

# Integration between Innovativeness and Australian Water Utilities

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**Abstract:- In the very dry continents, like Australia, it has always been a challenge for the water supply organizations to face the water demand. Furthermore, the demand is increasing day by day resulting from numerous factors. This literature-based study highlights the necessity for resilience in innovation capabilities in the Australian water utilities. The study established a strong integration between innovative capabilities and water service delivery in the Australian context.**

**Keywords:-** *Innovativeness, Water Service Delivery, Factors of Innovation.*

## I. INTRODUCTION

Life is synonymous with water. Taking this fact into consideration, the value of water utilities and their services are not only crucial but also underrated in our daily life, and for Australia the situation is acute.

Owing to rapid environmental threats, climate change and increasing demand for water, the provision of better service delivery is becoming tougher over the course of time [1]. Further, water utilities are traditionally risk averse, conservative, and highly regulated [2], [3]. In this environment, the adoption of innovative activities in service delivery is challenging. Nevertheless, in the face of increased demand for water and better service delivery, water utilities must focus on their innovativeness to enhance business performance in water service provision.

Typical problems with water-management systems includes dependency on huge water reserves and expensive investment [4]. Though the contexts may vary, the nature of problems remain the same and an effective way to deal with them is through the innovativeness of water utilities. Problems may be overcome by better managing existing water resources, and managing and recycling wastewater and stormwater; innovation is clearly required [5].

Numerous researchers across the world have emphasized the future water crisis and warned the relevant authorities [6], [7], [8], [9], [10], suggesting better water services through proper sanitation, wastewater management etc. [11], [12], [13],

[14]. However, very few have identified the role for innovativeness in water service delivery as a necessary prerequisite to solving these problems [15], [16].

A number of innovation-related studies have been done by [17], [18], [19], [20], [21], [22], [23]. These have focused on water supply augmentation techniques. However, they neglected influencing factors that could enable water utilities to deliver improved water services [24]. Operating in monopoly markets may be a major reason for not focusing on innovativeness.

Water utilities depend on comprehensive knowledge to sustain and advance their activities through transformations and inventions, inventions; however, this knowledge is often under-researched [25]. Therefore, researchers have suggested in exploring what obstructs the dissemination and use of water innovations, and what can be done to remove such obstructions [22].

Lastly, the water utilities in Australia have a moral obligation to concentrate on the global goal to ensure sufficient water for all people by 2025 [26]. Local action can have beneficial impacts on the world stage (i.e., through the development of new water technologies) to reverse the situation and ensure the best water service delivery to ensure adequate freshwater.

## II. AUSTRALIAN WATER UTILITIES

Australia is the second driest continent after Antarctica on this planet. Experts have warned that the struggle for the adequate water supply to urban areas has already started [27]. If this situation continues, these consequences will be alarming for Australia.

For better management and service delivery, the Australian government has reformed water industry with metropolitan (urban) and council-based (rural/regional) water utilities [28], and so has two main types of water utilities. The first one is the Metropolitan Water Utility, which are in most cases, larger, autonomous and independent [29]. The second type is the Council governed water utility, which by comparison are relatively financially constrained and lack freedom in operations [30]. The literature has used the term “water

utilities” in common for both types. In case of innovativeness, the Metropolitan water utilities are more likely to do better since they have more freedom than the Council utilities in their operations. This research addresses both these classes of utility, as they are involved in the same functions across Australia.

Since Australia is regarded as a very dry continent. The Commonwealth government introduced Federal water reform policy in 1994; accordingly an Intergovernmental Agreement detached privileges for water from land ownership and allowed water trading [31]. This agreement paved the way to establish a structure in water management for agriculture and urban use, and also for recycling water.

The Department of Agriculture and Water Resources controls water legislation in Australia through the following legal instruments [32]:

- a) Water Act 2007
- b) Water Efficiency Labelling and Standards Act 2005
- c) Water Regulations 2008 and
- d) Water Charges and Water Market Rules

Additionally, several departments of the Australian Government are playing roles in assisting and guiding water reform agenda; the Council of Australian Governments is in charge of water policy reform that necessitate supportive actions by the Government, and the National Water Initiative, the primary agreement for water policy, provides the water reform blue print [32]. The Australian Government considers the inputs from the community and engages them with related stakeholders through different forums, at local, national and even international levels [32]. Moreover, in May 2015, through the Department of Foreign Affairs and Trade, the Australian Water Partnership has been established for sharing their expertise with Indo-Pacific Region, where international partners reinforce water proficiency and deliver schemes for use in provincial water issues [32].

