

In a polluted corner of the Baltic Sea, community groups and government officials come together for better water management.

► COVER STORY: PAGE 5

The 2015 Stockholm Water Prize Laureate, Rajendra Singh, talks to us about wisdom, water wars and realizing Ayurveda.

► INTERVIEW: PAGE 8



James Workman, a water professional in drought-stricken California, writes about the democratizing effect of water scarcity.

► LAST WORD: PAGE 14

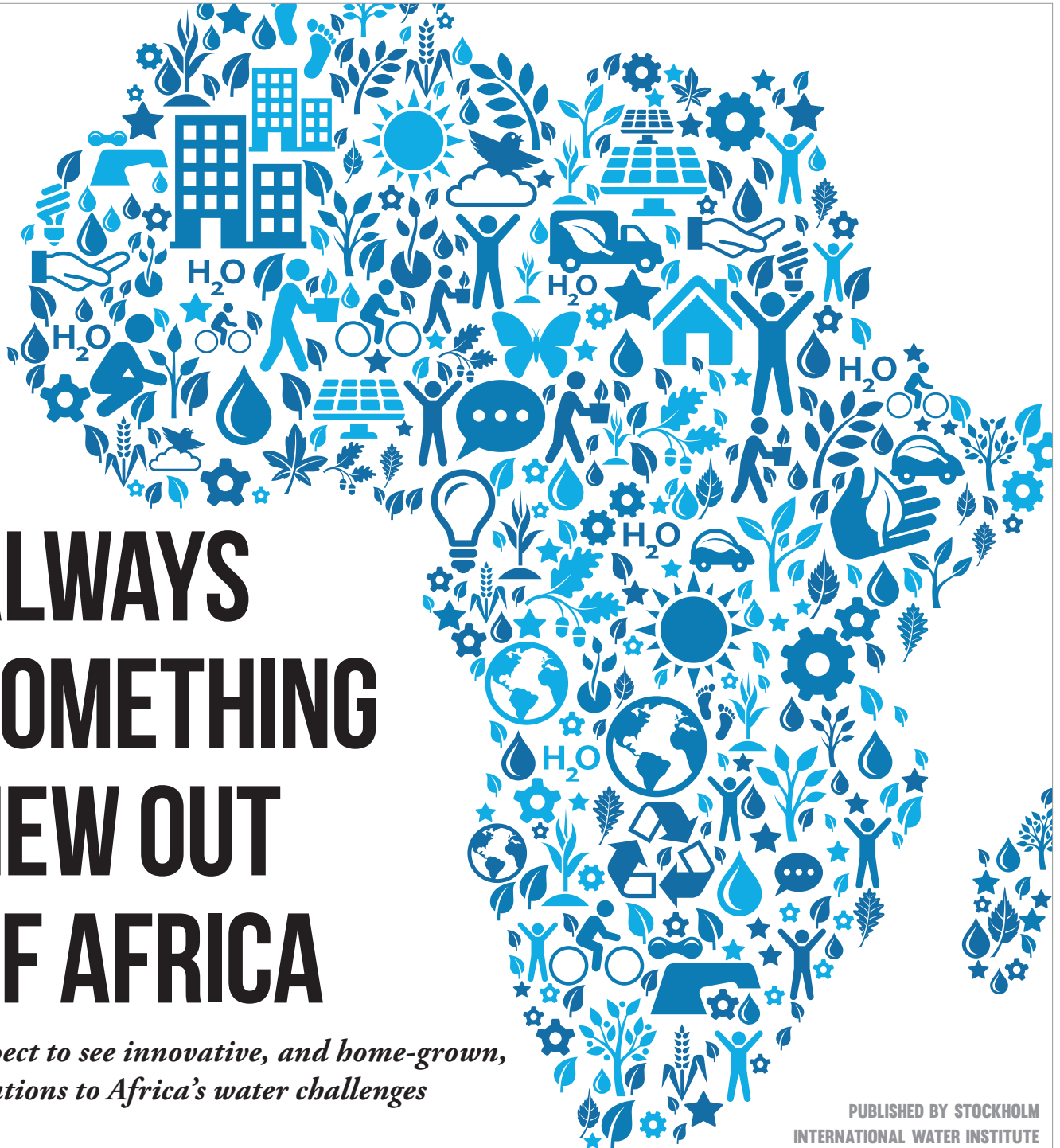
STOCKHOLM

WATERFRONT

THE FORUM FOR GLOBAL WATER ISSUES | # 2 | MAY 2015

**ALWAYS
SOMETHING
NEW OUT
OF AFRICA**

Expect to see innovative, and home-grown, solutions to Africa's water challenges



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INTERNATIONAL WATER INSTITUTE

Photo: Thomas Henriksson



A CHANGE OF PERSPECTIVE

Several of the stories in this issue force us to

change our perspective, ask us too view the world from a new angle.

We have interviewed Rajendra Singh, this year's Stockholm Water Prize laureate, who brought water, and life, back to the poorest, driest parts of India. Not by using advanced, new technology, but by reviving ancient Indian knowledge about water harvesting and conservation. Now, he is sought by Western governments to advise them on flood prevention and management. Find out more on page 8.

In California, home of the most advanced technology firms in the world, people are experiencing the worst drought in a millennium. Technology cannot (not yet, anyhow) make it rain. Lack of water, our most precious resource, has caused relations between competing water users to deteriorate to new lows. But the writer of this issue's Last Word,

James Workman, is an optimist nevertheless. Read why on page 14.

In the cover story, we read about the need for further cooperation to save the Baltic Sea, one of the world's dirtiest seas in one of the world's most developed regions. Coming together in Kaliningrad, on page 5.

