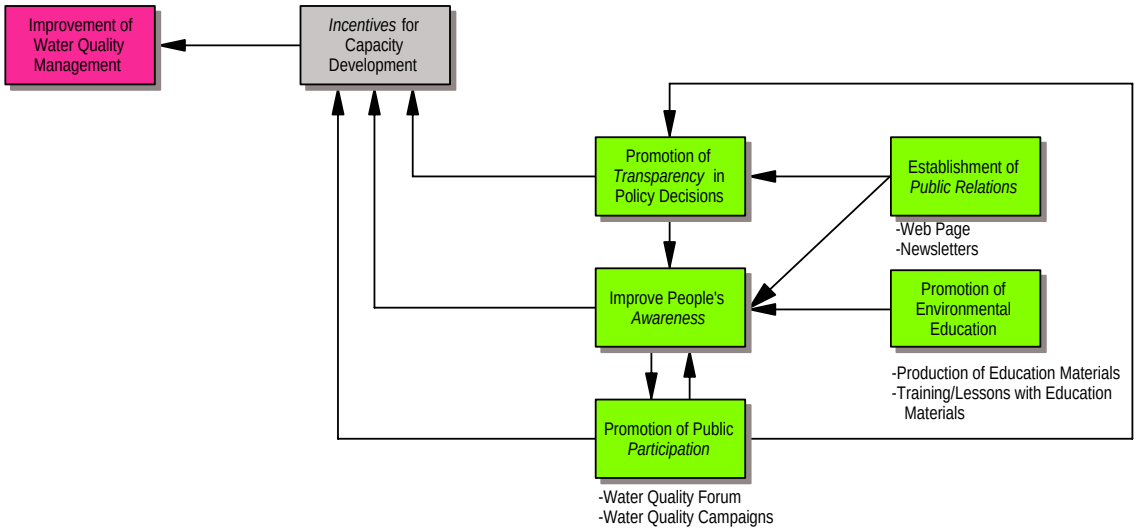


Figure 8.2.1 Structure of Effects of PLP 5&6

(4) Measures for Constructing Framework for Sustainability

In order that the activities of PLP 5/6 themselves are carried out with sustainability, the following measures are employed:

- Implementation plans of the activities are drafted under the leadership and agreement by the Working Group including DINAMA staffs (Group Leader: Mr. Agustín Giannoni, Environmental Education Advisor), which is expected to improve their ownership;
- Two publicity specialists of DINAMA (Mr. Jorge Barcala and Ms. Claudia Mongiardino) join the Work Group and they produce news letters on water quality, which is planned to be published as a part of DINAMA quarterly magazine;

- Establishment of an organization specialized for environmental education and public participation in DINAMA which is based on the Working Group has been proposed to the National Director by the JICA Project Team and a positive response that he would consider the establishment was given by the National Director;
- Web page on water quality is inserted to the DINAMA site. Rules for the contents, information collection and management are made in order to keep periodical updates by DINAMA;
- A working group has been set-up also in Florida (Group Leader: Dr. Nestor Pereira, General Director of Hygiene) and members work for explanation of the activities to related persons and media in the model area. The Working Group in DINAMA supports them. It is also a good opportunity to develop the ownership in the model area;
- Environmental education is mainly performed for teachers of elementary schools with expecting that they will in turn teach their children after their training. The program of their training includes how to use the videos and kamishibai produced in PLP 5/6 in order to be used for long time in the future;
- It has been agreed by Primary Education Supervising Office of Florida to examine the possibility that the teachers of primary schools give lessons of water quality conservation to their children in the classrooms;
- Education materials are made through the consultations with DINAMA staff, schoolteachers and NGOs from the draft version. It helps to develop their ownership of environmental education;
- The Coordination Body of the Water Quality Forum of Florida decides the contents of water quality campaigns and the members of the Forum also participate in the activities. It is also expected to develop their ownership; and
- Training/lessons on water quality (activities of PLP 5) and water quality campaigns (activities of PLP 6) are synchronized to enhance the effects of both activities with synergy. With this synchronization, the credibility of the people to the Pilot Projects is improved and it can be a step to their self-sustaining activities.

(5) Reasons Why Florida Municipality was Selected as the Model Area

Florida Municipality was selected as the model area with the following reasons:

- The upstream of the Santa Lucía River in Minas and Chamizo, present a lower concentration of nitrogen compared with the middle stream where the nitrogen concentration is increasing. The increasing of concentration of nitrogen in the water is a possible threat for raw water sources. With the implementation of the pilot projects at Florida will increase the people's awareness about the water quality and can help to lower the water pollution in the middle stream of Santa Lucía River;
- The Municipal Mayor and his Directors were willing to improve the environmental quality, especially water quality that is affecting the productive capability of the agricultural producers in the Municipality; and

- The former public participation mechanisms put in place during the last years (Local Dialog Commission) permit to anticipate the good predisposition of the local stakeholders to integrate the pilot projects.

The selection was approved in the Steering Committee Meeting on July 1, 2004, and agreed by the Mayor of Florida Municipality and other related persons in the meeting for explanation on July 7 in 2004.

8.3 Activities and Schedule

Figure 8.3.1 shows the summary of activities and schedule.

(1) Promotion of Dissemination and Education (PLP 5)

(a) Education Materials

Activities: Design and production of educative materials

Schedule: The design and elaboration of draft materials for educative activities in schools are to be done between August 2004 and October 2004.

(b) Training of Teachers and Evaluation of Materials

Activities: Training and evaluation of materials by teachers of primary level of Florida Municipality.

Schedule: November 03, 2004

(c) Design of Educative Activities for Children

Activities: Coordination of educative activities for children.

Schedule: February to March 2005.

(d) Education of Primary Students on Water Quality by Trained Teachers

Activities: Trained teachers will teach students of primary schools on water quality management (from March 2005).

Schedule: The end of March in 2005 to the end of November in 2005

(2) Public Participation (PLP6)

(a) Water Quality Forum

Activities: Establishment of the Water Quality Forum in Florida Municipality

Schedule: Set up of the Forum is on August 6, 2004

(b) Campaign Materials for public awareness

Activities: Design and production of campaign materials for public participation.

Schedule: End of October 2004

(c) Activities for Public Participation

(i) Flora Preservation Campaign

Activities: Training session on protection of Flora around rivers and dams as protective measure against water pollution and recognition of the Flora around Paso Severino Lake addressed to teachers, students of primary and secondary levels, municipal employees and the general people.

Schedule: October 26/November 9, 2004

(ii) Santa Lucía Chico River Cleaning Campaign

Activities: Training sessions addressed to teachers, students of primary and secondary levels, municipal employees and general people are to be carried out followed by a solid waste collection from the coastal zone of the River.

Schedule: November 5, 10,11,12,14, 2004

(iii) Workshop on Effluent Management

Activities: Presentation of wastewater treatment facilities used by industries and sewage of Florida Municipality.

Schedule: November 4, 2004

(iv) Workshop on Pesticides Management

Activities: Presentation of different views about pesticides: environmental, health and agricultural impacts by main governmental bodies.

Schedule: November 18, 2004

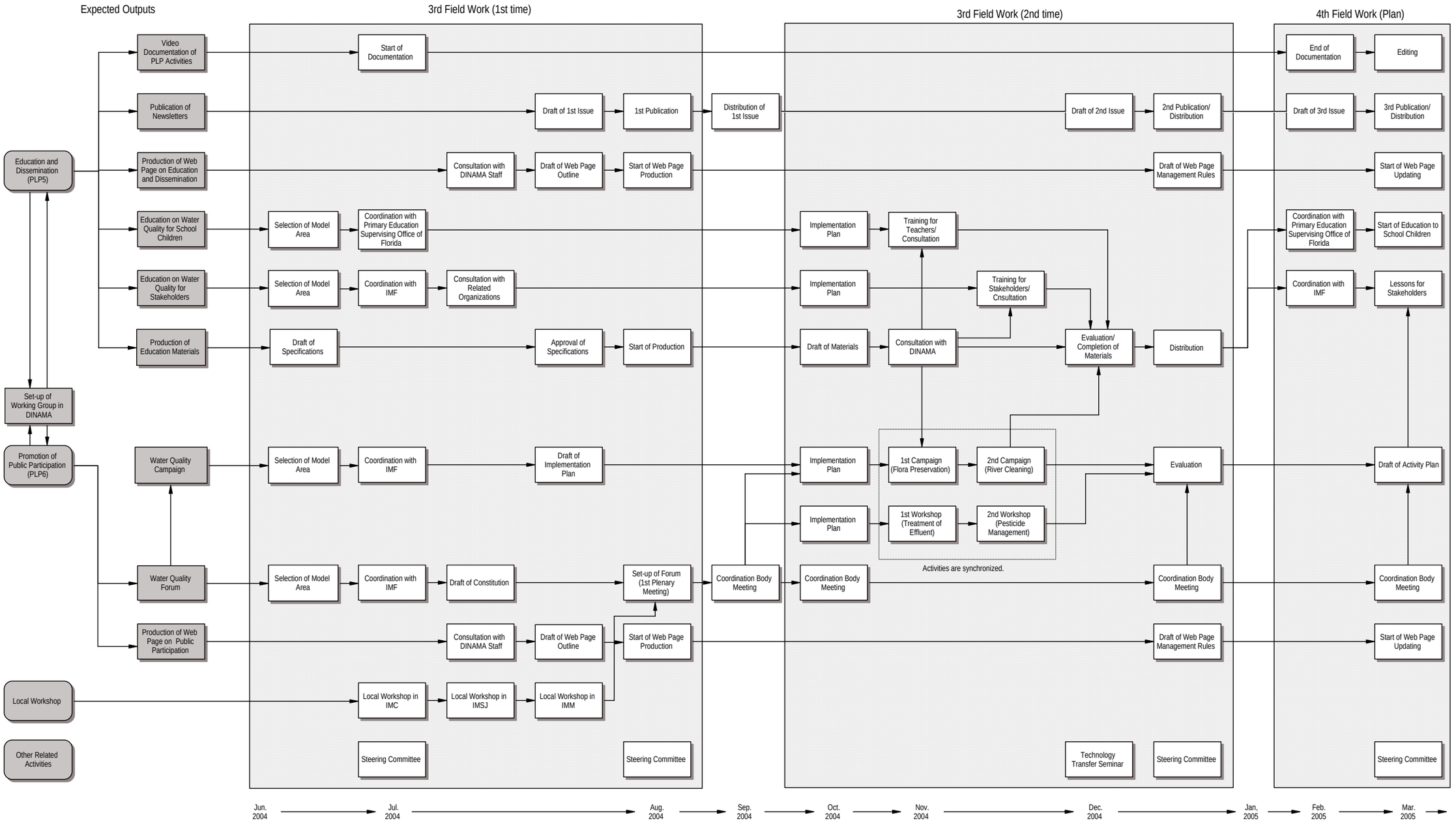


Figure 8.3.1 Summary of Activities and Schedules

8.4 Implementation and Results

(1) Promotion of Dissemination and Education (PLP 5)

(a) Education Materials

DINAMA and JICA Project Team had designed the production of educative materials to be used by teachers to teach students of primary education. As a condition before the final production, it was agreed between DINAMA, JICA Project Team and Florida Education authorities the realization of an evaluation of the draft of these materials. The materials were completed by December 2004 incorporating the comments of the evaluation. The components of the educative tools kit are as follows: video for children, illustrated story (kamishibai) and booklet. The numbers of education materials produced are as follows:

- Video for stakeholders, digital format (20), VHS (420)
  In the **Annex 8.4.1** is attached a copy of the video in digital format
- Video for children - digital format (50), VHS (1,000)
  In the **Annex 8.4.2** is attached a copy of the video in digital format
- Illustrated story (kamishibai) – 1,000 units
  In the **Annex 8.4.3** is presented the material
- Booklet – 1,000 units

  In the **Annex 8.4.4** is presented the material

(b) Training of Teachers and Evaluation of Materials

DINAMA and JICA Project Team agreed with Florida Education Authorities the implementation of capacity building activities addressed for teachers and future teachers (students). In this sense, it was carried out a training session by November 3, 2004, on water quality management, addressed to principals, teachers of all primary education schools of Florida Municipality and students of Florida Institute for Teaching Formation. In this session were presented the draft of education materials to get comments and recommendations for its finalization by December 2004. Program of the training session is shown in **Annex 8.4.5.** The number of trained persons was 21.

(c) Design of Educative Activities for Children

DINAMA and JICA Project Team implemented a workshop on water quality management and educative approaches addressed to principals and teachers of primary level of Florida Municipality. The workshop is aimed to develop and coordinate approaches to carry out water quality activities in schools during 2005 utilizing as a tool the educative materials produced by the present JICA Project. The coordination included the exploration of insertion of the materials elaborated by the Project in the normal curricula of primary school. Program of the Workshop is shown in **Annex 8.4.6.** The workshop was held on March 10 in 2005.

(d) Education of Primary Students on Water Quality by Trained Teachers

Trained teachers instructed students of primary schools on water quality management (from March 2005) using the agreed approaches defined and the educative materials elaborated by the project.

(2) Public Participation (PLP6)

(a) Water Quality Forum

DINAMA and JICA Project Team with the close participation of the Municipality of Florida had established a Water Quality Forum in Florida Municipality to be served as an instance of public participation in the water management. The Forum was established on August 6, 2004. **In Annex 8.4.7** is presented the Program for setting up the Forum, the Act of its Constitution and its structure.

(b) Campaign Materials

DINAMA and JICA Project Team had designed the production of these materials to be used in the framework of the Water Quality Forum of Florida in principle to organize campaigns of awareness on water quality management in the Municipality of Florida. These materials were completed by October 2004. The numbers of campaign materials produced are as follows:

- Posters (1,100 for children, 800 for stakeholders)
  Annex 8.4.8 shows the posters produced
- Triptychs (2,200 for children, 500 for stakeholders)
  Annex 8.4.9 shows the triptychs produced
- Stickers (2,200 for children, 500 for stakeholders)

  Annex 8.4.10 shows the triptychs produced

(c) Implementation of Activities for Public Participation

The Coordination Body of the Water Quality Forum had decided and organized many activities that were conducted during the month of November 2004, to raise the awareness of the population of Florida Municipality in the water quality management. The JICA Project Team, DINAMA and the Municipality of Florida had assisted to the Forum to design and implement these activities that are described here down:

(i) Flora Preservation Campaign

This campaign was to raise the awareness of the people on flora preservation around the Lake of Paso Severino in the city named 25 de Mayo. The existence of forest and shrubs around the dam helps to avoid the erosion and the entrance of sediments to the Lake that could affect the water quality.

The campaign included training sessions on the subject addressed separately to students, teachers and the general public. The Campaign was

conducted in the period October 26-November 9 of 2004. The Design of the Campaign is in **Annex 8.4.11.** Schools and participants who attended the sessions are as follows:

Table 8.4.1 Flora Preservation Campaign

Session	Participants (Number)
Primary School No. 5	Students (180), Principal, Teachers (7)
Secondary School No. 3	Students (110), Principal, Teachers (14), Administrative Officers (4)
25 de Mayo City	General People (50), Municipal Officers (2)

(ii) Santa Lucía Chico River Cleaning Campaign

This campaign was to raise awareness of the people on the current situation of solid waste discharging by the people in the watercourses. The Campaign was conducted in the period November 5-November 14 of 2004. The Design of the Campaign is in **Annex 8.4.12.**

The campaign included training sessions on the subject addressed to the following levels:

Table 8.4.2 River Cleaning Campaign

Session	Participants (Number)
Primary School No. 51	Students (70), Principal, Teachers (2)
Primary School No. 108	Students (60), Principal, Teachers (5)
Primary School No. 102	Students (70), Principal, Teachers (3)
Primary School No. 37	Students (80), Principal, Teachers (4)
Primary School No. 2	Students (120), Principal, Teachers (5)
Primary School No. 109	Students (70), Teachers (5)
Primary School No. 76	Students (65), Teachers (4)
Secondary School No. 3	Students (120), Principal, Teachers (23)
Secondary School Universidad del Trabajo de Uruguay	Students (80), Principal, Teachers (15), Administrative Officers (6)
Florida City	Municipal Officers (6), NGO: Florida Natural (12), General People (50)

After the training, a solid waste collection from the coastal zone of the Santa Lucía Chico River was carried out by approximately 100 persons including teachers, students, members of NGO, Municipal employees and the general public.

(iii) Workshop on Wastewater Management

One of the concerns of the community of Florida is how the wastewater is treated by the local industries and by OSE. In response to this concern, the coordination body of the Water Quality Forum had decided to carry out this workshop. Managers of sewerage services (OSE), Wool Industry, Milk Industry and Tannery Industry located at Florida Municipality had presented their current wastewater treatment systems. In addition, the

JICA Team presented the wastewater system applied in Japan and the current water quality management improvement. In this way, the people of Florida had the opportunity to know and understand the present situation of the wastewater management in Florida. Program of the Workshop is shown in **Annex 8.4.13.** In total of 29 persons attended the workshop.

(iv) Workshop on Pesticides Management

Other concern of the community of Florida is the current impact that could have on the human health and the environment the handling of pesticides and other chemical products used by rural producers. In response to this concern, the coordination body of the Water Quality Forum had decided to carry out this workshop. Officers from DINAMA, Ministry of Public Health (MSP) and Ministry of Livestock, Agriculture and Fisheries (MGAP) had presented their current plan of action and updated information. In this way, the people of Florida had the opportunity to know and understand the present situation of pesticides in Uruguay. Program of the Workshop is shown in **Annex 8. 4.14.** In total 43 attended the workshop.

8.5 Evaluation

The PLP 5/6 are evaluated based on the results of implementation of the activities by each objective as follows:

Table 8.5.1 Evaluation of PLP 5&6

Objective	Results	Evaluation
To improve awareness	• Newsletters on water quality were issued and distributed to stakeholders. • National and local media (TVs, newspapers and radios) reported most of the activities. • Posters, pamphlets and stickers are distributed for the campaigns. • Two workshops ("Effluent Treatment" and "Pesticide Management") were held in Florida. • Four training sessions were held in Florida for stakeholders using the education materials. • Eleven education sessions were held in primary and secondary school of Florida using the education materials. • Meetings with principals and teachers of Florida were held to assess the education materials.	• Materials and occasions were provided enough for the objective. It is not easy to measure actual effects of the activities in a short time. • Many activities related to water quality campaigns were planned and executed in a half month (two campaigns and two workshops, and other many education sessions). Its impact is fairly enough but the impression of each activity seems weak as a result. • Although the number of participants varies by activity, enough people joined the sessions in general.
To formulate wider basis for consensus	• Water Quality Forum (FWQF) was setup. • More than 70 people joined FWQF and	• Many people participated in FWQF and its preparatory

Objective	Results	Evaluation
To promote public participation	discussed the water quality issues. ● Coordination Body of FWQF had meeting regularly and promoted two water quality campaigns and workshops. ● Approximately 100 people participated in the river cleaning campaign. ● More than 350 people had participated in the Flora Conservation Campaign	sessions and Coordination Body meeting, and discussed the water quality issues ardently until late night. Members seem to develop ownership of the water quality. ● The schedule had to be arranged in order to avoid the negative affects from presidential and local elections held in October 2004 and in May 2005, respectively.
To improve the motivation of the related agencies	● Working Group was established in DINAMA and had a meeting regularly. ● DINAMA staffs promoted and joined campaign activities and education/training sessions for teachers. ● Florida Municipality actively promoted campaign activities. ● OSE staff joined the campaign activities. ● Florida primary education supervising office promoted education/training sessions for teachers. ● Teachers in Florida gave comments on the education materials.	● DINAMA staffs promote and joined the activities ardently. ● In Florida, especially staffs of Hygiene Department and Public Relations Office promoted and joined the campaigns actively and ardently. They seem to develop ownership of the activities.

