

China faces a mighty challenge as it transitions to its “new normal” economy: cleaning up its waters.

► ANALYSIS: PAGE 09



The golden rule of the African green revolution will be to catch the rainwater before it evaporates, writes Malin Falkenmark.

► OPINION: PAGE 11

**WITH THE WORLD'S  
BEST WATER IDEAS!**

► PAGE 22

STOCKHOLM

# WATERFRONT

THE FORUM FOR GLOBAL WATER ISSUES | # 3 | AUGUST 2015



## OUR SHARED THIRST

*For millennia, all water crises were local. Today, they are inextricably linked by trade, gravity, and climate*

**LAST WORD**

*We live in a richer,  
fatter world*

**THE HEROES  
OF OUR TIME**

*We celebrate activists,  
inventors, diplomats,  
and scientists*



Photo: Thomas Henriksson



# OUR SHARED PASSION

This is a momentous year. We have a string of meetings where the direction for global development work will be set for decades to come. This phrase has been on repeat for a long time, but it makes it no less important. This year, at the UN in New York in September and in Paris in December, we make choices that will affect our children's and grandchildren's lives.

In this jam-packed WaterFront issue, extra thick to celebrate the 25th jubilee of both World Water Week and Stockholm Water Prize, we have tried to approach some of the issues that we believe will be on top of the global agenda in the future.

Experienced water writer James Workman has taken on the subject of dryness in our cover story. Are water crises local, or is the crisis global? Dive into Our shared thirst on page 5.

SIWI's China experts untangle the giant's new water action plan in the analysis Slowing down, Cleaning up – China seeks a new normal on page 9.

Malin Falkenmark underscores the importance of managing rainwater in sub-Saharan Africa, in her opinion on page 11.

And, you will meet our Water Heroes. Together they prove that a person who is passionate about water and positive change can hail from anywhere, have any background. Read more on page 14. During the last few months, we at SIWI have run a campaign about The World's Best Water Ideas. Based on suggestions from the public and experts, we selected ten water ideas that are now being subjected to online voting. The voting will be open well into World Water Week, and the top ideas presented as the Week draws to a close. Best Water Ideas, page 22.

I hope these pages will serve as an inspiration for discussions during World Water Week and beyond. Happy reading!

Torgny Holmgren  
Executive Director  
Stockholm International Water Institute

### STOCKHOLM WATERFRONT

Stockholm WaterFront is a quarterly magazine that aims to inform the global water debate and be a source of knowledge and inspiration for professionals worldwide with an interest in water issues. Stockholm Water Front mixes popular science articles with news reporting and carries analyses by some of the world's most knowledgeable water writers. It is published in print and digitally by Stockholm International Water Institute, and is free of charge.

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# BRIEFING

## WATER RE-USE ADVOCATE WINS STOCKHOLM INDUSTRY WATER AWARD

CH2M, a Colorado-based global service and engineering company, has won the 2015 Stockholm Industry Water Award for developing and advancing methods to clean water, and increasing public acceptance of recycled water.

"CH2M has long recognized that our global community cannot afford to use water once and dispose of it—fresh water sources are too precious and growing more scarce," said Greg McIntyre, CH2M Global Water Business Group President.

CH2M has invented, implemented and refined methods for cleaning used water back to drinking water quality. But,

since this water is only valuable if people actually use it, the firm has put significant and successful effort into building public understanding and acceptance. They pioneered the application of social science research to better understand the underlying reasons for why people reject the notion of reuse and what might be done to change that mindset. This research, combined with demonstrations, education and transparency has dispelled myths around use of treated wastewater and paved the way for a surge in interest in and acceptance of potable reuse.

"Our planet does not hold any enormous, unknown sources of fresh water. We have to live with what we have. With growing populations and more unreliable precipitation patterns, it is essential to increase our reuse of water in the future," says SIWI's Executive Director Torgny Holmgren, and adds: "CH2M has understood this. In working for public acceptance of drinking treated wastewater, they have taken a step beyond engineering, and shown impressive commitment to wise water management."

[www.ch2m.com](http://www.ch2m.com)

## TEXTILE AND WATER PROJECT SHORTLISTED FOR GLOBAL SUSTAINABILITY AWARD...

The Sustainable Water Resources (SWAR) project has been shortlisted for the Global Leadership Award in Sustainable Apparel (GLASA). SWAR, a pilot project carried out within the framework of Sweden Textile Water Initiative (STWI), is a cooperation between Swedish brands and their Indian suppliers, SIWI, Sida, and India-based consultancy cKinetics.

Each year, the GLASA network identifies a theme to frame, for 2015 it is water. The award recognizes the most promising leadership and practices in the chosen area and in 2015, GLASA will produce a state of the apparel sector report focused on water.

The GLASA jury is comprised of leaders from Nordic industry and sustainability networks such as the Sustainable Apparel Coalition, Danish Fashion Institute, SEB and the Association of Swedish Fashion Brands. The process is coordinated by The Sustainable Fashion Academy (SFA).

The winner will be announced at a symposium and award ceremony during World Water Week in Stockholm on 27 August, 2015.



Photo: Teodora Vlaicu, SXC



Photo: Jean Scheijen, SXC

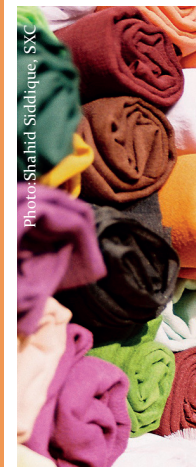


Photo: Shahid Siddique, SXC

## ... WHILE THE INITIATIVE EXPANDS TO MORE COUNTRIES

STWI will expand to more countries in Asia and Africa after the successful pilot project, SWAR, in India. Through the initiative, 28 Swedish textile and leather companies have cooperated with SIWI to catalyse a shift towards sustainable production globally. To achieve this, the initiative has educated suppliers and sub-contractors to help minimize the use of water, energy and chemicals throughout the supply chain. More than 40 factories participated in the pilot, which contributed to saving 284 million litres of water and 402 tonnes of chemicals annually.

Inspired by the success, the initiative will expand to include factories in Bangladesh, China, Ethiopia, India and Turkey. The Swedish International Development Cooperation Agency (Sida) will match the companies' and factories' investments in better water management. SIWI will continue the learning process with suppliers and sub-contractors in the new countries. The initiative also works with public authorities to increase institutional capacity to govern water sustainably.

<http://stwi.se>

## CONTENT

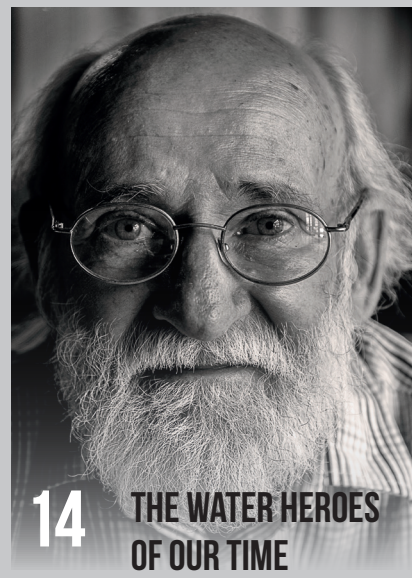


The printing process and paper have been certified according to the Nordic Swan label for environmental quality.

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PRINTING 13,000 • CIRCULATION 40,000 • ISSN 1102 7053



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## REPORTING QUINTET HEADS TO STOCKHOLM

Five journalists have been awarded the World Water Week Journalist Grant and will travel to Stockholm to report from 2015 World Water Week, themed Water for Development. The five are Seun Akioye from Nigeria, Rhaydz Barcia from the Philippines, Rhamesh Bhushal from Nepal, Selay Marius Kouassi from Côte D'Ivoire, and Stella Paul from India. They faced tough competition from over a hundred qualified applicants, more than double the number compared to 2014.

Sharing their experiences from last year's World Water Week, the 2014 grantees said their reporting on water issues has become more insightful and in-depth: "It made me aware of what is going on and how the world is coping with water issues. It gave me the insight to relate and compare the problems we face in India with a global perception," said Shiba Bose, a 2014 grantee from India. Ugochi Anyaka, a grant winner from Nigeria, told WaterFront: "I got a better understanding of the issues around sustainability in the water sector. I now find it easier to identify stories that need to be told urgently, and my passion for water coverage has increased with the clearer understanding of how important water is..." Amantha Perera from Sri Lanka said that "Now I look at water availability as not a standalone topic, but something that is interlocked with a host of other connected fields."

[www.siwi.org/media/world-water-week-journalist-grant](http://www.siwi.org/media/world-water-week-journalist-grant)



## UNILEVER PARTNERS WITH WWF TO SAVE TREES

WWF and Unilever have announced a one-year, international partnership to engage consumers in the fight against deforestation – one of the key drivers of climate change – and help protect a million trees. As part of the partnership, Unilever and WWF will support forest protection programmes in Brazil and Indonesia. Consumers are invited to pledge their support at <https://brightfuture.unilever.com>.



Photo: Peter Hol, SXG

# 9.2 %

of China's surface water is so polluted that it is dangerous for human use.

Source: China's Ministry of Environmental Protection

## VEOLIA TO IMPROVE ENERGY EFFICIENCY IN LATIN AMERICA

Veolia has announced an energy alliance with EPM, a group of Colombian companies providing water and power services to 20 million people in Latin America. The Veolia-EPM alliance will roll out energy efficiency projects which, it is planned, will reduce energy consumption and greenhouse gas emissions, improve competitiveness and protect natural resources.

[www.veolia.com/en/veolia-group/media/news](http://www.veolia.com/en/veolia-group/media/news)

# OUR SHARED THIRST



TEXT | JAMES WORKMAN PHOTO | ISTOCK

**FOR MILLENNIA, ALL WATER CRISES WERE LOCAL AND ISOLATED. TODAY'S CRISIS IS INEXTRICABLY LINKED BY TRADE, GRAVITY, AND CLIMATE. BUT THE REAL REASON THIRST HAS BECOME OUR SHARED PREDICAMENT? HUMANITY.**

## WATER FILM RELEASED ON WORLD ENVIRONMENT DAY

SIWI has launched a film, One Water – For Sustainable Development, together with partners UNDP, UN-Water, Knight Center for International Media and University of Miami School of Communication.

"Water is a precondition for human existence," says UN Deputy Secretary-General, Jan Eliasson in the film. Water is health, water is energy, water is food, water is climate, and water is equality.

2015 marks the 25th Jubilee of Stockholm Water Prize. Hear from previous laureates Rita Colwell, Sunita Narain and Tony Allan about water's centrality in sustainable development.



Photo: iStock

On 16 September 2011, New York hosted the "International Water Forum at the United Nations."

Neither date nor venue was chosen by chance. The "high-ranking" gathering of "world leaders" coincided with the opening session of the UN General Assembly, to "take the first step toward organizing a worldwide education and awareness campaign on the global water crisis."

It began predictably enough. Academics shared research. Sponsors showcased brands. Activists played

wrenching videos. Quasi-governmental officials intoned grim statistics. Attendees called for "urgent action" by "global decision-makers" who, presumably, made decisions outside that room.

But then it took a detour.

During the (water-intensive) lunch, discussions grew uncomfortable and animated. The catalyst was a keynote speaker who went off-key. "There is no global water crisis," announced Charles Fishman, author of *The Big Thirst*. "All water problems are local."

His blunt, blanket statement shocked some. But who could deny it? After all, water resources – rain, clouds, wetlands, rivers, aquifers, snow, mud, sewage – may trickle and meander, seep and run off. But in its natural state water is rooted to place, along with those who depend on it. This 'fugitive resource' only reluctantly wanders away from the basins where it falls.

Yet if the all-problems-local thesis holds water, so to speak, it raises thorny questions both high and low. ●●●



••• At the 10,000 metre level, should leaders ignore water for more pressing transnational concerns? Can “water for all” be removed from the Sustainable Development Goals, as it’s pointless to “act global”? Might water organisations with “national,” “global,” “world,” or “international” in their name be disbanded, now that SIWI (and GWP, WWC, IWA, IWMI, WRG, IUCN, or GEF brethren) faces a nemesis that’s illusory or imaginary?

