

# The South African Water Sector Skills Audit

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**WATER**  
RESEARCH  
COMMISSION



# Water Concepts



Water Research Commission  
Symposium 2013

LOCAL SOLUTIONS - GLOBAL IMPACT

# Local solutions with global impact



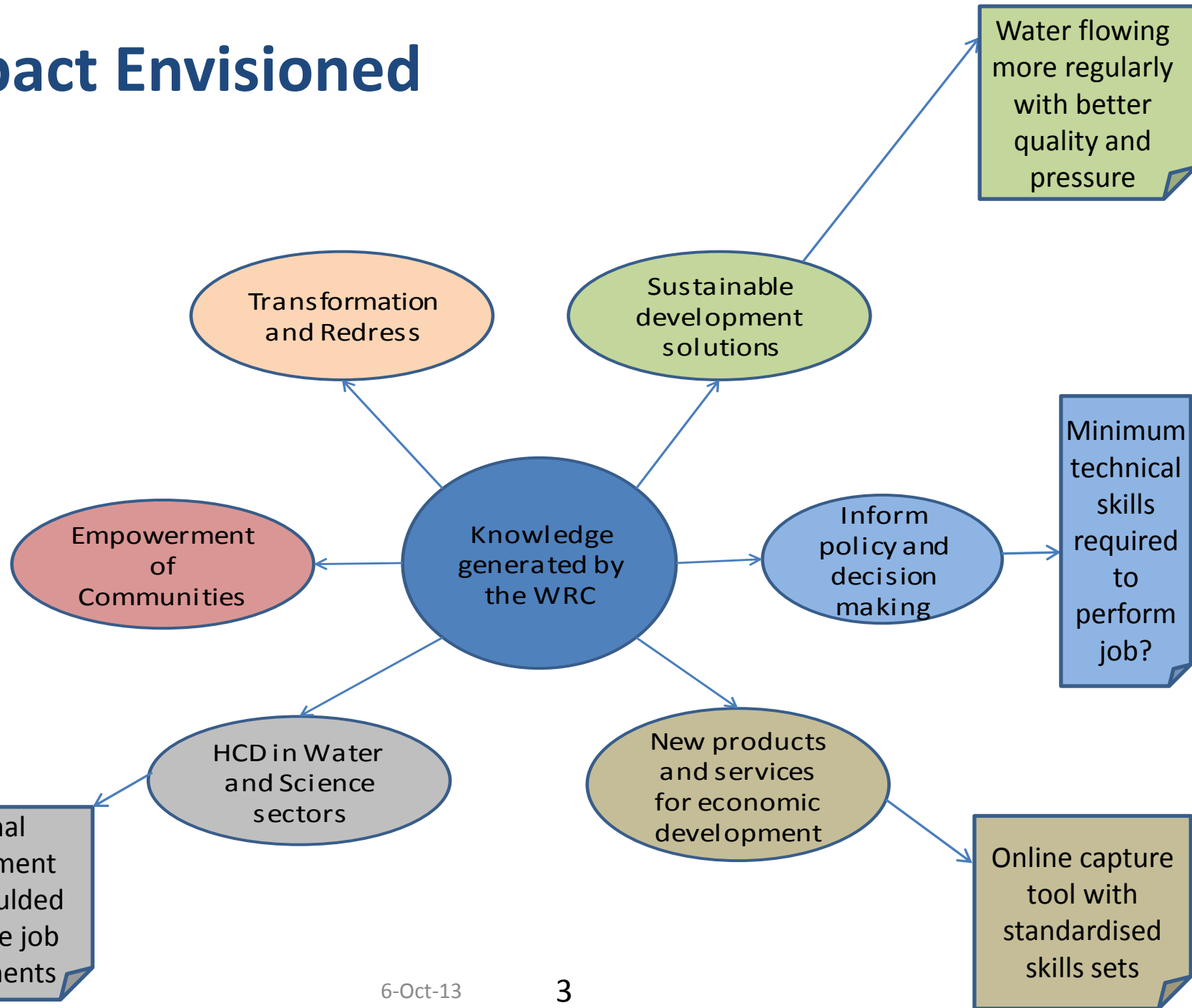
## International Linkages

- 💧 Will create linkages through publication of research in academically accredited journals:
  - 💧 International (1), but also
  - 💧 South African (1).

