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COP23 Bonn

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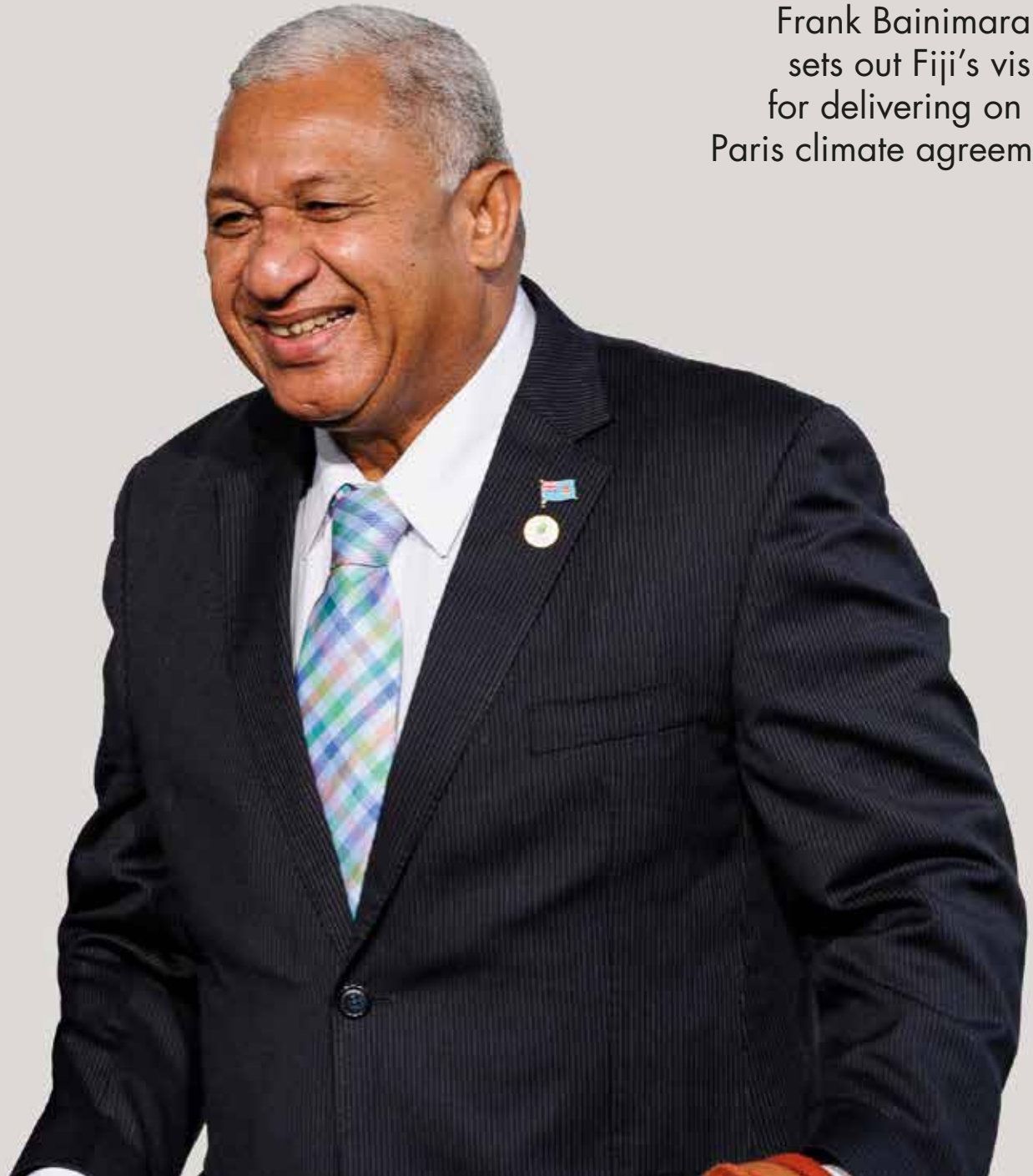
Responding to climate change

CLIMATE HOME

‘We are all in the same canoe’

Prime minister Frank Bainimarama sets out Fiji’s vision for delivering on the Paris climate agreement



Global Commons

"With the Sustainable Development Goals and the Paris Climate Agreement, the world's nations have provided momentum and direction that must be seized."

Naoko Ishii
Chairperson and CEO of the Global Environment Facility

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In 2017, one climate story has dominated the international news: Donald J Trump. The incoming president confirmed in June he intends to withdraw the US from the Paris Agreement his predecessor invested so much political capital in bringing to fruition. Every action of his administration backs that up, from axing climate finance to repealing the clean power plan.

But climate change is bigger than one man, no matter how obstructive. National leaders were quick to tell Trump the Paris pact is not open for renegotiation. Many US states and cities declared "we're still in".

Here in Bonn, Fijian prime minister and COP23 president Frank Bainimarama is pressing for ambitious action to protect communities vulnerable to global warming (p6), while California governor Jerry Brown is set to champion the role of subnational governments and business in pushing the climate agenda.

At Climate Home, we are proud to have published original, hard-hitting stories from all over the world. Check out our reports on Bangladesh's looming climate migration crunch (p8), mass murder on the Amazon's lawless frontier (p18) and Egyptian farmers' water security fears as Ethiopia's huge hydropower dam upriver gets closer to completion (p22).

Our international network of journalists is covering all the action from the COP. Don't miss a thing; sign up to our newsletter: **http://www.climatechangenews.com/newsletter-sign-up/**

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Thanks for reading and have a good COP.

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Editor, Respond magazine

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Recognizing Innovation

Invitation for Nominations 8th Award (2018)

Nominations open online until 31 December 2017

Winners for the 7th Award (2016)

Creativity Prize

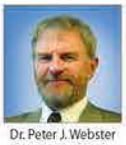
Rita Colwell (University of Maryland) & Shafiqul Islam (Tufts University)
for using chlorophyll information from satellite data to predict cholera outbreaks at least three to six months in advance.


Dr. Rita Colwell


Dr. Shafiqul Islam

Creativity Prize

Peter J. Webster (Georgia Institute of Technology)
for using data on ocean-atmosphere interactions on monsoon strength to provide up to two-week lead time forecasts of monsoonal floods for highly populated coastal regions.


Dr. Peter J. Webster

Surface Water Prize

Gary Parker (University of Illinois Urbana-Champaign)
for contributing to our understanding of meandering rivers, the shapes they take, and how they change themselves and their floodplains as they migrate.


Dr. Gary Parker

Groundwater Prize

Tissa H. Illangasekare (Colorado School of Mines)
for improving the fundamental understanding of fluid flow and chemical transport in porous media, leading to the reliable prediction of the long-term fate of pollutants in groundwater systems.


Dr. Tissa H. Illangasekare

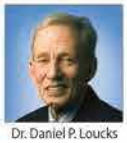
Alternative Water Resources Prize

Rong Wang & Anthony G. Fane (Nanyang Technological University, Singapore)
for developing hollow fibre membranes that combine forward and reverse osmosis with a previously undiscovered positively charged nanofiltration-like selective layer, greatly reducing the effects of scaling and flux losses.


Dr. R. Wang Dr. A. G. Fane

Water Management & Protection Prize

Daniel P. Loucks (Cornell University)
for the development and implementation of systems tools that provide an effective, dynamic, and successful framework for addressing practical water resources management problems worldwide.


Dr. Daniel P. Loucks

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2017 in climate news

January

Scientists discover an area of peatland the size of England in the Congo jungle, which stores a massive 30 billion tonnes of carbon.

Global sea ice falls to the lowest level on record, as natural variability in the Antarctic swings in the same direction as warming-driven low ice cover in the Arctic.

Photo credit: Pixabay

June

Donald Trump announces his intention to pull the US out of the Paris Agreement, arguing it harms America's economic interests.

France's Emmanuel Macron and the former "governator" Arnold Schwarzenegger subvert a Trump slogan, pledging to "make our planet great again". World leaders reaffirm their commitment to Paris, while a coalition of US states and cities declares "we're still in".

Photo credit: Michael Vadon/ Wikimedia Commons

July

A G20 leaders' summit ends in division, with the US opting out of a statement affirming commitment to the Paris climate agreement.

India commissions three research institutes to draw up long-term low carbon growth scenarios.

August

Marshall Islands climate champion Tony de Brum dies at home, aged 72. **Obituary p24**.

A gas tanker crosses the Arctic northern sea route without an icebreaker escort for the first time. The Russian coastline is opening up to trade as sea ice retreats. **Full story p14**.

The death toll for South Asian monsoon flooding exceeds 1,200, with millions displaced.

September

Hurricane Maria follows Irma and Harvey in one of the most destructive seasons ever for the Caribbean and southern US. Scientists point out warmer than average seas fuel stronger storms - a signature of climate change.

In solidarity with hurricane victims, Nicaragua belatedly announces plans to join the Paris Agreement, which it previously rejected as inadequate.

February

Sweden's deputy prime minister Isabella Lovin goes viral with an all-female photo announcing an ambitious climate law. It is a clear dig at US president Donald Trump, who a week earlier signed an order restricting women's access to abortion worldwide, surrounded exclusively by men.

Photo credit: Facebook/Isabella Lovin

The World Meteorological Organization warns climate change is pushing the world into "uncharted territory", following three record-breakingly warm years in a row.

The number of coal power plants in planning worldwide halved in 2016, a report from Coal Swarm, Greenpeace and Sierra Club finds. A freeze on projects in China and India improves the odds of meeting international climate goals.

April

An entire Canadian river changes course in four days, as a result of glacier melting. The Slims River in Yukon switched from flowing into the Bering Sea to Kaskawulsh River.

Brazil sees its worst land-related mass murder in decades. Deep in the Amazon, forest clearance and conflict go hand in hand. **Full story p18**.

Photo credit: www.flickr.com/photos/uwnews/33920496366

May

Exxon Mobil's shareholders win a landmark climate resolution, forcing the world's largest oil company to "stress test" its portfolio against a 2C global warming limit. **Full story p26**.

China's Xi Jinping talks up clean energy and science cooperation at the first forum on his "belt and road" overseas investment strategy. But the country remains the biggest backer of coal power development worldwide, which threatens to bust climate goals.

October

New York announces plans to go carbon neutral by 2050, in line with the tougher 1.5C warming limit in the Paris Agreement.

Germany's Green party makes climate action - a coal phase-out plan and clean transport strategy - a priority in negotiations to form a coalition government with a free market liberal party and Angela Merkel's conservatives.

From Fiji to Bonn, we are all in the same canoe

As the first Pacific island president of a UN climate summit, I will draw on the spirit of talanoa to build a safe climate for our shared prosperity

Frank Bainimarama, prime minister of Fiji

It is clear that global warming changes our very understanding of what our national interests are. It challenges us to understand that the only way for every nation to put itself first is to lock arms with all other nations and go forward together.

Anything else is self-destructive—for the world and for each nation. It may be tempting for political leaders to show that they are protecting some national industry or near-term economic goal, but at what cost? The wise leader must work hard to convince the people to embrace the path we know we must take.

There is no choice to be made between prosperity and a healthy climate. For how prosperous can we be if we must devote our resources to relocating entire populations or reinforcing major cities? What does it cost to find new places to farm? And what about the consequences for global and regional security if nations begin to compete for safe land or have conflicts over the movements of climate refugees? It is obvious that we need to cooperate.

The drua *is a traditional Fijian ocean-going canoe. Photo credit: www.druaexperience.com*

We need to learn from each other and to use the world's considerable resources to do the most good for the most people. We need to continue to create prosperity and to ensure the well-being of the nations and ecosystems of the world. If we view this as some sort of negotiation in which each country tries to preserve its narrow national interests, we will all lose. We will be powerless to protect our own people from the consequences of climate change. Collective action is the only way forward. Wise men and women will understand that.

That is why I took on the role of COP President, why I eagerly embrace becoming the first Pacific Islander to do so. Because it is about ensuring that my own people flourish and prosper now and into the future. And by collaborating with the other nations of the world through this process, we ensure that together, humanity can flourish and prosper.

Our presidency would not be possible without the wonderful assistance of Germany. We have forged a bond with Germany that is an example to the world of how countries at opposite ends of the earth and of vastly different means and size can work effectively towards a common goal.

Fiji is deeply conscious that governments alone cannot meet this challenge. Which is why we are placing such emphasis on the notion of a grand coalition of governments at every level, civil society, the private sector and ordinary citizens moving this agenda forward. I am reaching out to governors, mayors, leaders of every sort across our societies. People of faith. People on the front line of the climate struggle. Women. And the young people who represent our future.

We are going to do things in Bonn differently. The formal proceedings will be led by our chief negotiator, Ambassador Nazhat Shameem Khan, and I will play a roving role. I will be on hand to resolve any difficulties in the formal negotiations. But to reflect the importance of our grand coalition, I will be travelling between the two zones in Bonn - the formal negotiations and the climate action zone - with my good friend, our climate champion, Inia Seruiratu, and my fellow Pacific leaders. I am counting on them to help me get the message across that only by working together can we move this process forward further and faster.

In the climate action zone - the Bonn Zone - Fiji and Germany are bringing together all those who have a part to play in making this grand coalition a great transformation. Climate activists, companies at the cutting edge of technology, artists and creative people, dancers and performers. And we will be stamping this zone with the Fijian *bula* spirit of optimism and inclusiveness that has made our islands famous the world over.

In the formal zone – the Bula Zone – we want the nations of the world to embrace what we call the *talanoa* spirit in Fiji and certain other Pacific countries - a dialogue based on trust, empathy and the collective good. In our experience, it is the best way of getting things done, especially in difficult circumstances. Engagement that is respectful, honest, cooperative and acknowledges that no-one, no matter how powerful, can solve the climate challenge on their own. For humanity to survive, flourish and prosper, we have no alternative but to cooperate.

As we all know, the Paris Agreement calls for global warming to be kept well under 2C over that of the industrial age and as close as possible to 1.5C. A year ago, I stood here before being appointed President of COP23 and called for 1.5C to be our target. I meant it then and I mean it now. There is an urgent need to fix this number as our objective.

I certainly carry with me the authority of the Pacific to pursue this objective. And at this point, I want to pay tribute to a Pacific islander who we have just lost but whose legacy will live on in these negotiations. Tony De Brum of the Marshall Islands took a very powerful slogan to Paris two years ago: "One point five to stay alive". We intend to honour Tony's legacy. And I intend to draw upon his spirit during my presidency.

As well as ensuring decisive action to limit global warming, we must also do a lot more to make nations and communities more resilient to the effects of climate change. We know we are all going to have to adapt. But we must make special provision for those who are most vulnerable and have the least resources to cope with the catastrophic consequences we are witnessing all around us.

We are pleased to be part of a serious engagement with governments and the private sector to secure innovative and more affordable access to insurance to enable those affected by disaster to recover more quickly. It is a question of fairness and economic development. Because without insurance, restoration and rebuilding is simply too great a burden for many nations and communities.

We are also encouraged by the rapid development of clean, affordable alternative energy solutions for countries across the world. This offers great promise that we can achieve this 1.5C target and prosper.

Frank Bainimarama, prime minister. Photo credit: government of Fiji

There is an urgent need to fix 1.5C as our objective

I am in no doubt that the role that I have embraced as COP23 President is the most important any Fijian leader has undertaken. I appeal to my fellow Pacific leaders to support me as we tackle the greatest challenge to our own region and the greatest challenge to the world. I want to acknowledge the work of the Alliance of Small Island States these past 30 years, which has consistently looked after the interests of our people. And has reminded the world that our interests are the interests of every global citizen.

We are all in the same canoe. Which is why we will have a Fijian ocean going canoe – a *drua* – in the main hall in Bonn to remind everyone of the need to fill its sail with a collective determination to move this process forward. To deliver on the promise we made to each other in Paris.

This is an abridged version of a speech delivered by Fiji prime minister and COP23 president Frank Bainimarama to the UN general assembly, New York, on 21 September.

What will become of Bangladesh's climate migrants?

Millions of people on the Bengali coast are vulnerable to rising sea levels and may have to leave their homes. Meet the forerunners of a looming existential crisis for the south Asian country

By Megan Darby

When Cyclone Aila hit the coast of Bangladesh in May 2009, water swelled over embankments along the Kholpetua river.

The home Sirajul Islam (pictured) shared with his wife and four children in Kolbari village was flooded, along with the single acre he used to raise shrimp.

They left for Shyamnagar town, 15km away, where for four months he made 300-400 taka a day ($4-5) driving a rented motorbike.

When the floodwater subsided, his field was too salty for shrimp. Village buildings were flattened and there was no fresh water to drink. So in 2011, the family went to seek their fortune in the capital Dhaka.