More intimately, what does this mean for the Egyptian street vendor, Ahmed, who sold me carrots off his wooden cart two blocks from the Nile? Or the Cambodian fisherman I met, whose harvest depends on the demands of hydropower a thousand kilometres upstream on the Mekong? Or those Fulani women I watched striding across Nigeria, seeking water from drought-struck Sahelian wells and swamps that evaporated under unprecedented heat?

Such questions deserve honest answers, however painful, for the stakes keep growing. In recent years, local water stress, regional

## “And now, beyond trade and diplomacy, stir climate into our already volatile ‘local water’ cocktail”

droughts, and provincial resource (mis)management have only escalated, spread, accelerated, and combined into a force far bigger than any one isolated community can handle.

The World Economic Forum’s 900 leaders in politics, business, and civic life now rank water crises (plural) as merging into the world’s biggest risk (singular) and underlying driver of global instability. A few years after I bought Ahmed’s carrots, Egypt and its neighbours ignited in an Arab Spring, sparked by a street vendor just like him.

For development, the UN “recognises that water is the prerequisite” to achieve economic, equity, employment, health, educational, food, energy and ecosystem goals. From melting

Himalayan glacier source to their mouths in the South China Sea, river flows can make or break a fifth of humanity.

Even in military, national security, and foreign policy circles, water turns out to be a cross-cutting “threat multiplier,” inextricable from geopolitical trade pacts, diplomacy, climate forcing, or humanitarian crises. Whether Boko Haram in the Sahel or ISIS in the Middle East, it is perhaps no coincidence that terror thrives most where moisture comes least.

It appears thirst has gone global. The question is, Why?

The first complication of “local water” is the oldest: commerce. Wet stuff is a slave to gravity, but the wealth it creates is liberated by trade. Tony Allan first demonstrated in 1997 how products embedded with “virtual water” freely migrate across borders, travelling fast, frequent, and far by air, sea, or land.

The concept showed how leaders of any relatively arid country, say Mexico, Italy or Kuwait, could meet the needs of their citizens through imports of food, clothing and other water-intensive goods that were produced in damp regions half a world away. “More water ‘flows’ into the Middle East embedded in grain each year,” he noted, “than down the Nile into Egypt for agriculture.”

Crunching numbers, Arjen Hoekstra discovered how to “link the water footprint of production to the water footprint of consumption” worldwide, “to

map out the dependencies and to identify when and where risks may lie, in terms of scarcity and pollution.”

Trade policy can improve food security through efficiency. Hoekstra found that, globally, virtual water trade saves participating nations 370 billion cubic metres. Yet there is a dark side: it may also undermine progress on the ground. How? Global virtual flows relieve external pressure for local governance reforms. So Mexico saves 12 billion cubic metres of its precious water by importing maize, but loses far more than that subsidizing waste, leaks or misallocation.

Much as well-intentioned friends prop up substance abusers, observed Allan, virtual trade “enables politicians to treat water as a low policy priority, delay innovation, and thereby please those who perceive that they are prospering under the old order.”

If local water crises grow dissolute or dissipated, global trade only fuels their addiction.

A second threat to localism is geography. In the late 19th Century, diplomats midwived new

much of which currents for what purposes. His good news: even hostile neighbours – India v. Pakistan, or Jordan v. Israel – peacefully resolved conflicts over shared waters.

The messier news: those conflicts tend to originate locally – disputes between rival neighbours, farmers, irrigation districts, businesses, or villages – and escalate upward into a complex spider web of treaties. A rise in local population, pollution, and prosperity may stress geopolitical tensions.

Complicating life for hydro-diplomats is how affluent governments of dry, crowded countries are rushing to secure fertile and well-watered land of others, in what some call neo-colonialism, or land-and-water grabs.

The most troubling water quests occur within single basins. Each bucket diverted, pumped, fouled or withdrawn upstream amplifies stress among downstream rivals. Regions seeking to use or store headwaters – in Nepal, Tibet, China, Switzerland, Ethiopia, Uganda, Bolivia, Ecuador, Alberta, Lesotho – face

vapour. Rising heat drives local evaporation down here, which boosts global accumulation up there in the atmosphere, which magnifies the greenhouse effect, in a vicious feedback loop that takes on a life of its own.

Five years ago, Mark Smith, head of IUCN’s water programme, observed: “When we talk about climate mitigation, it’s all about energy and carbon; but when we talk about climate adaption,” i.e. heat waves, melting snowpack, protracted droughts, increased wildfires, lowered reservoirs, rising sea levels, sinking aquifers, flash floods, desiccating soils, “we really mean water.”

Yet the water-energy nexus complicates both sides. Every local allocation – for mining, farming, energy, manufacturing, transportation, or ecosystem services – has a water and carbon consequence. Even “clean” hydropower can prove dirty, said Philip Fearnside as tropical “reservoirs become virtual methane factories, with the rise and fall of the water level alternately flooding and submerging large areas of land around the shore.” Local water for hydraulic ‘fracking’ may yield gas with a lower carbon footprint, but still leak methane at levels that destabilize the atmosphere.

Subsidizing local water for biofuels impacts global hunger by removing grain from distant markets. “A thousand litres could grow enough calories to feed one person per day,” said Nestle’s chair, Peter Brabek-Letmathe, “or fuel the drive to your local bakery to buy croissants.”

What to do? Happily, saving one nexus resource saves others. As billions of municipal, residential, agricultural and industrial users reduce demand for water; they avoid the energy and greenhouse gases burned to lift, •••

### Upstream, downstream: who owns a transboundary river?

From Himalayan ridge to offshore coral reefs, sixty million lives depend on the 4,500-km long Mekong River alone for survival, and three hundred million depend on the food and energy its basin generates each year. Who decides how much of the flow goes for which reasons, and why?



## “Affluent governments of dry, crowded countries are rushing to secure fertile and well-watered land of others”

nations bordered by rivers. From the Rhine to the Rio Grande, the Kunene to the Kaladan, a river was simply a natural moat to deter hunger for land.

Today’s potential invaders thirst for water, ushering in diplomacy’s hydraulic age. Mercifully, an exhaustive study by Aaron Wolf at the University of Oregon mapped the extraordinary growth of accords and treaties that define exactly who controls or has access to how

riparian pressure not to.

One need not believe in ‘water wars’ to wonder how – in 263 transboundary rivers, aquifers, and lakes covering half the world, growing its food, sustaining 40 per cent of humanity – “all water problems are local.”

And now, beyond trade and diplomacy, stir climate into our already volatile “local water” cocktail.

Climatologists say the most potent “forcing” gas is water



••• move, clean, heat, and treat it. If we embrace smart political reforms, local water adaptations could increase global climate mitigation.

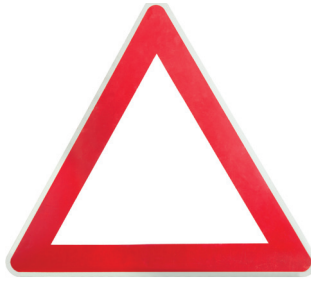
And if we don't?

When the Arab Spring seemed to erupt out of nowhere, analysts pored over recent events – like forensic pathologists after a crime – to piece together motives.

It would be naïve and dangerous to single out a single cause, like drought, or water. Most blame rigid regimes for oppressive conditions. Then there is the demographic bulge in restless, hungry, unemployed young men and women. Some credit Twitter and social media. Others say religious leaders played key roles. But one compelling graphic aligns the global food index with local outbreaks.

Correlation is not causation, and global scarcity is far from deterministic. “The food price-spikes certainly contributed to what happened on the streets in 2011,” cautions Tony Allan, but “they merely helped – along with other frictions – to expose the dissatisfaction of the Arab street with the authoritarian mode of government.”

Debate is healthy, with millions of hungry and thirsty lives at stake. Yet it is also fair to conclude that geopolitical stresses – virtual water trade, transnational scarcity, climate forcing – bind global dryness to local instability in ways that export terror and spill refugees across borders. “The Arab awakening was driven not only by political and economic stresses, but, less visibly, by environmental, population and climate stresses as well,” concluded foreign affairs writer Thomas Friedman. “If we focus only on the former and not the latter, we will never be able to help stabilize these societies.”



### Global warning

Water is the medium through which climate change manifests itself: drought, flood, reduced runoff, higher evaporation rates, lower subsistence crop output. Violence has many underlying drivers, from tribal hatred to resource scarcity. But national security analysts and military intelligence researchers are tracking climate models to anticipate in advance where geopolitical hot spots may emerge and how tensions will escalate due to the spread of aridity. Boko Haram offers one possible indicator or consequence of thirst-driven geopolitical instability; the genocide in Darfur offers another; ISIS a third.

At root, the latter focus animates “global” efforts: to democratize water into a secure, equitable, safe, and durable force for all.

It is far too easy, ensconced in a secure city like New York, to shrug “every water problem is local.”

But local decisions have a way of reaching out to us through ripple effects...and vice versa. European farmers, Chinese manufacturers, or U.S. motorists have a real bearing – good or bad, slight or substantial – on vendors like Ahmed, fishermen of the Mekong, women of the Sahel. Our choices limit their options; opportunity for us shifts

the burden of thirst upon them, elevating risks for us all.

Some claim isolated water innovations or reforms can scale far, fair, fast, and frequently. That is open to debate. The conveyance of ideas or technology to where they are most in need rarely occurs on its own, in a vacuum. Trade hits barriers. Power concentrates in urban zones. Virtual water flows toward capital. Climate change falls heaviest on the poor.

Water decisions involve painful human trade-offs. It means setting priorities about equity, value, gender, poverty, hunger, disease, energy, efficiency, and rights. These issues transcend local dynamics of people, place, demographics or time, to become universal.

They are, at root, what make us human.

Only in our humanity can we ask about the fate of Ahmed, or that fisherman, or those women striding across the Sahel, and rediscover, like John Donne, that no thirsty person “is an island, entire of itself; each is a piece of the continent, a part of the main”; any local waste, loss, or abuse of fresh water anywhere diminishes us all globally, for we, too, are “involved in mankind.”

So when sipping your coffee and reading news of a thirst-driven conflict in a foreign land, ask not for whom their well dries. It dries for thee. ●

**James Workman**, an authority on natural resource conservation markets, is author of the award-winning *Heart of Dryness: How the last Bushmen can help us endure the coming age of permanent drought*, and founder of AquaJust, an online utility-based platform that lets families and firms trade the water they save. Workman lives and works in San Francisco.

# SLOWING DOWN, CLEANING UP CHINA SEEKS A NEW NORMAL

TEXT | JOSH WEINBERG AND FRANK ZHANG PHOTO | ISTOCK AND FRANK ZHANG

**CHINA FACES A MIGHTY CHALLENGE AS IT TRANSITIONS TO ITS “NEW NORMAL” ECONOMY: CLEANING UP ITS WATERS. WITH A NEW ACTION PLAN, THE GOVERNMENT IS PUTTING FORTH AMBITIOUS REFORMS AND BILLIONS OF DOLLARS TO MAKE BETTER WATER A TOP PRIORITY.**



China’s water challenges are well documented but not overstated. With one-fifth of the global population, it holds only seven per cent of available water resources. The current projection from the government is for the economy to grow by five per cent every year over the next 15 years, while only using five per cent more water than it does today in total. Yet, the availability of water may not even be the greatest challenge. Restoring and cleaning water so that it is fit for use is priority number one. Almost 10 per cent of the surface water is worse than “grade 5” – defined by the government as water that has “lost all of its functions”.

Even amid strong government rhetoric to declare “war on pollution” and promote an “ecological civilization,” as well as the promulgation of a number of national policies and substantial investment in environmental technology and remediation, public pressure to improve environmental protection has grown on all fronts. Early in 2015, the documentary *Under*

*the Dome* reported on the cause and scope of the current crisis in air pollution. It was watched by 150 million people in the first three days after its release. It was one of the most recent catalysts sparking enormous public demand on the government for swifter action, and led to an unprecedented level of concern for the environment. China is pursuing a “new normal” that entails less rapid but more sustainable growth; a restructuring of the economy focused on green and circular production.

