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Editorial

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Editorial

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The Middle East region is one of the most freshwater-stressed places in the world. Although the region's population constitutes about 5% of the world's population, its freshwater resources represent only 1% of the world's water resources. Although some countries have the highest per-capita water demand, these countries fall under the freshwater poverty level of 1000 m^3 per year. Moreover, countries of the region only receive between 100 and 300 mm of rain annually on average, and with a climate that is hot and dry, the water evaporation rates are the highest worldwide. A number of countries in this region depend on treated wastewater as an important water resource, which is largely reused in irrigation and landscape. Water reuse is a viable alternative to the more costly – and environmentally unfriendly – use of desalinated water to augment their freshwater resources for sustainable development. In addition to the water demand, the production of solid waste is also high in some countries due to the standards of living. In most instances these wastes are not segregated for material recovery, but instead disposed of in landfills. While the technologies and methods to reuse treated effluent and recover materials from solid wastes exist, lack of public support, social and religious perceptions and practices often keep these technologies at bay and do not allow for the implementation of sustainable management options. This themed issue of *Journal of Environmental Engineering and Science* covers environmentally sustainable options for the treatment and/or recovery of materials from waste streams in three countries in the Middle East.

The first paper by Baawain *et al*. (2019) is a case study carried out in Muscat, Oman, which investigates reuse options for treated wastewater effluents. Although the treated effluent was to the standard of government regulations, a survey of people show that the public was reluctant to accept reuse that interfered with the food or drinking water supply.

The second paper (Abu Qdais *et al*., 2019) investigates the broader impact of wastewater reuse on climate change in Jordan. The authors found that 92% of the treated wastewater has been reused primarily for irrigation, which accounts for 52% of the water demand of the country in 2017. The authors conclude that reuse of treated wastewater could be a possible strategy for adapting to climate change that enables reduced use of water resources, with the potential to reduce the water deficit up to 48% by 2025.

The third article (Gharagheer *et al*., 2019) investigates current practices of recovering recyclable materials from municipal solid waste to determine what changes are needed to achieve Jordan government's target of 50% recovery by the year 2034. A comparison is made between recycling practices in Jordan with that in developed countries.

The fourth article by Assaf *et al.* (2019) is a case study that examines the socio-demographic and environmental awareness of recycling attitude and behaviour in the Emirate of Ras Al Khaimah in the United Arab Emirates (UAE). A statistical analysis is made based on a survey of stakeholders.

The fifth article (Shanableh *et al*., 2019) investigates the presence and fate of contaminants of emerging concern (CECs) in raw wastewater and treated effluent at a treatment plant in Sharjah, UAE. A total of 57 CECs were detected and identified. Since effluent from the wastewater treatment plant is reused, this study provides important information on the risks associated with reuse of the effluent.

The final paper (Rahmaninezhad, 2019) investigates the treatment of hypersaline produced water from petroleum industry using a sequencing batch bioreactor–membrane bioreactor system with halophilic bacterial consortium. The system proposed was able to produce high-quality water with low oil content.

We hope that the papers in this issue will provide a better understanding of the issues surrounding sustainable practices and barriers faced in achieving sustainable development goals in the Middle East. As Honorary Editors for this issue, we are keen to hear the views and invite the readership to comment on the articles in this themed issue by submitting up to 500 words to the Editor at journals@ice.org.uk.

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