"The cyclone had broken my economical backbone by destroying everything," says Islam. "If there had not been such a big cyclone, I would not have moved to Dhaka."

Bangladesh's prime minister Sheikh Hasina has told the UN that a one-metre rise in sea level – a plausible scenario this century – would submerge a fifth of the country and turn 30 million people into "climate migrants".

Islam shows off a set of deer antlers, a trophy from hunting in the Sundarbans, across the river. Most of the household income is from selling fish, crab and honey gathered in the mangroves – supplemented from his eldest daughter's wages at a garment factory in Chittagong.

If there were to be another cyclone, Islam says "I would fight" to stay. It is not likely to get any easier, though. Sea levels are set to rise, compounding the problem of salt intrusion into groundwater. Tropical cyclones are expected to get more intense and destructive with global warming. In combination, they raise the risk of another devastating storm surge.

Dislocation: Sirajul Islam and his family left home for five years after Cyclone Aila destroyed his coastal livelihood

Over the past two decades, Bangladesh's rural population has been pouring into its cities. A 2014 slum census found the number of people living on the margins of cities had doubled to 2.2 million since 1997. Meanwhile, the population in southwestern coastal regions is stagnating.

A smaller, but significant, number of displaced people cross borders, which is where it becomes a matter of at least regional, if not international concern. Up to 20 million Bangladeshis are said to be living illegally in neighbouring

India. A militarised fence along 70% of the 4,000 kilometre frontier sends an unwelcoming signal. Still, people find ways to evade the patrols, typically by boat across the rivers.

Zainab Begum (pictured), a 40-year old woman collecting water from Gabura village pond, across the river from Kolbari, has two younger sisters working as waste pickers in Tamil Nadu, a southern Indian state.

With their families, they have crossed the border illegally several times. It is a risky business: one got caught and was badly beaten by Indian border guards, detained for a week before she could bribe her way out.

There was little to keep them in Gabura, one of the worst hit areas by Aila. Not a single house was left standing, says Begum, a fierce note in her voice. The levee that was supposed to keep the river out trapped a layer of sludgy, salty water on the land for three whole years. She lived in a makeshift house on the embankment; others with more resources left permanently.

Eventually, the government helped them rebuild. A three-storey cyclone shelter stands proud at the heart of the village. But land that was previously good for one rice crop a year became too salty: now it is all shrimp.

In this battered economy, Ziaur Rahman is trying to make a living teaching English and maths to private students. With a degree from Khulna University, he shows more awareness than most about the global trends affecting his country. He tells Climate Home in English: "I know about climate change. When climate change in this place, we are not happy."

The number of people living on the margins of cities has doubled to 2.2 million since 1997

The outlook is not all bleak. Just as farmers adapted to fattening shrimp, now some have turned to crab, which can tolerate higher salinity. They do not eat it round here: it is "haram" (forbidden) for the Muslim majority and at 250 taka ($3) apiece in the market, beyond most budgets. But there is strong demand from China and Malaysia. A small plant in Kolbari packs the shellfish for export.

The scale of migration from vulnerable areas will depend on the success of these adaptations, as well as the severity of climate change impacts.

How many?

Prime minister Hasina's forecast of 30 million climate migrants is widely disputed, inside and outside Bangladesh.

Analysis by Climate Central, a US-based science outreach organisation, paints a less dramatic picture. It finds fewer than a million Bangladeshis living within one metre above sea level. Under five metres, the number is still less than 30m.

"It is a troublingly large difference," says Ben Strauss, a biologist by background who leads Climate Central's sea level work.

The government estimate has been in currency for at least seven years, its source apparently lost along the way. An official in the environment department could not say exactly where it came from, suggesting it was a rough assumption based on the population of 19 coastal districts.

Climate Central's "Surging Seas" model is more transparent and there are identifiable reasons why it might err on the conservative side.

Firstly, Strauss explains, they use land elevation data from NASA's Shuttle Radar Topography Mission (SRTM). It is the best publicly available dataset for Bangladesh, but it has limitations. The satellites cannot tell the difference between the tops of buildings or trees and the soil. In places where there is more precise light detection data to compare with, SRTM has been found to overstate the height of the land on average by more than 2 metres.

Secondly, it represents a narrow definition of those affected by sea level rise. Surging Seas maps out homes that will fall below the high tide mark or be exposed to annual flooding. But a household does not have to be under water for its members to feel the impacts of the creeping tide.

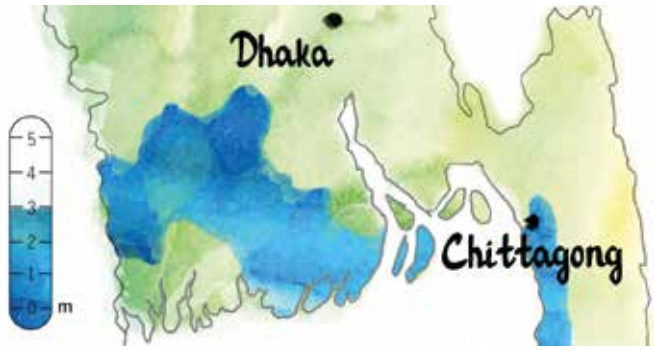
All along the coast, saltwater intrusion is hitting crop yields, contaminating drinking water and eroding infrastructure. Other things being equal – and the amount of freshwater India draws from upriver plays a major role – sea level rise will push salinity further inland.

(It is worth mentioning that rising seas are not the only climate change impact Bangladesh faces, just the most predictable. Earlier this year, abnormally heavy pre-monsoon rainfall wiped out 2m tonnes worth of rice crops in the northeast. Flooding, drought and ocean acidification are rising threats.)

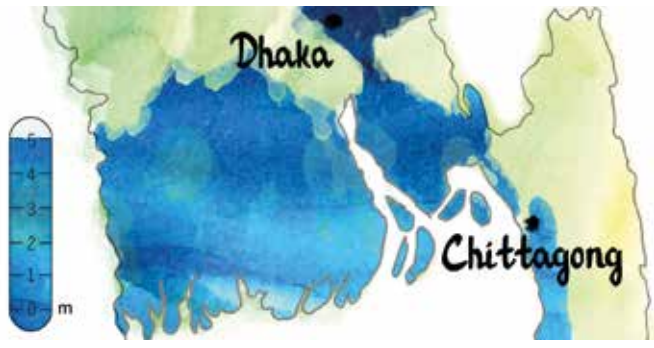
The flipside is that Surging Seas does not account for the thousands of kilometres of embankments that surround coastal settlements. Indeed, the ability and willingness

Some inhabited parts of Bangladesh are already below sea level, with embankments to keep the water out

Up to one metre of sea level rise globally could happen this century



Land subsidence means that some areas could experience faster sea level rise than the global average. The western Ganges delta is thought to be particularly vulnerable, although data is limited



In the far future, 2C of global warming is expected to unleash 4.7m of sea level rise, swamping much of Bangladesh. This could take between 200 and 2,000 years. (illustrations based on Surging Seas data visualisation)

to defend these homes may be more pertinent than the technical accuracy of measuring equipment.

Veteran Bangladeshi climate researcher Ahsan Uddin Ahmed is sceptical of mass migration predictions. Accepting that salinity is going to push northwards and some crops will become unviable, he nonetheless places great faith in the capacity of Bangladeshis to adapt.

"Salinity is no longer a hopeless scenario," he tells Climate Home from the office in his Dhaka apartment, expounding knowledgeably on mango orchards, pond sand filters and capillary action. "Through innovation and research, the tide has been diverted in a different direction."

The government is adding 30cm to the height of embankments, he says: "There is no reason we would not be able to match up with the gradually rising sea level. Our economy will allow further protection."

The experience of communities like Kolbari and Gabura shows the fragility of such gains. For all their ingenuity adopting shrimp cultivation, a tropical storm dealt a huge setback. At category one, Aila was not even an exceptionally strong cyclone.

And traditional defences may be counterproductive. The levee that was supposed to protect Gabura became a liability when the floodwater got in and could not get out again.

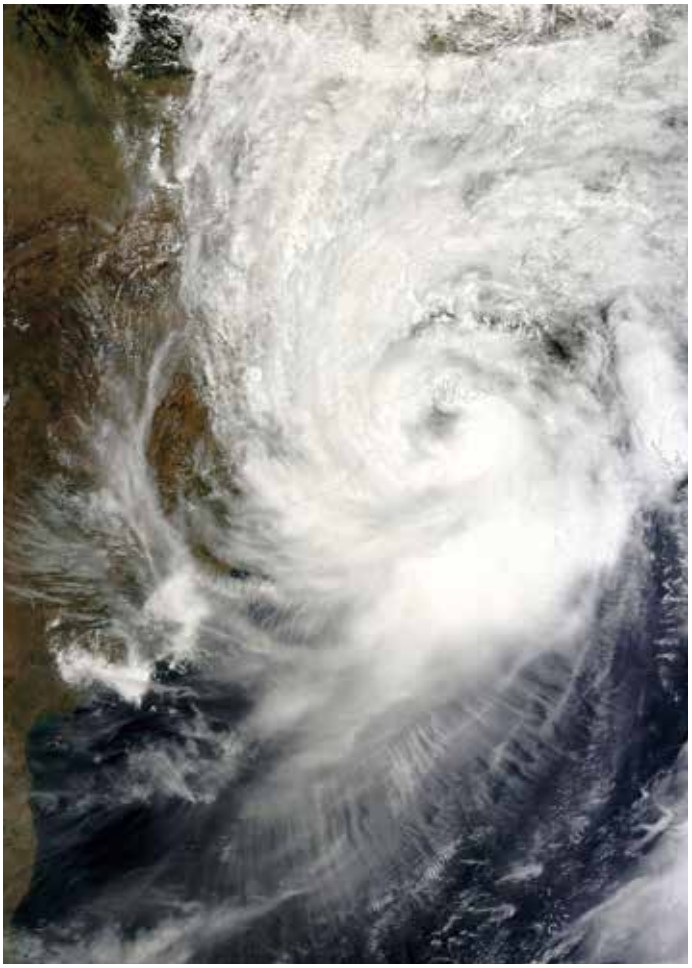
A 2015 study concluded that embankments do more harm than good, causing the land to subside.

Recovering from such crises is putting a drag on Bangladesh's economic growth, with the Asian Development Bank forecasting annual climate losses by 2050 will amount to 2% of GDP.

But none of these vulnerabilities, real as they are, lead inevitably to migration.

Alex Randall, migration expert at UK-based NGO Climate Outreach, argues it is futile to try and quantify climate migration. "Large numbers of people are already moving from rural areas in Bangladesh into cities. It makes more sense to see climate change as a force that adds to this existing trend, rather than trying to pick out a number of people who will move because of climate change," he says.

In some cases, climate impacts may even prevent people moving, he adds, as they become too poor to make the leap. "The ways in which climate change will re-shape patterns of rural to urban migration in Bangladesh are not straightforward."



But if the medium-term prognosis is not as clear-cut as official rhetoric implies, the ultimate destination of human-caused global warming is sobering.

Surging Seas' "seeing choices" interactive shows that 2C temperature rise – the upper limit countries have agreed to try and stay below – is consistent with 4.7m of sea level rise. That turns most of southwestern Bangladesh – and the city of Chittagong in the east – blue on the map. Unchecked pollution locks in sea level rise that ultimately swamps half the country, including its three biggest cities: Dhaka, Chittagong and Khulna. The timescale for this could be anywhere from 200 to 2,000 years.

"It is very plausible that the amount of carbon we put in the atmosphere between today and 2050 will determine whether Bangladesh can even exist in the far future," says Strauss. "Our emissions pathway does not make a big difference for mid-century sea level rise. It makes a consequential difference by the end of the century and it makes an existential difference after that for Bangladesh."

Where will they go?

Travelling inland from the salt-soaked coast, the trees get taller, the cows wandering across the road fatter, the crops more diverse: jute, banana, bitter gourd. Every field and pond is in use; there is seasonal work to be found, but no permanent home for the dispossessed.

Nazzma Begum came from Bhola, on the coast, as an 18-month-old baby. Now 32 and a widow, Dhaka is her only home: her parents lost everything to river erosion. She shares a single room with her two children in the generically named "boat ghat" slum and makes a living cooking and cleaning for wealthier families.

City life has its upsides: Begum loves the cinema, naming her elder son after film star Shakib Khan. An electric light and ceiling fan is included in the 1,800 taka ($22) monthly rent. But her flimsy shack lets mosquitoes in and she is suffering from the chikungunya virus – a disease that causes severe joint pain.

Her neighbour Mohamed Miraz, also from Bhola, came to Dhaka after one too many fishing nets came up empty. If he can save enough, he will go back and buy land. A single acre costs as much as he earns in a thousand days pulling a rickshaw. The struggle to escape poverty is relentless. The population of Dhaka has roughly doubled in 20 years to 19 million, its rapid growth not matched by its planners.

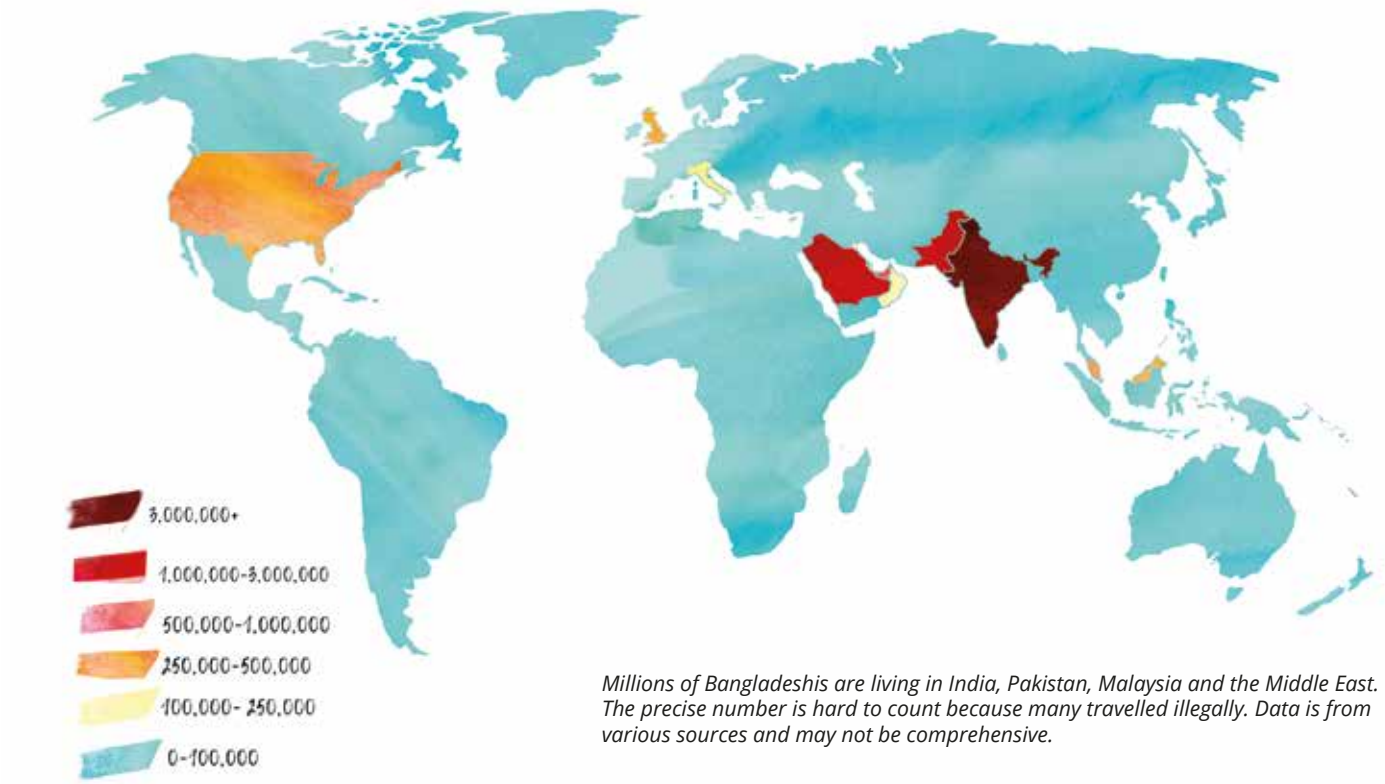
Ponds and canals have been concreted over with no regard for the natural drainage they provided. Monsoon rainbursts frequently submerge streets in knee-high water.

