

Opening doors

The Abdul Latif Jameel Magazine

Autumn 2018

In this month's issue we talk about

Featured Articles

J-WAFS in action: Farm waste to fertilizer - improving soil quality in agricultural communities

Leading from the front: Our first female of finance

The Greatest Challenge We Face?

Unlocking Digital Success: Combining Industry 4.0 and Lean Management

Abdul Latif Jameel has been investing from the heart of Arabia across the promising MENAT region and beyond for over seventy years – shining a light on new opportunities for investment and growth. Trusted to open new doors; now, we are opening more.

Helping people who strive for better, to have better: better means; better lives; better prospects. Helping businesses who look further, to reach further. Into new markets, new homes, and new considerations. We can do this because we are determined in our quest for new potential; and we succeed because we never lose sight of why this matters. In this magazine, we showcase our investment in the development of the economies and the quality of life of people in the region.

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Editorial Team – You can contact the editorial team by sending an email to editor@aljmagazine.com
The term “Abdul Latif Jameel” refers broadly to several distinct, separate and independent legal entities. Abdul Latif Jameel is not itself a corporate entity, association or conglomerate run by an overarching parent company but merely refers to a group of distinct and wholly separate legal entities that are collectively referred to as Abdul Latif Jameel. Abdul Latif Jameel is not a corporate group as defined in section 1161(S) of the Companies Act 2006.

J-Clinic set to revolutionize disease prevention, detection and treatment



Transforming medical outcomes for people around the world – that’s the bold ambition set out for the Abdul Latif Jameel Clinic for Machine Learning in Health (J-Clinic), the newest collaboration between Community Jameel and the Massachusetts Institute of Technology (MIT) in Boston.

The development of machine learning artificial intelligence (AI) technologies that can revolutionize the prevention, detection and treatment of disease will be put under greater focus than ever when J-Clinic – the fourth major collaboration between Community Jameel and MIT – begins its work.

It will concentrate on creating and commercializing high-precision, affordable and scalable machine learning technologies in areas of healthcare ranging from diagnostics to pharmaceuticals, across conditions as diverse as cancer, Alzheimer’s, Parkinson’s, diabetes, kidney disease and asthma.

According to Accenture, the use of AI technologies in the healthcare economy could create annual savings of US\$ 150 billion by 2026¹. Among these savings are US\$ 40 billion through robot-assisted surgery, US\$ 5 billion through preliminary diagnoses, and US\$ 3 billion through automated image diagnoses. If repeated

around the world, the scale of the financial impact of AI in healthcare could be colossal. J-Clinic intends to be at the forefront of this medical revolution.



Hassan M. Jameel, Deputy President and Vice Chairman, Abdul Latif Jameel

“Channeling MIT’s machine learning expertise into healthcare will transform medical outcomes for people around the world,” says Hassan Jameel, President of Community Jameel Saudi Arabia.

“Healthcare has been an important sphere of activity for Community Jameel since our earliest days, from founding the first non-profit hospital for physical rehabilitation

in Saudi Arabia, to partnering on the King Salman Center for Disability Research. J-Clinic continues our journey of supporting cutting-edge research and driving innovation in healthcare, in Saudi Arabia and around the whole world.”

This marriage of machine learning with clinical and biological insights aspires to spur a global transformation in the healthcare and medical fields with the aim to save the lives of millions of people, spawn new technologies, and improve the entire healthcare industry around the globe.

J-Clinic will draw on MIT’s expertise in cellular and medical biology, computer science, engineering and the social sciences to help it advance three main areas of focus:

1. **Preventative medicine** methods and technologies with the potential to change the course of noninfectious disease by stopping it in its tracks.
2. **Cost-effective diagnostic tests** that may be able to both detect and alleviate health problems.
3. **Drug discovery and development** to enable faster and cheaper discovery, development, and manufacture of new pharmaceuticals, particularly those targeted for individually customized therapies.

