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NEPAD
TRANSFORMING AFRICA



Integrated Water Resources Management (IWRM) and the Workplace:

Part 1 – Context and Integration

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our future through science

Our Objectives

- **Context:** What is IWRM in the Workplace?
 - Examples of IWRM in the Workplace
- **Becoming “Workplace Proficient”**
 - Discipline Knowledge and its Workplace Application
 - Skills vs Knowledge
 - Technical and Intellectual Abilities
- **IWRM Disciplines and Integration**
 - Which is Best?
 - How to Integrate?
- **Examples of Advertisements** (part of Friday’s Session)

Lecture Structure

- Examples from my experience
- Do not expect a lecture but **come prepared for engagement and discussions** about the relationship and relevance between classroom knowledge and exercises versus the work environment [“The real thing” they call it]
- Some of the questions that you should be asking him include:
 - What is the expectation of workplace people from you? What are they expecting you to know and do
 - Environment?
 - What are you expecting the workplace people to do for you?
 - What are your expectations from the work environment?

Lecture Structure

We will spend most of our discussions exploring the relevance of the following:

- **Academic knowledge:** Source, where, when, how and why
- **Practical skills:** Source, where, when, how and why
- **Workplace-based experience:** Source, where, when, how and why
- The relationship among these 3
- **Universities and Technikons:** Relationships/Differences
- **Advertisements and Interviews:** Do they speak to young graduates or not? What are they looking for and why?

Lecture Structure

- The **assignment question or exam question** will be given will you be able to design and implement [Use your academic knowledge to solve a practical problem in a workplace based environment]
- **Communication:** Given your academic reading and academic writing training that you received at university will you be able to.. at workplace environment?
 - Read documents at workplace and get relevant and key information
 - Look for information on internet for your report writing
 - Write reports [Field, Lab etc], draft reports for your seniors
 - Make a presentation to your colleagues and seniors
- **Calculations:** Given data sets or values, can you create a Table or a graph? Do you have these skills? Can you do analysis on the data? Can you produce a map given data sets? Do you have these skills?

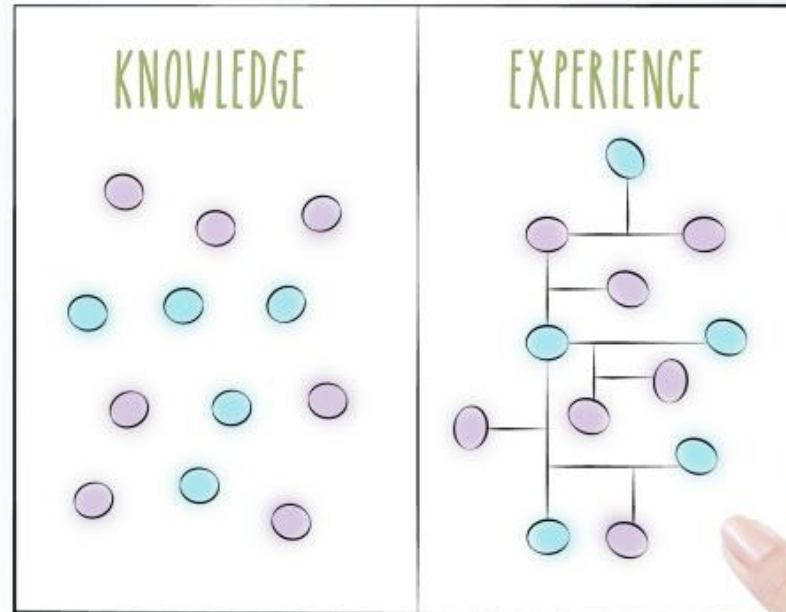


1.

**Origins, Rationale, Context &
Perspectives**

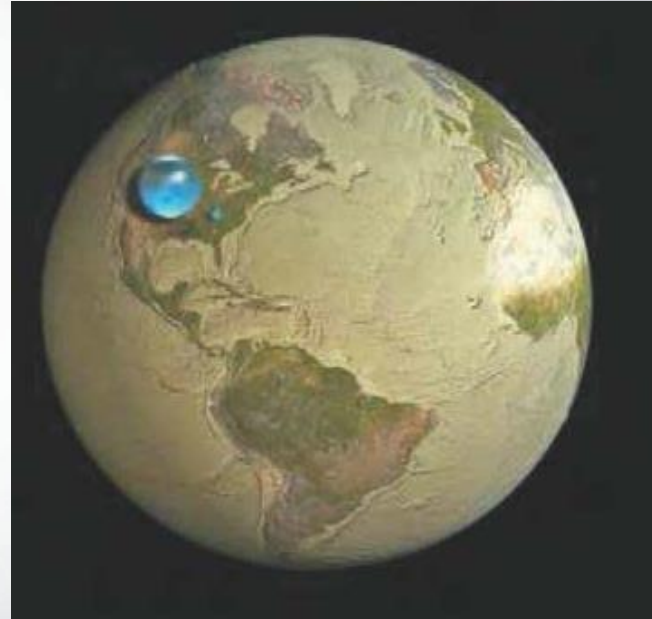
Knowledge and Experience

CONNECTIONS FUEL CREATIVITY:
NOTHING IS ORIGINAL



Global Water Availability

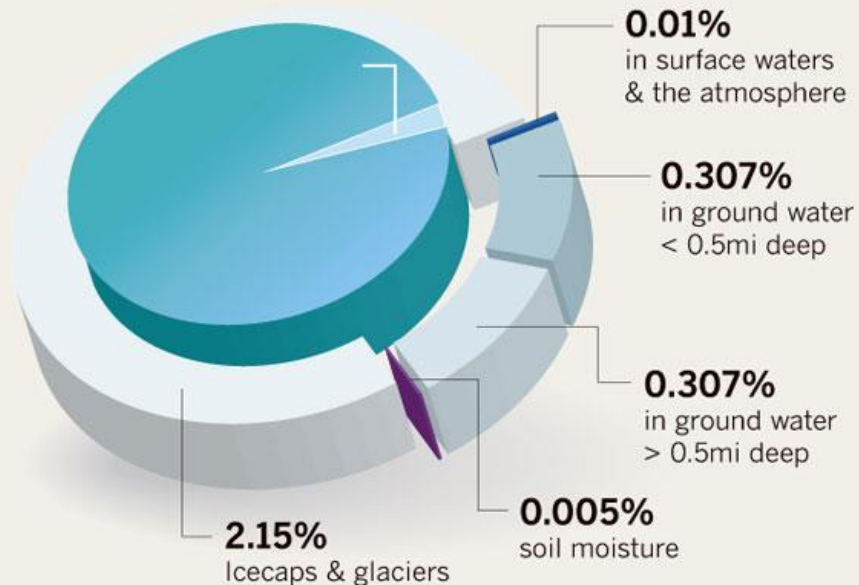
- While water is the most abundant natural resource on Earth, **97%** of it is too salty for human consumption and crop production.
- Much of the fresh water, an estimated 35 million cubic km, cannot be accessed for use since it is locked either in the ice cover of the Arctic or Antarctic or in deep aquifers (**2%**).
- Thus, the physically accessible fresh water potential of the world is only 90 000 cubic km per year (**<1%**).



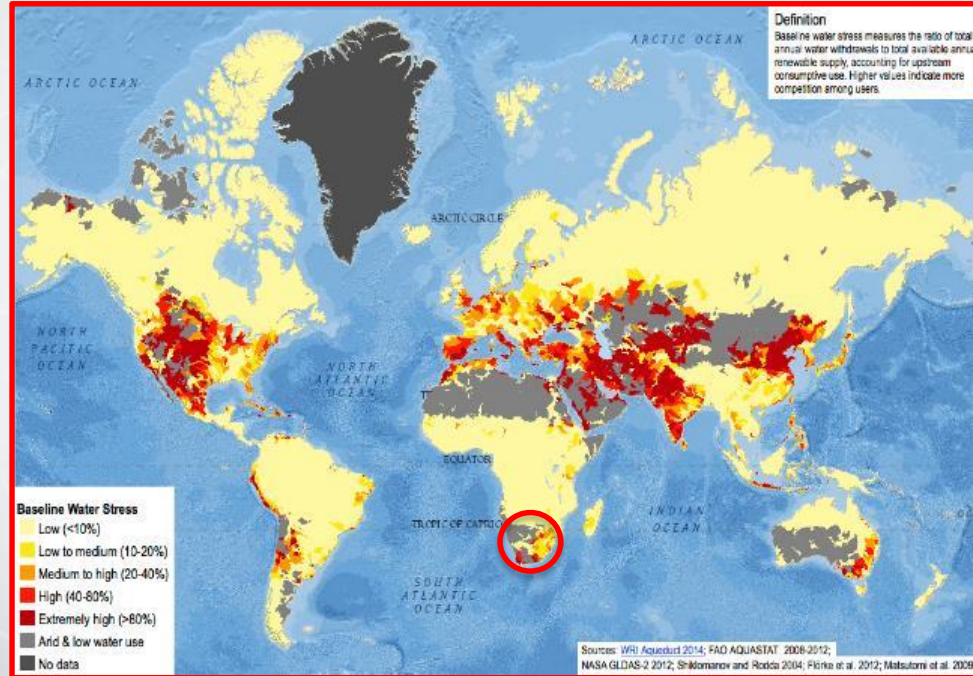
WHY MANAGE WATER ???

WHY WATER MANAGEMENT IS NECESSARY

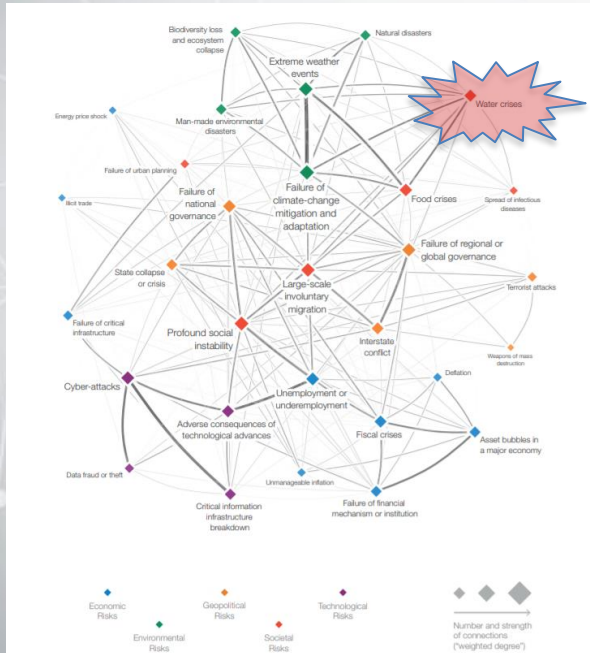
Global world water supply: Less than 0.7% of total water is available for human use (> 97% saline and > 2% frozen in ice caps; water in ice caps is an important part of rivers)



Geographical Water Stress Areas



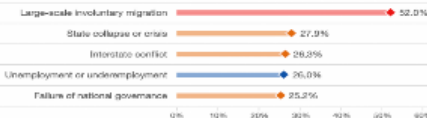
2019 WEF Global Risks



The Global Risks of Highest Concern, 2016

Percent of respondents in a survey identifying this risk as one of the top risks for the next 10 years or 18 months, respectively. Percentages could sum up to more than 100% due to rounding. For each category, the risks are ranked by the number of respondents.

For the next 18 months



For the next 10 years



Read more: wef.ch/risk2016 #risks2016

Water-Related Business Risks

- Companies experiencing increased detrimental impacts from water (security of availability and quality) – **water-related impacts result in financial impacts.**
- 05th Assessment of IPCC Projects found that each degree of global warming would result in approximately 7% of global population exposed to a decrease of renewable water resources of least 20% (UNCDP, 2016).
- With respect to climate change linkages – water is recognised as a very significant risk regarding the likelihood and impact of water crises, extreme weather events and natural disasters (WEF, 2017).

The Justification for “IWRM”

Water is a key driver of economic and social development while it also has a basic function in maintaining the integrity of the natural environment. However water is only one of a number of vital natural resources and it is imperative that water issues are not considered in isolation.

Managers, whether in the government or private sectors, have to make difficult decisions on water allocation. More and more they have to apportion diminishing supplies between ever-increasing demands. Drivers such as demographic and climatic changes further increase the stress on water resources. *The traditional fragmented approach is no longer viable and a more holistic approach to water management is essential.*

This is the rationale for the Integrated Water Resources Management (IWRM) approach that has now been accepted internationally as the way forward for **efficient, equitable and sustainable development and management of the world's limited water resources and for coping with conflicting demands.**

The “IWRM” Basis

There are great differences in water availability from region to region - from the extremes of deserts to tropical forests.

