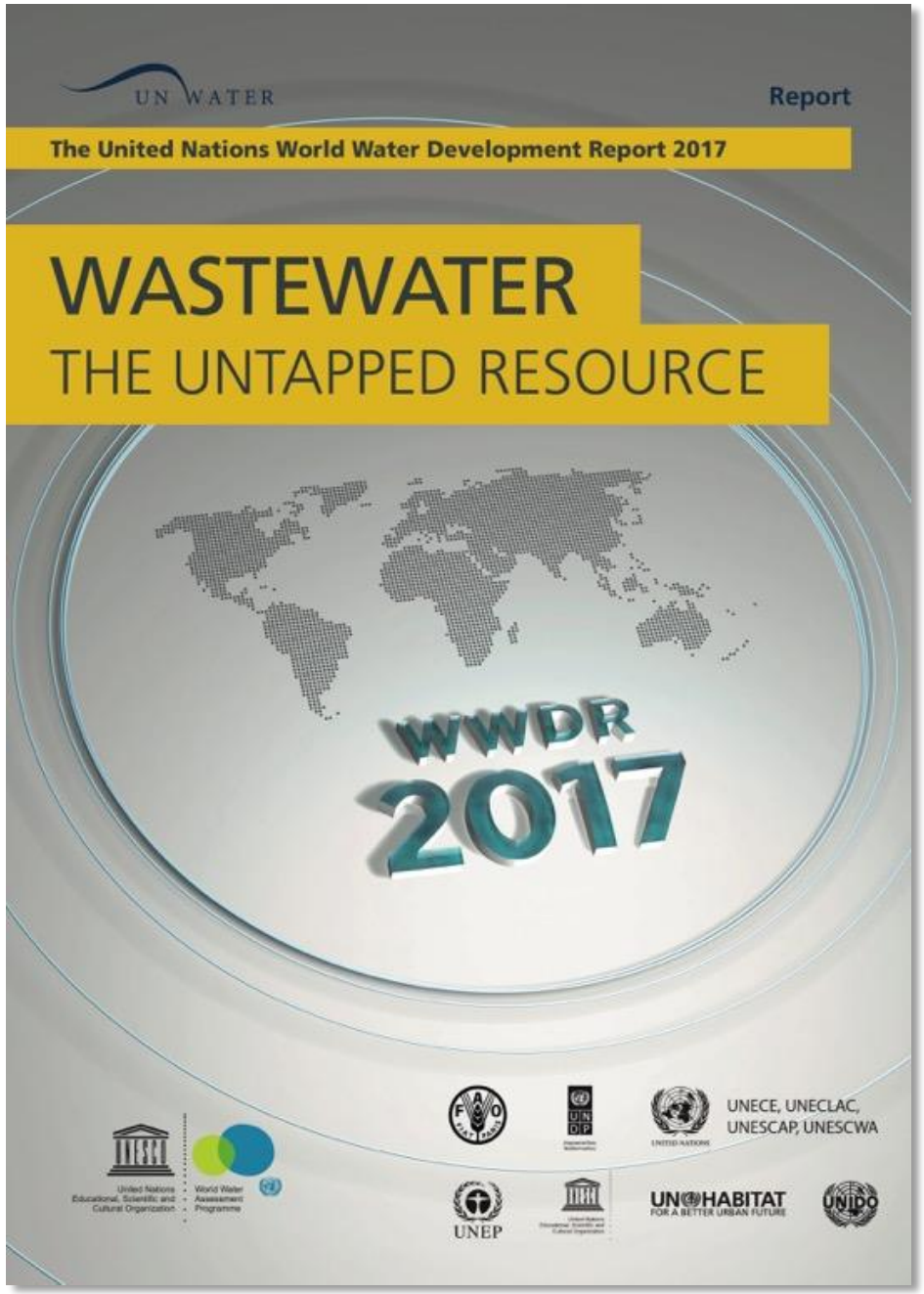


UN WATER

United Nations Educational, Scientific and Cultural Organization

World Water Assessment Programme

Improved wastewater management generates social, environmental and economic benefits essential to achieving sustainable development

