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Nexus Assessment of Urban Water Security in the Mediterranean Region

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Agenda

- Water Challenges in cities
- Water Security Concept
- Assessment Frameworks of water security
- Urban Water Security: Definition and assessment framework
- Measuring urban water security in Beirut
- The way forward



Urbanization: the most important demographic trends of our time.

- 55% of the world's population reside in city in 2018. By 2050, 68% of the world's population is projected to be urban.
- By 2030, the world is projected to have 43 megacities, most of them in developing regions.



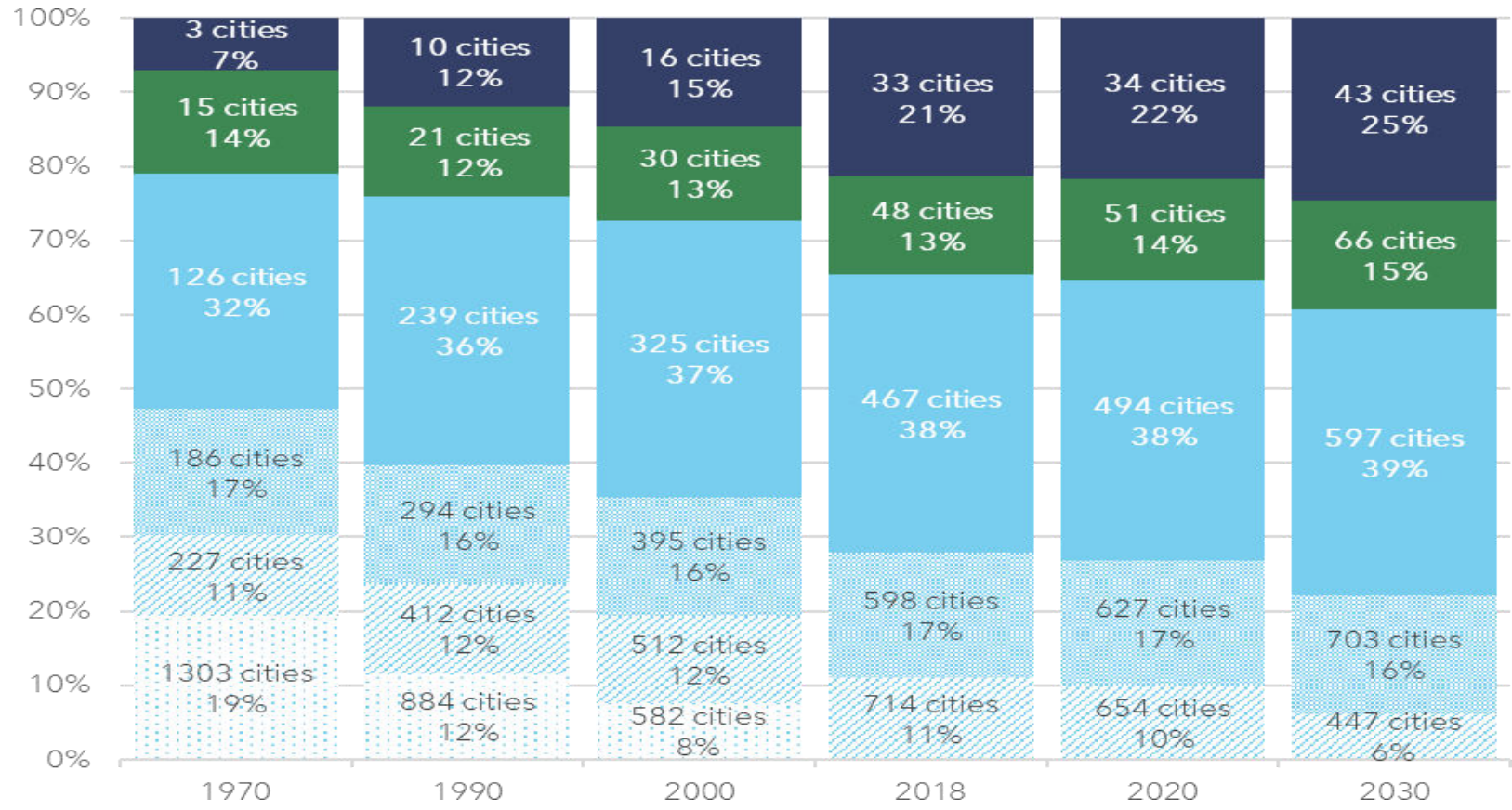
**THREE DATES,
THREE FIGURES**

1970
3 megacities

2016
31 megacities

2030
more than
40 megacities
WORLDWIDE

SHARE OF CITY INHABITANTS IN THE WORLD URBAN POPULATION (1970-2030 EXP)