In April 2015, the State Council of China released the “Action Plan for Water Pollution Prevention and Control,” which will strengthen regulatory measures to improve its water environment with specific targets set over the next 15 years. Coined the ‘Water Ten’, the plan sets out ten general measures, which are broken down to 38 sub-measures with deadlines for responsible government departments identified for each action. Broadly, it outlines over 240 actions under these measures that aim to control pollution discharge, stimulate economic and industrial transformation, promote environmental research, development and technology; strengthen management, regulation and legal enforcement; and improve inter-governmental coordination and accountability.

There are several reasons for optimism that the ‘Water Ten’ will make real change. It puts the focus on the most urgent issues with direct impacts on people’s daily livelihood, such as drinking water safety and black and odorous water in urban areas, and improving coordination and compliance between ministries as well as national, provincial and

local authorities.

In addition, the development of the ‘Water Ten’ has involved coordinated inputs and consultation with a dozen different ministries,

*“Almost 10 per cent of China’s surface water is dangerous for human use”*

and each action outlines specifically which government bodies will be lead and co-responsible for implementation. More importantly, for each action, plans to meet specific targets will be developed at the provincial and local levels throughout the country. All provincial and municipal governments will be forced to sign an official document that clarifies the goals and deadlines for their local action plan and their results will be published and used for their performance evaluation. Reforms set out to ●●●





### The 'Water 10': Goals and Targets at a glance

By 2020, water environment quality will be periodically improved and by 2030 water eco-system functions will be preliminarily recovered. By mid-century, overall ecological environment quality will be improved. Key interim targets include:

BY 2020

- 70% of water in the seven key basins reach grade three or better.
- 70% of coastal water reach grade two or better
- 'Black Smelly Water' in urban areas does not exceed 10%
- Over 93% of all the centralized drinking water resources reaches grade three or better

BY 2030

- 75% of water in the seven key basins reach grade three or better.
- 'Black Smelly Water' in urban areas is eliminated.
- Over 95% of all the centralized drinking water resources reaches grade three or better
- Overall quality of water ecological environment improved

●●● make local governments more powerful and accountable. Environmental protection bureaus will be empowered to implement a "yellow and red cards" system, to restrict or stop production and put repeat offenders out of services. Environmental data will also be made available to the public, and reports will highlight the best and worst performing cities and the worst polluting industries. In terms of investment, more than four trillion RMB (650 billion USD) will be needed from different sources in order to stimulate progress towards achieving the targets. Such substantial investments, in combination with growing efforts to reduce barriers for private and foreign investments, will boost the environmental technology sector, a new engine and pillar industry in the Chinese economy. This process bodes well for improving the integrated and effective management of resources – there is much more stick, more carrot and more clarity on how to avoid the former and receive the latter.

There is criticism of the plan as well. With aims to establish realistic and achievable targets, it is valid to wonder whether the plan goes far and fast enough. Good ecological status remains decades away for much of the countries most utilized water sources, and some targets are either on par or only slight improvements on the situation today. However, the plan does well to aim at the lowest-

hanging fruit first and requires credible plans for implementation and oversight at all levels. It keys in on priority problems and sets to establish a more effective regulatory environment to ensure policies are implemented and results can be better monitored.

As the economy develops and ecological constraints grow tighter, China must accelerate the transition to a more knowledge-based, service-oriented economy and modernize industrial and agricultural production with a minimal environmental footprint. A "new normal" focused on improved environmental regulation, and stable but slowed economic growth is a wise path amid the real ecological constraints China faces. The 'Water 10' is an important step on this road.

This experience will have a great impact, not only for the more than 1.3 billion people who live with and depend on China's watersheds. Water treatment technology providers can also expect a robust market for their products and services. For those invested in companies with production in China, the new normal will mean they need to get cleaner and greener, or get going. Those invested in agricultural and industrial production will need to take action in one direction or the other, and expect ramifications in the global markets. ●

# BLIND SPOTS DELAY SUB-SAHARAN STRUGGLE FOR WATER SECURITY

TEXT | MALIN FALKENMARK PHOTO | ISTOCK

**IN SEMI-ARID AFRICA, ELIMINATION OF POVERTY AND HUNGER IS LARGELY A QUESTION OF WISELY NAVIGATING IN A DRY LANDSCAPE. THE GOLDEN RULE OF THE AFRICAN GREEN REVOLUTION WILL BE TO CATCH THE RAINWATER BEFORE IT EVAPORATES, WRITES MALIN FALKENMARK IN THIS OPINION.**



**Water-blinding effect of Desertification convention** | Since the start of UNESCO's Arid Zone programme in 1951, much interest has been paid to water in arid lands. The droughts of the 1970's and 80's, with its severe African famines, lead up to the UN Desertification Convention in 1994. More recently, development of a Dryland Development paradigm has started, linking ecosystem management with human livelihoods. In the water sector, an odd side-effect of the attention to drought and drought-risk has been that more attention has in fact been paid to the ABSENCE of water in terms of drought-related damages, rather than to the PRESENCE of water in drought-ridden regions and the benefits that it could produce to support socio-economic development.

Still today, poverty, hunger and continuing population growth characterize a large group of low-income countries, particularly in sub-Saharan Africa. These are countries characterized by what Grey & Sadoff in their classical paper "Sink or swim?" (2007) identified as "hostages" of a difficult hydrology, noting that intermediate economies have tended to remain "hampered" by hydrological complexity but developed economies have been able to "harness" their hydrological particularities.

**What makes Africa different?** | The difficult water situation in the low-income sub-Saharan countries is characterized by a mainly semi-arid climate, very high evaporative demand, limited runoff and a large rain variability – within years as well as between years, increasing with climate change. In this region, the hot climate makes most of the rain evaporate. A great number of these countries have not succeeded

in navigating between water in its two opposite functions: water as a source of production, and water as a source of destruction. They have not been able to de-link their economies from the shortage and large variability of available water.

Today, the fine-grained geographical analysis by Vörösmarty et al (2005) has contributed to a large-scale quantitative overview of the water predicament of Africa. 82 per cent of the land is arid, hosting 75 per cent of the Africans. River water, originating from rain over sparse water towers, passes through these landscapes in a network of long river corridors, where the upstream parts of the rivers tend to be ephemeral, carrying water only during the rainy season. Locally, dry areas can have access to abundant water generated upstream, but 40 per cent of the population live where runoff is less than 100 mm/yr. and 60 per cent where it is less than 300 mm. The vast majority of Africans rely on locally generated runoff in small streams or on local groundwater. Overall, 30 per cent of people in Africa are exposed to both limited runoff and high inter-annual rain variability, i.e. drought risk. In view of the widespread scarcity of reliable river water, most agriculture is rainfed – only six per cent is irrigated. The situation is made even more precarious by the combination of extreme population growth, and vulnerability to droughts. Already in some 35 years, the dryland population may have grown to one billion.

**Towards larger global water wisdom** | A better understanding of the essential characteristics of the African water resources predicament, that make water security challenges different from more developed regions of the world will be important as international cooperation and endeavours now increase with the ambition to eliminate poverty and hunger and develop Sustainable Development Goals. Influential international expertise will have to get out of the past water blindness (Nature 19 March 2015). ●●●



●●● **Make use of the rainwater before it evaporates** | The experience of the more developed countries with catchment-based hydrology has not been applicable enough in the sub-Saharan situation because of fundamental differences in their hydro-climate. An arid climate dominates large parts of the continent, and the hot climate makes most of the rain evaporate. The part of the rain that falls over humid mountain areas (“water towers”), forms runoff, which gathers in long river corridors carrying the water to distant areas downstream. The rain falling over flatter savannah lands tends to evaporate. Making use of that water is a question of catching the rain before it evaporates, which can be made in two main ways: harvesting the rain in small dams for local use, or harvesting it in the soil through conservation agriculture.

This will have to be the key to social-economic development in large parts of sub-Saharan Africa. It will constitute a fundamental difference compared to Asia where agricultural development has been a question of irrigation, based on river flow originating from the Himalayas and other mountain ridges and groundwater from rich underground resources. Away from the river corridors, Africa’s agricultural revolution will have to be based on rain-fed agriculture, upgraded by rainwater harvesting in local tanks and supplementary irrigation.

In a recent assessment, IFPRI (2010) has estimated the water storage potential as a base for increased agricultural development: on the one hand irrigated agriculture from river corridor dams by an add-on function to hydropower, on the other hand away from the river corridors as local rainwater harvesting for supplementary irrigation in smallholder farming. ●

**Malin Falkenmark**, is a Senior Scientific Advisor at SIWI. She has contributed to the 2015 World Water Week report “Water for Development – Charting a Water Wise Path”.

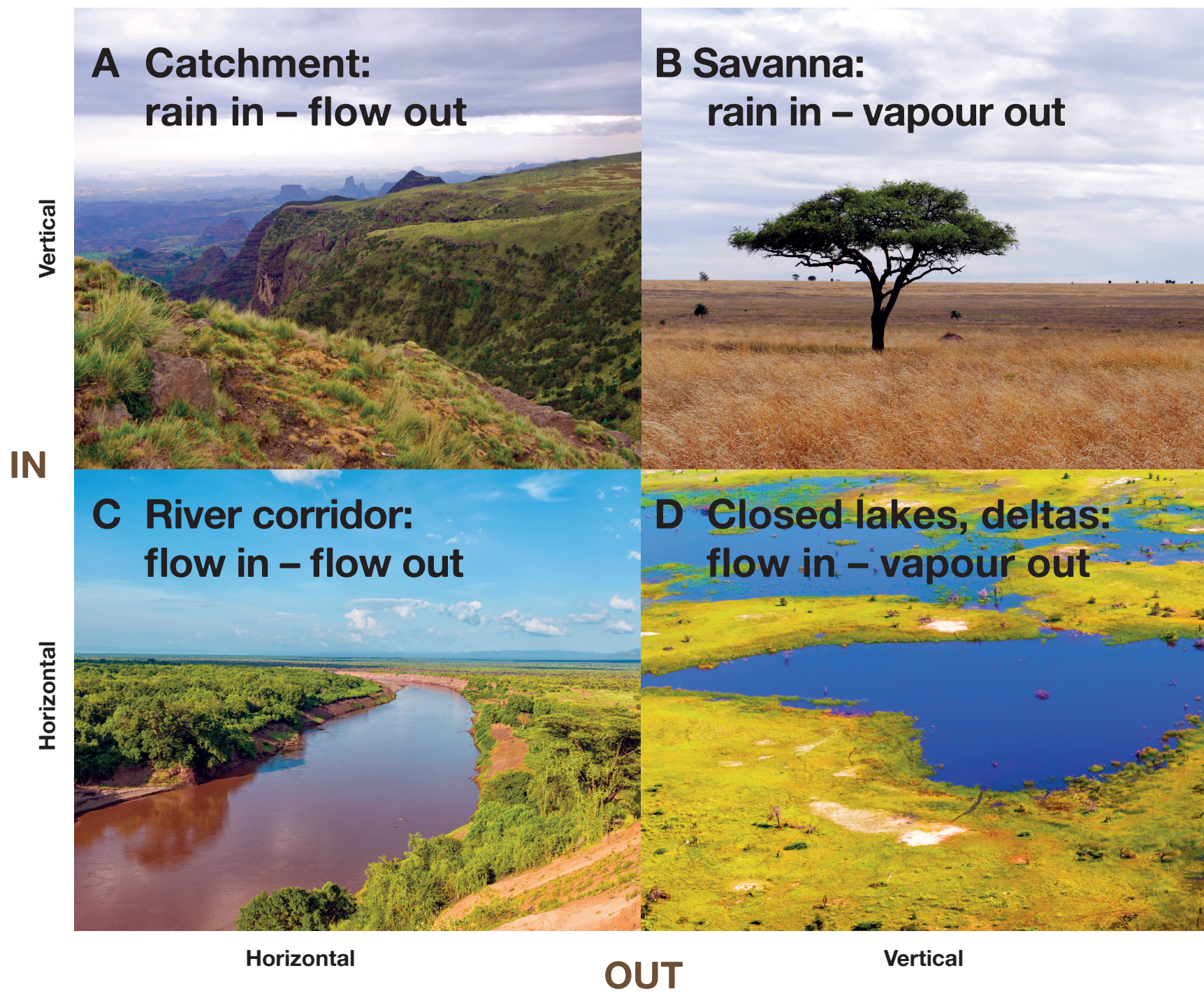


Figure 1 illustrates four contrasting situations in terms of water inputs to and water outputs from a particular area in a landscape. Water may reach the area as rain or as inflow, and it may leave the area as vertical vapor flow or as horizontal outflow. This means that activities aimed at achieving water security will be very different. They will differ between situations when these flows are vertical, involving rainwater input and vapour output, as opposed to situations when they are horizontal, involving river inflow and river outflow.