¹ Artificial Intelligence (AI): Healthcare’s New Nervous System, Accenture, 2017



Anantha P. Chandrakasan
Dean of the MIT School of Engineering

Anantha P. Chandrakasan, Dean of the MIT School of Engineering, has been named as the Chair of J-Clinic. **“J-Clinic will make a difference in patients’ lives everywhere from major hospitals to villages in the developing world,”** he says. **“It will draw on MIT’s longstanding strengths in biomedical fields, on our decades of collaboration with the concentration of world-class teaching hospitals in Boston, and on our proximity to the world’s major biotech companies.”**

Regina Barzilay and James Collins have been named as J-Clinic’s inaugural Faculty Co-Leads. **“Today almost every aspect of our life is driven by machine learning predictions – be it travel, banking or entertainment,”** says Barzilay. **“The only area where we do not benefit from this powerful technology is the one which impacts us the most, our healthcare. The goal of the center is to change it. We aim to bring the best of AI technology we develop in our labs at MIT to hospitals and clinics in the United States and around the world.”**

Health care AI in action

AI and machine learning technologies are already pushing the boundaries of health care into areas that were undreamt of even a decade or two ago.

At the Royal Free Hospital in London, for example, British AI research firm DeepMind has created a tool that analyzes live health data to identify the patients at greatest risk of a sudden and fatal loss of kidney function².

In the United States, AI is already being used in the battle against diabetes, which is estimated to cost the country more than US\$ 245 billion each year in medical bills and lost wages³. Virta Health’s combination of smartphone app, AI software and real-world doctors has helped 87% of patients who had been relying on insulin to control their condition to either decrease their dose or eliminate their use of insulin completely⁴.

Similarly, the use of AI is enabling review and translation of mammograms 30 times faster with 99% accuracy, reducing the need for unnecessary biopsies as well as reducing the uncertainty and stress of a misdiagnosis^{5&6}.

AI has also been found to accurately find specific anomalies on chest CT images between 62% and 97% faster than manual checks, giving radiologists more time to focus on reviews that require greater interpretation or judgement⁷.

In terms of drug discovery and development, the potential for

AI to drastically cut the time and expense of new drug development is clear.

Novartis, Sanofi, Pfizer, GlaxoSmithKlein, Amgen and Merck are among the pharmaceutical giants to have announced partnerships with AI startups aiming to discover new drug candidates for a range of diseases, from oncology and cardiology⁸.

Pfizer is using IBM’s AI technology “Watson” to power its search for immuno-oncology drugs, while Sanofi has signed a deal to use UK start-up Exscientia’s AI platform to hunt for metabolic-disease therapies, and Roche subsidiary Genentech is using an AI system to help drive the multinational company’s search for cancer treatments⁹.

An enduring partnership

MIT and Community Jameel are longstanding partners through three other major collaborations: the Abdul Latif Jameel Poverty Action Lab (**J-PAL**), which was established in 2003; the Abdul Latif Jameel Water and Food Systems Lab (**J-WAFS**), which was established in 2014; and the Abdul Latif Jameel World Education Lab, (**J-WEL**) which was created in 2017.

“We have worked together for more than 20 years on a mission to make a better world,” says Fady Jameel, President of Community Jameel International.

“With its goal of revolutionizing healthcare around the globe, the launch of J-Clinic opens an exciting new chapter in the shared history



Left-to-right: Hassan M. Jameel, President Community Jameel Saudi Arabia, Rafael L. Reif, MIT President and Fady M. Jameel, President Community Jameel International share a handshake and congratulations at the J-Clinic launch event.

of Community Jameel and MIT and builds on the achievements of our many joint projects to date.”

J-Clinic, which will represent a key part of the MIT Quest for Intelligence, will support education, research projects, workshops and other activities at the intersection of machine learning and biology. It will also seek to advance patentable research that could be commercialized and spun out through licensing to startups and pharmaceutical companies, putting these advances into real-life practice.

MIT President L. Rafael Reif says: **“The healthcare system has no shortage of data. But it has far too little access to the kinds of tools and experts who can translate population-level data into clinical insights that could make it possible to tune care precisely for individuals.”**

“Building on MIT’s deep expertise in

fields from cancer to neuroscience, and our longstanding connections to Boston’s world-class medical community, J-Clinic offers an accelerated path to creating new technologies that could help make healthcare more effective everywhere – from villages in developing nations to major teaching hospitals.”

“We are grateful to Community Jameel for their humanitarian vision, boldness, generosity and continued enthusiasm for collaborating with MIT on their efforts to help make a better world.”