ANNEXES

ANNEX (8.4.1)

ANNEX (8.4.2)

Annex 8.4.1 Video for Adult in DVD attached to Main Report

Annex 8.4.2 Video for Children in DVD attached to Main Report

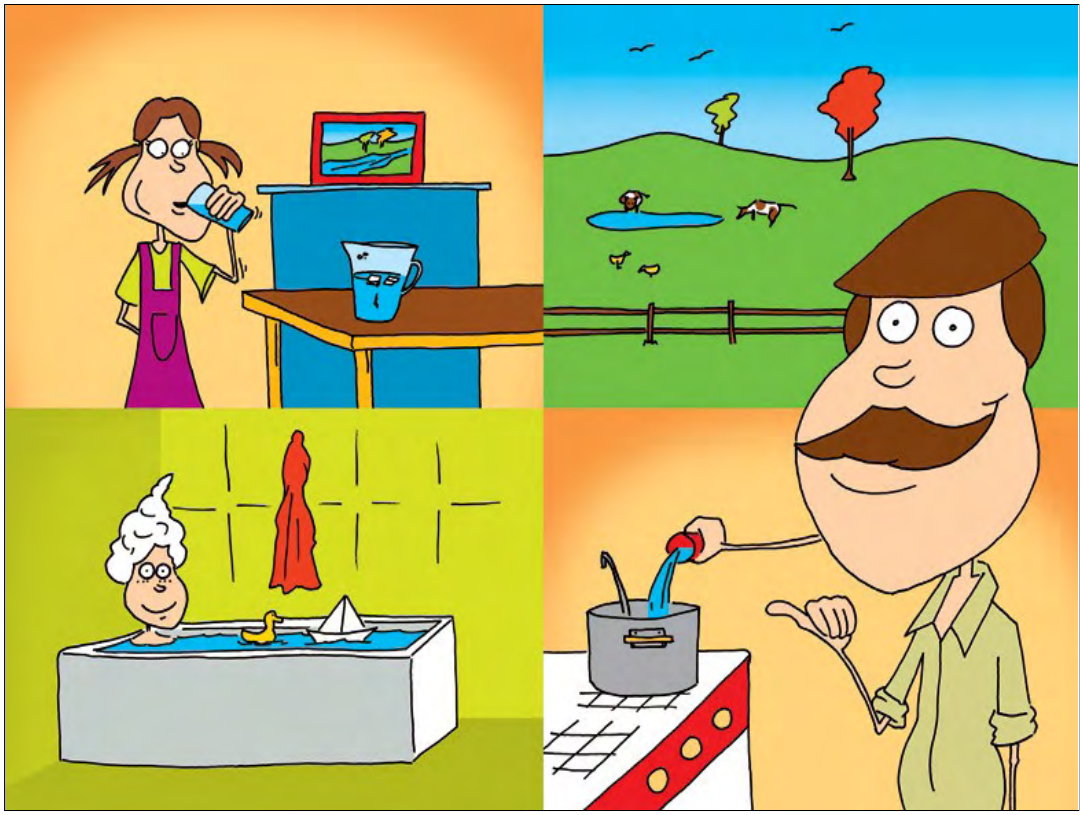
ANNEX (8.4.3)

Stories next to the river

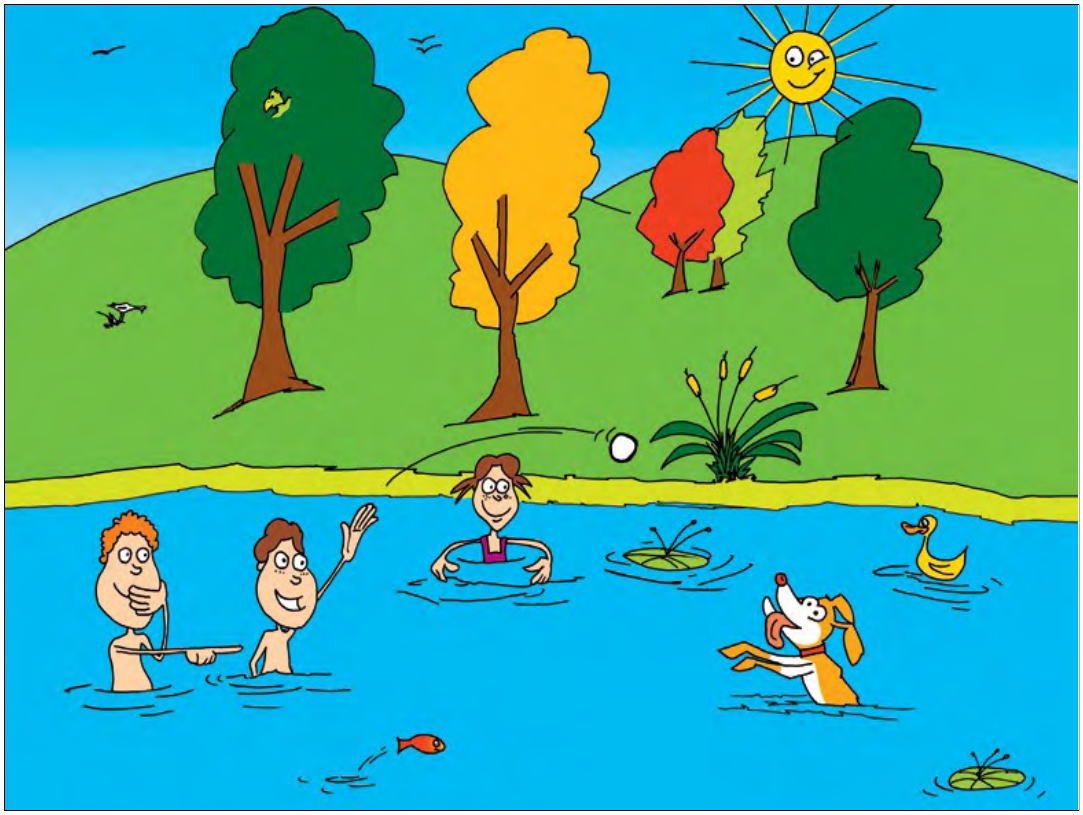
Story for children and young people
and adults with children's heart

My name is Sebastian and I have a very nice family with whom I live next to a beautiful river. My grandmother is Carmen, my dad Alfredo, my mom Teresa, my brother Mateo and my sister is Josefina. Fitón also lives with us, he is a very playful dog.

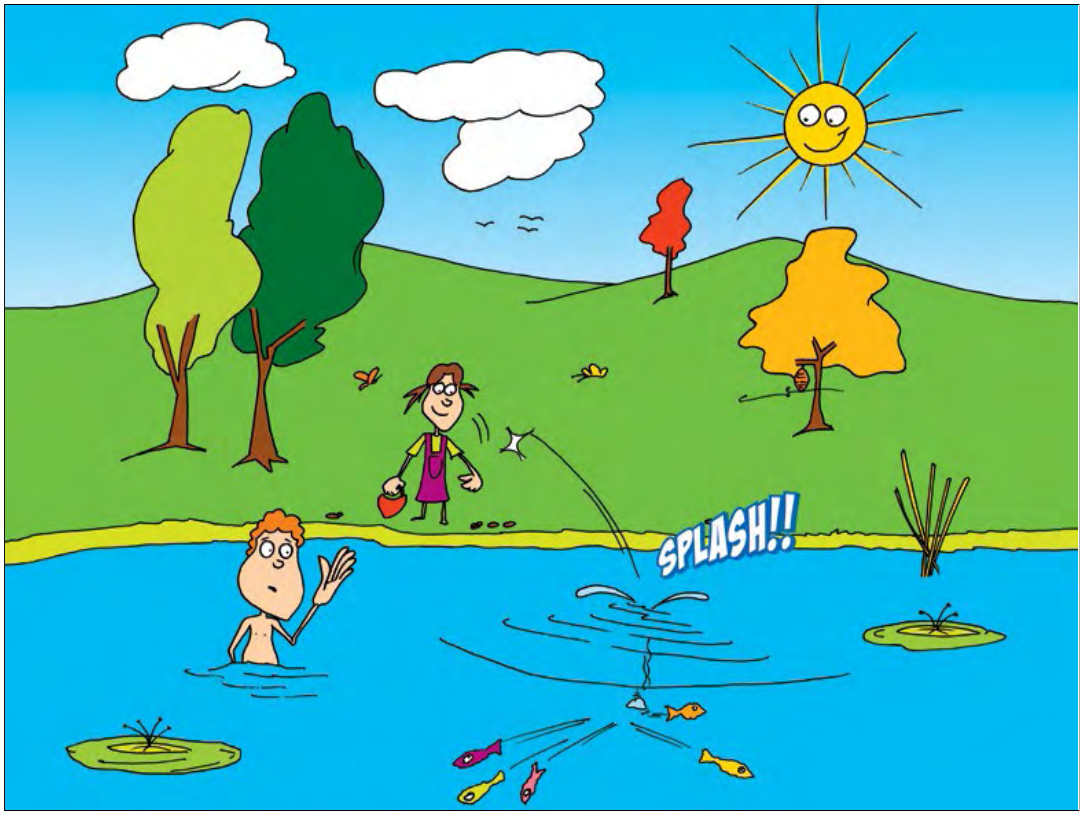
My grandmother has always told us stories about the river. She told us that when she was a child they had a great time in the river, because people spent the whole day swimming, playing, fishing or enjoying the view, with no rush. “There were promenades, boat trips and a lot of parties”, she said. Family trips were really important for people and they shared very pleasant moments until sunset. Although once a year there is still one party by the river, granny says nostalgically: "Real walks by the river were those of the past… "



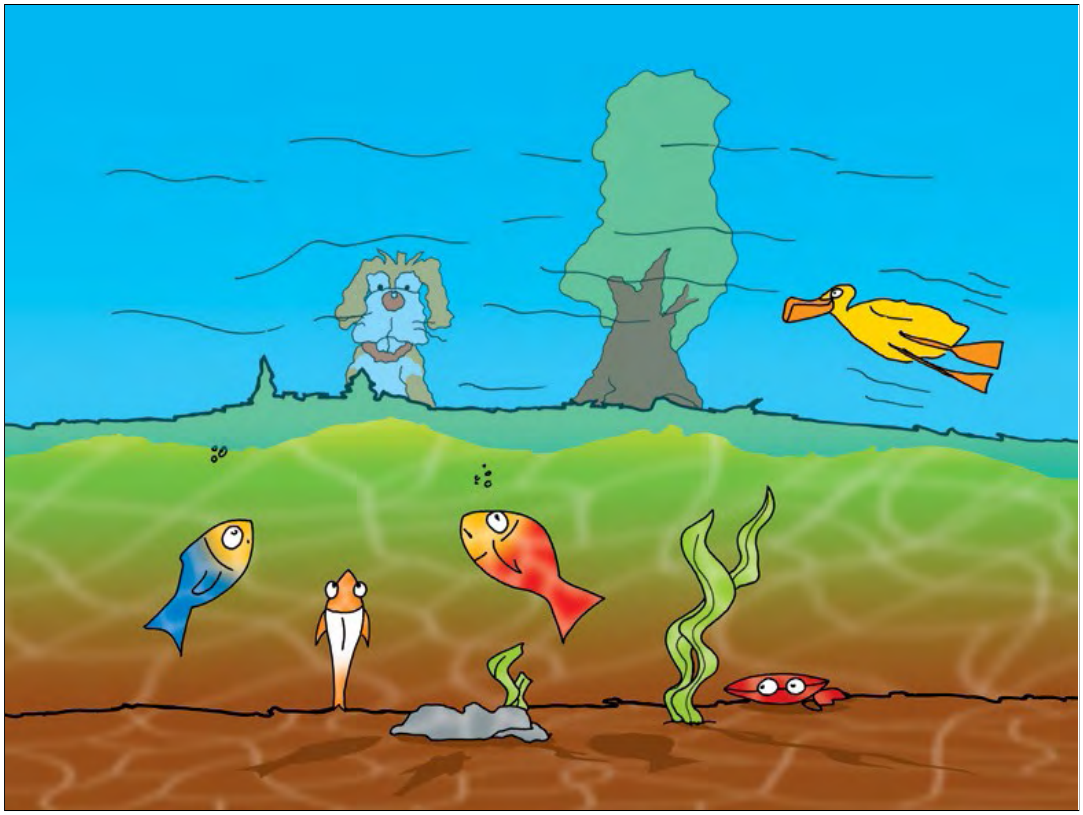
Alfredo, my dad, says that water is becoming more and more necessary, both in the city and in the country. He says that drinking water is taken from our river and it is purified then. It is used for drinking, cooking, bathing, watering, washing and to produce thousands of things. My mom Teresa uses it to prepare the fruit juice we like so much.



Sebastian remembers that since he was very small, he had lived beautiful stories in the shady banks, where there were plenty of trees and coloured flowers. "We played there and had a lot of fun". "I really enjoyed looking at my face reflected in the water". "The water was clean and fresh, and we used to take baths with my brother and sister and my friends, until we came out with the skin all wrinkled". "When my dog "Fitón" was a puppy, he used to splash about with no risks, and when he came out of the water he shook himself and got us all wet", he said laughing.

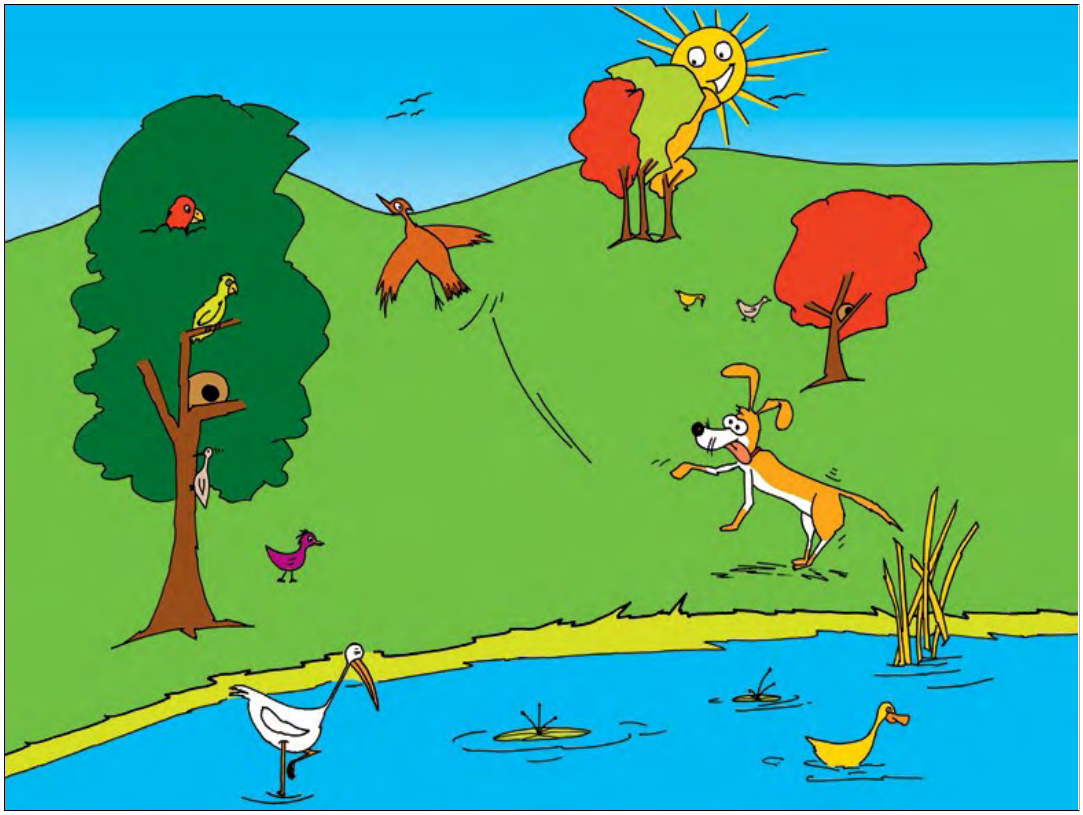


My brother Mateo enjoyed playing with sea breams, while my sister Josefina collected little stones in the bank and stored them in a bag. When she didn't like one she threw it into the water making the sea breams flee in a hurry, while we could see successive circles in the water slowly getting bigger and bigger.

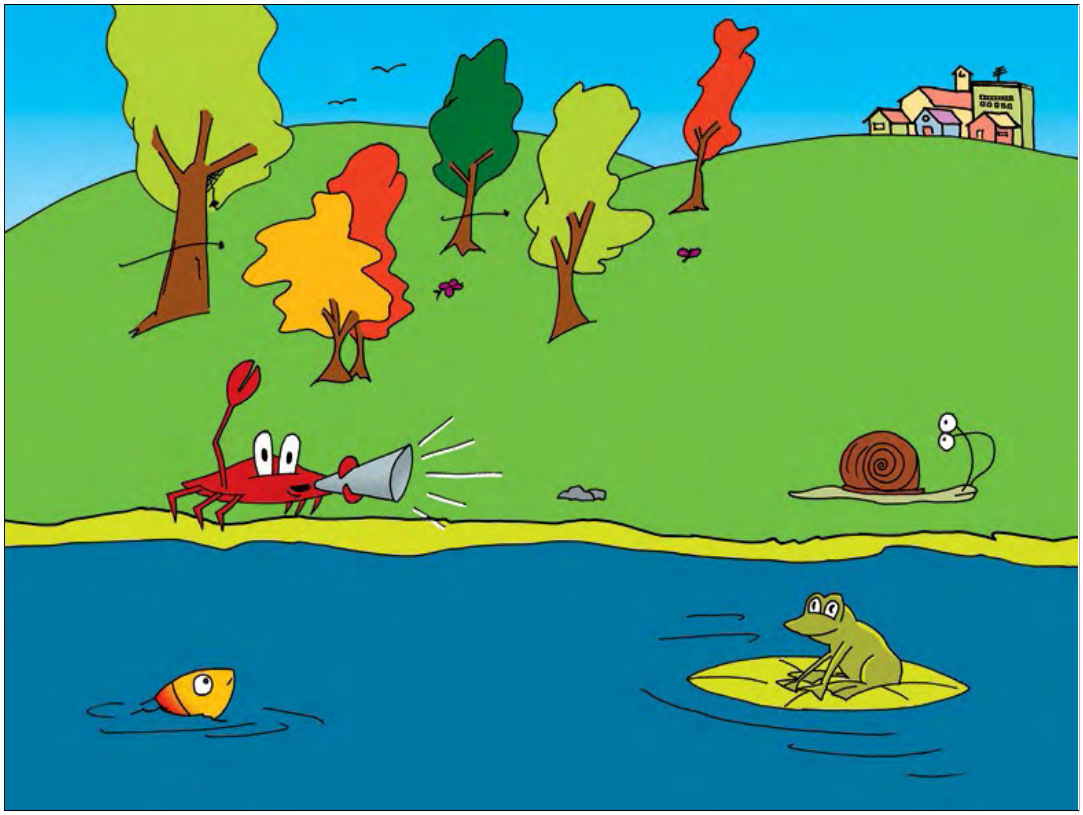


Many more animals inhabited the river then, such as fish, tadpoles, frogs, winkles, clams and also crabs that walk funny on one side. "With his movements and barking, Fitón frightened fish and other animals away which we approached to make friends", Sebastian says.

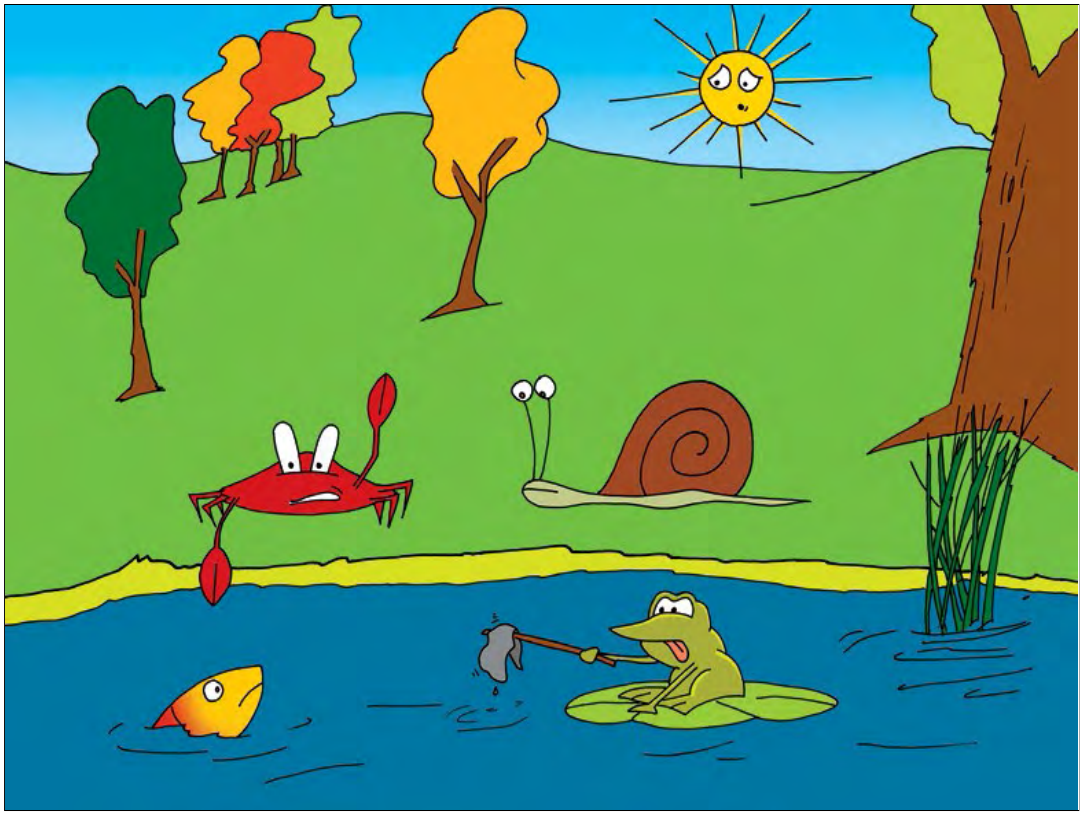
With the warm summer breeze the river was filled with thousands of insects that rushed around unceasingly. "Among them I remember the coloured butterflies, the tireless wasps and bees, and the "manganga" that passed buzzing among us", the kid says.



