BLUE FOR CITIES AND GREEN FOR AGRICULTURE

Low awareness of water shortage complexities characterizes the SDG 2 targets and delays sub-Saharan hunger alleviation, writes Malin Falkenmark. ▶ OPINION, PAGE 20

EYES ON THE BALL

The 2030 Agenda is holistic, integrated and universal. It is also extremely ambitious. We must keep our eyes on the end goal. ▶ ANALYSIS, PAGE 22

STOCKHOLM

WATERFRONT

#2–3 | JULY | 2017

A CLOSER LOOK AT THE

Great Green Wall

ADAPTING TO THE NEW NORMAL

GLOBAL TALES OF WATER REUSE

THE FORUM FOR GLOBAL WATER ISSUES • PUBLISHED BY STOCKHOLM INTERNATIONAL WATER INSTITUTE

REDUCE AND REUSE AT EVERY OPPORTUNITY

I think the full realization has sunk in. Many large-scale water users – not only the water users on the front line such as farmers – but also companies dependent on water (most, that is), cities and nations now see that there really is no way around the water challenge. The only way to deal with it is head on. All planning – public as well as private – must take increased water scarcity into consideration. Water must be reused at all opportunities. In parallel, us citizens as well as companies and institutions, must make an effort to reduce our water use.

We have dedicated a large part of this issue of WaterFront to reuse of water. We have looked at how some of the pioneers in the area, countries like Namibia, Singapore and Israel, have managed to cope with scarcity, increase reuse, and even change public perceptions.

In South Africa, Cape Town has suffered the worst drought in recent history, and is learning to live with water shortage as the new normal. How do they plan for the city to thrive under altered circumstances? We asked the city's mayor and a city water expert.

We also have an inspiring story on the Great Green Wall – how great is it, really?

Lastly, we remind ourselves to keep our eyes on the ball – let's not forget the end goal of establishing a water wise world while swimming through the sea of SDG targets and indicators!

Enjoy the read!

Torgny Holmgren

Executive Director, SIWI

FOCUS

22

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SECURITY COUNCIL BRIEFING: SIWI AND ICWC "IMPORTANT" FOR MAINTAINING PEACE

Photo: UN

SIWI and the UNESCO International Centre for Water Cooperation, hosted by SIWI, have been cited at a Security Council briefing as important actors in maintaining international peace and security.

In early June, the Security Council held a briefing on Maintenance of International Peace and Security: Preventive Diplomacy and Transboundary Waters, where Sweden's Deputy Prime Minister and Minister of International Development Cooperation, Isabella Lövin, as well as the United States Mission to the UN cited SIWI and its work in water diplomacy as important in maintaining international peace and security.

In recent years water cooperation has gained traction as an important tool in peace building. In the opening remarks of the special briefing UN Secretary-General, António Guterres, stressed the importance of water as a catalyst for cooperation. SIWI's work in water cooperation has also grown though the institute's work in water diplomacy, initiatives such as the Shared Waters Partnership, and the hosting of the International Centre for Water Cooperation.

The International Centre for Water Cooperation is the first UNESCO Category II Centre in Sweden, and the first in the world to focus on transboundary water management in connection with peace, conflict and regional development.

LOOK TO THE SOURCE TO SAVE THE SEAS

The importance of source-to-sea approaches was emphasized by ministers, practitioners and UN agencies at several sessions of the Ocean Conference in New York in June.

The outcome of "Our Ocean, Our Future: A Call for Action", which the Government of Sweden was co-hosting, refers explicitly to the need to significantly reduce marine pollution of all kinds, "particularly from land-based activities" and to promote waste prevention, develop sustainable consumption and production patterns and adopt 3R (reduce, reuse, and recycle) approaches.

The Action Platform for Source-to-Sea Management, which is supported by the UNDP-SIWI Water Governance Facility, co-organized two official side-events at the conference.

The opportunities for coordinated implementation and monitoring of SDGs 6 (on water and sanitation for all) and 14 (on oceans) were discussed by both freshwater and marine representatives from United Nations, donor agencies and private sector at one of the side-events.


Photo: UN

"The SDGs give us the goals and targets, but not the tools on how to get there" said Birgitta Liss Lymer, Programme Manager of the UNDP-SIWI Water Governance Facility and the Action Platform for Source-to-Sea Management.

"We need to find more effective ways of coordinating and financing development options that benefit both upstream and downstream stakeholders".

The need for a circular economy and sustainable waste management were highlighted by ministers from Sweden, Germany, the Seychelles and Jamaica at the side-event "Can we achieve SDG 14 without looking upstream? Starting at the source to save the sea".

Barbara Hendricks, Minister of Environment of Germany said: "the best waste is the waste never produced", emphasizing the need to involve consumers to achieve behavioural changes.

Dr. Naoko Ishii, CEO of the Global Environment Facility (GEF), informed that the needs to address the connections between upstream pressures and downstream impacts, to work with the private sector to address plastic and broader issues of circular economy and to break the silos between institutions will be central elements in the next strategy of the GEF.

"There is evidence that the Sahara Desert has been retreating over the last 20-30 years. In the future, it will come back. (…) A line of trees is not going to do a lot to stop it."

Jonathan Davies, Global Drylands Initiative, IUCN. **Read more on page 16.**

33 %

OF PIPED WATER SERVICES IN KYRGYZSTAN DO NOT MEET SANITARY STANDARDS

Source: Department of Disease Prevention and State Sanitary and Epidemiological Surveillance of the Ministry of Health, Kyrgyzstan

RAISING AWARENESS THROUGH JOURNALISM

SIWI WORLD WATER WEEK JOURNALIST GRANT

Close to a hundred journalists sought the opportunity to report from World Water Week with SIWI's Journalist Grant this year. Several weeks of reading, listening to, and watching impressive stories on water and related-issues led to the selection of three highly qualified reporters.

Sylvia Chebet from Kenya, Farahnaz Zahidi from Pakistan and Nhat Pham from Vietnam all show a deep interest in water- and water-related issues, and prove that journalism can be used as a tool for positive change.

We've asked them to share with WaterFront's readers what they believe are the biggest water-related challenges in their regions, and what they hope to get out from World Water Week.

Nhat Pham, Vietnam
Technology abuse and toxic pollution

Elevated sea water level, the ignorant abuse of technology, severe drought caused by El Nino... the combination of the above factors has given rise to the gravest thirst for fresh water in the past 100 years in the Mekong Delta region. Besides, approximately 100 tonnes of fish carcasses had been washed up to the shores of four central provinces of Vietnam in 2016. A foreign-owned steel plant admitted responsibility for discharging toxic industrial waste illegally into the ocean.

I am enthusiastic about visiting World Water Week, which will grant me access to Sweden – widely acclaimed as one of the cleanest countries in the world. In addition, I will have the precious opportunity to meet, learn and interview many prestigious scientists and journalists. This will entitle me to a thorough understanding of the issues of water, finding the solutions to the above issues so I may convey them to my readers in the most effective manner.

Sylvia Chebet, Kenya
Scarcity, dams and scandals

Kenya has been struggling to ensure equitable access to all her citizens, with little success so far, especially due to lack of water storage facilities. A raging drought early this year decimated livestock populations in north-eastern Kenya by more than half. The stress on families is far greater in this region, where the search for water causes separation, often for as long as the drought spell lasts. Men are forced to abandon their wives and children to drive herds of livestock to far away wells, some never return home for various reasons including sickness, bandit attacks, thirst and hunger.

Corruption around water development also continues to deny communities this important resource. Nearly all mega dams under construction in Kenya are at the centre of mega scandals. Kenya also boasts a 70 billion litre aquifer in one of the country's driest areas, Turkana. The water however, is saline. What I would like to know is if Kenya can still benefit from the aquifer, and in how long? I am also interested to learn about best practices and technological advancements in other parts of the world.

