ismail_asian

by Ismail_asian Ismail_asian

Submission date: 09-Dec-2022 01:55PM (UTC+0700)
Submission ID: 1976147048
File name: ajw_2022_19-1_ajw-19-1-ajw220004_ajw-19-ajw220004.pdf (323.23K)
Word count: 2323
Character count: 13762

Asian Journal of Water, Environment and Pollution, Vol. 19, No. 1 (2022), pp. 23-26.
DOI 10.3233/AJW220004

Implementation of Renewable Energy Indicators to Manage Water Supply Resources

Ismail Husein, A. Surendar[1], Marsel Kadyrov[2], Alireza Heidary[3]*, Mohsen Mortazavi[4] and Marischa Elveny[5]

Department of Mathematics, Universitas Islam Negeri Sumatera Utara, Medan, Indonesia
[1]Department of Pharmacology, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai, India
[2]Department of Development and Operation of Oil and Gas Fields, Tyumen Industrial University, Tyumen, Russia
Department of Civil and Environmental Engineering, Shiraz University, Shiraz, Iran
[4]Department of Computer Education and Instructional Technologies, Eastern Mediterranean University (EMU) Famagusta, Cyprus
[5]Data Science & Computational Intelligence Research Group, Universitas Sumatera Utara, Medan – 20155, Indonesia
✉ Alireza.heidary66@gmail.com

Received February 5, 2020; revised and accepted June 10, 2021

Abstract: Water management policies are considered critical issues in various industries to provide relevant demand for urban areas. In this study, renewable energy indicators are used to determine the efficiency of each indicator on water management issues. Therefore, it is evident that these indicators would enable policymakers to make proper decisions and propose novel methods to manage water resources in developed areas. The implementation of harnessing technologies would be the most influential index in developing indicators in the water management system. It is crucial to rebuild and innovate new technologies to eliminate the unnecessary expenses of water treatment virtually.

Key words: Harnessing technologies, sustainable indexes, environmental aspects, policy makers.

Introduction

The water scarcity problem is one of the critical issues, especially due to the shortcomings of rainfalls as a result of the increase in global warming in the recent decades; various energy sectors have proposed strategic plans and management to improve water resource utilisation (Bischoff-Mattson et al., 2020; Davarpanah and Mirshekari, 2019; Kahil et al., 2016; Mollahosseini et al., 2019; Nesic et al., 2020; Urquiza and Billi, 2020; Valizadeh and Davarpanah, 2020). It is necessary to provide a relevant demand for energy and other sectors to supplement water treatments (Alexandratos et al., 2019; Davarpanah et al., 2018, 2019; Hu et al., 2020; Zanker et al., 2007; Zhou et al., 2019). Although various industrial plants have developed novel methods to treat flow-back water, there are still some challenges and concerns on environmental issues (Appiah et al., 2020; Arshad et al., 2020; Asano, 2002; Dibazar et al., 2020; Jin and Davarpanah, 2020; Roychaudhuri et al., 2019). From environmental perspective, it might correspond to the solid particles and hazardous materials, which seriously add to the pollution level and atmosphere issues (Wang et al., 2001; Zolfani and Saparauskas, 2013). Policymakers have encouraged different research and field engineers to propose appropriate and

*Corresponding Author

applicable preplanning for water resources management to avoid water loss during treatment processes (Everitt, 2020; Gorondutse et al., 2020). In order to eliminate the virtual and real expenses of water treatment, sustainable indicators were defined based on the urban area's challenges in water supply problems. This proper management corresponds to many people in urban areas that needed large volumes of freshwater to proceed with their routine activities (Malik et al., 2015; Meneses-Jácome et al., 2016; Tryakina, 2017).

Makropoulos et al. (2008) developed multi-decision criteria-making approaches to provide sustainable and optional planning in water resources management, especially in urban areas. They concluded that integrated systems in water resources management would be essential and necessary to control the water loss issues and their further problematic concerns. Moreover, algorithm genetic was implemented to clarify the developed model and assess a life cycle assessment in urban areas. According to Van de Meene et al. (2011), water resources management in urban areas has been approved by energy sectors and governmental faculties, which can help develop a numerical and conceptual model. This measure can help us to have proper sustainable planning for urban areas.

This study aims to develop a conceptual model to manage water resources by expressing new sustainable indicators of environmental, economic, and policy concepts. The implementation of harnessing technologies would be the most influential index in developing indicators in the water management system. It is crucial to rebuild and innovate new technologies to eliminate the unnecessary expenses of water treatment virtually.