There were all kinds of birds: crested screamers, white herons, ducks, pigeons and ringdoves. There were also lapwings that made a great racket when frightened by "Fitón". In the trees by the coast, there were hundred of birds that sang and made a fuss.



"One day with my brother and sister…", Sebastian says, "the three of us were together with Fitón who romped playfully among us...when we were surprised to see a group of rowdy little animals by the river. Melgarejo (the crab) who walked along the bank, called loudly for Braco (the toad), Peteco (the winkle), and Saracha (the sea bream), to tell them something. We approached quietly to listen what they were saying", Sebastian says.



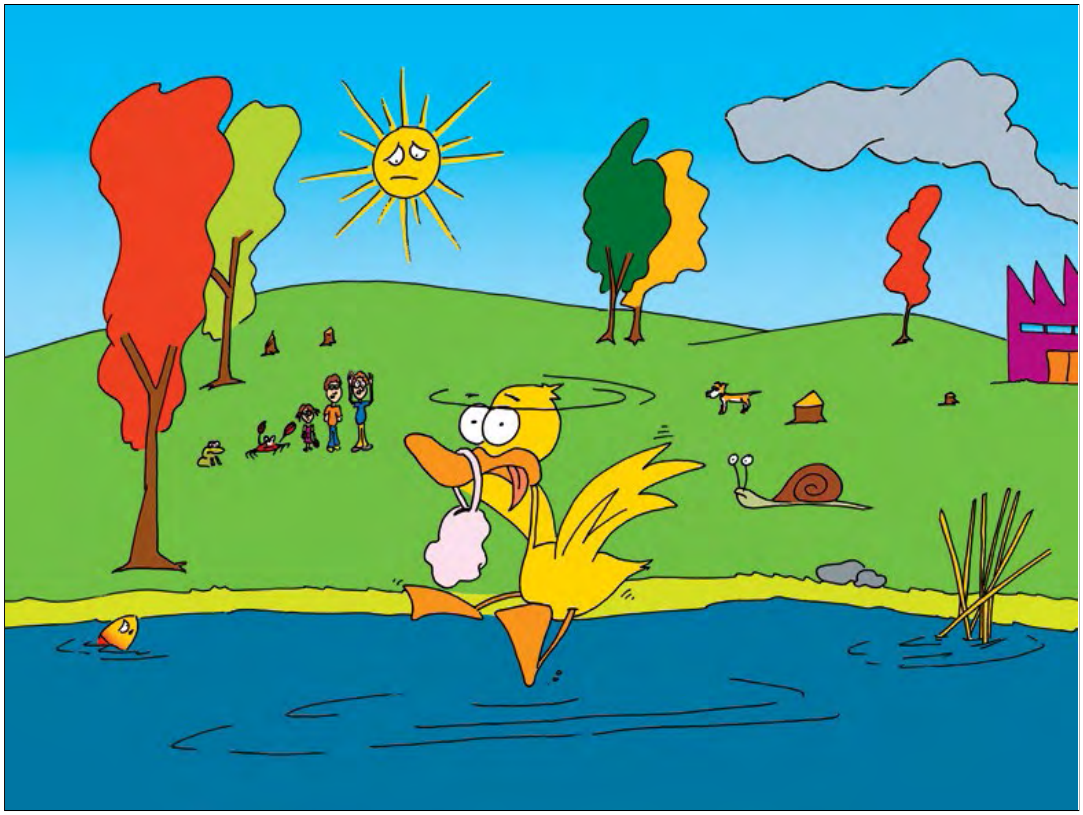
Melgarejo told the little animals "Hey folks! Have you seen the colour of the water?… yessss", they all answered. And the crab added upset: "it is no longer as it was before, now it is dark, opaque and cloudy.“

"When I was swimming towards here, I could hardly see you... " Saracha (the sea bream) said, "... because the water is filled with garbage that covers my eyes". “And the taste of the water… yuck! it is disgusting!" Fitón who understood everything, smelled the water and ran along the bank barking strongly.

Suddenly, a duck approached with a plastic bag stuck in its mouth. Melgarejo looked at him scared "Poor duck!" he said. And he turned his head towards the children, because he had seen them coming closer. The crab asked Sebastian: “how could this happen to the duck?” Sebastian answered: “people throw a lot of stuff into the river and now the river is sick". “It seems that the duck mistook the plastic bag for food. We have to help him, otherwise he will get ill", he added.

Mateo, feeling sad for the poor duck, said: "My teacher explained us that this illness of the river is called pollution". "Pollution?" Peteco (the winkle) repeated curious, "And what does it mean?" asked Melgarejo (the crab). "It means that a lot of things are thrown to the river: cans, nylon, paper and wastewater from our houses, dairy farms, pigpens and factories" Mateo explained. Besides, the rain drags earth from the fields and garbage from the town streets", he said.

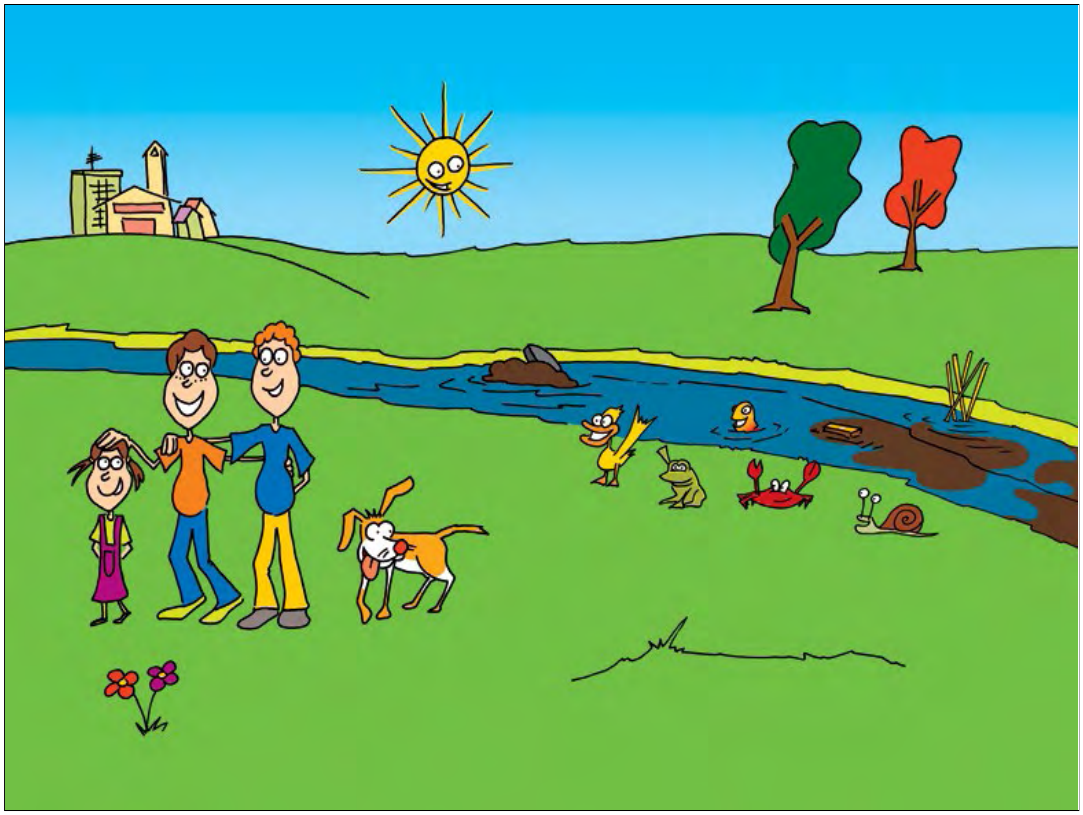
"We don’t like to come to the river as much as we used to any more", Sebastian said. "You know…, last time we came here we only caught bags, cloths and old shoes, and even a torn ball!" "We cannot take a bath because it is disgusting to step at the bottom since it is full of garbage", added Mateo. "And our parents don't allow us to swim here anymore”, Josefina said. “because we may get sick”.



Suddenly, the duck began to cough stonger and stronger. Peteco (the winkle) said worried… "The duck is choking!" "We must help him" they all said! Saracha (the sea bream) said sadly shaking her head: "We, the animals of the river, don't have enough strength to help him."

Our friend Melgarejo (the crab) spoke. "What do you thing if we help the duck altogether?" "Yes, yes...!" They all agreed… and with great effort, the crab, the toad, the winkle, the sea bream and other little animals, dragged the duck to the bank, and there the three children freed him from his gag.

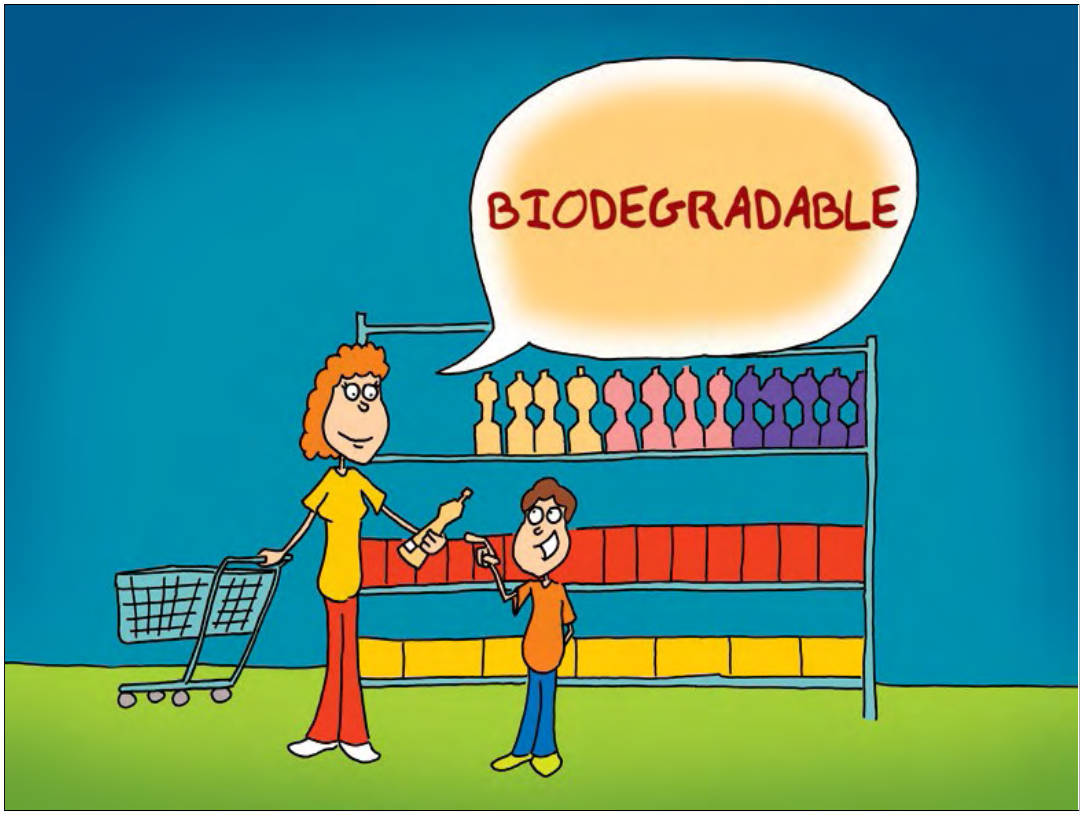
Relieved, the duck could finally breathe. Melgarejo (the crab) felt very proud of his friends and he thought that, while friends like them exist, taking care of each other, the inhabitants of the river would always be able to give and receive help". "Bark, bark!", Fitón jumped happily by the group.



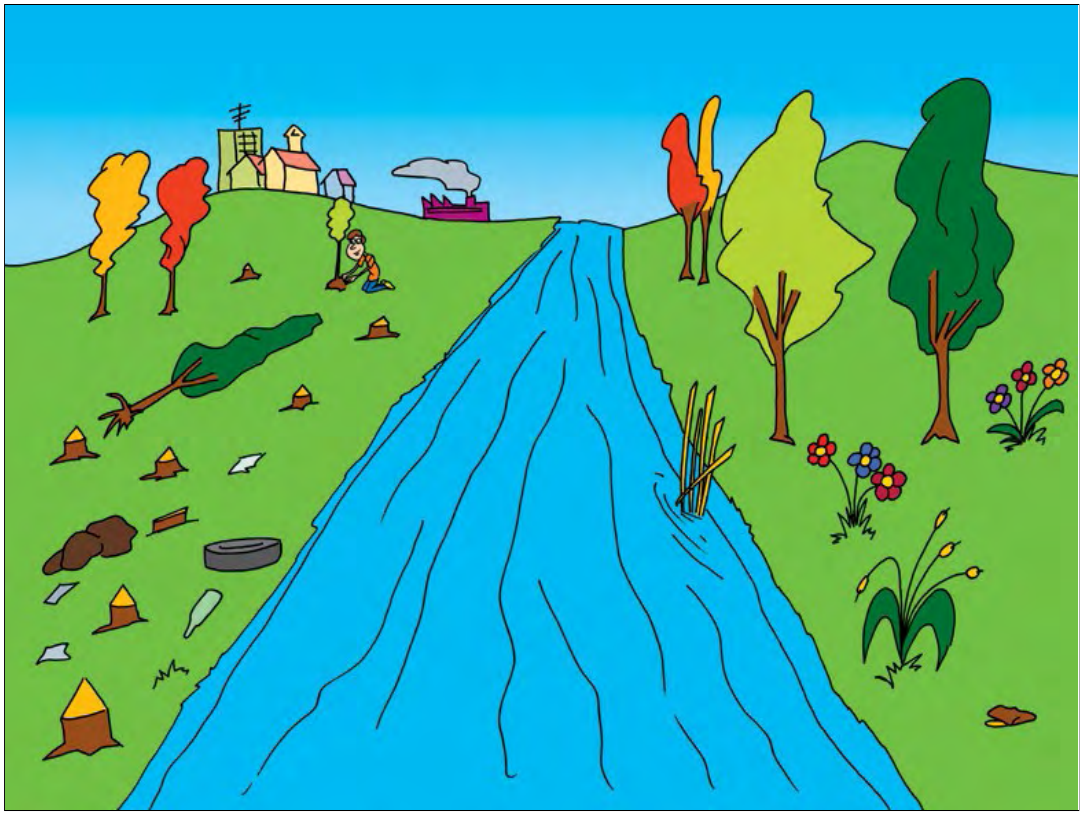
"Well done!" Sebastian, Mateo and Josefina congratulated each other. Water is vital and we all depend on it. We have to tell what happened to all our friends and to mom, dad and granny. I'm sure, Mateo said, that the Teacher will be very happy with us, and she will tell the whole school what is happening in the river. Everybody should know, in high school, the neighbourhood, everywhere.

We want the river to become again the one we all enjoyed once, the one of granny Carmen, dad's and mom's, the one from when we were small. What can we do? We should make a proper use of water and take care of its purity and do not waste it.

If nowadays water is polluted with garbage, such as paper and food wrappers, or cigarette buds, or waste thrown away in the public highway without thinking, we have to carry out cleaning campaigns and avoid as much as possible from throwing anything into the river.

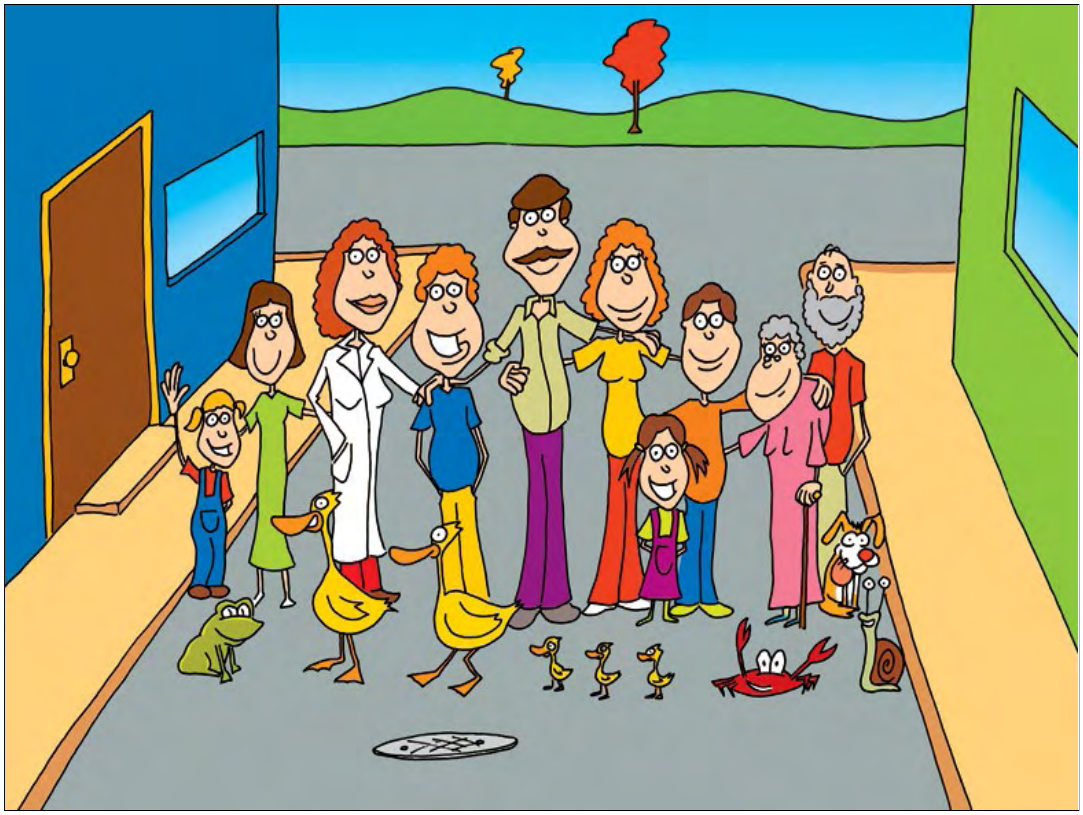


Washing detergents, both the ones used in the kitchen and those used to clean cars, may pollute water courses. If biodegradable detergents are used, it would not cause damage to the river. When going shopping with mom or dad, we can read the product labels to see which ones do not damage the river.



If today, part of those beautiful trees by the river banks that whispered songs we liked so much and that worked as a barrier against pollution are lost, we have to protect the remaining ones and plant new ones to replace those missing ."

Besides, it is important to use it without wasting it: making the best use of it when we take a shower; watering plants carefully, when we help mom in the orchard or in the garden; taking care of water when we help dad or someone else to clean his car, cart or sidewalk.



What can we do to stop pollution! We should invite teachers and children, professors and young people, our relatives and neighbours in the country and the city to do something altogether. Each one of us should speak with our parents and grandparents, our brothers, sisters and other relatives, and above all with our friends, so everybody can help. In each group, home, office, workshop or neighbourhood centre, we have to start working! Let's do something for the river, we can do it together!!!!

ANNEX (8.4.4)

Educational Manual

The Protection of Water Resources in the Santa Lucia River basin

Water
To protect rivers and creeks is to protect life

DINAMA – JICA

The Project on Capacity Development for Water Quality Management in Montevideo and Metropolitan Area in the Oriental Republic of Uruguay.

Pilot Project on Education and Diffusion

Ministry of Housing, Use of Land and Environment
National Directorate of Environment

Authorities
Minister: Mr. Mariano Arana, Architect
Subsecretary: Mr. Jaime Igorra, Architect
National Director of Environment: Mrs. Alicia Torres, Engineer

This manual for the "Protection of Water Resources in the Santa Lucia River Basin" was created within the framework of the Project on Capacity Development for Water Quality Management in Montevideo and Metropolitan Area, carried out by the National Directorate of Environment (DINAMA), with the support of the Japan International Cooperation Agency (JICA).
The Japan International Cooperation Agency is a body depending of the Japanese Government which executes the technical and economical cooperation programs, based on the developing countries' requirements. JICA is in charge of Technical Cooperation projects and Non Refundable Technical Cooperation projects, concerning bilateral donations.

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Acknowledgments: Mrs. Miriam Abreu (former Primary Education Departmental Inspector of Florida), Mrs. Cristina González (Primary Education Departmental Inspector of Florida), Mrs. Cristina Laxague (Principal of the Teachers' Training Institute of Florida), Mrs. Claudia Mongiardino (DINAMA), Mr. Jorge Barcala (DINAMA), and all the teachers, particularly from the Department of Florida, who contributed to improve these educational materials.
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Water Resources and ecosystems

Water resources in Uruguay are made up of water from the ocean, rivers, creeks, gullies and lagoons, underground water, as well as rainwater. Quantity and quality of water in a river or creek are extremely important for plants, animals and people that live along their course. Rivers and their environment, at a natural state, usually settle valuable ecosystems that maintain a rich flora and fauna, and on which different species rely. These ecosystems are dynamic complexes, of vegetable and animal communities, micro-organisms and the environment in which they live on, which interact with one another.

