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Assessing and Mitigating the Global Freshwater Crisis (6)

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SPACEBORNE L-BAND SAR REMOTE SENSING FOR POTABLE WATER LEAK DETECTION: A NOVEL SOLUTION FOR ADDRESSING THE GLOBAL WATER CRISIS

Abstract

The global freshwater crisis poses a serious threat to the sustainable development and wellbeing of society. One of the major challenges in this context is the efficient, timely and capital intensive detection of potable water leaks, which not only leads to loss of water resources but also increases water stress and damages infrastructure. In this regard, the use of spaceborne remote sensing technology has shown great potential for providing accurate and cost-effective solutions for water utilities operations.

According to a 2018 International Water Association report the global volume of Non Revenue Water (NRW) loss has been estimated to be 346 million cubic meters per day or 126 billion cubic meters per year. With a conservative loss of USD 39 billion per year.

ASTERRA has developed a novel methodology for the detection of potable water leaks based on spaceborne L-Band Synthetic Aperture Radar (SAR) remote sensing. The L-Band SAR technology offers several advantages, including high sensitivity to soil moisture and the ability to penetrate vegetation and ground cover. These unique features make L-Band SAR well-suited for leak detection applications, including potable wastewater leak detection.

Water production and distribution is valued between 10

ASTERRA's solution utilizes advanced image processing algorithms deep learning models to detect and localize potable water leaks. The L-Band SAR data is acquired by JAXA's ALOS-2 PALSAR-2 CONAE's SAOCOM-1A 1B satellite.

Since it's commercialization in 2016 ASTERRA have positively verified more than 80,000 leaks globally, saving more than 950 million cubic meters per year which translate to a saving of more than 570800 Megawatt's of power per year due to the reduction in water production and pumping. The latter converts to a GHG reduction of more then 210 million Kg CO2. To demonstrate the effectiveness of the proposed solution, we present case studies from different regions that show the successful detection and localization of potable water leaks. The results show that the L-Band SAR technology can detect leaks with high accuracy and resolution, allowing water utilities an efficient quick respond to mitigate the impact of the leaks.