Methodology

Indicators Definition

To quantify the required information and develop models to simplify the management plans, indicators are of interest and appropriate tools to obtain sustainable strategies. The proper definition of these indicators is considered an essentially vital issue in various industries to develop a development plan for water management. It would be applicable for urban areas regarding the decision criteria making policies. To virtually eliminate the time-consuming modeling aspects, it is urgent to add effective indicators to plan water management projects appropriately. Thereby, such factors as affordability, equality, water management systems, preplanning, and harnessing technologies were defined to predict energy sustainability, especially in urban areas. To conceptually define and interpret sustainable indicators, water management indicators should be considered in three different economic, environmental, and policy concepts. Table 1 describes these three efficient factors in more detail. These concepts are schematically depicted in Figure 1.

Results and Discussion

Due to the importance of water resources and water reuse treatment in urban planning, proper management and predefined estimations to overcome this issue

Table 1: Effect of sustainable factors in water management phenomenon

Environment concept	Environmental issues have always been considered as one of the most critical issues in water management systems. As a result, it should be taken into account to develop and renovate environmentally-friendly techniques to treat the flow-back water from industrial plants. On the other hand, regarding the enormous demand of various industries for freshwater, proposed methods should have a less environmental impact, especially near urban areas.
Economic concept	As the economic aspect of every water management plan is essential for governments, determination of water management limitations, maintenance operations, cost efficiency, and optimization techniques are required. These efforts would be performed by considering relevant indicators and economic plans to have a proper and sustainable overview in urban areas.
Policy concept	Water supply and its management would be critical issues in strategic and policy concepts that should be considered one of the public issues in urban areas. Thereby, new legislation and policies should be considered in managing water resources to have a fundamental understanding of sustainable energy demand; however, its various challenges and substrates should be of importance for developed and developing countries. On the other hand, governments should implement novel and updated plans to manage and treat the water resources that are utterly dependent on population growth in recent decades.

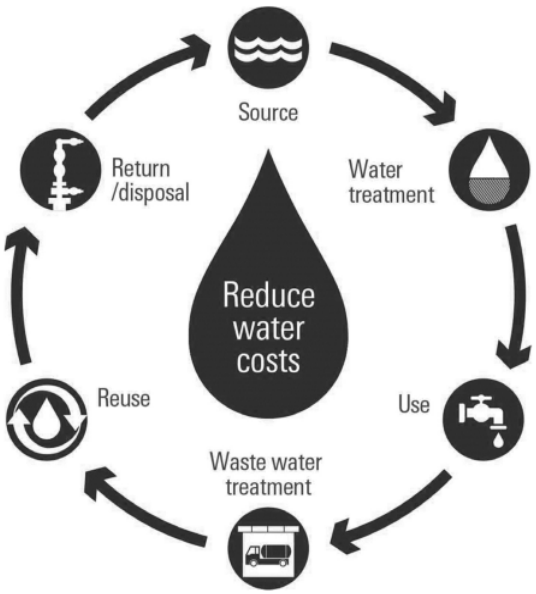

Figure 1: Different steps and concepts to manage water resources.

are necessary to improve life quality and assurance. To do this, provision of a relative balance with water supply as energy indicators and achieving sustainable programming for future generations have always been a concern for policymakers. In order to have efficient and detailed urban planning, indicators should be defined to solve water issues and respond to government demand for various industries. The following strategies and implementations should be detached from the system to propose a viable and confidential water management system. It is explained in Table 2 as sustainable indexes.

Chen et al. (2012) systematically reviewed the water recycling units to propose life cycle assessment criteria that can help various policy makers present appropriate risk assessments for environmental aspects. According to our results shown in Table 2, environmental issues would be the critical issues in sustainable management and preplanning of water resources. Behanduri et al. (2015) concluded that investment and economic issues would be important for sustainable management of water treatment, which is the focus of this study.

Conclusion

Proper management and treatment of water resources have imposed several challenges to industrial plants to ensure the confidentiality of sustainable energies in developed countries. Therefore, the purpose of this study is to define relevant, sustainable indicators such as environmental, economic, and policy concepts and what indexes would profoundly impact the water management systems. The implementation of harnessing technologies would be the most influential index in developing indicators in the water management system. It is crucial to rebuild and innovate new technologies to eliminate the unnecessary expenses of water treatment virtually.