Climate change will only intensify the pressures that drive people to the capital. If the slums are claustrophobic, the alternative – leaving the country – is daunting. India is welcoming enough to middle class Bangladeshis doing their Eid shopping, but an armed border patrol is there to deter unskilled labourers. Catching a plane to a wealthier nation is an outrageously expensive gamble. For every success story, there are cautionary tales of exploitation.

The UN Population Division estimates the Bangladeshi diaspora at 7.2 million, which is almost certainly an understatement. India alone claims to have 20 million Bangladeshis living within its borders, most of them illegally, although that could equally be an exaggeration.

Awareness of climate migration is well established at an international level. "As regions become unliveable, more and more people will be forced to move from degraded lands to cities and to other nations," said UN secretary-general Antonio Guterres in a speech on climate change.

Plans to deal with it are embryonic, however. A task force on displacement under the auspices of UN climate talks had its first meeting in May. Its work plan grapples with patchy data and institutional clashes.



Millions of Bangladeshis are living in India, Pakistan, Malaysia and the Middle East. The precise number is hard to count because many travelled illegally. Data is from various sources and may not be comprehensive.

There is no ready source of financial support directed at climate migrants, nor do they have any protected status under international law if they cross borders.

In most cases, climate migrants are not easy to distinguish from economic migrants: they arrive looking for work. The welcome they receive hinges more on the value of their labour than any duty of care to the climate-afflicted.

In Khulna, the third largest city in Bangladesh and regional capital of the southwest, technical education was as important as buildings in accommodating the people who arrived after Cyclone Aila and myriad smaller crises.

A pilot offering vocational training – phone repair, welding, sewing – to new arrivals recently marked its first 25 graduates. Eight of the city's 278 slums are in line for infrastructure upgrades, funded by German development banks.

"It is not enough," admits city mayor Moniruzzaman Moni, (pictured) holding court at his "club" one evening.

At between 2 and 4 metres above sea level, enmeshed in the Ganges-Brahmaputra river delta, Khulna is only marginally safer than the coastal villages. When heavy rainfall coincides with the high tide, water washes through the streets.

There is no ready source of financial support directed at climate migrants

"Khulna is one of the most vulnerable cities in Asia," says Moni. "This is because of climate change. Fifty years ago, the situation was not like this but now it is changed."

As though to demonstrate, during the half-hour audience rain lashes down and a large puddle forms outside the door. Bricks are laid out to step across to dry road.

Moni hopes that his grandchild will be able to stay in Khulna, where his family has lived for generations. But it will require "major projects" to keep the rising sea at bay. Meanwhile, he cannot deny the trend for outward migration.

"A large number of people, they are moving to Malaysia, India, Pakistan and the Middle East. These are climate-affected people. Officially, we have the number, but unofficially more and more people are going."

Gas tanker crosses thawing Arctic without icebreaker for first time

By Megan Darby

Sovcomflot vessel cut through thinning sea ice on the northern sea route to carry its cargo of fuel from Norway to South Korea in record time

A commercial ship has crossed the Arctic's northern sea route without an icebreaker escort, in the first such voyage logged by Russian administrators.

After embarking on her maiden voyage from Moscow on 31 July, the Christophe de Margerie completed the northern sea route in record time: six and a half days. She carried a cargo of liquefied natural gas (LNG) from Norway to South Korea in 19 days, about 30% quicker than a typical passage by the Suez canal.

"It was a significant thing to order this vessel, it was a significant first, it had not been done by anybody before," Sovcomflot spokesperson Bill Spears told Climate Home.

Maritime traffic along Russia's northern coastline is increasing in tandem with industrial developments, enabled by global warming. State company Rosatomflot reported a doubling in demand for its nuclear icebreaker escorts between 2015 and 2016.

Spears said: "There has always been a window in the summer period where we have been able to go through there with an icebreaker escort. Now, that window is getting a little bit longer. That obviously reflects different climatic conditions."

Designed to plough through sea ice up to 2.1 metres thick, the Christophe de Margerie can operate independently and not only in the summer months, giving her an edge over competitors. The Cypriot-flagged vessel is named for the former chairman of French oil major Total, who died in a plane crash at a Moscow airport in 2014.

The Christophe de Margerie is capable of sailing through ice up to 2.1 metres thick (Pic: Sovcomflot)

The Age of Sustainalism: the new socio-economic growth model for an inclusive 21st century

By Harry Verhaar, Head of Global Public and Government Affairs, Philips Lighting

It is becoming ever more clear that the major global trends which are having the greatest impact on the world around us are not only increasingly intertwined, but are also becoming ever broader in their impact, affecting a greater number of regions and citizens.

Global hunger is on the increase, for the first time in over a decade. According to the annual United Nations report on world food security and nutrition, this increase is primarily due to climate-related shocks and the growth in the number of violent conflicts. The report also points to concern at the number of overweight children and obese adults, with changes in dietary habits and economic slowdowns cited as some of the drivers of these trends. The authors of the report state that the world will not "end hunger and all forms of malnutrition by 2030 unless we address all the factors that undermine food security and nutrition. Securing peaceful and inclusive societies is a necessary condition to that end."

The impact of climate change has thus far been most keenly felt by the citizens in the developing world. However, this year's intense and destructive hurricanes, which tore through the Caribbean and then hit the southern USA, suggest that even the wealthiest country on the planet is not immune to the consequences of a changing climate.

It should be clear that we cannot continue to look at the challenges facing the world in isolation. It may be comforting to do so, as focusing on a single issue can provide for greater clarity and easier communication. But this approach has the danger of simply storing up trouble for future generations.

Our focus on measuring global success through GDP growth has trapped us in a linear view of society – focused on extracting, consuming and emitting resources from energy to water, materials and food. We need to become much smarter, more resource-efficient and change from a linear approach to a circular society, in which long term quality of life becomes the most important metric. This would ensure that while economic competitiveness remains important, our society would have at its core the health and well-being of all our citizens.

By adding a focus on social equity and inclusiveness, we can enter an age where the socio-economic model becomes about Sustainalism, building on the foundations laid by capitalism and socialism, but taking the broader view which the challenges of today and tomorrow demand of us.

That broader view of Sustainalism will take us

From	To
More is better	Better is best
Lowest initial cost	Least lifecycle cost
Open product chains	Closed systems / cycles
Invoicing products / hardware	Leasing / financing
Product focus	Service focus
GDP metrics	Quality of life metrics

No-one is unaware of the need for our products and processes to become more energy efficient and yet, often due to a focus on the short term, there remains a reluctance to make the transitions required.

To arrive at a carbon neutral world by 2050, we need to drive overall energy efficiency improvements of at least 3% per year. "We" – industry, transport, public infrastructure, homes – must at least double the rate of energy efficiency improvement, primarily by accelerating infrastructure renovation to around 3% per year. In parallel with this we also need to be moving to clean energy sources at a rate that also equates to 3% of our energy mix per year.

Critically, the current rate of energy efficiency improvement hovers at around 1.5% per year. At the same time, demand for energy continues to rise at about 3% per year driven by population growth, increased prosperity and mobility. Simply doubling the rate of energy efficiency improvement would reduce global energy costs by more than $2 trillion by 2030, slash the average household energy bill by a third, and create more than six million jobs by the end of this decade.

There are two main elements required to double the rate of energy efficiency improvement. The first is accelerating the renovation of existing infrastructure in developed countries. Secondly, there needs to be a focus on helping developing countries leapfrog to clean technologies such as solar-LED and combine these with new business models. It is a sad fact that many of the countries which have suffered the most from climate change have been least responsible for creating it. It is vital that developing countries do not follow the same destructive phases that the richer nations of the world have been through.

When speaking about energy we often talk about individual technologies and their potential in their respective silos. In reality we must pursue them all. Energy efficiency, renewable energy and carbon engineering are all needed. Only by enacting all of them in unison will we be able to achieve the ultimate goal of carbon neutrality in the coming 40 to 50 years. The International Energy Agency projects that energy efficiency needs to do over half of this job. One could say that by combining energy efficiency and renewable energy we can decarbonize society twice as fast and twice as cost-effectively.

The fact is that many of the technologies we need already exists, all that's required is to take a longer-term view, and use it.

LED lighting is a perfect example. LED street lighting uses at least 40% less energy than conventional lighting and has been around for years, and yet we still cling to outdated and inefficient technology. Globally, lighting accounts for about 15% of all electricity consumption. We project this will decline to 8% in 2030 while over the same period the global tally of light points will have increased by 50% to 70 billion. Simply adopting LED in place of incandescent lighting would reduce energy consumption by a massive 53% and CO2 emissions by 1,400 million tonnes.

Moreover, innovation brings benefits beyond energy efficiency. Looking at lighting specifically, around one in seven of the world's population (some 1.1 billion people) are trapped in light poverty because – cut off from the grid – they have no access to electric light. As a result, they are forced to use alternatives such as kerosene lamps and candles to light their homes – which claim an estimated 1.5 million lives every year through respiratory illnesses and fires.

But off-grid solar LED lighting solutions can help to end this injustice, at a fraction of the long-term cost of kerosene or typical infrastructure, while stimulating social and economic development as communities are brought out of the dark.


Street lighting, LA

However, in all these cases what can hold the development back is the initial up front cost. The cheapest individual lightbulb to buy remains the incandescent bulb – yet viewed over any length of time, it becomes the most expensive.

It is also extremely limited technology. In contrast, LEDs can now be embedded with sensors and intelligence so they can be connected wirelessly and managed remotely via the internet. This connected lighting for smart buildings and smart cities can further boost the initial energy savings by up to 80%.

The benefits of this connected technology can be measured in much greater terms than simple energy savings. Businesses can enable employees to personalize their lighting and temperature at their workspaces via a smartphone app, with associated improvements in both productivity and employee well-being. In addition, building managers can receive real-time data on how the office is being used, how much space is required, and how to optimize the space they have.

The benefits of connected lighting can be seen on a city-wide scale. For instance, the City of Los Angeles has converted 140,000 street lights to LED and has 110,000 nodes connected and managed through a Philips Lighting CityTouch connected street lighting management system. Not only does this allow the city to remotely manage and monitor the lighting, acoustic sensors can be used to detect vehicle collisions and thus reduce the emergency response time. Other benefits include a 21% reduction crime in areas where the improved lighting was introduced and a 30% reduction in night-time traffic accidents.

Buenos Aires is another city that has retrofitted its street lighting system with connected LED lighting, creating a safer, more welcoming environment to improve the quality of life of its residents, while also saving 50% in operating costs.

Better lighting can also have a significant impact in schools. In a year-long trial in a French primary school, a new system that allows the teacher to optimise the classroom ambience found that reading speed increased by 35%, while frequency of errors dropped by nearly 45% and hyperactive behaviour by 76%. All of these factors can provide a major boost to children's enjoyment of their school day and their ability to learn.

The key in encouraging the adoption of this type of technology is delivering the message that it does not require a sacrifice, or that we are looking at experimental concepts, but that the technology is already available and simply needs accelerating. This must take place through replicating best practice, putting the right policies in place, and communicating effectively.

We need to convince society's 'eco-majority' – those who are aware of the need to act, are willing to do so, but are uncertain about the steps to take. Creating momentum with this group will help embed Sustainalism as the new mainstream economic model.

We need a paradigm shift – slightly revised capitalism or moderated socialism are not going to suffice. We need Sustainalism, a new, inclusive and more equitable socio-economic model of a 21st century to meet the needs of the 10 billion people who in just a few decades from now will share the single planet that we call home.

http://lighting.philips.com

PHILIPS

Worst land-related killings in decades expose Amazon's lawless frontier

By Fabiano Maisonnave in Taquarussu do Norte

Nine men were brutally killed in April in a remote Brazilian settlement where deforestation, land grabbing and violence go unpunished

Nine men were stabbed or shot dead on 19 April over a territorial dispute in a remote area of Mato Grosso state, deep in the Amazon rainforest.

In the afternoon, hitmen swept through the land in question, known as Linha (road) 15, killing everyone they found. Some of the bodies bore signs of torture.

The worst land-related slaughter Brazil has seen in 21 years reflects a chronic ambiguity around land rights. On this lawless frontier, far from the gaze of the authorities, forest clearance and conflict go hand in hand.

The rampage happened in a remote region, accessible only by an unpaved road. The closest city, Colniza, is a 7-hour drive in the dry season; when it rains, it can take days. Communication here is so hard that the police were not notified of the crime until almost 24 hours later.

On 26 April, Climate Home was the first media to visit the crime scene. The journey involved an hour's flight in a rented aeroplane followed by a three hour drive in a 4×4 vehicle.

Around 120 families live in a rural community called Taquarussu do Norte, a smattering of wooden houses with water wells and bathrooms in the backyard and no electricity. Several of them are the offspring of settlers who colonised the neighbouring state of Rondônia in the 1970s and 1980s. Now, they have found their own land to farm. Known as posseiros, or squatters, they have no legal claim and take their chances with the inconsistent law enforcement.

Credit: Google maps

Fearing more attacks, most inhabitants left the region after the violence, especially women and children. In the area where the slaughter took place, dogs roamed inside the houses in search of food and their deceased owners.

After the attacks, state police arrested two men they suspect of carrying out the murders on the orders of a timber merchant. Squatters, however, said they had a good relationship with loggers (all of them illegal) and blamed unnamed rival farmers for the attack.

Everything in Taquarussu runs informally. Despite the fact they have occupied some 20,000 hectares since the early 2000s and that selling and buying lots are common, none of the families has land titles. As one squatter who asked to remain anonymous put it, "the only document is our presence here".

The two government agencies in charge of land regulation of that area disagree about who owns the land. Incra (the Brazilian Federal Agrarian Reform Agency) said it belonged to Mato Grosso state. Intermat, the state land management agency, said it had belonged to a private owner since 1984, but could not name the owner.

This imprecision is no exception. Official figures gathered by Imazon, an non-profit research institution, show that there are about 160,000 land claims pending regularization.

Moreover, there are 71.3 million hectares of public vacant lands in the Amazon, an area twice the size of Germany. These are vulnerable to illegal logging and land-grabbing, according to data gathered by another independent research institute, Ipam Amazônia.

House of farmer-squatter and evangelical pastor Sebastião de Souza in Taquarussu do Norte, Brazil; his body was found on the floor with a machete in the neck (Photo: Fabiano Maisonnave)

"Land regularization in the Amazon is an essential requirement for conflict reduction, curtailment of deforestation and implementation of more sustainable policies in the region," says an Imazon report published last month.

Under Brazilian law, 80% of any rural property in the Amazon must be preserved as primary vegetation. Prior authorisation from federal or state environment agencies is needed to cut any forest. In practice, squatters flout these rules with impunity.

Cláudio Gonzaga, a prosecutor in Cotriguaçu, an Amazon town not far from Colniza, said politicians and local merchants were typically the ones to lead and finance land-grabbing of these areas, taking advantage of the infamously slow Brazilian judicial system and feeble law enforcement.

The invasion process, described by Gonzaga, includes a topographical survey for land division, illegal logging in order to finance the whole process and eventually the use of cleared land for crops or ranching. By the time the authorities catch up, tens or hundreds of acres of forest may have been destroyed.

Besides feeding violent conflict, the legal uncertainty is a major impediment in fighting deforestation, according to Evandro Selva, the regional head of Ibama, Brazil's environmental protection agency.

"In most cases, our effectiveness depends on land regulation agencies," said Selva, who led a raid on Taquarussu in 2015, in a phone interview. One of the squatters who died in the slaughter was fined for deforesting 22 hectares.

"During the inspection, the farmer-squatters argued: 'How can we get a deforestation authorisation if we don't have the land titles?'"

The victims

Sebastião de Souza, 57
Pastor of the Assembly of God Church in Guatá, about 140 km north of Taquarussu. He was one of the squatters of the area subject of dispute, known as Linha (road) 15. Previously in 2014, his home at the site was burned down. He was found with a machete buried in the back of his neck.

Fábio dos Santos, 37
A father of four and member of de Souza's congregation, dos Santos worked mainly as a bricklayer. Pastor de Souza hired him to clear the land – the day rate for labourers is about $17 in the region. He lived in Guatá and had no land.

Ezequias de Oliveira, 26
A squatter in Taquarussu, de Oliveira's lot is outside the disputed area. He was onsite working as a day labourer and also belonged to the Assembly of God.

Edison Antunes, 32
Another squatter who was working in Linha 15 as a day labourer. He was the deacon of the local Assembly of God and left four children.

Aldo Carlini, 50
Also working as a day labourer, Carlini had a lot in a neighbouring area.

Samuel da Cunha, 23
A newcomer from the neighbouring state of Rondônia, da Cunha was also working as a day laborer when he was killed. His lot was outside the disputed area.