And in our analysis, Anton Earle draws Aristotle into his reasoning about Africa, the continent's water challenges, and where the solutions are likely to come from.

We hope that this year's World Water Week, themed Water for Development, will offer plenty of opportunities to discuss new perspectives and solutions, based both on ancient wisdom and advanced technology. The registration has opened, and it is time to book your ticket to Stockholm!

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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Photo: Elin Ingblom

Elin Ingblom is the graphic designer of Stockholm WaterFront Magazine. She works closely with editor Victoria Engstrand-Neacsu, with whom she re-designed the magazine in 2014.

"It's a wonderful challenge and a great responsibility to make each issue feel new and exciting visually, I always look forward to pushing myself and my designs", says Elin. "The magazine (WaterFront) is an excellent platform for getting our issues out there, and make them accessible to all kinds of readers, not just the highly expert, scientific crowd."

Elin Ingblom has previously worked with graphic design in London and joined SIWI in 2011.

BRIEFING

“WITHOUT WATER, NO LIFE”, SAYS SWEDISH MINISTER

As part of the World Water Day celebrations, SIWI arranged a seminar to discuss water's role for sustainable development. Swedish Minister for International Development Cooperation, Isabella Lövin, held a poignant speech about the centrality of water. “Without water – no life, without blue – no green”, she said.

The Minister's travels to countries such as Bangladesh, Lebanon and Pakistan had given her first-hand insight to how water problems are closely linked to poverty, inequality and political conflict.

“I talked to women in Bangladesh who every day risk assault and violation when going out in the dark to defecate. It became clear to me that working to improve water and sanitation is as much a health advancement as a long term equality effort.”

Last autumn the Minister visited a refugee camp in Lebanon where many of the millions of Syrian refugees live.



Photo: Peter Tvärberg, SIWI

Swedish Minister for International Development Cooperation, Isabella Lövin

“Researchers have recently proven that the war in Syria was partly caused by protracted drought and water scarcity. Cooperation around water has the potential to prevent and solve conflicts.”

Although the challenges relating to water are daunting, the Minister rounded up her speech on a hopeful note. In 2015, several international conferences focusing on development have been, or will be held: the Financing for Development conference in Addis Ababa, the Sustainable Development Goals in New York and the new climate agreement in Paris.

“We must use these opportunities to steer future development in the right direction”, said Isabella Lövin.

THE GUARDIAN LAUNCHES WATER IN DEVELOPMENT HUB

With a growing global population and ever-frequent droughts, how can the world's water needs be met? The Guardian's 'Water in Development' hub looks at the H₂O-related problems experienced by those in developing countries and the innovations and solutions improving water access, security and quality for all.

www.theguardian.com

“It is a paradox that the water pessimists are wrong but their pessimism is a very useful political tool [...]. The water optimists are right but their optimism is dangerous [...].”

Tony Allan

Paper presented at the 1997 British Association Festival of Science, University of Leeds, Water and Development Session

SIWI JOINED SWEDISH DEPUTY PRIME MINISTER'S MISSION TO BEIJING

Photos: Frank Zhang, SIWI



Chinese Minister for Water Resources, Hon. Chen Lei with Swedish Deputy Prime Minister Dr Åsa Romson (left picture) and SIWI Executive Director Torgny Holmgren.

Representatives from SIWI joined the Swedish delegation of Deputy Prime Minister and Minister for Climate and the Environment Minister Dr Åsa Romson on a visit to China recently.

SIWI Executive Director Torgny Holmgren joined in Sweden's bi-lateral meetings with the Chinese Minister of Environmental Protection, Hon. Chen Jining and the Minister of Water Resources, Hon. Chen Lei.

Together with the Development Research Centre of the Ministry of Water Resources, the Stockholm Environment

Institute, the Nanjing Hydraulic Research Institute and others, SIWI co-organized a Sino-Swedish roundtable on Water Management and Policy Innovation and presented recommendations made from the expert group on priority challenges with great potential to advance scientific cooperation and policy exchange to Ministers Chen and Romson. They highlighted a number of areas including water-energy-food nexus, water eco-cities, exchange on good practice for incentive and pricing schemes for improving water and resource efficiency and knowledge exchange on indicators and implementation systems to achieve environmental objectives and development goals of key issues to expand collaboration in future.

SIWI has been actively engaged in China over the past half-decade, with close collaborations with the Ministry of Environmental Protection (MEP) and the Ministry of Water Resources (MWR), providing applied research, policy studies and capacity building programmes, together with a range of partners from academia and research.



Photo: iStock



Photo: Nick Tandri

SIWI Africa Regional Centre in Pretoria, South Africa

SUPPORTING WATER-RELATED INNOVATION IN AFRICA THROUGH NEW REGIONAL CENTRE

Over 60 of SIWI's partners and colleagues have marked the official opening of its Africa Regional Centre (ARC) in Pretoria, South Africa. Sweden's Ambassador for Environment, Jan Olsson and Ambassador to South Africa, Anders Hagelberg were in attendance.

It is hoped the establishment of the ARC will help develop global, north-south consensus on how to address pressing and lead to a bi-directional exchange of knowledge and experience on water and environment issues among various regions and countries in Africa, as well as Sweden.

Africa is home to some of the world's fastest growing economies, with a combined average growth set to reach six per cent in 2015. SIWI is set to respond to these challenges in collaboration with partners in the region and looks forward to the opportunities set to arise over the coming years.

Read the analysis on Africa on page 10.

www.siwi.org/knowledge-services/africa-regional-centre

LOOKING FOR THE BEST WATER IDEA

You turn on the tap to fill a glass with water. What is that tap to you? A good idea? You go the toilet, and afterwards you pull the flush. It revolutionized society when it was introduced.