Reference

Alexandratos, S.D., Barak, N., Bauer, D., et al. (2019). Sustaining water resources: Environmental and economic impact. *ACS Sustain Chem Eng*, **7(3):** 2879-2888. https://doi.org/10.1021/acssuschemeng.8b05859

Appiah, B., Poudyal, A., Anum, D.A., et al. (2020). Challenges and facilitators of public engagement with water, sanitation, hygiene and other environmental health issues in Ghana and Uganda: Perspectives of scientists, journalists and the public. *J Water Sanit Hyg Dev*, **10(1):** 14-26. https://doi.org/10.2166/washdev.2019.019

Table 2: Relevancy of sustainable indicators and indexes

Indicators/Indexes	*Environment concept*	*Economic concept*	*Policy concept*
Harnessing technologies	✓	✓	✓
Affordability	✓	–	–
Development and strategic planning	✓	✓	✓
Applicability	✓	–	✓
Investment	–	✓	–
Sustainable reuse	✓	–	✓
Treatment processes	✓	–	–

Arshad, H.M., Saleem, K., Shafi, S., et al. (2020). Environmental awareness, concern, attitude and behavior of university students: A comparison across academic disciplines. *Polish J Environ Stud*, **30(1):** 561-570. https://doi.org/10.15244/pjoes/122617

Asano, T. (2002). Water from (waste)water – the dependable water resource (The 2001 Stockholm Water Prize Laureate Lecture). *Water Sci Technol*, **45(8):** 23-33. https://doi.org/10.2166/wst.2002.0137

Bischoff-Mattson, Z., Maree, G., Vogel, C., et al. (2020). Shape of a water crisis: Practitioner perspectives on urban water scarcity and "Day Zero" in South Africa. *Water Policy*, **22(2):** 193-210. https://doi.org/10.2166/wp.2020.233

Davarpanah, A. and B. Mirshekari (2019). Experimental investigation and mathematical modeling of gas diffusivity by carbon dioxide and methane kinetic adsorption. *Ind Eng Chem Res*, 58(27): 12392-12400. https://doi.org/10.1021/acs.iecr.9b01920

Davarpanah, A., Mirshekari, B., Jafari Behbahani, T. and M. Hemmati (2018). Integrated production logging tools approach for convenient experimental individual layer permeability measurements in a multi-layered fractured reservoir. *J Pet Explor Prod Technol*, **8:** 743-751. https://doi.org/10.1007/s13202-017-0422-3

Davarpanah, A., Mirshekari, B. and A.A. Razmjoo (2019). A simulation study of water injection and gas injectivity scenarios in a fractured carbonate reservoir: A comparative study. *Pet Res*, **4(3):** 250-256. https://doi.org/10.1016/j.ptlrs.2019.02.001

Dibazar, S.Y., Salehi, G. and A. Davarpanah (2020). Comparison of exergy and advanced exergy analysis in three different organic rankine cycles. *Processes*, **8(5):** 586. https://doi.org/10.3390/PR8050586

Everitt, J. (2020). Implications of educational policy-making which encourages schools to collaborate with the community, external agencies, private companies, employers and voluntary organisations. *Soc Sci*, **9(4):** 1-18. https://doi.org/10.3390/socsci9040039

Gorondutse, A.H., Arshad, D. and A.S. Alshuaibi (2020). Driving sustainability in SMEs' performance: The effect of strategic flexibility. *J Strateg Manag*, **14(1):** 64-81. https://doi.org/10.1108/JSMA-03-2020-0064

Hu, X., Xie, J., Cai, W., et al. (2020). Thermodynamic effects of cycling carbon dioxide injectivity in shale reservoirs. *J Pet Sci Eng*, **195:** 107717. https://doi.org/10.1016/j.petrol.2020.107717

Jin, Y. and A. Davarpanah (2020). Using photo-fenton and floatation techniques for the sustainable management of flow-back produced water reuse in shale reservoirs exploration. *Water Air Soil Pollut*, **231:** 440. https://doi.org/10.1007/s11270-020-04812-7

Kahil, M.T., Albiac, J., Dinar, A., et al. (2016). Improving the performance of water policies: Evidence from drought in Spain. *Water (Switzerland)*, **8(2):** 34. https://doi.org/10.3390/w8020034

Malik, O.A., Hsu, A., Johnson, L.A. and A. de Sherbinin (2015). A global indicator of wastewater treatment to inform the sustainable development goals (SDGs). *Environ Sci Policy*, **48:** 172-185. https://doi.org/10.1016/j.envsci.2015.01.005

Meneses-Jácome, A., Diaz-Chavez, R., Velásquez-Arredondo, H.I., et al. (2016). Sustainable energy from agro-industrial wastewaters in Latin-America. *Renew. Sustain. Energy Rev*, **56:** 1249-1262.

Mollahosseini, A., Abdelrasoul, A., Sheibany, S., et al. (2019). Renewable energy-driven desalination opportunities – A case study. *J. Environ. Manage.*, **239:** 187-197.