Human beings use water for agricultural activities, fisheries, industrial activities, energy generation, transportation, recreation and others. Besides, it is used to satisfy their vital and everyday needs, such as drinking, preparing food, cleaning or washing clothes. The water demand increases continually with the economical and social development and due to its use by the population and different organizations.

Water is never found in a pure state, not even in nature. In a *natural state* it may contain, among others: bicarbonate, sulphate, chloride, sodium, calcium, magnesium and potassium. Also, due to its flowing on rivers and creeks, or by soil and rock infiltration, it adds substances. Some of these substances are not innocuous.

Water is naturally purified by live organisms. Solar energy activates the photosynthesis process in aquatic plants, which produces oxygen, required for decomposing organic matter in water, of vegetal and animal origin. Decomposition produces carbon dioxide, nutrients and other necessary substances for plants and other aquatic live organisms. The purification cycle continues when these organisms die, being decomposed by bacteria.

The maintenance of the self-depuration capacity of water is related to the *stability of the ecosystem*. In general, this stability is based on capacities and mechanisms of resistance and resilience. These are the following: a) resistance is the system's capacity to endure alteration or disturbance tendencies and b) resilience, the system's capacity to return to its original conditions.

Water pollution is caused as a consequence of the introduction of matters or energy forms that directly or indirectly involve a harmful modification of quality regarding the uses given to the water course or its ecological function.

The increase in harmful modifications to water resources is produced generally by the intensification of agriculture and industrialization, as well as by the concentration of population in urban areas. This specially occurs when there is a lack of adequate planning for the use and preservation of soil, water and other resources.

In these cases, environmental problems that generate growing concern arise. Among them, the following can be included: the influence of agrochemicals and fertilizers; soil erosion; industrial, home and municipal water and solid disposal (including sewerage lacks) in rivers, creeks and lagoons, which cause an increasing deterioration and pollution of these water bodies.

When taking care of resources, the protection that can be given from standards and specialized institutions is of great importance, as well as the protection of natural areas within the national territory, good environmental management and people education and awareness.

Use of water courses

Water courses can be classified as follows depending on their uses:

- For extractive use or consumption of river, creek or lake water.
- For non-extractive use or non consumption of course water, occurring in natural environment, without significant modification of the original course.

(FIGURE)

Basin concept

A basin is a system formed by a set of interrelated elements. The main components are: water, soil, geological strata and the forest.
The water basin is defined as a territorial unit in which water falls by rainfall and drains towards a common point or flows all towards the river, lake or ocean itself. Within the basin live human beings, animals and plants, all inter-related.
In a supplementary way, a water basin is defined as an integral morphological unit which apart from including the concept of water basin, covers all the underground hydrogeological structure of the aquifer as a whole.
Within a basin we may distinguish: the high part, the middle part and the low part. In the high part, topography is usually steep and generally there are woods. The high and the middle parts is where most of the river origins are located. The lower parts are important for agriculture and human settlings, because those are the flatter areas.
The basin is of great importance due to the direct relations between the high basin and the low basin, so that actions carried out by men in the high part affect significantly the low part.
The basin has several functions:

Hydrological Function.
- It enables the water catchments of different rainfall (such as rain, frost or hail), and it forms the drain for springs, rivers and creeks.
- It allows the storage of water in different ways and time lengths.

Ecological Function.
- It provides a diversity of sites and routes along which water produces interactions depending on its physical and chemical quality.
- It provides the habitat for flora and fauna, biological elements of the ecosystem.

Environmental Function.
- It regulates the water recharge and the biogeochemical cycles.
- It is a gully of Carbon (CO_2).
- It keeps the soils' integrity and diversity.
- It preserves flora and fauna biodiversity.
- It holds germ plasm banks, for the preservation and improvement of species.

Socioeconomic Function.
- It offers natural resources for the development of productive activities that provide support to the population.
- It offers a space for the population's social and cultural development.

Besides, basins have regulatory functions in *the matter cycles* and in *the transformation of energy* carried out by natural ecosystems, which affect the improvement of environment and the population's quality of life.

Environmental Services

Due to its features and functions, the basin contributes with several environmental services.

- **Hydrological:** flow regulation and flood control, sediment transportation, recharge of aquifers, scattering of seeds and larvae of the biota, agricultural, industrial uses and use for the extraction of drinking water, among others, pollution dilution, electricity generation.
- **Biochemical:** sediment storage and release, storage and recycling of nutrients, storage and recycling of organic matter, detoxification and absorption of pollutants.
- **Biological:** creation and maintenance of habitats, maintenance of wild life, fertilization and formation of soils, decomposition and processing of organic matter, processing of human waste.

The various watercourse uses of a basin may often be incompatible with the preservation of environment and biodiversity. Considering the extraordinary richness of water and biota resources of this geographical space and the increasing degradation some basins are being subject to, the analysis of the relation between the environmental management in general and specifically of water resources, is a priority.
The vision of basin includes the most updated approaches regarding planning, management and fostering measures aiming at correcting negative environmental impact, which may result from a bad use and careless management of natural resources.

Santa Lucía River Basin

Uruguay is divided in six main basins: Uruguay River (45,860 km^2), De la Plata River (12,780 km^2), the Atlantic Ocean (8,480 km^2), Merim Lagoon (28,950 km^2), Negro River (68,140 km^2) and Santa Lucía River (13,482 km^2).
Santa Lucía River Basin borders at east with the Cebollatí River Basin, at south by the basins that flows into the De la Plata River and at west and north with the Negro River Basin. The mountain range or hills that serve as basin borders reach heights of up to 300 m. The hills located at the centre of the basin reach 100 m.
The predominant vegetation includes natural grazing areas, while the bush and tree vegetation is presented in strips at the side of the river flow.
Santa Lucía River is 225 km long, with two main tributaries, the Santa Lucía Chico and San José. Santa Lucía River begins in the proximity of the Cuchilla Grande in the department of Lavalleja. It is oriented from east to west, up to the intersection of Santa Lucía Chico River. From there on it is oriented north-south down to the mouth at the De la Plata River, in the locality of Santiago Vázquez. Along the 55km of its upper course, from the source to Paso Roldán, The Santa Lucía river flows along outcrops and pools or lagoons, where it deposits the gross material it drags.
From Paso Roldán to Santa Lucía the river covers 130 km with an average gradient of 0,6 m/km. In this section, which represents the middle course, it receives from its right bank the following affluents: Soldado, Tupambaé, Casupá, Chamizo Chico, Arias and

Mendoza creeks, Santa Lucía Chico river and De la Virgen creek. On the left bank it receives the Vejigas and Del Tala.
After the intersection with Casupá creek, the Santa Lucía belongs to a wide plain, presenting significant shifting/digression, mainly in the intersections with Vejigas and Chamizo creeks. From Fray Marcos, the presence of gravel and sand banks is verified.
The lower course starts in Santa Lucía and flows down to de mouth, after covering a distance of 55 km. On its right bank, contributes the San José river, and on its left bank it receives the Canelón Grande and Las Piedras creek. From the intersection with San José river, the Santa Lucía river is widened on a very flat area with low drainage density, forming wetlands and sandbanks.
On its upper course, Santa Lucía Chico river takes an east-west orientation, changing it to north-south on its middle and lower sections. The basin area down to the mouth has 2.620 km^2, with a 111km length. All the important affluents are received by its right bank. At the lower section, there is the Paso Severino Dam. This dam is the main reservoir of the current water supply system of Montevideo, located downstream the city of Florida, with a contribution area of 2,500 km^2.
San José River is the most important tributary of the Santa Lucía River and runs on a well-defined northeast-southeast orientation. Its basin has a 3,650 km^2 contribution area with a main flow length of 122 km. In part, its course runs narrowed down between ravines, presenting enlargements that act as natural regulator dams. On the lower section near its mouth, it runs on a flat area.

We may highlight some specific ecosystems of the Santa Lucía River Basin

- The Arequita park.
- The sandy areas of the Santa Lucía River, feeding, nesting and resting areas for birds.
- Riverside native forest of the San José, Santa Lucía Grande, Santa Lucía Chico and Casupá Rivers, with a great flora and fauna richness (biodiversity).
- Penino ecological beach.
- Santa Lucía River wetlands.
- Saline wetlands of the lower course of the Santa Lucía River.

Pollution of Water Courses

The main pollution sources of water courses are usually related to:
- Wastewater discharged to them.
- Industrial effluents.
- Surface runoff of lands used for agriculture, dragging fertilizers, pesticides and nutrients.
- Different uncontrolled sources of land infiltration (septic chambers, leachate of garbage dumps, filtration of stabilization ponds, etc).
- Urban pollutants dragged by rain.
- Pluvial precipitation that drags atmospheric pollutants.

Several alterations are produced in the aquatic ecosystem waters, with changes on its quantity and/or quality. Among the several human activities that have an impact the following are included:

a) Deforestation and intensive development of agriculture resulting on diffuse pollution due to an excess of nutrients and pesticides that return to the course through irrigation water.
b) Extraction of surface water by the industry, to use it as refrigeration water affecting the resource quantity during draughts, and eventually its quality.
c) Discharge of industrial wastewater, of medium or high temperature, resulting from the refrigeration cycle.
d) Discharge of wastewater from industrial processes or resulting from spillage or accidents.
e) Discharge of effluents from urban wastewater treatment plants.
f) Urban solid waste disposal or toxic and hazardous waste, that cause diffuse pollution by runoff and leachate water.
g) Building of dams for drinking water, irrigation, energy and others.
h) Dredging processes that may increase turbidity and pollutants release of sediment.
i) Tourist undertakings close to the water course, where waste with significant bacterial pollution are discharged.

Pollution types may be classified depending on the way they reach the water resource. We may distinguish:
Point sources: produced by an identifiable issuing focal point and that can be accurately delimited. It includes, among others: pipelines, channels, tunnels, ducts, wells, identifiable cracks, containers.
Non-point sources: whose origin cannot be accurately defined, emerging in wide areas. The issuing focal points are multiple and extremely vast.

Non-point pollution is usually generated by runoff or infiltration and percolation, dragging pollutants resulting from: agricultural, forest, mining, industrial (hazardous waste, spillages and others) and urban activities (drain leakage, sanitary land-fill and septic chambers) and atmospheric deposition. The main pollutants associated to non-point pollution are nutrients, pesticides, organic compounds, sediments, metals, salts and pathogens.

Classification of Pollutants

According to its nature, the water pollutants can be classified as physical, chemical and biological.

Physical Pollutants: In this category are included the thermal changes, color, turbidity, foams and radioactivity.

Chemical Pollutants: Include both the organic and the inorganic products. They come from both natural and anthropogenic sources.

The pollution by organic compounds produces the diminish of oxygen in water, because it is used in the biodegradation process of these compounds.

As an example of pollution by inorganic compounds we could mention the one produced by heavy metals, which in excessive amounts could cause serious toxicity problems for the biota and human beings.

Biological pollutants: Among the biological pollutants we could mention bacteria, viruses, toxic algae and fungus, that can be responsible for the disease transmission.

The microbial pathogens are considered as one of the most important threats for human health, related to the water consumption, being able to generate sharp effects, like gastrointestinal illnesses. The microbiological pollution sources are generally associated to solid wastes, animal production, wastewaters, industries, recreational and tourist activities; and to wildlife.

Effects of water pollution on the Santa Lucia River Basin

Environmental Impacts

The modern water quality management, using the concept of basin, and the evaluation of pollution potential sources, can be more clearly seen if we refer them to one of the most important basins in our country: the Santa Lucia River Basin.

In such basin there is a high anthropic effect as a consequence of several decades of agricultural and cattle exploitation, high industrial activity and urban concentration. The major water volume that is consumed is used for drinking water production, followed by agricultural irrigation and industries supply.

The main environmental negative impacts are produced as a result of derived activities of the human activity (anthropic): agricultural and cattle activities, industrial activities, wastewater treatment and solid wastes management.

Incorrect agricultural practices

The intensification of the crop systems and livestock can cause pollution of surface and underground waters, by rain water runoff from the agricultural lands, dragging chemical products like fertilizers, pesticides and other products, which can reach the rivers affecting their characteristics.
According to the Uruguay Report from 2000, risen up to the United Nations for the Fight against Desertification and Drought, "…in the Santa Lucia River Basin a high erosive process is occurring. To the loss of organic matter it is needed to add the agrochemicals, elements which are leached and dragged to the water bodies. The water resources are, therefore, the containers for the eroded soils and for the leachate from that agricultural activities, being able to generate in some cases physical and chemical pollution in the surface water bodies".

It is needed to spread among agricultural and livestock producers, good agricultural practices, like: appropriate storage and application of pesticides, avoid cattle to drink water directly on water bodies, abandon agricultural practices that generate erosion in the riverbank (the superficial runoff overturns the excess of fertilizers, pesticides and livestock manure into the course) and create a protection perimeters for the riverbank.

Industrial Effluents Insufficiently Treated.

The industries located in the Santa Lucia River Basin are mainly: slaughterhouses, dairy, wool industries, tanneries and chemical industries. Some of these can generate

important pollution, because they can lack an appropriate treatment of effluent. For example, the tanneries usually use in the tanning process Hexavalent chrome, which is a toxic substance for the living organisms[10]. Industries, in a local level, may affect the water quality in a significant way and therefore they can affect also the river course uses in the area if they produce accidents or inadequate effluent treatment systems.

Insufficiency in the Sewerage Systems

Despite the progresses made in the Sewerage System (Montevideo), the collective Sewerage system coverage is still delayed in several localities from the Santa Lucia River Basin, with an important fraction of the population that is not connected to the public net and with some other localities where there is a lack in the level of treatment of the recollected wastewaters (San Jose, Canelones). OSE is now under an advanced updating process of the wastewater treatment plants, in order to minimize the environmental impact of its discharge.

The individual systems are mainly constituted by septic wells, being many of them permeable to the ground and in many cases with overflowing to the sidewalks or rain pipes. The muds are taken by the vacuum vehicles . This independent sewage system, has authorized points where the disposal of the liquids is allowed, like the treatment plants of OSE, the municipal treatment plants that are exclusive for vacuum vehicles ant private lands. Not all these authorized points are generally used[11].

Solid wastes and derivates

Many of the current sites for the final disposal of the trash, are of the simple dump type, without any sanitary or landscape care, and causing a negative impact for the surrounding environment. The disposal of solid wastes under these conditions brings problems derived from the leachate that come up from the disposal sites. None of the simple dumps are equipped with adequately sealed structures and rain water drainages. In several disposal sites, it can be observed that the leachate gets directly into the rivers that are generally used as drinking water sources[12].

Another problem, is the illegal waste disposal in the rivers, due to the informal management of the solid wastes. The discarded generated by the recycling processes, many times is disposed in the rivers, which means a high organic matter contribution.

Sanitary Impacts[13]

There can be several agents which may cause or transmit illnesses related to water. For example: Viruses (can produce hepatitis A, gastroenteritis); Bacteria or protozoa (diarrheic states of different intensity); helmints (intestinal infections); illnesses transmitted by the animals t the human being (distomatosis**,** echinococcosis, leptospirosis); and toxic pollutants (nitrates, heavy metals, pesticides and others).

Diagnosis of the water resources status

From the analysis of the water resources status of the Santa Lucia river basin, comes up the need of impelling a resource protection culture.

The main problems of the aquatic environments, identified by a recent diagnosis in Montevideo and the Metropolitan area (related to the Santa Lucia river basin) are[14]:

- The water quality of the urban streams, like the Pantanoso and the Miguelete, are seriously affected, having little improving during the last years.
- In the middle and low sections of the Santa Lucia river basin, the nutrient concentration (nitrogen and phosphorus), has reached a high level due t the inflow of pollutants coming mainly from agricultural non point sources and domestic wastewaters. A consequence of the concentration mentioned is the possible algal bloom (known as eutrophication).
- It is possible that, the discharge of wastewaters from Montevideo without previous treatment, may cause a negative impact for the aquatic environment and the Rio de la Plata ecosystem.
- Rain water in Montevideo damage the water quality of the recreational beaches, due to the combined sewage system, specially when strong precipitations occur.
- The disposal of solid wastes and the informal recollection, generates a considerable pollution due to the leachate and irregular spills in the river courses.
- Due to the extended spill of non treated industrial wastewater, signs of heavy metal accumulations have been registered in the sediments of the Montevideo Bay.

Eutrophication

An eutrophic environment (lake, river, dam, etc.) is the one which has high values of nutrients that enhance a great algal development and the progressive degradation of the ecosystem. The eutrophication process is a natural process that is accelerated by the human action. The urban wastewaters, the industrial spills and the runoff waters from the intensive agricultural activities supply the water with huge amounts of organic matter an nutrients. This changes the ecosystem equilibrium, altering its flora and fauna.

The immediate effects of the eutrophication are: the excessive growing of the vegetation in the riverbanks and in the low regions, the algal overproduction (green), the algal blooms (blue-green algae or cyanobacteria, some of which generate toxic substances for the living organisms), the odors, colors and flavors typical from the spoiling and the absence of fish. The sudden growing of algae means high turbidity, which hinders the light to get into the deeper layers of the aquatic system.

The water eutrophication drives to a degradation of the environment and diminishes significantly the water quality. The eutrophication produces an algae excess and macrophytes in water bodies and this can cause problems in the drinking water supply due to the alteration of its organoleptic properties (odor, flavor), hydro-electric equipment corrosion and different disruptions in the water treatment processes due to the decrease in the oxygen contents, ammonium accumulation in the water column and re-suspension of several metals (Fe, Mn) in the sediments under anoxic conditions (without oxygen). In the eutrophic dams, the high levels of organic substances combined with the application of chlorine for the drinking water supply, generate harmful substances, like the chloramines[15].

The eutrophication turns into a real concern in the Paso Severino dam, the main reservoir of drinking water in the basin.

Minimization measures and eutrophication correction

It is needed to control and limit all the possible pollution types: diffuse (non point) pollution, permanent punctual pollution and accidental pollution. It is suggested:

- To adapt the crop activities (use of less pollutant technologies, control of the use of fertilizers and phytosanitary products, treatment of the agricultural effluents).
- To limit the agricultural activities in the surroundings of the water courses (like intensive cattle growing, livestock manure spreading, dangerous goods storage and others).
- To reforest the riverbanks and dam shores.
- To limit or to prohibit the domestic and agricultural spills in the small aquatic ecosystems or with slow dynamic.
- To purify the wastewaters prior to its devolution to the receiving body.

The Modern Management of the water resources

The pollution of the water resources represents a burden for society, due to the cost that it generates, like:

- Treatment and remediation of the pollution,
- Treatment due to the conditions of public health and the environment,
- Search of new drinking water sources and emergency solutions,
- Solutions for the loss of uses of the water resource or the development of new uses,
- Conflicts for the use of water,
- Awareness campaigns of pollution events,
- Legal resources and public actions against the pollution producers,
- Potential taxes resulting of the more expensive water treatments.

It comes up according to what was expressed, that is needed to stop the damage of the water courses and t take management measures to the recovery and preservation of them. Among the benefits that can be obtained for the public health it can be mentioned:

- The reduction of the public health risk, both for acute and chronic illnesses, due to the illnesses transmitted by water.
- The decrease of the costs associated to the medical and hospitalization expenses.

Besides, there is another series of important economical benefits:

- Expenses are saved to the community affected by the pollution phenomena.
- It is avoided the falling of the properties values, that generally occur under pollution events.

- It is avoided the loss of real or potential investments in water courses that have potential development.
- It is maintained the economical benefits of the recreational places.

It is added to this, the promotion of the commitment and the community solidarity, with the following benefit that this implies for the future generations. The protection of the water resources and their associated ecosystems, facilitate the flora and fauna biodiversity and the sustainable development of the productive and recreational activities, what generates a better quality of life of the population.

Protection and recovery measures

To keep using the water courses according to what was established by the community, or in order to recover them for new uses, it is needed to take new accurate protection measures. There is the need of protect the water resources and the variety of their uses, and the need also of the organisms and authorities to implement prevention, control and protection measures of the water resources. The National Direction of Environment is the responsible for the water quality (Decree 253/1979). Other governmental institutions are involved in the water quality management. They are: regarding to the use of water, the National Direction of Hidrography (DNH) and the General Directorate of Renewable Natural Resources (MGAP); regarding to wastewater discharge, State Sanitary Works (OSE); and the municipalities, regarding to the municipal maintenance of the hygiene and sanitation conditions.

Nowadays, the National Direction of Environment, jointly with the municipalities related to the Santa Lucia river basin (Lavalleja, Florida, San Jose, Canelones and Montevideo), the support of other governmental institutions related to water quality (OSE, RENARE and DNH) and with the technical cooperation of the Japan International Cooperation Agency (JICA), is working in order to improve the water quality management in the Santa Lucia river basin.

This improvement in the management will include as its main components: the improvement in the coordination policies and programs among the national and local governmental institutions, an information system about water quality for the use by the community, a decentralized monitoring and analysis system of water quality, environmental education for the protection of the water resources and citizenship participation instances to consider their worries and opinions.