## National linkages

- 💧 DPSA HR Connect Project
  - 💧 provided concept of a Competency Framework for HR staff
- 💧 CoGTA
  - 💧 this research referenced, and will feedback into, CoGTA's Competency Profiles (the functional competencies)

# Impact Envisioned



# QUANTITATIVE Skills Gap: Output

## Quantitative Skills Gap

Mandate A  
or Task A



Then summate for all  
Mandates (A) in  
organisation then sector

Mandate B  
or Task B



Then summate for all  
Mandates (B) in  
organisation then sector

Total for all  
mandates in  
organisation



Then summate for all  
organisations in sector

# Quantitative: Demand for Capacity (1)



## Assume factors affecting demand for capacity for each type of organisation, namely:

- 💧 DWA – not included in quantitative research
- 💧 Catchment Management Agency (CMA)
- 💧 Water User Association (WUA)
- 💧 Water Board
- 💧 Municipality or Water Services Authority

# Quantitative: Demand for Capacity (2)



## Calculate demand for capacity (generic method):

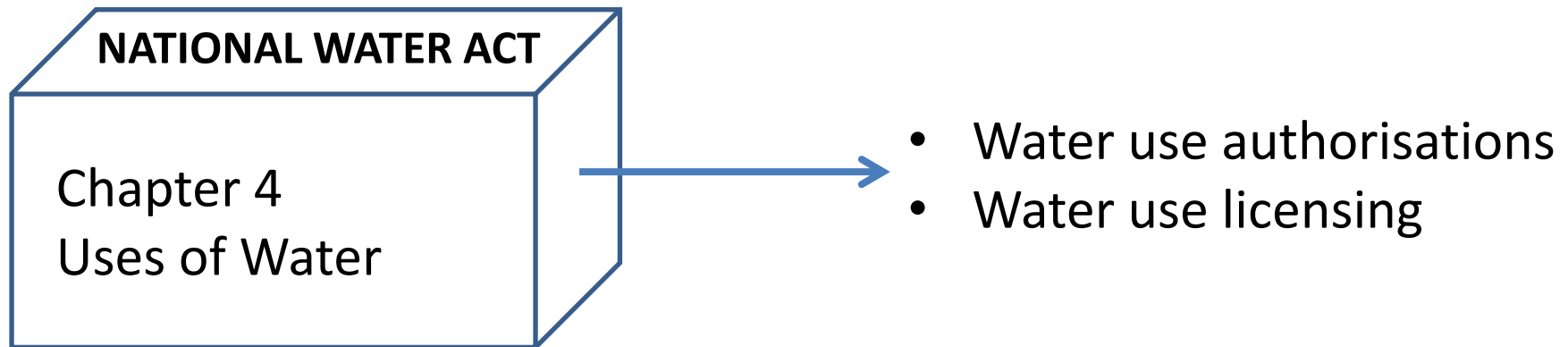
- 💧 Research organisation's mandate from legislation
  - 💧 Place mandates in organisation's organogram
  - 💧 Obtain technical data on extent / size of responsibility
  - 💧 Assume the number of times the tasks must be performed (to achieve the mandate)
  - 💧 Assume a unit time to complete a task/s
  - 💧 Calculate total time required
- = Number of tasks X unit time