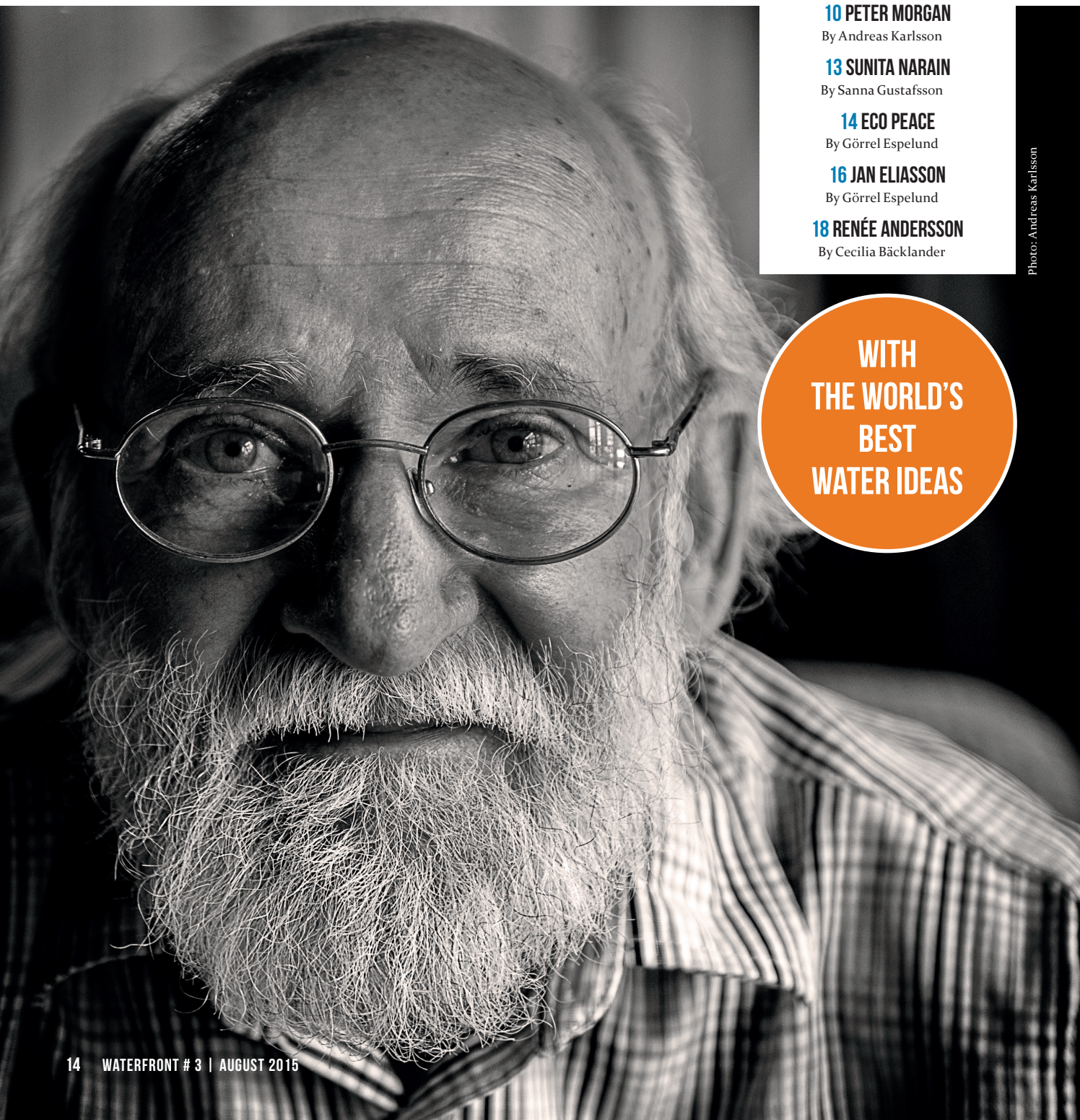
The vertical outflow dominance (case B) is typical for hot arid regions such as the vast savannah lands in sub-Saharan Africa, while the horizontal outflow situations (case A) characterize most of the developed regions of the world, Australia being an important exception. Up till now, most water security discussions have had their focus on the upper left, i.e. catchment situations (A). The challenges meeting the sub-Saharan savannah lands, expecting a population of one billion already in 35 years from now, are represented by the upper-right-hand situation (B). The lower-left-hand situation (C) is representative for the special case of the river corridors like the Nile and the Niger, and the lower right (D) to the situation of closed lakes and deltas, like the Aral Sea in Asia and the Okavango delta in Africa.

Figure 1. Four contrasting water balance situations in landscapes, characterized by different combinations of horizontal as opposed to vertical water inflows and outflows. (Based on Weiskel et al 2014)



# WATER HEROES

IN THE FOLLOWING PAGES, YOU WILL MEET PEOPLE FROM ALL PARTS OF THE WORLD, WITH VERY DIFFERENT BACKGROUNDS AND PROFESSIONS. THE ONE THING THAT UNITES THEM IS THEIR PASSION AND THEIR DEDICATION TO BUILDING A BETTER, WATER-WISE WORLD, IN ANY WAY THEY CAN. THEY HAVE INSPIRED US, AND MANY OTHERS. MEET OUR WATER HEROES!



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Photo: Thomas Henriksson

# MALIN FALKENMARK: THE TRAILBLAZER

**NO ONE BELIEVES IN A WOMAN ALONE, PROCLAIMS MALIN FALKENMARK WHEN WE HAVE TALKED FOR AN HOUR. BUT SHE IS WRONG.**

She has been listened to more than most people, men and women. At almost 90 years of age, Professor Falkenmark is still active. There is so much to do.

Malin Falkenmark resembles more an activist than an introvert scientist. She is a stately 184 centimetres tall, upright and razor sharp. During most of her life, she has been the only woman in a male-dominated scientific community. But she has not felt discriminated against, or she has refused to see prejudice against her if it existed. The only

rainwater through what is called water harvesting, must increase in Africa to secure agricultural production and food supply. The opposite would be a historic mistake.

Malin Falkenmark realized early on that it is important to develop concepts and create images to make science understandable. She coined the term green water. It was a brilliant term, an educational stroke of genius, which made it easier to understand the role various forms of water have in the Earth's supply. The green water is what is in the



Photos: Mikael Ullén



time she was openly questioned because of her gender was when the janitor at the Swedish Meteorological and Hydrological Institute (SMHI), where she had her first job dedicated to what would become her life's mission, did not want to give her the keys to the office because she was a woman.

Malin Falkenmark's battle cry is that we should focus on the available water. It makes no sense to focus only on the problems of the water scarcity that affects many parts of the world.

We meet in Malin's beautiful apartment at Karlaplan in Stockholm. It is filled with papers and books, revealing a constant activity. A few weeks earlier, she wrote an article in the journal Nature together with Johan Rockström. They propagate that the use of

root zone below the surface, water that the rain brought and which makes our food grow. But it is often invisible. The blue water we can see easily, it flows in rivers and is collected in ponds or available as groundwater deep below us. The more we can utilize the green water, the less we need to squander the blue.

Water is perhaps the only moving natural resource, says Malin Falkenmark. The ore lies still, but water moves. It is important to understand how water availability varies over time and what the trends are. In the past, water was an engineering issue. What mattered was to convey it and to take it out of the ground. Now we understand to treat it as a natural resource. If you cut down the trees in Brazil's rainforests it rains less in Argentina because evaporation is

reduced and thus the wind-borne water vapour that generates rain. Water does not care about national boundaries. Therefore, there must be agreement on how water should be used. One promising example is the partnership of the Nile. Battle for the Nile's water is disturbing and acute, yet classic. Entire civilizations were created around the Nile delta. Now the countries upstream in Africa also want to take advantage of the water for its energy supply. Under the leadership of the World Bank, they work together to regulate the use – a necessity to avoid devastating conflicts.

Right now, Malin Falkenmark focuses on Africa. The water is Africa's Achilles heel, she says. In Asia, there was the green revolution through irrigation. It will not work in Africa; there is not enough water. The solution is to collect rainwater and store it, to be used over time. Greenhouses, which reduce evaporation, must be built on a large scale. The limited blue water available in rivers and ponds will be spent on energy production, the household need for water and sanitation and on the growing cities. Meanwhile, food production has to increase to match the population growth. Radical solutions are required. The Chinese have ancient traditions of collecting water and in China, the efforts to bridge dry periods are now massive. Millions and millions of people engage in collecting water. In Africa, there is not the same tradition, but new technologies are being introduced to use the green water as productively as possible – by collecting the rainwater, improving infiltration into the ground, terracing and the creation of reservoirs.

However, it is a race against time. In Malin Falkenmark's view, population growth, – especially in Africa – is a bigger problem than climate change. But the two trends work together and the process is accelerating. The popula- ●●●



...tion of sub-Saharan Africa is projected to double by 2050. In arid zones more water is evaporating than what falls from the sky as rain, with global warming aggravating the situation. Those who previously denied climate change are silent now. Why? What drove them, I wonder. It was probably the result of several dry years and flood disasters that affected economic inter-

ests and made them admit there were problems, Malin Falkenmark says. Malin Falkenmark is not only the mother of the green water (and three children) but have also had an index named after her – the Falkenmark index. It involves measuring “water crowding”, how many people use a particular source of water, a kind of water stress measurement. Now she is a

dogged advocate for the world to better understand how the Earth’s water resources should be protected and utilized to eradicate hunger and poverty and promote development. The alternatives if we do not use water wisely are dismayingly. That is what spurs Malin Falkenmark.

The pace is too slow, she says. ●



Photo: iStock

# MATT DAMON: THE STAR

**USING HIS CELEBRITY AND SENSE OF HUMOUR, MATT DAMON WANTS TO PUT THE LIMELIGHT ON WATER ISSUES.**

His commitment goes much further than simply lending his name to a good cause. Six years ago, together with water expert Garry White, he founded Water.org.

It has become increasingly common for actors and sport stars to use their fame to highlight an issue, become goodwill ambassadors, or take part in a charity. But few have gone to as much depth as American actor Matt Damon has with water issues.

Matt Damon has been travelling around the globe for many years to get first-hand insight into the effects that polluted and untreated water have on people’s lives. He has learnt about microfinance strategies, studied reports from the field, and consistently emphasizes the importance of visiting the people he wants to help.

“If you want to understand how this works, there is no substitute for going there and talking to people in their homes,” he said in an interview with Fast Company.

This is an approach he learnt from his mother, a professor of early childhood education, who – accompanied by her teenage son – went to countries such as Mexico, Guatemala and El Salvador for her studies in non-violent conflict resolution.

So development issues were nothing new to Matt Damon when he travelled to Zambia in 2006 with U2-singer Bono’s ONE campaign. The aim of the trip was to study issues of extreme poverty, including HIV/Aids, microfinance, education – and water. In many interviews after the journey, Matt Damon told the story of how a 14-year-old girl in rural Zambia taught him the real importance of clean and accessible water.

Upon his return he wanted to do something so, together with colleagues in the film industry, he founded an organization named H2O Africa. The reasons he chose to work on water and sanitation was both the enormity of the problem and the availability of

solutions. “It made me feel there was a real chance to bring attention to it and to actually have a big impact,” he explained.

H2O Africa was a charity organization, but after a few years Matt Damon realized that there would never be enough charity to solve the problem. So he went into partnership with water expert Gary White, co-founder of Water Partners, and the two organizations, H2O Africa and Water Partners, merged into a new non-profit organization: Water.org.

One of Water.org’s most successful programmes is Water Credits, a microfinance tool that gives individual families the chance to install a toilet and get their homes connected to the piped water system.

The idea took off in India where water infrastructure already exists in many of the slum areas, but families cannot afford to connect to it. Instead, they have to fetch water from communal taps.