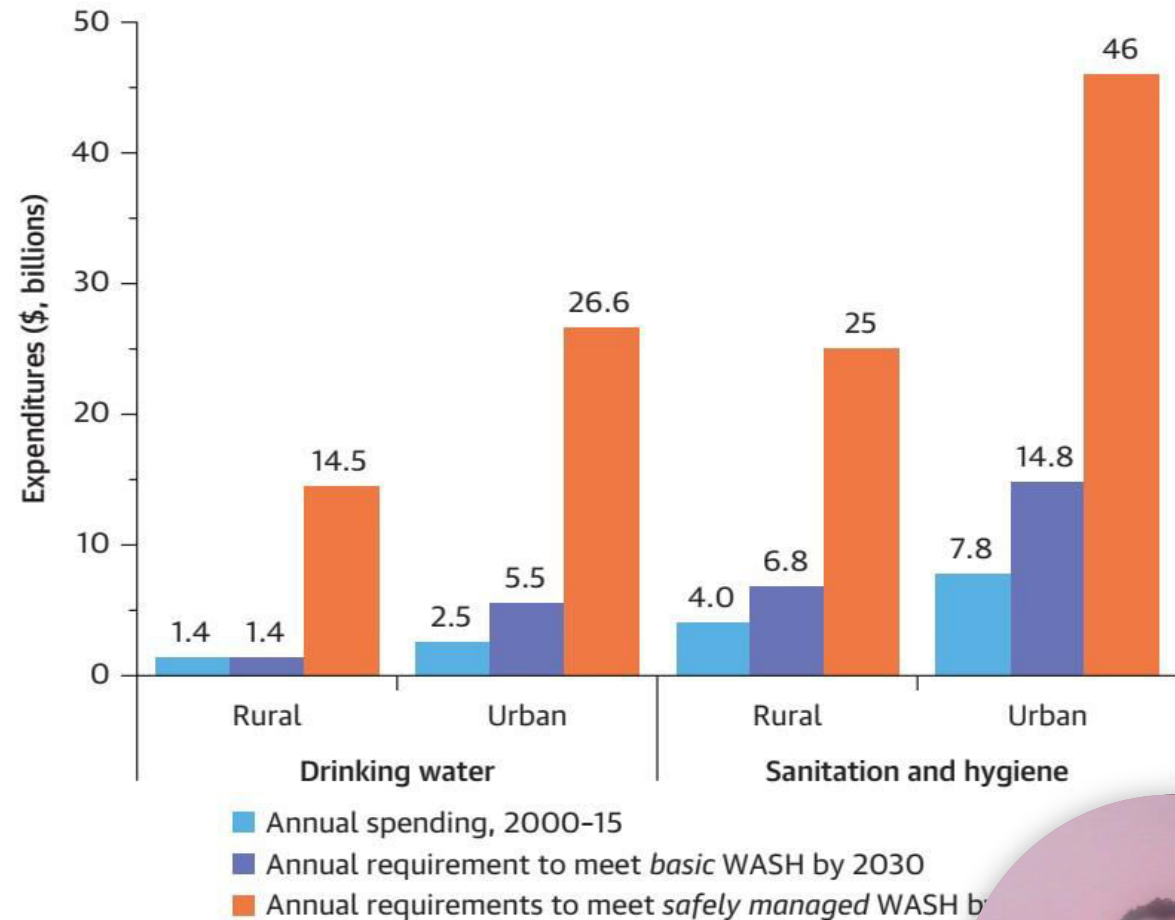
- Megacities of 10 million or more
- Large cities of 5 to 10 million
- Medium-sized cities of 1 to 5 million
- Cities of 500,000 to 1 million
- Cities of 300,000 to 500,000
- Cities with fewer than 300,000

Source : World Urban Pro



Costs of Extending WASH Access under SDGs (2016–30) Compared with MDGs (2000–15)

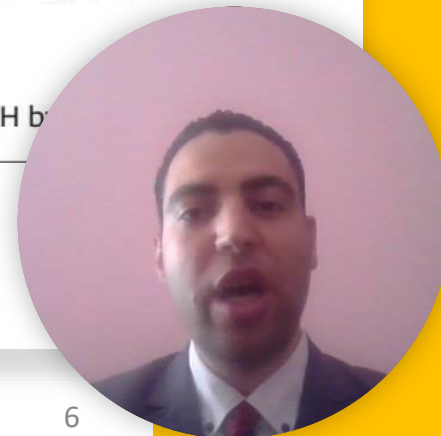
- What's needed to deliver universal access to safe services under the SDGs is around **\$112 billion** per year (ranging from \$74 billion to \$166 billion), or 0.39 percent of GDP.
- Most of this investment will be needed for **sanitation**, with 40 percent for urban sanitation and 20 percent for rural sanitation



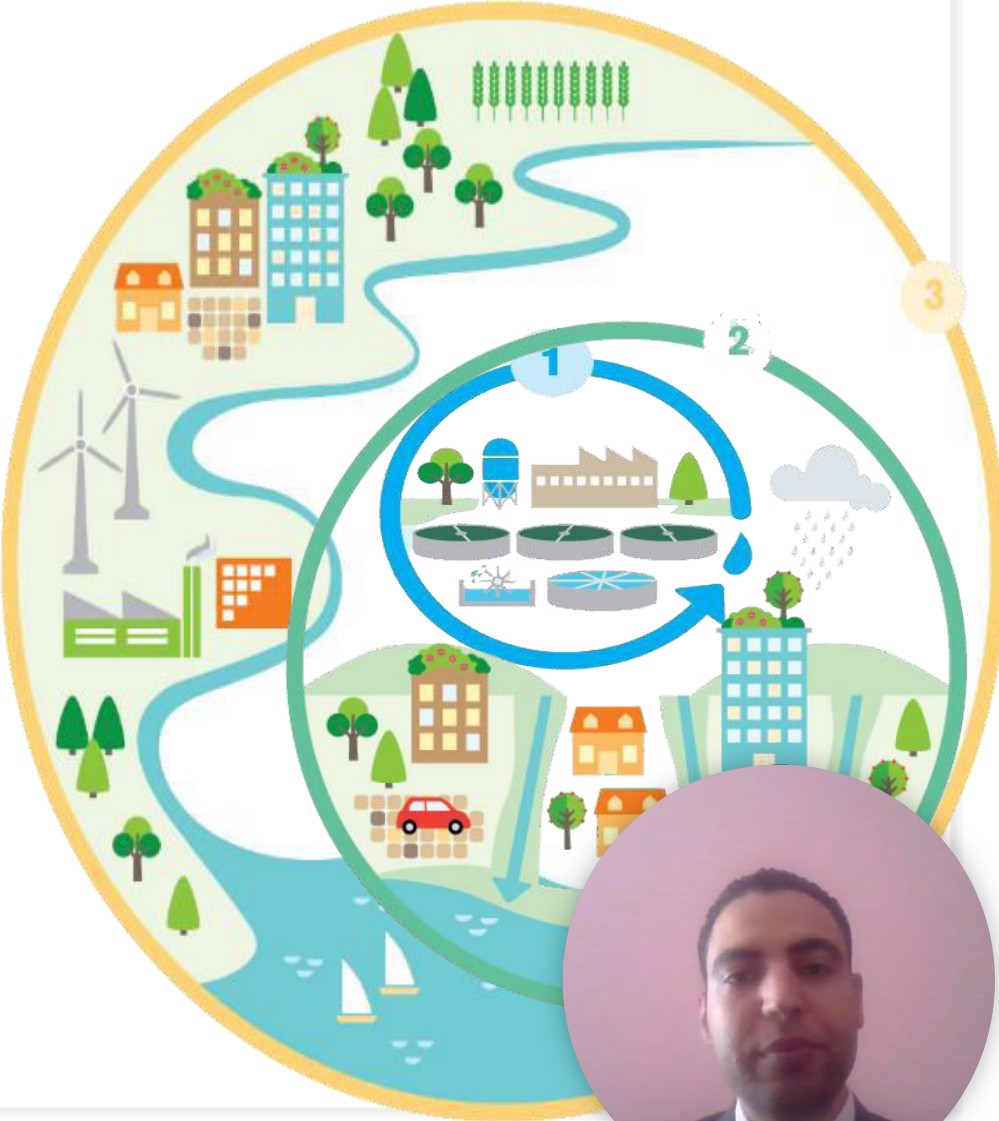
Source: World Bank/UNICEF 2017.