# Quantitative: Demand for Capacity (3)



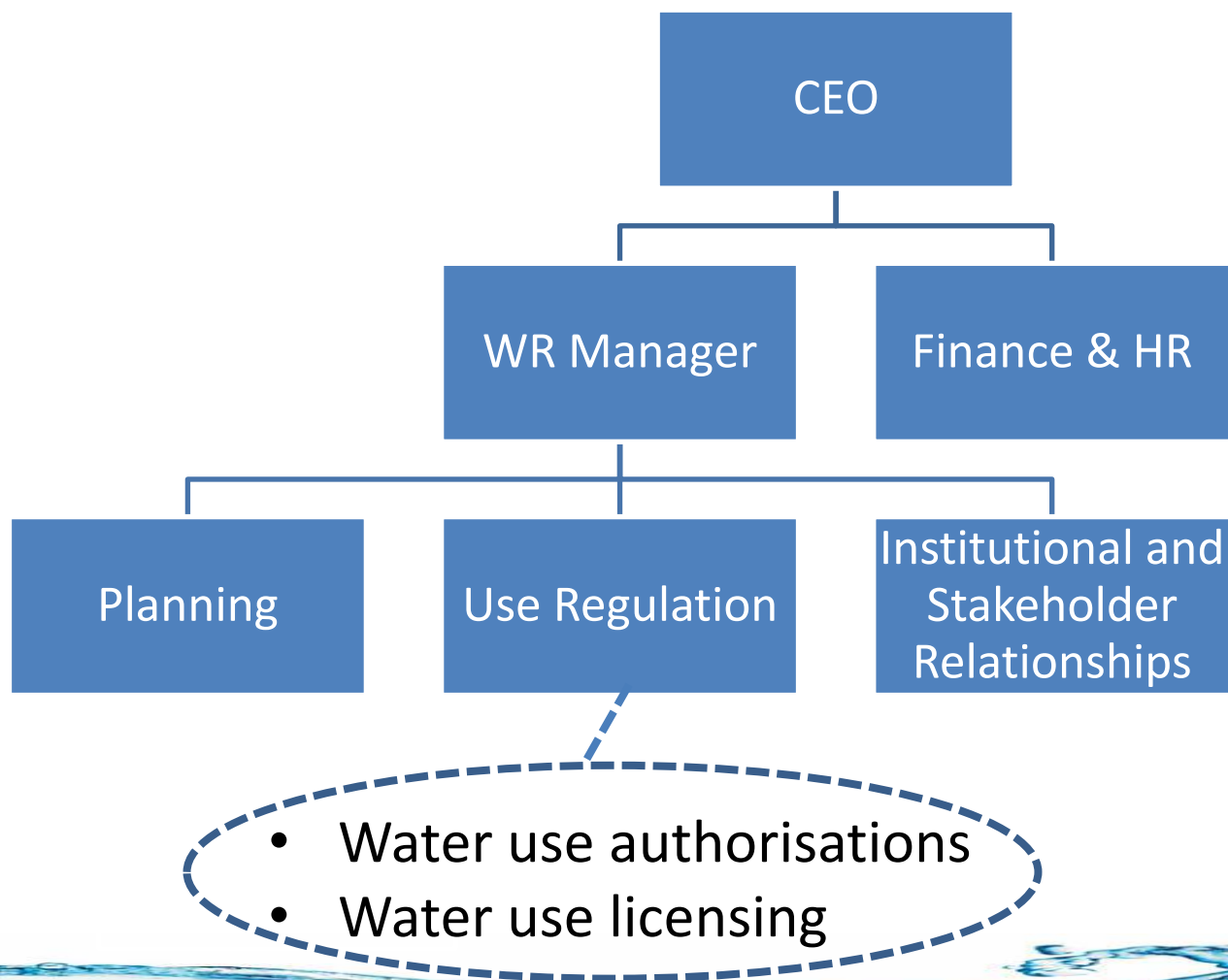
**Calculate demand for capacity (using a CMA as an example):**

## **Research organisational mandate from legislation**



# Quantitative: Demand for Capacity (4)

## Place mandates in organisation's organogram





# Quantitative: Demand for Capacity (5)



## Obtain technical data on extent of responsibility

💧 Length of rivers	812 km
💧 Number of farms	10 875 farms
💧 Number of stakeholders	33 stakeholders