In addition there is variability of supply through time as a result both of seasonal variation and inter-annual variation.

All too often the magnitude of variability and the timing and duration of periods of high and low supply are not predictable; this equates to unreliability of the resource which poses great challenges to water managers in particular and to societies as a whole.

The “IWRM” Basis

Most developed countries have, in large measure, artificially overcome natural variability by supply-side infrastructure to assure reliable supply and reduce risks, albeit at high cost and often with negative impacts on the environment and sometimes on human health and livelihoods.

Many less developed countries, and some developed countries, are now finding that supply-side solutions alone are not adequate to address the ever increasing demands from demographic, economic and climatic pressures; waste-water treatment, water recycling and demand management measures are being introduced to counter the challenges of inadequate supply.

In addition to problems of water quantity there are also problems of water quality. Pollution of water sources is posing major problems for water users as well as for maintaining natural ecosystems.

The “IWRM” Basis

In many regions the availability of water in both quantity and quality is being severely affected by climate variability and climate change, with more or less precipitation in different regions and more extreme weather events.

In many regions, too, demand is increasing as a result of population growth and other demographic changes (in particular urbanization) and agricultural and industrial expansion following changes in consumption and production patterns.

As a result some regions are now in a perpetual state of demand outstripping supply and in many more regions that is the case at critical times of the year or in years of low water availability.

What is “IWRM”?

IWRM is an empirical concept which was built up from the **on-the-ground experience of practitioners**.

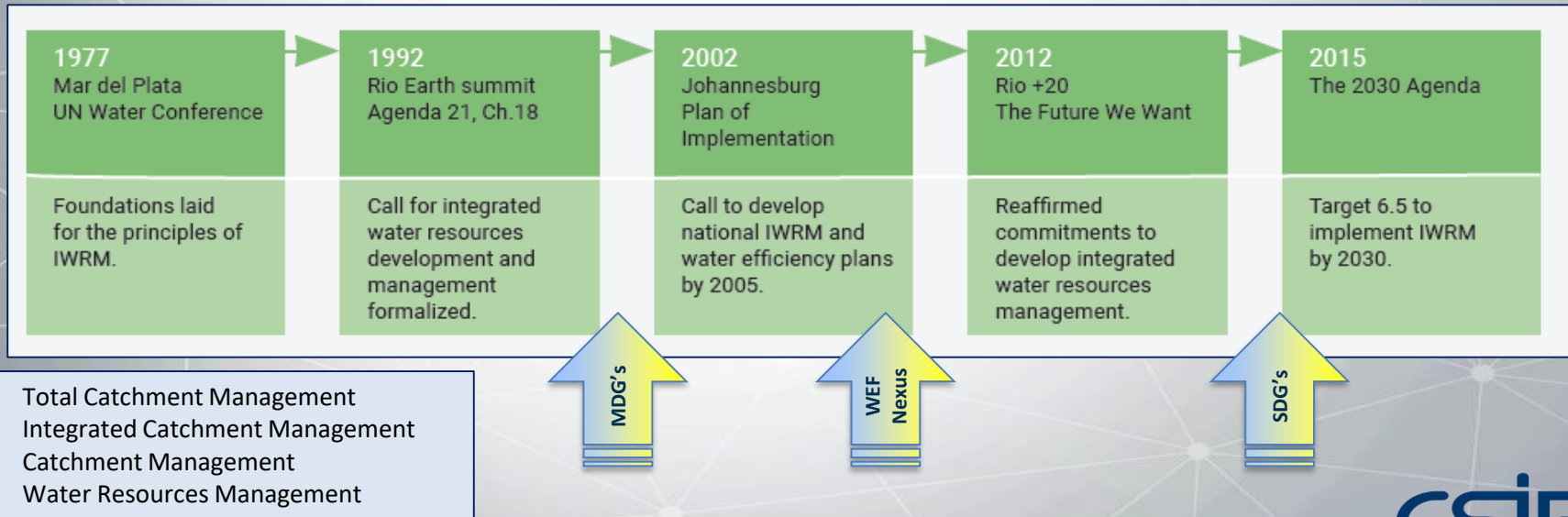
Although many parts of the concept have been around for several decades - in fact since the first global water conference in Mar del Plata in 1977 - it was not until after Agenda 21 and the World Summit on Sustainable Development in 1992 in Rio that the concept was made the object of extensive discussions as to what it means in practice.

The Global Water Partnership's definition of IWRM is widely accepted. It states:

'IWRM is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.'

Where did (global) “IWRM” begin? Other Conventions

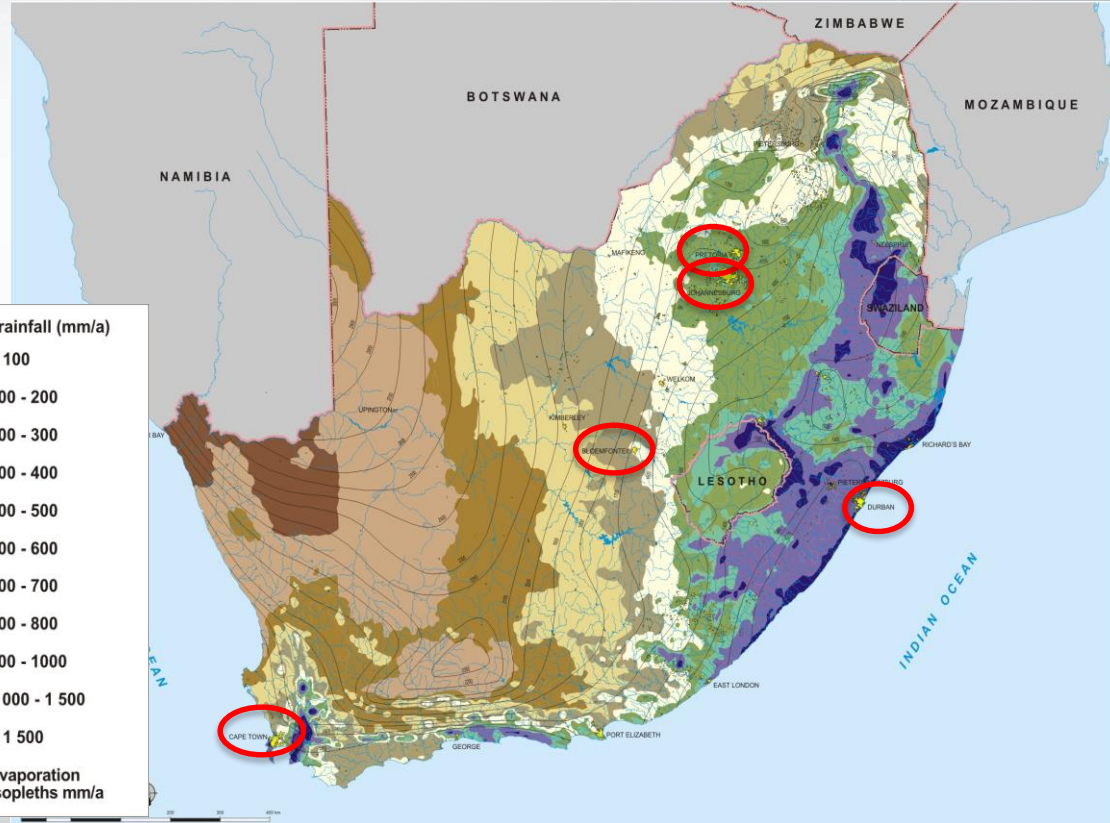
Countries have long recognized the benefits of implementing integrated approaches to water resources management, which has resulted in several global agreements.



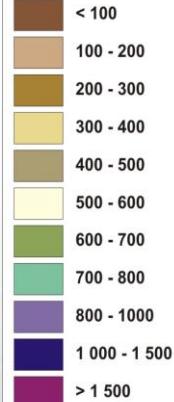
INTERNATIONAL RIVERS SHARED BY SOUTH AFRICA



NATIONAL RAINFALL AND EVAPORATION

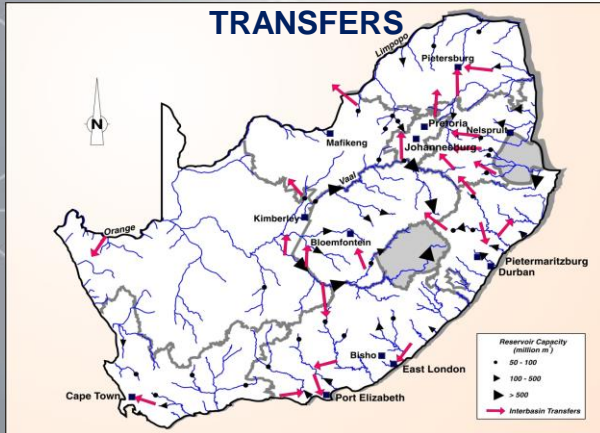


Average rainfall (mm/a)



Evaporation
Isopleths mm/a

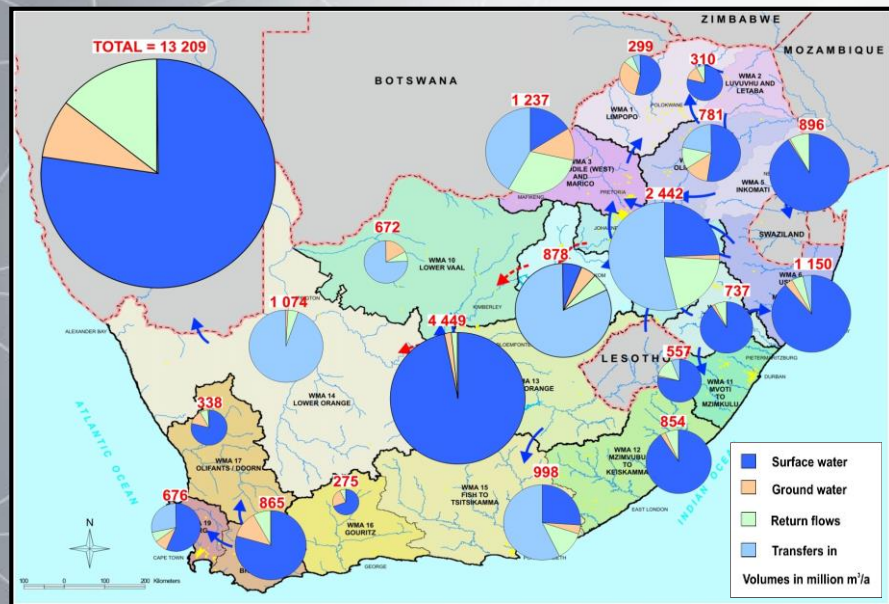
MAJOR EXISTING DAMS AND INTERBASIN TRANSFERS



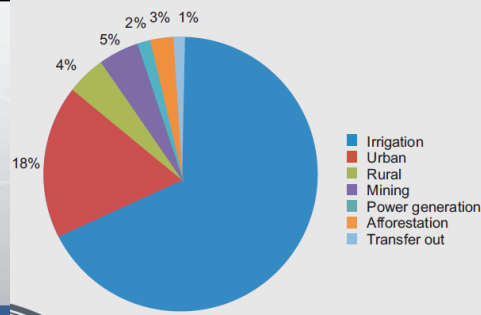
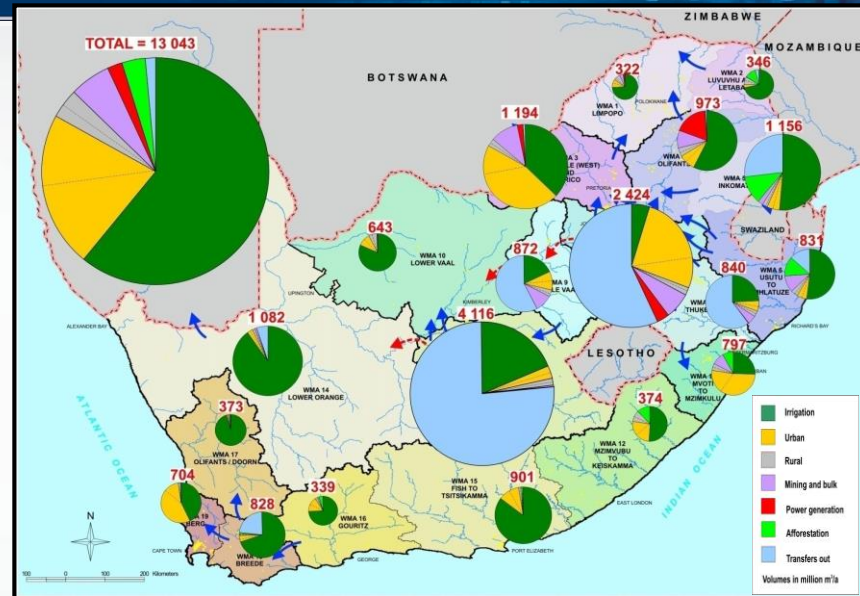
The current water needs in the country shows that (excluding water set aside for ecological flows):

- agriculture uses 67%
- urban households and industry use 18%, and
- mining and power generation use 5% and 2% respectively.