Note: WASH = water supply, sanitation, and hygiene.

Aboelnga (2018), **Doing more with less: The new paradigm for achieving SDG6**. Available at: <http://www.iwa-network.org/doing-more-with-less-the-new-paradigm-for-achieving-sdg6/>



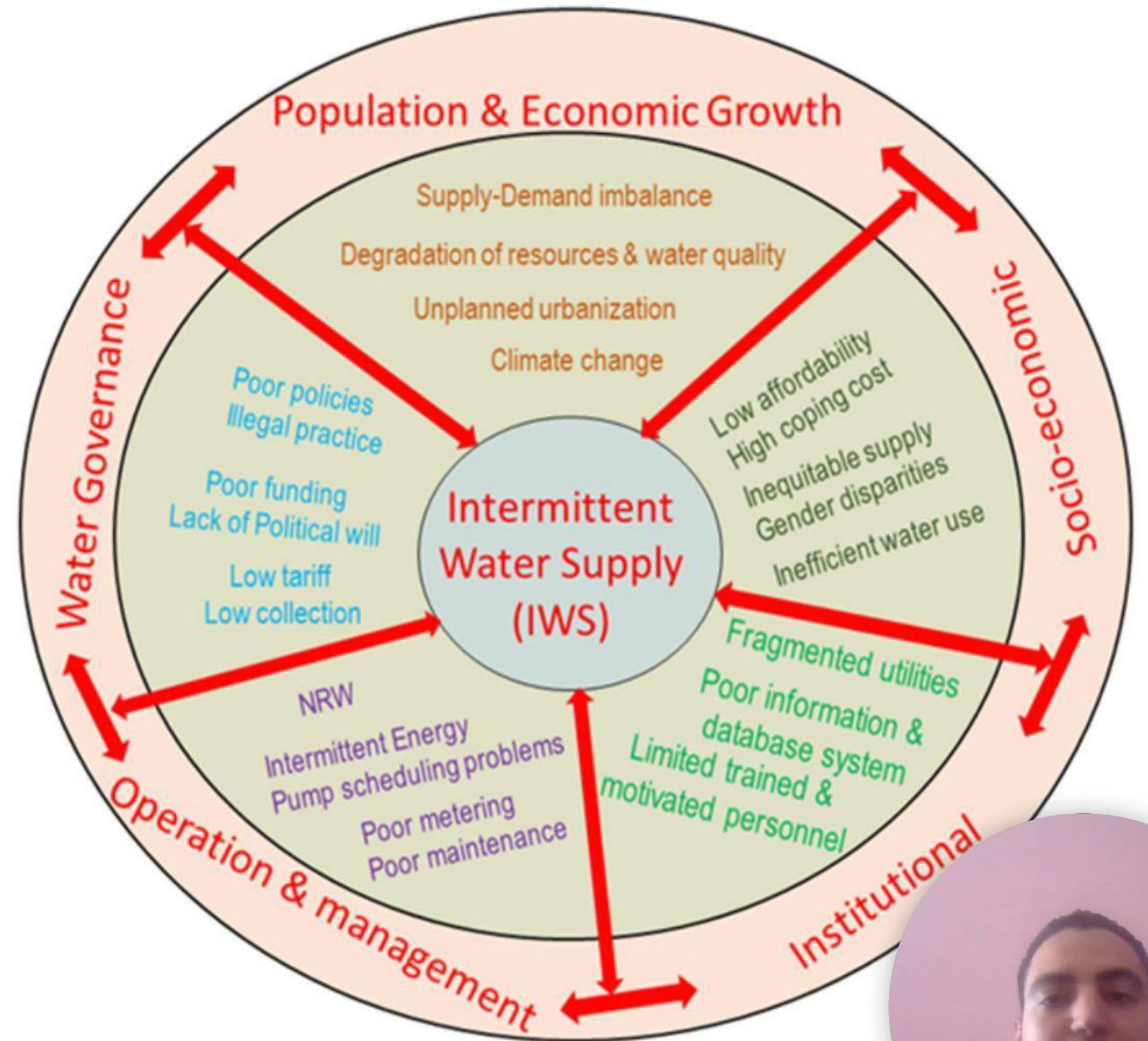
Water Management in Urban Areas is More Challenging



Intermittent Water Supply in Cities

Intermittent Water Supply (IWS) refers to piped water supply service that is available to consumers less than 24 hours per day

About [1.2 billion people](#) globally are affected by IWS.