Valmir do Nascimento, 55
Found with his hands tied behind his back, do Nascimento was one of the three squatters killed who had a lot in the area under dispute. He left two sons.

Izaul dos Santos, 50
A squatter in Linha 15, last year dos Santos paid $34,000 for 200 hectares. He was pending trial for murder. His son and daughter-in-law were two of the four people who were in the area during the slaughter and escaped with their lives.

Francisco da Silva, 56
One of the five squatters who were there as day labourers. In 2015, Ibama (the environmental protection agency) fined da Silva $36,000 for the illegal deforestation of 22 hectares, but he never paid it.

US exports of tar sands waste are fuelling Delhi's air pollution crisis

By Aditi Roy Ghatak and Karl Mathiesen

India has emerged as the world's largest importer of petroleum coke, an oil byproduct that is now a major cause of pollution in the capital

Come winter and the Indian capital, New Delhi, is preparing to once again struggle beneath the noxious fumes that have become a perennial crisis.

Eight Delhiites die each day from the city's bad air. In response, the regional government has made efforts to tackle pollution from coal plants and tailpipe exhaust. But any benefits these policies might produce are threatened by skyrocketing imports of a fuel more polluting than coal or diesel.

Petroleum coke – known as petcoke – is a high-carbon residue produced during the refinement of heavy oils. In its raw form, the high-carbon fuel can be used as a cheap substitute for coal.

Delhi's environmental authorities say petcoke, cut into coal power station feeds around the capital, is now one of the major sources of smog in the city.

In many parts of the world, petcoke is restricted because of its toxicity. In India however, the fuel is unregulated and burned freely. In this regulatory void, demand has soared, rising 23% a year for the last five years. The country imported 20 times more petcoke in 2016 than it did in 2011.

Delhi is in a race against time. The Supreme Court has ordered the use of petcoke to end but the government has failed to ban or regulate the fuel. Activists and public health officials are desperate to convince politicians to act before winter's still, stagnant weather conditions begin to pool smog above the capital.

When burned, petcoke emits 5-10% more climate change-causing CO2 than coal. But its true filthiness is revealed in the toxic smog it creates. The key air pollution-causing contaminant is sulphur, which creates oxide gases and particles, both of which are harmful to human health.

In Delhi, a (relatively lax) regulation limits sulphur in coal to 4,000 parts per million. The National Capital Territory's environmental agency (EPCA) says petcoke being burned around the capital contains sulphur up to 72,000ppm. Petcoke emissions also contain significant amounts of toxic heavy metals – particularly vanadium, nickel and iron.

Petcoke's primary use in India is in cement-making plants, where the process limits pollution. But when it is used in the coal power stations, the pollutants emerge unadulterated.

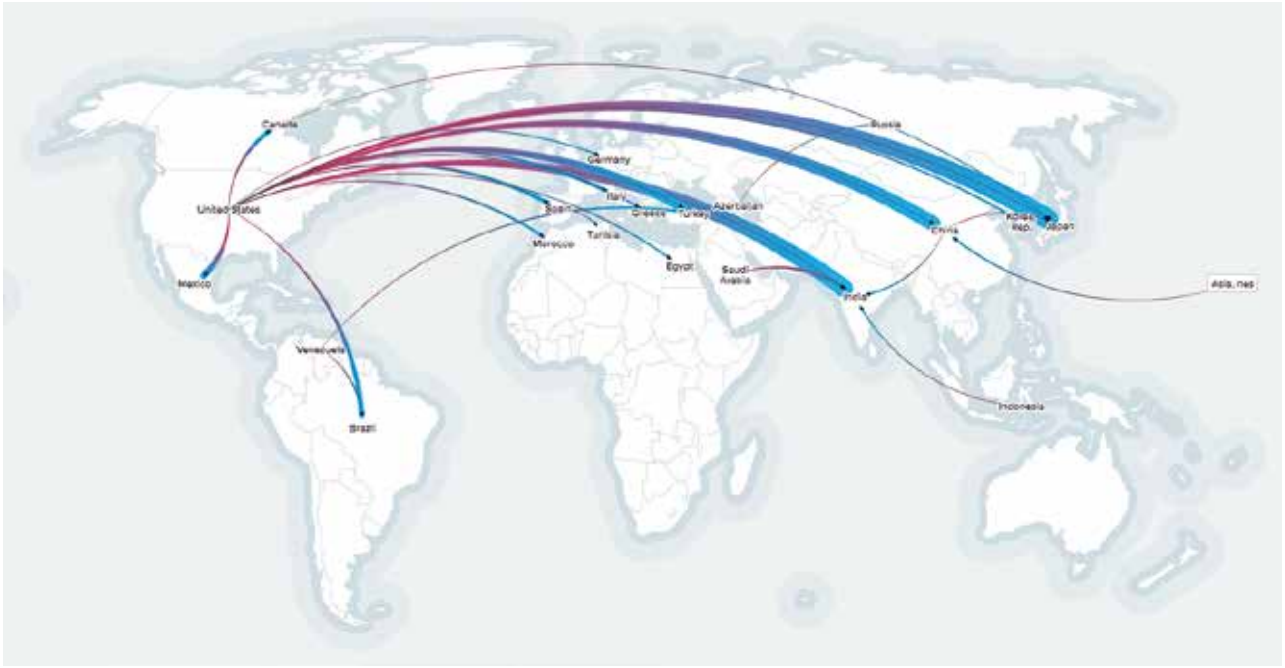
In February, India's Supreme Court released a finding that called the sulphur content in petcoke "extremely high" and said the fuel was a "major cause of pollution in Delhi". The court directed the national government to either ban petcoke's use in power generation outright or place restrictions on the sulphur content, which would be a de facto ban.

So far, no action has been taken. The ministry of environment has asked for more time. The court has given the government a final deadline of 24 October to come up with a plan.

This is a problem that begins, in part, in the tar pits of Alberta and the refineries of the US Gulf coast. India produces its own petcoke. But local refineries can't keep up with demand and the country has emerged from nowhere to become the largest importer of petcoke on earth.

In 2016, 87% of India's overseas petcoke came from the US, the world's largest producer. Its use in US power generation has plummeted due to heavy restrictions. As a result, US refiners and traders are looking to markets with looser regulation and, say environmental campaigners at both ends of the supply chain, fuelling India's airborne public health crisis.

Until 2014, China was the biggest buyer of US petcoke. But Asia's largest economy has been on a political journey with air pollution. Sulphur restrictions, brought in in 2016, economic downturn and local bans on new power plants combined to stifle US petcoke's access to the far east powerhouse.



Global trade in petcoke is dominated by one country, the US (Data: resourcetrade.earth)

Between 2013 and 2014, the trade was cut in half. (Japan also remains a stalwart consumer of US petcoke.)

"India has become the dumping ground of petcoke from countries like USA and China," Sunita Narain, who heads the Centre for Science and Environment, told the Economic Times in February. Narain is not only pushing for a domestic ban on petcoke's use in power plants but an import ban as well.

Lorne Stockman, a senior research analyst at Oil Change International, said much of the US petcoke was left over from the refinement of heavy oil from Canada's tar sands. Environmental restrictions in the US prevent it from being burned in most power stations, unless they are fitted with pollution scrubbing technology.

"The US refiners have invested in this heavy oil refining strategy in order to take advantage of the cheap dirty feed stock from Canada," he told Climate Home. "Then this waste product is dumped into markets that will accept it. It's a perfect example of the industry maximising its profits while maximising its pollution."

It is uncertain how much petcoke is being burned around Delhi, according to an EPCA report, as refiners do not collect data on how much is being sold into the capital territory. It is also uncertain what proportion comes from the US, as opposed to domestic refineries. During site visits, however, EPCA inspectors found industries were using imported product.

The trade within India is controlled by some of the biggest, most influential and least transparent corporations in the country, including Adani Enterprises. Adani's website says it sources petcoke from the US.

Climate Home contacted some of the largest US petcoke exporters. None returned emails except for Ahmed Jama, CEO and president of Florida-based PermuTrade.

"I cannot speak for other companies," he said. "But I do know petcoke is being sold into the power generation industry and steel industry [in India]."

PermuTrade is a relatively small fish. Jama said his company transports between 0.6Mt and 1.2Mt of petcoke every year, 75% of which goes to the cement industry in India. According to Jacobs Consultancy, Koch Carbon trades more than 20Mt globally every year. Oxbow, another company owned by the Koch brothers, also ranks among the largest global traders.

Jama said his company sells only to cement plants to ensure the "environment is protected". "We could make a lot more money selling petcoke to many other industries, like the power generation industry and steel industry but we are not all about the money," he said, adding that an India-wide ban on petcoke "might not be the greatest idea".

"Petcoke should be banned or limited for captive power plants but not for cement plants. There should be clear sulphur emission thresholds in place for companies to comply with and be held accountable to. If petcoke is cut, the government will need to provide cheap coal or they won't have power," said Jama.

In fact, environment authorities are not pursuing a ban on use in cement. But they are trying to control power plant emissions before Delhi again disappears beneath the smog of industry.

Egypt faces water insecurity as Ethiopian mega-dam rumours swirl

By Aya Nader in Cairo

Farmers along the lower Nile have little information to guide them as upriver barrage threatens to compound the impacts of global warming

"The land has become very dry," observes Mahmoud Abo Khokha, a farmer from Al Monofeyya governorate, in Egypt's Nile delta. "Drought is no longer predictable; it used to hit a certain 15 winter days. The whole year's crops could be destroyed because of one week's drought."

Like most farmers round here, he blames Ethiopia. They are under the impression that a massive hydropower dam being built upriver is already affecting their water supply.

In fact, the Grand Ethiopian Renaissance Dam is only half way to completion. In July, officials denied the reservoir had started filling after satellite photos circulated online of a lake behind the dam, which they said was simply the result of flooding.

The water scarcity farmers have experienced to date has other causes: climate change and the demands of a growing population.

But during the 5-15 years it is expected to take to fill the reservoir behind the 1,800 metre-wide barrage, the Nile's fresh water flow to Egypt may be cut by up to 25%.

"Nobody is telling farmers how to mitigate and adapt to climate change," says Magda Ghoneim, a socio-economist and professor of agricultural development at Ain Shams University. "Adding the pressure of a dam puts Egypt on the verge of catastrophe. Soon enough we won't [find food to] eat."

The challenges for farmers are myriad: new diseases and insects, unprecedented humidity, rising seas contaminating groundwater with salt. Indeed, when Abo Khokha tried pumping underground water to make up for reduced river flow, he found only half the usual volume, with a higher level of salinity.

A study recently published in Nature found that climate change is bringing greater variability in the Nile River flow this century compared to the last. In the Nile's seven-year cycle of flood and drought, the former is becoming heavier, and the latter more extreme.

Egypt's five million feddans (21,000 square kilometres) of crops consume more than 85% of the country's share of Nile water. With an annual supply of 600 cubic metres per person, the country is approaching the UN's "absolute water scarcity" threshold, as the population closes in on 100 million. Water is a sensitive subject.

Although Ethiopia claims to have taken climate change into consideration in the dam's design, the government did everything at the same time: construction and civil works, financing, and social and environmental impact studies, explains Emanuele Fantini, a researcher at IHE Delft Institute for Water Education. "So by the time these studies are concluded, we are already in front of the fait accompli".

Building was under way when the governments of Ethiopia, Egypt and Sudan – sandwiched between the two – in 2016 agreed to commission an independent study from Artelia, a French consultancy. "We are not sure if and when the results will be made public," says Fantini. "They should be made public so that the accuracy can be checked by the international scientific community".

So far, though, there has been little attempt to explain the risks to those at the mercy of the weather and geopolitics.

Egyptian farmers depend on the Nile to irrigate their crops (Pic: Flickr/Florian Lehmuth)

Alaa al-Zawahri, an Egyptian member of the tripartite committee studying the effects of the dam, tells Climate Home: "There are several scenarios, but nothing certain. Some studies predict a rise in temperature and thus little rain, and others predict more rain". Diaa al-Qousi, a water specialist who worked for government, says the findings point to heavy rains for the next 30 years, then a huge drop the 60 years that follow.

Asked if the different conclusions have been communicated with farmers, al-Qousi says "farmers would not understand such specialists' findings". Government is selective about what it releases to media, adds al-Zawahri: "Some information, like worst case scenarios, might cause unnecessary panic."

The country is approaching the UN's "absolute water scarcity" threshold

In the absence of reliable information, farmers turn to conspiracy theories and militaristic fantasies.

Qatar "is funding the dam, like it is funding terrorism" to harm Egypt, claims Mohamed Nasr, who owns three feddans in Al Gharbeyya. There is no evidence for this common rumour; the Ethiopian government says it is funding the project nationally.

Ethiopia will not be allowed to alter the balance of water supply along the river, Nasr asserts: "Egypt's water share is internationally known. If the share is touched, the dam will be completely removed."

Osama Saad, a farmer in the Upper Egypt governorate of Minya, is more explicit: "People talk about how the president should bomb it." The idea is not alien to higher level discussions around the dam. Previous leaders have threatened military action.

Yet work on the 6GW dam, a prestige project for the Ethiopian government, has continued unabated.

Al-Zawahri outlines some peaceful options for responding to water stress. The government is looking into telemetry, water-saving irrigation systems, and desalination. A navigational course from Lake Victoria to the Mediterranean is on the table, which would provide eight billion cubic meters more water for Sudan and Egypt. Egypt can also manage its own High Aswan Dam more efficiently to decrease evaporation of water. "These plans are to be applied gradually," he says.

Water expert al-Qousi is upbeat: "The Egyptian farmer has been cultivating lands for seven thousand years, and has always found a way around water shortages."

Ghoneim begs to differ. "Farmers have traditional knowledge, which they lived by for a long time. But this knowledge is now falling short," she says. "It is not an awareness problem that faces farmers, it is an issue of the state obstructing information."

1945-2017: Tony de Brum, Marshallese climate and anti-nuclear crusader

By Karl Mathiesen

De Brum, who fought for justice for his tiny island nation against formidable economic and political odds, died in August aged 72

Born in 1945, Tony de Brum grew up on the island of Likiep. When he was still a child the US, the colonial power in the Marshalls at the time, conducted a programme of 67 nuclear tests that saw many hundreds of Marshallese displaced after their atolls were blown up and irradiated.

Many years later, De Brum recalled viewing the mother of these explosions – the 1954 Bravo shot – while fishing with his grandfather 200 miles away. The pair were suddenly blinded, he said, as if the sun had grown across the entire sky. Then everything, the palms, the sea, the fishing nets, turned red. Later, a fine irritating white ash rained down, like snow, he said.

With the force of 1000 Hiroshima bombs, the Bravo test reshaped Bikini atoll, and de Brum's life, forever. The displacement of the islanders of Bikini and other atolls, as well as the deaths due to radiation, is a legacy the Marshall Islands still struggles with today.

The "Baker" explosion, a nuclear weapon test by the US military at Bikini Atoll, Micronesia, on 25 July 1946. Photo: United States Department of Defense

This childhood memory became de Brum's creation story and a pivotal experience he often used to explain the path his life took. He was one of the first Marshall Islanders to graduate from university and became his country's chief negotiator in their attempt to receive fair reparations for the annihilation and poisoning of their land.

He was a key figure in achieving the full independence of his country in 1986 on terms that granted Marshall Islanders a compact of free association and $150m compensation for the damages caused by the tests. This deal has since been criticised, by de Brum himself as well as others, as inadequate compared to the costs that continue to be borne by the Marshallese.

While in recent years de Brum has become associated with climate action, his anti-nuclear crusade was the work of his lifetime and extended beyond the interests of his people. In 2014, under his ministry, the Marshall Islands launched a legal attack on the US government, accusing them of breaching the terms of the Nuclear Non-Proliferation treaty (NPT). In the same year he was the architect of a landmark case in the International Court of Justice that charged nine nuclear powers with failing to negotiate nuclear disarmament in good faith.

Speaking to assembled NPT members last year in New York, he said: "Because no one ever considered the humanitarian impacts of nuclear weapons, the Marshallese people still carry a burden which no other people or nation should ever have to bear. And this is a burden we will carry for generations to come."

He received several awards for his anti-nuclear activism and was nominated for last year's Nobel Peace Prize.