# Quantitative: Demand for Capacity (6)



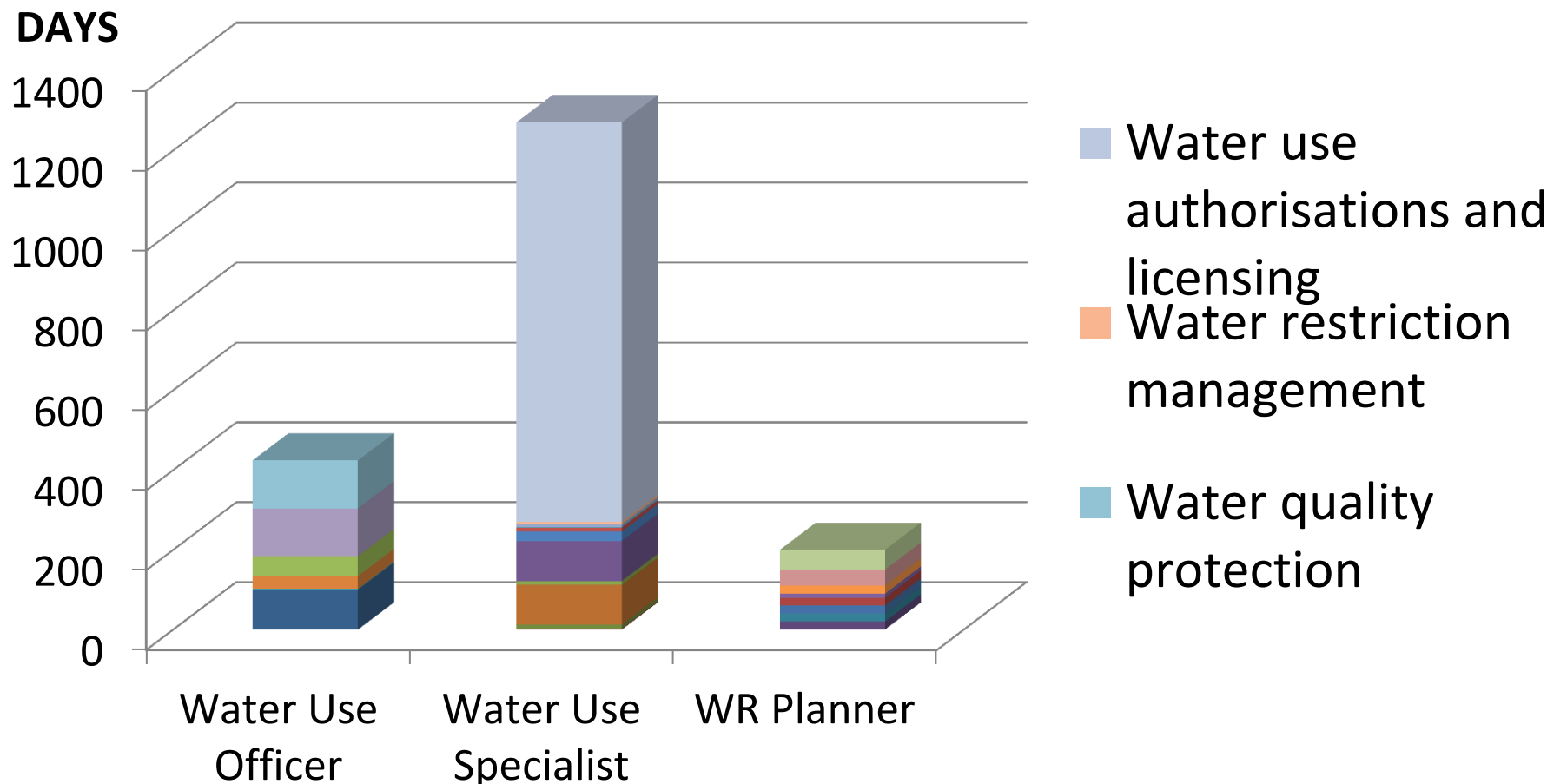
## Assume

- number of tasks to achieve mandate, and
- unit time per task

Tasks/Mandate	Allocation to Job Title	Number of Tasks	Time to Complete Task once	Total time
Water use authorisations	Water Use Specialist	1 087	1 days	1 087 days

# Quantitative: Demand for Capacity (7)

## Total time required or Demand for Capacity



# Quantitative: Supply of Capacity



## Obtain actual staff numbers available per Job Title

Staff must meet minimum qualification as per the job description

Job Title	Minimum Qualification Requirement	Year Appropriate Experience	Actual Qualification of Incumbent	Does incumbent meet qualification requirement ?
Water Use Specialist (n)	National Diploma/BSc (Chemistry, Biochemistry, Microbiology, Environmental Science)	7 years	B Tech Water Care	✓

# Quantitative: Capacity Gap



## The Quantitative Gap at this CMA would be:

- 💧 Demand for staff per Job Title (as per graph above)  
less the
- 💧 Supply of staff per Job Title (as per table above)

## Innovation:

This quantitative gap is **against** the ideal number of staff to meet the mandate (not against the number of staff as shown on the organisation's organogram approved by the board).