Nesic, S., Zolotukhin, A., Mitrovic, V., et al. (2020). An analytical model to predict the effects of suspended solids in injected water on the oil displacement efficiency during waterflooding. *Processes*, **8(6):** 659. https://doi.org/10.3390/PR8060659

Roychaudhuri, B., Tsotsis, T.T. and K. Jessen (2019). Shale-fluid interactions during forced imbibition and flow-back. *J Pet Sci Eng.*, **172:** 443-453. https://doi.org/10.1016/j.petrol.2018.09.048

Tryakina, A.S. (2017). Development of sustainable water treatment technology using scientifically based calculated indexes of source water quality indicators. *J Min Inst.*, **227:** 608-612. https://doi.org/10.25515/pmi.2017.5.608

Urquiza, A. and M. Billi (2020). Water markets and social–ecological resilience to water stress in the context of climate change: An analysis of the Limarí Basin, Chile. *Environ Dev Sustain.*, **22:** 1929-1951. https://doi.org/10.1007/s10668-018-0271-3

Valizadeh, K. and A. Davarpanah (2020). Design and construction of a micro-photo bioreactor in order to dairy wastewater treatment by micro-algae: Parametric study. *Energy Sources, Part A Recover*, **42(5):** 611-624. Util Environ Eff. https://doi.org/10.1080/15567036.2019.1588425

Wang, H., Zhang, L., Dawes, W.R. and C. Liu (2001). Improving water use efficiency of irrigated crops in the North China Plain - Measurements and modelling. *Agric Water Manag.*, **48(2):** 151-167. https://doi.org/10.1016/S0378-3774(00)00118-9

Zanker, G., Kepplinger, W. and C. Pecher (2007). Incineration of solid food waste: A project about spent grain. *In:* Utilization of By-Products and Treatment of Waste in the Food Industry. pp: 273-278.

Zhou, N., Zhang, J., Khanna, N., et al (2019). Intertwined impacts of water, energy development, and carbon emissions in China. *Appl Energy*, **238:** 78-91. https://doi.org/10.1016/j.apenergy.2018.12.085

Zolfani, S.H. and J. Saparauskas (2013). SWARA metodo taikymas nustatant energetikos sistemos darnos prioritetinius rodiklius. *Eng Econ.*, **24(5):** 408-415. https://doi.org/10.5755/j01.ee.24.5.4526

ismail_asian

ORIGINALITY REPORT

16%	11%	13%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	iwaponline.com Internet Source	2%
2	V. Subramanian. "Editorial", Asian Journal of Water, Environment and Pollution, 2022 Publication	1%
3	www.bioinformation.net Internet Source	1%
4	Wenhua Huang, Yan Huang, Juan Ren, Jinglong Jiang, Marischa Elveny. "Prediction of Sand Production Through Porous Media: Mechanisms and Challenges to Optimising the Inefficiencies", Asian Journal of Water, Environment and Pollution, 2021 Publication	1%
5	hdl.handle.net Internet Source	1%
6	Khaled Elsaid, Enas Taha Sayed, Mohammad Ali Abdelkareem, Mohamed S. Mahmoud, Mohamad Ramadan, A. Olabi. "Environmental Impact of Emerging Desalination	1%

Technologies: A preliminary Evaluation", Journal of Environmental Chemical Engineering, 2020
Publication

7	Adesina Fadairo, Rasouli Vamegh, Ling Kegang, Olusegun Tomomewo, Ayokunle Ayinde, George N Iwenjora. "Modelling flow for finite conductivity in long horizontal oil wells", Energy Exploration & Exploitation, 2021 Publication	1 %
8	Yueyang Bai, Tianzuo Zhang, Yijie Zhai, Xiaoxu Shen, Xiaotian Ma, Ruirui Zhang, Changxing Ji, Jinglan Hong. "Water footprint coupled economic impact assessment for maize production in China", Science of The Total Environment, 2020 Publication	1 %
9	Jessica Muniz Melo, Marina Ronchesel Ribeiro, Tiago Santos Telles, Higo Forlan Amaral, Diva Souza Andrade. "Microalgae cultivation in wastewater from agricultural industries to benefit next generation of bioremediation: a bibliometric analysis", Environmental Science and Pollution Research, 2021 Publication	1 %
10	doaj.org Internet Source	1 %

11	Caiyuan Xiao, Guiju Zhang, Yudong Yu. "Numerical analysis of hydraulic fracturing processes for multi-layered fractured reservoirs", Energy Reports, 2021 Publication	1 %
12	jurnal.uinsu.ac.id Internet Source	1 %
13	mdpi-res.com Internet Source	1 %
14	research.chalmers.se Internet Source	1 %
15	web.archive.org Internet Source	1 %
16	upcommons.upc.edu Internet Source	1 %
17	www.researchgate.net Internet Source	1 %
18	Antonio Andres Martinez. "Protecting sources of urban water supply in Haiti: An institutional analysis", Journal of Water, Sanitation and Hygiene for Development, 2019 Publication	<1 %

Exclude quotes	Off	Exclude matches	Off

Exclude bibliography Off