Does it make the flushing toilet a good idea? What about dams? The aqueducts of ancient Rome? Pumps? Irrigation? Coolers in the office? Lawn sprinklers? Hydration packs for long-distance runners? The list of inventions related to water is miles

long. Many people take most water inventions for granted. They are a part of our everyday life, and while we are grateful they exist, we don't take much notice of them.

But now, we want you to stop for a minute, think, and then let us know what YOU think is the **Best Water Idea of All Time**.



The Best Water Idea campaign, started by SIWI in April, hopes to get both experts and members of the public to discuss water's role in our daily lives and how it has affected society during every era of human existence. In June, the campaign moves onto online voting, which will culminate in the presentation of the World's Best Water Ideas during World Water Week in Stockholm in August.

www.worldwaterweek.org/bestwaterideas

PLACE IN JUNIOR WATER PRIZE FINAL FOR GLACIER STUDY WITH GLOBAL POTENTIAL

Michael Nyirenda is the Swedish finalist to Stockholm Junior Water Prize for his study on a glacier in Northern Sweden. Michael will represent Sweden in the international final where students from 31 countries participate.

In his study, Michael measured the mass balance of Storglaciären in Tarfala, Northern Sweden, to determine what effects a rise in global temperature would have on the glacier.

The Jury emphasized that Michael successfully had linked his project to the global importance of fresh water resources and that the findings have potential to save water resources

in highly populated and poor areas around the world.

– These measurements can be used to gain better control over future problems in Africa, Asia and South America where glaciers affect water resource management on a large scale, said Anders Nordström, Jury Chair for the prize.

This summer, Michael will compete against young people from over 30 countries across the globe in the international final of Stockholm Junior Water Prize, which will take place during World Water Week.

www.siwi.org/prizes/stockholmjuniorwaterprize

UNDP ASSISTS 84 COUNTRIES IN MANAGING POLLUTANTS

Persistent Organic Pollutants (POPs) are chemicals that negatively affect health and environment through air, water and soil. To help reduce the vulnerability, especially of the poor, to health and environmental hazards UNDP supports 84 developing countries implement POPs-related projects. As of May 2015, 9,500 tonnes of POPs have been safely disposed and 335,000 tonnes of contaminated wastes have been safeguarded.

www.undp.org

COMING TOGETHER IN KALININGRAD

TEXT | MARK RASMUSSEN PHOTO | ALEXANDER POPADIN

IN A CORNER OF THE BALTIC SEA PLAGUED WITH POLLUTION, NEW APPROACHES ARE BRINGING TOGETHER COMMUNITY GROUPS AND GOVERNMENT OFFICIALS TO BUILD BOTTOM-UP SUPPORT FOR WATER IMPROVEMENTS.



In 2012, officials and residents of Kaliningrad gathered at the construction site of a treatment plant aimed at bringing modern sewage treatment to this city of nearly half a million on the coast of the Baltic Sea. Getting to this point was a major achievement, not just for local residents but for the entire sea.

The water resources of Russia's Kaliningrad Oblast are defined by the Pregola and Neman rivers; the unique Vistula and Curonian Lagoons into which they drain and 610 smaller tributary streams which feed them. The waterways are polluted by inadequately treated municipal wastewater, industrial discharges,

and upstream agricultural runoff making this one of the most environmentally degraded corners of the Baltic region. Their impairment represents an ongoing challenge for Russian officials and a hindrance to international water pollution control efforts.

To date, the water resources of Kaliningrad have not received the same level of attention afforded Russia's principle Baltic Sea outlet – St. Petersburg – where major wastewater treatment plant upgrades have succeeded in reducing pollutant loads to the Gulf of Finland. As a result, poor environmental conditions hinder the Oblast's full economic potential,

reduce quality of life for its residents, and degrade the Baltic Sea.

Three years on and new sewer plants remain off line and much work remains. . The benefits of improved water resource management to the enclave's economic vitality are well established and accepted by Oblast officials. In the face of other fiscal priorities, however, action on water pollution can fall behind. It is a challenge confronting local officials in municipalities on all continents.

But today a new generation of Kaliningrad non-governmental organizations (NGOs) is working to raise the profile of the Oblast's rivers on the public agenda. And they ●●●

●●● are doing it through a new model of government support and cooperation. They are citizens who are impatient for improvements, but also optimistic about the future. They are a positive voice for water and one that is attracting attention throughout the eastern Baltic region.

Oleg Ivanov, a former law student, is chairman of GreenFront, an inter-regional environmental advocacy organization. Members of the NGO, which was set up in 2011, are also part of the Kaliningrad Public Council and work to maintain open dialogue with government officials to support the cleanup of illegal dumping, city wastewater planning efforts and restoration on agricultural lands. GreenFront also engages with the media to raise awareness of problems.

“We collect and present high quality information to help authorities not only take a closer look at the problems of the quality of water in the rivers but to insist on their cleanup”, says Ivanov. A recent GreenFront

“Poor environmental conditions hinder Kaliningrad’s full economic potential, reduce quality of life for its residents, and degrade the Baltic Sea.”

Kaliningrad Oblast and the Transboundary Water Resources



finding of an industrial polluter discharging waste into a tributary of the Pregola River provided the basis for the Kaliningrad Public Prosecutors office to take action. They proudly note that the industry today is investing approximately EUR one million in upgrading its waste treatment systems to avoid fines.

In other parts of the Baltic Sea

helping to implement on-the-ground projects such as the collection of environmental data.

Local governments now view civil society actors as partners in the enhancement of environmental quality at the community level; partners able to employ methods and resources unavailable to government. Most importantly, a supportive NGO community can bring the key element that is needed in democratic societies to make change: public support.