# Quantitative: Organisations in Sample

## 💧 DWA

- 💧 Not included

## 💧 CMA

- 💧 (1) BOCMA
- 💧 (2) Prototype CMA

## 💧 WUAs

- 💧 (3) Groenland WUA
- 💧 (4) Oranje-Riet WUA

## 💧 Water Board

- 💧 (5) Amatola Water
- 💧 (6) Botshelo Water

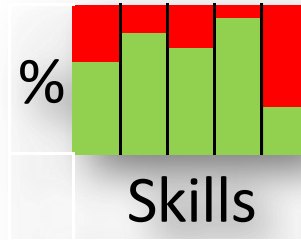
## 💧 Water Services Authorities

- 💧 (7) Tshwane Metro
- 💧 (8) Capricorn DM
- 💧 (9) Ehlanzeni DM
- 💧 (10) Ngaka Modiri Molema DM
- 💧 (11) iLembe DM
- 💧 (12) Blue Crane Route LM
- 💧 (13) Cape Agulhas LM
- 💧 (14) Ditsobotla LM
- 💧 (15) Maluti-a-Phofung LM
- 💧 (16) Newcastle LM
- 💧 (17) Sol Plaatje LM
- 💧 (18) Thabazimbi LM

# QUALITATIVE Skills Gap: Output

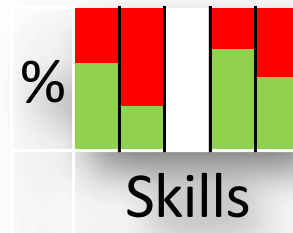
## Qualitative Skills Gap

Job Title (n) →



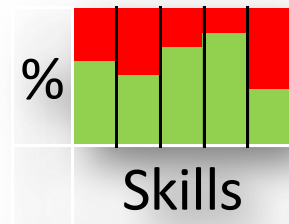
Then summate for all  
Job Titles (n) in  
organisation then sector

Job Title (m) →



Then summate for all  
Job Titles (m) in  
organisation then sector

Total for all  
Job Titles in  
organisation →



Then summate for all  
organisations in sector

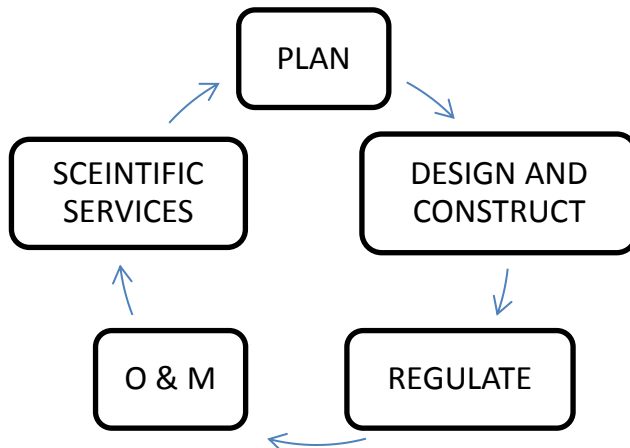
# Qualitative: Demand for Capacity

## Standard list of skills against which to measure demand

- Used the “water value chain” or the “water cycle” as guide



- Used the “project life cycle” as guide





# Water Sector Competency Framework (1)



FUNCTION	COMPETENCY CLUSTER	COMPETENCY	SKILL
Functional Management			
Water Resources Planning			
Water Resources Infrastructure			
Water Resources Regulation			
Water Resources O&M/Use Management			
Water Resources Environmental / Scientific Services			
Water Services Planning			
Water Services Infrastructure			
Water Services Regulation			
Water Services O&M			
Sanitation/Wastewater Planning			
Sanitation/Wastewater Infrastructure			
Sanitation/Wastewater Regulation			
Sanitation/Wastewater O&M			
Social Sciences/Development Planning			

# Water Sector Competency Framework (2)



## Level 2: Competency Cluster

FUNCTION	COMPETENCY CLUSTER	COMPETENCY	SKILL
Water Services Infrastructure			
	WS Design		
	WS Construction		