John Payne
Consultant to UNIDO

Date March 22, 2017

Download the Report at:

www.unesco.org/water/wwap/wwdr

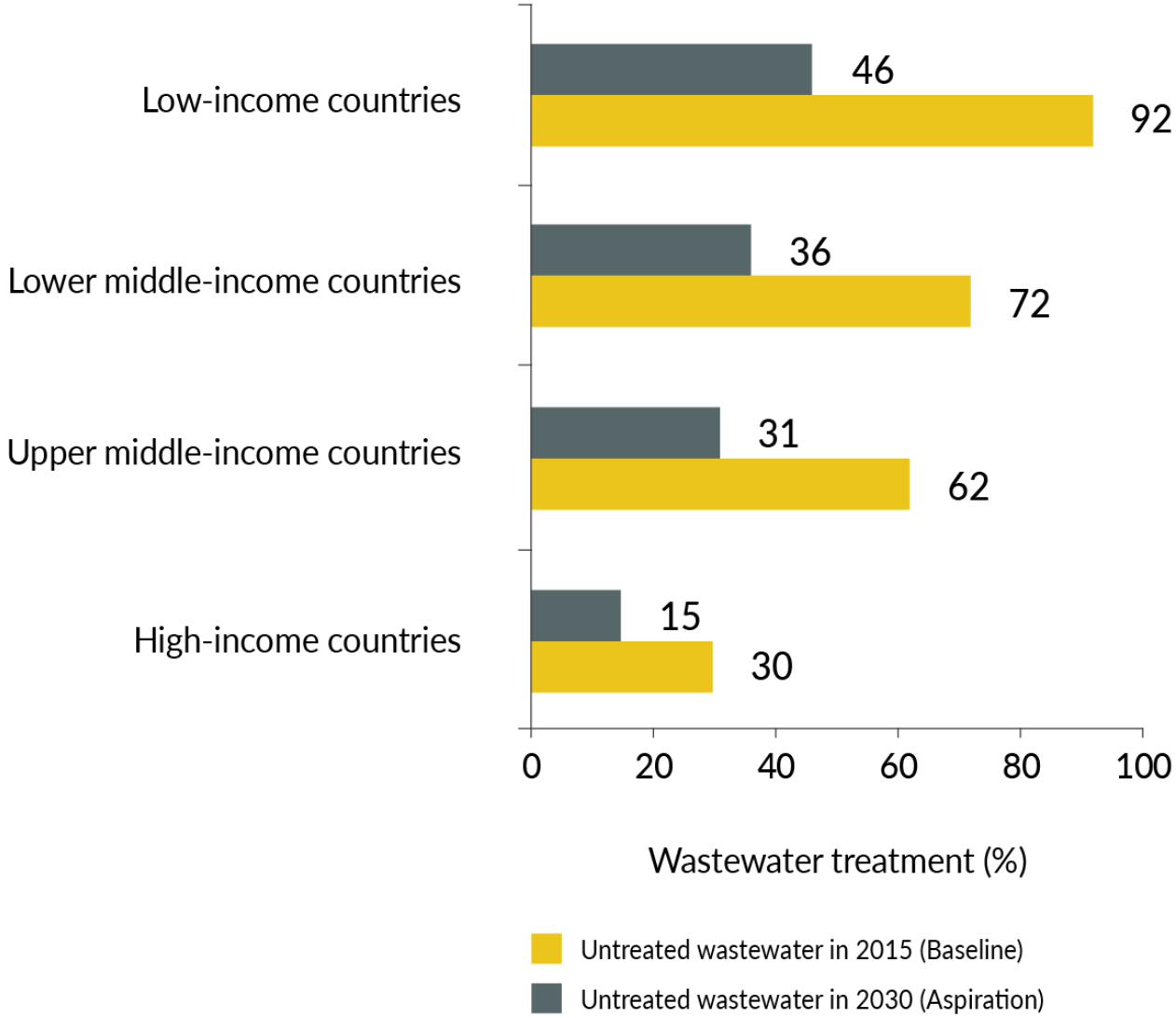
World Water Development Report

Based out of 18th Century Villa Colombella near Perugia in Italy

- Flagship publication of UN-Water
- Concrete example of the UN system ‘delivering as one’ in the field of water
- Published annually on World Water Day
- Designed, prepared and coordinated by the World Water Assessment Programme (WWAP) of UNESCO and financially supported by the Government of Italy

THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

SDG Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally



Source: Based on data from Sato et al. (2013)

