

SWITCH PROJECT: LIMA, PERU

LIMA

Area: 2,794 km²
Districts/Municipalities: 49 districts
Population: 7,765,151 (INEI, 2005)
Female Population: 51%
Growth Rate: 2.1% (INEI, 2002).
Rainfall (mm/year) = 25
Water Supply Coverage = 90%
Basic Sanitation Coverage = 84.5% connected to sewer system
Wastewater Treatment = 15% (from all wastewater)

DEMONSTRATION

The Ministry of Housing, Construction and Sanitation, IPES and the Municipality of Villa El Salvador, in order to demonstrate the validity of the policy guidelines established, are jointly developing the OGAPU Project, which stands (in Spanish) for "Optimizing Water Management to Combat Urban Poverty" in the Villa El Salvador District.

The main objective of the OGAPU Project is to help combat urban poverty, improve food security and foster public participation at the local level through the implementation of a wastewater treatment system for re-use in multi-functional green areas.

The Project consists of building a wastewater treatment plant with the capacity to treat 1 l/s of water that will help develop and maintain 2 hectares of recreational and productive green areas (for urban agriculture).

Activities include:

- Creation of the coordination team
- Prior research and studies
- Awareness-raising and consensus-building
- Participatory design and planning of the multifunctional productive area
- Selection of participants for the productive area
- Formation of the Management and Administration Committee
- Participatory implementation of the wastewater treatment plant and the multifunctional productive area
- Training and management of the multifunctional area
- Establishment of the distribution and commercialization system
- Sustainability, documentation and replication
- Cross-cutting attention paid to gender and monitoring and evaluation



LIMA WATER SYSTEMS & PRESSURES

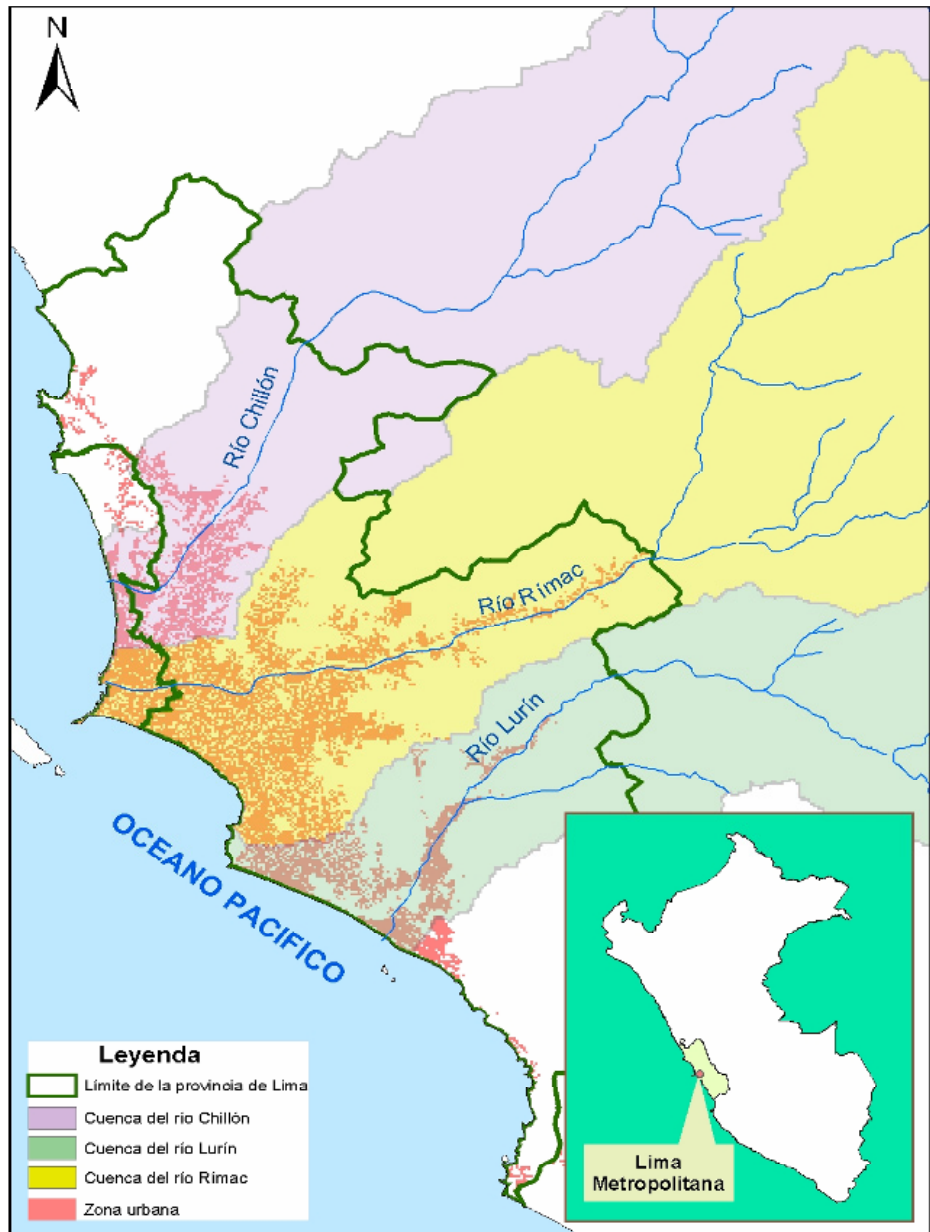
The city of Lima is located in the central part of Peru on the Pacific Ocean. Although it was initially founded in a valley (the Rimac River valley), today it extends to other surrounding valleys (of the Chillon and Lurin Rivers) and over extensive desert areas. Due to this latter characteristic, it is considered the most extensive city in the world built on a desert, after Cairo.

