

## Summary

### Case 1 - Yarra Valley Water, Australia



Yarra Valley Water utility located in southern Melbourne serves about 2 million people. The current growth acceleration in human development particularly socio economic and environmental trends for example (population, GDP, transport, fertilizer application, telecommunication) are pushing the planet beyond its boundaries. This challenge combined with climate impacts brings lots of uncertainties to cities in Australia with its associated impact on available water resources., Just as any water utility, Yarra Water is interested in the availability of freshwater both in terms of quality and quantity, and for this reason, present a great challenge as they find it difficult to plan and invest in long term decisions in an uncertain future.

With climate change as the most pressing issue, one major action taken by Yara Valley Water to embrace resilience is developing a Climate Resilience Plan to implement actions that can expand their capacity, reduce vulnerabilities and also support long term planning in an uncertain future. The Plan considers 3 focus areas 1) reducing service vulnerabilities 2) enhance adaptive Planning and 3) foster collaborative partnership. In the future, Yara Valley would also consider focusing on building community resilience as part of key actions as they believe this would help strengthen relations with customers and trust.

The lesson learned through addressing climate issues at Yara Valley Water is that

building climate resilience is dependent on collaborative efforts. Highlights were made on participation in government plans to support resilience also benchmarking with key organisations for improvement. Further to this, partnerships have also been established with other agencies for example the National Bureau of Meteorology to assist in providing data to manage future uncertainties during planning.

Click on the link below for more information

<https://iwa-network.org/learn/managing-climate-risks-the-tale-of-two-water-utilities-2/>

### **Case 2 -Metro Pacific Water, Philippines**



With the changing climate, flooding in the Philippines is increasing, which threatens lives and livelihoods. People do not have access to enough water for agriculture or enough clean drinking water. Therefore, it is necessary to manage the uncertainties and risks that threaten water security through risk management approaches such as water safety plans.

As an investment company, Metro Pacific water is committed to investments in water

utilities through Public Private Partnership in both green and grey infrastructure. With water utilities largely responsible for shaping the built environment, incorporation of Nature Based Solutions (NBS) to complement traditional infrastructure can be recognised as key to building sustainability and climate resilience. To complement the normal approaches of considering investment which traditionally focus on water quantity and yield, Metro Pacific Water is currently exploring the impacts of land use cover, climate risk and pollution on natural resources through space observation on two of their major lakes; Laguna Lake and Maasin Lake to ascertain the state of these resources in order to drive investment. Secondly, they believe considering investment in social infrastructure for stakeholders around water utilities can increase their willingness to pay for improved services. The case cited a Cost Benefit Analysis (CBA) on wastewater project which showed high Net Present Value (NPV) yet the difficulty was in communicating to stakeholders and why the need to pay for such improved service.

The lesson learned from this case is strong partnership and collaboration with key stakeholders is key when considering investments as the success of any investment is hinged on the social valuation of water and how ready organisations are in their attempt to manage climate risks. Also understanding the full catchment of the resource gives a better understanding of the competing users of resource and improves collaboration with regulators and other users.

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### Case 3 Tucson Water, Arizona, USA



Tucson Water is committed to providing water to Arizona and its residents by diversifying water supplies. Up until the early 2000s there was a high reliance on groundwater, however the extraction of groundwater has a number of negative environmental impacts as well as safety risks (e.g., subsidence). Groundwater has been replaced by Colorado river water, remediated, and reclaimed water, as well as a small amount of rain and stormwater.

Tucson Water employs a combination of measures to improve climate resilience. These measures include (1) maximizing protection, (2) optimizing and expanding supply to enhance diversity, (3) pursuing win-win partnerships, (4) undertaking preparatory work including identifying decision points and implementing responses, (5) monitoring and protecting to improve water quality, and (6) using groundwater as a reserve resource (rather than as the main water source).

Lessons learned from this case is that collaboration can help in building climate resilience. Strategies such as diversifying water supplies and using early warning systems were also cited as valuable. In addition, this case highlights the importance of sustainable use of groundwater, which can be used as a source of water for domestic use, industrial use, and irrigation of farmland. Groundwater has the advantages of

stable water supply but should be treated as a reserve resource and carefully protected and exploited in a limited way, for example, Tucson Water can improve the efficiency of its use of Colorado River water.