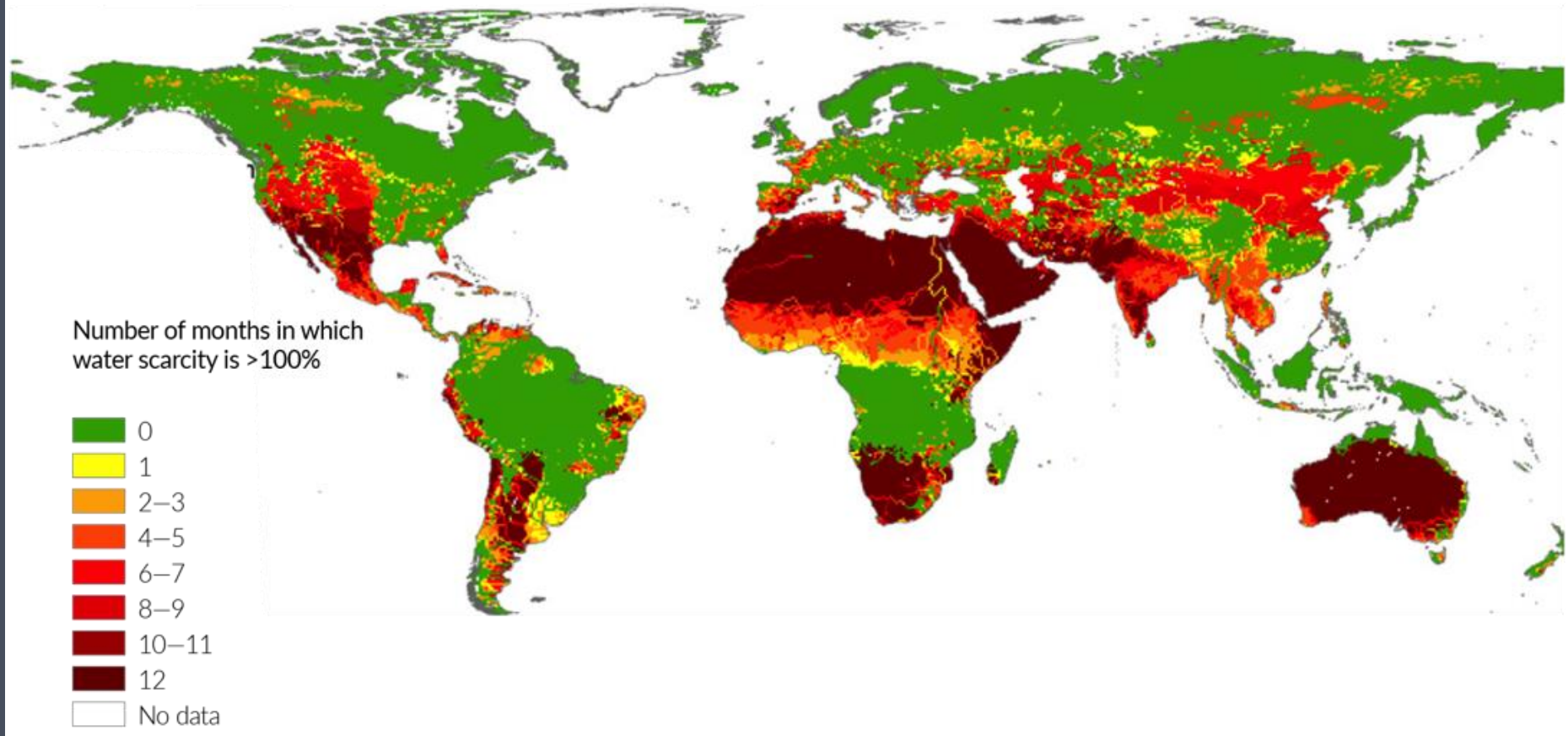
Source: Based on data from the World Bank (n. d.)