# Water Sector Competency Framework (3)



## Level 3: Competency

FUNCTION	COMPETENCY CLUSTER	COMPETENCY	SKILL
Water Services Infrastructure	WS Design		
		Design of Bulk Infrastructure	
		Design of WTWs	
		Design of Reservoirs	
		Design of Water Distribution Networks and Pump Stations	
		Tender Management, Bid Adjudication and Placing of Contracts	
		Contract Administration	
	WS Construction	Health, Safety, Environmental and Quality Management (SHEQ)	
		Surveying	
		Construction Management (Boreholes only)	
		Construction Management (WTWs, Reservoirs, Pumps Stations, Pipelines)	
		Building/Bricklaying	
		Carpentry	
		Welding	
		Plumbing	
		Electrical	
		Mechanical	
		Operating Construction Equipment	

# Water Sector Competency Framework (4)



## Level 4: Skills

FUNCTION	COMPETENCY CLUSTER	COMPETENCY	SKILL
Water Services Infrastructure	WS Construction		
		Tender Management, Bid Adjudication and Placing of Contracts	Define project scope, project schedule and deliverables.
			Prepare tender documents.
			Edit draft tender documents from consultants to ensure completeness.
			Compile contract/ service level agreement.
			Adhere to government supply chain management.
			Evaluate bids and negotiate where allowed.
			Appoint contractors with all required legal documentation.
			Oversee the appointment of contractors with all required legal documentation.

# Water Sector Competency Framework (5)



## Skills Matrix



FUNCTION	COMPETENCY CLUSTER	COMPETENCY	SKILL	JOB TITLE	
Water Services Infrastructure	WS Construction	Tender Management, Bid Adjudication and Placing of Contracts		Project Manager (Water Infrastructure)	Laboratory Technician (Hydrobiology)
			Define project scope, project schedule and deliverables.	✓	
			Prepare tender documents.	✓	
			Edit draft tender documents from consultants to ensure completeness.	✓	
			Compile contract/ service level agreement.		
			Adhere to government supply chain management.	✓	
			Evaluate bids and negotiate where allowed.	✓	
			Appoint contractors with all required legal documentation		

# Online Capture Tool

## Welcome to the WRC/DWA Water Sector Skills Audit

This skills audit project is being implemented by ONYXX Human Capital and Water Concepts on behalf of the Water Research Commission (WRC) and the Department of Water Affairs (DWA).

[www.waterskills.co.za](http://www.waterskills.co.za)



### Questions & Answers:

- How long will it take me to complete?  
± 45 minutes in total.
- Do I have to complete the audit in one go?  
No. However, we recommend that you provide as much information as possible.
- Why should I fill out this questionnaire?  
To help identify any skills gaps that you might have and to identify appropriate skills interventions you might need. Also to help the WRC and DWA to test this method of identifying skills gaps viz. this website and the generic skills list.
- Will I get a copy of my final skills audit?  
Yes, your HR representative will give you a copy to sign and place on your file.
- Is my information open for everyone to see?  
No. The information is hosted on a secure website which is not open or available to anybody except the HR Representative and the Project Administrator.

For any queries or assistance contact Alice Coelho on [083 540 7300](tel:0835407300) / [info@onyxx.co.za](mailto:info@onyxx.co.za)

[Click here to REGISTER](#)

[Login here to resume](#)

(When you resume you will continue where you left off)

ID Number  OR  
Passport Number   
Cellphone  (eg. [0821234321](tel:0821234321))

[Resume](#)

[Admin Login](#) (Office use only)

[Respondent's Manual](#) [HR Representative's Manual](#)



# Online Capture Tool : Obtain Actual Skills



Firefox WRC/DWA Water Sector Skills Audit +

www.waterskills.co.za/index.php/survey#

Most Visited

Norton Safe Web Share Access Vault Login Assistant

Biographical Information Organisational Information Educational Information Additional Training Professional Membership **Technical Skills** HR Skills

## WRC/DWA Water Sector Skills Audit

TECHNICAL SKILLS (PAGE 6 OF 7)

Functional Management

Water Resources Planning

Water Resources Infrastructure

Water Resources Regulation

Water Resources O&M/ Use Management

Water Resources Environmental / Scientific Services

Water Services Planning

Water Services Infrastructure

WS Construction

**Tender Management, Bid Adjudication and Placing of Contracts**

Define project scope, project schedule and deliverables.

1	2	3	4	5	Remove rating
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Prepare tender documents.