### III. INNOVATIVENESS IN AUSTRALIAN WATER UTILITIES

Water shortage problems are common all around the world; be it water capacity or quality or both; water capacity denotes the volume of hygienic water accessible for use, while water quality states the well-being and ease of access to water consumption by humans [33]. In the Australian context, water-related researchers identified a major gap in integrating water supply, stormwater, and wastewater components for recycling in urban areas, which can accelerate improved knowledge diffusion and skills augmentation [34]. Therefore, innovation ought to occur in water utilities. This could take the form of inventing new sources of water or recycling the wastewater in a manner that is innovative and accepted to all [35], [36], [37], [38], [39].

Australia usually seems ‘thirsty’, because of climate change and water scarcity [40]. So, water distribution/supply systems have struggled at development stages.

From the very beginning of European settlement, water supply was a continuous challenge to the people of Sydney. The unpredictable rainfalls in past 200 years subjected the water supply to enormous questions. Until 1960 and construction of the Warragamba Dam, there was no consistent source of water supply. Within the late 20th century Sydney Water again encountered the problem due to fast-growing population and development, along with drought. At this point, for sustainability, the NSW Government initiated a long-term plan that combined using water from dams, desalinating and recycling wastewater and ensuring effective water usages for securing water supply in Sydney [41]. Although Water NSW had been maintaining 21 dams and reservoirs, in Sydney experienced a serious drought during 1996-2010, resulting to the drop in water-level to 32% in Warragamba Dam [41].

As an example of water utility services, Hunter Water, a water utility of the Hunter region, responsible for delivering drinkable water, managing and recycling wastewater and providing stormwater facilities to approximately 600,000 people at houses and business premises over Hunter Region [42], was also affected by development and drought. Water-levels dropped faster than other Australian urban areas because of very low water storages and high evaporation losses. This environmental threat now is compelling Hunter Water to rethink service delivery to ensure sustainability and resilience; organizational agility towards innovativeness in water supply.

Australian water utilities are going to encounter immense challenges in their service due to societal, biological, and mechanical issues, threatened by climate change, increasing pressure of migration and dwindling resources [43], [44] endangering long-term water security [45]. On the other hand, the water regulatory bodies have sought sustainable solutions in the long run [3].

To meet the challenges in water service delivery, related organizations must be agile [46] because organizational agility helps them to cope with these changes and challenges [47]. Such changes and challenges often work as drivers to innovativeness, which can help solve this crisis. A recent research has proven that increasing organizational capabilities can control the major factors of innovativeness [48]. The major factors of innovation, e.g. HRM functions, culture, threats of external environment etc. can be shaped and controlled by the organizations’ abilities, if they attempt for innovation. While emphasizing that innovativeness is important in dynamic contexts, these water utilities must sense, plan and interpret outcomes accurately [49].

Innovativeness in water service delivery ranges from identifying new water sources to improving existing supply and consumption management with the aims of sustainable water security [50]. Water utilities are naturally cautious in pursuing innovation in water management as they are closely governed by the regulators, and sensitive to public health standards [51], [52]. Naturally, these organizations need to be agile for resilience to adopt changes, adapt to challenges and initiate innovations. This is because metropolitan water management must embrace resilience, emphasizing particular characteristics/forces of complicated socio-ecological systems [53]: assessing and improving water infrastructure using a resilience perspective has been found more productive [54].

Consequently, robust and resilient water management systems in urban areas, must be initiated and implemented through governance reform [55]. Thus, to adapt changes and initiate inventions, organizations need to be agile so that it is easier to meet the future challenges that are related to the proper management of water.