MIT President L. Rafael Reif, speaking at the J-Clinic launch, MIT Boston



Meet the J-Clinic leadership team

Anantha P. Chandrakasan

Chair (far-right of photo)

- Dean of the MIT School of Engineering
- Co-chair of the MIT-IBM Watson AI Lab
- Chair of the MIT-SenseTime Alliance on Artificial Intelligence

Regina Barzilay, Faculty Lead

(center-right of photo)

- Delta Electronics Professor of Electrical Engineering and Computer Science at MIT
- Investigator at the Computer Science and Artificial Intelligence Laboratory
- Recipient of a MacArthur Fellowship

James J. Collins, Faculty Lead

(center-left of photo)

- Termeer Professor of Medical Engineering and Science
- Professor of Biological Engineering at MIT
- Recipient of a Rhodes Scholarship and MacArthur Fellowship

Phillip A. Sharp, Chair, Advisory Board

(far left of photo)

- Institute Professor at MIT in the Koch Institute for Integrative Cancer Research
- Nobel Prize in Physiology or Medicine (1993)
- National Medal of Science (2004)

² A digital revolution in healthcare is speeding up. The Economist, 2 March 2017

³ How Artificial Intelligence Will Cure America’s Sick Healthcare System. Newsweek, 24 May 2017

⁴ How Artificial Intelligence Will Cure America’s Sick Healthcare System. Newsweek, 24 May 2017

⁵ What doctor? Why AI and robotics will define New Health, PwC, June 2017

⁶ This AI software can tell if you’re at risk from cancer before symptoms appear. Wired, 26 August 2016

⁷ 10 Promising AI Applications in Healthcare, Harvard Business Review, 10 May 2018

⁸ The AI Industry Series: Top Healthcare AI Trends To Watch, CB Insights, accessed October 2018

⁹ How artificial intelligence is changing drug discovery, Nature, 30 May 2018



Left-to-Right: Eng. Abdallah Al Hazani, VP, Automotive Cluster, NICDP, Shunkichi Kamiya, CEO & President, Kosei Aluminum, and Shigeki Enami, President & CEO, Abdul Latif Jameel Japan

Landmark Japan-Saudi investment set to boost Saudi Arabia's Auto-manufacturing sector and export growth

Japanese automotive manufacturer Kosei and Abdul Latif Jameel have signed an agreement with Saudi Arabia's National Industrial Clusters Development Program (NICDP) to explore the manufacturing of aluminum wheels in the country.

The deal, the first major Saudi Arabian automotive components venture aimed at manufacturing goods for the export market, will see Abdul Latif Jameel, Kosei and NICDP undertake a feasibility study into manufacturing automotive aluminum die casting wheels and components. This would contribute to the development of Saudi Arabia's manufacturing industry – a key priority of Vision 2030.

Long term plans for the venture include developing a new global hub for Kosei, contributed by Saudi Arabian Mining Company (Ma'aden), its first outside Japan and the United States. The volume of wheels produced would represent a significant world market share and seem set to generate significant local employment opportunities.



Mohammed Abdul Latif Jameel, Chairman & CEO Abdul Latif Jameel, and Masato Ohde, Director of Kosei Aluminum Co., Ltd. at the initial MoU cooperation signing in Spring 2018

Shunkichi Kamiya, CEO and President of Kosei, said at a ceremony to mark the agreement: **"We are delighted to sign this MoU with NICDP and Abdul Latif Jameel to discover the enormous potential and various opportunities in Saudi Arabia, as well as the MENA region. With the natural advantages possessed by Saudi Arabia combined with the technological contribution of Kosei, we hope to succeed in our ambition to contribute substantially to the development of the country's manufacturing sector."**

Abdul Latif Jameel Vice Chairman and Deputy President, Hassan Jameel, said: **"This MoU explores the exciting potential to bring manufacturing skills and jobs to Saudi Arabia and marks the first Saudi Arabian venture in large scale automotive components manufacturing for export. The agreement is an important step in NICDP's efforts to develop the manufacturing industry in Saudi Arabia in accordance with Saudi Vision 2030, and strives to make a valuable contribution to the Saudi automotive cluster."**



**Saudi Japan
VISION 2030**
الرؤية السعودية اليابانية 2030

The signing came ahead of an expected visit to Saudi Arabia by Japanese Prime Minister, Shinzō Abe, and follows a visit by King Salman bin Abdulaziz Al Saud in March 2017, during which Saudi Arabia and Japan agreed to deepen existing bilateral relations and establish a solid strategic partnership, as part of the Saudi-Japan Vision 2030.



