Review on: Water Resources Management an Art

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Abstract- A significantly enhanced approach to the management and regulation of drinking-water quality and offers a flexible and proactive means of optimizing drinking-water quality and protecting public health. Rather than the primary reliance on compliance monitoring, the Framework emphasizes prevention, the importance of risk assessment, maintaining the integrity of water-supply systems, and application of multiple barriers to assure protection of public health.

Keyword- Water Resource Management, optimum Used, Public Health

INTRODUCTION

Technological innovation and adaptation are key components of many efforts within the water sector. At the conceptual level models and forecasting systems are being improved, particularly as a result of advances in computer technology, to allow better predictions of temporal and spatial variations in the quantity and quality of available water resources. This may help to reduce uncertainties and risks in the use and management of the resources. Water saving technologies in irrigation (e.g. drip irrigation), improved and cost-effective methods for the treatment and reuse of wastewater in industries and domestic systems, aquifer recharge technologies, human waste disposal systems that require no or extremely small quantities of water, and cheap but effective water purification systems for villages are other examples of promising innovations which can promote the sustainability of future water resources (Scott D. Struck, et.al. 2009). However, achieving such technological advances requires both appropriate incentives and the willingness of more wealthy countries, particularly the more wealthy industrialized nations, to invest in research with a long-term return.

LITERATURE SURVEY

The report of republic of Indonesia (2003) Water Resources Management towards Enhancement of Effective Water Governance in Indonesia, For the 3rd World Water Form, Kyoto-Japan summaries the follow up actions to the 2nd World Water Forum that have been taken by water stakeholders, water resources substantive and institutional problems, water resources sector reform to address the problems, response and actions undertaken by stakeholders on seven water resources management challenges and Portfolio of Water Actions that consist of a compilation of the statements of programs and actions undertaken by government and its national and international partners that includes debt swap schemes to Indonesia's development partners. It is understood that the underlying "world water crisis" including in Indonesia is not merely associated with the severe scarcity of water to meet the human needs, rather, the crisis is most commonly due to inability to manage this distinct natural resources—a crisis of water governance.

T. Asano, M. Maeda and M. Takaki(1996) made a study on the Wastewater reclamation and reuse in Japan: overview and implementation examples. To alleviate potentially catastrophic water supply and wastewater disposal problems as well as expand dependable water supply infrastructure, Japan has launched comprehensive urban wastewater reclamation and reuse projects since 1968. In this paper, the status of national policies on wastewater treatment, wastewater reuse characteristics, and some wastewater reuse experiences are presented. Two implementation examples in Tokyo and Fukuoka are discussed in detail, with special reference to application for toilet- flushing in high-rise business buildings and stream restoration and flow augmentation. It was found that the key to the success of wastewater reclamation and reuse is the quality of reclaimed water; public acceptance is closely associated with water quality and water supply dependability.

Jasem M. Alhumoud (2008) studied Freshwater consumption in Kuwait: analysis and forecasting, with the rapid growth of population coupled with increasing urbanization and agriculture, the demand for water in Kuwait is continually on the increase. The main water source in the State of Kuwait is from desalination with small quantities from underground aquifers. The objective of this research is to analyse and forcast water consumption in Kuwait. Therefore, consumption and other related data were collected randomly from different households within Kuwait. Total water consumption in Kuwait has increased from 255×10^6

imperial gallons (1.159×10^6 m^3) in 1954 to 102×10^9 imperial gallons (463.7×10^6 m^3) in 2003, which represents a 400-fold increase. The government of Kuwait heavily subsidizes water production. While 1,000 imperial gallons (4.546 m^3) of water costs the Ministry of Energy (MOE) KD3.21 (US$11.00) to produce, the customer is charged KD0.8 (US$2.72) for it. Predictions of future water consumption would help the government in its efforts to reform its subsidy policy. Results of the analyses indicated that there is considerable waste of fresh water by the average Kuwaiti household. The paper concludes with useful remarks to both the Minsitry of Energy (MOE) and the citizens of Kuwait on water usage rationalization.

Fawzia Al-Ruwaih., et. al. (2000) focused on Groundwater Utilization and Management in the State of Kuwait. The main brackish groundwater resources in the State of Kuwait are the groundwater located in the Kuwait Group and the Dammam limestone aquifers. Most of the groundwater used in the State of Kuwait is for irrigation, some part of it is used for domestic purposes and for small scale industries. Since rainfall is seasonal and is less than the annual evaporation, the recharge from rainfall is negligible. Water levels in both the aquifers are highly affected by the pumping rate from each well. The groundwater is extracted heavily resulting in decline of water levels and the deterioration of groundwater quality though there is underflow from Saudi Arabia. Improvement of the groundwater management is essential for maintaining long-term productivity of the aquifers in the State of Kuwait.