The idea behind Water Credits is that if a family gets a microloan for a water connection, often for less than USD 100, they will not have to queue



Photo: iStock

for water any longer. The loan can be paid off in full in a reasonably short time as running water in their homes means that the women (the majority of the beneficiaries are women) can spend more time on income-generating activities.

The programme has proven a success, and many microfinance institutions have moved into the new market of financing clean water. As of January 2015, some 500 000 Water Credit loans had been made and 2.1 million people had directly benefited from the scheme.

**“When enough people start to take action, things are going to move really fast”**

Matt Damon is convinced that this is the kind of initiative that will help solve the world’s water crisis. He believes that no matter how many wells are being drilled by charity organi-

zations, there will never be enough. Another problem with drilling wells is maintaining them afterwards. However, Water.org has not given up on drilling wells, but they focus on forging partnership with local organizations that understand local conditions. Another important step towards making the well sustainable is forming local water committees that are trained in maintenance and finance management. Village-wide education on good hygiene practices is also undertaken before installing a new well in a village. And finally, to prevent people

from overusing the resources, a frequent cause of pump failures, villagers have to pay a usage fee. After completion, Water.org visits the well site over a five-year period to monitor its use, pro-

duction and condition, and the impact of safe water on the community. The vision of Water.org is clean water and sanitation for everyone in our lifetime. Matt Damon thinks it is possible:

“People are starting to become aware of the water crisis and more people are getting engaged. And when enough people start to take action, things are going to move really fast.” ●



Photo: iStock



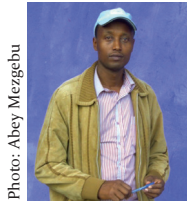


Photo: Abey Mezgebu

# ZERIHUN NEGUSE: THE EVERYDAY HERO

**IN AFRICA, MEN DO NOT CARRY WATER. WHY IS IT SO? THE ANSWER IS ALWAYS: IT IS OUR TRADITION. A BRAVE VILLAGE CHAIRMAN IN ETHIOPIA'S WESTERN OROMIA REGION HAS CHALLENGED THIS TRADITION.**

Think of all the pictures you have seen of water carrying. They always portray women. You may occasionally catch a glimpse of a little boy. Otherwise, only women – from thin little girls to mothers with small children and pregnant bellies to ladies bent with age, all carrying yellow plastic cans, red-brown clay pots or grey tin buckets on the head, the back or the hip.

You will see a daily exodus from the house to the well and back again.

*“If husband and wife share the burdens, their love will be strengthened”*

More boreholes, water pipes, lorries, and concentration of housing around water sources – all this would liberate a lot of female power. But those are long-term solutions. Meanwhile, the children in rural areas will continue to drink water lugged in the original way.

But in the Ethiopian village Dembeli with 1200 families the men now help to carry water. It all began when a team of nutrition experts worried that the hard-working women did not receive adequate nutrition for themselves and the children they gave birth to. The team asked the women what was their most onerous task.

Almost all the women gave the same answer – the worst is bringing the

water every day. There are two covered wells outside the village, at about four kilometres distance for most households. The toil can take three hours a day. There is no money to drill new wells. No one owns a car in the village where all are farmers. And the donkeys have other tasks.

The team challenged the men in the village: did they want to help the women and at the same time be re-

nowned throughout Ethiopia, perhaps the whole of Africa? Would they consider relieving the women of some of the water carrying? The reaction was very hesitant. Men have their own

duties. There is an immense respect for what is perceived as cultural traditions and the women had always fetched the water as part of the household chores.

But finally the village chairman, 35-year-old Zerihun Neguse stepped forward. He is a farmer, like all the villagers, and elected to the post. Zerihun is youngish but with authority, he went to school a little longer than most of his neighbours. He gathered 200 men and told them that they would begin to participate in water carrying the next day.

Ethiopia is thoroughly organized. There is a national, a regional, and a local structure where everyone is included. The structure is used to organize

community work, to keep track of land rights, to assist vulnerable families but also to control and mobilize the population. The decisions of a village chairperson are important. But he or she also takes a risk. It is difficult to go against tradition without a decree from above.

Zerihun's own family is quite ordinary – he is married and has four children between one and ten years of age. Two are girls. Zerihun calculates that his household needs up to 60 litres of water per day for drinking, cooking and washing. That means 60 kg carried on his wife's back. The girls start to fetch water when they are around ten years old, so his daughters are too young. The family has just over two hectares of land, which is more than the average Ethiopian farmer has. Like everyone else in the village, they cultivate the traditional Ethiopian crop teff, wheat, sorghum and vegetables like potatoes and pumpkin. The fields are ploughed with oxen and there are no agricultural machines. Everyone works hard. Small boys are sent out to guard the cattle while the girls bring water.

Zerihun wants his daughters to go to school and have the same opportunities as men. Previously the families wanted the girls to stay at home to help in the household. Nowadays Ethiopia has compulsory and free education and eventually the parents have begun to think that girls' education is as important as boys'. But water fetching and other household chores make them miss school sometimes.

When Zerihun explains why it is good that the men are involved in fetching the water, he emphasizes the cohesion of the family: “If husband

and wife share the burdens, the love will be strengthened, the family becomes healthier and better off, and this will spread to the community around them.” He also believes that most men were not aware how very heavy the water carrying is for the women.

It is difficult to change ingrained habits, especially if it requires hours of new efforts. Now the men's participation in carrying the water has been going on for almost a year. It is courageous and unique. ●



In the Ethiopian village of Dembeli, the inhabitants have defied tradition. The men have decided to help the women carry water.



Photo: Jason Cooper, Mashable

# ALISON BICK: THE PROBLEM SOLVER

**ALISON BICK IS NO ORDINARY 21-YEAR-OLD. HOW MANY OF HER CONTEMPORARIES HAVE BEEN GRANTED A PATENT? OFFERED TO JOIN A PROJECT WITH THE WORLD BANK? EMBARKED ON THEIR PHD STUDIES? AND IN THE UNLIKELY EVENT THAT ALISON WOULD HAVE TIME TO SPARE, SHE REBUILDS VINTAGE MOTORCYCLES.**

It all started with a storm. A massive storm that hit Alison's hometown Short Hills, New Jersey in 2007. There were talks on the radio that the storm had potentially contaminated the piped water to the households. It got Alison thinking about how to develop a quick and easy way to test that the water at home was safe to use.

“I have always been curious about science. Ever since I learned how to read, I flicked through the New York Times to find the science section. But it was not until something personal happened that my passion awakened for

real. That was the moment I realized I could make a difference myself.”

When the storm hit, Alison was about to start her first year of high school, contemplating which topic to choose for a science research class she was due to take the following year. The complexity of the contaminated water fascinated her, so Alison started her research right away.

“I thought that if I start investigating this immediately, the project will become so much better when the class actually starts.”

Said and done, Alison ploughed

through all research on testing water quality she could find. In one article, she learnt that by exposing water to certain types of light, particles normally imperceptible to the human eye could be revealed. The discovery boggled Alison's mind.

“My brain was working at full speed, trying to figure out how to simplify this technique so that it could be more accessible.”

And the class, which originally only lasted for two years, turned into four intensive lab years. She started out by photographing water and analysing it on a computer. She tested, tested again, tested a third time and eventually reached a result.

“I realized that I had to think mobile to develop a device that could reach people in the field. So I asked myself, ●●●



••• ‘why not use a phone instead of a camera and a computer?’ During the process, the invention more or less transformed from a shoe box to a complete application for smart phones.”

The long and intense days Alison spent in the lab and in the field demonstrate a devotion to problem solving. “I love seeing an idea develop from an embryo to a concrete product. So it is probably the process in itself that fascinates me the most.”

Alison says that her passion for the scientific process was awakened through female role models, and particularly a certain Marie Curie – chemist, physicist, two-fold winner of the Nobel Prize and the first female Nobel Prize recipient.

It does not seem to be a coincidence that Marie Curie once said that “a scientist in his laboratory is not a mere technician: he is also a child confronting natural phenomena that impress him as though they were fairy tales.”

The dedication to problem solving manifests itself in other parts of Alison’s life, too. When she is not busy studying, working in the lab, or mentoring younger students at the university, she rebuilds vintage motorcycles.

“In a sense, it is something completely different, a sanctuary I escape to when I want to get a break from my research. But on the other hand, the logic is the same. You identify a problem – maybe the clutch is broken – and you disassemble the whole motorcycle to find the solution. It is so rewarding!”

The lab years opened doors Alison could never have imagined. In 2011, she won the Stockholm Junior Water Prize and her invention got a global upswing.

“The competition was rewarding in so many ways. Not only was I given the opportunity to discuss water issues with likeminded students from every corner of the globe, but the attention the contest gave the app also generated great interest among scientists, companies and organizations.”

One of the organizations that approached Alison about her invention was the World Bank. Together with them, Alison has applied for a grant to implement the app in one of the bank’s projects in Nigeria – a country situated on a continent where more people have access to mobile phones than to clean water. Close to 358 million people in Africa are still lacking access to clean and safe drinking water.

“Introducing the app in Nigeria would be exciting. Hopefully it could contribute to helping the citizens, but it would also mean a lot for the development of the app itself.”

Alison’s career has rushed by and she does not plan to slow down. Fresh out of her Bachelor of Science’s degree in Chemical Engineering, she has just embarked on PhD studies at the Stanford University in California – a university constantly at the top of global rankings.

California, the most populous state in the US, is suffering the worst drought

in living memory. The drought has caused great damage to the state’s economy; cities are rationing water, inhabitants are losing their jobs and food prices are increasing drastically.

The proximity to the drought and its severe consequences has made Alison even more convinced to continue research on her app, and she enthusiastically recounts that Stanford’s laboratories have the equipment she needs to do just that.

“I want to take this project even further. Within a couple of years, my hope is that the app is a given on all people’s mobile phones, regardless of where in the world they are. All people, in all situations, should have the possibility to determine if the water surrounding them is safe to use.” ●

## HOW THE APP WORKS

By taking a picture of water with Alison’s application on a smart phone, you can assess if the water is safe to use. Most smart phones on the market can be programmed so that their display emits the right type of light. The app then analyzes

the picture and determines the water’s organic and inorganic qualities. The method estimates the amount of bacteria in the water – quicker and up to 200 times cheaper than standard methods for this type of assessment.



Photo: Jason Cooper, Mashable



Photo: Cecilia Österberg, Exray

## MA JUN: THE ENVIRONMENTAL CHAMPION

Ma Jun, widely recognized as one of the world’s foremost environmental champions, has both written the book and drawn the map on China’s water pollution challenges. His landmark 1999 publication, “China’s Water Crisis”, like Rachel Carson’s “Silent Spring” penned decades earlier, catalyzed public and government action to confront the enormous challenges faced with the deteriorating quality of the nation’s water environment. In 2006, he founded the Institute of Public and Environmental Affairs (IPE) and developed the China Pollution Map, the country’s first public database of corporate environmental

performance. IPE’s influence only continues to grow as it develops tools to increase pressure on polluters for example the new Blue Map app, which today has more than three million downloads, enables users to access and microblog the records of emitters. Through IPE, Ma Jun has shown a tireless dedication to ensure a greener global supply chain and push companies to concentrate on procurement and the environmental performance of their suppliers. He has been recognized by both Foreign Policy and Time Magazine as one of the planet’s most influential persons, and received the Goldman environmental prize. ●

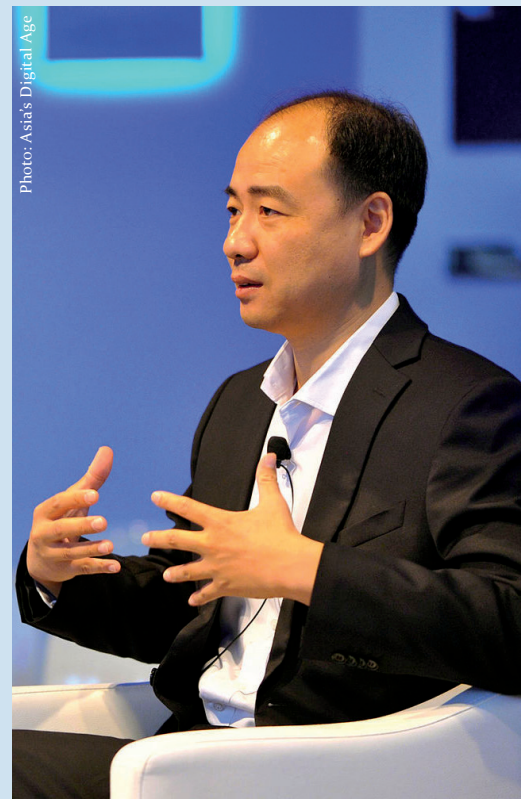


Photo: Asia’s Digital Age



# BEST WATER IDEAS

THE LIST OF INVENTIONS RELATED TO WATER IS MILES LONG. THEY ARE A PART OF OUR EVERYDAY LIFE, BUT WHILE WE ARE GRATEFUL THEY EXIST, WE DON'T TAKE MUCH NOTICE OF THEM. IN A RECENT CAMPAIGN, SIWI WAS SENT 150 WATER IDEAS FROM PEOPLE ALL OVER THE WORLD. THE TEN IDEAS PRESENTED BELOW WERE THE MOST POPULAR AMONG THE SUBMISSIONS. READ MORE ON [WWW.WORLDWATERWEEK.ORG/BESTWATERIDEAS](http://WWW.WORLDWATERWEEK.ORG/BESTWATERIDEAS) AND VOTE FOR YOUR FAVOURITE!



