

2013 MIECF

Macao International Environmental
Co-operation Forum & Exhibition
澳門國際環保合作發展論壇及展覽

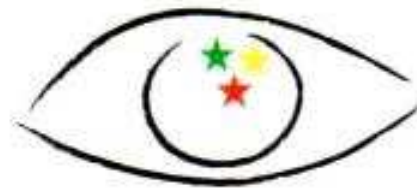
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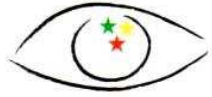
中華人民共和國澳門特別行政區政府
Government of the Macao
Special Administrative Region of
the People's Republic of China

**SUSTAINABLE CITIES –
THE WAY TOWARDS A GREEN FUTURE**

“Clean Stream Program”



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Para Desenvolvimento Cultural, Científico e Tecnológico



- The state of São Paulo and the city of São Paulo are crossed by the Tropic of Capricorn.
- According to IBGE, population in the city of São Paulo is **10.886.518** inhabitants. If considering metropolitan area, that is including 38 cities around the capital, population is almost **19,000,000** inhabitants.
- **Foundation of the city:** January 25, 1554
- **Climate:** Tropical temperate
- **Average annual temperature:** 19°C
- **Extension:** 1.530 km²
- **Altitude:** an average of 760 m.
- most developed industrial and technological park in Latin America;
- main source of energy of the State;
- all the large blue spots in and around the State are dams used to generate hydroelectricity.





Sabesp

- Sabesp is a mixed economy company responsible for water supply, sewage collection and treatment of 363 municipalities in the State of São Paulo in Brazil.

Since 2002 the Sabesp has shares traded on the stock exchanges of São Paulo and New York.

In number of customers, it can be considered as one of the largest sanitation companies in the world. There are 27.7 million people served, almost twice the population of Belgium

To offer quality services, it maintains a gigantic structure and in the last five years has invested approximately U\$D 2,5 Billion.

From 2009 to 2013 it will be invested U\$D 4,3 Billion in order to keep the indices achieved, expand the collection and treatment of sewage and offer:

- 100% of treated water
- 90% of sewage collected
- 88% de treating sewage



“Clean Stream Program”.

In order to reverse the degradation of urban streams, the Government of São Paulo, by Sabesp, and the municipality of the city of São Paulo launched the “**Clean Stream Program**”.

The **Clean Stream Program** has benefited 1.6 million people in the city of São Paulo. At the end of 2011 there were 103 streams completed. More than a thousand liters of sewage per second were referred for treatment, with reflections on the improvement of the water quality of the rivers Tietê and Pinheiros. So far it was invested U\$ 70 million, where U\$ 54,4 million from Sabesp and 49.7 million from the Municipality of São Paulo. By the end of 2012 the total investment will be U\$ 541,1 million, \$ 65,5 million from Sabesp and U\$ 386,5 million from the Municipality of São Paulo. Until December of 2012 it will be delivered more 49 streams.





“Clean Stream Program”

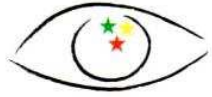
The streams are tributaries of large metropolitan rivers (Tietê, Pinheiros and Tamanduateí). In Sao Paulo, in these places, are found tires, used stoves, mattresses and a host of other materials discharged directly into waterways or even the trash thrown on the streets, which is conducted to the rivers during the rainy season.

Contamination of these areas usually affects other watercourses and drainage basin as a whole. The accumulated dirt causes bad smell, transmits diseases, attracts rats and roaches.



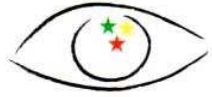
Integrated Actions

- A simple action to throw garbage on the street can affect the environment and the health of the population not only of his neighborhood, but of the entire municipality.
- That's because the streams are part of the urban structure and belong to the sub-basins that are interconnected to larger units, known as watersheds.
- In Sao Paulo, the stormwater drainage systems and sewers are delimited by the rivers Tietê, Pinheiros, Tamanduateí and Aricanduva, in addition to basins draining the Guarapiranga and Billings reservoirs. In these areas there are 105 basins or sub-basins, a total of 305 across the metropolitan region of São Paulo.
- This means that interventions must be integrated to equate the Metropolitan-scale problem. Hence the **Clean Stream Program** interface with other programs developed by Sabesp as the **Tietê Project**, the **Metropolitan Sewerage Program** and the preservation of the supply sources called “the mananciais”.