As a result of the nearly non-existent precipitation that Lima receives (around 25 mm per year), the main sources of water in the city are surface and underground water. This leads to a situation where treated and untreated wastewater is seen as an important alternative source for irrigation water.

Surface water: Originates from the Rimac, Chillon and Lurin Rivers. Their total average monthly historical flow volume is 39 m³/s, of which 29.5 m³/s comes from the Rimac (SENAMHI, 2005), 5.1 m³/s from the Chillon (SENAMHI), and 4.5 m³/s from the Lurin (INRENA, 2005). 75% of the water available in the city is used for human consumption, followed by agriculture (22%) and industrial and mining activities (INRENA, 2005).

Underground Water: Comes from the filtration of the Rimac, Lurin and Chillon Rivers. Currently, underground water is extracted at a rate of 8.3 m³/s (SUNASS, 2002), and is primarily used for human consumption and industrial activities.

Wastewater: 85.4% of the city's population (SEDAPAL, 2005) has access to a sewer system which collects 17.5 m³/s of wastewater.

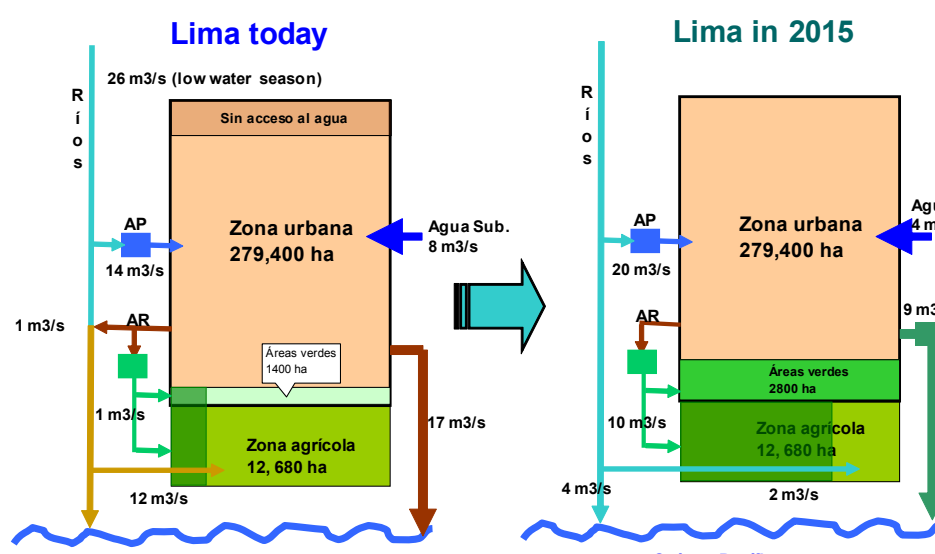


POTENTIAL FUTURE SCENARIOS

Lima today: 84.5% of residents have access to the sewer system. Of all of the river water during low level season, approximately 54% (14 m³/s) is captured to be treated and turned into drinking water and the rest (12 m³/s) is used without treatment to irrigate more than 90% of the Agricultural Zone (approximately 12,000 hectares).