accelerating urbanization

Additional 2.3 billion people living in cities by 2050

INCREASING WATER SCARCITY

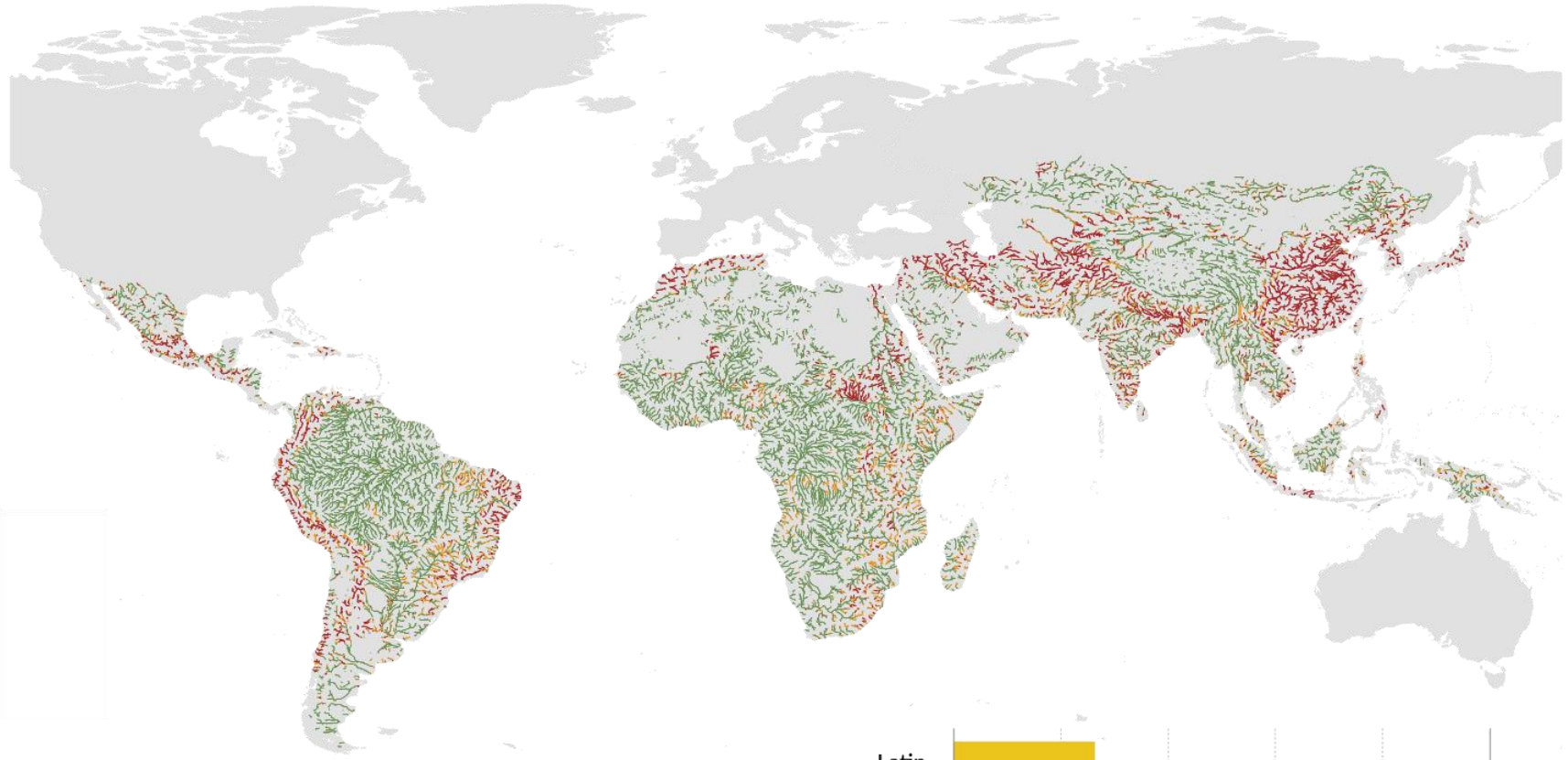
Two thirds of the world's population currently live in areas that experience water scarcity for at least one month a year

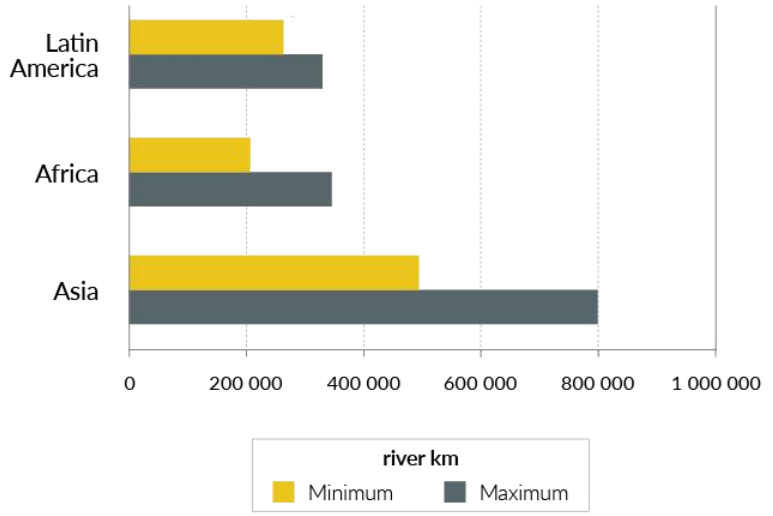


Source: Mekonnen and Hoekstra (2016)

