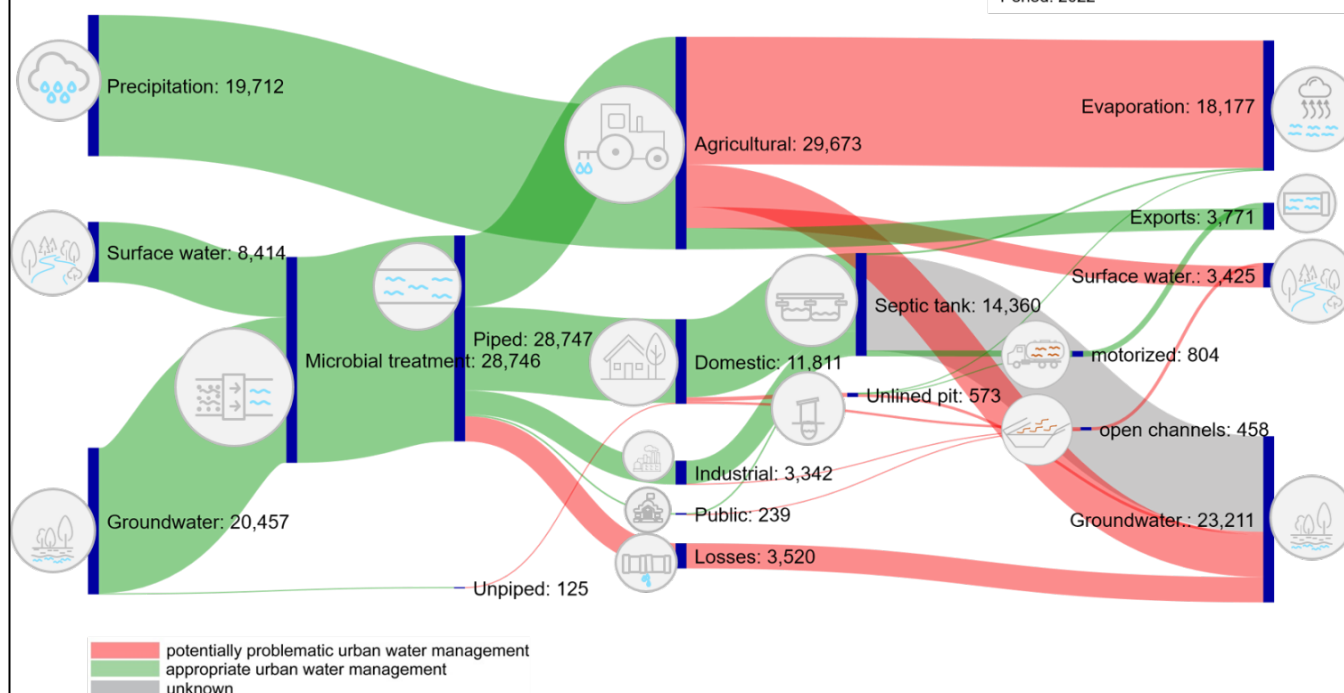


Water Flow Diagram of Santa Maria Bulacan

Area: 91km²
Population: 289,820 (2020)
Population density: 3,188 per km² (2020)
Unit: 1,000m³
Period: 2022



Partners

National Economic and Development Authority (NEDA), Maynilad Water Academy, the Philippine Association of Water Districts

Data sources

Municipal Government Unit of Santa Maria Bulacan, the Santa Maria Water District, private water concessionaires, the National Irrigation Association and the municipality's Socioeconomic Plan.

System boundaries

Municipality of Santa Maria Bulacan, Philippines (91 km²).

Context and motivation

The municipality of Santa Maria lies in the Philippine province Bulacan. Over 90% of the economic activities were in the service sector, with marginal industry, agriculture and fisheries sectors.

Interpretation and main learnings

In Santa Maria Bulacan approximately 30% of the drinking water originated from surface water, whereas 70% originated from groundwater. After chlorination, the piped water was distributed to the different users. The domestic sector used 41% of the treated water, the industrial sector 12%, the public sector 1%, agriculture 34% and 12% were lost in the distribution network. There was no sewer system, the wastewater was either collected in septic tanks (93%) and in pit latrines (4%) or was collected in open channels and directly discharged to the surface water (3%). The pit latrines were unlined and therefore polluted water leaked from the pit latrines into the groundwater. A small proportion of septic tanks were regularly emptied with trucks and the sludge was exported, but it is unknown what happens to the rest of them (grey flow). Agriculture accounted for the major part of the water consumption. In Santa Maria, rain-fed agriculture was considered in the diagram as opposed to other case studies. It was estimated that 19'712 m³ per year of precipitation fed into agriculture lands and that 60% of the water used in agriculture evapotranspired, partly because inappropriate irrigation techniques were used in the area. Additionally, it was estimated that 10% of the polluted agricultural water flow into surface water bodies, 20% flew into groundwater and 10% of water from agriculture was exported as agricultural products.

Actions triggered

The WFD was well received by the stakeholders included and triggered a dialogue on water utilization and wastewater treatment in Santa Maria. The WFD was also presented at the 44th Philippine Association of Water Districts Convention 2023.