In Kaliningrad, government officials today are embracing this support role played by groups like GreenFront. Mr. Denis Kim, Kaliningrad Inter-district Environmental Prosecutor, has said, “We see Green Front as our partner who helps us to identify, reveal and solve problems of water pollution and water quality in the Oblast.”

It is a trend that extends far beyond local government. Even large multi-lateral institutions such as the 40-year old Baltic Marine Environment Protection Commission, or Helsinki

basin, throughout Europe and elsewhere in Russia, NGOs play a critical role in raising public awareness of environmental issues, educating people about the need and benefits to be accrued from clean water improvements, building political will which local officials can use to advance cleanup actions, and

Commission (HELCOM), is adjusting its approach to water problems to invite greater NGO participation.

“HELCOM’s enhanced cooperation with the non-governmental sector, particularly in project-based collaboration, is a sign of a shift in its policy: the inter-governmental level alone is no longer recognized as sufficient for the successful implementation of environmental policy. To create awareness, legitimacy and acceptance of decisions requires the participation of societal actors.” (Joas, Jahn and Kern, *Governing a Common Sea: Environmental Policies in the Baltic Sea Region*, 2008)

Last year, Stockholm International Water Institute (SIWI) brought together the most active and effective NGOs in Kaliningrad working in the areas of environmental protection and youth education – GreenFront, EkoRybOhot, Green Planet and Natural Heritage – to discuss how best to enhance river protection efforts in the Oblast.

“The NGO community can bring the key element that is needed in democratic societies to make change: public support.”

Joining them in this effort were non-profits from Sweden, St. Petersburg, Lithuania, and Belarus to provide examples of regional models and to build stronger transboundary relationships.

The project was rooted in a fundamental belief that a credible NGO effort in Kaliningrad – one that is both locally based and supported but also connected to similar organizations in other river basin countries – can support and encourage local, regional and federal officials in water protection and ecological restoration. Together, these partners envisioned coordinated NGO activities that can:

- act as a credible, public and independent voice to support the improvement of water resources in Kaliningrad Oblast.
- build public support for clean water, highlight needs, and convey those needs to local, regional and federal officials. Active public involvement should be a hallmark of the work as a means to building community awareness and support for water quality investments in the Oblast.
- manage a long-term water quality-monitoring programme for the Neman and Pregola Rivers.
- work to support city, oblast and federal officials in efforts to advance river restoration.

Oleg Ivanov from GreenFront sees great potential in the NGO model that is developing in Kaliningrad. He is focused on achieving practical fixes to pollution at the local level in partnership with government officials, but also on the power of his new connections to NGOs working upstream across the border in Lithuania, Belarus and Poland. And his eyes are on the future.

“After we’ve eliminated the major sources of water pollution here in Kaliningrad, we can start developing programmes focused on restoration of the health of these rivers.” ●

A discharge of industrial effluents discovered by GreenFront (Kaliningrad)



Mark Rasmussen is a SIWI Associate.



THE WATER MAN

INTERVIEWED BY | VICTORIA ENGSTRAND-NEACSU PHOTO | TARUN BHARAT SANGH

RAJENDRA SINGH, AKA THE WATERMAN OF INDIA, IS THE 2015 STOCKHOLM WATER PRIZE LAUREATE. HE SPOKE TO WATERFRONT ABOUT WISDOM, WATER WARS, AND FULFILLING THE OBJECTIVES OF AYURVEDA THROUGH WATER.

You have not chosen the path of least resistance – what motivates you?

Meeting challenges has always been a huge part of my life. When I went to Rajasthan, this area was arid, unhealthy, impoverished and helpless. The aquifers were completely dry. We started harvesting and conserving the rainwater, so that it wouldn't evaporate or flow away and get wasted. We built johads (small dams), so that the underground aquifers could be recharged again. Our area became fertile and prosperous, and dead rivulets came to life again. The challenges of those times have become victories for me.

What was your immediate goal when you first went to Rajasthan?

Addressing the drinking water crisis that people had, that was our first goal. As soon as we started the work, and as

the aquifers started to get recharged, the drinking water crisis was averted, and agriculture started to happen again. Those who had abandoned their villages came back.

What is your goal today?

When we started, we were only looking at the drinking water crisis. Today, we aim higher. This is the 21st century, the century of exploitation. The current exploitation of water that is happening, the pollution of water that is happening, and the encroachment on water structures that is happening, to stop all this, to give new life to rivers, and in this century, the war on water that we can see, to convert that into peace, that is my life's goal.

What difference has your work made?

In the last thirty years, 8,600 square kilometres of land, which were barren and dry, have become fertile and green. This is a change towards prosperity. The state governments and the national government are now trying to do similar work. Therefore, I feel that this work has had some impact on our government and on our society. That is why they are promoting work

in water conservation. On the international level, this work is considered the solution for floods and droughts. Because of this harvesting of rainwater and recharging underground aquifers, there is no scope for drought or floods in our area. This is a way to solve both floods and droughts globally. Therefore, we believe the impact of this work is on the local level, national level, the international level and above all at the village level.

What are you most proud of?

Abandoned villages being resettled again, return of fertility to the land, rivulets coming to life again.

These people who were considered illiterate and uneducated, their work is awarded the world's most prestigious water prize, which is truly something to be proud of.

Do you ever regret leaving medicine?

My education was in Indian traditional medicine. The goal of this system, Ayurveda, is the safeguarding of health. Safeguarding health is only possible when everybody gets pure and clean water. With my work, the area that was filled with salt water, by filtration through the ground, became fresh and sweet water. The people became healthier. Illnesses and diseases lessened. So the work I have done followed the method and realized the objectives of Ayurveda. Therefore, I have no regrets. I am extremely happy.

What do you hope to focus on in your work in the future?