De Brum lived on the capital atoll of Majuro and became the patriarch of one of the island's largest and most successful families. During a long political career, de Brum served as minister for health, minister for finance and minister in-assistance to the president. He was three times foreign minister – most recently until 2016 before losing his seat in

Tony de Brum invited 18-year-old Selina Leem to give the Marshall Islands closing statement at the critical Paris climate summit. Negotiators including the US' Todd Stern wore coconut leaves in solidarity with island states (Photo: IISD/ENB | Kiara Worth)

parliament in a cutthroat federal election. It was in this role that he became a prominent voice in the global response to climate change.

Mirroring his nuclear diplomacy, de Brum relentlessly pursued justice in the climate arena. The Marshall Islands are low-lying atolls, especially vulnerable to climate change. It is thought that an increase of 2C, for years the widely accepted upper limit of "safe" warming, would cause enough sea level rise to make the Marshall Islands uninhabitable. King tides already cause mayhem as they sweep through villages and crops.

Outgunned by vast economic and political forces, again and again de Brum returned to the key moral argument of climate change: how can the countries that have created the problem allow his country to suffer? In this refrain, he was able to draw from the nuclear politics that forged his youth and world view.

The appeal to justice afforded de Brum, and representatives of other small, vulnerable countries, a status disproportionate to their tiny populations and GDP.

Other atoll nations have begun to make heavy-hearted evacuation plans. But de Brum, remembering the effects of nuclear dislocation, would never countenance this thought.

"Displacement is not an option we relish or cherish and we will not operate on that basis. We will operate on the basis that we can in fact help to prevent this from happening," he told the Guardian in 2015. Ever the operator, he also regarded this as a fine way to give away your bargaining position at climate negotiations.

While speaking truth to power, de Brum did not neglect his country's own rogue industry: shipping. During his lifetime, the island became the second largest flag registry in the world, enabling a lightly regulated sector with a growing carbon footprint.

In reality, the business of registering ships operated out of Virginia, US, with little benefit to islanders. But it relied on the Marshallese government for legitimacy and de Brum knew leverage when he saw it. He shocked the registry's representatives to the International Maritime Organization in 2015 by claiming the country's seat to make an impassioned plea for emissions reductions at sea.

His intervention shook up the industry-dominated forum, launching a – still slow – process of setting climate goals that has been taken up by other island leaders.

De Brum's canny political mind – forged amid the ruthless island politics of his home country – was central to the establishment of the "high ambition coalition". This group of likeminded nations met in secret on the side of climate negotiations throughout 2015 before breaking cover at a critical moment during the Paris climate talks at the end of that year.

"1.5 to stay alive" was de Brum's catchphrase at the Paris conference. He assured the world that the Marshall Islands would no longer exist if the agreement only limited the world to 2C of warming. Yet many scientists believe the goal to be quixotic. With global temperatures already 1C above average and climbing rapidly, the window is closing for the Marshall Islands.

The intervention of the coalition contributed to a last minute push for a stronger deal, which succeeded in scripting a lower temperature limit of 1.5C into the final agreement in December 2015. The inclusion was an unexpected diplomatic victory and in it de Brum can be credited with chipping out a fingernail hold for his country's future.

For the Marshall Islands' closing statement in Paris, he ceded the floor to 18-year-old Selina Leem. "This Agreement should be the turning point in our story; a turning point for all of us," she told an emotional room.

On his islands, de Brum leaves behind a wife, three children, ten grandchildren and five great grandchildren.

Exxon shareholders win 'historic' climate vote against board's advice

By Megan Darby

Shareholders in world's largest private oil company won a victory that signals deep unease about climate change amongst major investors

The world's largest private oil company is being forced to reckon with the clash between its business model and international climate goals, after a "historic" showdown with investors.

At ExxonMobil's AGM in Dallas, Texas Wednesday 31 May, 62% of shareholders voted in favour of a climate change resolution, against the board's advice, according to a preliminary count. While detailed data is not yet available, the convincing majority suggests some major funds joined sustainable investment activists after the same proposal won 38% of the vote last year.

Coming amid reports president Donald Trump plans to withdraw the US from the Paris climate deal, it signalled that concern about climate change is stronger than ever in financial circles.

"Investors voting against management at Exxon is a powerful rebuke to the climate denialist policies of this White House," said Raj Thamotheram, head of thinktank Preventable Surprises. "Markets are moving and corporate America would be foolish to bet so much on the protection from this regime."

The resolution requires Exxon to disclose how the international goal to hold global warming below 2C – as agreed in Paris – could dampen future demand for its oil and gas.

Thinktank Carbon Tracker estimated in 2015 that Exxon was planning to sink $72 billion over the next decade into developing fuel reserves that would be surplus to the requirements of a 2C world.

Despite Trump's apparent refusal to honour the Paris Agreement, advances in clean technology and policy action elsewhere have convinced some other oil majors to start adjusting their expectations.

During the AGM, Exxon chief executive Darren Woods reiterated his company's support for the Paris Agreement and call for a revenue-neutral carbon tax to meet climate goals. But management opposed shareholder demands for more transparency, insisting none of Exxon's reserves would be "stranded" in the global shift to clean energy.

Woods promised to "step back and reflect" after the result was announced.

The Church of England and New York State public pension fund, which led the shareholder rebellion, described Wednesday's victory as "historic" and "unprecedented".

Edward Mason, head of responsible investment for Church Commissioners, said in a statement: "Despite strong opposition from the Board, the majority of Exxon's shareholders have sent an unequivocal signal to the company that it must do much more to disclose the impact on its business of measures to combat climate change."

"Climate change is one of the greatest long-term risks we face in our portfolio and has direct impact on the core business of ExxonMobil," added New York State comptroller Thomas DiNapoli. "The burden is now on Exxon Mobil to respond swiftly and demonstrate that it takes shareholder concerns about climate risk seriously."

It piles the pressure on Exxon at the same time as it faces multiple lawsuits over allegations it deliberately cast doubt on the scientific consensus around climate change, even as its internal research confirmed it.

Grassroots campaign network 350.org has consistently argued that engaging with Exxon is futile and shareholders should take their money elsewhere.

"Exxon's climate lies are finally catching up with them," said Jamie Henn, strategic communications director at 350, ahead of the vote.

"Any real climate risk assessment will show that Exxon's drill-baby-drill business plan is incompatible with a liveable planet."

LES EAUX MINÉRALES D'OULMÈS

OUR 5 COMMITMENTS TO PROTECT THE PLANET

Eco-innovation

Innovation is part of our DNA. Today, the challenge is to show our clients that we are environmentally responsible. So far, our researchers have replaced 3% of petroleum-based PET with plant-based PET using sugar cane residue. To this end, Oulmes Mineral Water is the first company in Morocco to develop and implement plant-based PET in its manufacturing process.

Water-economy

By respecting water tables and their regeneration time we are ensuring continued supply of our water for future generations. We use innovative solutions in our water treatment process, working towards a better future.

Eco-Consumption

We know that oil resources are not infinite and we have to find alternative solutions. By reducing the weight of our bottles, changing our labels and lids, we are working towards becoming less dependent on fossil fuel.

Eco-energy

By investing in new generation, energy efficient meters, we are saving intelligently and controlling costs on all of our production lines.

Eco-Distribution

Our experts have optimized and streamlined delivery routes, allowing us to reduce our fuel consumption and consequently our CO2 emissions. In addition, we have reorganized sales channels to increase productivity and maximize our efficiency.

Less paper, more justice

How an overhaul of court information systems in Brazil is saving trees

By Tiago Melo, Softplan's executive and CSR expert and Rodrigo Santos, Softplan's chief business officer

Softplan is a software development company based in Florianopolis, south of Brazil. It operates in different segments, the most representative being the Justice Unity. One third of all the judicial cases in Brazil are handled in Softplan's system, called SAJ (Automation System of Justice). Its main slogan is less bureaucracy and paper, more agility and justice.

Synergy in visions of private and public companies as drivers of the judicial transformation in Brazil.

SAJ's main user is the State Court of São Paulo. The biggest Latin American Court is composed of more than fifty thousand employees, distributed in around two thousand local courts in three hundred and twenty-two cities. Its annual expenditure topped 2.8 billion euros in 2016.

Until 2011, São Paulo's state court internal operations could be defined as chaotic by any standards. The judicial cases were still handled and managed following the same procedures and rites of the 1980s. Inefficiency in all levels of the judiciary procedural chain constantly raised issues of reliability, fairness and questioned the reason of the Court to exist, which is to serve society.

The sculpture "Survival of the Fattest", by Jens Galschiot and Lars Calmar, is a good example of how justice was perceived by society. An over fed and an unmovable figure.

It was in 2011 that the Court took the strategic decision to invest in information technology and most of all, to reorganize its processes, structures and human resource management. The revolution that started in 2012 and is still in course, catapulted São Paulo's Court from the 22nd place in a productivity ranking amongst the 27 states of Brazil to a Top 5 spot in 2016.

The main key performance indicator in terms of productivity, the Demand Response Index has grown 68%, from 0.79 in 2010 to 1.33 in 2016. This means that in 2016 the Court has terminated a ratio of 1,33 processes to each 1 that was initiated in the same year.

The sculpture "The Justice", by Alfredo Ceschiatti, located in front of Brazil's Supreme Court illustrates the now bright future of São Paulo's State Court. It stands brave and confident, blind folded – to represent impartiality and holding a sword – portraying a quiet, and courageous woman, embodying order and the will and power to impose the rule of law.

Information technology as an instrument of societal improvements through a more productive and reliable judiciary system

The SAJ system is a key component of this revolution. The digital judicial case, which is the core concept of SAJ, either automated, simplified or extinguished numerous and unnecessary labour intensive tasks. The Court's current vision "To be nationally recognized as a modern court, rapid and technically differentiated, turning it in an effective instrument of Justice, Equity and Social Peace" that would be considered as wishful thinking in the not so distant year of 2012 is now on its course.

The acquisition and implementation of a state of the art management system was motivated by the Court's noble objective of providing better working conditions to its employees, and through their improved wellbeing,

significantly improve efficiency levels to all stakeholders involved.

The SAJ implementation project has impacted not only on the efficiency levels of the State Court. It has improved the whole ecosystem of stakeholders involved in judicial processes.

Claimants' and lawyers' need of physical presence in the local courts have been practically eliminated, except in cases of personal audiences. Considering that the Court has a stock of around twenty million judicial processes and that every year four million processes are initiated, it can be conservatively inferred that the SAJ system has avoided at least eight million displacements to local courts.

The pictures below show a local court of law in São Paulo before the implementation of SAJ in 2010 and 6 years later, with the system in full operation, without "physical" judicial cases, on paper. The contrast in working conditions are overwhelming.

Tangible and intangible gains

In an internal study of the impact of the adoption of a group of five key functionalities in 2015, Softplan estimated the elimination of around fourteen million hours of work annually, or the equivalent of ten thousand employees, one fifth of the Court's workforce. These highly skilled public employees have shifted from labour intensive to intellectual challenging tasks. In practical terms, this meant better quality of work and increased productivity.

An important intangible gain enabled by a more productive judiciary lies on its impact in the economy. There is an important line of academic research that correlates the effects of greater legal security and the economy, particularly in the growth of the gross domestic product. In

2003 the World Bank published a seminal work titled "Legal and Judicial Reform: Strategic Directions" This publication indicated that there is a direct effect of the quality of the judiciary (represented by characteristics such as predictability, impartiality, accessibility and the wide-spread perception of the rule of law) on economic growth and poverty reduction.

The impact of this project in the environment is as overwhelming as it was in terms of efficiency. Considering the estimated number of four million processes being initiated every year and that as of 2016, 100% of those judicial cases are entered in the digital format, there can be estimated that, by 2026, approximately ten million kilograms of paper will not be used. This represents approximately two hundred and fifty trees that were not cut, equivalent to two thousand and two hundred football fields. The avoided production of the papers also meant the non-emission of sixteen tons of CO2 and one million cubic meters of water.

Bottom-up involvement and coincidence of purposes as drivers of transformational strategies

The choice for Softplan proved to be of vital importance in this process. With its own mission – "To make a difference in the life of organizations and people, providing specialized technologic solutions in business processes" – being an almost perfect fit with the objective of the State Court.

São Paulo's State Court success story is a good example of how the tripod Processes, People and Systems, when strategically operationalized, is a key driver of organizational transformation. It also illustrates the benefits and significant increases in efficiency levels of the judiciary system in a developing country, brought by the association of public and private enterprises.

The deeply rooted beliefs and the sense of belonging that the State Court fostered in the process of implementing SAJ were effective in converting stakeholders' individual satisfaction into societal collective gains: reduce global warming, higher efficiency and productivity levels of public services and increase the gross domestic product.

www.softplan.com.br

SOFTPLAN

Digital revolution meets sustainability

How technology can sustainably drive projects and operations

By Luiz Eduardo Ganem Rubião, executive director, Radix Engineering and Software

Companies are also facing a dramatic change in their human resources needs, along with big environmental accidents in different industries. At the same time, new technologies are emerging, transforming the way of doing business.

Radix began its operations in 2010. The expectation of its founders was to target the big greenfield and brownfield capex projects that were being planned and executed by Petrobras. With a solid engineering team, Radix was the ideal partner for Petrobras and the big Brazilian engineering and construction companies in complex oil & gas projects. The beginning of the story was perfect. Radix became one of the engineering partners for the design of eight floating production storage and offloading vessels for Petrobras. However, with all the problems related to the global decrease of the oil barrel price and the corruption investigations in Brazil, Radix had to reinvent itself. The company decided to diversify its activities, portfolio, markets and customers. At the same time, Radix was faced with the challenges of emerging digital technologies and the impacts of big environmental accidents in different industries (the Gulf of Mexico oil spill, the Fukushima nuclear accident, the collapse of

a mining dam in Rio Doce). That was how the digital revolution met sustainability.

The oil & gas industry has always been very active and innovative in terms of the use of digital technologies to solve operational and design problems. Since the 1970s, most oil companies have been working with plant floor digital automation, chemical process simulation, plant and laboratory information management systems, computational fluid dynamics and 3D models for process plants and oil fields, among many other digital technologies developed over the last four decades.

Society has seen a giant digital revolution in recent years and the clear digital leadership of the most powerful industry in the world started to decline. Demands coming from diverse industries boosted innovative concepts and ways of effectively using data, as well as new sources of data to be integrated. The users then became data sources through cooperation-based applications. All the various data coming from these users through diverse channels had to be analyzed and interpreted, leading to huge data analytics activities. The speed of this changing

Demands coming from diverse industries boosted innovative concepts

Robotics teams from various universities, sponsored by Radix, participating in an international competition

process has been astonishing, and now traditional industries are trying to react and critically plan their digital futures.

For instance, oil companies are now working closer together with traditional suppliers in order to rethink their control systems and establish the foundations for the so-called 'next generation control system'.

As a component of this digital revolution, companies are also facing a dramatic change in their human resources-related needs. Professionals that can combine the knowledge of traditional engineering design, software development and processes with the understanding of new concepts in data analytics are becoming extremely valuable.

A very promising approach for technology companies is to invest together with universities on the development of a new engineering profile. In this context, some ideas and initiatives are already being implemented across the world. Many universities in the US and Brazil have been providing resources for students to take part in various initiatives that are attracting the attention of different technology companies. Competition teams working with robotics, solar boats, electrical cars, and aeronautical design are now sponsored by companies that want to attract young talent for future internship programs and professional careers.

As part of this big picture, engineering students are willing to provide a concrete contribution on critical sustainability issues. In Brazil, the collapse of a mining dam in Mariana, Minas Gerais, motivated many groups of students from local universities and schools to take part on projects related to the recovery of the Doce river valley.

Radix was one of many Brazilian companies that decided to support several of these projects and facilitate the development of a nongovernmental network using digital technology in favour of sustainability projects.

www.radixeng.com

Radix:

Radix offers technology services and solutions, highly qualified and with technology independence, to meet the demands of the primary process industries in Brazil and the world. Radix considers itself a multiplier of a transformation process in Brazil. A process of building a country with more technology, results, universities and strong companies.

Specialists from Brazilian universities, sponsored by Radix, collecting and analyzing water from the Rio Doce valley after the dams break in Mariana

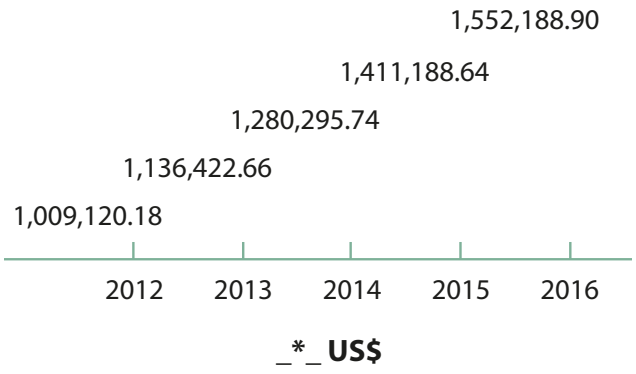
Community, investment and sustainability

By Yanio Ciromin Concepción

A Cooperative as a socio-economic doctrine promotes the organization of people to satisfy their needs together. One of its principles explicitly envisions the commitment to the community, which seeks to work for a sustainable development of society through policies accepted by its members.

