USE CASES - Digitalization of the Water Sector

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This document lists the use cases to be used as part of the “Digitalization of the Water Sector” thematic call. It aims at developing sustainable services leveraging space assets and technology in consort to address key challenges and opportunities to develop operational solutions. The use cases presented focus on water sustainability and water resilience.

When writing the initial proposal (APQ/APQ+ proposal), the applicant will make clear which use case(s) their solution will address, if chosen from those listed here.

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Use Cases

1. Water Sustainability

According to UN-Water, water sustainability covers all the aspects needed to ensure a responsible management and use of water resources in a way that meets current human, environmental and economic needs without compromising the ability of future generations to meet their own needs. It includes: water quality monitoring, water availability management, water pollution and monitoring of industrial charges. The latter is particularly important in the industrial sector, which can significantly contribute to the pollution of water bodies if proper measures are not implemented. Key industries involved include textiles, agriculture, chemical, pharmaceutical and others.

Consultation with key partners have indicated the following topics as priorities:

- Water Quality Monitoring
- Water Availability Management
- Water Sanitation
- Monitoring of Industrial Discharge
- Water Pollution
- Global freshwater

Water Sanitation is also considered as part of the water sustainability as it deals with digitised sanitation systems that optimise data for operating efficiencies, maintenance, plus consumer use and health information insights.

2. Water Resilience

Water resilience encompasses the measures and systems required to ensure the efficient use of limited water resources, while minimizing the impacts of climate change, population growth, and aging or inadequate infrastructure. It involves the ability of water systems to anticipate, withstand, adapt to, and recover from disruptions. Key components include infrastructure monitoring, reduction of non-revenue water, prevention of sewage system failures, resilience to droughts and flooding, minimization of system losses, and the promotion of urban climate resilience.

Consultation with key partners have indicated the following topics as priorities:

- Infrastructure Monitoring
- High Non-Revenue Water

- Failure in Sewage
- Resilience to drought and flooding
- Infrastructure and system losses
- Urban climate resilience

Role of satellite technology and data

SatEO data are essential inputs for monitoring (near) real-time water quality indicators (e.g., turbidity, algal blooms, chlorophyll-a) and for forecasting and modelling future scenarios. EO data can determine the influence of environmental and anthropogenic variables driving impacts on watersheds and ecosystems. Satellite-based images can be incorporated into strategic modelling and operational workflows of water utilities and contractors for monitoring ground movement, which can impact the risk of pipe failure. EO data are essential also to analyse the impact of climate related events such as flooding and drought.

SatNav can be used for geo-location of local sensors underpinning GIS technologies and feeding into more accurate models of water catchment areas. IoT combined with remote sensing can be adopted to manage freshwater resources and improve water basin health through informed decision-making. Satellite imagery can contribute to identifying network anomalies and SatNav facilitate maintenance scheduling and coordination. GNSS Interferometric Reflectometry (GNSS-IR) is a method that can be used to measure water levels.

SatCom guarantee asset tracking and efficient responses also in remote areas and during emergencies situation to deliver water management data. SatCom supports as well early warning systems for droughts and floods.