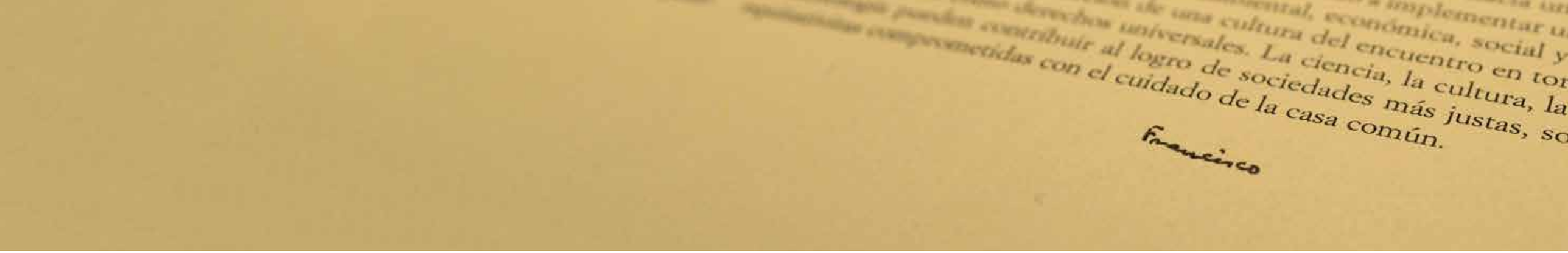


PONENCIAS

SEMINARIO DERECHO HUMANO AL AGUA

# PONENCIAS

## SEMINARIO
# DERECHO HUMANO AL AGUA

23 al 24 de febrero de 2017
Casina Pio IV | Ciudad del Vaticano

SGBATOS
MEJOR QUE DECIR ES HACER

CÁTEDRA DEL DIÁLOGO Y LA CULTURA DEL ENCUENTRO

PONTIFICIA ACADEMIA SCIENTIARVM

# PONENCIAS

SEMINARIO

# DERECHO HUMANO AL AGUA

## Aportes y perspectivas interdisciplinarias sobre la centralidad de las políticas públicas en la gestión de los servicios de agua y saneamiento

23 y 24 de febrero de 2017
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"En realidad, el acceso al agua potable y segura
es un derecho humano básico, fundamental y universal,
porque determina la sobrevivencia de las personas,
y, por lo tanto, es condición para el ejercicio de los demás
derechos humanos."
(*Laudato Si'*, 30)

# EJE 3

## ECOLOGÍA INTEGRAL: UNA MIRADA CONJUNTA DE TRABAJADORES, CIENTÍFICOS, POLÍTICOS Y EDUCADORES EN LA CONSTRUCCIÓN DE UN LIDERAZGO PARA UNA PARA UNA CULTURA DEL ENCUENTRO

## Panel 6

# INNOVACIONES TECNOLÓGICAS Y DE GESTIÓN EN EL ÁMBITO DEL SANITARISMO Y EL FUTURO DEL TRABAJO

# TECHNOLOGICAL AND MANAGEMENT INNOVATIONS IN SANITATION AND THE FUTURE OF LABOUR

**Cecilia Tortajada**[71]

Water resources globally have become more limited because of physical scarcity, over-exploitation and pollution. The end result has been that more options for water supplies have had to be developed, including the production of non-conventional sources of water such as reused water from municipal sources and desalination of seawater or brackish water.

The potential of reused water for potable use has been explored for decades for potable uses. Studies have focused on safety, health and water quality considerations, social perceptions, positive and negative environmental impacts, and more advanced and cost-effective technologies. Guidelines on water quality have been developed nationally and internationally to ensure that reused water becomes a reliable source of safe, clean water. So far, the main constraint for implementation of reused schemes in many cases has been lack of public support due to perceived health hazards and environmental impacts.

Windhoek in Namibia from 1968 (Van Rensburg, 2016), and the city state of Singapore from 2003, have been the pioneers in producing high-quality reused water for potable use. In both cases, policy, planning, management, technological development, monitoring, regulation, business models, public communication and awareness campaigns, as well as political support have been essential for the long-term implementation of the schemes.

In Singapore, reused water is obtained through two products. One is industrial water, a lower grade of reclaimed water for nonpotable use in industries. The second one is NEWater, a very high quality reused water for both potable and nonpotable uses. NEWater is used in water-intensive industries such as wafer fabrication plants, power generation and petrochemical industries, as well as in commercial and public buildings for air-conditioning cooling towers. NEWater for potable use requires additional treatment steps that include reverse osmosis, filtration and ultraviolet disinfection. It is then injected into the reservoirs where it mixes with rainwater and undergoes further treatment to potable water (Lee and Tan, 2016). In terms of cost, NEWater is more expensive than Industrial Water because of this additional treatment. The membrane bioreactor (MBR), a combination of the conventional activated-sludge process and membrane filtration, produces effluent of consistently good quality. Industrial water treatment was introduced in 1966 and NEWater was introduced in 2003.

NEWater can cover up to 30% of total water demand which in 2015 was 1179 million cubic metres. The plan is to increase the capacity so that it covers up to 55% of demand by 2060 for which technology will have to improve much further.

Technology for reuse is thus well established. This refers mainly to membrane technology that is able to remove contaminants that other processes are not able to remove with the same degree. Its cost has reduced with time resulting in the increase of wastewater treated to very high quality standards. The technology increases operational and maintenance requirements,

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mainly the cost of operations and required skill levels of operation personnel (Van Rensburg, 2016).

Scarce water resources have the potential to limit socio-economic growth and affect quality of life. Within this framework, reused schemes for potable use are being increasingly implemented in cities in developed countries. In all cases, these have been triggered by scarcity.

## REFERENCES

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