#### IV. DISCUSSION

The wide-ranging and enriched literature of innovation was thoroughly reviewed based on the concepts of innovation, introduced by Joseph A. Schumpeter, in his book [56] as well as in his studies [57]. Various types of innovation and the characteristics of Australian water utilities were described to identify the suitable innovative approach in Australian perspective.

It has been recognized that the incremental innovation is the most suitable for the water utilities [58]. This is because, if considered as service, continuous process improvements in the water service delivery, the incremental innovations are the most contributing in nature [59]. Moreover, literature supports such innovations that include effective participation of managers and non-managers along with the stakeholders [60]. Besides, in considering the water utilities in particular, the incremental innovations are the best [61], [38].

This research concentrated on innovation capabilities, which has been termed as ‘innovativeness’ by the researchers [62], [63], [64], [65], [66], [67], [68], because, it refers to the organizational significant performances towards innovation [69], [70]. Therefore, rather than the innovation, the organizational innovativeness of the water utilities in Australia for delivering their services became the central to this research.

The literature, in this research already proved that while dealing with service delivery, the water utilities in Australia have to be extremely focused on successful service providers as it is the key to business growth and sustainability [71], [72], [73], [74].

Organizations, operating under the government are generally non-profit by nature and as such they are extremely very less competitive i.e., they do not face any sort of high

competition with the rivals [75], [76]. In other words, they operate in monopoly market [77].

It is due to the typical nature of almost all the government organizations that in the absence of any strong competition, they are hardly interested in focusing on improvements of their services through innovativeness. Consequently, the utilities will fail to sustain in long term. The detailed discussion of such statement is a result of strong literature support onwards.

Hence, the water utilities found reluctant in making themselves competitive, which was a big reason of being less innovative as competition for market power was the major driver for innovativeness [78].

However, none can deny the fact that for the organizational growth, innovations are essential, even if, there is less or no competition [79]; and it applies to government sector organizations as the researchers have established that capabilities to innovate are very crucial for the public service organizations [80], [81], [82]. In the case of water utilities, solving the service delivery problems through innovativeness is a social responsibility and there is no reason to contradict it. [83].

The integration of product and service towards the successful business operations has been proven economically beneficial for the organizations through value propositions [84]. Such integration allows organizations in combining both the product and service in their delivery systems [85].

The water utilities deliver their services with a tangible product -- water. So, the integration of product and service proved extremely vital for the success [86], and if required, utilities should focus on process reengineering [87]. The reason behind it was that the improvement of innovative capabilities largely depends on successful product-service integration [88].

Thus, the researcher clearly revealed from the literature that though operating in non-competitive market, the Australian water utilities required to be innovative and to integrate their product appropriately while delivering their services.

Like other organizations, i.e., Google, Apple etc., water utilities cannot undertake any innovative activities as they wish or think essential, because they operate under numerous statutory regulations and legislations [89], [90], [91]. Thus, the water utilities frequently face the problems of undertaking innovative activities [92], [38], [93].