World water wars are on our doorstep. World peace is only possible when everyone gets clean and pure drinking water and the availability of their water is secure. By harvesting rainwater, and by encouraging people to use water wisely, we want to achieve world peace. My goal is to increase water conservation and wise water usage worldwide, and to fulfil global water needs. ●

Stockholm Water Prize founders

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BAN THE BURGER?

TEXT | ROBIN SIMPSON PHOTO | ISTOCK

SHOULD WE, AND COULD WE, BAN PRODUCTS THAT WASTE TOO MUCH WATER? THE QUESTION WAS PUT TO ROBIN SIMPSON FROM CONSUMERS INTERNATIONAL.

As the unstoppable force of consumer demand meets the immovable object of natural resource limits, it is understandable that policy makers seek ways of reducing waste that can be enforced by statute. Posited measures include economic incentives such as water pricing to reflect scarcity and levies and taxes such as the large bottle tax which acts in effect as a sugar tax in soft drinks in the US – both a public health measure and environmental measure – two for the price of one! Should governments go further and ban products whose production involves wasteful use of resources such as excessive quantities of water?

The issues revolve around who is banning whose products. At national level, a government can insist on, say, full internalisation of environmental costs for water, but does that mean banning products that are thought to waste water, which will only be one element of cost? Surely the more direct way forward in this case is to apply legislation on water use across all sectors, something which for example the EU and California have been slow to do with their agriculture sectors.

Things get more complicated when one considers cross-border trade and competition from imports operating under different constraints. There should be no problem with imports per se, why should countries with abundant water not export water intensive products to those with less? That is what comparative advantage is all

about. But what if the exporting countries are also water-scarce, does their import

then become a classic instance of environmental dumping? So why not legislate to ban those imports? Because that means the importing country deciding the environmental policy of the exporting country. In much of the debate on water footprints that means the US



and Europe deciding the environmental policy of much poorer countries, who are unlikely to turn round and challenge the failures of the US and EU to apply their water directives to agriculture while continuing to dump subsidized agricultural exports on world markets, notably cotton in the case of the US, whose dumping has ruined African producers.

Product bans have long been allowed under Art 20 of the General Agreement on Tariffs & Trade against imports found to be dangerous for humans, animals and plant life.

The Sanitary and Phytosanitary (SPS) agreement further allows a precautionary approach if the risk is uncertain. But this is for risk emanating directly from the product (eg UK beef during the BSE outbreak, whose ban was never contested). Production involving waste of water is what is known in trade jargon as a PPM – Process and Production method, and has nothing to do with the intrinsic qualities of the product, which may be perfectly harmless to the user. Art 20 does not therefore apply.

And it never will if developing countries have their way in trade negotiations. Invoking PPMs as justification for import bans, they argue, would be a thinly disguised protectionism. This accusation is borne out by the contortions of rich country negotiators during the WTO negotiations in the 1990s under the guise of defending environmental and labour rights. And so such issues as embedded water will get lost in this wider and bitter history.

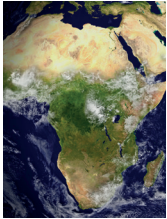
Far quicker to attack waste at source – by introducing legislation on the use and misuse of natural resources, including levies and taxes in the armory of measures. As for imports, by all means campaign and worry. But attacking foreign exporters, while leaving domestic abuses unheeded will not be agreed through trade policy. ●

Robin Simpson is a Senior Policy Advisor at Consumers International. He has written this article in a private capacity.

AFRICA: GROWING THIRSTIER

TEXT | ANTON EARLE PHOTO | ISTOCK

THE ECONOMIC, DEMOGRAPHIC AND POLITICAL LANDSCAPE IN AFRICA HAS CHANGED DRAMATICALLY IN THE PAST FEW DECADES. WATER MANAGEMENT IS CENTRAL TO THIS NEW AFRICAN ERA, WRITES ANTON EARLE IN THIS ANALYSIS.



Writing in the third century BC, Aristotle discussed the seemingly wild melange of animals unique to Africa; suggesting that the lack of water forced animals to congregate at watering holes, prompting the evolution of hybrid species. Today we know that Africa is the origin of all humans, with waves of emigration over the millennia populating the other continents. The irony is that while human society emerged in Africa the more recent interaction of the people living in Africa with those who left has been an acrimonious one.

A special report by the usually sober Economist newspaper in 2013 was boldly titled “Emerging Africa: a hopeful continent”; and concludes that “despite all the caveats, the Africo-pessimists have got it wrong. This time the continent really is on the rise”. African economies now rank among the fastest-growing in the world and reforms in laws and institutions made over the past two decades are bearing fruit with several countries seeing improvements in social development indicators, accompanied by the nascent emergence of an African middle class. The positive news of socio-economic development is tempered by the impact on environmental resources, water being prime. Projections on climatic change show that Africa is the continent likely to experience the greatest impacts, with an increase in precipitation variability leading to floods and droughts across vast areas. Water management is central to this new African era. Decisions on who gets how much water, how discharges from industries, agriculture and urban areas are managed and how investment is made in water infrastructure will increasingly facilitate or constrain the projected “rise of Africa”. To understand the future of freshwater resources and service provision in sub-Saharan Africa it is necessary to consider the implications of three shifts affecting the continent, namely economic, demographic, and political.

Of the ten countries enjoying the highest rates of economic growth globally from 2011 to 2015 seven

are in Africa and the average rate of GDP growth on the continent is now the highest in the world at just over five per cent annually. Of more importance is the sustained nature of this economic growth over the past decade, with low inter-annual variation (African economies were little affected by the 2008-2010 global financial crisis). According to the World Bank 22 of the 47 sub-Saharan African economies are now classified as middle income or above, potentially allowing them access to domestic as well as international capital markets for financing of infrastructure projects.