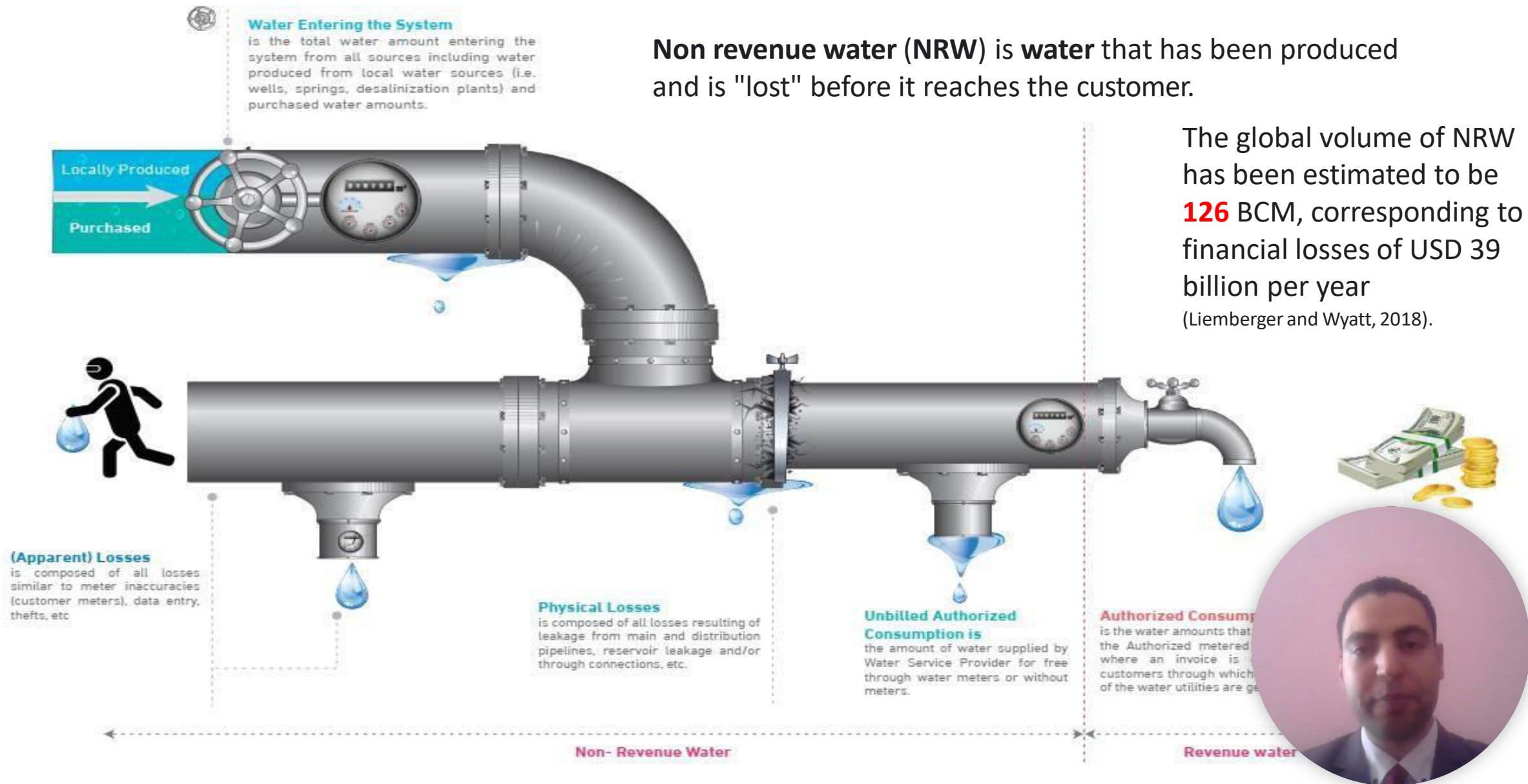
Sources: Aboelnga, 2023, Smart Water Magazine, <https://smartwatermagazine.com/blogs/hassan-tolba-aboelnga/drip-stream-transforming-intermittent-water-supply-a-24x7-supply>

Aboelnga, 2019, International Water Association, <https://iwa-network.org/running-out-of-water-cities-shifting-from-24x7-to-intermittent-water-supply/>

Non-Revenue Water (NRW)