J-WAFS in action: Farm waste to fertilizer – improving soil quality in agricultural communities



Ahmed Ghoniem, Professor in the Department of Mechanical Engineering at MIT (above), and Kevin Kung, a PhD student in the School of Engineering, are leading one of the latest MIT research projects awarded J-WAFS funding earlier this year. Ahmed and Kevin are looking to refine new biomass processing technology to produce fertilizer on a small scale in rural communities, using mostly local resources, labor and agricultural waste.

Opening Doors spoke to Ahmed (AG) and Kevin (KK) about the project and its aims.

Q. What is the title of your research project?

AG: The project is called “Decentralized torrefaction for producing high-yield, irrigation-saving fertilizer.”

Q. What issue are you seeking to address?

KK: Many smallholder farmers in rural communities, particularly in developing countries, depend on costly, synthetic fertilizers imported from abroad. The misuse of these fertilizers – using the wrong fertilizer

in the wrong context - can often lead to soil acidification and crop yield loss.

For example, I was working in Kenya in 2013, and I noticed that a lot of smallholder farmers would indiscriminately use one type or other of chemical fertilizer, without consideration for the specific nature of the soil. In some cases, it led to an improvement in yield, but in other cases it had the opposite effect. Many farmers had noticed that their soil was degraded, but they weren’t sure why.

Part of the problem was knowledge, in that they weren’t aware of the correct fertilizer for their context, but it is also about access. Imported fertilizer tends to be quite expensive, so farmers can often only afford the cheapest variety. They don’t have five or 10 different types to choose from, according to their soil type.

Q. In simple terms, can you briefly describe your proposed solution?

KK: The general concept of burning organic waste to produce fertilizer is not new. For thousands of years, people would burn wood

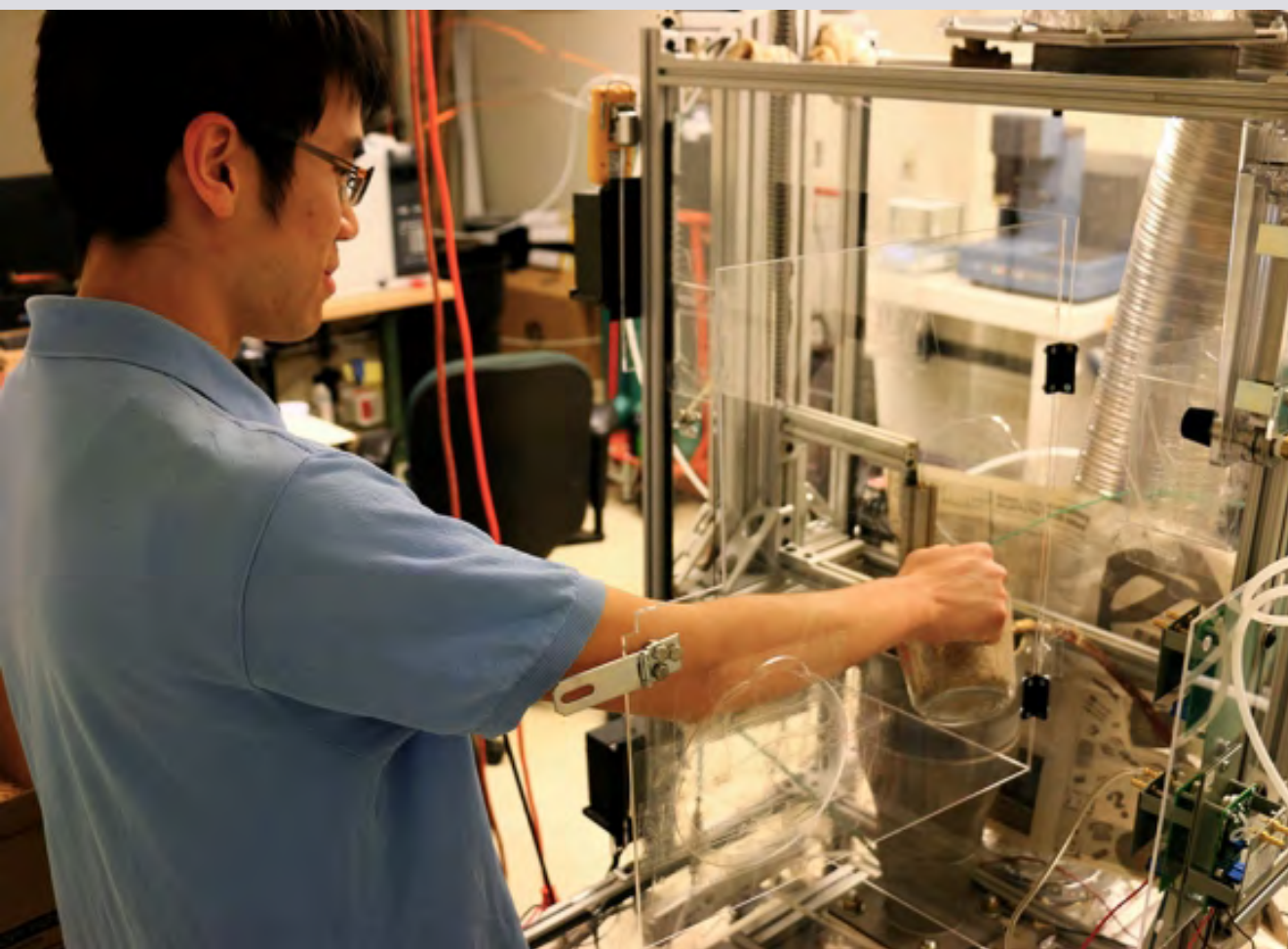
and plant matter and then mix the resulting ‘char’ in the soil to fertilize it.

