

EXECUTIVE SUMMARY

EVOLVING JOBS IN THE URBAN WATER SECTOR

Keynote Lecture for the Institute for Environment and Sustainability,
Lee Kuan Yew School of Public Policy
National University of Singapore

By

Virgilio (Perry) RIVERA, Jr
Founder-Managing Consultant
WatSan Analytics

February 23, 2024

Key Messages

- 💧 Water utilities in urban areas face significant and unique challenges with **transformational impact** on human capital.
- 💧 The workforce **must adapt** to the water utility of the future.
- 💧 Addressing the sector's workforce challenges require a **strategic approach**.
- 💧 A glimpse of the **emerging competencies** required by the water utility of the future.

There is a HUGE difference in WSS between developed and developing countries.

Developing countries lack in various aspects such as:

- inadequate infrastructure
- lack of funds
- fluctuating service coverage and quality
- weak regulatory enforcement
- affordability is not certain
- community engagement varies

Developed countries in contrast are advanced:

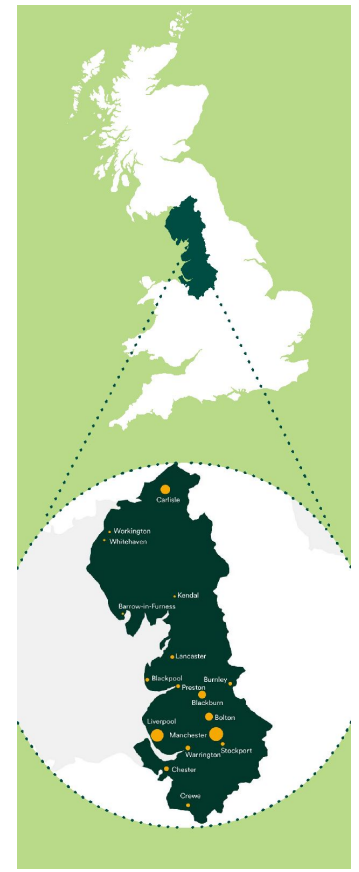
- has well-established infrastructure
- has greater financial resources
- higher service coverage and quality
- has well-established regulatory enforcement
- adopts metered billing systems
- community engagement is consistent

A tale of two utilities...



7.5	Population	7.4
~20,000	Pop Density / (sq.km)	526
1.75	Production (bld)	1.80
6,991	Length of potable water pipeline (kms)	43,000
41	Wastewater treatment facilities	584
34.7%	Sewer coverage	100%
~1,500	Employees	~5,000

Sources: Company Annual Reports



Framework for Analysis

Challenges & Accelerators

Customer / stakeholder expectations
Climate change / environment
Compliance / regulatory pressures
Technology
Demographic trends, urbanization
Political economy, governance
Cost of provision and its affordability
Uncertainty
Financing expenditures / capital market conditions

Impact on utility workforce

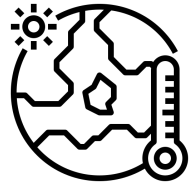
Demand and supply of talents
Talent retention and continuous skill development
Organizational imperatives: Productivity, wages, incentives, well-being, gender equity and inclusion
Embracing new technology

Transformation

Public policy
Industry strategy and programs
Professional / career plans



There are rising customer and stakeholder expectations.



Changes in the climate and environment is proving to be a significant threat to the future of our water supply.



It will be a challenge to remain compliant with all regulatory pressures put in place.



The water sector is moving into a phase of "digitalization" with the growth of technology



Water insecurity is a growing issue as populations rise globally



The political economy has a significant impact on the kind of service received by the public.



Water costs are rising in shrinking regions.



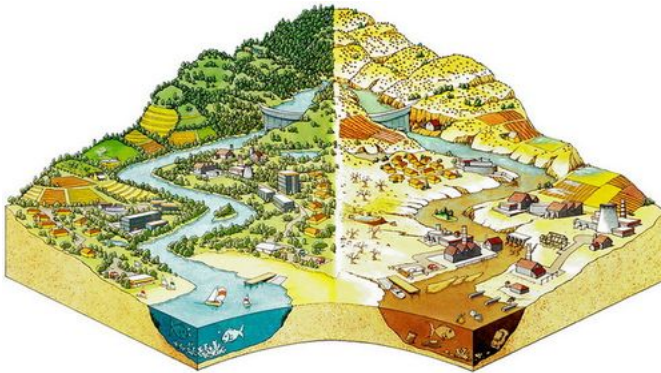
Uncertainty is magnified and outcomes are difficult to predict.