Some of the programs and projects related to the water quality management, that are currently being carried out, are: the Pollution Control of the Uruguay river Program, by CARU (Uruguay River Administration Commission), the National Plan for the Implementation of the Stockholm Agreement (PNUMA-GEF), the Project for Environmental Protection of the Rio de la Plata and its Marine Front (FREPLATA), the Project for the Institutional Strengthening of the Pesticide Management in Uruguay (MGAP-RPC Canada), the Program for the Modernization of the Public Administration (OPP) and the Project on Capacity Development for Water Quality Management in Montevideo and Metropolitan Area (Japan International Cooperation Agency-JICA).

Regarding to environmental education and civic participation , there are several projects that are currently working for the contribution to the improvement of the water resources quality. The Project Aquatox, supported by the Canadian Cooperation, educates primary school students and train teachers and students in the application of bio-analytical techniques for the water course monitoring. Also, the Program Globe, with the support of the United States government, promotes the teachers and students training for the measure of parameters related to water quality.

A pioneer activity in the monitoring and control of a water course is the one that has been carried out for several years by APRAC (Association for the Carrasco Stream Rehabilitation), where, with the strong support of the neighborhood, many activities of recovery and stream ecosystem preservation are carried out. More recently, it has been created COMMAC (Commission for the Monitoring of the City Environment), a city environmental monitoring system that works in Montevideo City and it is integrated by environmental NGOs and environment commissions from every zonal community center, with the support of the Group of Environmental Education of the Montevideo Municipality. This is an environmental space for the public participation in the water quality monitoring . The citizens are trained in the monitoring of water courses using bio-analytical techniques for the determination of possible places and pollution sources.

The protection, conservation and recovery of the water resources cannot be reached without the cooperation and joint effort of all the social actors: national and local governments, agric and cattle producers, industries, public services, community associations, NGOs. Each of them, according to their function, duties and commitment, are responsible for the establishment and development of policies and protection programs, for the management and monitoring of the pollution sources, and the development of spreading, education and citizen participation instances, in order to preserve and avoid the decrease in the quality of our rivers and streams.

Environmental Education

The water resources quality management and the recovery and improvement of them involve the development in a community scale of a series of appropriate tools. One of the essential approaches in the management for the water resource protection against the pollution, is environmental education.

The current approaches in education show the importance of increasing the development of this educational activity in the school programs, in order to form citizens conscious about their responsibility in the management, protection and sustainable use of the water resources.

There are several advantages that simplifies the agile placement of this topic in the school programs:

- The topic “Water” already exists as a curricular content in Primary education and teachers have developed several tools for the didactic work about it.

- This material is directed to establish as a thematic axis, the protection of water resources, included in a transversal proposal, which makes possible the organization of the current curricular contents. “It is like this that we consider the teacher as an active producer of the curricular program, creating (according to the reality in which is acting) true ways for the construction of significant and useful knowledge for the active participation in the society. In this way, every teacher will be able to add, integrate and relate, the contents, areas and competences according to what is considered convenient”[16].
- Primary education is a key stage in the cultural formation of the future citizen. This allow the student, not only to learn, but also to practice about what was learnt, developing sensibility and attitude regarding the environment, which motivates the transformation. “The construction of new cultural patterns that promote an harmonious life together between the human being an the environment, and particularly the water, require educational strategies which provide from an early age, an adjusted knowledge about the dynamic of the natural and social processes that are associated to its existence and use”[17].

As it is remarked in the teacher manual “Education for life and environment” from ANEP-MECAEP, environmental education must not be seen like an isolated intermittent activity: “It must be intended an annual and sustained program, focused in one or two thematic “axis” and in which it must be combined the work in class with research, participation and action proposals that move students and teachers. To do that, it is always necessary to start from a diagnostic analysis of the health and environment related topics, in the most immediate context to the school and the community.

The selection of one topic based on the scholar diagnosis, will allow the teacher to see the basic contents that must be considered. The implementation of the educational projects is probably, the most accurate and efficient way to introduce Education for Life and Environment in schools, in such way that can be sustainable, and can project real matters of the children lives, being sustainable and developing in a progressive way along the year” [18].

Basis

The development of classroom projects (as well as the bigger ones, like the educational or central improvements) generate a series of methodological principles that must be taken into consideration and which were subjacent to the most of the plan principles incorporated by schools and teachers during the past years [19].

- “The consideration of a “diagnosis” in which are contemplated the existent needs of the children and their own conceptions and representations of them.
- Informing and being informed (stressing the data collection from different sources) about the identified topics in the diagnosis and reflecting on them, making possible a “quality headway” regarding these problems, emphasizing the individual responsibility to face them and a new way of thinking and treating them.
- The identification of previous experiences that have had the school or the community, as participants, recovering learned lessons and the already existing working resources.

- The facilitation of all the possible exchanges among students and their partners, families and community institutions related to the topic. Promoting the outstanding as a way towards responsibility.
- The evaluation and analysis of the working process in its widest and richest possible sense, using it as a feedback medium and to reformulate the interest of the students".

In the particular case of the protection of water resources (protection of flora and fauna, ecological services, water uses, pollution ways), under the conduction of the expert teacher, the students could reach through the observation and critical analysis of the water related phenomena, the development of values, aptitudes and attitude to protect this fundamental element for life on Earth, water.

In this frame, current pedagogy and didactic, include as a central process, the teaching-learning process with the support of audio-visual media, which allow the recovery, production and reproduction of the general knowledge, and which allow its systematization. In this case, we aimed to support the re-organization of the technical contents, integrating and re-elaborating them in different discursive ways, supported by a tale and a video, to generate motivation. These didactic tools were elaborated with a multi-disciplinary participation and with a continual reformulation of the technical contents and the audio-visual language, searching for referring to environments that children can recognize as theirs, being daily common, respecting their intellectual capacities and trying to get reason and emotion.

The purpose of the tools given together (whose main elements are a tale in separated laminas, a video and complementary information resources) is to generate activities in the classroom, adapting their use according to the learning objectives established in the project. During the application of these tools, the teacher will guide their use and approach, simplifying to the student the perception according to the learning objectives, stimulating the settlement of previous common knowledge of the students, searching the problems to solve in the proximal surroundings, in order to convert them in objects for the analysis and search of solutions and contributing to the development of environmental management plans regarding such topic. The search of solutions will allow the student to experiment new and different ways of learning (awareness-rising; critical thought; action), the construction of concepts and the development of personal valorizations.

Objectives

- Understand and to establish relations between facts and phenomena of the natural and social environment in relation to the water courses.
- Contribute to protection of the water ecosystems and resources, through the knowledge of the water courses related to the daily life.
- Identify and settle questions and problems, from the daily experiences and propose and produce possible solutions and measures for the water protection.
- To integrate the family and the community to the participation, jointly with the children, in water protection topics related to their daily lives.

Methodology

The environmental education methodology for classroom projects, regarding, in this case, to the protection of water resources, may include three steps:

1. Classroom activities for the diagnosis ob initial knowledge based on a trigger audio-visual activity.
2. Fieldwork research.
3. Share the research results with the specific problematic approach.

1. Classroom activities.

The application of the environmental education methodology regarding to the water resources protection, shows that group work is the most suitable way for the development of activities based on an active and participative methodology[20]. To do this, the teacher must consider the add of some group activities, in his/her design of the classroom projects.

Development of the cognitive aspects:

- Physical dimension of the contents: water uses (pages 5-6), water pollution (pages 14-16) pollution effects (pages 16-20).
- Biological dimension: hydrological ecosystems (pages 4-5), eutrophication (pages 19-20), sanitary impacts (page 18).
- Antropic dimension: environmental impacts (pages 16-18), pollution prevention (page 22), protection measures (pages 23-25).

Development of affective aspects:

- Promote reactions, emotions, feelings, through the evaluation of the daily and common activities by the students:
- Relate water to the child daily life: games, foods, routines, religion and others.
- Study in depth of the way the water problems affect their daily lives: for example, during droughts and floods and others.

Development of aspects of value:
Incentivar values of respect in the children about:

- The importance of water, as an essential substance for the whole human race and in nature.
- Promote the caring of the water resources, from the analysis of the way in which pollution affects the daily children's lives and their beloved people.

Development of attitudinal aspects:
It is essential the kids to be able to develop capacities for:

- Relating the received information to the daily context in which he/she is developing, identifying water problems at home, at school, in the neighborhood and in the city, including garbage, bottles, oils and other wastes.
- Team work in activities of research and analysis of the water courses.
- Planning and carrying out protection activities with the classmates, friends, relatives and neighbors tending to protect water in their daily environment.

Tools

A) Tale in laminas: a possible application Stories near the river – “El Pato Salvado” (“The duck safe”). Directed to school children of the first, second and third grade (year).

Proceeding:

For the youngest children, the teacher must “give life” to the tale, in order to encourage them to exchange information and opinions regarding the topic treated.

Tale in Laminas (Kamishibai)

Kamishibai is a Japanese art , that was very popular during the 20´s and the 30´s in the 20th century. The street candy sellers used to ride their bicycles, from town to town carrying laminas with the stories on their backs. After assuring that the children who had bought their products were sitting on the floor, the sellers started to tell the stories, including voices and effects. They showed their laminas one by one in the front of the bike reading the printed guión in the back of the laminas.

In Uruguay, in several opportunities, it has been used the text joint by laminas. With the development of child literature (literatura infantil) , many writers and story tellers (narradores orales) are now implementing this perspective that teachers have to carry out a creative and encouraging teaching (enseñanza).

This tale can be read or told, all together or step by step, being able to be armado y rearmado from the situation (anécdota) which operates as the central axis of the tale. It can be added parts, or tried different endings, depending on the creativity and objectives of the people involved.

It is recommended the precaution of conserving the global vision, the unity and the originality of the story and the internal tension of the facts, as basic elements of the story.

It can be used also, as a resource, the superposition o substitution of texts of the original tale. The textual basis that is offered has been elaborated considering the most number of didactic elements, which are necessary when it is considered the protection of water resources in Uruguay.

It can be shown all the laminas, or just some of them, recommending for the last option the most appropriate selection for the pedagogical objectives.

a) The teacher divides the students into five member groups.
b) Before the class, the teacher takes the tale in laminas and divides it into approximately equal fractions (one for each student of the group) and then numbers (numera) them. Then requires to every student to draw a bosquejo of the laminas that have been assigned. It is important to remark that the drafts must include only the drawings and not the text.
c) After that, the teacher explains to the students that the story has been composed by 5 parts like pieces of a rompecabezas. Each group should rearmar the tale, telling every child his/her part of the story.
d) The teacher tells the story using the original tale. The students will tell the same story, so they must listen carefully.
e) The children redact in a separated sheet their notes to read when each of their laminas is being exhibited.
f) The students (one of each group) that are going to present part one, stand up. They go to classroom corner and practice together. The ones that are going to present the other parts, do the same. These groups jointly decide how they are

going to tell their parts. The teacher makes sure that the students do not learn by heart their part of the story; they just have to take short notes of it.

g) Then, the original groups sit together. Some minutes are given to visualize and tell on their own their parts. Now, the students could be ready to listen the whole story in their groups.
h) The teacher asks the students that have the part one to stand up and tell their part of the story. All the students with part one tell it to the rest of their groups. And then every part of the story is told.
i) When all the groups have finished, the class can choose the five best tellers (one of each part) to present the story to the entire class using the original tale.

For students of upper grades (clases superiores) , a more complex procedure can be instrumented, which allow the students to develop their own creative capacities to animate it.

B) Video Applications.
Directed to children of 4^{th}, 5^{th} and 6^{th} grade.

The video will satisfy different needs, according to the requirements of the child and the teaching objectives:

- Give a general view of the protection of water resources. Based on this the teacher can remark the basic concepts to analyze.
- Interest the students about the protection of the water courses, generating an active response, problematizar????? phenomena, stimulate the participation or promote investigation attitude.
- Allow the search of questions and answers that the children have about water.

C) Further activities, after the use of the selected tool.

- After the application of the selected tool, it must be proposed to the students to analyze topics related to water quality, for example: pollution sources of close water courses; kinds of pollutants that get into the course (conscious or by accident); which are the pollution sources that cause major damage or impact in the water quality; analysis of the pollution sources regarding a basin (pollution upstream, damage downstream).
- Identification of costs and benefits of the water courses protection for the homes, the school and the community.
- Search of proposals to avoid the pollution sources that have been identified.

2. Research work in the field

The teacher may form students groups in order to carry out different projects, according to the different “dimensions” or “objectives” to investigate and treat, in class as well as in the usual surroundings of the student. These groups can be formed depending on the interests, with the active participation of the students to select and define the group topic.

If it is possible to develop activities out of class, the group must know from the beginning: what is going to be done, how is going to be done and what is expected from this fieldwork. The investigation guide is indispensable. Apart from this, the

participation in the definition of the investigation guide, will encourage even more the student to be interested and comprometido in the project development.
This guide must define: the places to visit, where the problems are, who must be interviewed regarding them and what initial questions can be asked.

Insumos preliminares

The students must have the necessary elements to register the evolution of the project (notebook).
It will be important to have besides, a map of the basin or micro-basin that is going to be investigated. For such effects, the teacher can get the necessary maps and encourage the students to re-analyze in a graphic way the given maps. Another previous and indispensable stage is the identification of the easy access experts. The teacher will be the key element for the data obtaining to find these experts.

Fieldwork

1. Identify the surrounding places that can be visited to understand the dynamic of the water courses. Go, if possible, to the upper places where the perception of the water course dynamic is perceptible.
2. Examine sinuous fields to reflect in groups in which direction will the water go if rains or if the fields are irrigated. Identify the flow direction and the places where the water would go through while flows (the students can realize drawings of the basin using that perspective).
3. Identify sources of water damage and relevant pollution problems in the area and compare them with the previously discussed topics during the classroom activities.
4. Identify which are the daily practices or activities that provoke the pollution of the water resources.
5. Identify where the correct measures are taken for the water resources protection.
6. Visits: wastewater treatment facilities, industrial facilities and effluent treatment and drinking water plants.
7. Interviews: to managers, technicians and workers of the above mentioned facilities, representatives of the national or municipal government in charge of water quality management (DINAMA, MSP, MGAP, Municipalities, etc.), people responsible for the agricultural dairy and livestock activities , people affected by water quality problems, like neighbors from the river bank or close to a pollution source, camping managers and other developments for tourist.

3. Sharing results

Coming back to the classroom: from the diagnosis of the initial knowledge and from the fieldwork carried out, this third stage will allow the students to an exchange of opinions. The group can present a report about the investigation done and the developed activities, using different communication ways: problem maps and models of the local basin, forums, workshops, newspapers. This allows the materialization of the active participation of the students in the knowledge creation and formation.

It can be also proposed cleaning campaigns of the river banks, the identification and protection of vegetal species and many others that can born from the teacher-student work and from the interaction with the community.

Glossary and References

A

Aquifers. Rocky formations that have water in the underground, which can be extracted for its use.

Algae. Group of simple plants that live in the water or in humid areas. Algae have no roots, stems or leaves. They generally contain chlorophyll and require simple food like nitrates. They use the carbon dioxide and expulse oxygen.

B

Bacteria. Unicellular organisms. They consume nutrients and generally are found where there is food and humidity.

Biochemical Oxygen Demand. Dissolved oxygen required by the organisms for the aerobic decomposition of the organic matter present in water. It indicates the rate in which oxygen disappears from a water sample and it is used as a water quality indicator. The determination is carried out at 20 ºC and in a five days long period.

Biogeochemical cycle. Natural processes that recycle nutrients in different chemical shapes from the non-living environment to the living organisms and then the way back to the non-living environment.

Biota. Living organisms from a region, such as a current or water body.

C

Chlorination. Is the adding of chlorine to the water, generally for disinfection.

Coliforms. Group of bacteria that can have a fecal or environmental origin and that use as indicators of the possible presence in water of harmful organisms.

D

Disinfection. effective inactivation of organisms capable of causing infectious illnesses, through a chemical and physical process. It is referred to the selective destruction of the pathogen micro-organisms. Chlorination is the most commonly used disinfection method for the wastewater treatment.

Dissolved Oxygen. Is the concentration of free oxygen that can be found in water. Such solubility can be affected by surface turbulence, temperature, atmospheric pressure, oxygen concentration in the atmosphere, the deficiency in oxygen concentration in water, the surface area exposed to the atmosphere and many other conditions. Oxygen is more soluble in freshwater than in brackish waters.

Drinking water. Is the water that does not contain pollution, minerals or infectious agents and that is considered satisfactory for the human consumption.

E

Ecosystem. Dynamic complex of vegetal, animal and microbial communities and their non living environment, which interact as a functional unit.

Effluent. Water that runs from a receptacle or a pond or a treatment plant or any of its sections.

F

Freshwater. Natural water with low concentration of salts, or generally considered, with previous treatment, right to produce drinking water.

G

Germ Plasm. Fraction of the cell protoplasm which has the reproductive or regenerative capacity, conforms the base for inheritance and that is transmitted from one generation to the next one.

H

Heavy Metals. Are the metals like nickel, lead, manganese, chrome, cadmium, zinc, copper, iron and mercury. The presence of any of these metals in excessive amounts will interfere with many water uses due to their toxicity. That is why it is recommendable the constant measurement and control of such metals concentrations.

Hydrological basin. The land where waters flow to the sea through a courses net that converge in a main course, or the land where water forms an autonomous unit, even when it does not flows to the sea. The basin, jointly with the aquifer, are a management unit of the hydrological resource. Is the area that contributes to the runoff and that gives a portion or all, the main current flow and its tributaries.

Hydrological cycle. The sun heat evaporates the water from the land and water bodies; this water vapor being lighter than air goes up until it reaches the higher levels of cold air, where it condense in the shape of clouds. Besides, the condensation produces precipitation, which falls into the land in the form of rain or snow. A fraction of the water is retained in the soil and others runoff going back to the rivers, lakes and seas; this sequence of climate events is known as water cycle.

Hydrology. Science which studies the properties, occurrence, circulation and distribution of water, over the earth's crust and under it, its presence in the atmosphere and its relations with the environment. It is the science that works on all the stages of the hydrological cycle.

I

J

K

L

Lake or Lagoon. The naturally formed container in which water comes from superficial underground currents or rain, that can generate new currents or not, as well as the artificially formed container that is originated by the construction of a dam.

Leachete. Is the product obtained from the liquids that flow through the residuals.

M

Microorganism. Organism that is only visible under the microscope. The organisms that are visible to the naked eye are called macro-organisms.

N

Nitrogen. Is a necessary element for the nutrition of microorganisms and plants.

Nutrients. Are the chemical species used in wastewaters as food for the development of microorganisms. Nitrogen and Phosphorus are the main nutrients.

O

Organic Matter. In wastewater it is referred to the matter that comes from the animal and vegetal kingdoms and the human activities, related to the synthesis of organic compounds.

P

Percolation. Water that infiltrates under the root zone and that possibly will reach the ground water level.

Pollutants. Are those parameters or compounds that in a determined concentration may cause negative effects in human health and in the environment, may damage the hydraulic structures or inhibit the treatment process of wastewater.

Polluted Water. Presence of prejudicial or disgusting enough materials to cause a damage in the water quality.

Potabilization. Group of operations and physical and chemical processes that are applied to water in order to improve its quality and make it right for its use and human consumption.

Q

R

Rain water. Is the water that comes from the rain, including the one from snow and hail.

Reservoir. Is a deposit or artificial lake made by the construction of a retention wall or a dam, which is used to collect water.

River. Natural water current, permanent or intermittent that flows into other currents, a natural or artificial reservoir or into the sea.

Runoff. Is the fraction of precipitation that forms superficial currents. It is divided into two types; the superficial, which is the one that runs over the surface to the nearest river; and the runoff of underground waters which is the one that runs under the soil surface before reaching a river. The runoff can drag pollutants from the air or the land and carry them to the receptor waters.

S

Self-purification. Is the capacity of a water body, which receives or has received a pollutant charge to recover the physical, chemical and biological conditions that existed before the incorporation of the pollutants.

Sewerage. It is referred to the actions of picking up, conducting and disposing domestic wastewaters.

Sink. Any process, activity or mechanism, including biomass and specially woods and oceans, which removes a greenhouse gas (like CO_2), an aerosol or a precursor of a greenhouse gas from the atmosphere. It may be also constituted by other terrestrial, coastal or marine ecosystems.

T

Toxic compounds. These compounds can inhibit the biological processes in the conventional treatment systems or they have can have a sharp or chronic effect over the human health or aquatic life of the receptor body. They can be divided into inorganic and organic toxics.

Treatment plant. Is the facility where the processes to remove or stabilize basic pollutants in wastewater are carried out. The pollutants in water can be removed by physical, chemical or biological operations. Generally, the treatment plats combine the three operations mentioned before.

U

Underground water. Freshwater found under the Earth surface, normally aquifers, which supply wells and springs.

V

W

Wastewater. Is the water with variable composition that comes from the discharge of municipal, industrial, commercial, from services, agricultural, herd and domestic uses, including fractionation and any other use, as well as the mixing of them.