**UN RESOLUTION:** Close to two billion people lack access to safe drinking water, and 2.5 billion have no proper toilet to go to. In 2010, UN Resolution 64/292 stated that access to clean drinking water and sanitation is a human right. The resolution increases the pressure on world governments to provide the unserved with a tool to claim their rights.



**THE WATERLESS TOILET:** When the flushing toilet made its big breakthrough in the industrializing world in the late 1800's, it revolutionized sanitation. But today, many agree that the toilet of the future must work without water. With our strained global water resources, it is a bad idea to use a relatively large amount of water to flush away a small amount of waste.



**THE TAP:** All over the world, women and girls spend several hours every day fetching water from distant water points. With a pipe that leads water into their house, and a tap attached, significant time will be freed up for these women and children to engage in other activities. Another important benefit with a tap is that it can be closed, thereby controlling a household's water use and limiting potential water waste!



**DESALINATION:** There is plenty of water on our planet – but as much as 97 percent is salty. Using desalination, it is possible to remove the salt and make sea water drinkable. In dry coastal areas, desalination can greatly improve water security.



**RAINWATER HARVESTING:** The world's population is growing fast, and with it, the demand for freshwater resources. With a constant amount of fresh water available, we will need to become more innovative in managing it. Rainwater has long been neglected. We must get better at treating it as the resource it is, harvest it and use it wisely.



**FROM DRAIN TO DRINK:** Wastewater has increasingly come to be perceived as a resource. Using today's technique, water from our sinks and toilets can be made drinkable again. It can also be used in agriculture, for industry, and in the rehabilitation of natural ecosystems.



**GOING VEGAN:** Did you know that it requires 15,500 litres of water to produce 1 kg beef? This can be contrasted to 180 litres for 1 kg tomatoes and 250 litres for 1 kg potatoes. If more consumers changed to less water intense diets and chose for example pulses, vegetables and grains over meat, a lot of water could be saved.



**THE DAM:** The dam is a formidable tool for storing and controlling water to protect people from both droughts and floods. It can also be used for producing electricity. One dam can provide hundreds of thousands of households as well as industries with electricity, and alleviate poverty in a region or country.



**SARI AS A WATER PURIFIER:** Contaminated water kills roughly two million people around the world every year. Through studies in India, scientist Rita Colwell discovered that Saris and other pieces of cloth can be used to filtrate water. A simple, cheap and handy way to remove bacteria from water!



**THE WELL:** In many societies around the world, the burden of collecting water falls on women and girls. Typically, they have to walk to water sources far away from the village several times a day, usually affecting their education. Installing a well closer to the village brings many benefits, for example that girls can go to school instead of carrying water.

Photo: iStock



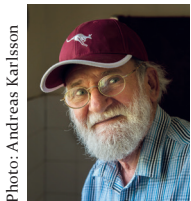


Photo: Andreas Karlsson

# PETER MORGAN: THE INVENTOR

**MANY WOULD ARGUE THAT ZIMBABWE'S DR PETER MORGAN DESERVES TO BE A CELEBRITY. YET THE MAN BEHIND SEVERAL OF AFRICA'S MOST IMPORTANT WATER INVENTIONS REMAINS UNKNOWN TO MOST. THAT, HOWEVER, IS EXACTLY THE WAY HE PREFERS IT.**

Peter Morgan's house is on a side street in one of Harare's older districts, tucked away behind pines, cypresses and jacarandas. Trained by a somewhat tired Labrador, the inventor, researcher and Stockholm Water Prize laureate, comes to open the gate. Stepping inside is like stepping into a treasury, a cross-section of a life's work, where decades of successful water and sanitation inventions for rural Africa are gathered.

The single storey stone house provides relative coolness and shelter from the African sun. Peter Morgan sits down in front of the tiny desk where he keeps his laptop. This is where he compiles his reports, but his real passion is not theoretical work. It is the hands on, practical work of developing pumps, toilets, wells and water tanks.

Peter Morgan was born in the United Kingdom, where he studied zoology and acquired a PhD in marine biology. But the academic world never appealed to him, and when his supervisor told him to go travelling, he did. He went to Africa, where he spent three years doing research at Lake Chilwa in Malawi.

"It was fascinating and I enjoyed it very much. I really didn't want to leave, but eventually I had to return to the UK, which I did, taking a somewhat unusual route."

He smiles at the understatement; Peter Morgan packed his car and set off on his own into the African continent. He travelled through East Africa, most of which was part of colonial Britain at

the time. He made a detour into Uganda after which he turned back south, finally ending up in Cape Town, where he put himself and his car on a ship bound for England.

"It was an incredible experience and a journey that fuelled my growing love for Africa. When I returned to the UK, I realised how happy I'd been and how much I missed the continent."

That is why he grabbed the first opportunity to return: an offer to come and work in what was then Rhodesia – now Zimbabwe. He put his car back on a ship to Cape Town and drove from there to Harare, then called Salisbury. He arrived in 1972 and has remained ever since.

His new position did not see him doing much work as a marine biologist, though. Instead, he worked at the Blair Research Laboratory, the research wing of the Ministry of Health, named after its founder, Dr Dyson Blair. And since Peter Morgan proved himself a skilled practitioner, he was soon asked to work on developing sanitation solutions.

"That led to my first big and probably most-known invention: the Blair Toilet, which my colleagues and I developed during 1972 and 1973. It was adopted as a national standard, and we followed up with working on pumps and a few other things that have also been widely used."

Peter Morgan walks into the garden

behind the house. In passing, he points out some of the devices he has installed to minimise the water consumption and dependence on electricity. He says he wants to be as self-sufficient as possible, since power cuts occur frequently in Harare. He indicates one of several water tanks, explaining that electrical pumps are impractical and taps do not really appeal to him.

"It's very easy to forget to close a tap properly, and then you can lose a season's worth of water in a single night. That's why I prefer the simplest possible solution," he says, picking up an unusual bucket. Called the Bailer Bucket,

*"This is the land of the loos, he says"*

it is made from a piece of pipe with a one-way valve cast in concrete at the bottom. This allows it to sink, letting water into the bucket via the valve.

He draws a few buckets of water and notes that it is probably quicker than a pump or a tap in any case. A black bag sitting in the sun nearby is heating the water that he and his wife will use in their bucket-with-a-nozzle shower.

The fact that the inventions are serving the Morgans well in their everyday life is merely a positive side-effect. The real purpose of all the installations in the garden is to try them out before they are put to use under much more demanding conditions, around Zimbabwe and the rest of the African continent.

Peter Morgan makes his way through a shrubbery at the back of the garden and into the opening behind it, where



Photo: Andreas Karlsson

about 15 toilets compete for space – some fully functional, others just dummy prototypes or work-in-progress.

"This is the land of the loos," he says. "This is where I've continued to work on different versions of simple toilet solutions. Several are in working condition and I've been using them for decades."

The so-called Blair Toilet or Blair VIP (Ventilated Improved Pit) is by now a well-tried and tested construction. Via

a chimney on the outside and thanks to the natural airflow that is created, bad smell is being ventilated away from the inside of the toilet, also removing flies and other inconveniences.

The actual toilet can be as simple as a hole in the foundation, or it can have a proper seat, and the outside can have many variations too. Peter Morgan is quick to point out, though, that regardless of how it is constructed, it is vital

to keep it away from any fresh water source. There should also always be a hand washing facility next to the toilet, since that is one of the most important factors for improving hygiene and health.

The various versions of the Blair Toilet in Peter Morgan's garden have different shapes and construction methods. Some are even portable, and one has been fitted with a urine ●●●



••• separator, making it possible to use the waste as fertiliser.

“Self-supply has always been a key issue for me. I want things to be as simple as possible and I’ve therefore based my inventions on traditional methods and practices, working to uplift and improve them.”

Not being an engineer by trade is probably an advantage, he adds, since that might have made him aim for more complicated contraptions, purely for prestigious reasons and to showcase his competence.

Having said that, the so-called Type B Bush Pump, which Morgan constructed a few years after the Blair Toilet, and which has also become a standard in rural Africa, is by no means a simple design. It is, however, based on the principle that it should be easy to maintain. Ultimately, it is an upgrade of a very basic well, which can also be operated using traditional, manual methods, preferably in combination with the

same simple pipe bucket that he has just demonstrated.

“Most people in the world don’t have piped water and so they’re in need of a well,” he remarks. “This construction consists of a pipe that’s been sunk into the ground and which the bucket fits into. It can be used manually, with a winch system, or a complete pump.”

He seizes the pump lever to demonstrate, but stops after only one stroke. Clearly, there is something he is not satisfied with.

“Something is not right here,” he says, more to himself than anyone else.

Suddenly he seems to have forgotten about our tour of the garden – or even that he has company. He moves the lever up and down a few times, listening to the pump as if it might start talking to him. Then he smiles.

“This is actually really good. I’ve been trying a few new parts to see if I can minimize the stress on the seals, since it’s sometimes difficult to find

high quality seals. Clearly something’s now broken, which means that I can find out what it is, before this pump is put to use. That is, after all, why I’m conducting all these experiments in my garden,” he says, obviously trying to hide the fact that he would not mind getting started on disassembling the pump straight away.

We return to the house. Peter Morgan makes it clear that he does not want to talk politics, but says he has never felt like leaving Zimbabwe, something many others who have had the opportunity to do have already done. He gave up his British citizenship many years ago, and today he is a Zimbabwean. The decision was not a difficult one for him, nor has he ever regretted making it.

“This is a wonderful country with wonderful people. If they can soldier on, then I can too. I’ve always felt that I have a meaningful job to do here.”

However, Morgan says he has always preferred to keep a low profile and has

never been interested in attention and fame. Quite the opposite, in fact. So it is no coincidence that none of his inventions are named after him.

He picks up a photograph showing him and his family in full gala outfits. It was taken in Stockholm in 2013, just before the ceremony where he received the Stockholm Water Prize from King Carl XVI Gustaf of Sweden.

“See how uncomfortable I look. It was a great shock and a wonderful surprise to be awarded the prize, but big stages have never appealed to me. I’d rather work in the background, conducting my experiments and training others to take them further. I’m not interested in personal attention, but I’m very happy if water and sanitation issues are being highlighted. What I can do is to provide information and hope that someone wants to spread it.”

He pauses for a moment, slowly scratching his beard.

“Journalists, organizations, and

others who spread information have a very important role to play. And I think it would be even more useful if water issues were incorporated into popular culture, like major Hollywood movies, or if international celebrities would start talking about it. That would mean a lot.”

And so he returns to his fundamental principle of keeping things simple, saying he is convinced that the solutions for the future are fundamentally simple things. It is about equipment and practices that already exist, but the knowledge has to be spread. That is also why he is constantly documenting his experiments and writing down his thoughts and ideas, filing them in what has become a huge archive that he hopes future generations will find useful.

“We live in a changing world, and water supply is closely related to the climate. The first step is to realize that. Awareness is very important. Then, on

a local level, we need to build on and further develop existing knowledge and solutions. Ultimately it’s not about the technology, although we should indeed strive to make it better and more user-friendly.”