Click on the link below for more information

<https://iwa-network.org/learn/from-vision-to-action-how-water-utilities-are-building-climate-resilience-part-1/>

#### **Case 4 Denver Water, North America**



Denver Water takes its water source mainly from the Colorado River and provides water to about 25% of the state of Colorado's population. In 2002, the Denver area experienced simultaneous natural disasters from drought to wildfire and then rainstorms and this had serious impact on the supply of water in their largest water reservoir. Following this disaster and with existing knowledge of global warming, Denver Water decided to study the effect on temperature and precipitation on their supply system. The different warming scenarios studied in 2005, 2011 and 2017 all indicated that the watershed supply is sensitive to temperature changes and could result in further decreased water volumes. For example, in 2011, a warming of 0.15 degrees Celsius resulted in a 20 percent reduction in water supply, while water demand increased by 7 percent. In addition, Evaporative losses, snow and ice melt, changes in runoff patterns, and decreases in local precipitation are some associated

impacts being experienced with these high temperatures. The increased demand for water from population growth cannot be ignored either.

As a utility, Denver Water has embraced the uncertainty that comes with these challenges and developed an Adaptive Strategy by considering the changes in warming climate, economy, and social values of the people. This plan includes a diversified water portfolio which considers all geographic locations and types of investment, scalable options to be prevent over investing, preserve options, and employs a continuous & iterative planning process.

Some of the lessons learned from this case is that dealing with climate change requires developing new techniques into planning approaches and mainstreaming climate adaptation across organizational practices. Partnership and collaboration are also key as this case cited the strong alliance with 12 water utilities through the [Water Utility Climate Alliance](#) to collaborate on advancing water utility climate change adaptation. In addition, as a coordinated and holistic strategy for a safe and reliable water supply are part of the strategy for adaptation and resilience.

Click on the link below for more information

<https://iwa-network.org/learn/from-vision-to-action-how-water-utilities-are-building-climate-resilience-part-1/>

**Case 5 Frederiksberg Forsyning, Denmark**





Frederiksberg water, one of the 10 largest water utility companies in Denmark is committed to providing water and wastewater services as their core mandate. In addition, they also provide heating and cooling services. With the heavy dependence on groundwater as their water source, Frederiksberg water faces the challenges of rising sea level, saltwater intrusion, and high chlorinated compounds. Climate change and the densely populated nature of the city of Frederiksberg have also resulted in higher temperatures affecting operations of the utility.

The Frederiksberg Forsyning case cited a series of measures to protect and improve groundwater quality and also improve climate resilience (1) investing in new technologies (carbon filtration and Air stripping) (2) relocation of wells from the coastal areas (3) building heat pumps for cooling. Aside from these actions, there are national plans that have been adopted as a guide to governance and planning water resources. Some of these plans include Water Plan Baltic sea, Water Action plan, Groundwater protection action plan and Water Supply Plan.

Lessons learned from this case includes the use of flexible solutions when addressing climate issues. Emphasis was built on a need to focus on systems that could cope and adapt to climate change rather than systems that can last for the long term. Climate change has the potential to affect water supply systems in a variety of ways, ranging from changes in water abstraction and storage, the frequency and intensity of droughts,

water demand and the risk of water infrastructure failure. Proactive adaptation to this uncertain changing climate includes the protection of groundwater sources as a prerequisite for its exploitation.

Click on the link below for more information

<https://iwa-network.org/learn/from-vision-to-action-how-water-utilities-are-building-climate-resilience-part-2-2/>

### **Case 6 Water & Waste (Cape Town), South Africa**



Over the past years, water supply in Cape town has been reliant on rain fed dams with management based on reconciling annual demand and supply system. Currently, the water supply system relies on six (6) large dams with a capacity of 900,000m<sup>3</sup>. Between 2015-2017, the city experienced three (3) consecutive years of low rainfall.

To overcome this drought period, the municipality of Cape Town managed to reduce their demand by 55% by adoption of the following measures. 1) managing dam levels by reducing demand to other sources of the dam usage and making information transparent on percentage usage for both domestic and agriculture purposes; 2)



managing demand through effective communication, water restrictions at household level, tariff increment and pressure management; and 3) augmenting supply through projects to increase supply. To ensure Cape town stay more resilient to future droughts, they have developed a strategy which highlights commitment towards a future in which there will be sufficient water for all, and more resilient to climate and other shocks. It also considers the important yet complex relationships between water, people, the economy and the environment.

With the risk of climate change increasing the rainfall variability of the catchment, some of the lessons learned from this case as cited were the need to consider political influence during communication. Several campaigns were employed to communicate the occurrence of drought and advice given on how to use and manage water. Also, collaboration is considered very important and the case highlights the support received from partner organisations such as the World Bank on developing and reviewing their water plans.

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<https://iwa-network.org/learn/from-vision-to-action-how-water-utilities-are-building-climate-resilience-part-2-2/>