The Urban Zone (297,400 hectares) and just over 90% of the city's green areas (approximately 1250 hectares), using a total of 22 m³/s of clean water (14 m³/s of potable water from the river and 8 m³/s of underground water).

Of all of the wastewater generated (17.6 m³/s), 9.2% is treated and only half of that is reused (approx. 1 m³/s) to irrigate less than 10% of the Green Areas of the city and the Agricultural Zone) and the remaining treated wastewater is dumped into the river (approx. 1 m³/s). The rest of the wastewater (approx. 17 m³/s) is not treated and is eliminated directly into the Pacific Ocean, causing significant problems to public health and the environment.



* During times of low water levels, the average flow volume in Lima's rivers is 26 m³/s

Lima 2015: 100% of residents has access to the sewer system. The water capture system and the potable water drinking system have been upgraded, and it is hoped that of all river water during the season of lowest flows, approximately 80% (20 m³/s) will be captured to be treated and turned into drinking water, just under 10% 2 m³/s will be used to irrigate 15% of the Agricultural Zone (1,902 hectares) and the rest will be dumped into the sea. The Urban Zone (279,400 hectares) uses a total of 24 m³/s of clean water (24 m³/s of potable water from the river and only 4 m³/s of underground water).

Of all of the wastewater generated (19.0 m³/s), 100% receives treatment, of which more than half is re-used (approx. 10 m³/s) to irrigate 100% of the city's green areas (which have doubled in size to 28,000 hectares) and to irrigate close to 85% of the Agricultural Zone (10,778 hectares). The remaining wastewater (9 m³/sec.) is treated and deposited into the ocean, eliminating the health and environmental problems caused by the dumping of untreated wastewater.

VISION & GOALS

The main objectives of the SWITCH Lima project are:

- To prepare policy guidelines for the promotion of use of domestic treated wastewater for the irrigation of green areas and urban and periurban agriculture.
- To establish a functioning multi-stakeholder group at national and local level (with representatives from the national government, local governments, universities, NGOs, CBOs, etc.) which analyzes and implement innovative wastewater treatment and reuse systems.

LIMA LEARNING ALLIANCE (LA)

The Learning Alliance in Lima has two levels: National level (Peru) and Local level (Lima). The purpose of the LA is to facilitate the development of policy guidelines and regulations through research activities results, and promote the implementation of them and treatment and use of wastewater systems for green areas and agriculture.

RESEARCH FOCUS AREAS

The entire process in Lima has been implemented using an action-research approach.

The dimensions that were analysed are:

Technical: type of treatment technology used, quality of the wastewater treated, quality control of the effluent, technical aspects related with reuse, etc. Institutional: organizations involved, roles and responsibilities, contributions, instruments and mechanisms for agreements, governance, decision making, etc.

Legal: legal and normative framework for wastewater treatment and for (the promotion and regulation) of wastewater reuse, legal responsibilities of the institutions involved, etc.

Social: benefits for the population/communities involved, (potential) conflicts, constraints regarding adoption of the technology, participation in decision making, etc.

Environmental: benefits and risks of the treatment and reuse activities on the environment.



LA MEMBERS

National LA	Local LA
<ul style="list-style-type: none">• Ministry of Housing, Construction & Sanitation*• IPES – Promoción del Desarrollo Sostenible*• Water and Sewer Service of Lima "SEDAPAL" *• National Agrarian University of Molina*• Ministry of the Environment• Ministry of Health• Ministry of Agriculture• National Institute of Natural Resources• National Water Authority• National Superintendence of Sanitation Services (SUNASS)• National Board of the Users of Irrigation Districts of Peru (JNUDRP)• Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) / Pan American Health Organization (PAHO)• Water Sanitation Programme / World Bank	<ul style="list-style-type: none">• Carabayllo Municipality• Comas Municipality• Pucusana Municipality• Villa El Salvador Municipality• Miraflores Municipality• Lima Municipality – Lima Municipal Toll Administration Company (EMAPE)• Rimac Users Board• National University of Engineering• Inmaculada School

* Original members of the Learning Alliance

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