Wastewater treatment. It is referred to the physical, chemical and/or biological actions that tend to remove or eliminate the pollutant elements from the water, aiming to avoid human health conditions, as well as to restore a resource that is susceptible to its use.

Water. A chemical compound formed by two parts of hydrogen and one part of oxygen, in volume. It can have in solution or suspended other solid materials, liquids or gases. Its formula is H_2O.
Water course. Natural or artificial channel through which water runs in an intermittent or continuous way.
Water pollution. This is a general name used to indicate the presence of substances in water, nearly always, chemical products or wastes introduces by humans, that are harmful for the organisms living in the water or for the ones that drink it or are exposed to it.
Water quality. Is the group of physical, chemical and biological characteristics that must be satisfied in order to the supplied water being safe for the recipient. Water quality depends on the given use.

Wetland. Is the transition zone between the aquatic systems and the temporary or permanent flooding lands, that is under the effect of tides and which limits are constituted by the kind of seasonal or permanent vegetation presence. Wetlands are the areas where the soil is mainly wet; and the lake or soil areas that are permanently wet, originated by the natural discharge of aquifers.

X

Y

Z

ANNEX (8.4.5)

DINAMA
Dirección Nacional
de Medio Ambiente

JICA

ANNEX 8.4.5

Workshop for Training of Teachers on Water Resource Protection

Date: November 3rd, 2004
Place: Instituto de Formación Docente, Florida
Time: 9:00

Agenda

9:00 Opening.

9:10 Introduction of DINAMA / JICA Project

9:25 Concepts on importance, use, protection and recovery of water resources and water quality management.

9:55 Educational Manual regarding water resource protection.

10:00 Representation of the kamishibai. Presentation of the use guidelines.

10:20 Work group for feedback on the kamishibai.

10:50 Exhibition of the children videotape on Water Resource Protection. Presentation of the use guidelines.

11:15 Work group for feedback on the video.

11:45 Presentation of results.

12:00 Closure.

ANNEX (8.4.6)

DINAMA
Dirección Nacional
de Medio Ambiente

JICA

Workshop “The Insertion of Water Resources Protection in the School Activities”

Date: 10th, March, 2005
Time: 17 – 20 hs.
Location: Instituto de Formación Docente de Florida

Agenda

1. Presentation of the Florida Water Quality Forum (15´)
2. Background and Presentation of Educational Materials (30’)
3. Identification of Related Concepts, Areas and Disciplines of the School Program (30’)
4. Break (10’)
5. Evaluation of cognitive, application, attitudinal and skills and value aspects, (30’)
6. Plan of the Activities to be Developed in the different educational levels (30’)
7. Summary and closure (15’)

ANNEX (8.4.7)

ANNEX 8.4.7

ESTABLISHMENT OF WATER QUALITY FORUM OF FLORIDA

Date: Friday August 6, 2004

Time: 16:00 - 18:20

Place: Quincho Municipal - Florida

1.	16:00	Accreditations
2.	16:30	Opening speech by Florida Mayor
3.	16:35	Presentation of the Project on Capacity Development for Water Quality Management, Mr. Keiji Sasabe (Leader of JICA Project Team)
4.	16:50	Aspects on Water Quality in the Department of Florida, Mr. Héctor Villaverde (JICA Project Team)
5.	17:05	Perspective of DINAMA towards the Water Quality Forum, Ms. Magdalena Hill (DINAMA)
6.	17:10	One example of public participation: Environmental Group of Montevideo (GAM), Mr. Leonardo Herou (IMM)
7.	17:20	Water Quality Forum of Florida. Objective. Functions. Linkage. Establishment of Forum Plenary, Mr. Sebastián Jara, Mr. Agustín Giannoni, Mr. Hector Villaverde
8.	18:05	Signature of the Constitution Act of the Forum by stakeholders that represents the institutions and the society
9.	18:15	Closing

ANNEX (8.4.8)

ANNEX (8.4.9)

ANNEX (8.4.10)

Annex 8.4.8 Poster for Adult and for Children (refer to Spanish Version)

Annex 8.4.9 Triptychs for Adult and for Children (refer to Spanish Version)

Annex 8.4.10 Stickers for Adult and for Children (refer to Spanish Version)

ANNEX (8.4.11)

ANNEX 8.4.11

WATER QUALITY FORUM OF FLORIDA

DESIGN OF THE FIRST PUBLIC CAMPAIGN

"AWARENESS CAMPAIGN ON FLORA PRESERVATION AROUND PASO SEVERINO DAM"

1. Objective

To arise the awareness of the people to preserve the flora around the Paso Severino Dam

2. Justification

The Paso Severino Dam is an important complementary water resource for the water supply of the metropolitan area. Besides, the Dam is used also for recreational activities. The existence of forest and shrubs in the influence zone of the Dam helps to avoid the erosion and the entrance of sediments into the Dam. Many trees located around the Dam had been already exploited in the past for combustible or timbering. However, there are still many species of trees and shrubs that needs to be preserved in order to avoid the deterioration of the water quality of the Dam. Consequently, the implementation of this campaign is justifiable to arise the awareness of the people on the protection of the flora and its relationship with the water quality conservation.

3. Methodology

As a preparatory step of the campaign, teachers of primary and secondary schools and officers of Florida Municipality will be trained on the subject on October 26, 2004. The trained persons will act as guides during the campaign and will be able to conduct future campaign in a sustainable manner.

The campaign properly said will last two days. In the first day (November 9, 2004), students of primary and secondary levels and interested persons will learn about the water management, the importance of the flora preservation on the water management and existing species in the zone of influence of the dam.

The second day (November 10, 2004), all interested persons (students and the public in general), will participate in a walk tour in the zone of influence of the dam in order to identify the natural condition of the place including the existing species for preservation.

After the tour, all the people will assemble at the Primary School N.5 of 25 de Mayo city to proceed to the evaluation of the campaign followed by a festival, which will include music and poetry oriented to the preservation of the environment.

4. Activities

4.1 Training Session

(1) Training of teachers and Municipal officers

It is scheduled to have one session for training teachers and municipal officers (October 26, 2004). This will be made as a preparatory activity of the campaign.

(2) Training of students and the public in general

It is scheduled to have one session in the morning for primary students (place: Primary School N.5, one session in the afternoon for secondary students (place: Secondary School 25 de Mayo) and one session in the evening for the public in general (Municipal Community Center). These trainings shall be carried out on November 9, 2004.

4.2 Walk Tour

Students and the public in general will walk on a way previously accorded to recognize the natural environment. The last point of the walk tour will be the place of the Water Supply Plant of OSE where the people will be instructed by technicians of OSE about the water purification process.

The teachers and Municipal officers will act as the guides of the tour who will teach about the existing flora and their importance. The walk tour will start at 8:00 hs of November 10, 2004 from the central park of the 25 de Mayo city.

At 11:00 hs, all the people will assemble at the Primary School N.5 of 25 de Mayo for the evaluation of the campaign.

4.3 Festival

As a closing activity of the campaign, after the evaluation, a festival will be held at the Primary School N.5 of 25 de Mayo city.

5. Necessary Materials for the Campaign

5.1 Education materials

The project JICA/DINAMA will provide the education materials for training teachers, municipal officer, students and the public. In addition, pamphlets and stickers shall be provided to promote the campaign.

5.2 Provision of Peaked Cap

Peaked caps will be provided to all the participants of the campaign by the project JICA/DINAMA.

5.3 Provision of Installation for Festival

The Municipality of Florida and local schools shall provide the installations including audio and necessary elements for the festival.

Florida Water Quality Forum

Design of the first campaign (Awareness about the Preservation of the flora around the Paso Severino Dam)

Item	Activities	October													November																								
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Preparatory meeting for the first campaign in 25 de Mayo (Awareness about the Preservation of the flora around Paso Severino Dam).																																												
2	Design of the first campaign																																												
3	Implementation of the first campaign (Awareness about the Preservation of the flora around Paso Severino Dam)																																												
3.1	Training of the teachers and municipal staff																																												
3.2	Didactic sessions for students and general public.																																												
	Students from School N.5, 9-11hs.																																												
	Highschool students, Liceo N.3, 16-18 hs.																																												
	general Public, Community Center, 19 hs																																												
3.3	Trip																																												
3.4	Campaign evaluation and Festival, School N.5, 11 hs																																												

ANNEX (8.4.12)

ANNEX 8.4.12

WATER QUALITY FORUM OF FLORIDA

DESIGN OF THE SECOND PUBLIC CAMPAIGN

"CLEANING CAMPAIGN OF SANTA LUCIA CHICO RIVER"

1. Objective

To arise the awareness of the people to protect the Santa Lucia Chico River from discharging of domestic solid waste.

2. Justification

Santa Lucia Chico River is commonly used by the population of Florida and visitors for recreational activities. Besides, this River serves as water source for OSE to supply potable water to the community of Florida.

Currently, the River is receiving domestic garbage discharged directly by the population of Florida. This fact, affect directly the quality of the river and the landscape of the places used as beaches.

The deterioration of the quality of waters may affect the water suitability for bathing and may bring complications in the water supply treatment systems.

Consequently, the implementation of this cleansing campaign is justifiable to arise the awareness of the people in order to change attitudes of discharging domestic solid waste into the watercourses.

3. Methodology

As a preparatory step of the campaign, teachers of primary and secondary schools, community leaders and officers of Florida Municipality will be trained on the subject on November 05, 2004, 19 hs., place: Italian Society Center. The trained persons will act as guides during the campaign and will be able to conduct future campaign in a sustainable manner.

The cleaning campaign will be implemented in the urban area of the city along the coast of the Santa Lucia Chico River. For the purpose of campaign implementation, the river was divided into three zones:

Zone 1: between Lesaeta St. and 18 de Julio St. The following stakeholders will form part of the campaign in this zone: Neighborhood Committee "Corralon del Tigre", National Football Club, Primary School N. 51, Primary School N. 108 and its Commission of parents, Church of the Mormons and the general community of the zone.

Zone 2: between 18 de Julio St. and Independence St. The following stakeholders will form part of the campaign in this zone: Neighborhood Committee "Piedra Alta, Football Club "Atletico Florida", Football Club "La Vacongada", Primary School 102, Primary School 37 (Canada), Primary School 2 (Varela), Secondary School N.3, Housing Cooperative of Florida, Open Doors Project, and the general community of the zone.

Zone 3: between Independence St. and Boat Lake St. The following stakeholders will form part of the campaign in this zone: Neighborhood Committee "Prado Español",

Football Club “San Lorenzo”, Football Club “España”, Primary School N. 109, Primary School 76, “Cruz Alta” Center, Infant and Family Attention Center (CAIF) and the general community of the zone.

The campaign properly said will last four days. In the first three days, students of primary and secondary levels and the public in general of the above three zones will learn about water management, the impact of garbage on the water quality, study cases, etc.

In the fourth day, all interested persons (students and the public in general), will participate in the cleaning of the river coast in the three mentioned zones.

After finishing of the cleaning, all the people will assemble in the Prado Park “Piedra Alta” to proceed to the evaluation of the campaign followed by a festival, which will include music and poetry oriented to the conservation of the water environment.

4. Activities

4.1 Training Session

The JICA Team with the close cooperation of Florida Municipality will carried out training sessions for all primary schools and secondary schools of the mentioned three zones. This will be implemented on November 10,11 and 12 of 2004.

Likewise, for the public in general, it is scheduled to have one teaching session/designated zone per day in the evening.

For the zone 1, the training place will be the Church of Mormon on November 10 at 19:00 hs.

For the zone 2, the training place will be the Secondary School N.3 on November 11 at 19:00 hs.

For the zone 3, the training place will be Infant and Family Attention Center (CAIF) on November 12 at 19:00 hs.

4.2 Cleaning of River Coast

Students and the public in general will assemble in a designated location according to its correspondent zone. Those who belong to the zone 1, will assemble at the bridge de la Calzada; those of the zone 2 at Primary School 102; those of the zone 3 at Independence st. and La Rambla respectively.

The teachers, Municipal officers and community leaders will act as the guides of the works. The cleaning works will start at 8:00 hs of November 14, 2004 from each designated zone.

At 11:00 hs, all the people will assemble at Prado Park “Piedra Alta” for the evaluation of the campaign.

4.3 Festival

As a closing activity of the campaign, after the evaluation, a festival will be held at Prado Park “Piedra Alta”.

5. Necessary Materials for the Campaign

5.1 Education materials

The project JICA/DINAMA will provide the education materials for training teachers, municipal officer, students and the public. Besides, pamphlets and stickers will be provided by the project to promote the activity.

5.2 Provision of Peaked Cap, Button, Plastic Bags and Gloves

These materials will be provided to all the participants of the campaign by the project JICA/DINAMA.

5.3 Provision of Equipment for Garbage Collection

Municipality of Florida will provide containers, trucks and tools for the smooth implementation of the campaign.

5.4 Provision of Installation for Festival

The Municipality of Florida, football clubs and other institutions shall provide the installations including audio and necessary elements for the festival.

ANNEX (8.4.13)

Annex 8.4.13

Workshop on "Wastewater Management: Industry and Sewerage"

Date: November 4th, 2004

Time: 18:00

Place: Sociedad Italiana - Florida

Agenda

1.	18:00	Workshop presentation by the Technical Secretariat of the Water Quality Forum of Florida
2.	18:10	Pollution sources and important contaminants in wastewater. Basic treatment methods. Standards on wastewater discharges in Japan. Examples of water pollution in Japan. Examples of water quality improvement in Japan. Presentation by Eng. Tadashi Shoji
3.	18:40	Effluent treatment in slaughterhouses, by Eng. Javier Osta, Kladil
4.	19:00	Effluent treatment in the wool industry, by Eng. Carlos Rodríguez, "Piedra Alta" Wool Factory
5.	19:20	Effluent treatment in the milk industry, by Eng. Rosario de Oliveira, Conaprole
6.	19:40	Domestic wastewater treatment, by Eng. Gustavo Luciano, OSE
7.	20:00	Questions and answers

ANNEX (8.4.14)

Annex 8.4.14

Workshop on Pesticide Management

Date: November 18th, 2004

Time: 18:00

Place: Municipal Theater 25 de Agosto - Florida

Agenda

1.	18:00	Workshop presentation by Mr. Néstor Pereira, from the Technical Secretariat of the Water Quality Forum of Florida
2.	18:10	Pesticides and human health, by Dr. Carmen Ciganda, Occupational and Environmental Health Department of the Ministry of Public Health (MSP)
3.	18:40	Pesticides and Agricultural Production, by Land Eng. Marcelo Bonilla, Agricultural Services, Ministry of Livestock, Agriculture and Fisheries (MGAP)
4.	19:00	Coffee Break
5.	19:10	Pesticides and Environment, by Ph. Chem. Jacqueline Álvarez, Coordinator of NIP Program, DINAMA
6.	19:30	Questions and answers

SECTOR F
TECHNICAL TRANSFER

TABLE OF CONTENTS

1. SEMINARS

1.1 1st Seminar

(1) Title and Date

The title of the 1st Seminar was "Seminar on the Advancement of Water Quality Management in Uruguay- Activities of JICA Project –". The Seminar was held on 5th March 2004.

(2) Objectives and Overall Contents

The objective of the Seminar was to understand the schedule and overall goals/ activities of the "The Project on Capacity Development for Water Quality Management in Montevideo and Metropolitan Area" for all the participants, include, DINAMA, IMM, IMC, IMF, IMSJ, IML, OSE, OPP, Ministry of Transport and Public Works (MTOP) in Uruguay, Ministry of Livestock, Agriculture, and Fisheries (MGAP) in Uruguay, Ministry of Public Health (MSP) in Uruguay, Chamber of Industry in Uruguay, MERCOSUR, and Environmental NGOs in Uruguay.

The main topics of the Seminar are i) objectives, stakeholders, and the schedule of the JICA Project, ii) Proposed contents of the six Pilot Project of the JICA Project.

(3) Participants

The participants were the Counterpart (C/P) and the coordinators/representatives of DINAMA, and above relevant organizations in terms of water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

1.2 2nd Seminar

(1) Title and Date

The title of the 2nd Seminar was "Seminar toward the Favorable Water Environment ". The Seminar was held on 1st December 2004.

(2) Objectives and Overall Contents

The objective of the Seminar was to share the information on the JICA Project with all the stakeholders of water quality management in the Santa Lucía Basin.

The main topics of the Seminar were i) proposed principles of water quality management in Uruguay, ii) major outputs of the Pilot Project of the JICA Project, iii) discussion on education and public participation in the water quality management, iv) presentation and discussion on cases of water quality management in other countries.

(3) Speakers and Participants

The speakers of the Seminar were i) the Ambassador of Japan, Mr. Yoshihiro Nakamura, ii) Minister of Housing, Use of Land and Environment, Mr. Saúl Irureta, iii) Chairman of the JICA Advisory Committee, Mr. Taizo Yamada, iv) Leader of the Project Team for Sustainable Technology for Pollution Prevention, Dr. Michio Kuriyagawa, vi) Advisory Committee Member, Mr. Hiroyuki Ito, and other water quality management experts.

The participants were the above speakers, the Counterpart (C/P) of DINAMA, and the relevant organizations in terms of water quality management in Montevideo and Metropolitan Area, and the JICA Study Team members.

1.3 3rd Seminar

(1) Title and Date

The title of the 3rd Seminar was “Water Environment Projection: Task of All“. The Seminar was held on 30th November 2006.

(2) Objectives and Overall Contents

The objective of the Seminar was to share the information on the all the results of the JICA Project with all the stakeholders of water quality management in the Santa Lucía Basin.

(3) Speakers and Participants

The speakers of the Seminar were i) National Director of Environment, Ms. Alicia Torres, ii) the Counselor, Embassy of Japan, Mr. Shuji Goto, iii) Assistant Resident Representative, JICA Argentine Office, Mr. Takeshi Nagata, iv) Chairman of the JICA Advisory Committee, Mr. Taizo Yamada, v) Director of Environment Quality Evaluation Division, DINAMA, Ms. Magdalena Hill, vi) Advisory Committee Member, Mr. Katsuhiro Onuma, vii) Leader of the JICA Project Team, Mr. Keiji Sasabe, viii) Director of Environmental Control Division, DINAMA, Ms. Silvia Aguinaga, ix) Ms. Natalia Barboza, Technical Normalization Department – Laboratory, DINAMA, x) General Directorate of Hygiene, Municipality of Florida, Ms. Yanet Hagopian, xi) Director of Hygiene and Life Style, Municipality of Lavalleja, Ms. Beatriz Piriz.

2. PCM SESSIONS

2.1 PCM Session 1

(1) Title and Date

The "PCM Session 1" was held on 21st November 2003.

(2) Objectives and Overall Contents

The objective of the PCM Session 1 was to conduct Stakeholders Analysis by each common interest group in terms of water quality management in Montevideo and Metropolitan Area by the participants, which include DINAMA, IMM, IMC, IMF, IMSJ, IML, OSE, OPP, MTOP, MGAP, and NGOs.

(3) Participants

The participants were the Counterpart (C/P) and the coordinators/representatives of DINAMA, and above relevant organizations in terms of water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

2.2 PCM Session 2

(1) Title and Date

The "PCM Session 2" was held on 16th February 2004.

(2) Objectives and Overall Contents

The objective of the PCM Session 2 was to conduct Problems Analysis and Objective Analysis by each common interest group in terms of water quality management in Montevideo and Metropolitan Area by the participants, which include DINAMA, IMM, IMC, IMF, IMSJ, IML, OSE, OPP, MGAP, APRAC, ANONG. This PCM Session 2 was also conducted based on the findings on PCM Session 1.

(3) Participants

The participants were the Counterpart (C/P) and the coordinators/representatives of DINAMA, and above relevant organizations in terms of water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

3. WORKSHOPS AND TECHNICAL COMMITTEE MEETINGS

3.1 Workshop 1

(1) Title and Date

The title of the Workshop 1 was "Toward the Improvement of Information Sharing". The workshop was held on 9th December 2003.

(2) Objectives and Overall Contents

The objective of the Workshop1 was to understand the situations of water quality management and information sharing in Montevideo and Metropolitan Area to all the participants, which include DINAMA, IMM, IMC, IMF, IMSJ, IML, OSE, OPP, DNH, RENARE.

(3) Participants

The participants of the Workshop1 were the Counterpart (C/P) and the coordinators/representatives of DINAMA, and above relevant organizations in terms of water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

3.2 Workshop IML

(1) Title and Date

The title of the Workshop IML was "Local Workshop at Lavalleja". The local workshop was held on 10th January 2004.

(2) Objectives and Overall Contents

The objective of the Workshop was to conduct Problems Analysis and Objective Analysis based on PCM method by each common interest group in Lavalleja Municipality by the participants, which include DINAMA and IML. This Local Workshop is to discuss measures for improving water quality management in Lavalleja Municipality.