Acquiring funds for WSPs is a complex process.

Water Jobs

Jobs in water sectors fall under one of three functional categories:



*Image Credit: Waterwatch Queensland (2012)
cited in Freie Universitat, Berlin)*

MANAGING OF RESOURCES

Including integrated water resources management (IWRM) and ecosystem restoration and remediation



Image Credit: Rizza Garcia

BUILDING OF INFRASTRUCTURE

Building, operating and maintaining water infrastructure



Image Credit: UNICEF

DELIVERY OF SERVICES

Provision of water-related services including water supply, sanitation and wastewater management

Source: UN Water. 2016, United Nations World Water Development Report 2016

Jobs in the water sectors

Developing countries face critical workforce-linked bottlenecks:

Lack of human resources under Operations and Maintenance, Monitoring and Evaluation and the social development disciplines

Gap between qualification levels and critical numbers of professional capacity in rural and urban systems

Lack of incentives for workers

Lack of coordination between industry needs and supply from education institutes

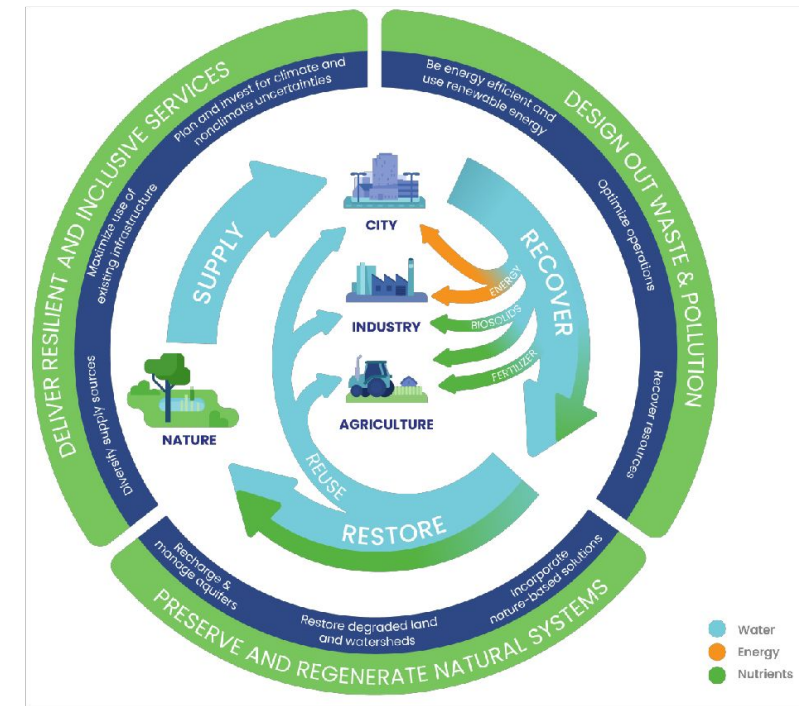
There is the risk for workers specifically trained for occupations that are green and entirely new to be left with limited options for employment.

Source: UN Water. 2016, United Nations World Water Development Report 2016

Transitioning to water utility of the future

- Effectively managing the challenges requires a transformation of a utility.
- It is essential that decision-makers and planners be cognizant of these potential impacts and make concerted efforts to consult the various stakeholders.
- Convergence of interest provides an opportunity for synergistic water investments beneficial to local economies and job creation.

WATER IN CIRCULAR ECONOMY AND RESILIENCE (WICER)



Source: Delgado, Anna., et al. 2021. *Water in the Circular Economy and Resilience*. World Bank

Changing capacity needs

💧 Classic water treatment and network operation skills are still paramount, but the scope of expertise needed nowadays includes topics such as:

	Biodiversity Assessment		ICTs		Skills, knowledge and competences of professionals and civil society
	Nexus Issues (e.g. food and energy)		Human rights-based approaches and dialogue with stakeholders		Organizational and institutional capacity
	Modelling				

💧 Lack of capacity and the challenges facing the water sector require appropriate organizational design that ensures strategy culture

Technology and Innovation – *Impact Jobs*

- 💧 The number and nature of jobs as well as the required skill sets and competencies are likely to change. Hence, those with limited skill set are at risk of possible employment loss.
- 💧 New technologies may improve existing methods and processes and make them more appropriate, efficient, and cost-effective. On the other hand, disruptive technologies may fundamentally change the way that water is used.
- 💧 ICT-based advances support various facets of water supply and demand.
 - STEM backgrounds are critical.