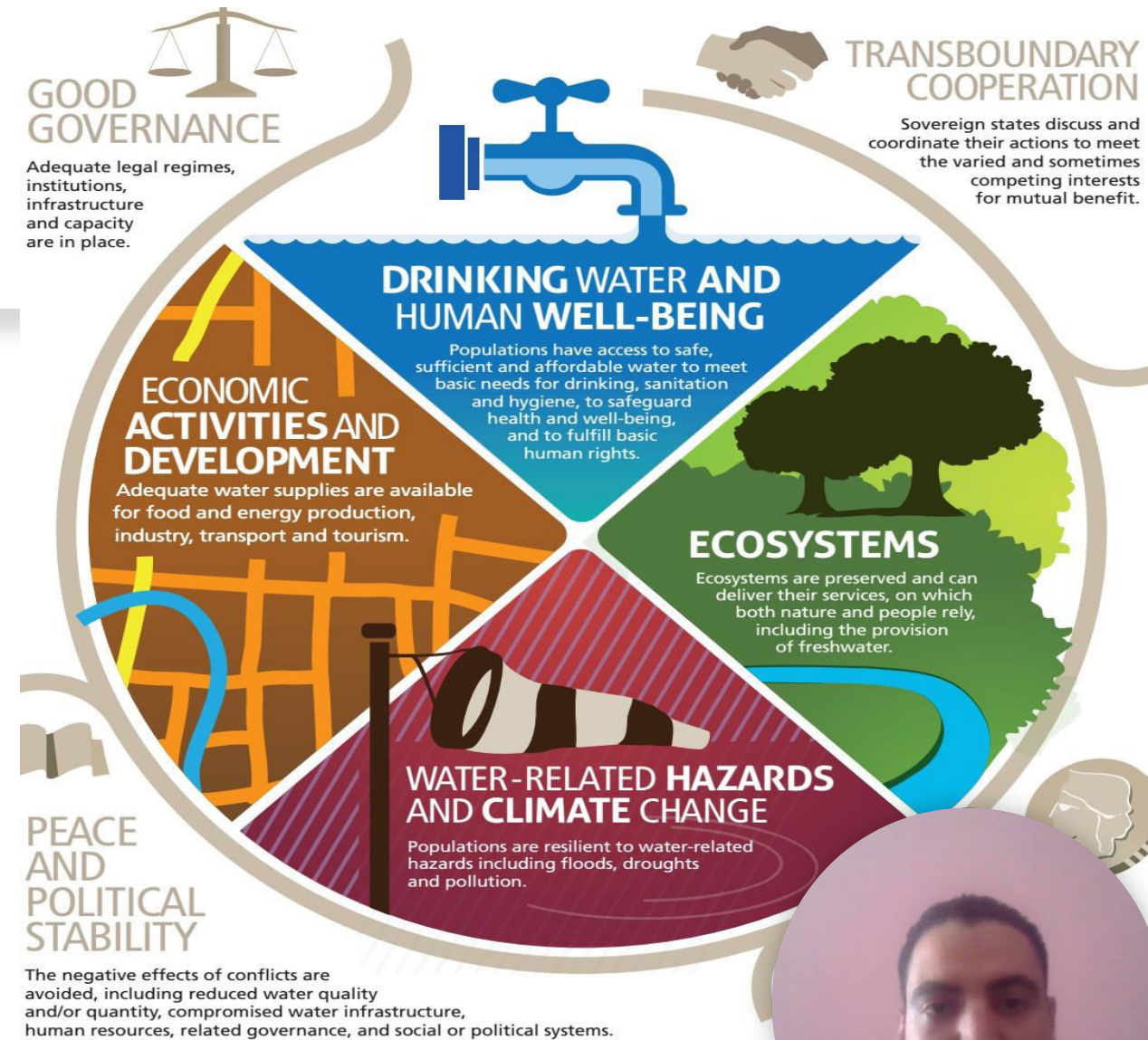
Non revenue water (NRW) is **water** that has been produced and is "lost" before it reaches the customer.

The global volume of NRW has been estimated to be **126 BCM**, corresponding to financial losses of USD 39 billion per year (Liemberger and Wyatt, 2018).



UN-Water Water Security

- *“The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.”*
- UN-Water supports the inclusion of water security on the agenda of the UN Security Council and in the post-2015 development agenda as part of the Sustainable Development Goals.



Ref. (UN-Water, 2013)



Benefits of Water Security Indices

They reveal at a glance precisely where a city's strong and weak points lie and can serve as the key first step in strategic long-term planning to realize cities to be sustainable and water secured.

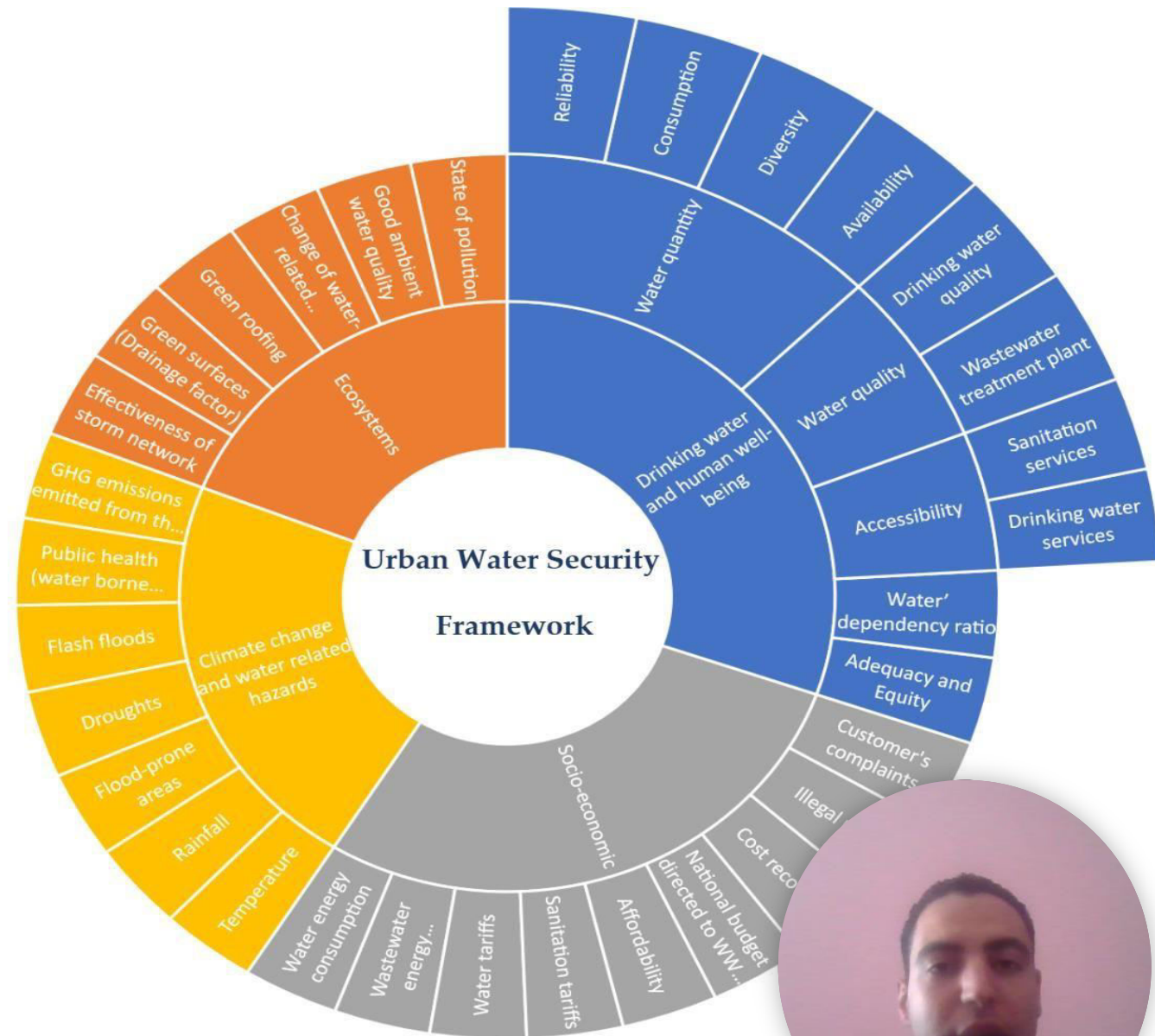
The framework is an easy-to-understand interactive tool serving strategic decisions. The actual assessment is done together with key stakeholders ensuring usable results and quick access to expert knowledge.