(3) Participants

The participants of the workshop includes i) governmental officials, ii) school teachers, and iii) medical doctors, iii) medical doctor, iv) private company, v) and NGOs in Lavalleja Municipality, as well as the JICA Project Team members.

3.3 Mini Workshop

(1) Title and Date

The title of the Mini Workshop was held on 3rd January 2004.

(2) Objectives and Overall Contents

The objective of the Workshop was to conduct Problems Analysis and Objective Analysis based on PCM method by each common interest group in Lavalleja Municipality by the participants, which include DINAMA, IML. This Mini Workshop is to discuss measures for improving water quality management in Lavalleja Municipality. This discussion was based on the results of the PCM Session 1.

(3) Participants

The participants of the Workshop were the main staff of the DINAMA, as well as the JICA Project Team members.

3.4 Workshop IMF 1

(1) Title and Date

The title of the Workshop IMF 1 was "Local Workshop at Florida". The Workshop was held on 10th February 2004.

(2) Objectives and Overall Contents

The objective of the Workshop IMF 1 was to to conduct Problems Analysis and Objective Analysis by each common interest group in terms of for water quality management in Montevideo and Metropolitan Area by the participants, which include DINAMA,

(3) Participants

The participants of the Workshop IMF1 are the Counterpart (C/P) and the main staff of DINAMA, IMF, and the related to water quality management in Florida Municipality, as well as the JICA Project Team members.

3.5 Workshop IMC

(1) Title and Date

The Workshop IMC was held on 20th June 2004.

(2) Objectives and Overall Contents

The objective of the Workshop IMC was to conduct Problems Analysis and Objective Analysis based on the results of the discussion on PCM Session 1 by each common interest group in Canelones Municipality.

(3) Participants

The participants of the Workshop IMC were the Counterpart (C/P) and the main staff of DINAMA, IMC, and the related to water quality management in Canelones Municipality.

3.6 Workshop IMSJ

(1) Title and Date

The Workshop IMSJ was held on 22nd July 2004.

(2) Objectives and Overall Contents

The objective of the Workshop IMSJ was to conduct Problems Analysis and Objective Analysis based on the results of the discussion on PCM Session 1 by each common interest group in San Jose Municipality

(3) Participants

The participants of the Workshop IMSJ were the Counterpart (C/P) and the main staff of DINAMA, IMSJ, and related to water quality management in San Jose Municipality, as well as the JICA Project Team members.

3.7 Workshop IMM

(1) Title and Date

The Workshop IMM was held on 29th July 2004.

(2) Objectives and Overall Contents

The objective of the Workshop IMM was to conduct Problems Analysis and Objective Analysis based on the results of the discussion on PCM Session 1 by each common interest group in Montevideo Municipality

(3) Participants

The participants of the Workshop IMM are the Counterpart (C/P) and the main staff of DINAMA, and the mayor of IMM, and the related to water quality management in Montevideo Municipality, as well as the JICA Project Team members.

3.8 Workshop 2

(1) Title and Date

The title of the Workshop 2 was "Report of Training in Japan". The Workshop was held on 11th March 2005.

(2) Objectives and Overall Contents

The objective of the Workshop 2 was to share the outcomes by the training in Japan, which some the staff of DINAMA participated in and reported to the other staff of DINAMA as well as more broad stakeholders of water quality management in Montevideo and Metropolitan Area.

(3) Participants

The participants of the Workshop 2 were the Counterpart (C/P) and the main staff of DINAMA, IMM, IMC, IMF, IML, IMSJ, and the related to water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

3.9 Technical Committee Meeting 1

(1) Title and Date

The Technical Committee Meeting 1 was held on 11th March 2005.

(2) Objectives and Overall Contents

The objective of the Technical Committee Meeting 1 was to discuss the results of Pilot Projects, Action Plan and Work Plan of the JICA Project the participants, which include DINAMA, IMM, IMC, IMF, IMSJ, IML, OSE, DNH, MTOP, MGAP, and the NGOs, which are related to water quality management in Montevideo and Metropolitan Area.

(3) Participants

The participants of the Workshop 2 were the Counterpart (C/P) and the main staff of DINAMA, and the above related organizations for water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

3.10 Monitoring

(1) Title and Date

The Monitoring for Evaluation of Each Activity of the JICA Project had conducted every three month in Phase III of the JICA Project, namely May, August, November 2005, and February 2006.

(2) Objectives and Overall Contents

The objective of the Monitoring was to evaluate each activity of the JICA Project by the staff of the DINAMA using a evaluation format. This monitoring activities would contribute to improve DINAMA's Project ownership of the JICA Project.

(3) Participants

Main staff of the EQCD and Laboratory of DINAMA had conducted the monitoring on a regular base.

3.11 Technical Committee Meeting 2

(1) Title and Date

The Technical Committee Meeting 2 was held on 8th June 2005.

(2) Objectives and Overall Contents

The objective of the Technical Committee Meeting 2 was to discuss future activities of each module of the JICA Project, which include DINAMA, IMM, IMC, IMF, IMSJ, IML, OSE, and DNH.

(3) Participants

The participants of the Technical Committee Meeting 2 were the Counterpart (C/P) and the main staff of DINAMA, and the abov related organizations for water quality management in Montevideo and Metropolitan Area, as well as the JICA Project Team members.

3.12 Workshop 3

(1) Title and Date

The title of the Workshop 3 was "Uruguay-Japan Cooperation Environmental Training". The Workshop was held on 31st January 2006.

(2) Objectives and Overall Contents

The objective of the Workshop 3 was to share the outcomes by the training in Japan, which some the staff of DINAMA participated in and reported to the other staff of DINAMA as well as more broad stakeholders of water quality management in Montevideo and Metropolitan Area.

(3) Participants

The participants of the Workshop 3 were the Counterpart (C/P) and the main staff of DINAMA, IMM, IMC, IML, and the related to water quality management in Montevideo and Metropolitan Area, as well as the staff of Embassy of Japan, JICA Uruguay, and the JICA Project Team members.

3.13 Workshop IMF 2

(1) Title and Date

The title of the Workshop IMF 2 was ″basic Analysis of a collaboration mechanism for pollution sources management″. The Workshop was held on 18th September 2006.

(2) Objectives and Overall Contents

The objective of the Workshop IMF 2 was to discuss the collaboration mechanism and works for pollution source management among the Environmental Control Division (ECD) of DINAMA and the Florida Municipality.

(3) Participants

The participants of the Workshop IMF 2 were the main staff of ECD, DINAMA, and the main staff of the Florida Municipality, as well as the staff of Embassy of Japan, JICA Uruguay, and the JICA Project Team members.

4. FORUMS AND EVENTS

4.1 Florida Forum

(1) Title and Date

The title of the Florida Forum was held on 6th August 2006.

(2) Objectives and Overall Contents

The objective of the Forum was to establish the "Florida Water Quality Forum" to authorize the decision making process in terms of water quality management in the Florida Municipality as a pilot municipality of the JICA Project, and to discuss the collaboration mechanism with the relevant organizations, as well as the future activities of the Forum.

(3) Participants

The participants of the Forum were the main staff of IMF, DINAMA, OSE, MGAP, as well as the JICA Project Team members.

4.2 River Cleaning Campaign

(1) Title and Date

The cleaning campaign was conducted on November 14, 2004 from each designated zone along the Santa Lucía Chico River.

(2) Objectives and Overall Contents

The objective of the Activities is to arise the awareness of the people to protect the Santa Lucía Chico River from discharging of domestic solid waste. The teachers, municipal officers, and community leaders were acted as the guides of the river cleaning works. The cleaning works, which were involved with students, the citizens was started in the morning of November 14, 2004 for 8 hours.

(3) Participants

The participants of the campaign were the teachers, municipal officers, and the community leaders, and the citizens along the coast of the Santa Lucía Chico River.

4.3 Florida Campaign

(1) Title and Date

The cleaning campaign was conducted on November 10, 2004 on the waling area around the Paso Severino Dam in the Florida Municipality.

(2) Objectives and Overall Contents

The objective of the Activities is to arise the awareness of the people to preserve the flora around the Paso Severino Dam. The teachers, municipal officers, and community leaders were acted as the guides of the tour who taught about the existing flora and their importance. The walk tour was started in the morning of November 10, 2004 from the central park of the Municipality. The campaign, which was involved with students, the citizens was started in the morning of November 10, 2004 for 8 hours.

(3) Participants

The participants of the campaign were the teachers, municipal officers, and the community leaders, and the citizens around the Paso Severino Dam in the Florida Municipality.

4.4 Lavalleja Forum 1

(1) Title and Date

The title of the Lavalleja Forum 1 was held on 30th September 2005.

(2) Objectives and Overall Contents

The objective of the Forum was to establish the "Lavalleja Water Quality Forum" to authorize the decision making process in terms of water quality management in the Lavalleja Municipality as a pilot municipality of the JICA Project, and to discuss the collaboration mechanism with the relevant organizations, as well as the future activities of the Forum.

(3) Participants

The participants of the Forum were the main staff of IML, DINAMA, OSE, MGAP, as well as the JICA Project Team members.

4.5 Environmental Day Event

(1) Title and Date

The title of the World Environment Day Commemoration was held on 3rd June 2005.

(2) Objectives and Overall Contents

The objective of the Event was to arise environmental awareness of the Uruguay peoples as a whole. The event includes speeches of the Minister of MTOTMA, National Director of DINAMA, and the Team Leader of the JICA Study Team, as well as environmental education video show, *Kamishibai* (Illustrated Story) Show by the School Children in Uruguay.

(3) Participants

The participants of the Event were the above speakers and the main staff of DINAMA and the JICA Project Team members, as well as the citizens of Uruguay.

4.6 Lavalleja Forum 2

(1) Title and Date

The title of the Lavalleja Forum 2 was held 3 days from October to December 2005.

(2) Objectives and Overall Contents

The objective of the Forum 2 was to discuss the collaboration mechanism of "Lavalleja Water Quality Forum". The Coordination Body (CB) discussed the objectives and functions of "Lavalleja Water Quality Forum". In the framework of the proposal made by the JICA Project the people confirmed the Civil society representative and the productive sector representative. The CB was defined a special meeting for the representation of governmental sector.

(3) Participants

The participants of the Forum were the main staff of IML, DINAMA, OSE, MGAP, as well as the JICA Project Team members.

5. TRAININGS IN JAPAN

5.1 Group Training "Environmental Management of Regional Drainage Basin II"

(1) Title and Duration

The Group Training was held from 9th May to 25th July 2004 in Japan.

(2) Objectives and Overall Contents

The participants will gain sufficient knowledge of an Integrated Approach as effective methodology based on basic framework to analyze the capacity and resource management mechanisms in the content of a regional drainage basin and social system.

(3) Participants

Mr. Gabriel Yorda, Cheif of Water Quality Department, Environment Quality Evaluation Division, DINAMA.

5.2 Group Training "Industrial Wastewater Treatment Technique II"

(1) Title and Duration

The Group Training was held from 12th July to 14th November 2004 in Japan.

(2) Objectives and Overall Contents

The training course is designed to enhance the capability of the manager and engineers in charge of pollution control, especially in the field of industrial wastewater. It will enable them to acquire basic knowledge of pollution indexes required for planning, designing and operational control of wastewater facilities.

(3) Participants

Mr. Angel Zieleniec, Chemical Engineer, General Directorate of Health Attention and Environmental Improvement, Municipality of Canelones.

5.3 Group Training "Domestic Wastewater Treatment Technique"

(1) Title and Duration

The Group Training was held from 16th August to 28th November 2004 in Japan.

(2) Objectives and Overall Contents

The participants will be provided with the knowledge and techniques to improve their ability to solve existing problems relating to domestic wastewater in their countries by achieving:1) Understanding the generation mechanism of

environmental pollution caused by domestic wastewater, 2) Obtaining comprehensive understanding on domestic wastewater management in urban areas, 3) Obtaining the basic monitoring methodology of environmental pollution related to domestic wastewater, 4) Understanding Japanese administration framework on domestic wastewater management.

(3) Participants

Mr. Eduardo Sergio, OSE

5.4 Individual Training "Strengthening of Water Quality Management System (1)"

(1) Title and Duration

The Group Training was held from 27th August to 11th September 2004 in Japan.

(2) Objectives and Overall Contents

The participants will be provided basic knowledge and the concepts to improve their ability for considering water quality management policies and planning in the region.

(3) Participants

Mr. Eduardo Garino, Professional Director, Environment Development Department, Municipality of Montevideo.

5.5 Individual Training "Strengthening of Water Quality Management System (2)"

(1) Title and Duration

The Group Training was held from 27th August to 19th September 2004 in Japan.

(2) Objectives and Overall Contents

The participants will gain sufficient knowledge and the concepts to strengthen their ability for formulating water quality management policies and planning in the region.

(3) Participants

Mr. Yanet Hagopian, Bromathology Department, Municipality of Florida.

5.6 Individual Training "Water Quality Management Administration in Japan"

(1) Title and Duration

The Individual Training was held from 22nd August to 13th November 2005 in Japan.

(2) Objectives and Overall Contents

The participants will gain sufficient practical knowledge and measures to improve their ability for formulating water quality management policies and planning in the country through the lectures and filed visits in Japan as case study of Japanese water quality administration and management.

(3) Participants

- Ms. Sandra Castro, Chief of Technical Normalization, Department Laboratory Environment Quality Evaluation Division, DINAMA
- Mr. Daniel Vignale, Chief of Emission Control Department, Environment Control Division, DINAMA
- Dr. Juan Carlos Barranquet, General Direction of Environmental Management, Municipality of Canelones

5.7 Group Training "Domestic Wastewater Treatment Technique"

(1) Title and Duration

The Group Training was held from 17th August to 26th November 2005 in Japan.

(2) Objectives and Overall Contents

The participants will be provided with the knowledge and techniques to improve their ability to solve existing problems relating to domestic wastewater in their countries for focusing on the understanding of comprehensive domestic wastewater management in urban areas.

(3) Participants

Ms. Sonia Pagalday, Civil Engineer of Studies and Sanitation Projects, Municipality of Montevideo.

5.8 Group Training "Environmental Education Focused on Fresh Water Environment –for Tertiary Level Teaching Staff"

(1) Title and Duration

The Group Training was held from 22nd August to 22nd October 2005 in Japan.

(2) Objectives and Overall Contents

The purpose of the course is to provide the participation with practical knowledge and method of environmental education mainly fresh water environment) through typical examples and observation, in order to contribute to enhancement and development and development of environmental education.

(3) Participants

Mr. Fernando Romero, NGO in Montevideo Municipality

5.9 Horizontal Cooperation "Gestión Politica Ambiental para Latino America y El Caribe, Sandiago de Chile"

(1) Title and Duration

The Horizontal Cooperation was held from 8th August to 26th August 2005 in Chile.

(2) Objectives and Overall Contents

The participants could understand major concepts of administration and environmental policies such as pollution source management/techniques, Environmental Impact Assessment (EIA), and environmental education of Latin American Countries, as well as international level.

(3) Participants

Ms. Magdalena Hill, Director of Environment Quality Evaluation Division, DINAMA.

5.10 Japan Chile Partnership Program (JCPP) "Strengthen of Laboratory of DINAMA"

(1) Title and Duration

The following two Chilean experts were dispatched to Uruguay. Duration of the dispatch was from 17th October to 26th October 2005 in Uruguay

(2) Objectives and Overall Contents

The main objective is to strengthening the technical capacity for analysis methods of several pesticides such mirex, ethyl and parathion-methyl, and heptachlor, endrin, aldrin, DDT and chlorpyrifos.

(3) Dispatched Expert and Participants

<u>Dispatched Experts</u>

- Mr. Luis Roas, Environmental Chemist, University of Chile
- Ms. Stella Moyano, Institute of Agricultural Researches (INIA), Chile

Participants

- Ms. Sandra Castro, Head of Technical Normalization Department, Laboratory of DINAMA.

5.11 Submission of the Project Profile to" Mexico 2006 4th World Water Forum"

(1) Overall Contents

The objective of the submission is to use environmental education materials by the JICA Project for the " Mexico 2006 4th World Water Forum", which has main theme as "Local actions for global challenge" and convened in Mexico City from 16th to 22nd 2006.

(2) Contacted Persons in DINAMA

Ms. Magdalena Hill, Director of Environment Quality Evaluation Division, DINAMA.

5.12 Individual Training "Water Quality Management Administration in Japan"

(1) Title and Duration

The Individual Training will be held from 2nd December to 22nd December 2006 in Japan.

(2) Objectives and Overall Contents

The participants will gain sufficient practical knowledge and measures to improve their ability for formulating water quality management policies and planning in the country through the lectures and filed visits in Japan as case study of Japanese water quality administration and management.

(3) Proposed Participants

- Ms. Magdalena Hill, Director of Environment Quality Evaluation Division, DINAMA..
- Mr. Enrique Joaquin Grosse Schuler, DINAMA
- Ms. Beatriz Píríz, Director of General Direction of Hygiene & Living Environment, Municipality of Lavalleja

5.13 Group Training "Water Environmental Monitoring"

(1) Title and Duration

The Individual Training will be held from 2nd December to 22nd December 2006 in Japan.

(2) Objectives and Overall Contents

This course aims to provide necessary information and skills on the water quality monitoring, which includes the technical knowledge and analytical skills.

(3) Proposed Participants

- Ms. Carlos Lacava, Chief of Laboratory, Municipality of San Jose

5.14 Group Training "Participatory Local Social Development; Theory and Practices"

(1) Title and Duration

The Group Training will be held from January to March 2007 in Japan.

(2) Objectives and Overall Contents

The participants will gain sufficient knowledge of the Participatory Approach as effective methodology for social preparation among target local people acquire the basic framework to analyze the local people's capacity and resource management mechanisms in the content of a local community and social system.

(3) Proposed Participants

Not known.

SECTOR G
STEERING COMMITTEE MEETINGS

TABLE OF CONTENTS

1. STEERING COMMITTEE MEETINGS

Minutes of meeting of each steering committee meeting are attached in Annexes.

1.1 Steering Committee Meeting 1

(1) Meeting Date and Place

Date: From 27th to 31st October 2003; Place: Salon de Actos, MVOTMA

(2) Attendants

MVOTMA
Arq. Saúl Irureta Saralegui

DINAMA
Mr. Aramis Latchinian / Ms. Silvia Aguinaga / Mr. Eduardo Andrés / Mr. Gabriel Yorda / Ms. Rosario Lucas / Ms. Gabriela Medina / Mr. Fernando Pacheco / Mr. Daniel Vignale / Ms. Monica Moscatelli / Mr. Cesar García / Ms. Luján Jara / Mr. Daniel Collazo / Mr. Marcelo Cousillas

DNH, MTOP
Mr. Daniel Costa / Mr. Ariel Rodríguez / Mr. Ernesto de Macedo / Mr. Juan Von Cappeln

OSE
Ms. Emma Fierro

LATU
Ms. Diana Miguez

IMM
Mr. Esteban Garino

IMC
Mr. Juan Carlos Barranquet / Mr. Gonzalo Fernández

Embassy of Japan
Mr. NAKAMURA Yoshihiro / Mr. HAYASHI Masanori

JICA Advisory Committee
Mr. YAMADA Taizo Chairman

JICA HQ
Mr. FUKASE Yutaka

JICA Project Team
Mr. SASABE Keiji / Mr. YAJIMA Makoto / Mr. KIN Hitoshi / Mr. KAGEYAMA

Kazuyoshi / Mr. TAMAGAWA Kazuhiko / Mr. Hector Villaverde / Mr. Sebastian G. Jara / Mr. ISHII Masaki

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) the contents of Inception Report, ii) Others.

The discussed topics of the Meeting are i) Importance of the Leadership of the Ministry, ii) Project Implementation Organization, iii) Project Area, iv) Office Space for JICA Project Team, v) Assignment of Counterpart Staff, vi) Comments to the Inception Report.