Beyond the magnitude of the economic growth figures it is also important to look at a shift in the composition of that growth. Until around 2000 growth rates of African economies tracked commodity prices closely as a consequence of the reliance on mining, oil and other extractive industries. Since then there has been a decoupling of economic growth from commodity prices, meaning that despite a 50 per cent drop in the oil price over the past year oil dependent economies such as Angola and Nigeria have continued to grow. Zambia was previously largely dependent on copper exports, but even though the price of the metal has dropped sharply over the past year the economy is predicted to expand by over seven per cent in 2015. Growth in its financial services sector hit 12 per cent in 2014. Agriculture and extractive industries still account for the largest share of economic output across the continent, but growth in sectors such as financial services, manufacturing, construction, tourism and telecoms exceeds the rate of overall GDP growth. A decade ago almost all foreign direct investment (FDI) went to the resource-rich economies in Africa and although they still attract the bulk of FDI the increase in the share destined for resource-poor economies is increasing more rapidly.

The second shift is in the realm of demographics. With a population of over 1.1 billion, Africa is today the second most populated continent. The sub-Saharan population is over 900 million and growing at a net rate of 2.7 per cent a year, the highest in the world (global rate is 1.2 per cent, south Asia 1.3 per cent and the MENA 1.7 per cent). The population

of sub-Saharan Africa is set to be over 1.4 billion by 2030 at which point growth is predicted to decrease to 2.3 per cent annually. This population is young, with people below the age of 14 comprising 43 per cent of the total (global percentage is 26; south Asia and MENA 30). Fertility rates (births per woman) are high, but dropping; as is the child mortality rate, which has halved since 1990. Life expectancy has increased by a decade since then.

Today just under 40 per cent of the population live in cities, by 2030 this will exceed 50 per cent. Several large cities are set to double in size between 2010 and 2025, including Dar es Salaam, Nairobi, Kinshasa, Luanda and Addis Ababa, with 12 cities in sub-Saharan Africa set to exceed five million inhabitants by 2025. Urbanization and economic diversification are mutually reinforcing trends, with the bulk of the new jobs being created in high-value sectors such as financial services and telecoms located in or close to urban centres. The result is that a nascent middle class is emerging on the continent, where previously there was a small elite of the very rich and the vast majority living at or below the poverty line. A study by the African Development Bank estimates the middle class in Africa in 2010 (defined in their study as people with a daily consumption spend of USD 2-20 a day) to be around 330 million. This study has been criticised for its broad definition of what constitutes middle class (at two USD a day the bar is set low), however the point is that in the period 1980 to 2010 the growth of the middle class has averaged 3.1 per cent a year, compared with growth of the continent's overall population of 2.6 per cent. This is an

“Economic growth has translated to a greater demand for water in emergent sectors.”

encouraging development, but levels of inequality remain high.

The third shift is in the area of politics and governance. In 1990, at the end of the Cold War, only four countries in Africa could be termed democracies, while 41 were classified as autocracies.

By 2012 this number increased to 17, with another 30 countries following hybrid systems – not fully democratic but also not full autocracies. Most countries now run regular multi-party elections and have been implementing reforms of the public governance institutions, extending public participation in decision-making in a range of sectors. There has been a general decrease in the number of wars on the continent (civil as well as inter-state) since 1990, halving in number by 2012.

The above three changes, of economic development and diversification; demographic shift and urbanisation; and improvement in governance are certainly not evenly spread across the continent, as with any overview it masks large variations between countries as well as within countries. However the general trends hold profound implications for water management on the continent. Economic growth has translated to a greater demand for water in emergent sectors such as industry, mining, energy, construction and tourism as well as for domestic supply within urban areas.

The greater ability of these sectors to pay for water and have it transferred over great distances places them in direct competition for limited water supplies with the agricultural sector and the rural population generally. For instance, in sub-Saharan Africa around 61 per cent of the population have access to an improved water source (either a piped connection on the premises or a communal stand pipe within walking distance). But in urban areas this figure is over 75 per cent of the population, while in rural areas it is less than 50 per cent. Similar disparities exist in access to sanitation.

Higher concentrations of people in cities makes it easier to develop bankable projects as the consumer base is larger and wealthier; and there are more possibilities of using cross-subsidisation of domestic users by industrial ones. However, urban growth has led to a rapid increase in slum areas, posing health risks for the inhabitants where water and sanitation services are not provided.

Governance reforms being undertaken in the water sectors of several countries in Africa opens the possibility of responding to these development challenges. These reforms will be implemented ●●●



●●● in a step-wise manner with support from a range of local and international partners proving useful. The engagement of the private sector in the planning, development, operation and maintenance of water infrastructure (at various levels of scale) will become increasingly important as the needed capacity and resources in the public sector is typically not sufficient to respond adequately. Several innovative examples of this exist on the continent, such as mining companies treating wastewater for sale to municipalities, hydro-power dam operators supporting catchment conservation efforts; and performance-based contracts for private water supply operators to increase network coverage and reduce leakage. A great challenge exists in translating the project opportunities identified by water planners into infrastructure investment opportunities which can attract investors locally and internationally. The success in being able to do this lies with establishing a viable business case which has realistic recovery of funding from the population (and industries) being served, while the necessary social-safeguards are put in place to ensure the poor

and marginalised are not excluded from a guaranteed life-line supply.

In the long run, effective water governance institutional frameworks need to be combined with innovative technological, finance and management practices.