*The industry needs
'specialized integrators'
- students and
professionals trained
deeply in their disciplines
but **capable of linking
their expertise across
siloes** on problems that
matter to society."*

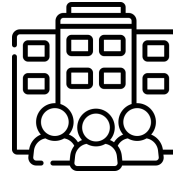
– John Briscoe

Policy Responses



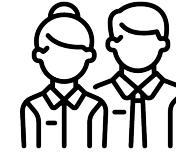
National / Government

Focuses on further emphasizing the importance of water jobs and professionals to the public through education and awareness programs



Industry

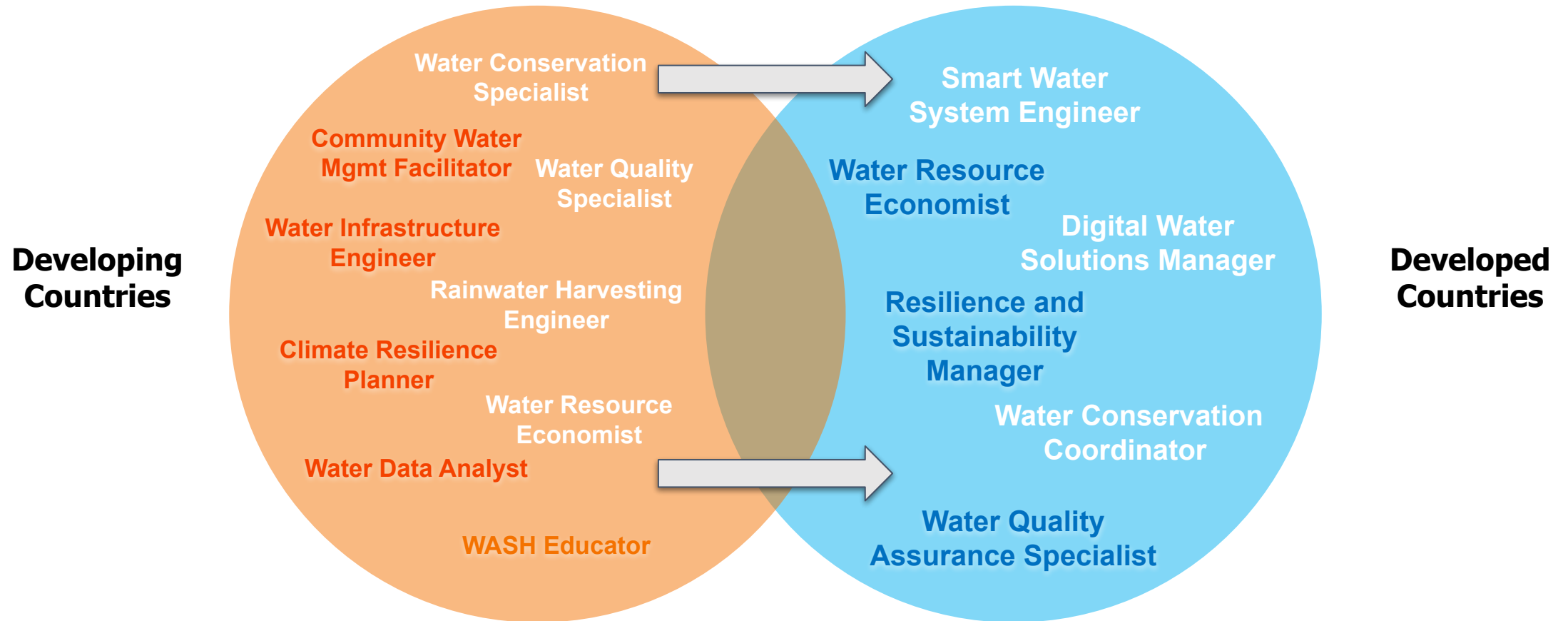
Focuses on creating a likable and engaging work environment for employees as well as collaborating with different groups



Professional

Focuses on continuous learning as well as honing and expanding their skillset so as to become well-rounded professionals who are prepared for whatever challenge that they may face in the future

Emerging Jobs





Leadership ●

- *champion leader*
- *enabling leader*
- *cross-boundary*
- *team leader*
- *thought leader*
- *strategic leader*
- *trusted advisor roles*



"Deregulation of key industries and the liberalization of the economy; he encouraged the privatization of public entities to include the modernization of public infrastructure through an expanded Build-Operate-Transfer law."