Al-Zubari W. K. (1998) analysed about the establishment of a total water cycle management and re-use program in the GCC countries. Water is rather scarce in the GCC countries. Therefore, every drop of water must be carefully used economically, i.e., no higher quality water should be used for a purpose that can tolerate a lower quality. As a substitute for fresh water in agriculture and industry, treated wastewater has an important role to play in the GCC countries' water resources management. The present gap between water demands and available water resources has led these countries to consider domestic wastewater as an integral part of their water resources. At present, GCC countries recycle no more than 3.5 percent of their total treated wastewater, which contributes 2.2 percent of their total water supply, being used mainly for landscaping, fodder crop irrigation, and some industrial uses. However, major plans for water recycling exist in most of these countries. The main handicaps for reuse expansion are both social (psychological repugnance and religion) and technical (microbiological pollutants, potential heavy metals accumulation in irrigated soil, and industrial

waste mixing). If only 50 percent of domestic water supplies are treated and recycled in agriculture, recycled waters have the potential to meet more than 11 percent of the GCC countries total water demands, could satisfy more than 14 percent of their agricultural sector demands, and could reduce fossil groundwater withdrawal by more than 15 percent by the year 2020.

Dolnicar, S (2006) studied about the public perception of desalinated versus recycled water in Australia, water resources are limited in both quantity and quality. In the continuum of the global water cycle, an interesting debate emerges regarding the acceptance and suitability of water recycling. The motivation for water recycling is mostly the realization that human water consumption has increased beyond sustainable levels, resulting in extended periods of 'drought', depletion of environmental flows in natural water systems and the decrease in healthy levels in drinking water reservoirs, including groundwater systems. However, the public often vehemently reject water recycling activities and as a result recycled water is available in countries with severe water restrictions, but clients for this recycled water often cannot be found. Several public consultation studies have been carried out to explore reasons for this resistance and how to gain community support.

Jasem M. Alhumoud (2010) studied Public Perceptions On Water Reuse Options: The Case Of Sulaibiya Wastewater Treatment Plant In Kuwait. The main sources of water in Kuwait are seawater desalination and groundwater. Reclaimed wastewater effluent could be an additional water source. Its use would reduce the volumes of recycled water being disposed of to the environment and it could reduce the demand for fresh water supplies. The results of a questionnaire survey of more than 1,500 random households residing in 64 districts in Metropolitan Kuwait are presented. The frequency distribution of the education level, knowledge of wastewater reuse, age, nationality and gender of the sample population are presented.

Sara Dolnicar (2011) analysed about what affects public acceptance of recycled and desalinated water? This paper identifies factors that are associated with higher levels of public acceptance for recycled and desalinated water. For the first time, a wide range of hypothesized factors, both of socio-demographic and psychographic nature, are included simultaneously. The key results, based on a survey study of about 3000 respondents are that: (1) drivers of the stated likelihood of using desalinated water differ somewhat from drivers of the stated likelihood of using recycled water; (2) positive perceptions of, and knowledge about, the respective water

source are key drivers for the stated likelihood of usage; and (3) awareness of water scarcity, as well as prior experience with using water from alternative sources, increases the stated likelihood of use. Practical recommendations for public policy makers, suchas key messages to be communicated to the public, are derived.

June S. Marks (2003) presented a paper on California Dreaming: Public Acceptance of Potable Water Reuse. Traditional sources of water are being supplemented by recycled water to alleviate the growing pressure on local water resources. This paper outlines the main findings from several case studies drawn from the Californian experience of proposals to supplement drinking water supplies with highly treated sewage effluent. California in particular has demonstrated an obsession with this highest level of recycling water, despite cautionary warnings by Bruvold (1972, 1985) published in water industry literature. The grounded theory and wider data collection drawn from a cross-national PhD study on the social experience of recycled water contributes to the discussion. Sztompka's (1999) explanatory framework for 'the social becoming of trust' suggests ways in which the water and sewerage industry can rebuild public trust in recycled water for uses involving higher level human contact.

CONCLUSION

Studies majority of the studies are pertaining reuse of water the related studies reflects that reuse of water is practiced mostly at domestic sector. The rain water harvesting and the reuse of wash water for gardening purpose are the major practices of water resource management.

The studies related to recycle are only in the industrial sector. It focuses on waste / effluent water treatments and Desalination of water.

The overall picture of the related studies initiated the researcher to choose the sample with respect to domestic, office and Industrial sector. The findings of the related studies enlightened the researchers to focus on the challenges in the implementation of water resource management with respect to Reduce, Reuse and Recycle – 3R.

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