This is already taking place in the telecoms and the finance sectors in Africa, where solutions such as performing banking transactions over mobile phones, have already transformed the lives of millions on the continent. Discussing innovation in Africa, the Economist newspaper concludes by stating that the problems faced by Africa are different to the ones faced in Europe and America; hence the solutions are likely to come out of Africa. The coming decade is likely to see such innovations being developed specifically in response to the water and development challenges of the continent. ●

Anton Earle is the Director of SIWI's Africa Regional Centre in Pretoria, South Africa.

MAKE BACTERIA WORK FOR US

TEXT | ANDREAS LINDSTRÖM, JOACHIM ÅHLANDER AND LINDA ROSENDAHL NORDIN INFOGRAPHIC | ELIN INGBLOM

THE USE OF CHEMICALS HAS INCREASED BY 3900 PER CENT IN THE LAST HALF-CENTURY. IT IS TIME TO CONSIDER REPLACING THEM WITH BIOTECH SOLUTIONS TO MINIMIZE THREATS TO HUMAN HEALTH, WRITE ANDREAS LINDSTRÖM, JOACHIM ÅHLANDER AND LINDA ROSENDAHL NORDIN IN THIS OPINION.

In 50 years, the use of chemicals in the world increased from ten million to 400 million tonnes. In the last ten years alone, the use of chemicals more than doubled and the Organisation of Economic Development and Co-operation (OECD) predicts an annual continued increase of three per cent to 2050. We know very little about the potential impact these chemicals have when released into the environment. Exposure to potentially dangerous chemicals occurs continuously as they enter airways and water.

Up to 15 per cent of pollutants reaching the Baltic Sea comes from decentralized private sewage systems. It is unknown how efficient these systems are when treating pollutants, especially household chemicals. Globally, many households do their washing and cleaning in open water sources that often serve as drinking water sources as well.

Cleaning products are bought and used in every corner of the world. The content of many of these products are often unknown to the public. But there is evidence to support that they contain potentially harmful components. Only very recently did some of the world's major retailers announce that they were removing phosphates and chemical toxins from detergents and household cleaners.

In order to stem the flow of chemicals reaching humans and the environment from different household activities, we must use a broad approach. One avenue is to increase access to and efficiency of waste and water treatment systems. This, however, might only help in limiting negative impacts. By rethinking the very products that people use and consume today, and thereby addressing the problem higher up in the supply chain, the effect could be much greater.

Biotechnology is the use of micro-organisms, such as bacteria, micro-fungi and mold, to create substances that

humans can benefit from. Humans have used the technique for thousands of years, for example, when producing yeast to get dough to ferment, or fungi and bacteria for cheese and wine.

We already use biotechnology in the pharmaceutical, agricultural and water treatment sectors. In addition, when it comes to products for different household activities, biotechnology offers an ever-increasing range of solutions that can lessen the load of harmful chemicals released into the environment. Furthering the development of duplicating natural systems and processes, using enzyme-producing micro-organisms that break down organic waste, could offer a more sustainable and non-polluting alternative to products created by chemical synthesis. Promoting biotech solutions in the development of a new generation of consumer goods aimed at households, such as cleaning and washing products,

could dramatically reduce the use of hazardous chemicals, chemical emissions and solvents, benefitting users, producers as well as the environment.

Biotechnological production is a natural process, relying dominantly on renewable resources rather than fossil fuels, which in turn means lower emissions of greenhouse gases, and less environmental impact.

A greater saturation of more afford-

able products (not least in developing parts of the world lacking waste and water treatment) generated through biotechnology, could offer sustainable alternatives and competition to established, environmentally unsafe consumer products by market leaders. ●



IN 50 YEARS, THE USE OF CHEMICALS IN THE WORLD HAS INCREASED FROM 10 MILLION TO 400 MILLION TONNES

1965 → 2015

Source: Swedish Chemicals Agency

Andreas Lindström is an environmental engineer. His co-authors **Joachim Åhlander** and **Linda Rosendahl Nordin** are environmental entrepreneurs.

“It’s the end of the water as we know it ... and I feel fine”

TEXT | JAMES G. WORKMAN PHOTO VANESSA LEMAIRE-WORKMAN

In California, Mark Twain explained, “whiskey’s for drinking; water’s for fighting over.” 19th Century readers chuckled. Today my state faces the worst arid spell in 1,200 years. No one’s laughing. In 2015 every water user – farm, firm, fishery, forest, family – is fighting over the matrix of life.

Bitter conflict is unusual for our enlightened population. Other crises – earthquakes, wildfires, mudslides, bankruptcy, pollution, social strife – bind us together. Water scarcity tears us apart.

Never mind Democrat versus Republican. Thirst divides San Francisco against Los Angeles, urban importer against almond exporter. It pits skier against angler, river diverter against aquifer pumper, alpine hydropower against solar thermal. Restrictions on cemetery lawns turn us, the living, against our dead.

Local stress turns even uglier. Silicon Valley doesn’t just punish lawns with signs, or fines, shaming a “Water Hog!” Some hurl tar, or dead cats, at their automatic sprinkler-owning neighbours.

Finger pointing breeds fatigue. Propaganda – “Brown is the new green!” “Water is life!” – grows tired. Jacking up rates to curb “excessive” use (however defined) is ineffective to affluent residents, vineyards, golf courses and escalates tensions over inequality.

California is hardly an island; our thirst crosses borders. In Boston my snowbound sister’s *schadenfreude* is undercut by rising prices for her avocados, walnuts, and tomatoes. Indeed, while scarcity was once local or regional, trade means thirst has gone global. The World Economic Forum in Davos no longer relegates water as a ‘local charity for the poor,’ but rather the single worst threat to human security.

Twain also quipped, “God created war so that Americans would learn geography,” and we “connect the drops” between California thirst and overseas stress. Utility rations link to up-stream irrigation, to biofuel subsidies, to crop exports, to commodity speculators, to global grain prices, causing urban conflicts, food riots and civil wars overseas. Our grocery carts and gas tanks shape national security policy.