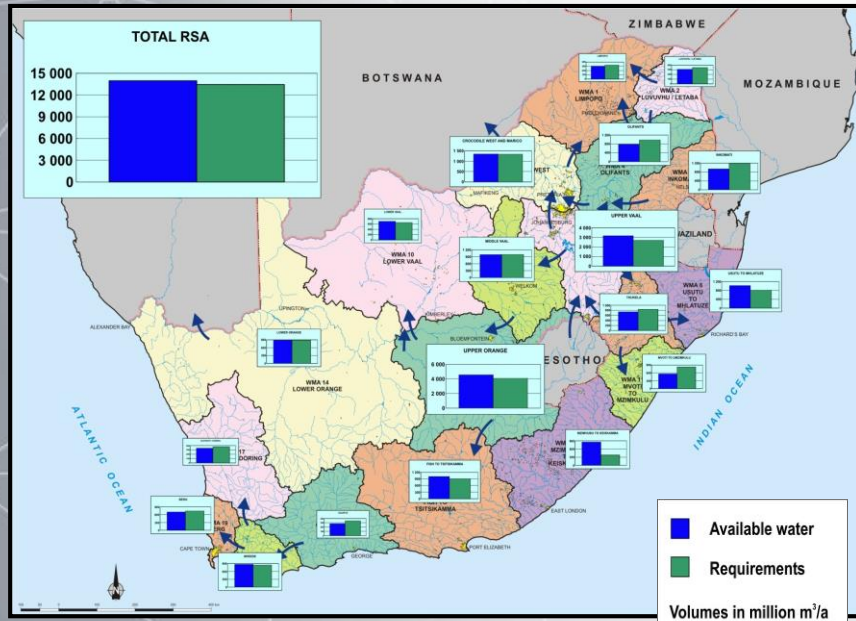
WATER REQUIREMENTS: YEAR 2000 and 2013



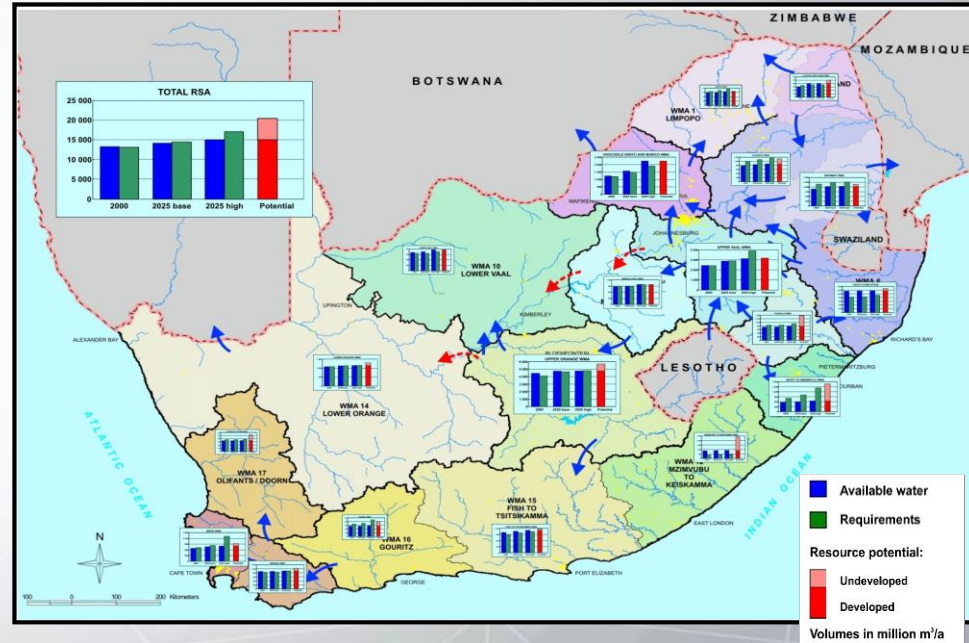
WATER AVAILABILITY: YEAR 2000



WATER RECONCILIATION: YEAR 2000



THE FUTURE: WATER RECONCILIATION SCENARIOS

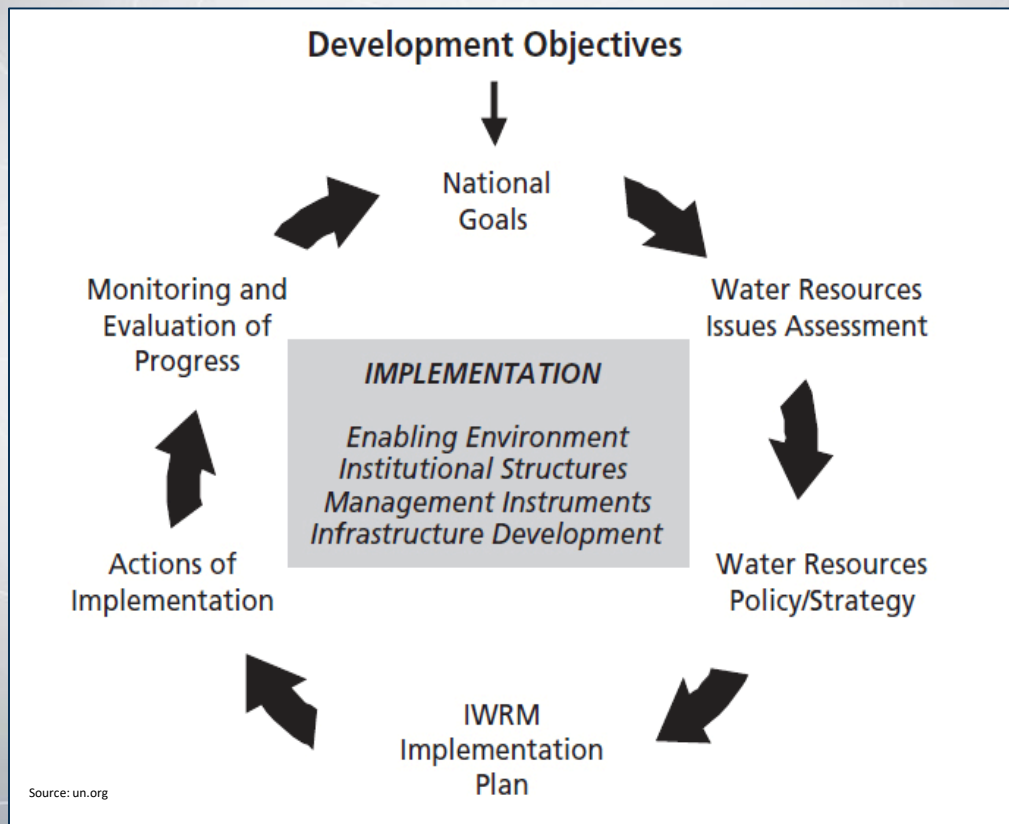




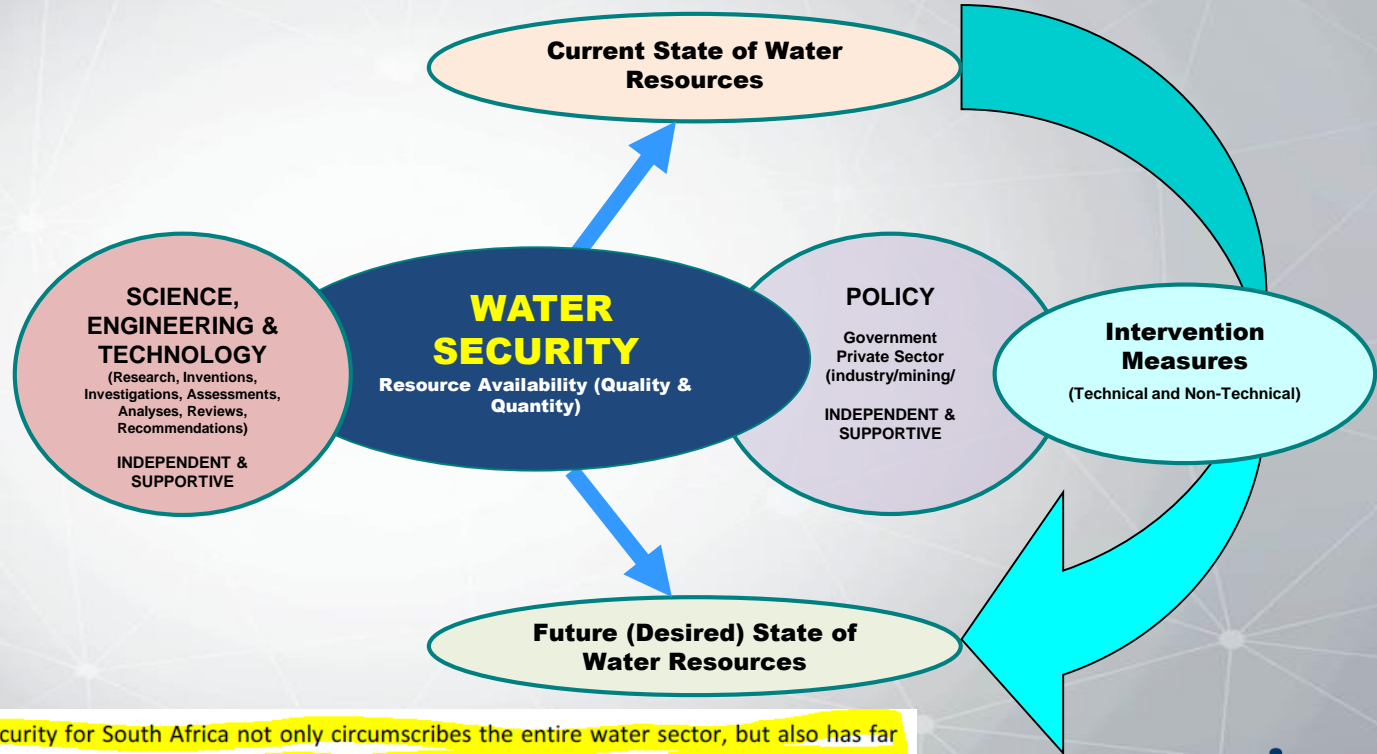
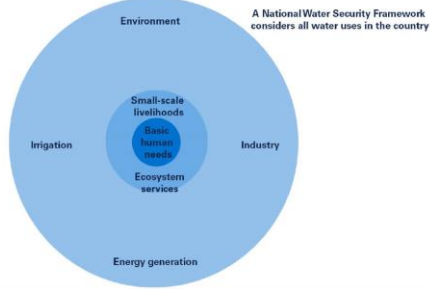
2.