They offer a platform that enhances city-to-city learning, exchange of best practices. Cities can learn important practical lessons from other cities that have already implemented best practices.



Urban Water Security: Definition and Assessment Framework

“The dynamic capacity of water system and stakeholder to safeguard sustainable and equitable access to water of adequate quantity and acceptable quality that is continuously, physically and legally, available at an affordable cost for: sustaining livelihoods, human well-being, and socio-economic development, ensuring protection against waterborne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.”



Interpretation of the integrated urban water security index scores

Grading Urban Water Security	Level of Security	Explanation
<1.5	Poor	Urban water security is poor at meeting the basic needs of the people. Lack of water governance and management is a major concern in all dimensions.
1.5–2.5	Fair	Policies and measures are not enough to achieve urban water security, with major concerns in almost all dimensions.
2.5–3.5	Reasonable	Urban water security is satisfactory to meet the basic needs, with gaps in some dimensions that affect the resilience and sustainability of the system.
3.5–4.5	Good	Sound policies and management exist for achieving urban water security for most of the dimensions, but some improvements are still needed.
>4.5	Excellent	A well-managed and water-secure city that is capable of meeting the basic needs and is resilient to future shocks and risks. The index shows a high level of performance in all dimensions.



Measuring the Integrated Urban Water Security (IUWSI) in Beirut, Lebanon

The score of 2.48 indicates “fair” urban water security being slightly short to reach the “reasonable” level. The policies, strategies and current situation are not enough to achieve water security in most of the dimensions.

- IWUSI(Drinking water & human wellbeing)=2.73
- IUWSI(Ecosystem)=1.72
- IUWSI(Climate change and waterrelated hazards)=2.12
- IUWSI(Socio - economic)=2.26