With 15 years to close a 40 per cent gap between global supply and rising demand, how will it end? Ominous headlines project Armageddon: in a groundwater-depleting ‘race to the bottom,’ California (the 8th richest economy) or Yemen (the 88th) could soon “run out of water.”

Don’t bet on it. As a dangerous optimist, I actually see escalating thirst as a progressive force for good.

Why?

Because the end of water *democratizes* us.

Scarcity sets priorities. Water crises breed opportunities. Rations reveal hidden connections. Basin-wide debates provoke ingenuity. If nature causes drought, people discover we cause shortage... or abundance. Facing shortages, we recalibrate what ‘community’ means, and redefine what constitute ‘family values.’

The lower scarcity pinches down, the higher it rises up our political agenda, seeping into its rightful place: front pages, Twitter feeds, elevator pitches, and editorial cartoons.

Some say this transformation could threaten the water professional’s power. Good. We need to share. If scarcity remains exclusive, our own elite crisis, insulating the rest of society from its severe complexity, water can never become a catalyst for governance of, by, and for the people.

But if scarcity devolves decisions about water’s use, then it reallocates vital risks, rights, rewards, and responsibilities over our shared dominion and liquid asset.

Scarcity makes people confront the most basic questions in life: Who owns water? Where does it belong? What is it worth? In trying to answer, they become dangerous optimists, like us. ●

James Workman is a writer and authority on natural resource conservation.

25-29 MAY
EDINBURG, SCOTLAND
XVth World Water Congress – Global Water, a resource for development: Opportunities, challenges and constraints

Organised by: IWRA – International Water Resources Association
 In collaboration with Scotland’s Water, the IWRA Congress will promote in-depth discussions on the complexity of water policies, management, development and governance practices at the local, national, regional and global levels in a rapidly changing world as the fast evolving global landscape is driving decisions in the sectors’ policies, performance and prospects.
www.worldwatercongress.com

29 JUNE
NEW YORK CITY, USA
UNGA High-level Event on Climate Change

The President of the General Assembly will convene a High-Level Event on climate change which intends to provide impetus and political momentum for an ambitious climate agreement, by keeping the issue high on the agenda at the mid-point between COP20 in Lima and COP21 in Paris. It aims also to provide space for showcasing climate action and concrete initiatives, through multi-stakeholder approaches to address climate change.
<http://climate-l.iisd.org/events/high-level-event-on-combating-climate-change>

JUNE 2-3
PARIS, FRANCE
OECD Forum 2015 Investing in the Future: People, Planet, Prosperity
 An opportunity to share views on the most critical issues confronting the world today.
www.oecd.org/forum

JUNE 3-5
CAPE TOWN, SOUTH AFRICA
World Economic Forum on Africa 2015 - Then and Now: Reimagining Africa's Future
 The 25th World Economic Forum on Africa will convene regional and global leaders from business, government and civil society to take stock of progress over the last 25 years, share insights on the present landscape and identify innovative approaches to accelerate inclusive growth while bringing about sustainable development in the future.
www.weforum.org

JULY 13-16
ADDIS ABABA, ETHIOPIA
3rd International Conference on Financing for Development
 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.un.org/esa/ffd/overview/third-conference



Photo: UN

23-28 AUGUST
STOCKHOLM, SWEDEN
World Water Week in Stockholm: Water for Development

The annual meeting place to discuss the globe’s water issues. It is organized by SIWI. This year is the jubilee year for both the Week and the Stockholm Water Prize.
www.worldwaterweek.org

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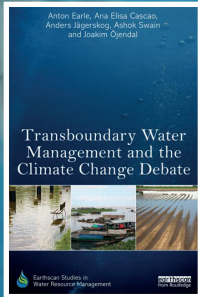
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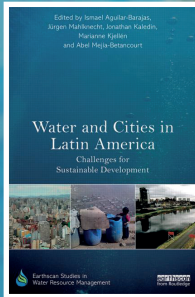


TRANSBOUNDARY WATER MANAGEMENT AND THE CLIMATE CHANGE DEBATE

By Anton Earle, Ana Elisa Cascao, Stina Hansson, Anders Jägerskog, Ashok Swain and Joakim Öjendal

ISBN: 978-0-415-83515-2
Published by Routledge
www.routledge.com

The starting point for this book is that actors within transboundary water management institutions develop responses to the climate change debate, as distinct from the physical phenomenon of climate change.

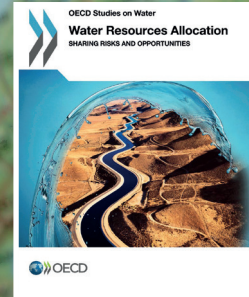


WATER AND CITIES IN LATIN AMERICA – CHALLENGES FOR SUSTAINABLE DEVELOPMENT

Edited by Ismael Aguilar-Barajas, Jürgen Mahlknecht, Jonathan Kaledin, Marianne Kjellén and Abel Mejía-Betancourt

ISBN: 978-0-415-73097-6
Published by Routledge
www.routledge.com

Pressure on water resources and water management in Latin American cities provide major challenges. There has been little coverage of the topic in book form. This work fills a gap in the literature by providing both thematic overviews and case study chapters.



WATER RESOURCES ALLOCATION – SHARING RISKS AND OPPORTUNITIES

ISBN: 978-9-264-22962-4
Published by OECD
www.oecd.org

“Designing fair and sustainable reform mechanisms in a participatory manner will be key to unlocking opportunities for improved water allocation”, comments SIWI Chief Economist John Joyce on the recently released report, to which SIWI was a key contributor.