Examples and Case Studies

UN IWRM Planning and Implementation Cycle



1. Water Security (and its linkages...)



The issue of water security for South Africa not only circumscribes the entire water sector, but also has far reaching consequences across the entire economy of the country. It touches on growth and development of all sectors of our economy. This National Water Security Framework (NWSF) recognises the importance of water security for our country and operates at national, regional and local levels. Water security touches on many facets, including identifying future water sources for our growing population and the attendant future

South Africa Quick Facts NWRS2

- Semi-arid and water-scarce country – **30th driest in the world**
- Mean Annual Rainfall – **460 mm, half the world average**
- **Challenges** – security of supply, environmental degradation and water pollution
- **Priorities** - provision of basic water services, meeting the needs for economic growth, equitable water allocation and maintaining the environmental integrity of water resources
- Per capita water consumption – **275 litres/capita/day vs world average of 175 litres/capita/day**

Water Sector Priority Focus Areas

2013 - 2018

- Achieving equity, including Water Allocation Reform
- Water conservation and water demand management
 - Institutional establishment and Governance
 - Compliance monitoring and enforcement
- Planning, infrastructure development & operation and maintenance of water resources infrastructure

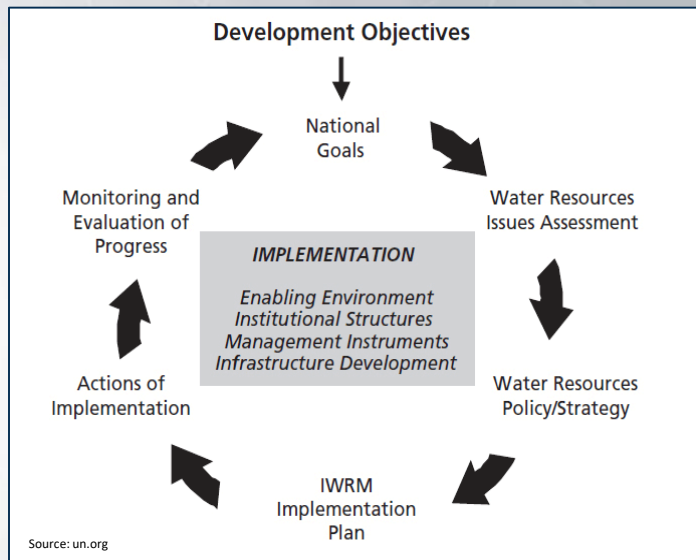
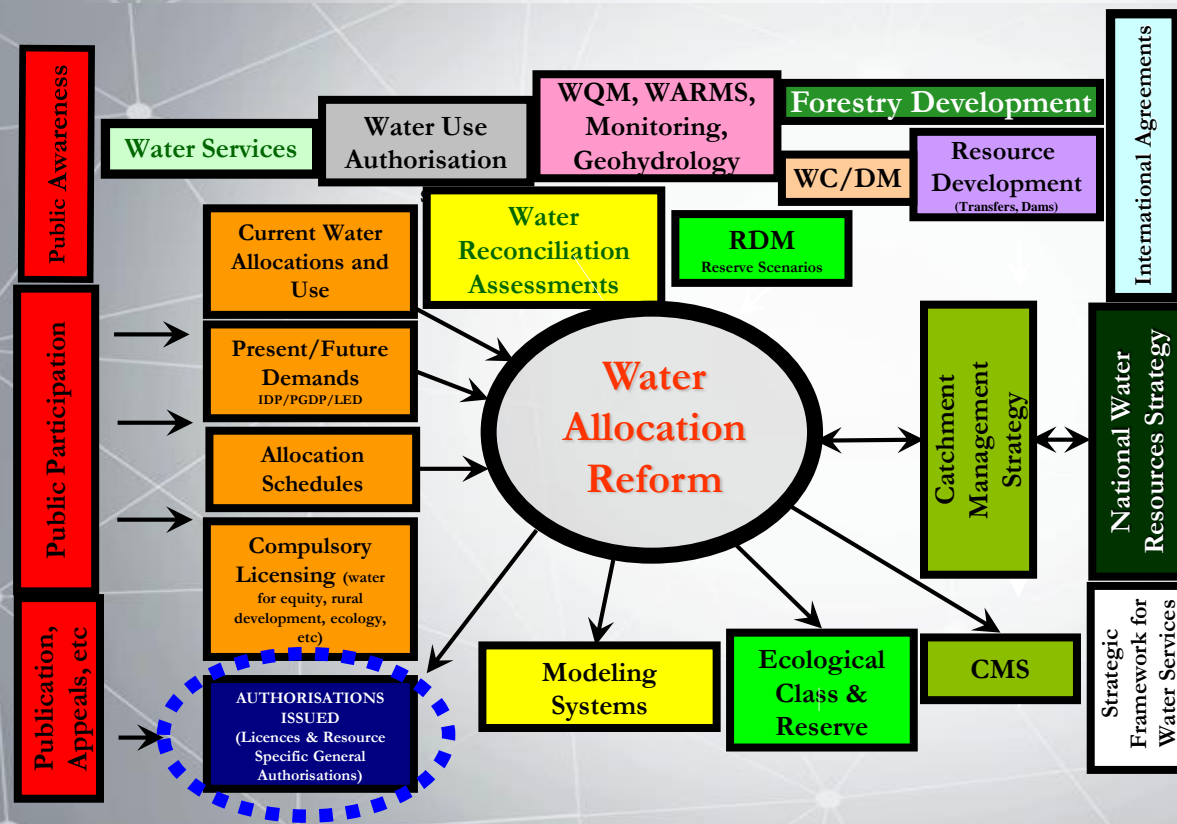
DWS battles pollution as Ramaphosa authorises new investigation

Sep 10, 2018 | Effluent, News, Wastewater, Wastewater, Water, Water management, Water pollution, Water quality, Water sources, Water supply, Water treatment | ★★★★★



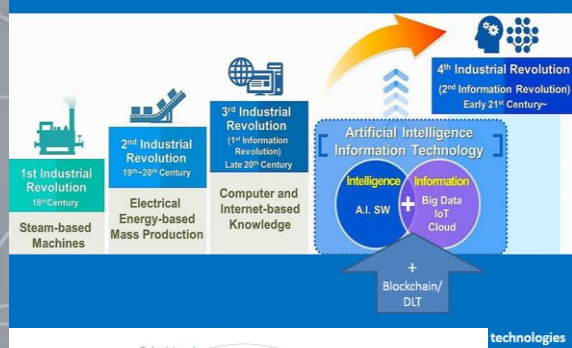
The South African Human Rights Commission is conducting an inspection at the Vaal Dam following allegations that approximately 150 ML of raw sewage is flowing into the Rietspruit and Vaal rivers daily.

2. SA Example: Water Allocation Reform (WAR)



3. Continental (and its linkages...)

The Fourth Industrial Revolution



SDG 6: "Ensure Availability and Sustainable Management of Water and Sanitation for All"



Global warming: severe consequences for Africa

New report projects greater temperature increases

A succession of new wars across Africa?

Africa, though the continent the least responsible for greenhouse gas emissions,* is almost universally seen as the continent most at risk of climate-induced conflict—a function of the continent's reliance on climate-dependent sectors (such as rain-fed agriculture) and its history of resource, ethnic and political conflict (Brown and Crawford, 2008).



BLUEPRINT FOR AN INTEGRATED
APPROACH TO IMPLEMENT AGENDA 2063

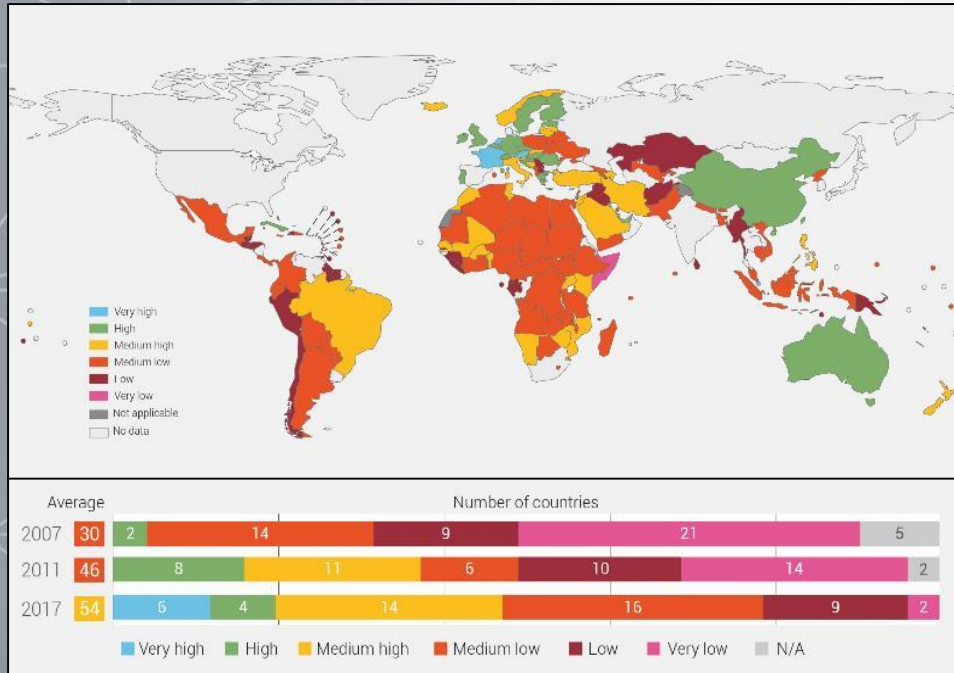
"Agenda 2063 is a strategic framework for the socio-economic transformation of the continent over the next 50 years. It builds on, and seeks to accelerate the implementation of past and existing continental initiatives for growth and sustainable development."



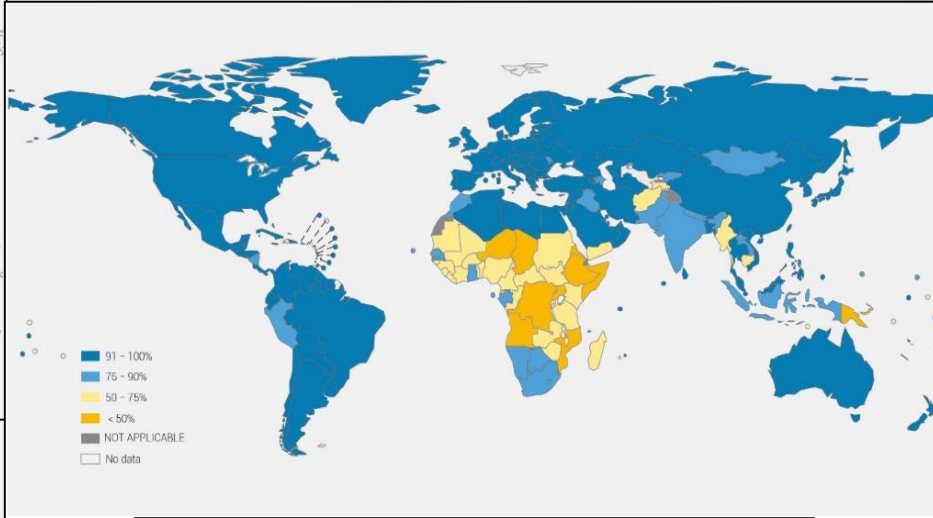
**Towards Water Security
and Safe Sanitation for Africa**

CSIR
our future through science

The Status Quo Drivers



Progress with implementing IWRM, 2007–2017



SDG 6 Status

Skills and Capacity in Africa - AMCOW (2013) and SADC

“....the growing gap in professional, technical and management capacities in the water sector in Africa as has been identified by Declaration 12 of the recent AMCOW EXCO meetings held in Cairo 2013, which states the following:

12.0 Addressing Junior Professional and Technician Level Capacity Challenges in the Water Sector in Africa

12.1 EXCO/11/2013/CAIRO/17: EXCO notes the growing human resources shortages to achieve water and sanitation goals in Africa and directs the Secretariat to work with the AUC and NEPAD Centres of Excellence to develop a Human Capacity Development Programme aimed at addressing junior professional and technician level capacity challenges in the water sector.

Annex II. Terms of Reference on the Activities for Human Capacity Development Component for Southern African NEPAD Water Centres of Excellence

1 BACKGROUND

This document describes the HCD activities to be carried out by Stellenbosch University through the Coordinator of the NEPAD Water Centres of Excellence Network for Southern Africa in the framework of the project “NEPAD African Network of Centres of Excellence on Water Sciences and Technology (phase II)”, thereafter “ACE2” under the responsibility of UNESCO.