The World Water Week theme this year "water and waste – reduce and reuse" captures the very lesson Kenya needs to learn, and urgently. Water wastage is an enormous problem in the country that is ironically water scarce, both in the urban and rural areas. I look forward to the exchange of ideas and solutions by industry experts, practitioners, decision-makers, innovators and young professionals who will grace the occasion to help me to contribute to a water-wise world through the media.

Farahnaz Zahidi, Pakistan
Drought and contamination, floods and poor sanitation

Pakistan is rich in natural resources. It is a diverse country geographically and environmentally. Our water-related challenges are also, thus, diverse and many. We have water shortage in areas like Kashmir and Khyber-Pakhtunkhwa. Though these regions are rich in rivers and rainfall, clean water often does not reach villages.

More challenging are drier, arid regions in the South like the drought-stricken Tharparkar district from where I have reported extensively. The water wells have water that is contaminated, high in fluoride and arsenic levels, resulting in severely stunted populations with bone and skin issues, and dental and skeletal fluorosis.

Our challenges also include a lack of proper sanitation, especially in rural areas and over-populated informal settlements in cities. My city, Karachi, is a megacity with a population of approximately 24 million people, suffering from acute water shortage all year round. We rely on water sold at steep prices that reaches us in containers. The heat waves and climate change has reduced instances of rainfall in Karachi, but when it does rain in the monsoons, it almost always results in a flood, owing to choked waterways and ravines that are blocked due to informal settlements and being used as garbage disposal dumps.

Pakistan, thus, needs careful planning and development to ensure that all its citizens get clean and enough water to sustain lives and livelihood.

KEEPING SCARCITY AT BAY – GLOBAL TALES OF WATER REUSE

Text | Tom Freyberg

WITH GREATER UNCERTAINTY ABOUT WATER AVAILABILITY, NATIONS AND CITIES WILL HAVE TO RETHINK THE WAY THEY USE AND ALLOCATE FRESHWATER. WE TAKE A LOOK AT HOW NAMIBIA, ISRAEL AND SINGAPORE HAVE MET THIS CHALLENGE.

Around the world more and more nations are rethinking the way they look at the water they drink and waste they produce. What was once seen as a nuisance and something to dispose of is now being seen as a resource and possibly one answer to eliminate the escalating problem of water scarcity. With the help of technology, mankind has found a way to reengineer new water sources from the old.
Yet there remains a chasm of success between nations which lack simple sanitation infrastructure and those which are collecting and reusing almost 100 per cent of the water they use. Why does such a gap exist when the same technology to necessitate reuse is available to all?

Tel Aviv, Israel.

ISRAEL

QUENCHING THE DESERT

Before looking at recent examples of reuse in the US, it's important to go back and see how countries such as Israel, Namibia and Singapore addressed their water challenges.

Located in one of the most water scarce regions of the world, Israel has a unique tale to tell. Today the country's financial hub, Tel Aviv, with the Mediterranean Sea lapping up against its beaches, acts as a barometer of the nation's success and struggles to get there. New technology startups in the IT, medical, defense and clean tech industries populate the now buzzing city.

Since it was declared a state in 1948, Israel built out its desalination capacity, harvesting rainwater and reinventing drip-feed irrigation for farming. Today the country is collecting and reusing 90 per cent of its wastewater.

With a population doubling in size from 1948 to 1952, Israeli officials invested into building out basic water infrastructure, digging trench lines and putting in pipes. Without a major river, such as the Nile or Ganges to build a society around, Israel had to engineer its own. Measures put in place from over 50 years ago mean today the country manufactures two thirds of the total water it consumes.

"Israel has always challenged the Sciences," says Seth Siegel, author of Let There be Water: Israel's Solution for a Water Starved World.

"As a result, it has advanced in about every area of technology. They lead the world in cyber security; they're among the world's leaders in digital health, financial technology and other areas. It makes sense – everywhere you can add technology, Israel punches way above its weight of a country of only 8.8 million people."

Such success however did not come without its challenges. Raising the price of water was met with disdain by consumers.

"I don't want to pretend that it was all rainbows and unicorns and everybody was happy and throwing petals at the water administrators as they were raising the prices," adds Siegel.

NAMIBIA

NAVIGATING SCARCITY

Home to dunes the size of mountains, Namibia sits along the Atlantic coast in south-western Africa. Similarly to Israel, Namibia comprises substantial desert but again did not let this hamper its journey to water reuse.

It was in the 1960s when regular drought in Namibia, coupled with a continuous shortage of potable water in the capital city Windhoek necessitated an investigation by the city authorities into alternative sources of raw water. It was decided to reclaim water from the Gammams Water Care works, as well as the then polluted Goreangab Dam. Other options – such as desalination and transporting water from the Okavango River – were deemed too expensive.

"The city of Windhoek had no other choice, as water reclamation for potable use was the only affordable option", says Rajiv Mittal, MD and Group CEO of VA Tech Wabag – an engineering company that delivered Namibia's first industrial water reuse project.

The developments from the 1960s led Windhoek to become the first municipality to employ direct potable reuse (DPR): water is treated to potable standards before being supplied in the network. In-direct water reuse, on the other hand, means to mix treated water back in with other collected water sources.

As the early pioneer of such processes, it was important for Namibian authorities to get it right.

Mitall says "no health problems have been experienced or verified in epidemiological studies with regards to reclaimed water".

Add to this to a candid information policy implemented from the beginning in 1968 and the country overcame the public perception challenge of accepting direct potable reuse. Backing this up, since 1995 Windhoek arranged suitable education programmes in schools a part of the curriculum, as well as radio and television campaigns, in the process overcoming barriers. They engaged their nation to cement reuse water as part of their supply.

Based on the success of Namibia, a direct potable reuse project has been implemented at Beaufort West in South Africa.

"The city of Windhoek had no other choice, as water reclamation for potable use was the only affordable option."

Namibia

Singapore

SINGAPORE

TRIPLE-BARRIER TECHNOLOGY

Jumping across to Asia and what has become known as a global hydro hub, Singapore is often cited as a successful example of water reuse. Back in 1965 the independent country severely lacked resources. Singaporeans were known to have queued in the streets for water during rationing caused by prolonged dry spells. At the opposite end, heavy rain led to widespread flooding, wrecking homes and destroying lives. Under guidance from Lee Kuan Yew – the country's first prime minister but since deceased – the small nation reinvented itself over the next five decades.

Today, Singapore is one of Asia's economic, thriving hubs – a financial jewel in Asia's developed crown. Its skyline is punctuated by modern buildings, yet the bustling activity of boats crossing the waters suggest the city's trading port roots are never far away.

In 2015 the World Resources Institute ranked Singapore as one of the most water-stressed countries in the world. Furthermore, as an island nation with just 5.5 million people, Singapore faces land constraints. Located in the tropics, the island nation is blessed with a lot of rain but cursed with a lack of space or capacity to store this water. As a result, the lack of land, coupled with a reliance on water from Malaysia drove the need to create a diversified water supply.

Taking matters into its own hands, Singapore pro-actively sought to create four sources of water supply, or "Four National Taps" as national water agency PUB calls them: desalination, water from local catchments, imported water from Malaysia and reused water, known as NEWater. Today, NEWater can meet up to 40 per cent of supply and desalinated water up to 25 per cent. However, the country has further ambitions. By 2060 it aims for NEWater to meet up to 55 per cent of its water supply. In effect, Singapore is gearing up so that reclaimed water can meet over half of its nation's water needs.

"I think the main reason for success and the bottom line is that we had no choice," says Harry Seah, chief technology officer at PUB. "Singapore is a such a tiny place – a major challenge is very severe land constraints... In the end we have to look at other ways to develop other, what you call unconventional sources of water to meet our growing water demands. Water reuse is a key strategy that will help us overcome our land constraints."

Often visited by water professionals to see how the once resource-rationed country reinvented itself, many people think Singapore's success story can be replicated quickly and simply. This is not the case.