degradation of water quality

Severe pathogen pollution affects around one-third of all river stretches in Latin America, Africa and Asia, putting the health of millions of people at risk



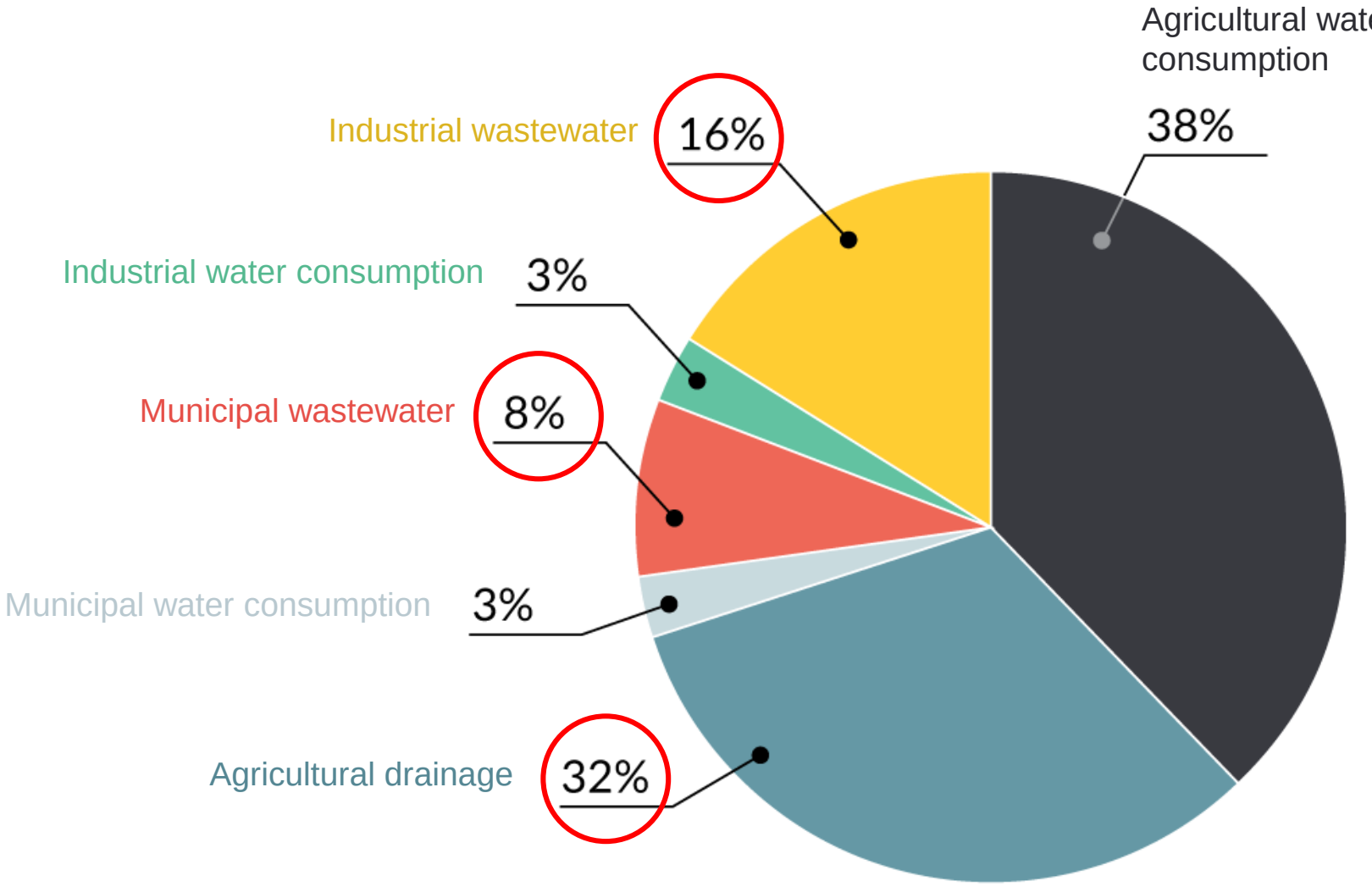


© CESR, University of Kassel, April 2016, WaterGAP3.1

Source: UNEP (2016)

more wastewater than ever

As the overall demand for water grows, the quantity of wastewater produced and its overall pollution load are increasing worldwide