Communities are the setting par excellence to undertake investment initiatives that guarantee improvements in both the environment and people's quality of life.

Cooperative Vega Real plans strategies and actions to address effective solutions to the community's social concerns. It has a community investment of an average annual figure of US$ 1,552,188.90 to mitigate the impact on economic, educational, social and environmental development, reaching 809 communities.



Community leadership training
Each community is organized with a leadership structure, composed of leaders formed by Vega Real, Community Leadership Training to manage and channel the communities' economic, social, educational, environmental, cultural and sports health needs.

The cooperative has 9,708 registered leaders distributed in 809 communities, directly serving 105, 997 people.

Associative development
With technical-labor training and entrepreneurship, people are given the opportunity to design and implement projects, providing them with the support to ensure economic and social feasibility.

Every year people from different communities gain endorsement from Infotep, local universities and other national educational institutions.

Courses are focused on basic tasks for the rapid and practical development of communities, such as: pastry; hairdressing; sewing; floristry; make-up and beauty;

upholstery; plumbing, residential electricity; natural food; aquaponics and aquaculture; bakery and fish breeding in fresh water, among others.

Resources required for these courses are completely provided by the Cooperative, including participants' transportation, food and travel.

Financial education
Education in saving, personal finance, family values, gender equality and personal safety provides positive outcomes for members which in turn influences their family and communities.

To guarantee peace and tranquility in the communities, groups of neighbors attend social initiatives which educate and advise them, along with creating bonds of solidarity these initiative also help prevent and fight crime in their territories.

Support to community service institutions
Support for institutions of common welfare services seeks to mutually benefit people in communities. The economic and moral collaboration to Geriatric Centers, Rehabilitation Center, Civil Defense, Red Cross and Firemen strengthen the values of cooperation, teamwork and union.

The Cooperative offers young people opportunities to be involved too. They are able to develop leadership skills, assigning them responsibilities in Youth Congresses, Summer Educational Camps, and Ecological Camps in national parks across the country, as well as

Investment in the communities:

Environmental responsibility

Congress Environment
"Crisis of water and water sources"

Cleaning and seeding days in the
7 provinces where we affect, in
deforested areas and affected areas

Recycling education
Donation of ecological Garbage to schools

Ecological sensitization talks, courses and
Workshops in communities and schools

Preservation and conservation
"Loma Miranda, National Park"
Struggle for the non-exploitation of this mountain

Rescue, protection, care and
preservation of the low basins of the
Camu River and its tributaries

Walk for health and the environment

Sponsorship of green areas
and Life Forests in communities

offering them programs of summer work. Vega Real operates a scholarship program for young people with school merits who have limited resources to carry out their university career, at no cost to the student.

Health
Facing health situations is a constant concern for the most deprived people of the communities, especially when they are not beneficiaries of government programs. We offer primary health care in the communities, bringing health care professionals to perform medical operations, ophthalmology and dentistry, as well as giving lectures on illness prevention.

Cooperativa Vega Real, Inc. is an institution of savings, credits and multiple services, founded on November 7, 1982, in La Vega, Dominican Republic.

As a leading cooperative, made up of a family of 105,000 members, we work under an ethical, efficient, ecological, educational and solidarity management, certified with the Norm ISO 9001.

http://cvr.com.do

VEGA REAL
Grande y Confiable

Holistic approaches for sustainable homes

Nurturing a corporate focus on overall well-being can unlock carbon savings in urban environments, according to the property development arm of DT Group of Companies (DTGO).

For achieving more sustainable environments, there are advantages to being a property developer based in an emerging megacity such as Bangkok. Cities already contribute 70% of greenhouse gas emissions and the creation of ever-larger urban areas could deepen their negative impact.

But in most cities, the property development sector can greatly contribute to combating climate change. Not least, the industry can play a leading role in curbing the surge in carbon emissions that could follow economic development and changing lifestyles.

Against this backdrop, the developer Magnolia Quality Development Corporation (MQDC) is one of the many actors endeavoring to introduce more socially and environmentally conscientious approaches to urbanization.

MQDC is the property development company within the DT Group of Companies (DTGO), an organization set up in 1993 as a charity but now active in architecture, design, sourcing, trading and property development.

All these companies dedicate 2% of their revenue to charities, in the areas of education, health, and the environment. In its charitable contributions, for example, DTGO is a substantial donor to Bhutan for Life, set up by the World Wide Fund for Nature (WWF), this initiative aims to preserve unique Himalayan habitats and support their inhabitants' livelihoods.

DTGO's donations are also helping address social deprivation through supporting education programs in Hong Kong and Thailand. In particular, the group is funding teachers and vocational training in remote country locations and in deprived inner-city neighborhoods.

But DTGO seeks to make its greatest contribution through its business activities, which are chiefly in property development, through MQDC.

DTGO's description of 'Sustainnovation'

MQDC development featuring Internet of Things technologies to curb energy use

MQDC's specific route is a structure and culture that prioritizes the planet as well as prosperity. Its guiding concept, which we call 'sustainnovation', encompasses care for society, the environment, well-being and health, in line with UN sustainability goals.

Sustainnovation involves identifying needs, through insights from psychology or other research fields. We then look to nurture or create the human 'ecosystems' that can supply these requirements over the long term.

A comprehensive application of this approach is a development underway on the outskirts of Bangkok. Planned as Thailand's first zero-waste property development on this scale, the harmonized forest and urban living site will feature a series of technologies and strategies aligned with our commitment to the well-being of all living beings.

We envision that, with proper planning, city life can be greatly enhanced. For much of the developing world, one of the key requirements is to create cooler environments and curb power consumption. In urban areas, for example, air-conditioners consume much of domestic electricity demand. And in areas where forest cover has been removed, the urban heat island effect can drive up consumption by raising night time temperatures.

MQDC is addressing these issues with a versatile response across its projects. We are applying traditional local wisdom, such as by orienting houses for shade and wind. And we are also broadening access to innovative technologies such as advanced district cooling and systems that combine high air quality with energy recovery.

Cutting-edge energy-saving features in MQDC developments include a system to harvest energy from footfalls on a 'skywalk' linking the mixed-use project to the public transport network. Based on research into the psychological drivers of energy use, residents in the project's condos will also be nudged to curb their power consumption with information and control capabilities provided by sensors, remote management devices, and the Internet of Things.

In line with our belief in applying and diffusing advanced technology and innovation, MQDC has funded a research base in Bangkok that is accessible to the public and our peers. The Research & Innovation for Sustainability Center (RISC) holds, along with extensive testing facilities, a repository of eco-materials for construction.

Sustainnovation, by requiring such measures, serves future, hidden stakeholder needs. But it can also raise awareness of sustainable living. A key route here is to encourage long-term thinking and accountability, which is why we offer for all our projects a warranty of 30 years.

While MQDC wants its projects to have a direct positive impact, the true measure of success is whether we are contributing to a wider shift in society. Property developments in the markets where we operate are, in fact, moving towards more sustainable approaches. For MQDC, this is an encouraging sign that our approach is viable and sustainable in commercial as well as social terms.

www.dtgsiam.com

DTGO
DTGO CORPORATION

Smart façades for a sustainable future

By Ms. Pamela Phua, Cluster General Director, Vietnam Singapore & Indochina,
Director, RD&I, South East & South Asia, Middle East
Director, Exterior, Wallpaint Expertise Group, RD&I, Global
AkzoNobel Decorative Paints
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To mitigate the impact of the frenetic pace of urbanisation that the world is seeing, a tremendous effort in research & development is necessary. Indeed, more than ever it is essential to support improvements in sustainability by using renewable energies whilst decreasing carbon footprint and reducing waste and pollution generation. At AkzoNobel, we believe that we can play a key role in addressing parts of these challenges through innovative solutions.

AkzoNobel is constantly developing better and more sustainable products, delivering essential ingredients, essential protection and essential colour to help create more human cities around the world for a more liveable and inspiring life. Our commitment to sustainability is evidenced by our consistent high ranking over the last 10 years on the Dow Jones Sustainability Index (ranked 1st consecutively for four years) and our *Planet Possible* initiative dedicated to constantly finding ways to deliver more with less.

AkzoNobel is a leading paints and coatings company with worldwide recognized brands such as Dulux and Sikkens. Our global research, development and innovation (RD&I) centre for exterior wall paints is located in Singapore, a vibrant innovation hub in Asia. Our research programs are mainly focused on sustainability, energy efficient solutions, durability and protection, and of course bringing aesthetic delight to exterior façades.

Pollution control and self-cleaning delivered through photocatalysis

According to the World Health Organization, 92% of people across the world breathe in unhealthy air, resulting in millions of deaths every year. Rapidly evolving into a global health crisis, worsening air pollution in the form of thick smog continually engulfs Asia's megacities like Beijing and Delhi as well as Europe's metropolises such as Paris and London.

To support urban communities to combat pollution, AkzoNobel embarked on a program to deliver next-generation depolluting paint based on the technology of photo-catalysis of titanium dioxide. By absorbing sunlight, specifically ultraviolet radiation, photoactive titanium dioxide particles can be activated in the presence of oxygen and moisture to produce free radicals. These highly active radicals are capable of degrading pollutants like nitrogen oxide and sulphur oxide, thereby contributing to the abatement of noxious emissions from motor vehicles and other human activities. However, the radicals can also decompose organic constituents in the paint and consequently impair the paint durability with excessive chalking. This challenging obstacle was overcome by a specially formulated inorganic film having a higher resistance to radical attack.

While cleaning up the air, our photocatalytic paint can also deliver outstanding self-cleaning properties with low dirt pick-up to building facades. This eco-positive benefit derives from both the degradation of the dirt particles by the radicals and the photo-induced super-hydrophilicity effect, where the latter is manifested by a water-loving

AkzoNobel is a leading global paints and coatings company and a major producer of specialty chemicals. We supply industries and consumers worldwide with innovative products and are passionate about developing sustainable answers for our customers. Our portfolio includes well-known brands such as Dulux, Sikkens, International and Eka. Headquartered in Amsterdam, the Netherlands, we are consistently ranked as one of the leaders in the area of sustainability. With operations in more than 80 countries, our 47,000 people around the world are committed to delivering leading products and technologies to meet the growing demands of our fast-changing world.

surface that allows rain to spread readily on the surface, under the dirt, suspend it and wash it away.

Stay-clean façade delivered through Superhydrophobicity

Alternatively, a façade that stays clean can also be delivered via super-hydrophobicity. To this end, AkzoNobel is developing an extremely water-repellent coating with inherently low surface energy, enhanced by multi-scale surface topography. In essence, water beads form and roll off easily, or simply do not stick at all, on the coating. Owing to the extreme resistance to rain, mud, stains and dirt, the coated surface will stay dry and clean. This new technology will help urban communities reduce their environmental footprint through significant reduction in the energy and chemical detergents used in building maintenance. This is particularly important for fast-growing cities in emerging markets populated with high-rise residential and commercial buildings.

For many cities around the world, for example San Francisco and Paris, it remains a perennial challenge to keep public places clean and the walls away from such abuses as public urination and spitting. In particular, in its fervent pursuit to embrace the issue as a national agenda, the Government of India has embarked on an strong nationwide campaign called "Swachh Bharat Abhiyan" to promote public cleanliness at all of its cities and towns. AkzoNobel's super-hydrophobic coating is an innovative solution to address such needs. It can protect walls by resisting the adhesion of urine, spit and other stains, thereby deterring public urination and spitting. In line with our Human Cities initiative, our innovation has vast potential to help transform and maintain the cleanliness of urban areas, providing the communities with more liveable neighbourhoods and inspiring surroundings.

Keeping pace with new trends in construction: increase productivity and sustainability

Compared to other industries, the buildings and infra-structure sectors has seen much slower increases in productivity and have been slower to adopt new technologies. However, major transformations are now happening. Prefabrication and modularization are now playing an increasing important role in shaping the evolution of the construction industry; as driven by cost, schedule, safety and environmental benefits. Project schedules can be made more productive with shorter site-built construction time and less weather delays, leading to significant labour cost reduction. Work sites safety is also improved with fewer weather-related complications and less work at heights.

Construction-site waste is also reduced, leading to a lower environmental impact.

One good example is the rising trend in the use of Thermal Insulation Decorative Boards in China where such boards deliver both aesthetics and insulation in one solution. Unlike a traditional External Thermal Insulation Composite System (ETICS/EIFS) where every layer is painstakingly applied and put together on site, the coating layers are systematically applied and combined with the insulation layer in a factory environment. This enables a much higher construction efficiency and better quality control than conventional ETICS/EIFS which can be highly subjective to the reliability and quality of workmanship.

The controlled application processes also allow access to a much wider technology platform, some of which would have been inhibitive to use in traditional exterior wall paint. For instance, with UV or high temperature curing, new technologies can be considered such as UV-cure binders, fluorocarbon polymers and sol-gel processes. Advanced manufacturing processes, with new technologies including 3D printing, will allow more sophisticated coating systems design, opening the way to advanced functionalities such as solar energy harvesting through photovoltaics, or thermoelectric features.

Last, but not least, as the current market is mainly driven by solvent-based solutions, AkzoNobel's objective and motivation is to develop, deliver and promote water-based solutions to contribute to the reduction of VOC emission, while maintaining an equivalent performance.

AkzoNobel's research community and our partners are working hard to extend exterior wall paint functionality and durability to up to 30 years. This will enable a much longer maintenance and repainting cycle, hence reducing building maintenance costs and environmental impact.

Save energy by keeping buildings cooler

For cities experiencing seasons with high temperature, cooling building is a significant source of energy consumption. The Intergovernmental Panel on Climate Change anticipates that by 2100 the need for electricity to power cooling will have increased to more than 30x the level of year 2000. To decrease this need for cooling, the choice of the paint on the building has an important role as it can absorb more, or less of the solar energy, subsequently transmitting this as heat energy to the building. Traditionally the only way to influence this was to recommend white or light shades which reflect light, notably visible light which contributes to 50% of the total solar energy. AkzoNobel has successfully developed a first generation of paints that offer vivid colours together with the ability to keep the surface cooler. This technology, KeepCool™, is based on special pigments that have been selected based on their ability to reflect better in the near infrared region of the solar spectrum, which contributes to 40% of the solar energy. The result is that the surface can be 5 degrees C lower than without this technology, leading to a potential 10 to 15% energy saving for the building. AkzoNobel is already progressing with the second generation of thermal energy management, incorporating objects of a same size order as the wavelengths of light intended to scatter, but with a refractive index very different from its surrounding medium. This allows light diffraction and scattering back part of the incoming energy.

At AkzoNobel we are working everyday to propose the most sustainable and performing products to our customers. With their trust and support, we will continue to be a pioneer in the market on sustainability and innovation.

www.akzonobel.com

Pamela Phua has more than 20 years' experience in Research, Development and Innovation (RD&I) in the coatings industry. In her current role as Director of RD&I for AkzoNobel, she drives new technology development and product implementation across the South East, South Asia and Middle East regions.

Ms Phua was instrumental in setting up the global research and laboratory operations for AkzoNobel Decorative Paints (Global Exterior Wallpaint Expertise Group) in 2011. In her global capacity, Ms Phua implements the functional and product innovation strategy for Exterior Wallpaint. She spearheads the RD&I functional excellence, standards and capability.

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Shifting to a green economy – it's all about striking a balance

By Raji Hattar, Chief Sustainability Officer at Aramex

Over the past ten years, we have seen a change in the way corporates view sustainability. In the old days, corporate activism was traditionally seen as a way to give back to the local community or support environmentally friendly initiatives. Organizing philanthropic activities such as employee volunteering programmes or donating to charities, broadly captured how these companies approached corporate activism. But with business dynamics changing, and some companies beginning to look for new ways of enhancing performance, corporate activism is taking on a different role within these companies. Rather than being seen as only geared towards environmental and community development, corporate activism is becoming viewed as a strategic investment for business development.

What has facilitated this shift? In my opinion, there are four main drivers.