"Some people see Singapore and get really excited – they say to me they want to do this in their country," says Harry Seah, chief technology officer at PUB.

"The first stage is to get the basic infrastructure in place and then we'll talk. For our situation in Singapore, because we have the infrastructure we have, we're able to collect 100 per cent of the wastewater."

"The answer was not the PR; it was the institutional credibility of the utility."

During the early years, Singapore collected and treated wastewater, which it treated to the necessary standard before releasing to the environment. Over time, as the standards got higher, it was seen as wasteful to simply throw what was treated, clean water in to the sea. After all, why not reuse a product you've spent time, effort and money on treating?

Today, Singapore produces NEWater, which it feeds through to its growing industries, known as direct non-potable use. For municipal use, NEWater is blended with raw reservoir water and further treated at the waterworks before it is sent to customers. This is called indirect potable use. Advances in technology have helped this journey. A combination of membranes, together with ultraviolet treatment are used to make sure the reclaimed water meets the standards.

One of the common problems associated with a water supplier rolling out water reuse is public perception. There is an inherent fear that the public, or paying customer, will reject the proposals on a perceived "yuck" factor of having what was once flushed down their toilet recycled back into public supply. It's not an easy sell for any utility. Advanced technologies may be able to clean up wastewater to a far cleaner, and healthier state than many drinking water sources around the world. Yet conveying the technical excellence of the engineering and technologies to the public in a pill that is easy to swallow is the hard part.

Seah believes the reputation between utility and consumer should be solid to start with.

"The public hasn't been educated globally – [water reuse] is still perceived on having that 'yuck' factor," he says.

"The public trust in us was already quite high. It's something that is earned, from many years of hard work we've been able to continue supplying the water. It's not something that we take for granted – one mistake can take that away."

He also says the key factor behind water reuse is about transparency, as well as engaging with the media. Many of the so called PR problems with reuse stem from the US in the 1990s, adds Seah, when the nation was trying to push reuse. "As soon as the 'toilet-to-tap" phrase got out, the damage was done. So we educated the media – how do we treat the water and why call it NEWater?"

Others believe regardless of PR, it's the reputation of the authority delivering the news that is key to success.

"In Singapore, they were a well-regarded and well-functioning utility doing the basic job for two decades before they started doing the work internally and preparing the communication on water reuse," adds Glen Daigger, professor of engineering practice at the University of Michigan and former president of the International Water Association (IWA).

"The answer was not the PR; it was the institutional credibility of the utility."

Interestingly, in California a Pure-Water programme is now being pushed through years after a direct potable reuse plan was rejected. To augment the Orange County Water District's groundwater replenishment project, PureWater is designed to create a stable and local supple of water in San Diego.

Mayor Kevin Faulconer was recently quoted saying: "Support for our Pure-Water program has never been stronger than it is today... That wasn't always the case 10 and 15 years ago."

Singapore

The River Ganges, India

INDIA

INVIGORATING REUSE

If Israel, Namibia and Singapore are seen at one end of the reuse spectrum, with California on its way there, India could perhaps be seen at the other. Not only in terms of its booming population – now over 1.3 billion but perhaps also its environmental challenges.

The river Ganges has played a key part in India's growth, deeply connected with water and energy, not to mention livelihood for more than 500 million people living along its banks.

Although it has also been called one of the most polluted rivers in the world, this could soon change.

Now known as India's 'Ganga Mata', or divine mother following a high court ruling, it's been declared that the Ganges and main tributary, the Yamuna, are indeed "living persons". As a result, polluting or damaging the rivers could be classed legally as harming a person.

At the end of last year a PwC knowledge paper – 'Closing the water loop: Reuse of treating wastewater in urban India' – said that government intervention is needed at both a national and local level to develop reuse schemes.

Part of the driver is that water stress has become a perennial concern in most Indian cities: India is expected to add over 400 million new urban dwellers between 2015 and 2050.

Many believe India's Smart Cities initiative is a fresh chance for urban planners to build in reuse plans now, for the future.

"I think any city planning should be anticipating reuse," adds Daigger. "

As they put in water infrastructure they should do nothing to inhibit it and make sure reuse can take place in the future. There are fundamental decisions about pipes and where facilities will be, not only today but into the future."

For others, an absence of the "triple helix" – effective collaboration between industry, government and academia – is what's lacking in the Indian market.

"You can think of the models where they have this right: Singapore, Israel and Korea," says Gary Sharkey, global sustainability network driver at PWC. "You can see the way the government gives incentives for industry, meanwhile academia is co-housed with government. They are all linking and sharing ideas more effectively. I think India could do with more focus on that. They have such a great asset in terms of their human resource and higher education levels but getting the government working together with the private sector would open up some opportunities."

WALK BEFORE YOU CAN RUN

Water is a precious resource fundamental to life, to growth and to a prosperous society. Humans may have this need in common yet the way in which water is treated, respected and disrespected differs dramatically around the world.

Nations whom have successfully become the masters of their own water destiny will continue to drive forward their own ambitious targets and projects. The success of countries such as Israel, Singapore, and Namibia did not come overnight. Other nations no doubt wish to replicate this success quickly. Yet they must walk before they can run: put in place basic sanitation infrastructure and then evolve this to advanced water reclamation infrastructure.

The hydrological cycle may have been recycling water way before mankind. Yet the way in which we can now master nature and produce our own sources of water will no doubt be debated long into the future. ●

ABOUT THE AUTHOR
Tom Freyberg is Chief Editor of Water & Wastewater International.

CAPE TOWN TREATS DROUGHT AS NEW NORMAL

Text | Görrel Espelund Photo | Andreas Karlsson

RAPID URBANIZATION AGGRAVATES THE IMPACT OF CLIMATE CHANGE IN MANY AFRICAN CITIES. AT THE SOUTHERN-MOST TIP OF THE CONTINENT, CAPE TOWN IS STRUGGLING TO MANAGE THE WORST DROUGHT IN RECENT HISTORY.

At the end of a cul-de-sac in the affluent suburb of Newlands, water flows freely out of a white plastic pipe and into a stream below. The water originates from the Table Mountain aquifers and for as long as anyone can remember, citizens of Cape Town have come to collect water from this fresh water spring. Previously, it was a question of taste. Today, it's about saving municipal water and cutting down water bills.

On any given day, there is a steady stream of collectors: old and young, Christian and Muslims; the lycra-clad house wives and the civil servants in their uniforms. No one jumps the queue.

While some carry a couple of five-litre containers, Rameez Solomons and his friends are filling drums of several hundred litres.

"We collect water for people in our neighbourhood who don't have transport. In the last few months, I've seen an increase of people collecting water here," Solomons says. At his house, several water-saving practices are already in place, such as reusing the rinse water from the washing machine and flushing the toilet with grey water.

On May 22, with dam levels standing at about 20 per cent, the Western Cape Province was declared a disaster area in response to the current drought crisis. A few days later, the Mayor of Cape Town, Patricia de Lille, announced even more severe water restrictions prohibiting the use of potable water outside the house

Phumeza Gosani runs a daycare centre for about 50 children. "When there is no water at home we have to collect it from a communal tap", she says.

and urging every citizen to use no more than 100 litres of water a day.

"We have put in place an extensive awareness and communications campaign to ensure all residents know that we cannot take water for granted or have any wastage," says Mayor de Lille.

The city has, for the past decade, been implementing an intensive water conservation plan and in 2015 its Water Conservation and Water Demand Management Programme (WCWDM) was awarded first prize in the Adaptation Implementation Category of the C40 Cities Awards.

The C40 network is an important platform for learning and discussing best practice solutions with other mayors from across the globe, de Lille points out.

"The city is constantly measuring overall consumption so that we get a sense of where in the city there is an overuse of water – both in the formal, informal and commercial sectors."