The specific objectives respond to the challenge identified in the Declaration above by addressing aspects of the sector gaps and identifying broad lines for a strategic response as follows:

1. Clarify the gaps in the sector both vertically in terms of Decision making to Management to Service provision and horizontally in terms of regionally specific needs.
2. Identify the gaps in existing learning and capacity building institutions.
3. Identify a strategy to build back capacity into the sector with appropriate training and capacity building of incoming young professionals, tailored to the sector needs

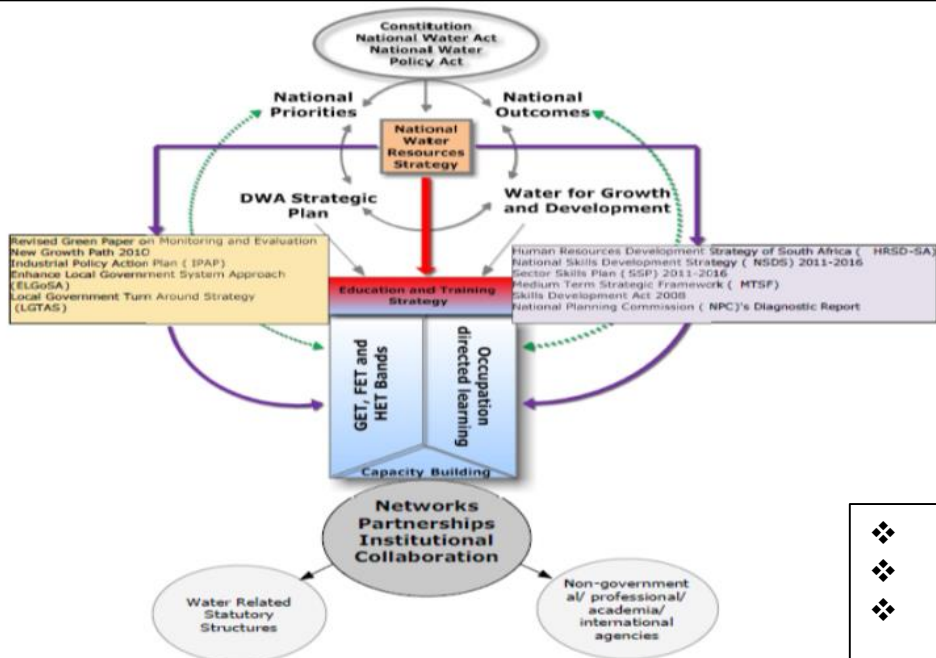
The Support of the European Commission to the NEPAD CoEs is inscribed in the framework of the support to the AU and the work plan of AMCOW. The “Joint Africa-EU Strategy Roadmap 2014-2017” established at the 4th EU-Africa Summit, held in Brussels on 2-3 April 2014, by the Heads of State and Government of the EU and Africa, the President of the European Council, the President of the European Commission, the President of the AU and the Chairperson of the AUC explicitly stated among others:

- The need for the EU to support the development of the Centres of Excellence in Africa in the framework of priority area 3 “Human development”;
- The need to include water amongst the strategic priorities for cooperation and urged actions in the water sector to ensure, through institutional strengthening, sustainable and efficient management of water resources, contributing to growth, peace and security in the framework of priority area 4 “Sustainable and inclusive development and growth and continental integration”.

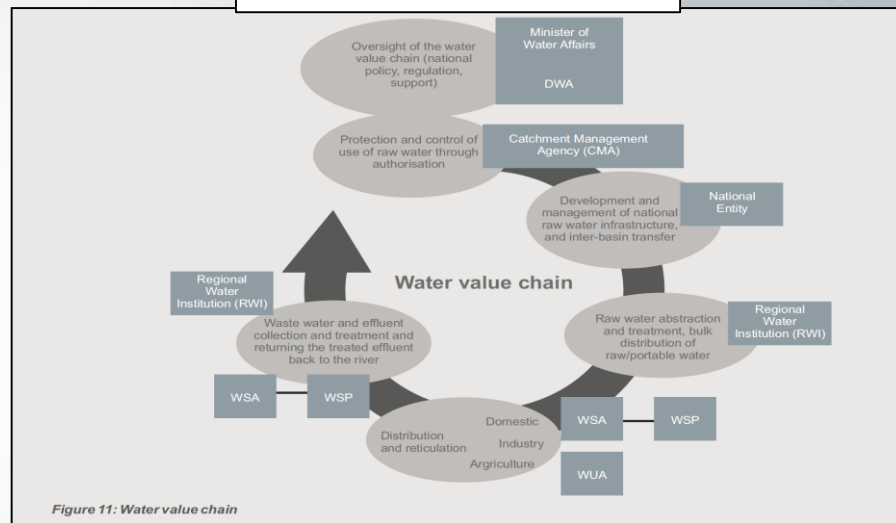
This second phase of NEPAD Centres of Excellence on Water has the aim of supporting the establishment of Human Capacity Development (HCD) Programme in the Water Sector in Africa through the NEPAD African Network of Centres of Excellence in Water Sciences and Technology (CoE).

IWRM Skills and Capacity in South Africa

NWRS2 – Chapter 15 (Skills Chapter)



Scope of the Water Sector



- ❖ Scope of the Water Sector
- ❖ NWRS2 Chapter 15 Skills Development
- ❖ Surveys and Results on Skills Requirements in the Sector
- ❖ Progress
- ❖ Remaining Challenges
- ❖ Suggestions and Interventions

MONITORING,
EVALUATION AND
REVIEW



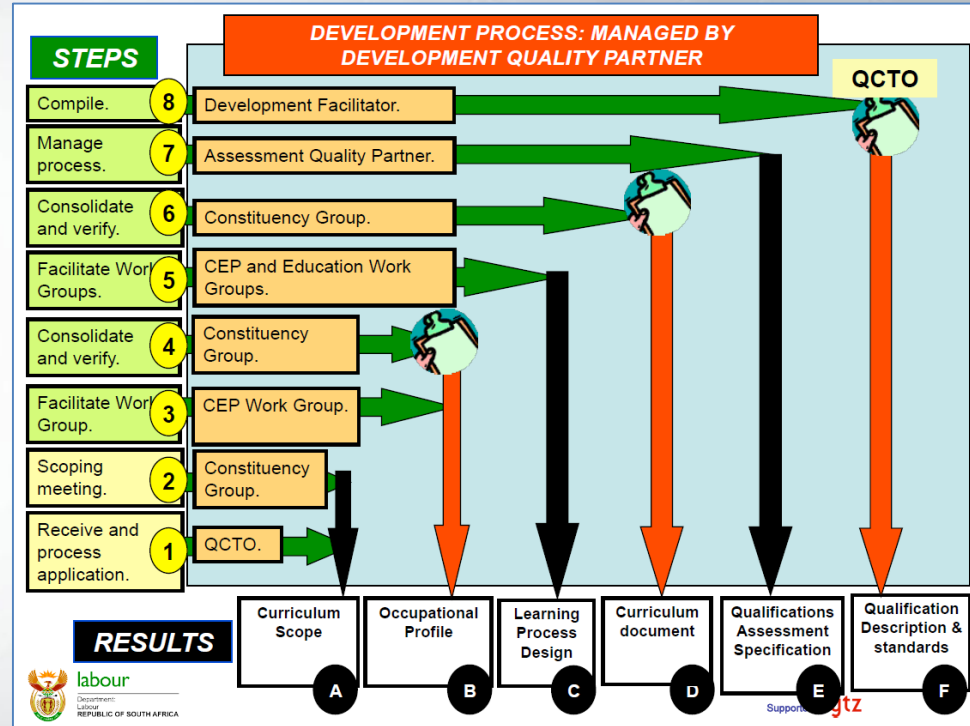
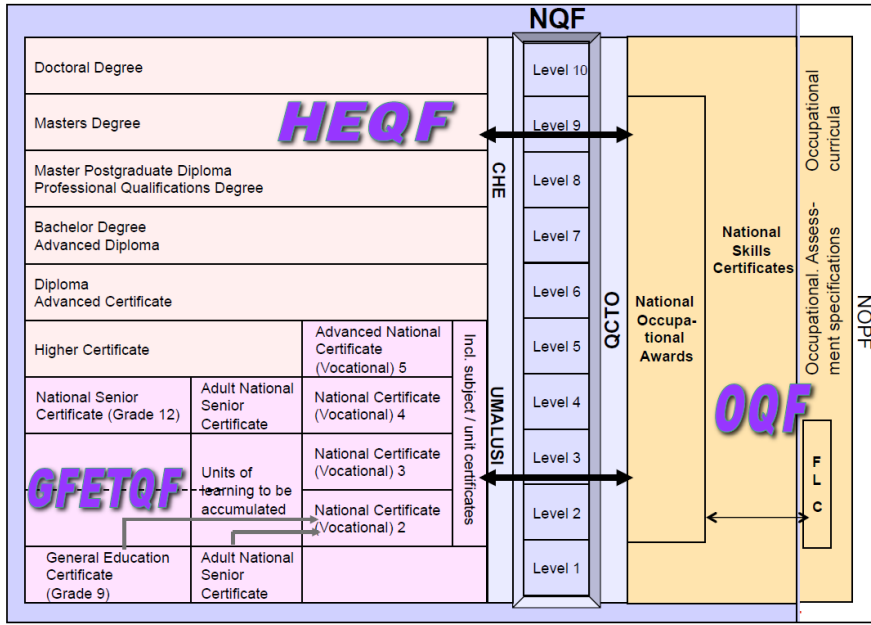
South Africa

WHAT IS THE FOCUS OF NEW LEGISLATION ?

- ▶ Ensuring fit for purpose qualifications for the Labour Market
- ▶ Emphasis on:
 - Labour Market needs - both employers and trade unions need competent, employable workers (people in occupations) to grow business and the economy
 - SETAs must collect information on Labour Market needs in terms of occupations – who is needed?
 - QCTO must ensure that there are fit for purpose occupational qualifications to respond to the labour market needs

South Africa

RELATIONSHIP WITH OTHER SUB-FRAMEWORKS



FETWater Example

About FETWATER

In 1996, the then Department of Water Affairs and Forestry requested support from the United Nations Educational Scientific and Cultural Organisation (UNESCO) and the World Meteorological Organisation (WMO) to assess education and training needs in integrated water resources management in South Africa.

The two organisations conducted an assessment in 1998 at national, provincial and community levels. The assessment evaluated the education, training and capacities needs of the then Department of Water Affairs and Forestry (DWAF) and linked them with the needs of other government departments, non-governmental organisations and the private sector.

The assessment took into account various imperatives, including South Africa being a country in transition, its affirmative action policy, staff and career development concerns, capacity building required for achieving sustainable development and the need to link and interact with efforts by Southern Africa and the international community.

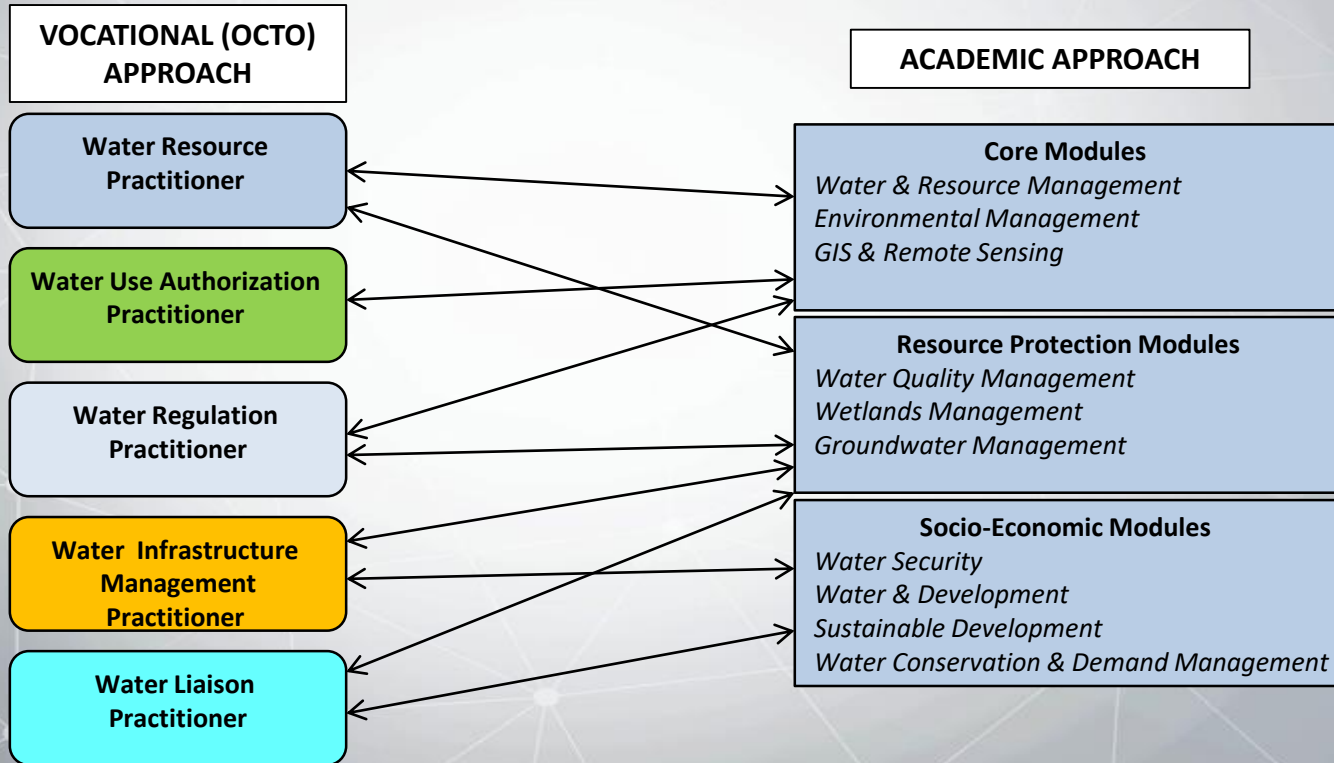
FETWater Example

Theme	Water Resource Management	Water Use Authorisation	Water Regulation	Water Governance	Water Infrastructure
Occupation at Professional level	Water Resource Management Practitioner	Water Use Authorisation Practitioner	Water Regulation Practitioner	Water Liaison Practitioner	Water Infrastructure Management Practitioner
Occupation at Associate Professional level	Water Use Officer			Water and Sanitation Coordinator	Process Controller
					Water Reticulation Officer