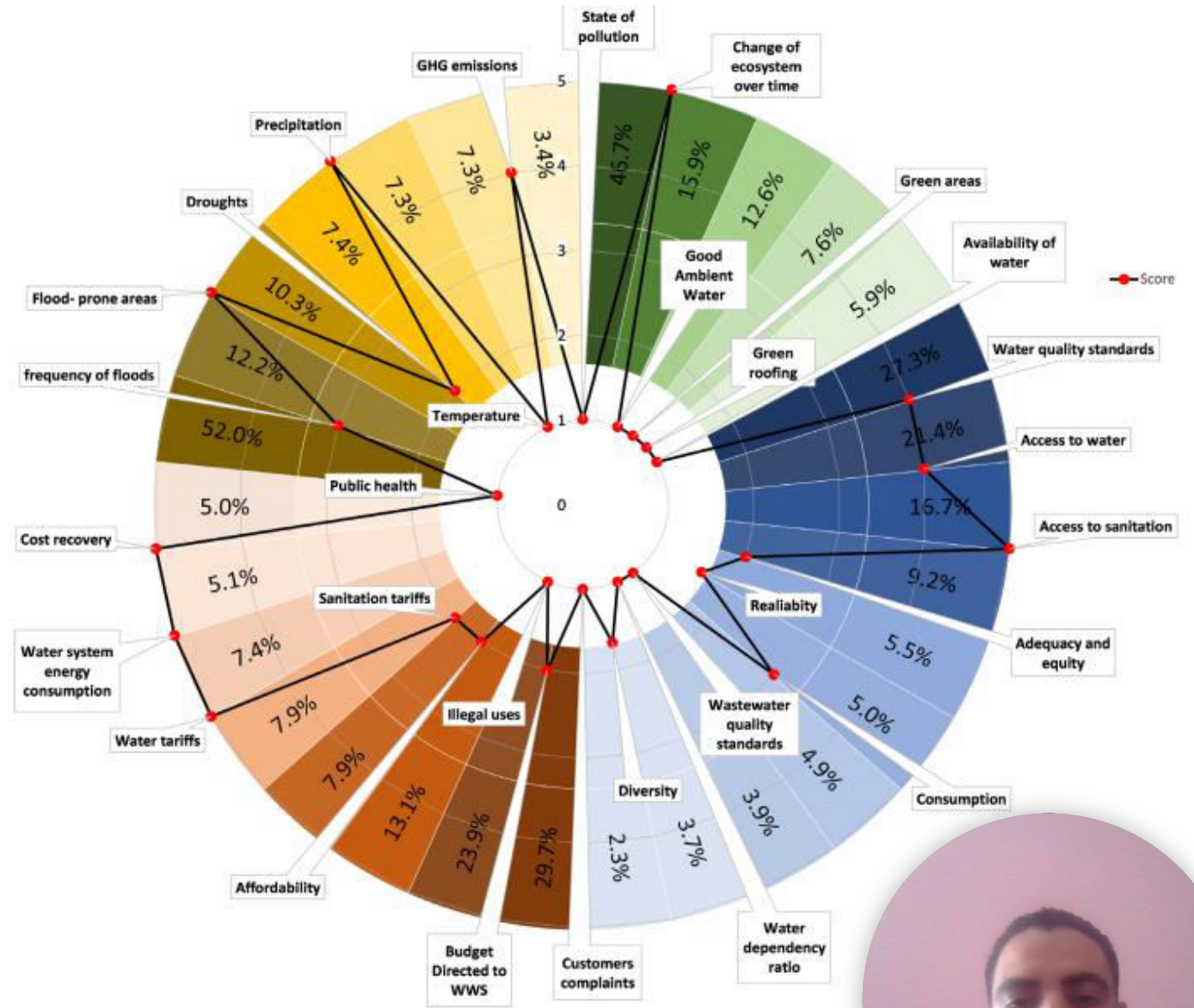
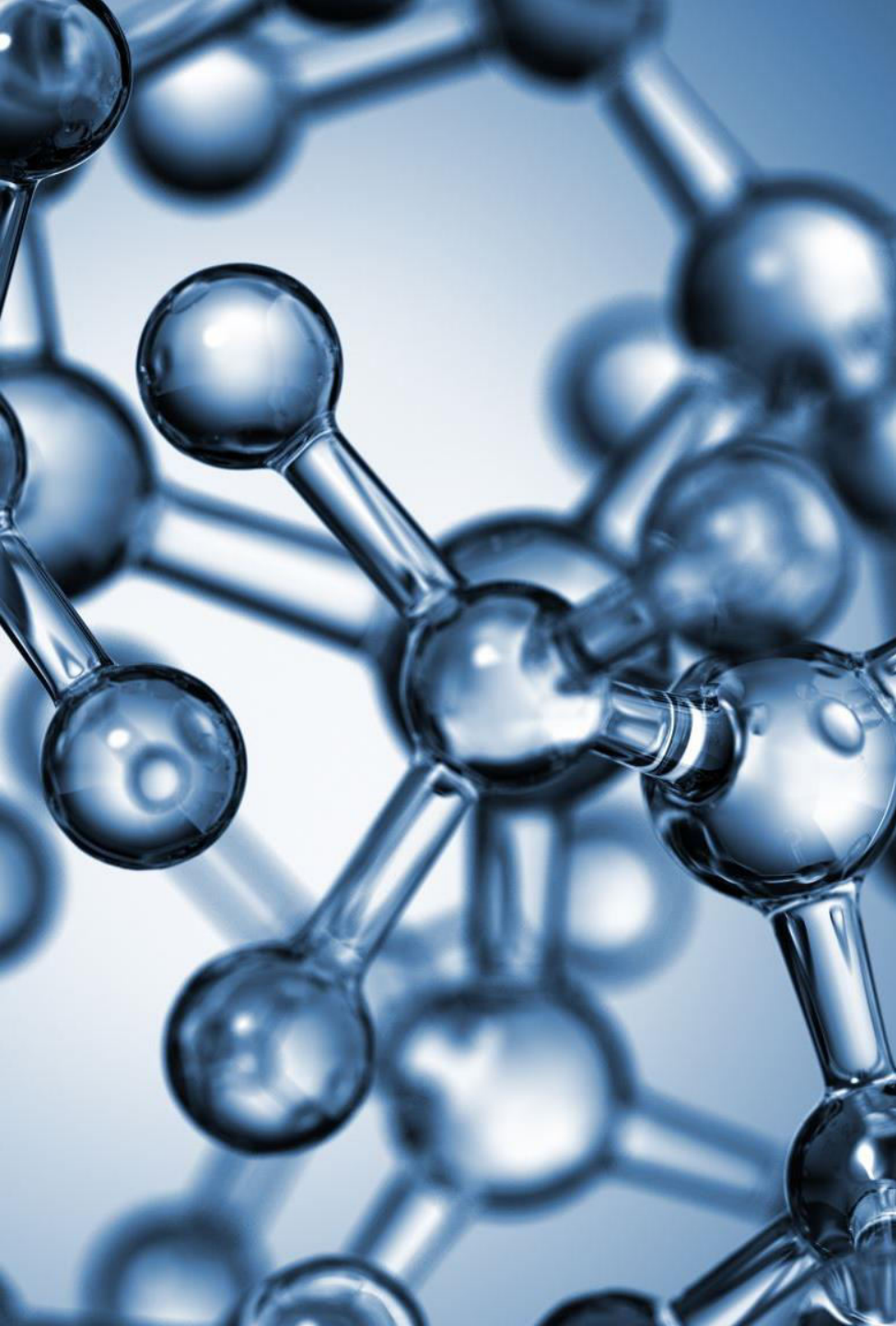


Figure 10-4 The score and weight of IUWSI indicators in Beirut, Lebanon. The red spots indicate the score (center to 5 (high) at the edge of the circle). The color ramp with different hue/tint represents the weight (sorted according to weight (darker representing higher weight (assigned more importance), lighter representing lower weight (assigned less importance)). The percentage indicates the weight (importance) of each indicator.