"Cities can learn from each other so we can act faster and draw from technical expertise from around the world. I have certainly borrowed ideas from elsewhere. For water management we've learnt from cities such as Melbourne and Perth, Copenhagen and Oslo. What the Cape Town experience shows is that while our water supplies were secure only three years ago, the realities of climate change can alter all that in a short space of time. We cannot see drought as something that may or may not happen. It has to be seen as the new normal so that we are prepared and more resilient in the future," says de Lille.

"Our water conservation programme has been working well, limiting water consumption growth to less than two per cent per annum and achieving water savings at approximately 30 per cent, despite rapid economic and population growth. But, we are simply not getting enough rain so we need to improve our water resilience plan."

This means diversifying the water mix and finding alternative sources of water such as drawing water from the Table Mountain Group aquifer and the Cape Flats aquifer. Establishing a small-scale desalination plant also forms part of the emergency supply scheme.

Many citizens of Cape Town come to collect water from this fresh spring, with water from the Table Mountain aquifers.

In addition, the city is looking at increasing the use of reused water. Currently, about eight per cent of the city's water is reused as treated effluent for non-potable purposes.

"We are going to be expanding water reuse measures even further and we are looking at ways in which reused waste water can be used for potable purposes," the mayor says.

One important part of the WCWDM has been to reduce the city's water waste. To date, 258 kilometres of water pipes have been replaced to reduce water leaks, there is an ongoing door-to-door awareness campaign, 1 000 community plumbers have been trained and employed by the city.

A call centre that operates around the clock gets some 500 water-related and 300 sewerage-related complaints per day.

Xanthea Limberg, a member of the Mayoral Committee for informal settlements, water and waste services, and energy, explains further:

"We've got a water inspector unit that responds to these complaints and if they find a contravention of the water restrictions, they can issue a fine or a notice to appear in court. The city is constantly measuring overall consumption so that we get a sense of where in the city there is an overuse of water – both in the formal, informal and commercial sectors."

The water inspection team also advises property owners on how to detect leaks at an early stage. Free plumbing is offered to poorer households that can't afford to repair leaks.

In March, the city listed the streets with the top 100 water consumers.

"We've discovered that a third of them had high consumption because of leaks they either didn't know about, or hadn't felt the need to attend to. The following months, consumption in all these areas went down," says Limberg.

There is a risk, she admits, that the wealthy are trying to pay their way out of the water restrictions. There is also a blame game in which residents of formal areas think there is wastage in the informal areas, and the residents of informal areas think that the formal areas are consuming far too much water.

"However, our data shows that our formal residential consumers use between 55 and 65 per cent of the water. The informal areas which are home to 14 per cent of the city's population, consume only 5 per cent of the water supply," Limberg says.

One such area is Khayelitsha, a township where some 500 000 people live in formal and informal structures.

Among the residents is Phumeza Gosani, who runs a daycare centre for about 50 children. A plastic drum that collects rainwater from her roof stands in her small yard. But with no rain, nothing fills up the tank. The area has been earmarked to become a formal settlement with indoor water and sewerage facilities. Currently, each plot has outdoor plumbing, a sink and an outdoor toilet. However, the water is sometimes cut off for a full day.

"The municipality never gives a warning. When there is no water at home we have to collect it from a communal tap in the informal settlement neighbouring our community," she says.

Sometimes when water is cut off the city circulates water trucks in the area and she does, occasionally, get water warnings on her phone.

"With the drought, there is talk about us buying bottled water, but people out here can't afford it. Another thing, if we report a broken pipe it takes too long before someone comes to fix it. Despite the drought, we go about our normal business; we don't have much in the first place," Gosani says. ●

Rameez Solomons collecting water for people in his neighbourhood who don't have transport.

ADAPTING TO THE WEATHER
CALIFORNIA FORCED TO LEARN FAST

YEARS OF DROUGHT FOLLOWED BY UNUSUALLY HEAVY PRECIPITATION IS TESTING CALIFORNIA'S WATER INFRASTRUCTURE, AND SUCH WEATHER SHIFTS ARE LIKELY TO BE THE NEW NORM. HOW IS AMERICA'S LARGEST AGRICULTURAL STATE ADAPTING? WATERFRONT ASKED TWO EXPERTS.

Text | Christina Anderson

In April, Governor Jeremy Brown declared California's six-year drought over after the state was drenched with rain this past winter. In April, the Sierra Nevada snowpack, an essential source of water from snowmelt during the dry season, was at 160 percent of its annual average. Two years ago, the mountain range had only five percent of its average snowpack.

While the state's farms, homeowners and businesses may be drawing a sigh of relief, Governor Brown cautioned in a statement that "the next drought could be around the corner" and that "conservation must remain a way of life."

Indeed, this drought may be over, but it is not the end of dramatic weather swings, according to Nick Brozovic, Director of Policy at the Daugherty Water for Food Global Institute in Nebraska, and Gabriele Ludwig, Director of Sustainability and Environmental Affairs at the Almond Board of California.

According to Brozovic, California and its agricultural industry must prepare for more variation in surface water availability, with more pressure on groundwater as a result. For cities, it means more years with drought restrictions in place, and more measures to address storm water management and flooding.

California's water supply system is set up to move water from the north to the south and to store it from the winter to the summer, relying on snowpack and dams to move it into the canal systems. The important question, said Ludwig, is how can California manage when there is less snow to store the much-needed water?

"If the models for climate change hold, less as snow and more as significant rainfall events, what mechanisms are there to capture some of that water to move it from the north to the south and from the winter to the summer?" she asked.

The state's valuable agricultural industry has been relying on heavy overdrafting of groundwater resources during the drought.

California is America's agricultural state, growing more than a third of the country's vegetables and about two-thirds of the country's fruit and nuts. When and where there are shortfalls in surface water availability, groundwater is pumped from limited supplies. Until recently, farmers in much of the state were basically free to pump as much as they needed. In contrast, surface water is strictly regulated in California.

As a response to overexploited groundwater supplies and a variety of attendant problems such as salinity increases and land subsidence, in 2014 the state enacted the Sustainable Groundwater Management Act (SGMA), laying out a long-term state-wide sustainability plan that empowers Groundwater Sustainability Agencies (GSAs) to coordinate and govern groundwater locally with stakeholder participation. Better groundwater management is part of California's Water Action Plan and is intended to provide a buffer against drought and climate "and contribute to reliable water supplies regardless of weather patterns," according to groundwater.ca.gov.

Nick Brozovic, Director of Policy at the Daugherty Water for Food Global Institute.

"...there is a lot of opportunity for clever, creative solutions that are also cheap.

Still in its infancy, the state-wide mandate towards sustainable water management targets aquifer depletion, degraded water quality, and land subsidence, said Brozovic. "Overall, SGMA is not intended as a response to the recent drought, but a longer-term response to drought in general. So far, the GSAs

are still forming, and no new restrictions on pumping related to this legislation are in place."

According to Ludwig, it's not going to be easy or look the same everywhere. "SGMA focuses on finding out locally what the problems, opportunities and solutions are. For some areas that is okay. In other areas, it will be difficult," she said.

Under the SGMA, state government will have a role in setting the parameters, including mapping and stepping in at the local level if they can't govern themselves, she said.

"At the end of the day, managing groundwater is going to be up to the individual landowners within the framework provided by the local Groundwater Sustainability Agency, newly formed entities with SGMA." In the meantime, she added, "They need to come up with a plan to restore groundwater. Economically, it's going to be painful. But in order to have it available in the dry years, we need to household it in the good years."

In addition to self-imposed local restrictions for groundwater, Brozovic predicts that California will likely see an increased mix of public–private solutions, which help to reallocate limited water supplies to their highest uses, or create incentives to increase available supply. "People are talking about grand solutions, which often require very large budgets, but there is a lot of opportunity for clever, creative solutions that are also cheap." said Brozovic, adding that these include things like water swaps between urban and agricultural water users where both parties benefit, voluntary recharge schemes, and even new education programs for the nascent group of California groundwater managers.

What can we learn from California?