- ❖ Provide strategic inputs and support for capacity building and training initiatives in alignment with the National Water Resource Strategy using an occupationally directed approach
- ❖ Close the gap between Sector requirements and SETA systems - Unlock funding for curriculum development, delivery, quality assurance and RPL
- ❖ Foster the development of efficient workplace-based learning and development opportunities – appropriate delivery and certification systems related to competence development, grading and career advancement
- ❖ Professionalise the water sector occupations in line with regulatory requirements and offer appropriate CPD courses

FETWater Example

Linkages between Post-Graduate and Occupationally Directed Training



FETWater Example

OCCUPATIONAL PROFILE

213302 Water Use Specialist¹

1. Qualification Purpose

The purpose of this qualification is to prepare a learner to function as a Water Use Specialist. A Water Use Specialist enables governance of sustainable water uses which includes the preparation and evaluation of the water use authorisation processes as required under the water legislative framework. This includes, but is not limited to the development and implementation of the related regulations, authorisations, policies, strategies, business processes and guidelines.

2. Occupational Tasks

1. Develop water use institutional/organisational framework such as water use authorisation regulations, authorisations, policies, strategies, business processes and guidelines
2. Facilitate and oversee the water use authorisation process
3. Evaluate and make recommendations about the water use authorisation applications and processes
4. Monitor and review water use authorisation

3. Occupational Tasks Descriptions

1. Develop water use institutional/organisational framework such as water use authorisation regulations, authorisations, policies, strategies, business processes and guidelines

Products and services

- Developed and implemented water use regulations, authorisations, policies, strategies, business processes and guidelines
- Stakeholder engagements through oral, written communication
- Provided stakeholder capacity building and support

Occupational responsibilities

The learner will be required to:

- Develop the local, regional and national water use institutional/organisational framework
- Implement local, regional and national water use institutional/organisational framework

MODULES	SPECIFICATION	LEVEL	CREDITS
PRACTICAL SKILLS MODULES			
PM-01	Develop the local, regional and national water use institutional/organisational regulatory framework	9	20
PM-01-PS01	Research/Analyse water use needs and/or opportunities and risks		
PM-01-PS02	Develop new and/or revise existing water use policies		
PM-01-PS03	Develop new and/or amend existing legislation and the supporting regulations		
PM-01-PS04	Develop new and/or revise existing water use strategies		
PM-01-PS05	Develop new and/or amend existing general authorisations		
PM-01-PS06	Develop new and/or revise existing water use business processes		
PM-01-PS07	Develop new and/or revise existing water use guidelines		

EXTERNAL INTEGRATIVE ASSESSMENT STRATEGY			
Assessment Model			
PM-02	Implement the approved institutional/organisational regulatory framework	An external integrated summative assessment, conducted through the relevant Quality Council for Trades and Occupations (QCTO) Assessment Quality Partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes (integrated summative assessment focus area) and associated assessment criteria.	
PM-02-PS01	Compile implementation plan		
PM-02-PS02	Configure the management implementation		
PM-02-PS03	Monitor and evaluate the efficiencies, where required		

SECTION 3C: WORK EXPERIENCE MODULE SPECIFICATION

List of Work Experience Module Specifications

213302-WM-01	Strategy and policy design and development processes
213302-WM-02	Stakeholder engagement process such as the marketing, advocacy, communication and capacity building processes
213302-WM-03	Water use authorisation approval processes
213302-WM-04	Water use audit processes
213302-WM-05	Water use monitoring, compliance and enforcement support processes

213302-WM-01 Strategy and policy design and development processes, NQF level 8, Credits, 60

Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to experience the full range of activities to design and develop the local, regional and national water use institutional/organisational regulatory framework for a minimum period of 12 weeks

The learner will be required to:

- WM-01-WE01: Observe and assist a Water Use Specialist develop the water use institutional/organisational framework such as the water use authorisation regulations, authorisations, policies, strategies, business processes and guidelines for a minimum period of 2 weeks
- WM-01-WE02: Develop water use institutional/organisational framework such as water use authorisation

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The candidate will complete a written assignment in the form of a Portfolio of Evidence that will be presented to the panel of registered assessors and additional expert practitioners from the water sector at a QCTO accredited assessment centre. The written examination will be concluded at the accredited assessment centre and marked by registered assessors. In addition the candidate will present him/herself for an interview where the panel asks probing questions to assess the candidate's competence on the completed assignment.

Assessment will be carried out at an assessment centre accredited by QCTO. The assessment will take place over a minimum of 30 days.

Qualification Outcomes

1. Develop water use institutional/organisational framework such as water use authorisation regulations, authorisations, policies, strategies, business processes and guidelines
2. Facilitate and oversee the water use authorisation process
3. Evaluate and make recommendations about the water use authorisation applications and processes
4. Monitor and review water use authorisation processes and guidelines

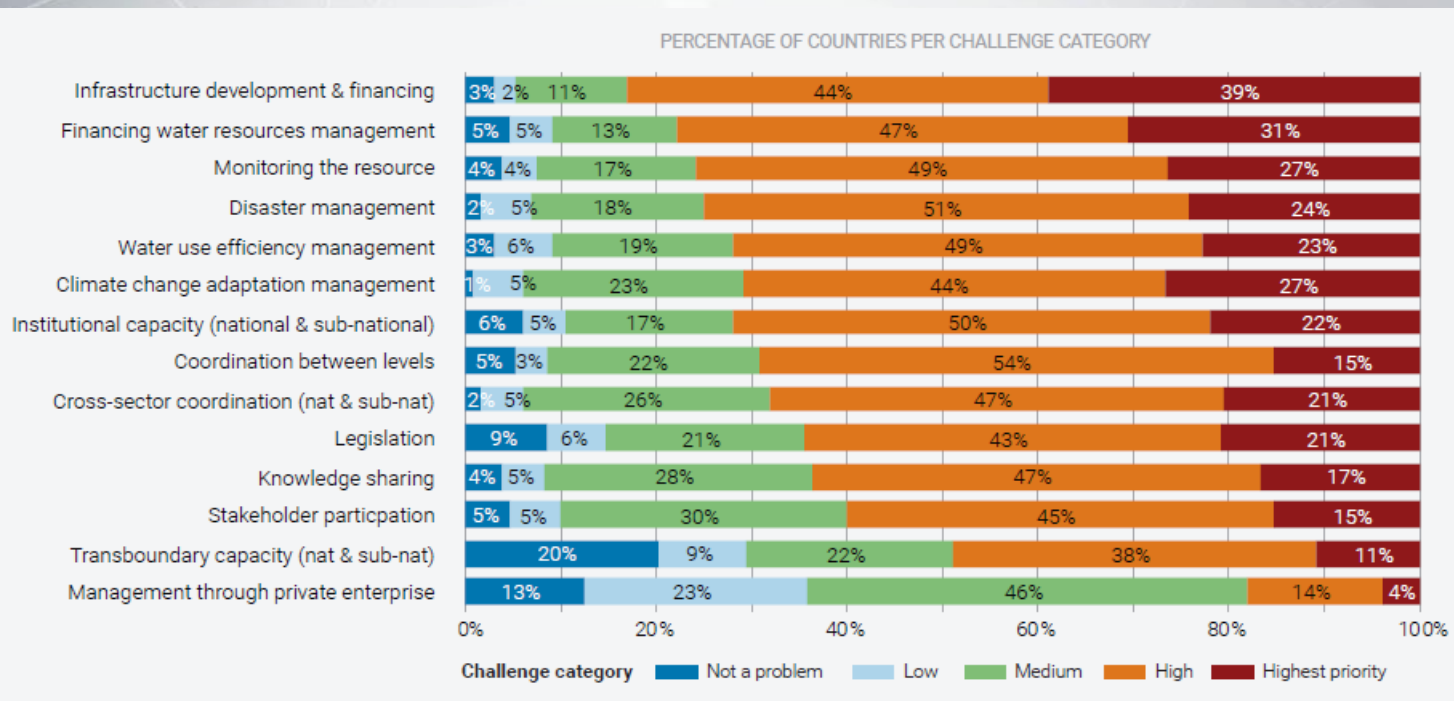
Assessment Standards

Integrated Assessment Focus Area 1

Compile water use licenses as the primary tools for addressing issues of optimal water allocation for socio-economic development and sector reforms at a tertiary catchment scale (50%)

- Approved institutional/organisational framework are interpreted against the requested water uses and allocation types
- Type of water use authorisation required per application are determined as per the regulated requirements
- Economic returns/benefits/value of each water use is mapped to existing water uses and recommendation are made in terms of optimal water uses for a particular catchment and as part of the

Challenge areas for IWRM (reported by 133 countries in 2012)



Opportunities

A “new normal”—and its consequences

Core to every analysis of these drought episodes, and extreme weather events in general, is the phenomenon of a change in Southern African climate on the back of global climate change. There is a growing political acceptance of the concept of a “*new normal*”—a term that has found resonance in platforms like the African Union (AU) African Ministers Council on Water.

This “*new normal*” has precipitated changes that have had a profound impact economically, with direct and dramatic losses in earnings at many levels experienced by individuals, as well as countries’ GDPs and growth rates.

The second impact of the new normal is social. Climate change events are directly reducing livelihood opportunities, with citizens eking out a living from a rapidly degrading environment in the short-term. In addition, indirect repercussions, such as challenges of social upheaval in the medium to long-term are also becoming evident. Indeed, two features of this emerging trend are social delivery protests in countries like South Africa and Ethiopia as well as the new phenomenon of what can best be described as “climate change migration.”

This is an important outcome of the third impact, which is environmental. Degradation of the environment and biodiversity loss is a graphic feature of a new drier and hotter regional climate.

So, is there a silver lining?

What makes this opportunity even more exciting is that the new science points to water-energy nexus solutions that, if engineered imaginatively, will provide combined water and energy solutions in a sustainable development paradigm. That will not only relieve the burden on existing water and energy grids, but because of their ingenuity, organize to engage and achieve these goals with lower carbon dioxide emissions—thus paving the way to a lower carbon future. These new solutions include new sanitation mechanisms epitomized by the Gates Foundation-led Reinvent the Toilet Challenge, and exciting new solutions to turn polluted waters like acid-mine water into potable water. New technologies can enable water-sensitive cities to not only have the ability to see to a significant percentage of the city’s nutritional needs through urban agriculture, but to also develop inner-city artificial and enhanced natural wetland systems that radically decrease the city’s ecological footprint and impact on surrounding rural areas.

The brightest part of this silver lining is that Africa, precisely because of its lower levels of development, is not as locked into the existing infrastructure as those in Europe and the Americas. Therefore, the continent has the best opportunity to leap frog with these new solutions, transforming into a water-secure continent, and pioneering the possibility of a water-secure world.