First, staying in business. Regulations are raising the bar when it comes to environmental protection, and companies must find solutions to reduce their carbon footprint if they want to stay in business. In the United Arab Emirates, for example, Abu Dhabi introduced new laws in 2009 requiring all new building developments to adhere to green building codes. Dubai Municipality also introduced its green buildings specifications in 2011, making it mandatory for any new government building to abide by these codes. The government also recently announced its plans for a new federal environmental legislation, allowing the Ministry of Environment and Water to directly impose penalties on polluters and implement recycling and waste reforms. Therefore, for corporates to stay in business, they must become more environmentally friendly. This is a trend that will only continue to grow as governments around the world introduce more environment-based laws.

Aramex solar farm in Amman , Jordan

Second, improving financial performance. Businesses increasingly realize the positive benefits corporate activism can have on their bottom line. A decade ago, running a successful business may have been broadly defined as 'output' - or what the company is capable of producing. An increase in share price, a newly acquired company, or expanding into a new market would all possibly contribute to stronger financial results. But what companies didn't always think about was that business growth could also come from cutting back. Minimizing operational efficiencies can significantly impact finances, and investing in initiatives that reduce water and electricity consumption can lead to an internal rate of return of up to 80%, according to McKinsey. With more research and data in the public domain on this trend, companies quickly realize that half the battle in maintaining sustainable business growth is keeping operational costs low.

Third, maintaining and developing stakeholder relationships. Clients, employees, and investors are increasingly choosing to pursue relationships with firms that have active corporate activism programmes. According to EY, many investors are finding companies' non-financial disclosures, such as their corporate activism activities, as essential to making an informed decision about their future investments. Because of this growing trend, a lot of organizations are now required to include sustainability activities in their annual financial reports. There is no doubt that companies are seeing the value in robust corporate activism programs, as this has a direct impact on the decisions existing and potential stakeholders make when it comes to pursuing a relationship with a business.

Fourth, becoming a market leader. Businesses are starting to see how corporate activism can raise industry standards and make them market leaders. Technology has played a major role in growing this trend, with advancements over the past decade turning corporates on to the idea that they can outperform competitors if they have the right innovative, digitally-based solutions in place. Some companies have been so successful in sourcing technology-based solutions that they have put competitors out of business, or significantly reduced their share in the market. So while corporate activism continues to contribute to supporting the environment and community, it also has a material impact on the growth and success of businesses and their ability to lead in their sectors.

I believe it is this holistic approach to corporate activism around the world – one that focuses on the success of all aspects of the business - that will contribute to the development of greener economies in the future. We cannot go on managing businesses in ways that

are inefficient or harmful to the communities where we operate. We also cannot go on only contributing to environmental and community initiatives, as this is just one piece of the bigger puzzle. Making our businesses more lean and efficient is just as important as our ongoing dedication to the local environment and community-based initiatives.

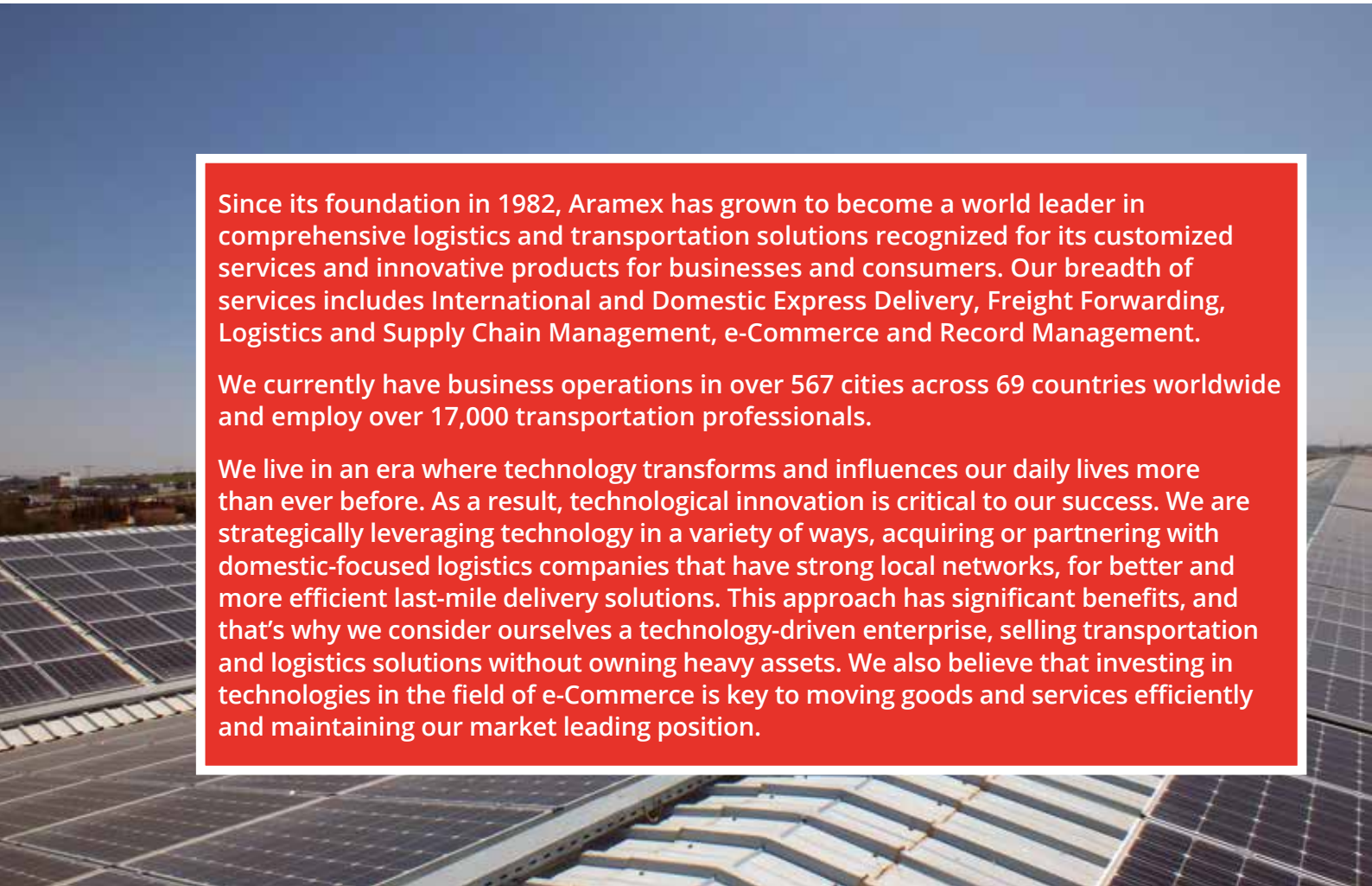
And there is also a catalyst that companies can leverage to better and more quickly achieve this balance. As the Chief Sustainability Officer of Aramex, I have seen first-hand the benefits digital solutions can bring to the business. We, at Aramex, fully embrace this mind-set when developing programs and activities for our corporate activism platform 'Delivering Good', putting technology at the heart of many of our programs. For example, in recent years we have undertaken a number of technology-driven initiatives to achieve this balance between supporting the environment and community, while also making our operations more green and efficient.

We are currently in the process of making most of our facilities entirely powered by solar technology. This has already been completed in Amman, Jordan, and we recently launched a similar project in Dubai. We continue to adopt global best practices in environment certifications and have Leadership in Environment and Energy Design (LEED) accreditations for our warehouses. We are also exploring options to make our Aramex fleet entirely electric. These technology-based initiatives have not only positively impacted the environment and communities where we operate but have made our business more sustainable.

When it comes to corporate activism, in my opinion, it's all about balance. We must deploy programmes and initiatives that not only give back to the environment and communities where we operate, but that help us sustainably grow our operations. Technology will also continue to play a fundamental role in how quickly we strike this balance and move towards a green economy. What is key is that we not only work hard to get there but fully leverage technology in our everyday corporate activism practices moving forward. This will not only contribute to more efficient and successful business operations but fuel the development of our future green economy.

www.aramex.com

aramex



Since its foundation in 1982, Aramex has grown to become a world leader in comprehensive logistics and transportation solutions recognized for its customized services and innovative products for businesses and consumers. Our breadth of services includes International and Domestic Express Delivery, Freight Forwarding, Logistics and Supply Chain Management, e-Commerce and Record Management.

We currently have business operations in over 567 cities across 69 countries worldwide and employ over 17,000 transportation professionals.

We live in an era where technology transforms and influences our daily lives more than ever before. As a result, technological innovation is critical to our success. We are strategically leveraging technology in a variety of ways, acquiring or partnering with domestic-focused logistics companies that have strong local networks, for better and more efficient last-mile delivery solutions. This approach has significant benefits, and that's why we consider ourselves a technology-driven enterprise, selling transportation and logistics solutions without owning heavy assets. We also believe that investing in technologies in the field of e-Commerce is key to moving goods and services efficiently and maintaining our market leading position.

Lean, green, quality building machine

We are currently living in a civilizational impasse due to a development model that is quickly destroying the planet's natural resources on an unprecedented scale with negative impacts to people's quality of life. Nowadays production and consumption constitute the sustentation for this model, where the focus is maximising profits, with the understanding that nature is an inexhaustible source of raw material and energy.

Sustainability is the fundamental principle of intelligent management, where the expected results are not only the financial side, but the triple bottom line, where we have three pillars: economic, social and environmental.

C. Rolim Engenharia has been active in the civil construction industry in Brazil in favour of a more conscientious world, where the question is: "*Is it necessary to destroy in order to build?*" Of course not. The path to sustainable construction is the unification of "lean" and "green". So, let us be "lean" and "green" as nature is, because the flora takes from the environment only what it needs, in other words, every plant is born lean.

At the centre of our management model we have the Lean Philosophy, based on the Toyota Production System.

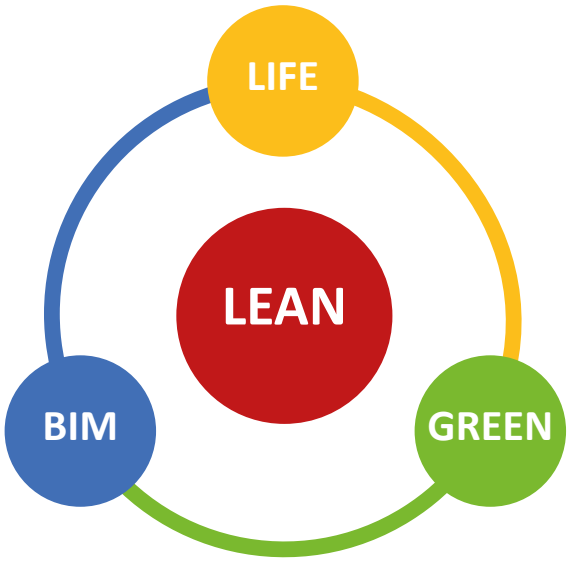


Figure 1 - C. Rolim Engenharia's management model

The pillar "BIM" symbolizes the search for technical innovation throughout the entire life cycle.

The pillar "Life" is a reference to the quality of life of our collaborators and workplace safety. It encompasses a series of actions that are aimed at the loyalty of the internal client.

The third pillar is the green philosophy. The predisposition to this green philosophy has its seeds in the passion of our president and his collaborators. In 2009, the program Green Commitment was created. The program consisted of planting one tree in a public space for each square meter of land acquired, in order to increase our planet's afforestation. Even without knowing the concepts and politics established about the management of emissions back then, our first initiative was to reduce the environmental impact of our activities. This project was awarded regionally and nationally.

In 2014, we certified the first residential building in Brazil with LEED for core & Shell, and the first building with the energy efficiency label of "Brasil PBE Edifica nível A". In 2015, we published our first report within the Global Reporting Initiative (GRI) guidelines, and started to make carbon offsets.

This year, to celebrate the company's 40th anniversary and as a way to improve our planet's arborisation, C. Rolim Engenharia is going to plant 40,000 trees in the biggest park in Fortaleza.

To reduce waste and improve the management of solid, liquid and gaseous effluents of civil construction, C. Rolim Engenharia developed a program of carbon management with established goals, such as the industrialization of the processes in construction with technology, reduction of solid waste, water consumption, energy use, vegetal suppression and fuel consumption, in addition to making all the carbon offsets.

Planting 40,000 trees in Cocó's Park. From left to right: Artur Bruno (environmental secretary of Ceará State); Edson Queiroz Neto (entrepreneur); Camilo Santana (governor of Ceará State); Pio Rodrigues (C. Rolim Engenharia's CEO) and Roberto Claudio (mayor of Fortaleza)

Other goals are the acquisition of materials that have less embodied carbon emissions, while seeking ways to diminish the consumption of wood, and to study and conduct the LCA of our buildings.

It is notable that the choice of the constructive typology and materials that diminish the generation of waste and the use of less humid processes is essential to reduce emissions and waste, in addition to increasing the efficiency in production. Furthermore, because of its substantial values, the Scope 3 emissions should be accounted, as they are considerable in the civil construction industry.

Raising awareness is fundamental to everyone: construction companies, government and society. We need to reduce environmental impacts throughout our industry to guarantee the preservation of the environment as well as collective wellbeing.

www.crolim.com.br

C. Rolim Engenharia is a construction company active in the Brazilian market for 40 years. Practitioner of the Lean Philosophy since 2004, its goal is to exceed customer's expectations. The company is committed to the triple bottom line (price, planet and people), seeking the sustainable development, and to "building constructions, building lives".

C. ROLIM ENGENHARIA 40 ANOS
Evoluindo para você

Construction industry's paths and challenges towards a sustainable future

By Petrônio Braz Junior, Construtora Queiroz Galvão National CEO

Construtora Queiroz Galvão Brasil combines economic development and environmental preservation in one of the most complex engineering projects in Brazil.

Performing complex engineering projects combining population quality of life, economic development and environment preservation is the great challenge for Construtora Queiroz Galvão Brasil (CQG) in major engineering projects. Historically associated with high consumption of natural resources and energy, the industry begins to incorporate concepts of sustainable construction into the productive chain. We are overcoming cost, infrastructure and technology challenges to become a global benchmark in green building. Our projects respect the harmony among economic, social and environmental sustainability, having construction and the environment working together for innovation, job creation and income.

A good example of these new practices is the duplication of the Tamoios Highway, on the North Coast of São Paulo, where CQG has committed to reduce cutting areas and removal of vegetation, the so-called suppression areas. The initiative earned the developer an appointment to the ECO Amcham & Estadão Award, Brazil's most traditional seal of corporate sustainability, created in recognition of companies with business models that combine profit and social responsibility.

The reduction of impacted areas began during engineering studies and assessments in April 2015. The suppression areas are located within an Atlantic Forest Conservation Unit, the Serra do Mar State Park, a region of marked topography and difficult access. The CQG provided a multidisciplinary team of professionals to verify impact assessment. The work group carries out topographic and geological surveys, field inspections, recognition of obstacles to engineering, as well as studies of local fauna and flora. The goal is to understand the region as much as possible in order to use the most appropriate engineering solutions and to promote good sustainability practices. The group's progress in the region has already reached 70%.

Construtora Queiroz Galvão gave rise to one of the largest business conglomerates in Latin America: the Queiroz Galvão Group. There's more than 60 years of history, marked by the effective contribution for the growth of Brazil. With a focus on sustainable business development, Construtora Queiroz Galvão offers innovative solutions for engineering works with a high degree of complexity. The quality of the works, together with the commitment to the deliveries of the projects, made the company a national and international reference in engineering solutions.

Our team had to find an innovative strategy to facilitate access to the forest without compromising native vegetation. The constant rainfall and the heavy fog prevent the transport of equipment by helicopter, making the task even more challenging. Our research has resulted in the choice of Cable Crane, an unprecedented technology in Brazil that uses cables, winches and tools, which is similar to a cable car for passengers and freight. The choice of this engineering solution eliminated the need for new interventions in native vegetation areas. The innovation suspended earthworks with excavations in soil and rock located in areas susceptible to erosion and landslides.

The reduction of the suppression areas and the implementation of Cable Crane will represent savings of approximately R$300,000 in the final cost of the work. The benefits, however, cannot be assessed solely on the financial prism. The initiative shows the commitment of the Construction Company to the environment. We face all the challenges of setting up a highway in the Serra do Mar State Park (PESM), a Conservation Unit, where the basic objective is to preserve nature.

Most of PESM has areas with vegetation cover and preserved ecosystems. There are also several sections near human habitations, featuring a number of impact restrictions on the population.

