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1. River water pollution by wastewater can cause significant negative impact on the aquatic sustainability. Hence, accurate modeling of this complicated system and its cost-effective treatment and reuse decision is very important because this optimization process is related to economic expenditure, societal health, and environmental deterioration. In order to optimize this complex system, we may consider three treatment or reuse options such as micro screening filtration, nitrification, and fertilization-oriented irrigation on top of two existing options such as settling and biological oxidation. The objective of this environmental optimization is to minimize the economic expenditure of life cycle costs while satisfying the public health standard in terms of groundwater quality and the environmental standard in terms of river water quality. Particularly, this study improves existing optimization model by pinpointing the critical deficit location of dissolved oxygen sag curve by using analytic differentiation. Also, the proposed formulation considers more practical constraints such as maximal size of irrigation area and minimal amount of filtration treatment process. The results obtained by using an evolutionary algorithm, named a parameter-setting-free harmony search algorithm, show that the proposed model successfully finds optimal solutions while conveniently locating the critical deficit point.
2. Environmental water experts are mostly looking at pathogens outside of the host. They are detecting pathogens in environmental samples, understanding their environmental fate or designing approaches, such as water disinfection, to remove them from the environment.

While

Water engineer undertake a wide rang of technical and nontechnical duties in their role of supplying, managing and maintaining clean water and sewage/waste water services and preventing flood damage