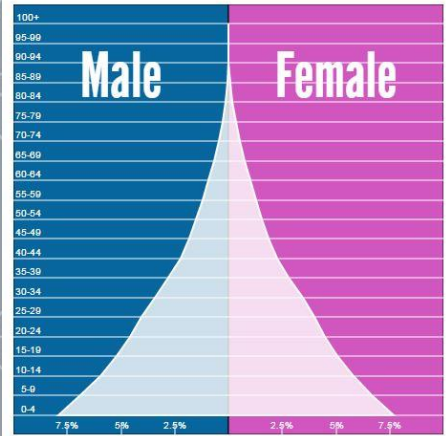
SOURCE:

Africa's Resources

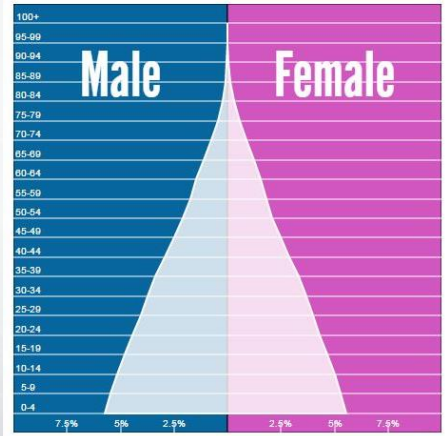


Africa's Population: 2015 to 2100

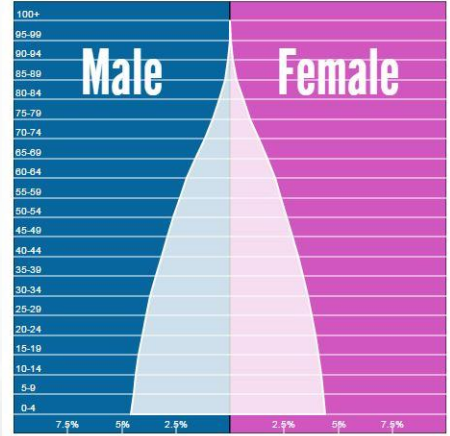
**AFRICA
2015** Population: **1.186.178.000**



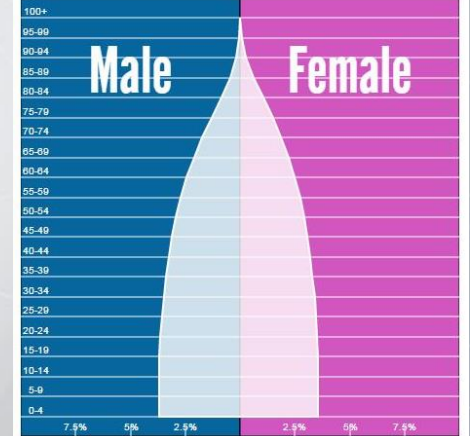
**AFRICA
2050** Population: **2.477.536.000**



**AFRICA
2075** Population: **3.524.627.000**



**AFRICA
2100** Population: **4.386.591.000**



to Wear: from used fabrics into high-fashion footwear

Koliko Wear: from used fabrics into high-fashion footwear

How do you take a broken-down pair of jeans and turn it into a pair of high-fashion shoes? That's the mission of Koliko Wear, a Brooklyn-based fashion and footwear company. The company's founder, **Colin Vertus**, is a 30-year-old entrepreneur who has turned his passion for fashion into a successful business. Vertus, who is also a professional athlete, has created a unique line of footwear that combines recycled fabrics with high-fashion design. The shoes are made from repurposed denim, leather, and other materials, giving them a distinctive look and feel. Vertus's shoes are not only stylish but also sustainable, as they are made from recycled materials. The company's mission is to create high-quality, sustainable footwear that is both fashionable and functional. Vertus's shoes are available in a variety of styles, including sneakers, loafers, and boots. The company's website, kolikowear.com, features a collection of the latest designs. Vertus's shoes are a perfect example of how recycled materials can be transformed into high-fashion footwear.

Colin Vertus

Coliko Vertus

Bamboo bikes made in Ghana a global hit

ventures: turning plastic waste to riches

Coliba Ventures: turning plastic waste to riches



A young boy in a green jacket with a logo, looking off-camera.

Ugandan students turn waste to wealth

[illegible]

MAKING ACTION ON CLIMATE CHANGE

Ugandan school where students turn waste to wealth



Union on climate change

[illegible]

Women pastoralists feel the heat of climate change

SHARON BIRCH-JEFFREY

INTERVIEW

Pushing for a green economy & clean energy

—Joyce Msuya, United Nations Environment Programme's Deputy Executive Director

Africa is grappling with myriad environmental and climate challenges, from drought to loss of biodiversity, cyclones and plastics pollution. Africa Renewal's **Zipporah Musau** spoke with the United Nations Environment Programme's Deputy Executive Director, **Ms. Joyce Msuya**, on how African countries can mitigate some of these challenges and the opportunities that are available.

It is about a year since you were appointed Deputy Executive Director of UNEP, and for a while you acted as the Executive Director. What has this journey been like for you?

I joined UNEP in August 2018 and it has been a fulfilling journey for me. Given the absolute centrality of environment in development, in attaining Sustainable Development Goals (SDGs), it's been great to see how the UN has played a leading role in many ways. For example, we recently released the Global Environment Outlook 6, showing that we are increasingly connecting the environment to the broader development issues.

What are some of the highlights of your time at UNEP?
A key highlight has definitely been the Fourth UN Environment Assembly in March 2019, which focused on the innovations that can help us achieve sustainable production and consumption. After five days of discussions, ministers from more than 170 UN

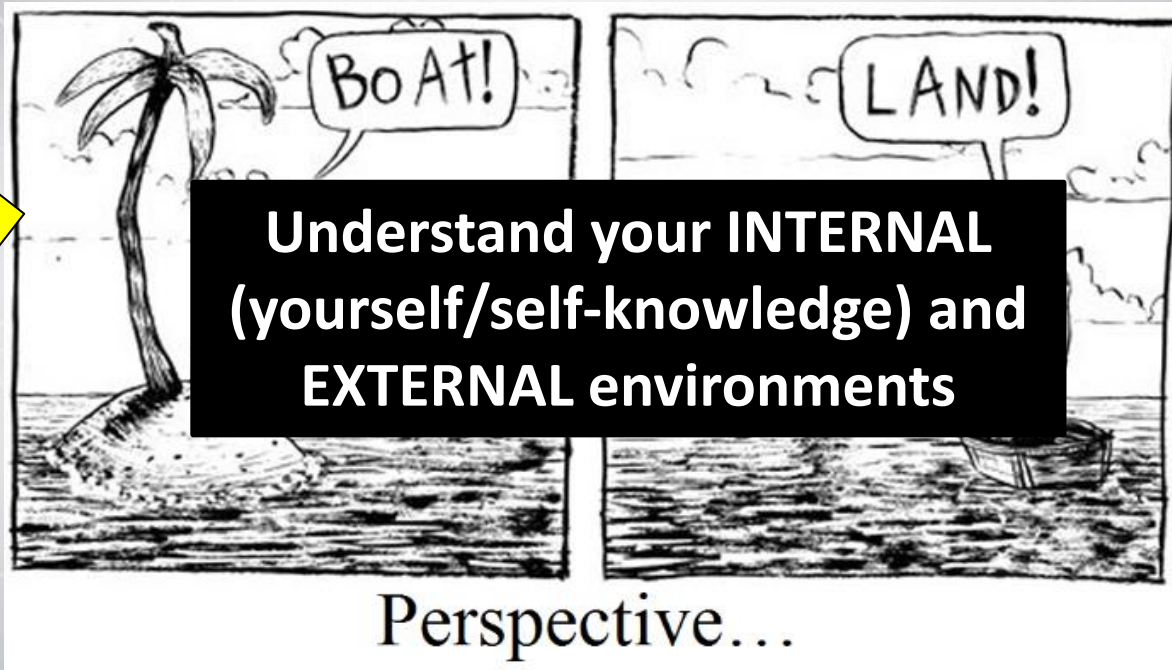


group
those who fish water and
are the ones who take
"ownchildren from their
own animals as well,"
a human rights activist
Abby Burrows.
The Transylvanian
postcardists have
are excluded from
and are often not
thing despite the
take.
she invited to the
to of World War
work, an appar-
tion of the 1930s
postcardists in
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Even
up
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the

CLIMATE CHANGE

[illegible]

Context and Perspective



Perspective-Context-Relevance
Seeing/Understanding
its value

Perspective-Context-Relevance
Application

Perspective – point of view

Context - setting / situation / environment / background

Relevance - significance / importance / application

QUOTE OF THE MONTH

If...

ABCDEFGHIJKLMNOPQRSTUVWXYZ

EQUALS...

1234567891011121314151617181920212223242526

THEN...

$$K \cdot N \cdot O \cdot W \cdot L \cdot E \cdot D \cdot G \cdot E \\ 11 \cdot 14 \cdot 15 \cdot 23 \cdot 12 \cdot 5 \cdot 4 \cdot 7 \cdot 5 = 96\%$$

$$H \cdot A \cdot R \cdot D \cdot W \cdot O \cdot R \cdot K \\ 8 \cdot 1 \cdot 18 \cdot 4 \cdot 23 \cdot 15 \cdot 18 \cdot 11 = 98\%$$

Both are important, but fall just short of 100%.

BUT

$$A \cdot T \cdot T \cdot I \cdot T \cdot U \cdot D \cdot E \\ 1 \cdot 20 \cdot 20 \cdot 9 \cdot 20 \cdot 21 \cdot 4 \cdot 5 = \underline{\underline{100\%}}$$

Coincidence
OR
Not ???

Perspective - the Generational Value Proposition

THE GENERATIONS IN THE WORKPLACE

BASED ON A SURVEY OF 1,200 WORKERS ACROSS DIFFERENT GENERATIONS MEASURING THEIR STRENGTHS & WEAKNESSES

EXECUTIVE PRESENCE



GENERATING REVENUE



ADAPTABILITY



COST-EFFECTIVENESS



TECH SAVVINESS



RELATIONSHIP BUILDING



PROBLEM SOLVING



COLLABORATION



BABY BOOMERS

BORN: <1963

PROS: Productive, hardworking, team players, mentors

CONS: Less adaptable, less collaborative



GEN X

BORN: 1963-1980

PROS: Managerial skills, revenue generation, problem solving

CONS: Less cost-effective, less executive presence



MILLENNIALS

BORN: 1980-1995

PROS: Enthusiastic, tech-savvy, entrepreneurial, opportunistic

CONS: Lazy, unproductive, self-obsessed



WEF 2019: Job Creation Strategy for the 4IR



World Economic Forum ✓

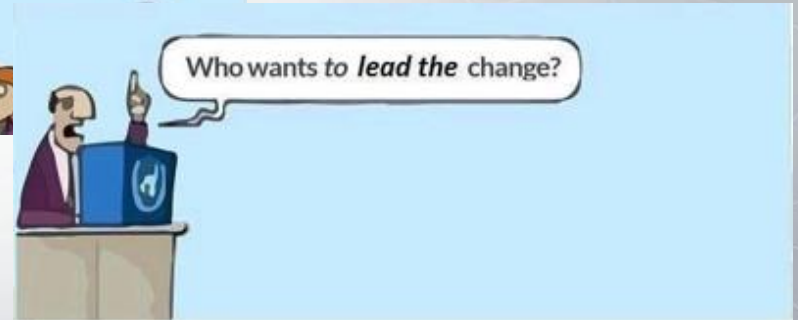
Published on Feb 9, 2019

According to the Forum's Future of Jobs report, machines and algorithms in the workplace could lead to a net positive growth of 58 million jobs if the right labour policies are applied. How can leaders shape a holistic job creation strategy in the Fourth Industrial Revolution?

WEF Statistic

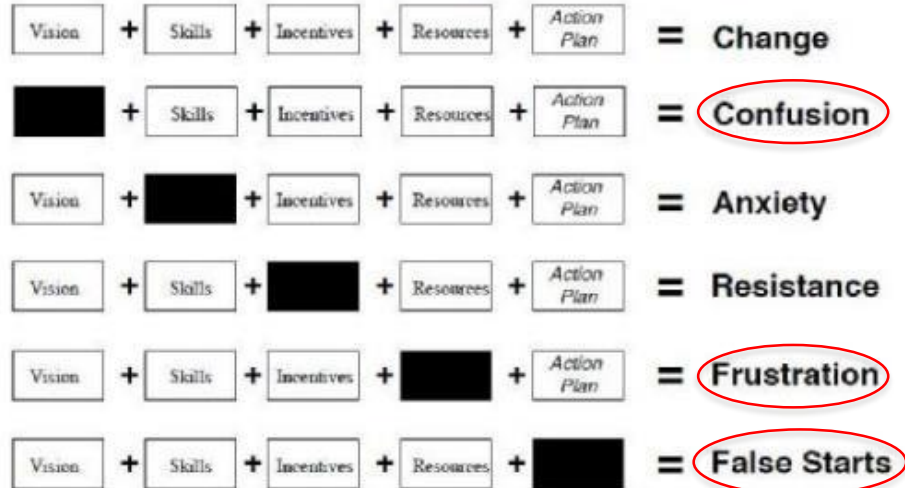
“..... 65% of children entering primary school today are going to work in jobs that don't even exist ”

Change



Change amidst Complexity

Managing Complex Change



Adapted from Knoster, T., Villa R., & Thousand, J. (2000). A framework for thinking about systems change. In R. villa & J. Thousand (Eds.), *Restructuring for caring and effective education: Piecing the puzzle together* (pp. 93-128). Baltimore: Paul H. Brookes Publishing Co.