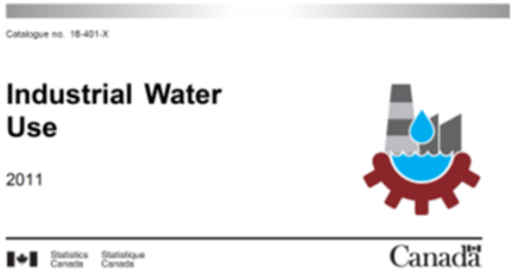
Source: FAO, based on data from AQUASTAT (n.d.a.), Mateo-Sagasta et al. (2015), and Shiklomanov (1999)

Extent of industrial wastewater generation

Globally, data and information concerning the volume of wastewater produced by industry are very deficient.

- The volumes of industrial wastewater will double by 2025 “relative to today’s levels” (UNEP FI, 2007)

- European Union limited data
  - wastewater generation has generally decreased
  - manufacturing the greatest generator of wastewater among the main industrial sectors



In Canada thermal-electric power was by far the largest user and discharger of water

Industrial wastewater quality

Toxicity, mobility and loading of industrial pollutants have potentially more significant impacts on water resources, human health and the environment than actual volumes of water.

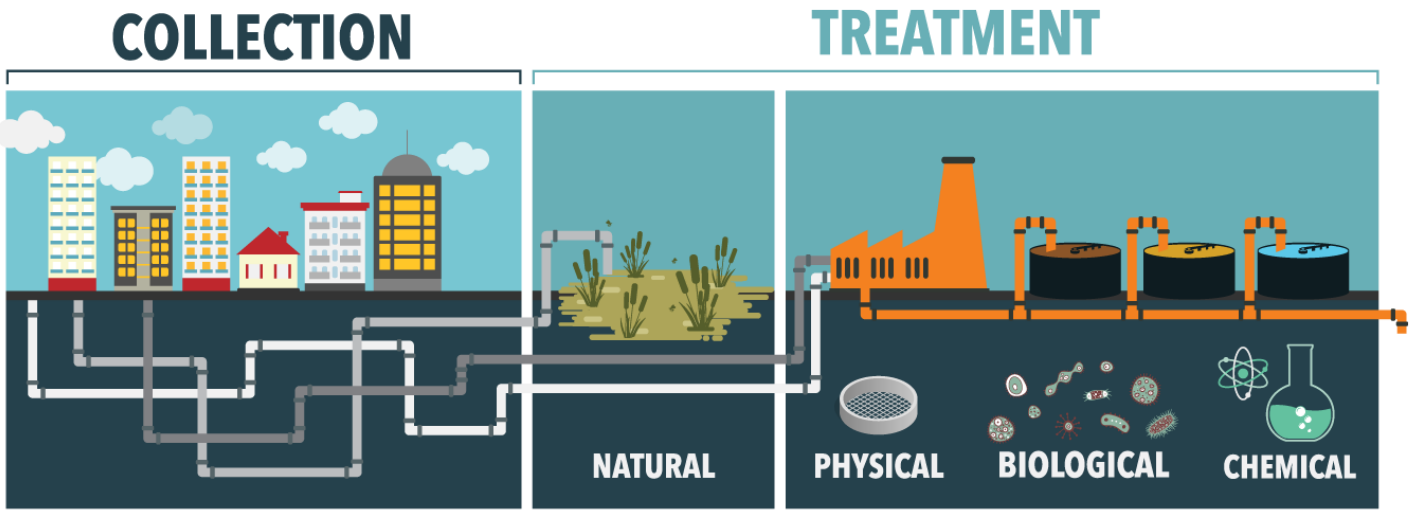
- More data available - Pollutant Release and Transfer Registries (PRTRs)
- Characterized by a broad spectrum of pollutants
  - Chlorinated organic compounds and hydrocarbons … from pulp and paper, iron and steel, and mining.
  - High BOD, COD, suspended solids (SS) … from the food, brewing and dairy industries … plus antibiotics, pesticides and insecticides as well as variable pH.
  - A huge variety from textiles … disinfectants, biocides, insecticide residues, detergents, oils, knitting lubricants, spin finishes, spent solvents, anti-static compounds, stabilizers, surfactants, organic processing assistants, cationic materials, colour.