– Fidel V. Ramos



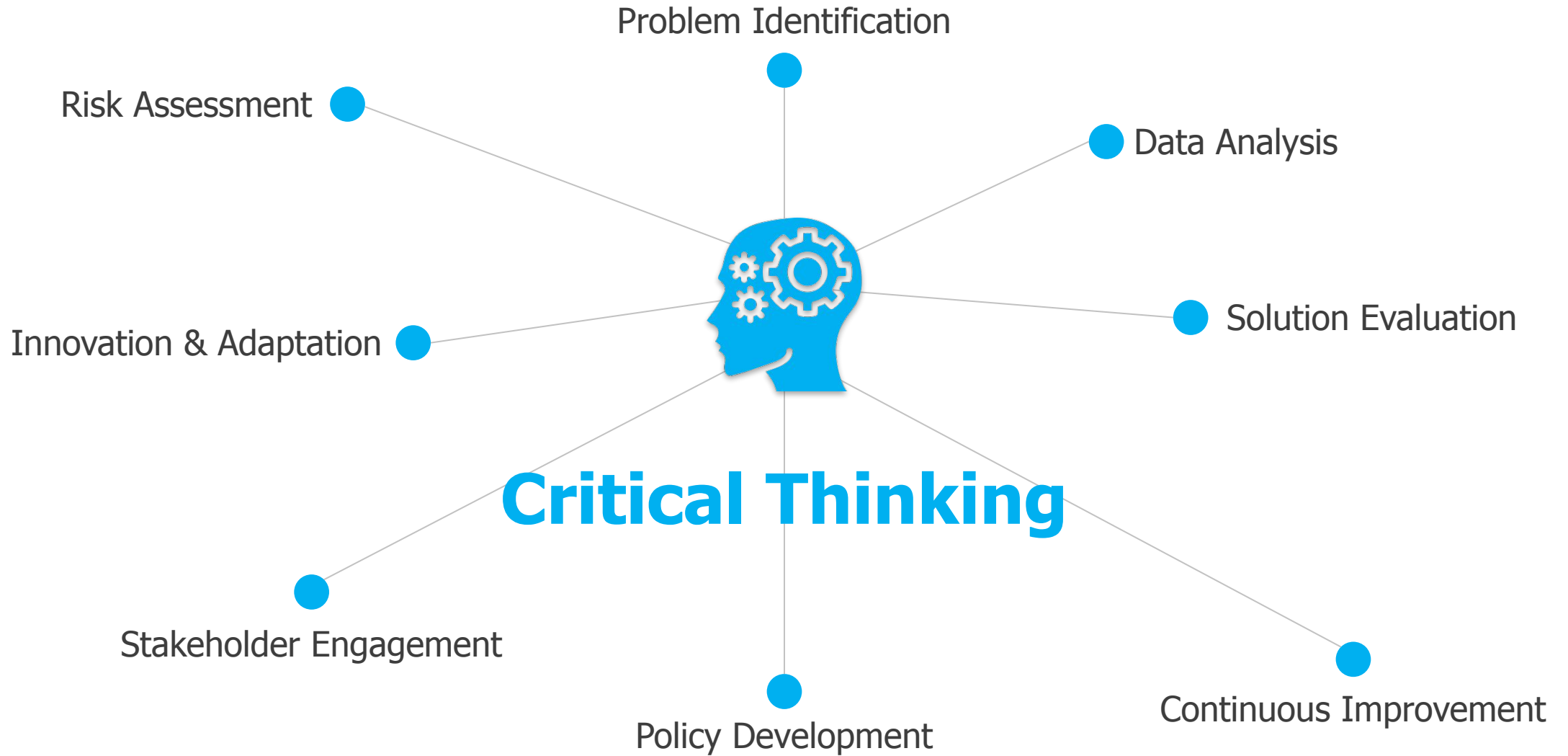
"Every other policy has to bend at the knees for our water survival."

– Lee Kuan Yew



"Decentralization and empowerment. Alignment of social and business goals anchored on Total Management System."

– Antonio T. Aquino





JOBSP

URBAN WATER SECTOR

OTHER INFRASTRUCTURE

MANUFACTURING

FINANCE & INVESTMENT BANKING

CAREERS?



Image Credit: Dmitry Kovalchuk

End of Presentation

References may be requested from the author