Emerging Technologies

WORLD
ECONOMIC
FORUM

COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

Insight Report

Top 10 Emerging Technologies 2019

The top 10 emerging technologies for 2019

1. Bioplastics for a Circular Economy
2. Social Robots
3. Tiny Lenses for Miniature Devices
4. Disordered Proteins as Drug Targets
5. Smarter Fertilizers Can Reduce Environmental Contamination
6. Collaborative Telepresence
7. Advanced Food Tracking and Packaging
8. Safer Nuclear Reactors
9. DNA Data Storage
10. Utility-Scale Storage of Renewable Energy

Biodegradable plastics can ease these problems, contributing to the goal of a "circular" plastic economy in which plastics derive from and are converted back to biomass. Like standard plastics derived from petrochemicals, biodegradable versions consist of polymers (long-chain molecules) that can be moulded while in their fluid state into a variety of forms. However, the options currently available – mostly made from corn, sugar cane, or waste fats and oils – generally lack the mechanical strength and visual characteristics of the standard kinds. Recent breakthroughs in producing plastics from cellulose or lignin (the dry matter in plants) promise to overcome those drawbacks. In an added boon for the environment, cellulose and lignin can be obtained from non-food plants, such as giant reed, grown on marginal land not suitable for food crops, or from waste wood and agricultural byproducts that would otherwise serve no function.

Fertilizers that more fully fit the description "controlled release" have been developed recently – made possible by sophisticated materials and manufacturing techniques that can tune the shells so they alter nutrient-release rates in

Emerging skills

Analytical thinking and innovation
Creativity, originality and initiative
Active learning and learning strategies
Technology design and programming
Complex problem-solving
Leadership and social influence

Reasoning, problem-solving and ideation
Critical thinking and analysis
Resilience, stress tolerance and flexibility
Emotional intelligence

TOP 10 EMERGING TECHNOLOGIES

CompTIA's Emerging Technology Community selected the top 10 technologies that have near-term business and financial opportunity for the IT channel and those working in the business of technology.

1 Internet of Things

IoT is driving change and impacting efficiencies in businesses around the world by providing the data needed to improve marketing, increase sales and decrease costs.



2 Artificial Intelligence

AI is significantly impacting the way customers interact with businesses through the advent of intelligent bots and websites and is becoming increasingly commoditized, accessible and integrated with everyday tools.



3 5G

5G is increasing our ability to move, manipulate and analyze data across wireless platforms. It will continue to drive the development of more complex apps to solve problems and increase growth across a wide array of industries.



4 Serverless Computing

Server-less computing is enabling organizations to create a NoOps IT environment that is automated and abstracted from underlying infrastructure, reducing operational costs and allowing businesses to invest in the development of new, impactful, value-add capabilities.

5 Blockchain

Blockchain is solving the increased need to secure and manage an increasing number of transactions across the Internet as it provides an alternative to centrally managed record keeping.

6 Robotics

Robotics is automating routine processes by leveraging machines in all shapes and sizes to make businesses faster, cheaper and more efficient. This is driving conversations and opportunities due to its incredibly fast ROI and significant opportunity for cost-savings and growth.



7 Biometrics

Leveraging biometric technology from facial recognition to retina and fingerprint scans will become the mainstream methodology for confirming your identity. These solutions, both stand alone and integrated, will

8 3D Printing

3D printing is providing an effective solution for low volume manufacturing of complex parts and quick and local production of obscure products. The opportunity for the industry is expected to become bigger as

9 VR/AR

VR/AR is transforming the way we engage with machines, data and each other. Organizations are exploring opportunities to use VR, AR, mixed reality, AI and sensor technologies

10 Drones

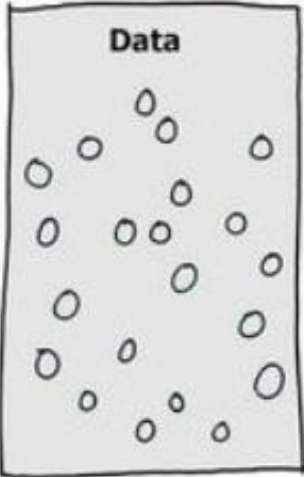
Drones are enabling robotic automation without geographic restriction and the opportunities for technological development and integration are high for the market.

Connecting the dots

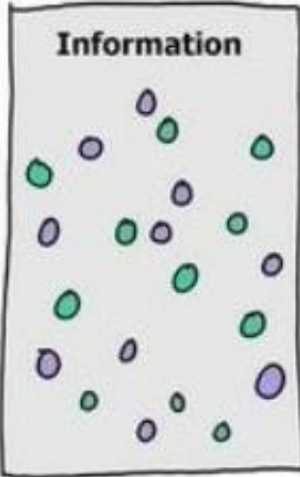
THE WORLD



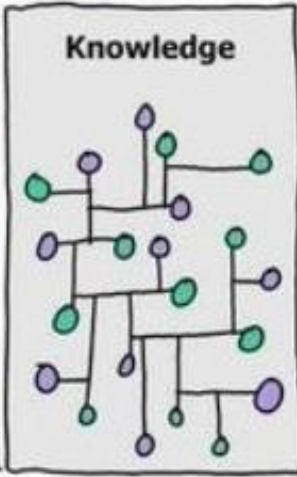
Data



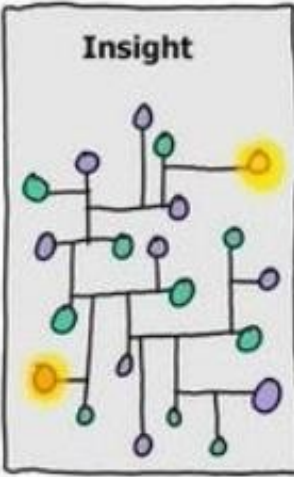
Information



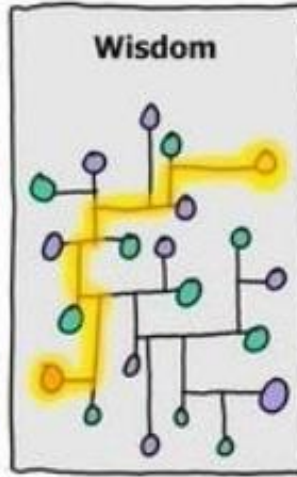
Knowledge



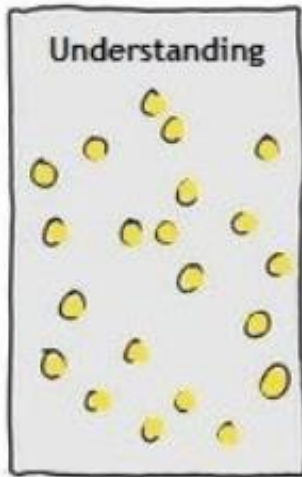
Insight



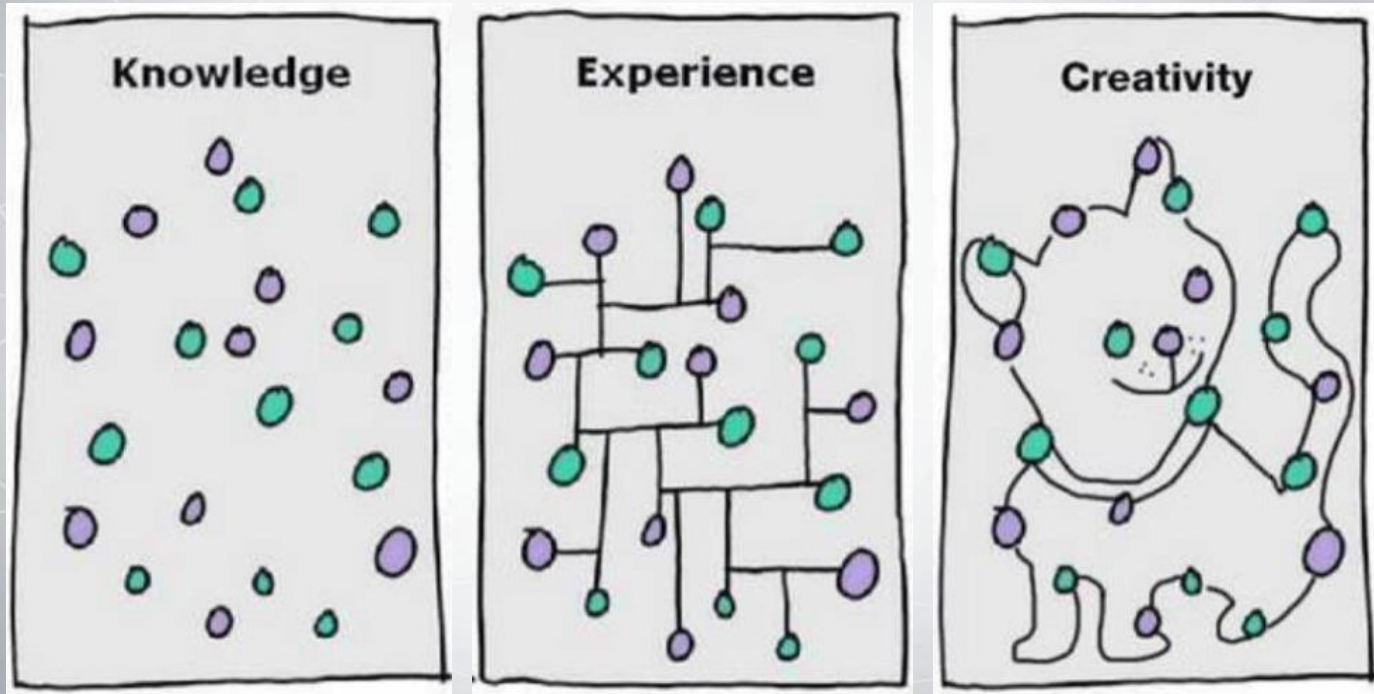
Wisdom



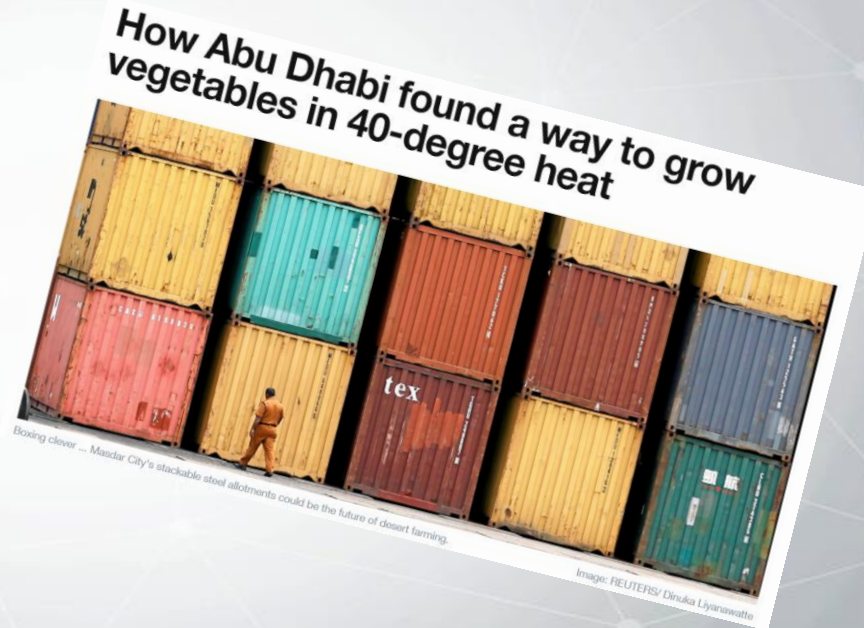
Understanding



More importantly the key!



Innovation doesn't have to mean sophisticated or complicated; simplicity always works better.....



Thank You!



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