"I think that the better question to ask is what can be learned about water management elsewhere that can be applied to California, particularly when it comes to groundwater management," said Brozovic, adding that several other states have imposed pumping limits and well-drilling moratoria for years, and use technology to monitor, and incentive-based systems such as groundwater markets to reallocate water to high-value uses.

In Nebraska, where Brozovic is based, groundwater management districts called Natural Resources Districts (NRDs) were created 45 years ago. "Some of these have had pumping restrictions in place for nearly 40 years," he said.

A 2015 report commissioned by the Water for Food Global Institute assessing the impact of Nebraska's NRDs showed that the locally-controlled water governance framework has benefited productive agriculture without depleting or degrading water supplies. In addition to becoming one of the most "intensely irrigated and most productive agricultural areas in the world", many areas in Nebraska have seen water tables rise and improved water quality since the framework was introduced in 1972.

"Looking in California, there is a need to reduce the water being used, but it will also require participants to understand that this is necessary. I work with farmers in the central part of the U.S. What I often hear them say is that they would like their grandchildren to have the kind of life that they did. In a sense, you have self-policing. You have a community that understands," said Brozovic.

Gabriele Ludwig, Director of Sustainability and Environmental Affairs at the Almond Board of California.

Economically, it's going to be painful. But in order to have it available in the dry years, we need to household it in the good years."

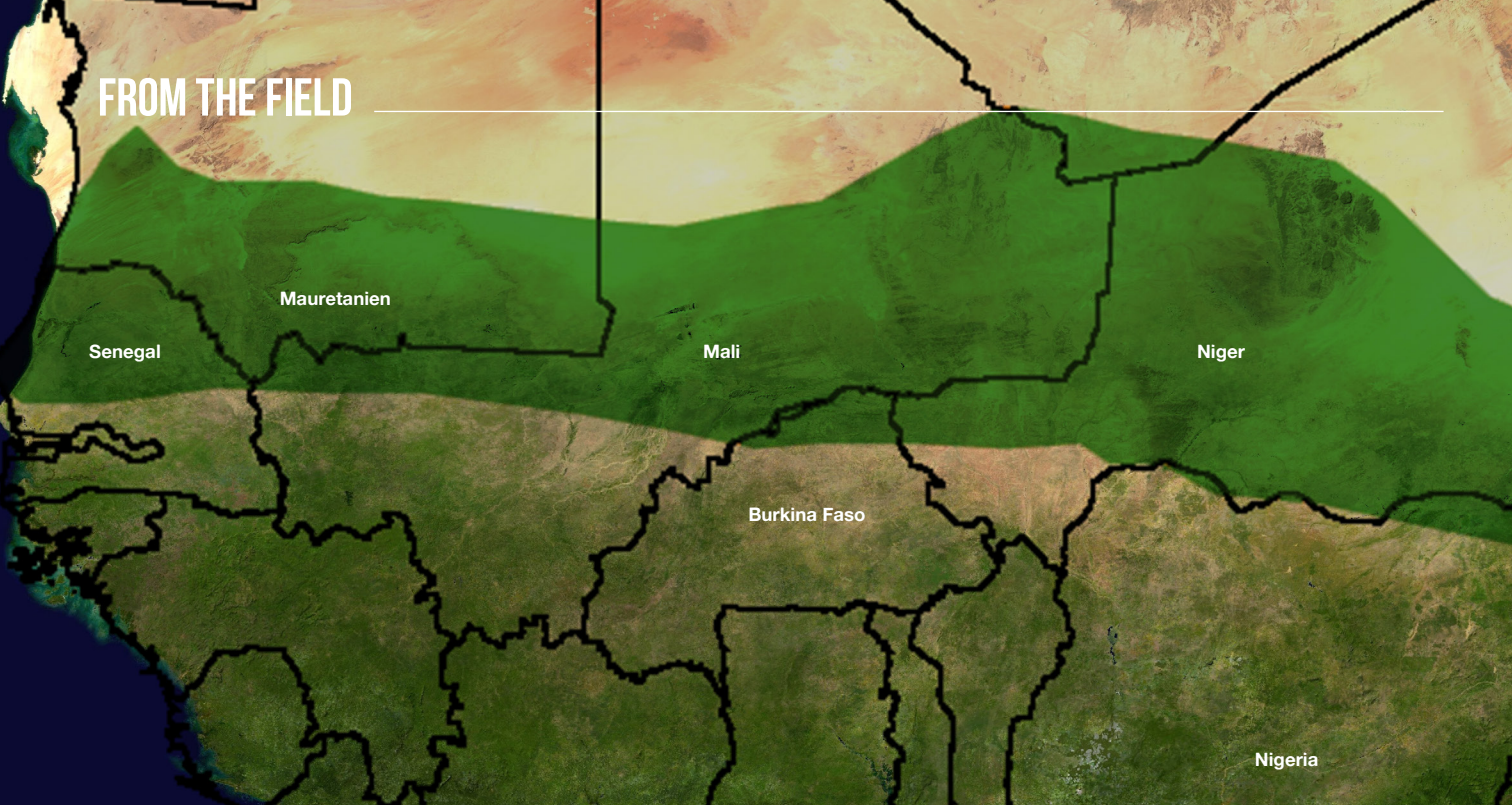
Another key issue, said Ludwig, is that ground water and surface water are inextricably linked geologically and in terms of how regulations affect the use of each.

"For California, the ease or difficulty to sustainably manage ground water is also a question of how surface water is managed within the State. The effects of SGMA will vary widely depending on how the available surface water is managed," she said.

While farmers are uneasy over what SGMA will bring, there have been major shifts in agricultural production in the last 20 years that may have an even more significant impact on agriculture than the state's water problems.

"These are linked more to regulatory and economic issues, not necessarily water," said Ludwig. "A lot of agricultural production, where possible, has moved south to Mexico and even Peru, because the labour costs are so much cheaper there. It's the same reason that Ikea does not produce most of their products in Sweden."

Farmers growing crops that are uniquely suited to produce in California's climate will struggle with water issues, she added. ●



Eleven countries were involved in the project to begin with, now over twenty countries participate. The map is a rough sketch over the Sahel area.

AFRICA TRADES IN THE GREAT GREEN WALL FOR A MAGICAL MOSAIC CARPET

Text | Bill Hinchberger

A DECADE AGO AFRICAN LEADERS LAUNCHED AN AMBITIOUS SCHEME TO HOLD BACK DESERTIFICATION IN THE CONTINENT`S DRYLANDS BY BUILDING A WALL OF VEGETATION. COVERING 780 MILLION HECTARES, THE GREAT GREEN WALL OF THE SAHARA AND THE SAHEL (GGW) WOULD RUN FOR OVER 7,000 KILOMETERS THROUGH 11 COUNTRIES.