How to measure pollution

- With the pollution, the watercourses are filled with organic matter, requiring large amounts of oxygen to keep bacteria and other microorganisms that feed on waste. So, to measure the contamination, is used an index known as “Biochemical Oxygen Demand” or BOD representing the amount of dissolved oxygen in the water needed for stabilization of the biodegradable organic matter presented. The values are expressed in milligrams of oxygen per liter and the higher the level of BOD, there is more pollution in the water.



Pollution thermometer

Characterization of the Streams according to BOD - Biochemical Oxygen Demand



0 to 5 mg/liter

Natural conditions, allows the primary contact of persons and watering vegetables

5 to 10 mg/liter

Good condition, no longer recommends the primary contact or irrigation of vegetables, but allows the existence of fish, the use of water for animals and the conventional water treatment.

10 to 30 mg/liter

Good condition, good aesthetic look, allows the existence of fish, it gives off odors and makes possible the conventional treatment of the water.

30 to 70 mg/liter

. Still good aesthetic condition, though with restrictions for fish and exhalation of odors in certain times of the year (mostly with dry summer); treatment of water with high consumption of chemicals needed.

Above 70 mg/liter

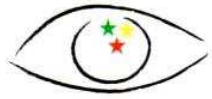
Polluted.

NOTE: There are other determinants of water quality conditions (chemical pollution). Here refers only to the case of organic pollution.



Program in the communities

- The success of the project depends on the participation and involvement of the community, since the works performed must be maintained and preserved. In this way the population takes care of streams and areas around to avoid the garbage deposit, illegal sewage release and irregular occupations. In order to make this possible, it was developed an environmental education work in 42 areas of streams that should be cleaned.
- In this work, the residents were invited to participate in the process by identifying the importance of the stream for their region and the need for remediation activities to improve the quality of life of the population, not in an isolated way, but with gains to all municipalities.



Program in the communities

- Among the actions taken were the importance of the stream to the region through historical, lectures and papers presented by their own people about what they knew and did to the continuity of the program.
- In this area it was possible to follow the detailing and scheduling of the work carried out in schools, neighborhoods, and other associations.



Do your part

- Keep the stream cleaned;
- In addition to the technology and professional procedures of Sabesp, the collaboration of the population in conservation of plants is fundamental. The collection network, for example, it is essential to move away from the sewers, avoid diseases and clean the environment, especially the streams and rivers in the city.
- To combat the pollution, the actions are integrated and include the interconnection of buildings to the pipe of Sabesp, extension of collecting networks and removing garbage and junk streams.



Do your part

- The first connection of sewers is always free. Residents must observe if the house is below street level and consult the Sabesp about the possibility of connection.
- Once this is done, the resident provides internal installation, according to guidelines of the Sabesp, and requests an inspection at his residence. An inspector duly identified is sent to verify installation. After this step, if everything is correct, Sabesp runs the sewage link.
- With the connection of the collection network, some care must be taken, because misuse can bring both disorders for those who administer the services as to the residents.
- In unclogging sewage pipes are found absorbent, toilet paper, diapers, rest of cigarettes and food scraps. That's because many customers use the network improperly. Another problem is to make the connection of the sewer system of rainwater. As the installation is not scaled for this purpose, it is common for sewage and flood ebbs occur.
- It is very important to note that no one should throw garbage on the street and hillside streams, in order to prevent contamination of water resources and floods during the rainy season.



Estimated time of decay in nature

Papel: 3 a 6 meses



Pano: 6 meses a 1 ano



Cigarro (filtro): até 5 anos



Goma de mascar: até 5 anos



Plástico: mais de 100 anos



Madeira pintada: até 13 anos



Metal: mais de 100 anos



Vidro: até 1 milhão de anos



Borracha: tempo indeterminado



How to Collaborate.

- make sure your home has sewer connection;
- check that the connection with the rainwater is independent;
- do not throw rubbish in the drains or toilets and avoid depositing trash or debris on the streets or areas of streams;
- Reduce the amount of your trash. Consume products with less packaging and separate the organic waste from the others. Find out about the selective collection of garbage in your neighborhood and on the possibility of sending it to solid waste cooperative!



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Thanks!!!

Dácio Pretoni - President

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