The company expects that sustainable practices are replicated by other organizations. To this end, we have adopted a new management tool, which is a digital platform for archiving the licensing processes to disclose environmental indices and disseminate good practices. Within the Queiroz Galvão Group, this process serves as a reference for projects implementation. In the scope of large public construction projects, this initiative will serve as an example of good project management and also implementation of environmental improvements.

www.construtoraqueirozgalvao.com.br

queiroz galvão
CONSTRUCTION

Estre Ambiental establishes itself as a benchmark in solid waste management in Brazil

Today, Estre Ambiental is the leading and largest company in solid waste management in Brazil and Latin America. The company offers a full range of environmental services throughout the waste chain – collection, transportation, recovery, treatment and final destination – to municipalities, industries, hospitals and companies in a wide range of segments present in seven Brazilian States.

Estre uses innovative technologies that allow it to go beyond the final and adequate disposal of waste, which is transformed into electricity using biogas in landfills and through the production of refuse-derived fuel (RDF), used in cement plants. Two biogas plants – in Guatapará (São Paulo state) and Curitiba (Paraná state) – generate approximately 14 MW and have a short-term potential of 80 MW.

The company is one of Brazil's largest specialists in reverse manufacturing, a process that reuses more than 85% of electronic waste. Additionally, it recycles building materials and adopts microwave and electrothermal deactivation technologies for treatment and disposal of hospital waste. All this reduces waste volumes by up to 70% without polluting the atmosphere. It also acts in the decontamination of soils by bioremediation.

Estre's landfill operations are distributed in 13 units in the states of São Paulo, Rio de Janeiro, Paraná, Bahia, Sergipe and Alagoas – where about 50% of the country's population lives. Landfills annually receive 6 million tonnes of waste. Another five units are expected to start operating in the next few years.

Commitment to the environment, social responsibility and ethical action

Estre's mission is to provide innovative environmental solutions in a safe and responsible way to improve the quality of life of the communities where it operates. In line with its mission, in 2006 the company created the Estre Institute for Socio-Environmental Responsibility, which, over the course of 10+ years, has become a reference center for environmental education, with projects that reached more than 300,000 participants. Moreover, it maintains a compliance program, which includes an integrity policy based on the anti-corruption legislation and all its laws and decrees.

Brazil's largest company in the sector offers innovative solutions, including the transformation of waste into electricity

Merger with Boulevard Acquisition
With 14,800 employees, the company is expected to generate US$ 466 million in revenue and US$ 132 million in EBITDA in 2017. Estre and Boulevard announced that a business combination agreement was signed and the two companies should merge by the end of this year, resulting in Estre's capitalization and faster growth pace from next year.

www.estre.com.br

estre
LIXO É SÓ O COMEÇO

Distinct performance attracts international investors, making Estre a public company with an initial value of US$ 1.1 billion

Fulfilling the promise of Paris – quality infrastructure for the energy sector

By PTB Physikalisch-Technische Bundesanstalt

How rigorous testing and certification can make sure renewable and energy efficiency technologies deliver on climate change goals.

Renewable energies and energy efficiency play a key role in achieving mitigation targets and they thereby combat climate change. When generating energy, the efficiency, the quality and the operating life of systems are of key importance. To test the profitability of such efficient energy systems, an earnings prognosis based on reliable measurement data (e.g. radiation intensity, wind speed) is required. Without physically testing performance, durability and reliability, there is a risk that products which have been installed will fail to deliver the performance specified, or will even be faulty. To ensure the comparability of data, measurement procedures must be harmonised and the correct measurement instruments must be calibrated. Recognised certificates certify the compliance of products and components with binding standards. Metrological and testing services play a decisive role during enhancements to increase the efficiency and operating lifetimes of systems, and also while characterising new materials, models and procedures. Here, development and approval may

also be necessary for new measurement instruments. Laboratories which carry out tests in accordance with valid standards are required to maintain a recognised quality management system, as well as furnish proof that their measuring instruments undergo regular inspections. An accreditation then certifies that the laboratory possesses the corresponding expertise.

The efficient use of energy makes a significant contribution to resource conservation and mitigating climate change. The lower the energy losses during the production, conversion, distribution and utilisation of energy sources, the higher the energy efficiency is. Here, contributions to the quality infrastructure include the specification of standards in the fields of construction engineering and building technology (such as for insulation, heating, cooling, ventilation and lighting), and consumption labelling for electrical devices. These contributions also support the dissemination and acceptance of renewable energy technologies. Consumers gain trust in the functionality and operating life of these technologies and are more willing to switch from climate-damaging energy sources. Hence, governments' efforts to meet their mitigation targets are supported.

PTB contribution and impact

Many developing countries and countries in transition lack internationally recognised quality infrastructure systems comprising measurement, testing, standardisation, certification and accreditation. Under such conditions, laws, ordinances, technical regulations and quality requirements can only be implemented with great difficulty.

For this reason, PTB provides training for experts and managers in public institutions and in the private economy, thereby providing assistance in the establishment of a quality infrastructure for renewable energies and energy efficiency. National and international experts provide consultation to the various institutions, and their employees are professionally trained and take part in regional and international exchanges of experience.

As one of Germany's national implementation organisations in the field of development cooperation, PTB conducts projects mainly commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ). The Technical Cooperation Department of PTB strengthens the existing quality infrastructure of partnering countries amongst other

things through cooperation work in the energy sector. In doing so, locally available and demand-oriented services can be offered with expertise. This support is provided with the intention of enabling businesses to manufacture their products so that they are reliable, of high quality, internationally competitive and protective of resources. Ministries and regulatory bodies will then be able to make increased use of the instruments of conformity assessment to determine safety standards and limits, and to monitor compliance with them. By supporting quality infrastructure in the energy sector, PTB is supporting its partnering countries in keeping the promise they made in Paris.

www.ptb.de/cms/en/ptb/fachabteilungen/abtq/fb-q5/

PTB
Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

The Physikalisch-Technische Bundesanstalt (PTB), Germany's national metrology institute, has been providing its services for more than 125 years. For over 50 years, PTB has shared its core competence in international development cooperation. It supports developing and emerging economies in the comprehensive field of quality infrastructure.

Banking on sustainable development

Rawbank is the largest bank in the Democratic Republic of Congo in terms of customer deposits and has nearly 100 branches spread across the country.

Rawbank is striving to reconcile its strong growth together with the development of communities and stakeholders, and has created a department in charge of corporate social responsibility (CSR), in order to grasp the social and environmental challenges and control its impacts on nature.

Its CSR activities are based on a number of principles: humanistic and ethical commitment to its human capital, its clientele, suppliers and partners, environmental values, economic development and social contribution of the local communities, the region and the country, the contribution to the banking of populations through its proximity, its products and services and the high social impact of its activities.

Rawbank acts on several strategic axes, including:
1. GOVERNANCE: which applies to the three economic, social and environmental strands, ie, People, Planet and Profit, through a transparent, ethical attitude and compliance with local and international laws and regulations. Through the eco-compliance of its financing, for example, Rawbank grants credits in strict compliance with social and environmental risk standards and the categorization of activities to be financed, excluding those included in the internal exclusion list, aligned with recommendations of IFC or the AfDB.

The bank documentation department also regularly publishes periodicals in support of the bank's good governance, in terms of fighting corruption, improving relations and working conditions, protecting the environment, with consumers, etc.

2. ENVIRONMENT: Rawbank is committed to protecting nature. For the past few years there has been a voluntary, paperless attitude expressed through the dematerialization, digitization or automation of processes, archives, operations transactions and human resources administration. Green IT has guided the choice of equipment and IT solutions as well as the use of renewable energy, including in our branches in the underprivileged communities in the country. In fact, an 18% reduction in the fuel cost center was achieved in 2016.

Rawbank also supports nature-friendly initiatives and partners, for example those involved in protecting mangroves.

3. ECONOMY: Because the customer is king, relations with consumers are constantly refined. Rawbank is committed to fair marketing, consumer protection, data protection and privacy.

To this end, note by way of example:
- Distribution of the general settlement of operations to any customer;
- Market segmentation, responding specifically to the expectations of different customer profiles;
- The existence of services such as the Call Center or the Customer Experience for consumer access ,to information, education, assistance and resolution of claims, etc.
- The offer of services and products designed for customers with special needs or fragilities. To name just two, the Lady's First program for women entrepreneurs offers a tailor-made preferential rate, as well as non-financial services such as legal assistance or various training modules: financial plan, management marketing, etc.

The Academia product has enabled banking inclusion of young people under the age of 26, using paperless, online and electronic products, at a zero interest rate.

Rawbank is committed to fair marketing and anti-corruption practices: at least two levels of control are required for each business process, whistle blowing also allows any agent to anonymously report suspicions of fraud, compliance works in the fight against money laundering, terrorist financing and corruption, etc.

4. SOCIAL: In the field of human rights, Rawbank is committed to continually improving internal relations and working conditions, including employment, employer and employee relations, social protection, human capital development, health, hygiene, safety at work, etc.

Rawbank supports the elimination of discrimination in employment and occupation, in line with the sixth principle of the United Nations Global Compact. It is distinguished by its cultural diversity, with a dozen nationalities, a reflection of Congolese society and a source of creativity, innovation and efficiency. It currently has 1,603 employees, of which 5% are expatriates and 33% are women.

We also note the training provided by the Rawbank Academy, various cultural and sports activities, genuine means of integration and cohesion. By supporting its Rawladies platform dedicated to building women's capacities for natural access to positions of responsibility, Rawbank

respects the freedom of association in business advocated by Global Compact.

Concerned about the development of populations, Rawbank expresses in many respects its solidarity in the fields of education, culture or health, through various philanthropic actions, sponsorship and patronage. Alongside support for orphans, the elderly, the sick and the street children, Rawbank grants scholarships and supports Congolese athletes and talented artists, famous or not.

Rawbank is also involved in projects to assist local communities. The Walungu project as an example, conducted in partnership with UNDP and AIRTEL through the microfinance institution COOP EC CAHI, whose main objective was to involve the private sector in order to improve the living conditions of a community through the concept "Adopt a community" by the promotion of local entrepreneurship.

The project resulted in the construction of two market hangars and enabled the training of micro-entrepreneurs through SMETOOLKIT and BUSINESS EDGE, the dissemination of communication activities, the banking of indigenous people and the visibility of businesses. Among the win-win outcomes of this healthy and prosperous partnership were the creation of 200 micro-entrepreneurs, 50% of them women, the distribution of Airtel telecommunications products, the sale of banking products and services, increase of the customers and the turnover of COOP EC CAHI. As a result of the creation of economic activities, there is also an improvement in the living conditions of poor and rural people, peace building, capacity building, access to health care and payment of children's schooling.

Finally, through its innovative products and services, Rawbank contributes to the sustainable development goals (SDGs) signed by the DRC in 2015.

"Easy Energy", Rawbank's first green product, is a consumer credit that offers employees the opportunity to purchase solar kits and other renewable energy solutions. It promotes environmentally friendly technologies and activities and contributes to the development of communities where electricity is either non-existent or poorly supplied. It responds to SDGs 7, 9, 12 and 13.

"Illico Cash", allows the holder of a mobile phone to manage all its accounts and execute many transactions. Paperless product also accessible to non-banked, Illico Cash responds to SDGs 9, 10, 11, 12 and 13.

Progress has helped propel financial inclusion into the country's most remote corners and reduce our pollution by using solar energy. Of course, capital is needed to sustain this momentum and to fund more responsible initiatives.

Let us unite to lift people out of poverty and especially those affected by climate-related disasters and promote public and private innovations. Because strong economic growth is compatible with community development, because we can choose innovation by renouncing pollution, because we care about the well-being of our contemporaries and want to bequeath a worthy legacy to future generations, our commitment and determination remain.

www.rawbank.cd

RAWBANK
is my bank.

Defining moment: How we are raising our ambition for a healthier environment

Despite grave threats, development in harmony with the planet is within grasp.

By Naoko Ishii, chief executive officer and chairperson, Global Environment Facility

We stand at a defining moment for the future of the planet and human well-being. Our global commons –the land, seas and atmosphere we share, and the ecosystems they host – are under severe threat from ever more powerful human activities.

Several planetary boundaries, within which human society has become established and thrives, have already been transgressed as we have taken the global commons for granted. On this trajectory, the threat – not just to the environment but to global aspirations for economic growth, prosperity, jobs and security – risks escalating out of control.

Business as usual will guarantee disaster. Incremental change will not suffice to avoid it: the challenge is just too great for that. The only solution is transformational, systems change.

To get on the right path to a better, safer future, we need to work together on common and systemic solutions, and to address the drivers of environmental degradation.

Three global megatrends will lead to further major degradation of the global environment under a business as usual scenario: a growing population, which will exceed nine billion by 2050; a rapidly rising global middle class resulting in a tectonic shift in consumption and diet patterns; and rapid urbanization which is expected to add one billion new residents to the world's cities.

To "de-couple" the impact of these megatrends, we must fundamentally transform our key economic systems. We need to change the systems that support how we live, how we eat, how we move and how we produce and consume. In other words, four revolutionary shifts in social and economic life are needed: transforming cities, re-thinking food and agriculture, decarbonizing energy systems, and investing in the circular economy.

With its unique mandate across multiple multilateral environmental agreements – and its financing, holistic approach and wide network of partners – the Global Environment Facility is particularly well placed to help catalyze the required transformation.

Established on the eve of the 1992 Rio Earth Summit, the Facility was set up to help tackle our planet's most pressing environmental problems.

Its strong, diverse, and expanding network of partners includes 183 governments, together with civil society organizations, academia and private companies, as well as its implementing and executing agencies.

Since its inception, it has accumulated a vast body of experience and knowledge. It has a key role in bringing together multiple stakeholders and in catalyzing the private sector to form sustainable partnerships. And it has also always been ready to innovate.

But the uncomfortable truth is that we, like the rest of the international community, are failing to reverse the sharp downward trend in the global environment. We have won battles, but the war is still being lost. There have been many good initiatives, but the Facility's projects, too often fragmented and isolated, have come up short in shifting the needle in the right direction, let alone in bringing about transformational change.

It's increasingly clear that the Facility cannot afford to stand still. In the face of the scale and the urgency of the threats facing the planet, the emerging global momentum for change, and the evolving global financial landscape, the Facility needs to seize opportunities to make a bigger difference.

It is high time for the Facility to change and – with the full support of its Council – it is doing so. Three years ago, the Council agreed on the GEF2020, the organization's first- ever

Naoko Ishii, chief executive officer and chairperson, Global Environment Facility

We are switching our focus to address the underlying drivers of environmental degradation – rather than merely its effects

long term strategy, which we are now implementing. We are switching the focus of our operations to address the underlying negative drivers of environmental degradation – rather than merely its effects – and to support innovative and scalable activities that cost-effectively deliver the highest impacts.

We have a golden opportunity ahead of us. We are currently in the middle of discussions on the seventh replenishment of the Facility's Trust Fund. Participants will assess what works and what does not, and what strategy we should embrace at this critical moment. It's a chance to raise our own ambition.

The emerging overall programming architecture of the Trust Fund is aimed at advancing the 2020 vision by addressing the drivers of environmental degradation and contributing to systems change in key areas that impact our mission.

It is increasingly evident that it is simply not possible to address a particular environmental issue in isolation, as if it inhabited its own silo. Instead we need to address complex challenges in an integrated manner.

Some of the Facility's recent activities have provided clear evidence of the need to go deeper into the fundamental causes of environmental degradation. If we are to protect biodiversity, for instance, we should invest not only in protected areas but also make integrated investments in reforming land use and food systems, the major drivers of biodiversity loss. This in turn will meet the goals of multiple conventions and deliver more global environmental benefits, with greater impacts.

We all want to live on a healthy planet, and enjoy the beauty of nature. The world is responding to the threats we face, but not fast enough. With the Sustainable Development Goals and the Paris Climate Agreement, the world's nations have provided momentum and direction that must be seized. And multi-stakeholder sustainability platforms have proliferated, reflecting a growing recognition from business of both the risks and the economic opportunities that exist.

But, important as this all is, it is only a start. Much more is needed, and it must happen fast: we are at a tipping point, for good or ill, for the world's environment and prosperity.

The replenishment of the Trust Fund should be more about looking forward than back. And, grave though the current threats may be, future development in harmony with the planet is within our grasp.

We need to act swiftly, and at scale, to realize it – and that is just what the Facility intends to do.

www.thegef.org

This article was originally published in the UN Environment "Our Planet" magazine in September 2017

gef

Smarter cities powered by **connected** street lighting

New connected lighting systems like CityTouch can serve as a digital backbone for a city improving both the quality of life and light for citizens while delivering greater energy efficiency, reduced maintenance costs and improved management of lighting services.
It's just one of the many ways Philips Lighting is taking light beyond illumination.

innovation + you

Learn more at philips.com/citytouch
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