New Paradigm for the Future of Water and SDGs- “No Room for Business as Usual” to preserve precious water



Changing

How we manage water today



Changing

How we finance water



Changing

How we collaborate at different levels

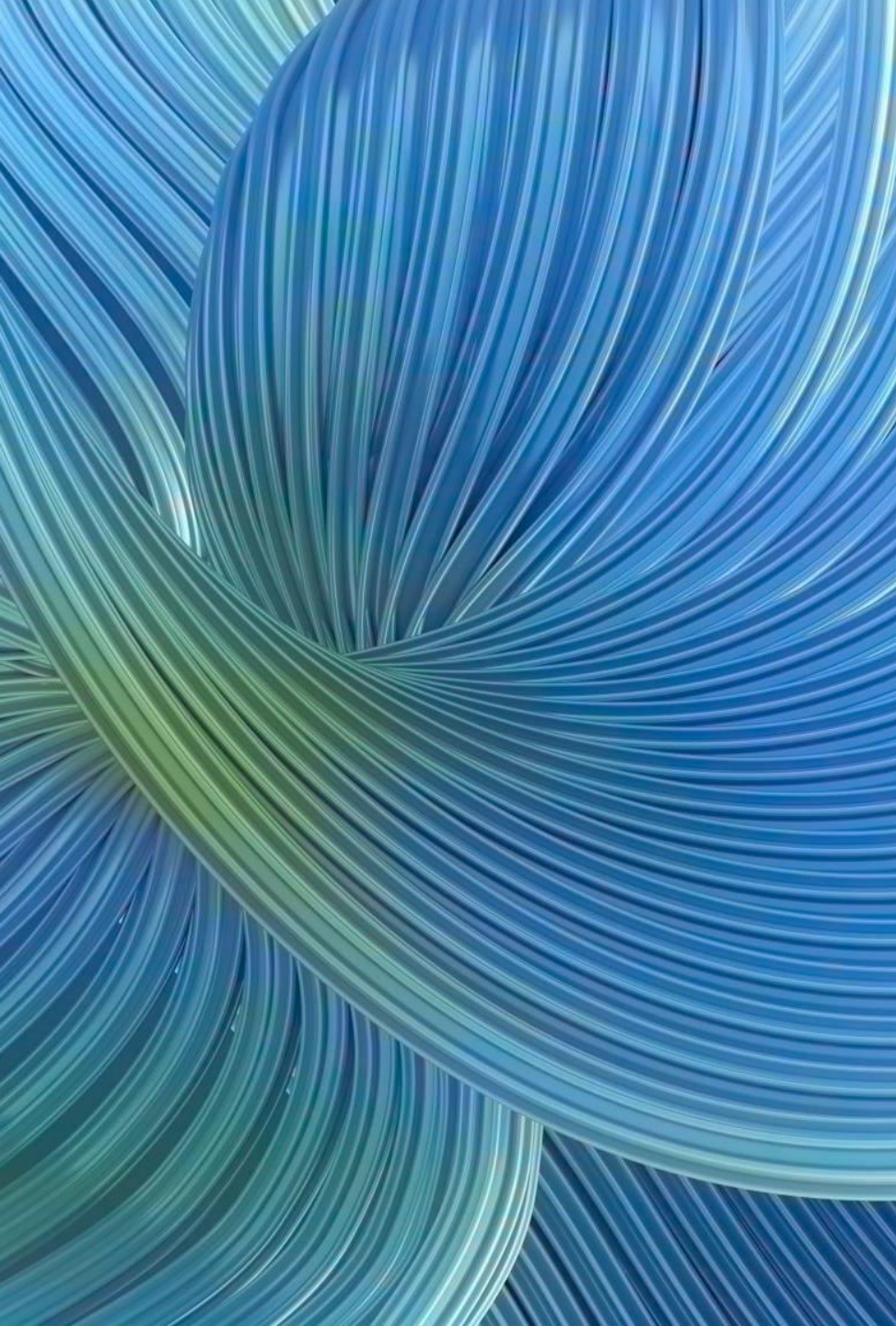


Changing

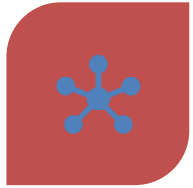
the way we design our policies



Aboelnga, Saghir (2019), **A New Paradigm to Achieve Water Security and the SDGs in**
Available at: <http://sdg.iisd.org/commentary/guest-articles/a-new-paradigm-to-achieve-water-security-in-the-arab-region/>



The Five I's to Leapfrog in Achieving Water Security and Sustainable Development



INTEGRATION



**INNOVATION THROUGH
NEW TECHNOLOGIES,
FINANCING, AND
PARTNERSHIPS**



**INFRASTRUCTURE
(RESILIENT
INFRASTRUCTURE)**



INFORMATION



INSTITUTIONS



Aboelnga, Soliman (2020), **How can the Arab World leapfrog uncharted waters for development?** Available at; <https://blogs.worldbank.org/water/how-can-arab-world-leapfrog-uncharted-waters-sustainable-development>

Key publications

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- Atlas: Gawlik B, Easton P, Koop S, Van Leeuwen K and Elelman R (2017) The European Urban Water Atlas, European Commission, Publication Office of the European Union, Luxembourg, 160 pp. : <https://publications.europa.eu/en/publication-detail/-/publication/c296a413-24cc-11e7-b611-01aa75ed71a1/language/en/format-PDF/source-31420221>
- City Blueprint: Koop SHA, Van Leeuwen CJ (2015b) Application of the improved City Blueprint Framework in 45 Municipalities and Regions. Water Resources Management 29:4629-4647 <https://link.springer.com/article/10.1007/s11269-015-1079-7>
- Aboelnga, Hassan Tolba; El-Naser, Hazim; Ribbe, Lars; Frechen, Franz-Bernd (2020, May 5): Assessing Water Security in Water-Scarce Cities: Applying the Integrated Urban Water Security Index (IUWSI) in Madaba, Jordan. In Water; MDPI, Basel, Switzerland, 12 (5), p. 1299. DOI: 10.3390/w12051299.
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- Danilenko, A., Van den Berg, C., Macheve, B., & Moffitt, L. J. (2014). The IBNET water and sanitation blue book 2014: The international benchmarking network for water and sanitation data book. World Bank Publications.
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