1	2	3	4	5	Remove rating
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

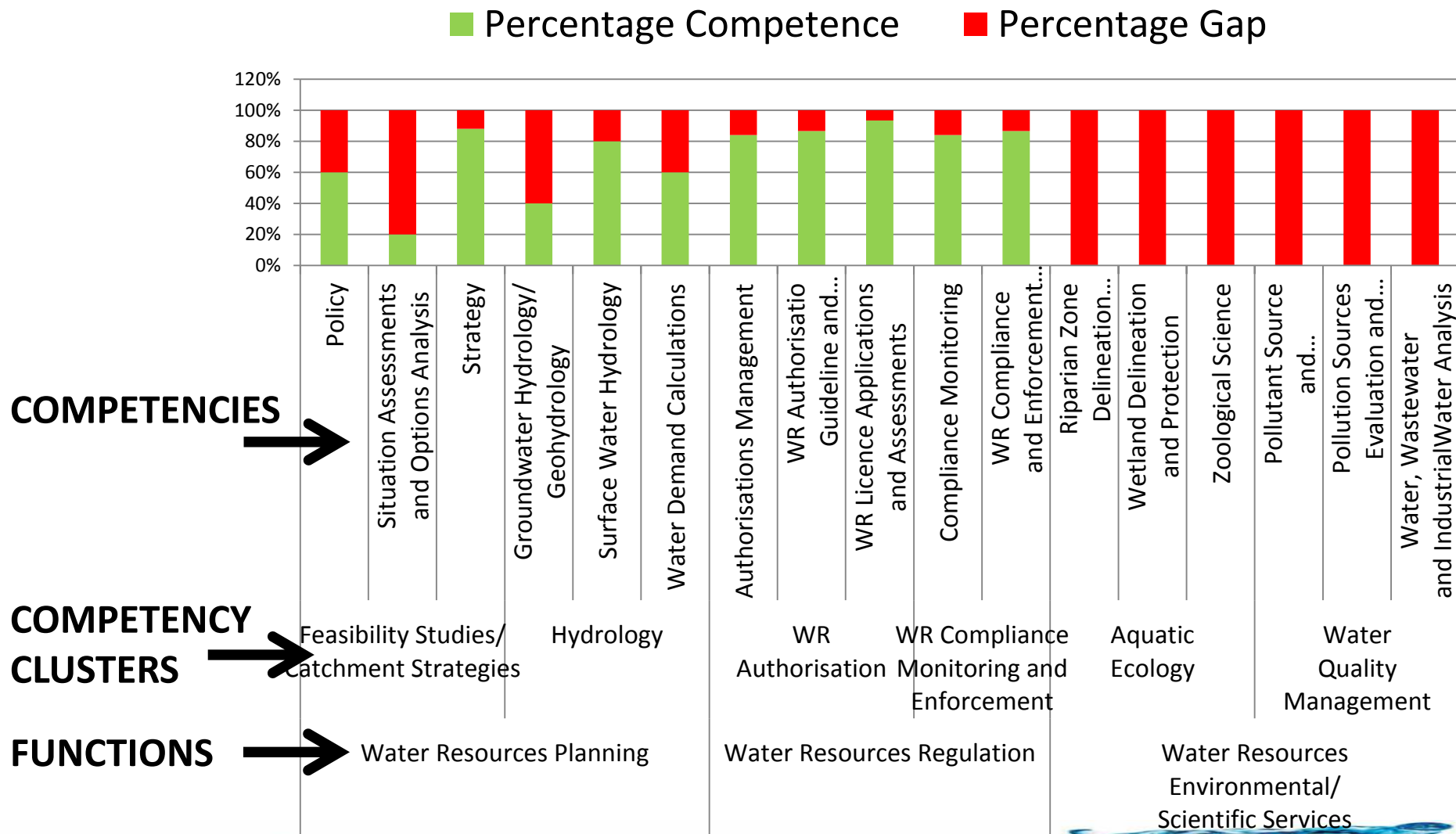
Edit draft tender documents from consultants to ensure completeness.

1	2	3	4	5	Remove rating
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Compile contract/ service level agreement.