1.2 Steering Committee Meeting 2

(1) Meeting Date and Place

Date: 3rd March 2004; Place: Salon de Actos, MVOTMA

(2) Attendants

DINAMA
Mr. Andrés Saizar / Ms. Silvia Aguinaga /Ms. Marisol Mallo / Mr. Gabriel Yorda / Mr. Cesar García / Ms. Sandra Castro / Ms. Patricia Simone Mr. Agustín Giannoni

Planning and Budget Office
Ms. Ana Cazzadori

IMM
Mr. Esteban Garino

IMC
Mr. Juan Carlos Barranquet / Mr. Gonzalo Fernández / Mr. Angel Zieleniec

IML
Ms. Beatriz Píriz

IMF
Ms. Yanet Hagopian

JICA Project Team
Mr. SASABE Keiji / Mr. YAJIMA Makoto /Mr. SHOJI Tadashi / Mr. Hector Villaverde / Mr. Sebastian G. Jara

(3) Subjects and Discussed Topics:

The proposed meeting subjects is the contents of Progress Report (1)

The discussed topics of the Meeting are i) Proposed Action Plan, ii) Assignment Schedule of JICA Project Team, iii) Schedule for Steering Committee Meeting

1.3 Steering Committee Meeting 3

(1) Meeting Date and Place

Date: 1st July 2004; Place: Salon de Actos, MVOTMA

(2) Attendants

DINAMA
Mr. Andrés Saizar / Ms. Magdalena Hill / Mr. Agustín Giannoni

Planning and Budget Office
Ms. Ana Cazzadori

OSE
Mr. Santiago Ham

IMM
Mr. Daniel Nogueira / Ms. Raquel Piaggio

IMC
Mr. Angel Zieleniec

IML
Ms. Beatriz Píriz

IMF
Ms. Yanet Hagopian

JICA Project Team
Mr. SASABE Keiji / Mr. YAJIMA Makoto /Mr. SHOJI Tadashi / Mr. KAGEYAMA Kazuyoshi / Mr. Hector Villaverde / Mr. Sebastian G. Jara

(3) Subjects and Discussed Topics:

The proposed meeting subjects is the contents of Progress Report (2)

The discussed topics of the Meeting are i) PLP 1c: Development of Capacity for Ambient Water Quality Monitoring and Strengthening of Coordination, ii) PLP 2: Establishment of Water Quality Information System, iii) PLP 3: Establishment of Industrial Wastewater Management Manual and Strengthening of Coordination, iv) PLP 5/6: Promotion of Dissemination, Education and Public Participation, v) Schedule in Phase II.

1.4 Steering Committee Meeting 4

(1) Meeting Date and Place

Date: 10th August 2004; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Andrés Saizar, DINAMA / Ms. Anna Cazzadori, OPP / Mr. Juan von Cappeln, DNH / Ms. Santiago Ham, OSE / Mr. Esteban Garino, IMM / Dr. Juan Carlos Barranquet, IMC / Mr. Julio Callorda, IMSJ / Dra. Beatríz Piriz, IML / Dr. Nestor Pereira, IMF

DINAMA
Ms. Magdalena Hill, Mr. Fernando Pacheco, Mr. Agustin Giannoni, Mr. Eduardo Andrés, Ms. Sandra Castro, Mr. Gabriel Yorda, Mr. Daniel Vignale, Mr. Cesar García, Mr. Daniel Collazo, Dr. Marcelo Cousillas

JICA Project Team
Mr. Sasabe, Mr. Yajima, Mr. Shoji, Mr. Villaverde, Mr. Jara

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) present status of the Pilot Projects, ii) the Project schedule.

The discussed topics of the Meeting are i) the progress of the "PLP 1a: Development of Capacity for Strategic Part of Water Quality Management", ii) the progress of the "PLP 1c: Development of Capacity for Ambient Water Quality Monitoring and Strengthening of Coordination", iii) the contents of the other Pilot Projects, iv) the contents of the Seminar in December 2004.

1.5 Steering Committee Meeting 5

(1) Meeting Date and Place

Date: 2nd and 6th December 2004; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Andrés Saizar, DINAMA / Ms. Anna Cazzadori, OPP / Mr. Juan von Cappeln, DNH / Mr. Santiago Ham, OSE / Mr. Esteban Garino, IMM / Dr. Juan Carlos Barranquet, IMC / Mr. Julio Callorda, IMSJ / Dr. Nestor Pereira, IMF / Dra. Beatríz Piriz, IML

DINAMA
Ms. Magdalena Hill, Mr. Fernando Pacheco, Mr. Agustin Giannoni, Ms. Sandra Castro, Mr. Gabriel Yorda

JICA Advisory Committee
Mr. Yamada, Mr. Ito, Mr. Fukase

JICA Project Team
Mr. Sasabe, Mr. Yajima, Mr. Shoji, Mr. Villaverde, Mr. Jara, Mr. Yamada

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Present status of Pilot Projects and mid-term evaluation, ii) the Project schedule.

The discussed topics of the Meeting are the progress of i) PLP 1a: Development of Capacity for Strategic Part of Water Quality Management, ii) PLP 1b: Development of Capacity for Pollution Source Management, iii) PLP 1c: Development of Capacity for Ambient Water Quality Monitoring and Strengthening of Coordination, iv) PLP 2: Establishment of Water Quality Information System (SISICA) v) PLP 3: Establishment of Wastewater Management Manual and Strengthening of Coordination, vi) PLP 4: Establishment of Manuals for Monitoring Network Designing and Sampling, vii) PLP 5/6: Promotion of Dissemination, Education and Public Participation.

1.6 Steering Committee Meeting 6

(1) Meeting Date and Place

Date: 16th February 2005; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Saúl Irureta, Minister of MVOTMA / Ms. Anna Cazzadori, OPP / Mr. Andrés Saizar, DINAMA / Mr. Juan von Cappeln, DNH / Mr. Santiago Ham, OSE / Mr. Esteban Garino, IMM / Dr. Juan Carlos Barranquet, IMC / Mr. Julio Callorda, IMSJ / Dr. Nestor Pereira, IMF / Dra. Beatríz Piriz, IML

DINAMA
Ms. Magdalena Hill, Mr. Fernando Pacheco, Mr. Agustin Giannoni, Ms. Sandra Castro, Mr. Gabriel Yorda

Embassy of Japan
Mr. Hayashi, First Secretary / Ms. Ikeda

JICA Project Team
Mr. Sasabe, Mr. Yajima, Mr. Shoji, Mr. Villaverde, Mr. Jara

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Overall Project Implementation, ii) Interim Report.

The discussed topics of the Meeting are i) TOR in the JICA-Consultants Contract, ii) Confirmation of the definition of Steering Committee, iii) Equipment for monitoring and laboratory analysis, iv) Assistants in the Consultants Group, v) C/P training in Japan in the Fiscal Year 2005 (April 2005 to March 2006), vi) Outline of Interim Report.

1.7 Steering Committee Meeting 7

(1) Meeting Date and Place

Date: 25th February 2005; Place: Salon de Actos, MVOTMA

(2) Attendants

DINAMA
Mr. Andrés Saizar / Ms. Magdalena Hill / Ms. Sandra Castro

OSE
Mr. Santiago Ham

IMM
Mr. Esteban Garino

IMC
Dr. Juan Carlos Barranquet / Mr. Gonzalo Fernandez / Mr. Angel Zeileniec

IMSJ
Mr. Carlos Lacava

IMF
Ms. Yanet Hagopian

IML
Dra. Beatríz Píriz

JICA Project Team
Mr. SASABE Keiji / Mr. YAJIMA Makoto / Mr. SHOJI Tadashi / Mr. KAGEYAMA Kazuyoshi / Mr. Hector Villaverde / Mr. Sebastian G. Jara / Mr. YAMADA Hideyuki

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) TOR in the JICA-Consultants Contract, ii) First Draft Integrated Master Plan presented in Interim Report, iii) Schedule for the Remaining Part of the Fourth Field Work.

The discussed topics of the Meeting are i) Contents of the Interim Report, ii) Schedule of Workshop and Technical Committee Meeting.

1.8 Steering Committee Meeting 8

(1) Meeting Date and Place

Date: 15th March 2005; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Mariano Arana, Minister of MVOTMA / Ms. Anna Cazzadori, OPP / Ms. Alicia Torres, DINAMA / Mr. Juan von Cappeln, DNH / Mr. Santiago Ham, OSE / Mr. Esteban Garino, IMM / Dr. Juan Carlos Barranquet, IMC / Mr. Julio Callorda, IMSJ / Dr. Nestor Pereira, IMF / Dra. Beatríz Piriz, IML

DINAMA
Ms. Magdalena Hill, Mr. Fernando Pacheco, Mr. Agustin Giannoni, Ms. Sandra Castro

JICA Project Team
Mr. Sasabe, Mr. Shoji, Mr. Kageyama, Mr. Villaverde, Mr. Jara, Mr. Yamada

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Fourth Field Work Report, ii) Others

The discussed topics of the Meeting are i) Confirmation of General Contents of the Project ii) Contents of Fourth Field Work Report, iii) Counterpart Training in Japan for the Fiscal Year 2005.

1.9 Steering Committee Meeting 9

(1) Meeting Date and Place

Date: 25th May and 7th June 2005; Place: Salon de Actos, MVOTMA

(2) Attendants

DINAMA
Ms. Magdalena Hill Mr. Fernando Pacheco

DNH
Mr. Juan von Capeln

OSE
Mr. Santiago Ham

IMM
Mr. Esteban Garino

IMC
Dr. Juan Carlos Barranquet

IMSJ
Ms. Lilián Trujillo

IMF
Ms. Yanet Hagopian

IML
Dra. Beatríz Píriz

JICA Project Team
Mr. SASABE Keiji / Mr. Hector Villaverde

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i), Modules ii) Counterpart Training and Uruguay Country Training Program

The discussed topics of the Meeting are i) Status of Module 1,2,3 and 4, ii) Confirmation of the members and schedule of Counterpart Training.

1.10 Steering Committee Meeting 10

(1) Meeting Date and Place

Date: 4th October 2005; Place: Salon de Actos, MVOTMA

(2) Attendants

DINAMA
Ms. Alicia Torres / Ms. Magdalena Hill / Mr. Daniel Vignale

DNH
Mr. Juan von Capeln

OSE
Ms. Carla Brunetto Chiazzo

IMM
Mr. Esteban Garino

IMC
Dr. Juan Carlos Barranquet

IMF
Ms. Yanet Hagopian

IML
Dra. Beatríz Píriz

JICA Project Team
Mr. SASABE Keiji / Mr. Hector Villaverde

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i)Members of the Steering Committee and the Technical Committee, ii) Evaluation of the Activities in Phase III, iii) Schedule of Counterpart Training Program.

The discussed topics of the Meeting are i) Confirmation of the members for the Steering Committee and the Technical Committee, ii) Evaluation of the activities in Phase III by Evaluation Sheet prepared by DINAMA and relevant agencies in August 2005

1.11 Steering Committee Meeting 11

(1) Meeting Date and Place

Date: 3rd February 2006; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Mariano Arana, Minister / Ms. Alicia Torres, DINAMA / Ms. Anna Cazzadori, OPP / Mr. Edi Juri, DNH / Mr. Juan von Cappeln, DNH / Ms. Carla Brunetto Chiazzo, OSE / Mr. Esteban Garino, IMM / Eng. Mario Pareja, IMC / Dr. Juan Carlos Barranquet, IMC / Dr. Carlos Olagüe, IMSJ / Ms. Beatriz Piriz, IML / Dr. Ariel Pisano, IMF / Ms. Yanet Hagopian, IMF

DINAMA
Ms. Magdalena Hill / Ms. Silvia Aguinaga / Mr. Fernando Pacheco / Mr. Agustin Giannoni / Mr. Gabriel Yorda / Ms. Sandra Castro / Mr. Daniel Vignale

JICA Project Team
Mr. Sasabe Keiji, Leader / Mr. Hector Villaverde / Ms. Mariana Bercianos (Interpreter)

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Interim Evaluation Report, ii) Draft of Progress Report (3) and Evaluation Sheet for February 2006, iii) Amendment of Draft Integrated Master Plan , iv) Others

The discussed topics of the Meeting are i) Establishment of DINASA, ii) Principle of the Water Quality Management of Uruguay, iii) Holding of Periodical Steering Committee Meeting, iv) Comments on Modules.

1.12 Steering Committee Meeting 12

(1) Meeting Date and Place

Date: 9th June 2006; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Mariano Arana, Minister / Ms. Alicia Torres, DINAMA / Ms. Anna Cazzadori, OPP / Mr. Edi Juri, DNH / Mr. Juan von Cappeln, DNH / Ms. Carla Brunetto Chiazzo, OSE / Mr. Esteban Garino, IMM / Eng. Mario Pareja, IMC / Dr. Juan

Carlos Barranquet, IMC / Dr. Carlos Olagüe, IMSJ / Ms. Beatriz Piriz、IML / Dr. Ariel Pisano, IMF / Ms. Yanet Hagopian, IMF

DINAMA
Ms. Magdalena Hill / Ms. Silvia Aguinaga / Mr. Fernando Pacheco / Mr. Agustin Giannoni / Mr. Gabriel Yorda / Ms. Sandra Castro / Mr. Daniel Vignale

Embassy of Japan

Mr. Sakurai Kenji, First Secretary

JICA Project Team
Mr. Ito Tsuyoshi, Water Quality Management System Specialist / Mr. Hector Villaverde / Mr. Sebastian Jara / Ms. Mariana Bercianos (Interpreter)

JICA Senior Volunteer
Mr. Nonaka Toshihiro, SV for System Engineering

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Work in Phase IV (Fiscal Year 2006), ii) Status of the activities by DINAMA and related agencies, iii) Proposal of campaign in Phase IV -Determination of animal mascot for Santa Lucía River Basin, iv) Others.

The discussed topics of the Meeting are i) Joint Monitoring of Water and Sediment between DINAMA and each Municipality, ii) Coordination of Compliance Inspection between DINAMA and Municipalities/ Mutual exchange of the inspection results of industrial wastewater facilities, iii) Present Situation and Future Plan of DINASA, iv) Proposal of campaign in Phase IV – Determination of mascot for Santa Lucía River Basin, v) Water Quality Forum, vi) Counterpart training in Japan in the fiscal year 2006.

1.13 Steering Committee Meeting 13

(1) Meeting Date and Place

Date: 24th July 2006; Place: Salon de Actos, MVOTMA

(2) Attendants

Steering Committee
Mr. Mariano Arana, Minister / Ms. Alicia Torres, DINAMA / Ms. Anna Cazzadori, OPP / Mr. Edi Juri, DNH / Mr. Juan von Cappeln, DNH / Ms. Ema Fierro, OSE / Mr. Esteban Garino, IMM / Eng. Mario Pareja, IMC / Dr. Juan Carlos Barranquet, IMC / Dr. Carlos Olagüe, IMSJ / Ms. Beatriz Piriz, IML / Dr. Ariel Pisano, IMF / Ms. Yanet Hagopian, IMF / Mr. José Luis Genta, DINASA / Mr. Daniel Greif, DINASA / Mr. Fernando Olmos, RENARE

DINAMA
Ms. Magdalena Hill / Ms. Silvia Aguinaga / Ms. Luján Jara / Mr. Agustin Giannoni / Mr. Gabriel Yorda / Ms. Sandra Castro / Mr. Daniel Vignale

JICA Project Team
Mr. Sasabe Keiji, Leader / Mr. Hector Villaverde / Mr. Sebastian Jara

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Progress Report (3), ii) Future input (JICA scheme and others) needed for the implementation of the Final Integrated Master Plan, iii) Proposal of a council with function of Steering Committee on the JICA Project, iv) Others.

The discussed topics of the Meeting are i) Present Status and Major Issues on the Project Activities, ii) Necessary Future Input for the Implementation of the Final Integrated Master Plan, iii) Setup of Council for the Water Quality Management of the Santa Lucía and Adjoining River Basins.

1.14 Steering Committee Meeting 14

(1) Meeting Date and Place

Date: 6th September 2006; Place: Sala de la Cámara de Industrias, Rondeau 1665, 1º piso

(2) Attendants

Steering Committee
Arq. Mariano Arana, Ministro / Ing. Alicia Torres, DINAMA / Ing. Ana Cazzadori, OPP / Ing. Edi Juri, DNH / Ing. Juan von Cappeln, DNH / Ing. Ema Fierro, OSE / Ing. Esteban Garino, IMM / Ing. Mario Pareja, IMC / Dr. Juan Carlos Barranquet, IMC / Dr. Carlos Olagüe, IMSJ / Dra. Beatriz Piriz, IML / Dr. Ariel Pisano, IMF / Q.F. Yanet Hagopian, IMF / Ing. José Luís Genta, DINASA / Ing. Daniel Greif, DINASA / Ing. Fernando Olmos, RENARE

DINAMA
Ing. Magdalena Hill / Ing. Silvia Aguinaga / Ing. Rosario Lucas/ Lic. Luján Jara / Lic. Agustin Giannoni / Bach. Gabriel Yorda / Lic. Sandra Castro

Observers
Ing. José Luís Genta, DINASA / Ing. Daniel Greif, DINASA

JICA Project Team
Ing. Sasabe Keiji, Líder / Mr. Kunio Ishikawa/ Mr. Tsuyoshi Ito/ Mr. Tadashi Shoji/ Lic. Hector Villaverde / Ing. Sebastián Jara/ Mr. Hitoshi Shimokochi

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Progress of Activities during 7th Filed Work, ii) Proposal of a Council with function of Steering Committee on the JICA Project, iii) Others.

The discussed topics of the Meeting are i) Assignment of "Laboratory Management Specialist", ii) Workshop “Laboratory Management ”: carried out by September 4, 2006, iii) Agreement on Joint-work for Water Quality Monitoring, iv) Annual Report, v) Industrial Manual (Industrial User Inspection Manual vi) Discussion on the draft and preparation of a setup plan of Council

1.15 Steering Committee Meeting 15

(1) Meeting Date and Place

Date: 19th September 2006; Place: Sala de la Cámara de Industrias, Rondeau 1665, 1º piso

(2) Attendants

Steering Committee
Arq. Mariano Arana, Ministro / Ing. Alicia Torres, DINAMA / Ing. Ana Cazzadori, OPP / Ing. Edi Juri, DNH / Ing. Juan von Cappeln, DNH / Ing. Ema Fierro, OSE / Ing. Esteban Garino, IMM / Ms. Gabriela Feola, IMM / Lic. Leonardo Herou, IMC / Sra. Ethel Badin, IMC / Ing. Gerardo Vanerio, IMC / Dr. Carlos Olagüe, IMSJ / Lic. Julio Callorda, IMSJ/Dra. Beatriz Piriz, IML / Dr. Ariel Pisano, IMF / Q.F. Yanet Hagopian, IMF / Ing. Fernando Olmos, RENARE

DINAMA
Ing. Magdalena Hill / Ing. Silvia Aguinaga / Ing. Rosario Lucas/ Lic. Luján Jara / Lic. José Pedro Díaz /Lic. Agustin Giannoni / Bach. Gabriel Yorda / Lic. Sandra Castro

Observers
Ing. José Luís Genta, DINASA / Ing. Daniel Greif, DINASA / Mr. Gonzalo Carambula, Metropolitan Agenda Programme

JICA Project Team
Ing. Sasabe Keiji, Líder / Ing. Tsuyoshi Ito / Ing. Tadashi Shoji / Ing. Kunio Ishikawa / Lic. Hector Villaverde / Ing. Sebastián Jara / Ing. Hitoshi Shimokochi

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) General Contents of Draft Final Report, ii) Setup of a “Committee for the Implementation of the Master Plan DINAMA/JICA, iii) Request for the JICA Technical Cooperation from the Fiscal Year 2007, iv) Others

The discussed topics of the Meeting are i) General Contents of Draft Final Report, ii) Output of Florida Workshop ,iii) Design of Mascot for Santa Lucía River Basin, iv) Setup of a "Committee for the Implementation of the Master Plan DINAMA/JICA in the Basin of Santa Lucía River and Sub-Basins of Carrasco and Pando Streams" with function of Steering Committee on the DIANAMA/JICA Project, v) Progress of Technical Cooperation, vi) Dispatch of Experts (Horizontal Cooperation), vii) Training in Japan, iiiv) Dispatch of Senior Volunteer for Water Quality Management for the River Basin.

1.16 Steering Committee Meeting 16

(1) Meeting Date and Place

Date: 24th November 2006; Place: Sala de la Cámara de Industrias, Rondeau 1665, 1º piso

(2) Attendants

Steering Committee
Ing. Ana Cazzadori, OPP / Ing. Juan von Cappeln, DNH / Ing. Ema Fierro, OSE / Ing. Esteban Garino, IMM / Ing. Beatriz Brenna, IMM / Sra. Ethel Badin, IMC / Q.F. Carlos Caraballo, IMC / Ing. Ángel Zieleniek, IMC / Lic. Julio Callorda, IMSJ / Dra. Beatriz Piriz, IML / Dr. Ariel Pisano, IMF / Q.F. Yanet Hagopian, IMF / Ing. Fernando Olmos, RENARE

DINAMA
Ing. Magdalena Hill / Ing. Silvia Aguinaga / Lic. Luján Jara / Lic. Agustin Giannoni

Observers
Mr. Paul Moizo, Metropolitan Agenda Programme

Japan Embassy
Mr. Kenji Sakurai, First Secretary / Mr. Masahiko Mori

JICA Monitoring Team
Arq. Yamada Taizo, Leader / Ing. Onuma Katsuhiro, Administration of Water Management / Dr. Takeuchi Tomonori, Cooperation Planning / Mr. Ujiie Hiroyuki, Evaluation

JICA Project Team
Ing. Sasabe Keiji, Líder / Ing. Tadashi Shoji / Lic. Hector Villaverde

(3) Subjects and Discussed Topics:

The proposed meeting subjects are i) Draft Final Report – Outcome and Future Activities on Capacity Development for Water Quality Management; ii) Evaluation of the Project by JICA; iii) Specific Items for Discussion (Progress of Mascot Campaign for Santa Lucia River Basin; Request for the JICA Technical Cooperation from the Fiscal Year 2007, iv) Others.