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Overview

- An introduction to innovation in the water sector
- Are consulting engineers well placed to innovate?
- Conclusions
- Recommendations

An introduction to innovation in the water sector

A useful place to start: definitions

invention is the "what" (the new idea), while innovation is the "how" (making that idea useful and valuable).

Why do we need innovation in the water Water loss issue sector?

Gauteng Water Crisis

Four projects must be undertaken asap to avert water collapse in Gauteng water and sanitation dept



Gauteng's water supply crisis 'exacerbated by failing infrastructure' - WaterCAN



(14 Oct

Rand Water warns that water supply is 'critically low' in Gauteng... and heatwave isn't helping



() 13 Oct

Hammanskraal **Cholera outbreak**

Daily Maverick https://www.dailymaverick.co.za > Articles

Hammanskraal cholera outbreak 'represents the ears of ...

26 Jul 2023 - The investigation highlights a much bigger issue: wastewater treatment works that release other harmful bacteria into the water system



https://groundup.org.za/.../deadly-cholera-outbreak-was...

Deadly cholera outbreak was just a matter of time

24 May 2023 - A cholera outbreak such as is occuring in Hammanskraal, where 17 people have died from the disease so far, was just a matter of time given South Africa's

SowetanLIVE https://www.sowetanlive.co.za/.../2024-05-15-sowetan-r...

Sowetan revisits Hammanskraal after cholera ravaged the ...

15 May 2024 - It has been a year since more than 20 people from Hammanskraal, north of Pretoria, died of cholera. The outbreak devastated families and the community at large.





The poor state of treatment works, distribution and collection networks

Climate change

Trend from 1973 to 2023

-1.8 -0.9 -0.4 +0.4 +0.9 +1.8 +3.6 +7.2°F



Who drives innovation in the water sector in South Africa?



Barriers to innovation in water sector



"Water innovation" is a relatively **new concept** in academic literature.



Reluctance to change: Often no action is taken on known risks until a crisis occurs.



Water is an essential, irreplaceable service—failure is not an option



Water infrastructure is built to **last 50-100 years**



Delays to project roll out



Number of publications in categories of either desalination or water treatment (Source: Ahmed et all 2023)

What is the Consulting Engineers Role in the Water Sector?



Where have all the civil engineers in local government gone?



Figure 3 Civil engineering practitioners in local government by qualification (Numbers and Needs, 2005, 2015; and LGSETA WSP, 2020)

Are consulting engineers well placed to innovate?

New

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Is industry training candidates adequately to implement innovation?

Candidate registered with ECSA by years since registration



Registered as a candidate for less than 3 years Registered as a candidate between 4 and 6 years Registered as a candidate for more than 6 years

Source: Various ECSA annual reports

Is industry training candidates adequately to implement innovation - the lost generation

Cumulative total of engineeing graduates vs registered professionals



The number of engineering graduates is increasing much faster than the number of professional and candidate engineers.

An uncertain future

Professionals registered with ECSA by age



Delays to 12 recent WWTW projects in numbers





Conclusions

- 21% of Professionals registered with ECSA are past retirement age and another 16% reaching retirement age.
- 40% of Candidates have been registered with ECSA for more than 6 years
- The number of **engineering graduates is increasing much faster** than the **number of professional and candidate engineers**.

What can we do better?

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What can Consulting Engineers do to contribute to innovation in Water Sector?

- Improve training programmes
- Fostering a Learning Culture
- Digital innovation

Please reach out jenniferr@mpamot.com



THANK YOU