WASTEWATER:
Not a
BURDEN
but a
VALUABLE
RESOURCE

REDUCING or PREVENTING POLLUTION at the SOURCE

Pollution prevention and the minimization of wastewater flows should be given priority over traditional ‘after-use’ treatment whenever possible

REMOVING CONTAMINANTS from WASTEWATER: COLLECTION and TREATMENT

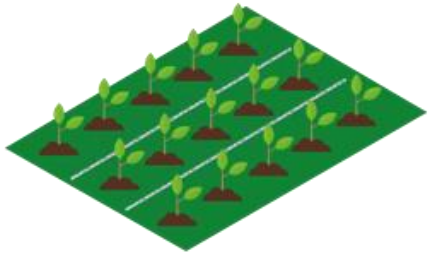


By 2020 the market for industrial water treatment technologies is predicted to grow by 50%

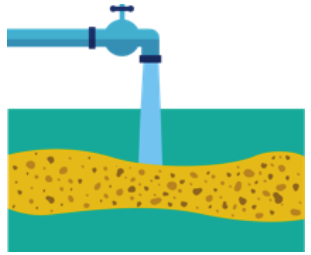
Healthy ecosystems can also complement engineered solutions to wastewater treatment in a cost-effective manner

REUSING WATER

IRRIGATION



AQUIFER RECHARGE



INDUSTRIAL PROCESSES

HEATING/COOLING

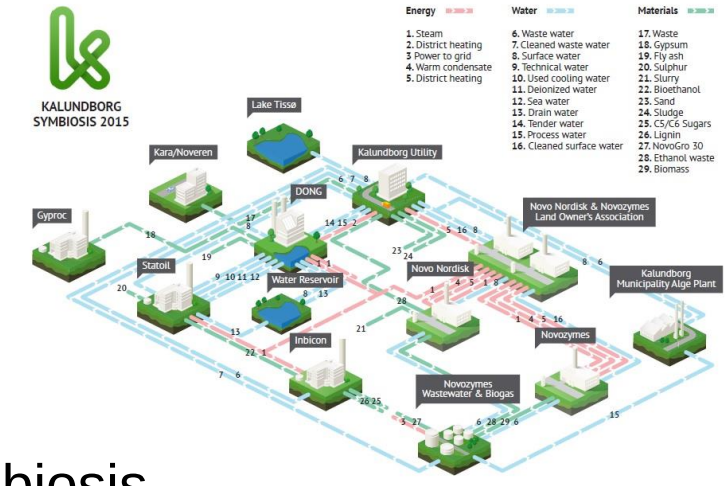
POTABLE WATER

Treated wastewater is a safe and reliable source of water that can be used to offset water scarcity

REUSING WATER

Industrial Symbiosis: cooperation between plants

- exchange of process water
- recycling of treated wastewater



Kalundborg Symbiosis

Source of illustration: Kalundborg Symbiosis
http://www.symbiosis.dk/en/diagram

Eco-industrial parks which locate industries adjacent to one another in such a way as to take convenient advantage of wastewater management and recycling

RECOVERING USEFUL BY-PRODUCTS

Wastewater’s vast potential as a source of recoverable resources remains largely underexploited

The recovery of nutrients and energy can add significant revenue streams to help cover the investment and operational costs of wastewater treatment and sanitation

Take home messages from the WWDR 2017

1. Wastewater **increasing** worldwide
2. Vast majority released **without treatment**
3. Affordable (‘**low-cost**’) treatment options are available
4. Reliable and sustainable **source** of water
5. Sustainable source of energy, nutrients and other recoverable **by-products**
6. In a circular economy, wastewater use and by-product recovery can generate new **business opportunities** while helping finance sanitation services
7. The costs of improved wastewater management are outweighed by **benefits** in terms of human health, socioeconomic development and environmental sustainability
8. Essential for achieving the **2030 Agenda** for Sustainable Development