He adds, “I believe one has to be optimistic. Sure, I sometimes wonder if we really have to sink all the way to the bottom before we can evolve and create something better. But fundamentally, I really am an optimist.”

Footnote:

A few days after our interview, Peter Morgan sent an email explaining what had gone wrong with the pump in his garden. An imported rod that he had fitted to test out had broken. After he had refitted the original, slightly thicker, Zimbabwean-made rod, the pump is back in working order.



Photos: Andreas Karlsson



Photo: Thomas Henriksson

## SUNITA NARAIN: THE ACTIVIST

Sunita Narain has led the Centre for Science and Environment – a prominent non-profit organization in India – for 15 years. Last year, she was listed as one of India’s 25 most powerful women, but she sees herself as an environmental activist.

“Water is everyone’s concern” is the motto Sunita Narain lives by. Through

an indefatigable engagement, she has placed water at the top of the agenda in India and around the globe – not the least through her work in reviving the idea of harvesting rainwater as a means to eradicate poverty in rural areas. For these achievements, she received Stockholm Water Prize in 2005. ●





# ECOPEACE MIDDLE EAST: THE GOOD NEIGHBOURS

**IN A REGION THAT HAS LIVED THROUGH DECADES OF CONFLICT, WATER HAS BECOME A UNIFYING ELEMENT ACROSS BORDERS. FOR TWENTY YEARS, ECOPEACE HAS BROUGHT TOGETHER ENVIRONMENTALISTS FROM JORDAN, ISRAEL AND PALESTINE TO STRENGTHEN AND PROMOTE COOPERATION AROUND THE ISSUES OF WATER AND PEACE.**

Nader Khateb's voice over the telephone from Bethlehem is at times quite faint. But his message is clear: Water is life and there can be no sustainable existence without it. Nader Khateb is the Palestinian Director for EcoPeace, and he explains why water is so important to him and his colleagues.

"It touches everybody's daily lives and is at the core of sustainable development in our region. Unfortunately, water has also been part of the conflict in the Middle East. At EcoPeace, we're tackling the water issue from a non-political angle, and we're trying to demonstrate how working together can benefit everybody. It's not about doing each other favours. We think it's in our own interest, but at the same time it benefits everybody," Nader Khateb says.

Water and the environment know no borders. All the main water resources in Israel, Jordan and Palestine are interdependent and transboundary. This makes water a vital part of life in the region, as well as an agent for change.

With this in mind, several of the region's environmental organizations came together in Taba in Egypt in December 1994 to join forces and promote the integration of environmental issues in the peace process. A few months later, EcoPeace was born.

The non-governmental organiza-

tion started with an all-volunteer staff, working out of other agencies' offices. It has grown into a strong, influential voice with its own offices in Bethlehem, Amman and Tel Aviv. Israeli lawyer Gidon Bromberg, one of the original founders, says: "EcoPeace was initiated out of concern for the region's environment. At the time, the peace process was at its height. There had been major economic summits about development, but sustainability and environmental issues weren't on the political agenda. Our fear was that these issues would never get onto the agenda unless a regional environmental organization was established. So, we set out to make sure sustainable development and the environment got a place at the table."

From Jordan, Co-founder, Director and President, Munqeth Mehyar, adds that, as much as EcoPeace is about protecting the environment and sharing water resources, water has also become an important tool for peace.

"We try hard to use water as a catalyst to enhance our peace talks and to bring people closer together. Whether they like each other or not, water brings people to the negotiating table," he says.

One example of this, and one of the most successful peace and environmental programmes that the organi-

zation has developed over the years, is the Good Water Neighbour project. It was started to raise awareness of the shared water problems in Palestine, Israel and Jordan. Today almost 30 communities are participating in the programme and more are waiting to join. The idea is to identify cross-border communities and develop a dialogue around their mutual dependence on shared water resources.

"We've developed a curriculum and we've engaged young water trustees who undertake environmental hazard mapping in their communities," explains Gidon Bromberg. "This helps them understand their water reality and the water reality of their neigh-

*"We're creating a constituency of people calling for action"*

bours, and how the two are inter-linked."

One of the core messages of the project is that, by building trust and understanding, it is possible to solve common problems – even in a conflict area. "Working together isn't a favour to the other side, it's a necessity. As an organization, we're really trying to highlight the self-interest that could motivate each side to improve their own water reality. And the only way to do that is to engage with the other side," says Gidon Bromberg.

Getting young people on board is also a way of spreading the message in an efficient way. The youth can educate

their parents, put pressure on the mayors, and ask adults what they are doing to solve the problems in the communities. "In this way we're creating a constituency of people calling for action, not because they're nice guys but because it's in their own self-interest," says Gidon Bromberg.

He adds: "You cannot downplay the importance of water in the desert and the semi-arid parts of the world. It's something we're concerned about every single day. In Israel, for the last 50 years – although less so today because of desalination – people would check the front page of the newspaper to find out the water level of the Sea of Galilee. That's something ingrained into our mind-set, because we've experienced long periods of drought, and that's had dramatic implications for the economy as well as quality of life." Munqeth Mehyar notes proudly that the Good Water Neighbours project has taught people in the communities to make their voices heard and to think outside the stereotypical blame game. "The Good Water Neighbours project has fundamentally changed the way people think about water, reality and their neighbours," he says.

However, activism comes at a price. At first, the three directors gloss over the threats they have received, but, scratching the surface, it becomes clear that the last 20 years have not always been an easy journey.

"People receive threats because we live in a region of conflict," says Nader Khateb. "There are radical groups who don't like what we do, and then there's the majority who stays silent. But there are fewer threats today because the projects are bringing a lot of good to the region and people can see the benefits."

However, Gidon Bromberg has a more stern view. "In order to work productively, for every measure we undertake we must ask the question: Can the people we're seeking to empower defend their actions and stand up to those who will condemn them?

Because they will be condemned.

And if they can't stand up and defend themselves, then we'll be causing more damage than good. That's a constant challenge, and we must find the right balance of risk-taking, because we're risking people's lives – including our own – in this effort."

One such example was the most recent Gaza war, when EcoPeace advocated for more fresh water to be piped into Gaza. The call was not well received. "The drinking water situation was a humanitarian disaster and the population was desperate. Our campaign was very unpopular, but it was also a call to self-interest," says Gidon Bromberg.

"A population of 1.8 million without water will not stand still. They will knock down any fence in their pursuit of water. So, it wasn't an easy stand to take, but it was a very important one, and we succeeded. The military has announced that they will double the water pumped into Gaza in recognition that it is a security issue."

On the subject of security and peace, Nader Khateb points out that the work EcoPeace has conducted in the Middle East could be applied anywhere there is conflict over water. "Most rivers globally are transboundary, and I'm convinced that the model of the Good Water Neighbours project can work as a peace building tool nationally and internationally. People must realise that they have to talk to their neighbours, their enemies across the river, to solve the issues and improve everybody's situation. Only if you get together can you determine the best way to create a win-win-situation."

Another of the organization's success stories is the work done to rehabilitate the Jordan River. After decades of pollution, the river had turned into little more than a sewage canal. It would have been easy to point fingers, but a study done by EcoPeace showed that responsibility for the environmental disaster was shared between Israel, Jordan and Syria. The three countries had all diverted ●●●





●●● upstream water for domestic and agricultural use, at the same time as discharging large quantities of untreated sewage into the river.

“The whole region was hungry for fresh water and, at the time of conflict, each country tried to grab as much as they could from the enemy. We ended up with a dramatic drop in water levels flowing down the river, and the water that did trickle through was polluted,” says Munqeth Mehyar.

Once EcoPeace finalized their study, the next step was to work out how to rehabilitate the river. A master plan has been drawn up with international partners SIWI and Global Nature Fund, and will be launched in 2015. But progress has already been made.

One big victory was the release of fresh water from the Sea of Galilee into the Jordan River in 2013.

“This was really a breakthrough. For 49 years the river hadn’t seen a drop of fresh water from that source,” says Munqeth Mehyar.

Technological revolutions in wastewater treatment and heavy investment in new desalination plants on the Israeli coast have relieved pressure on the region’s fresh water resources and Israel is now less dependent on water from the Sea of Galilee.

“We took advantage of this to apply pressure on the Israeli authorities to release water into the river. And we succeeded,” says Munqeth Mehyar. Water release into the river will contin-

ue and expand, and, although it is not yet at the level that EcoPeace would like it to be, the organization acknowledges that it is an important precedent. It has taken two decades of hard work to build a regional environmental organization, but change in the region is now evident. Gidon Bromberg says the thing that makes him most proud is this: that EcoPeace has become a model for how people can work together, irrespective of nationality and religion, for the benefit of their people and their region.

“I can honestly say that EcoPeace represents the possibility of a better future together. It hasn’t always been easy, but it’s been worth every drop of sweat along the way.” ●

talk about. However, you have introduced the words into the diplomatic discourse. What were the reactions?  
**JE:** At first, surprise and many raised eyebrows. These days there is more acceptance and an overall positive reaction to breaking down these taboos.

**WF:** An issue that might be even more difficult to discuss is open defecation. What are the hard facts and the consequences for people who lack toilets?

**JE:** More than a billion people worldwide practice open defecation. This in itself is an indication of poverty, but it also entails many health and security risks, especially for women and girls. Reports from several countries show that many rape cases occur when women have to venture out from their homes to isolated places for their basic needs. At the end of the day, the lack of toilets undermines human dignity.

**WF:** Adequate sanitation is at the core of sustainable development. Can you explain?

**JE:** We have not reached the sanitation target set in the Millennium Development Goals by a long way and we need to speed up the process. Because improved sanitation means that child mortality goes down and maternal health improves. The lack of safe and private toilets at schools is also a major impediment to girls’ education. If sanitation facilities improved, more girls would remain in school past puberty. The result would be improved education rates as well as better equality.

**WF:** What is needed to convey the message?

**JE:** Everyone must be engaged: Governments, the UN, civil society, scientists, the media, the private sector. No one can do everything, but everyone can do something.

**WF:** Out of a global population of seven billion people, six billion have mobile phones, but only 4.5 billion have access to adequate sanitation. Why?



*“No one can do everything, but everyone can do something”*

## THE DEPUTY SECRETARY-GENERAL OF THE UNITED NATIONS DOES NOT SHY AWAY FROM TALKING ABOUT TOILETS.

The sanitation target is among the most lagging of the Millennium Development Goals. The target was to halve the number of people without adequate sanitation. This will not be met.

More than 2.5 billion people around the world lack basic sanitation and

thousands of children die of easily preventable diseases caused by poor sanitation.

In 2013, on the eve of World Water Day, United Nations Deputy Secretary-General Jan Eliasson launched a call for urgent action to end the crisis. The reason for the call was simple. Access to toilets goes to the heart of ensuring good health, a clean environment, and fundamental human dignity.

**WaterFront (WF):** When did you become aware of the importance of clean water and basic sanitation?

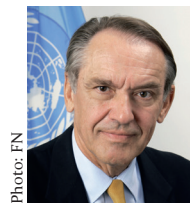
**Jan Eliasson (JE):** During my time as the United Nations Under-Secretary-General for Humanitarian Affairs from 1992 to 1994, I saw children in Somalia dying from diarrhoea, dysentery, and dehydration right in front of me.

**WF:** Sanitation and toilets are sensitive matters that people are not keen to

management when we talk about improving the current situation.

**WF:** You have called for a new era of hydro-diplomacy. What do you mean by that?

**JE:** Hydro diplomacy is my unifying term for the importance of reaching peaceful solutions to water disputes and competition over water resources. Scarce water should lead to increased cooperation rather than conflict. ●



# JAN ELIASSON: THE TABOO BREAKER





# RENÉE ANDERSSON: THE PIONEER

**RENÉE ANDERSSON'S COMMITMENT TO BRINGING ABOUT POSITIVE CHANGE RUNS DEEP. IT HAS SHAPED HER ENTIRE LIFE.**

"I've always been thinking about water! I have lived in countries where I had to boil water for 20 minutes to make it drinkable. I have seen women's bodies break from carrying heavy clay pots with water long distances from early girlhood. I have worked in slums during floods where dirty water that spreads infection is as big a problem as drought and lack of water. And the lack of sanitation affects women more than men – they hold back all day and when they sneak out under the cover of darkness, many are raped. It is terribly unfair."