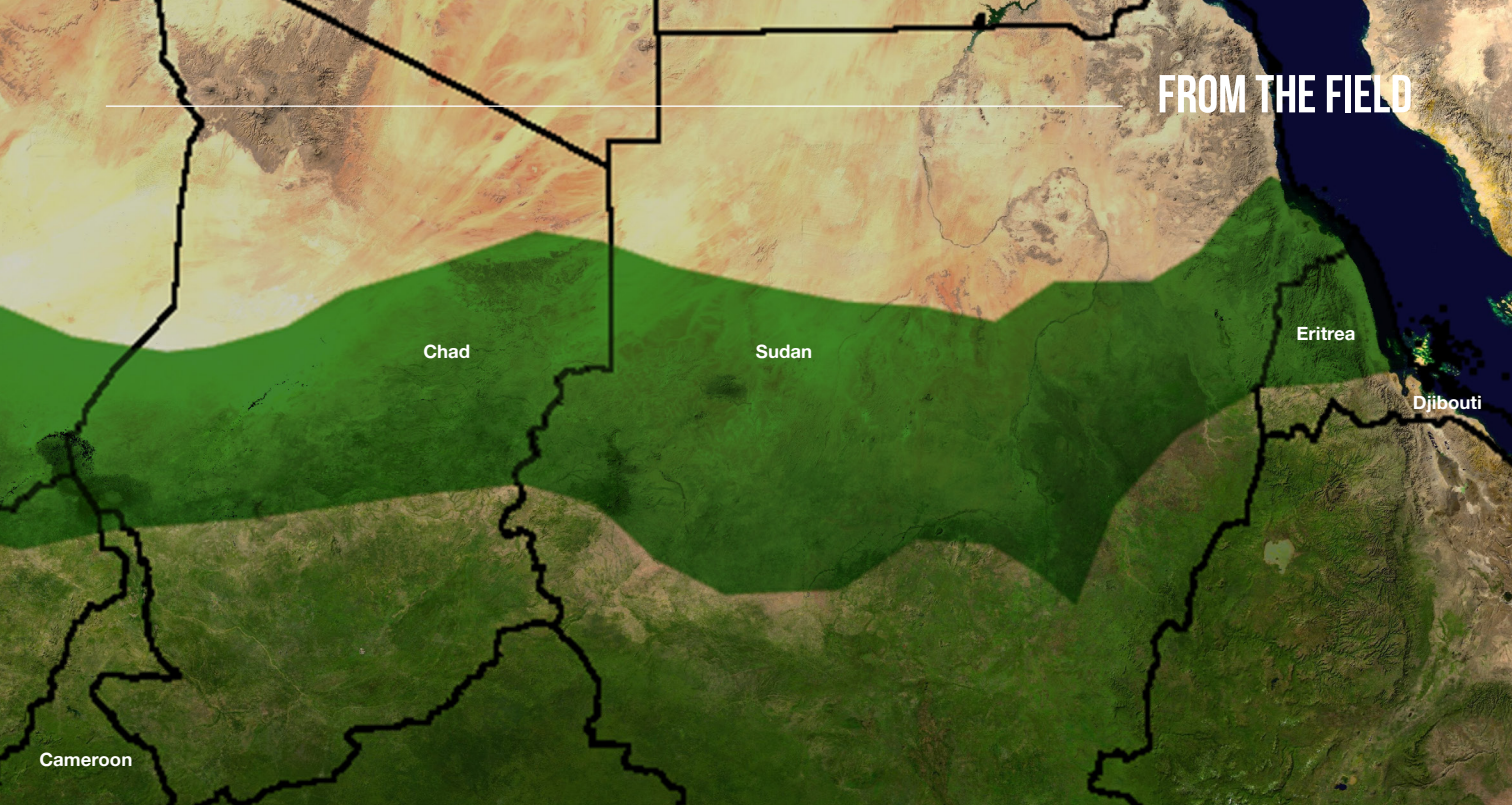
With backing from the African Union, leaders from Bamako to Djibouti jumped on board. Now over 20 countries are implementing projects under the GGW umbrella. International support has come from an alphabet soup of agencies and organizations that include the World Bank, the United Nations Convention to Combat Desertification (UNCCD), the United Nations Environmental Program (UNEP), the Food and Agriculture Organization of the United Nations (FAO), the International Union for Conservation of Nature (IUCN), the World Resources Institute (WRI), the French government and more.

With so many players, it is hard to come up with reliable numbers for overall investments, but estimates run from USD 2–4 billion. The World Bank alone is laying down USD 800 million.

For once, environmentalists can`t complain about lack of political will. Politicians have taken the lead.

So, what`s wrong with this picture?

For starters, the science. The GGW was designed to stop encroaching desertification. But scientists agree that desertification has its ebbs and flows, much like those of ocean tides, albeit with much longer time scales. Right now, they agree, the desert is pulling back. No matter what it does, the GGW



An illustration by Felix Koenig combined with a photo by NASA/Wikipedia.

"There is evidence that the Sahara Desert has been retreating over the last 20–30 years. In the future, it will come back..."

Jonathan Davies, coordinator of the Global Drylands Initiative

project is fighting a "winning battle" because the desert is retreating anyway.

Eventually, the process will reverse itself – whether or not there's a lush green "Maginot Line" standing in the way.

"There is evidence that the Sahara Desert has been retreating over the last 20–30 years," said Jonathan Davies, coordinator of the Global Drylands Initiative at IUCN.

"In the future, it will come back. It is a mythical problem. And if it comes back, a line of trees is not going to do a lot to stop it."

The idea of walling off desertification with trees is not new. In the 1960s. Algeria tried something called the Barrage Vert (Green Dam).

"That resulted in a failure," said Nora Berrahmouni, FAO forestry officer for drylands.

"There wasn't a participatory approach. Communities were not involved. Soldiers planted trees that were never properly watered. Wrong species were introduced. They became *bonzais*."

"My view is that large-scale tree-based restoration can only be achieved through the protection and management of natural regeneration," said Chris Reij, a sustainable land management specialist with the World Resources Institute.

"There is of course a role for tree planting, but tree planting alone won't get us close to the 350-million-hectare target adopted by the New York Declaration on Forests. Besides, the survival rates of planted trees in drylands, and certainly in the Sahel, has been quite low."

Yet development professionals and environmentalists fret about abandoning the Great Green Wall concept because it is good marketing.

"It is easy to understand – the image of trees stopping the advancing desert," noted Davies. According to Berrahmouni, "The Great Green Wall inspires people. It makes people dream."

"It has a lot of political support," said Davies.

"But we need to steer it in a better direction."

Photo: UN's Convention to Combat Desertification

Great Green Wall

- The GGW core area covers 780 million hectares – more than twice the size of India.
- Encompassing both arid and semiarid zones, the GGW`s core area receives average annual rainfall of 400 mm.
- The population of the GGW core area is 232 million.
- 21 % of the l and in the GGW core area is in need of restoration.

Source: FAO

Desertification may not the main enemy, and tree planting might not be the best or only response, but the GGW's core area is still home to 232 million people, including many who live in poverty. Much of the land in this arid and semi-arid region has been degraded, sometimes by overgrazing. Ten million hectares need to be restored every year to meet the target in the sustainable development goals.

Climate change is also playing a role. "Some studies say that drylands are likely to be growing due to changes in hydrology, precipitation and temperatures," said Lovei.

Many scientists and development professionals working in the region agree with Davies, who would like to see a "100-kilometer carpet" to ensure "environmental restoration and development in one of the world's poorest regions, including food security, water security and climate change mitigation and adaptation."

Efforts seem to be moving in that direction. Crowding out tree planting are small-scale local projects such as community gardens run by women in rural Senegal. Elsewhere in that country, villagers are working to regenerate land to create an animal reserve that they hope will allow them to develop ecotourism.

"The original idea of a wall of trees across the African continent was not feasible or desirable," said Deborah Goffner, a plant biologist and research director at France`s National Center for Scientific Research (CNRS). It has been replaced by "a patchwork mosaic of actions" that encompass the complexities of "environmental and human well-being."

Magda Lovei, manager of the World Bank Environmental and Natural Resources Global Practice called it "regreening" as part of "a multisector land initiative."

The French scientist added that "this will be a long process. You don`t build resilience overnight."

One of the GGW's biggest success stories involves water harvesting schemes in Niger and Burkina Faso. Even when robust indigenous species are planted, "water can really be a limiting factor," Berrahmouni pointed out. Combining traditional practices with modern technology, a special mechanized plow can dig the same kind of half-moon ditches that people in the region have relied upon for hundreds of years – albeit over a larger area in much less time.

In Ethiopia, the World Bank is financing a sustainable land management project to regenerate vegetation on hillsides. As a result, dried up streams have begun flowing again, creating opportunities for small-scale irrigation by farmers in the lowlands. Local women have turned to beekeeping to produce honey. "Ethiopia has focused on a watershed management approach," said Lovei.