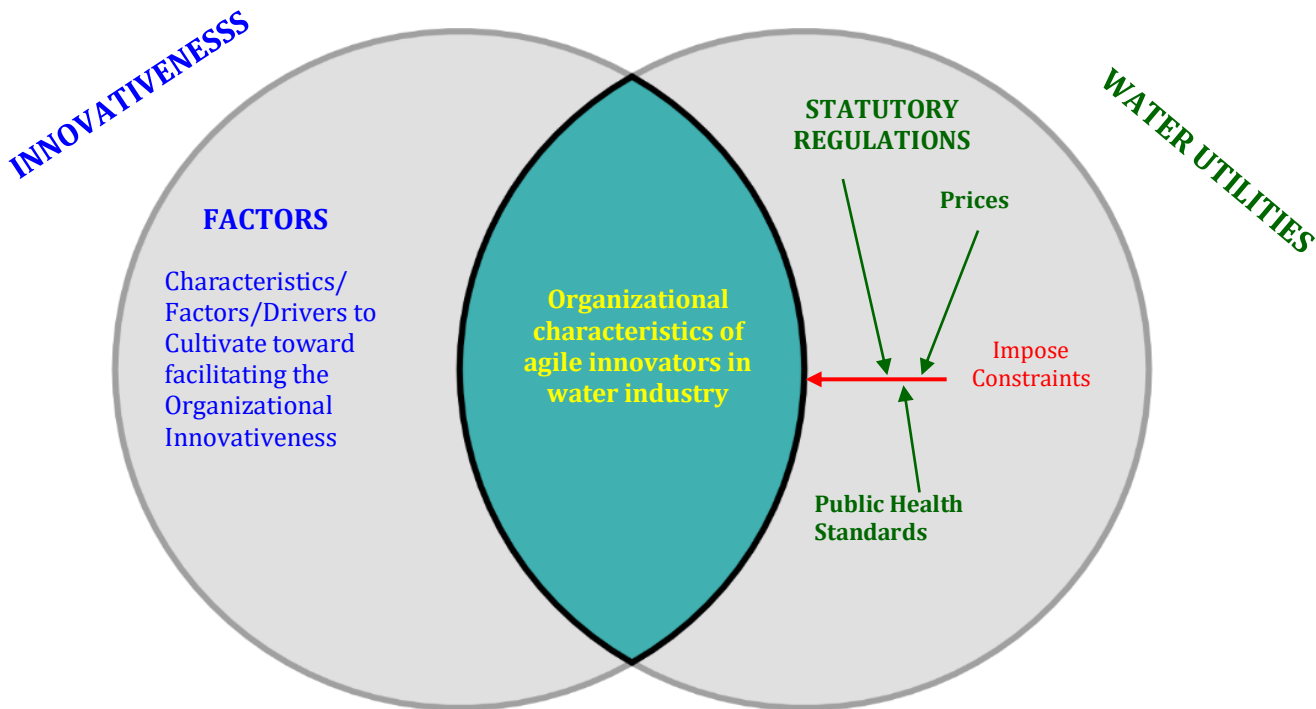
However, the huge pressure of migration and challenges from environmental and climate changes, has been accelerating the demand for water. The influences from the regulators of the water sector in Australia should be aligned with the improvements of innovative capabilities for better service delivery to meet the increasing demand for water.

Innovativeness must be nurtured in water utilities for service delivery improvement and thereto; statutory regulations, related legislations must be revised where required. If through cultivating some factors/characteristics of innovativeness, water utilities can extend capacity and increase service quality then policies should be so developed. Water is the crucial for livelihoods, and sustainable livelihoods are governed by policies which are people-oriented, receptive and partaking, multilevel, accompanied partnership with government and private enterprises, dynamic, and sustainable [94]. Furthermore, safe drinking water is a human right and there is no room for a compromise. History reveals ample incidents of failure in safety water-systems, and modern societies always attempts to eliminate all water related diseases [95]. So naturally, there must be a balancing point between regulators and water utilities in enabling to be innovative in their service delivery with more customer satisfaction. The

current research did not aim at balancing the interaction between regulators' influences and the water utilities activities towards innovativeness in Australian context. Nevertheless, it is a burning issue for the further research in this specific area.

The literature found numerous factors or drivers that pushed organizations towards innovativeness. Water utilities in Australia required to emphasis on these factors, because to be innovative, there was no alternative to cultivate the essential factors of the organizational innovativeness and this triggered the research to move forward.

Considering the restrictions from the authority, regarding price, health issues, and legislations, with the light of the foregoing, the interactions between innovation and water utilities can be represented through following model.



(Figure : *Conceptual Model of Relationship between Innovativeness and Water Utilities*)

**V. CONCLUSION**

The present water crisis in Australian water sector, which has been predicted to be increased in very near future, is very alarming. The source of fresh water is impossible to create for handling this crisis. The best and only way to deal with this problem is to make the water utilities more innovative in their service delivery.

Waste water management and distribution service should incorporate new ideas to ensure the maximum use of water in efficient way.

Proper cultivation of the factors of innovativeness is the key f success in overcoming the water problem in Australia. Though there are few barrier, like legislations and bindings from the regulatory bodies, but for the better future both the parties should sit together for a viable solution.

In the concluding remark, it can be confidently stated that this study has substantially verified very precious for the Australian water utilities in developing their innovative capabilities in service delivery and to meet the challenges for water in coming days.



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