Renée Andersson responds easily to the question on whether she wants to call herself an activist. She left many years of development work for Save the Children and other organizations to go into the private sector. She thought she could influence better there. With the Swedish family-run company Indiska behind her, she started extensive work on ethics and environmental issues. This led to codes of conduct for production at the suppliers in India, China and Turkey and eventually to guidelines for more economical, energy-efficient and clean water use.

"When I went to China to check the working environment among our suppliers people said to me: 'Do you think you can go to China and change the factories? Forget about it.' But you can."

Now, Renée has received an honorary doctorate from the University of Lund for her efforts to influence suppliers to improve working conditions and reduce the environmental impact of textile production. She works her final weeks

at Indiska before retirement.

We meet at the headquarters in Stockholm, among collections of the colourful, thin cotton clothes that are typical of Indiska. The cotton is grown, woven, dyed and sewn mostly in India, China and Turkey.

We go back in time. Renée Andersson grew up in a working-class family. The father cut shoe soles at the Tretorn factory in Helsingborg for 40 years, but hated his job. The mother had to start working for farmers when she was still a child.

"We had so little. Mom even patched our nylon stockings. And speaking of water – we bathed once a week, jumped into the water one after the other, and we could use the laundry room only once in five weeks."

Renée married early. For 13 years, she cared for day-care children, foster children and children of her own. She also began to volunteer at the Adoption Centre and stood in line for adoption.

When the question came - would you consider adopting a disabled child? – Renée and her husband answered yes. They received a little foundling, Sandhya, from India with cleft lip and cleft palate. It was there and then Renée's life changed. She became a fighter and an activist.

Renée discovered that the cleft palate children in Stockholm received medically professional care but were treated as laboratory animals before surgery. They were kept separately from family and proximity while subjected to

months in hospital during pre-surgery.

"It was like 'a little shop of horrors', the Red Cross Hospital. But beautiful and high-class with exquisite tablecloths crocheted by the nurses. They curtsied to the doctors. I refused to leave Sandhya there and demanded to go back and forth with her every day."

Two years later, Renée together with other parents put a stop to that form of treatment.

"I realized then that things could be changed. I brought that knowledge with me when I started working with social changes in the factories."

Renée got a job at Save the Children and met her new husband. The family worked in several countries. When they came home from Bangladesh in 1999, she saw that the companies H&M, Indiska, KappAhl, Lindex and the network Clean Clothes were looking for a project manager to find a system for monitoring the working environment in the clothing industry. Clean Clothes members are Swedish trade unions and organizations working to improve conditions in the textile industry by getting companies to adopt codes of conduct and the right for employees to form unions. But it was not enough to have

***"I realized then that things could be changed"***

nice rules for the production conditions; they must also be followed up on the spot. Renée got the job, took leave from Save the Children and went out on tourist visas to perform discreet interviews with workers in small shops, in homes and buses. After the project concluded, she worked for other similar networks,

and started the Amnesty Business Group in Sweden. Her view of corporate community commitment changed in the course.

"I have worked for human rights since I was 13 but never imagined that companies cared. My father always said: 'without the union, no food on the table'. But the companies we worked with were always well informed and engaged, while human rights organizations changed people all the time and the labour unions were rigid and uninterested. Sida, the Swedish International



Photo: Abbas Rehman, SXC

Development Agency, did not want to be involved from the beginning. They did not want to support companies. They are now on board, but they missed 10 years of learning."

Renée learned the national laws, which are often very good.

"The people I met on my travels said: 'You demand that we change ourselves according to Swedish law.' 'No,' I said, 'that is Indian law. Here you have stipulated the right to overtime pay, vacation, health insurance.'"

Renée worked for several years visiting suppliers in India and China who had signed a code of conduct.

"What we did was nothing less than a revolution. There were no rules in place. Child workers hid on the roof when we arrived. It was dirty, dangerous, and messy, there were no fire drills, no first aid, no toilets for women and those for the men were disgusting."

Renée always tried to work in a respectful way and listen carefully to the people she met.

"If I do not understand how you think, I can yell until I am blue about workers' and children's rights, without accomplishing anything."

When the project assignments ended, Renée did not want to return to the

development cooperation sector.

She wanted to work with businesses on the ground so she contacted Indiska and immediately got a job travelling around to suppliers and suggest improvements for the workers. After three years, the management wanted to move on with environmental issues. 'But I only know human rights issues', Renée said. She was sent for an environmental education in India.

"After the training I was able to do environmental audits. What I saw was terrible. Textile industry polluted to an



Photo: Renée Andersson

extreme degree. You could see in the groundwater what the colour of consumer clothes would be next season – pink or blue. The groundwater pumped up was dyed. Slag products were used in road construction and house building and poisons were leaked out. We had to change all the way back in the production chain."

But by 2010, Renée had had enough. "I told the Indiska's management that we must come together with others to develop common guidelines for water."

Renée contacted SIWI, the Stockholm International Water Institute, which became enthusiastic. Textile import companies in Sweden were invited to a big meeting. A learning project with 34 companies together with SIWI started. When the guidelines were completed Indiska, KappAhl, Lindex and SIWI wanted to test them properly for two years. Sida supported the project, which was carried out in three states in India.

"We worked with talented Indian consultants who are experts in water, chemicals and energy, and good at training. We tried to get suppliers to understand that it will be cheaper if you use the resources correctly. The problem was that water was free. It was easy

for the producers to understand that energy used for heating water costs, the chemicals cost, and cleaning the water costs. But the water had no price on it except the pump cost. They often pumped it up from deep down in the water table. It was horrible. You have to clean the water and then recirculate it."

In 2014, 42 suppliers collaborated in what is called STWI, Sweden Textile Water Initiative. The same year they saved 284 million litres of water and 402 tonnes of chemicals, and 3 per cent of energy and 3 per cent of other pro-



Photo: Samuel Rosa, SXC

duction costs. That means the investments in water and more efficient production methods have given manifold back. Meanwhile, workers are trained on chemicals and water economy.

"We calculated that the project has saved the equivalent of daily water for 15 Indian villages for a year. Nothing has been lost from focusing on water – all is included – chemicals, energy and waste. Water is so extremely central."

It was Renée who took the initiative to STWI. She and her employer the Indiska took the lead, and some much larger companies followed – H&M and Ikea to name a few. The method can be transferred to other industries. This is just the beginning.

"We are competitors on the shop floor but not when it comes to preserving the environment. It is a whole new way of thinking, both here at home and among our suppliers."

Renée is retiring this year, but she will continue to be active. She sits on the board of SWEDFUND, the development financier of the Swedish state, where she intends to monitor H&M's new textile production in Ethiopia, a country she used to live in. "I think it is good, they need jobs, but it must be done right." ●



# “We live in a richer, fatter world”

TEXT | JAN LUNDQVIST PHOTO THOMAS HENRIKSON

During the last 50 years, average global food supply increased by 30 per cent – a remarkable achievement in view of the fact that the world’s population increased from three to seven billion. Never before have so many been exposed to such a tempting variety of food supply from so many origins for such a low expenditure.

So, even if price and access to a proper diet for the poor remain barriers, there seems to be good reason to exclaim that the strategy and battle against food insecurity has been successful. Or has it? Well, it depends. Two partly new forces have muscled their way into the dynamics of food security and socioeconomic progress. One is changes in water, the other one is changes in consumer attitudes and behaviour, modified through significant increases in disposable income, more for some, less or nothing for others.

A rapidly growing middle class in China, India and in several countries in Africa also want two meals a day, and they are able to pay for food that generally requires more water and energy, and which generates more greenhouse gases. Why shouldn’t they enjoy a better diet and other amenities that are common in the rich world?

Water flows naturally by gravity but also to people and places where money is. When the rivers are desiccated and the rains fail, people turn to groundwater. In affluent as well as developing countries, groundwater is now lifted several hundred meters with implications for energy demand and outflow to local streams. Yet, in spite of impressive hydraulic works and ingenuity, water-related risks top decision-makers’ agenda.

Prevailing food strategies ignore elevated risks and global warming. According to official statements, 60 per cent more food is needed and demanded from 2005/07 to 2050. How comes? Population increase during that period is only about half of that figure.

Let’s put the figures in context. About 800 million people are undernourished but prevalence is going down. Parallel with this laudable trend, the number of people who are overweight and obese has accelerated and is now well over 2 billion. The overweight and obesity epidemic



is a major component in the nutritional crisis, at par with climate change in terms of global threats for human well-being and progress. Equally disturbing, the losses and waste of food produced are about a third of what is produced.

Rivers of water are exploited in vain and so are energy, land, investments and labor.

Seven billion consumers today and nine billion in 35 years can make or break a strategy for food and nutrition security. A growing middle class is responsible for the largest part of food waste, either in terms of food discarded or in terms of overeating.

Contrary to other actors in food systems, consumers are not accountable for wrong-doings. Overeating and waste of food are social challenges with significant implications for water, the environment, energy, the economy, and public health. It is reasonable that actors from all parts of the food system assume responsibility for water and food and nutrition security. Initiatives to revive a sound food culture among consumers are urgent. ●

**Jan Lundqvist** is a Senior Scientific Advisor at SIWI. He is lead author of Water, food security and human dignity – a nutrition perspective. Ministry of Enterprise and Innovation, Swedish FAO Committee (July, 2015).

## CALENDAR

### 8-10 SEPTEMBER POLAND

**Economic Forum,**  
Organized for over 20 years, the Economic Forum in Krynica has become the biggest and the most important meeting place for political and economic leaders from Central and Eastern Europe. The Forum will be attended by about 300 guests: investors from Poland and East-Central Europe, as well as representatives of governments and parliaments, responsible for the processes of privatization in Central Europe.  
[www.forum-ekonomiczne.pl](http://www.forum-ekonomiczne.pl)

### 15 SEPTEMBER NEW YORK CITY, USA UNGA 70

The 70th Regular Session of the UN General Assembly (UNGA 70) is scheduled to open at UN Headquarters on Tuesday, 15 September 2015. On 25 September 2015, His Holiness Pope Francis will address the UNGA, and from 25-27 September the Summit for the Adoption of the Post-2015 Development Agenda will convene. The General Debate of the 70th Session of the UNGA will take place from 28 September-6 October 2015.  
<http://sd.iisd.org/events/70th-session-of-the-un-general-assembly-unga-70>



### 9-11 OCTOBER LIMA, PERU Annual Meetings of the World Bank Group and the International Monetary Fund

The 2015 Annual Meetings of the World Bank Group and the International Monetary Fund (IMF) will take place in Lima, Peru, in October 2015. The Annual Meetings bring together ministers of finance and central bank governors from the institutions’ 188 member countries, and provide a forum for civil society, the private sector, academics and others to engage in discussions on economic issues.  
[www.worldbank.org/en/news/press-release/2012/09/14/world-bank-group-imf-hold-2015-annual-meetings-lima-peru](http://www.worldbank.org/en/news/press-release/2012/09/14/world-bank-group-imf-hold-2015-annual-meetings-lima-peru)

### 25-27 SEPTEMBER NEW YORK CITY, USA UN Summit for the Adoption of the Post-2015 Development Agenda

The United Nations summit for the adoption of the Post-2015 development agenda will be convened as a high-level plenary meeting of the General Assembly.  
<https://sustainabledevelopment.un.org/post2015/summit>

### 19 OCTOBER WASHINGTON D.C., USA 49th Meeting of the GEF Council: Consultation with Civil Society Organizations

The Third International Conference on Financing for Development Conference will result in an inter-governmentally negotiated and agreed outcome, which should constitute an important contribution to and support the implementation of the Post-2015 development agenda.  
[www.thegef.org/gef/node/10941](http://www.thegef.org/gef/node/10941)

### 19-23 OCTOBER BONN, GERMANY Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP)

UNFCCC ADP 4 BONN, 4th session of the Ad Hoc Working Group on the Durban Platform for Enhanced Action is one of the main event on Clean Development, Environmental Protection, Legal, Law, Climatology and Methodology aspects.  
<http://unfccc.int>

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