Some early GGW initiatives seemed to be repeating the mistakes of Algeria`s Barrage Vert. Not only was there an early overemphasis on tree planting, but local communities were not always included in decision-making. The government of Senegal fenced in an area to allow it to regenerate – but without consulting the locals, thereby guaranteeing opposition to the scheme.

However, Senegalese officials learned their lesson, Berrahmouni said. There and elsewhere along the GGW, central governments have been working more

'Growing a World Wonder' captures the story of the Great Green Wall in Virtual Reality (VR). The film follows Binta, a young Senegalese girl, as she and her family tend to their section of the Wall. It explores the challenges they face and how the project is already transforming their lives for the better. Watch at Youtube or in you phone: http://www.greatgreenwall.org/.

Photo: United Nations Convention to Combat Desertification

closely with local populations. FAO, IUCN and other organizations focus on bringing all stakeholders together.

A few years later Senegal fenced in a 1,000-hectare area but did so in accordance with a management plan that was prepared with input from villagers. They were allowed restricted access, for example to collect fodder. "There has been a paradigm shift," noted Berrahmouni.

With the support of local communities, land can be recovered without extensive tree planting.

"If you allow natural regeneration by fencing off the communal grazing area, it is remarkable how fast it comes back," said Goffner.

Natural regeneration makes sense "from a water resilience perspective," noted Goffner.

"A lot of the best practices are not new. They are traditional practices that have been abandoned. Our job is to help them do what they know, and do it better."

Jonathan Davies, coordinator of the Global Drylands Initiative

"When you plant trees, you never calculate the biomass. The survival rate is low." Plus, seedlings must be cared for in nurseries for two months before planting.

"If you look at the biomass produced from trees that naturally regenerate, there`s more. And there`s not any watering."

Especially when they have land titles, farmers invest in natural regeneration themselves.

"A lot of the best practices are not new. They are traditional practices that have been abandoned. Our job is to help them do what they know, and do it better. That`s a significant shift", said Davies. ●

BLUE FOR CITIES AND GREEN FOR AGRICULTURE
TOWARDS WATER DECOUPLING

Text | Malin Falkenmark

LOW AWARENESS OF WATER SHORTAGE COMPLEXITIES CHARACTERIZES THE SDG2 TARGETS AND IS DELAYING SUB-SAHARAN HUNGER ALLEVIATION, WRITES MALIN FALKENMARK, AND SUGGESTS PARALLEL MANAGEMENT OF BLUE AND GREEN WATER TO MEET THE MASSIVE WATER REQUIREMENTS.

For six consecutive years, World Economic Forum has issued alarms over a global water scarcity crisis, in 2015 becoming the highest rated risk of all in terms of societal impact.

The water scarcity situation is most alarming in Africa. Besides the arid deserts and the blue water-rich regions in Central Africa's humid tropics, Africa is basically composed of two main water scarce hydro-regions; the blue/green water regions in countries in north-west, east, and South Afric with local rivers emerging from regional mountains, all approaching water shortage constraints; and the vast semi-arid green water dominated sub-Saharan savannah region, with widespread hunger, poverty and exploding population growth.

As stressed by South African water researcher Roland Schulze of the University of KwaZulu-Natal, several water-related phenomena distinguish Africa from most developed temperate zone countries: very high thirstyness of the atmosphere, very high aridity, low run-off generation, strong rainfall seasonality, dreaded droughts in the weather phenomenon El Niño/Southern Oscillation, and small rivers that tend to be ephemeral, carrying water only during rains. In this region, most of the rain evaporates before reaching a river, and

"Decoupling pressure on water resources from economic growth is key to sustainable development because of the uneven geographical distribution of global water resources and the cost of transporting water."

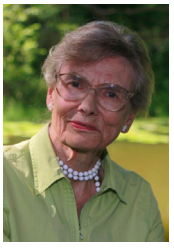
UNEP Water working group of International Resource Panel 2015

Nairobi, Kenya

blue water is generated in "water tower" regions and concentrated either in large transnational river corridors, or upstream in local rivers. In small-scale agriculture, water available for the crops is basically limited to infiltrated rainwater in the soil.

This means that, in sub-Saharan Africa, water managers will have to secure socio-economic development, while coping, at the same time, with dry climate, massive hunger and poverty, and an exploding population growth. Its water scarcity will call for a new approach to water resources management, decoupling water resources pressure from economic growth.

In Kenya, for instance, huge blue urban water demands are now developing in response to rapid urbanization, driven by the ambition of its capital Nairobi to develop into not only an African, but a global hub. Its limited blue water availability (see Figure 1) shows that Kenya would evidently be wise in water decoupling of its socio-economic development, in particular its food production. Since the mid 1990's, upgrading small-scale agriculture by rainwater harvesting for supplementary irrigation – a method practised on large scale in China – has in fact been tested and found to have huge potential for scaling up. This type of combined blue-green approach would involve increasing water use efficiency, waste water reuse, increasing management and use of rain water, and expanding IWRM, paying attention to both land use, societal and environmental sectors.



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Malin Falkenmark is a globally renowned water expert and serves as Senior Scientific Advisor at SIWI.

The Sustainable Development Goals' time horizon is short; only 13 years remain till 2030. On this time scale, water decoupling might be a sensible way to approach the two parallel goals – the urban/industrial water supply and water for local scale hunger alleviation. In other words, to concentrate the food security development on locally available green water, and the socio-economic development on blue water in rivers and aquifers – a pathway that would in fact also considerably reduce the degree of technical complexity.

All this means that in Africa's situation, water wisdom might mean parallel management of these two types of rapidly expanding water sectors: liquid water for human and socio-economic development of exploding urban and industrial areas, hosting a population approaching 2.5 billion before the end of this century, and hidden soil water supplemented by harvested rain for food production, meeting the need for hunger alleviation.

However, the non-existent awareness about water shortage characterizing the SDG 2 targets has been delaying sub-Saharan hunger alleviation. This severe problem was highlighted at World Water Week in Stockholm 2016, where a number of high level experts issued a Call for an African Green Water Revolution. This effort now needs to be rapidly put in place under African ownership, making hunger alleviation possible even in the semi-arid savannah regions, expected to be home to 1 billion people already before 2030. ●