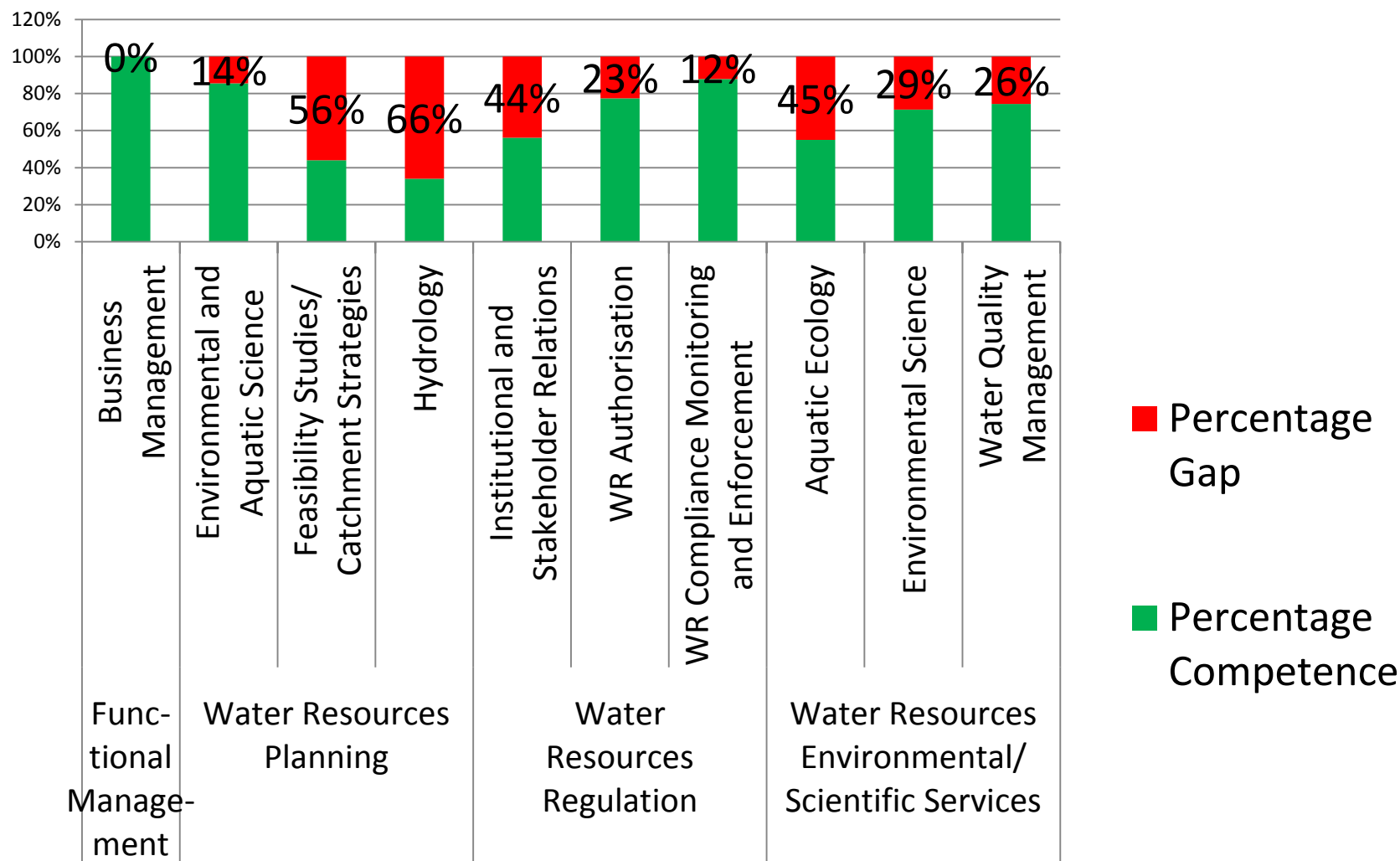
Incumbent  
completes  
self-rating  
online.

# Qualitative: Skills Gap (Individual)





# Qualitative: Skills Gap (Organisation)



# Qualitative: Organisations in Sample



## 💧 DWA

- 💧 (1) 350 technical staff (of approximately 1 400 technical staff)

## 💧 CMA

- 💧 (2) BOCMA

## 💧 Water User Association

- 💧 not included in qualitative research

## 💧 Water Board

- 💧 (3) Umgeni Water

## 💧 Water Services Authorities

- 💧 (4) Moses Kotane LM (North West)
- 💧 (5) Chris Hani DM (Eastern Cape)