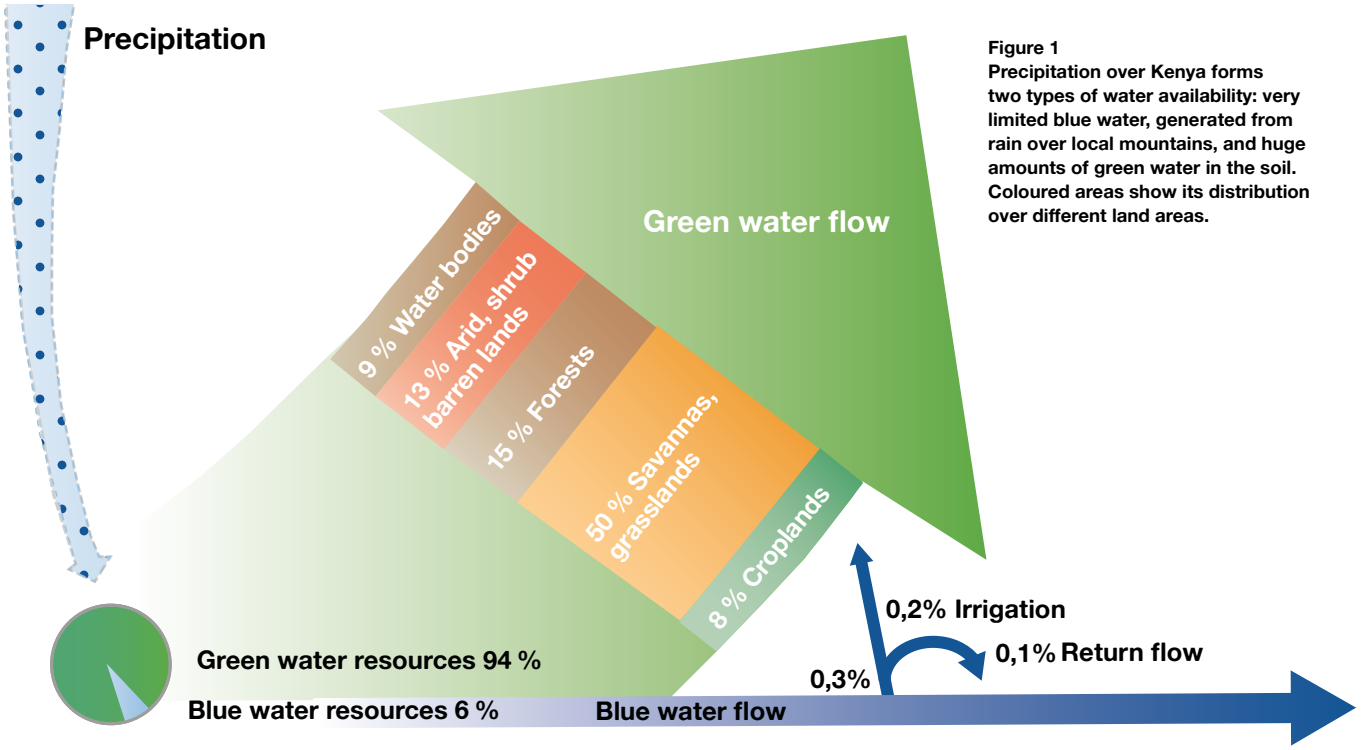

Figure 1
Precipitation over Kenya forms two types of water availability: very limited blue water, generated from rain over local mountains, and huge amounts of green water in the soil. Coloured areas show its distribution over different land areas.

EYES ON THE BALL

HOW TO NAVIGATE THE SEA OF SDG INDICATORS

Text | Marianne Kjellén and Birgitta Liss Lymer

THE 2030 AGENDA IS HOLISTIC, INTEGRATED AND UNIVERSAL. IT IS ALSO EXTREMELY AMBITIOUS WITH IMPORTANT COMMITMENTS NOT ONLY TO ACT, BUT ALSO TO MONITOR THE ACTION. WILL COUNTRIES BE ABLE TO KEEP THE VISION ON THE GOALS WHILE TAKING ACTION ON THE GROUND?

At the 2015 Summit on Sustainable Development, 193 Member States of the United Nations agreed upon the 2030 Agenda to transform our world – to address the root causes of poverty – increase economic growth and prosperity and meet people's health, education and social needs – while protecting the environment. The core of the Agenda holds 17 global Sustainable Development Goals (SDGs), each containing specific measurable targets; 169 in total. The scope goes far beyond the Millennium Development Goals (MDGs): While continuing the development priorities of the MDGs such as poverty eradication, health, education and food security, the 2030 Agenda contains broader economic, social and environmental objectives, promising more peaceful and inclusive societies. Defining also the means of implementation, it takes an integrated approach that recognizes interconnections and cross-cutting elements across the SDGs and targets.

The SDG water goal targets universal access to safe and affordable drinking water, sanitation and hygiene and to end open defecation.

Compared to the MDGs, the SDGs are much more holistic and topically complete to be able to serve as an overall development agenda. This comprehensiveness is very clear in the "water goal" – SDG 6 – to "Ensure availability and sustainable management of water and sanitation for all." The MDG "water target," included under the Environmental Sustainability MDG, sought to halve the proportion of the population without sustainable access to safe drinking water and basic sanitation. The SDG water goal goes well beyond this, firstly by aiming for universal access to safe and affordable drinking water, sanitation and hygiene, and to end open defecation (targets 6.1 and 6.2), and secondly by explicitly including the environmental dimension and the broader management of water resources – by assuring water quality (target 6.3), water-use efficiency (target 6.4), and the protection and restoration of water-related ecosystems (target 6.6). Thirdly, the SDG water goal also addresses integration itself along with broader governance matters: Target 6.5 sets out to implement integrated water resources management at all levels, and the means of implementation vow to expand international cooperation and capacity-building (6.a) and to strengthen the participation of local communities (6.b). Reflecting the broader interconnections of the whole 2030 Agenda, water-related targets can be found under several other SDGs.

To review progress, inform policy and ensure accountability in the implementation of the 2030 Agenda there is an elaborate framework of indicators and statistical data to monitor implementation and achievements. The goals and targets are supported by no less than 232 indicators.

With one or several indicators per target, and with metadata being developed to define each indicator, one might think that the essence of sustainable development would be clearly framed. However, as indicators have to be specific, they also need to be narrow. And the narrower one gets, the larger the gaps. For example, target 6.3 sets out to improve water quality by reducing pollution and has the results of its achievement indicated by the proportion of water bodies with good ambient water quality (indicator 6.3.2). However, the water quality indicator on the related action – proportion of wastewater safely treated (indicator 6.3.1) – captures only point sources of pollution and the action of wastewater treatment.

"How can the sectoral information to be gathered about the progress guide decisions and action towards the overarching goals, in a way that gives justice to the integrated nature of the agenda?"

"Developing countries will need an estimated USD 1 billion in statistical support annually in order to meet the data requirements of SDG monitoring."

This misses out on preventing pollution at the source, in particular non-point source pollution, typically from agriculture. This source of pollution risks being missed also by indicator 2.4.1. 'Proportion of agricultural area under productive and sustainable agriculture,' as the currently available metadata for this indicator does not define sustainable agriculture in relation to pollution of water environments. Instead it focuses on sustainability in terms of maintaining the natural resource base to ensure sufficient productivity and providing sufficient livelihoods and social safety nets. The integrated and indivisible nature of the SDGs is evident when looking at the Agenda as a whole, but barely visible at the level of its indicators.

The availability of high-quality, timely and disaggregated data is vital for evidence-based decision-making and to ensure accountability for implementation of the 2030 Agenda. This builds on capabilities to aggregate and make sense of sectorially specific data and results to understand the broader development trends, along with the coordination, flexibility and consultation in order to guide action on the ground. Governments have the primary responsibility for implementing the agenda, as well as the follow-up and review of progress. In many cases, data that is already regularly collected can be used. However, in most cases, the data is not readily available and significant investment has to be made to collect new data in accordance with the SDG monitoring framework.

Tracking progress on the Sustainable Development Goals requires an unprecedented amount of data and statistics at all levels, which poses a major challenge to national and international statistical systems. According to the Report by the Secretary General on Progress towards the SDGs, developing countries will need an estimated USD 1 billion in statistical support annually in order to meet the data requirements of SDG monitoring. This can be compared to the current global expenditure on water and sanitation, estimated by the Water and Sanitation Programme at the World Bank to around USD 28.4 billion per year, or the required USD 114 billion per year, three times the current investment levels, to bring drinking water nearby and manage fecal wastes safely, in accordance with the higher ambitions of the SDGs.

Significant investment in terms of funding, time and expertise is required to monitor the implementation and achievements of the 2030 Agenda, but manifold more is required for the implementation. It is important to assure that the proportion of efforts that goes into monitoring and implementation, respectively, is balanced. Further, analysis to ensure that the collected data and information be transformed into actionable knowledge to guide the pathway towards sustainable development can make the ongoing efforts of monitoring indeed being worthwhile.

DISCLAIMER
The views expressed herein are those of the author(s) and do not necessarily reflect the views of the United Nations Development Programme.

While searching for evidence and indications of development results and trends, we need to invest as much in understanding the meaning of the information and its implications for decision-making. We also need to appreciate the limitations of data and assure to use a critical mind and sound judgement in the application of policy and implementation of activities on the ground. Sustainable development – human and planetary prosperity and well-being – cannot really be captured by any indicator. In fact, what we treasure the most cannot be measured. The life buoy to keep afloat in the ocean of indicators must be to always keep the overarching vision in sight and the broader development aspirations at heart. ●

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