The technology to scale up and commercialize this so-called ‘torrefaction’ process is not new either. But it is a very large-scale process, producing hundreds of tons a day, and the equipment costs millions of dollars.

Our objective is to design something that brings the torrefaction process to the local level, so it can work in rural settings, using locally available resources and labor, to cost-effectively produce fertilizer on a village or community scale.

AG: There is also a second objective, which is to develop a ‘clean’ method of biomass torrefaction that doesn’t release harmful compounds, like soot, into the environment.

So although the concept of biomass torrefaction is not new, we are trying to make it more environmentally-acceptable at a scale where it is both economically viable and accessible to farmers.



Kevin Kung, a TATA Fellow and PhD candidate in biological engineering, feeds rice husks into the torrefaction reactor in his lab at MIT. A thermochemical process will convert the biomass to a more energy-dense form, making it easier to transport and use as fuel. Photo: Ben Miller, MIT

Q. Could you explain the torrefaction process?

KK: Torrefaction is a thermo-chemical process. You start with biomass, such as old crops or agricultural waste and you heat it up. The heat causes chemical reactions in the matter and you lose a lot of the 'bad' stuff, like acids and CO₂. What's left is something that is more carbon rich, called 'torrefied biomass', or 'biochar'. This is alkaline, so in acidic soil it acts as a liming agent and restores a lot of the nutrients and the pH balance to the soil.

Produced under the right conditions, it also has a porous structure that allows it to retain nutrients and moisture more effectively, which can help to improve the condition of bleached soil.

Q. Is your technology aimed at individual farmers, or at the village and community level?

KK: Typically, we expect it to be aimed at a village level, so maybe a 10-20km radius with about 500 to 1,000 farmers. It's much easier to coordinate it at a village level where you have a harvest season and it is very intensive.

AG: This is actually one of the issues we're still working in. Our concept is based on a mobile

torrefaction system that can move from community to community on the back of a trailer or similar. Optimizing the process clearly means we need to find the right size farm or village where that torrefaction reactor can park up and perform the process, and leave the charcoal behind to be used on the farm, or distributed locally. There may even be surplus product that could be sold to earn additional income.

Q. Are you confident that the product can be delivered at a low enough cost to be commercially viable in those communities that most need it?

KK: This is one of the areas we are looking to refine over the next 12 months, to demonstrate that this will work.

The basic technology is already in place and we have demonstrated that it will work in the lab. The next task is to scale it up and make sure it still works in the environments we are focusing on, or if we need to make any interventions. And then how do we translate that into a design that uses local components as much as possible.

AG: The local manufacturing element is important. We want to explore the local talent

and capabilities in these areas, so that most of the equipment can be produced and assembled locally, keeping costs to a minimum.

Q. How important is this funding from J-WAFS Solutions in terms of helping you achieve these ambitions?

AG: It is vital. Most of our previous work on biomass torrefaction has been focused on turning biomass into energy, rather than fertilizer. So the whole area of agriculture and food production is relatively new to us.

The funding from J-WAFS Solutions is enabling us to take the essential first steps to start making in-roads into this market, and hopefully turning our vision into a reality.

We are confident, too, that working with J-WAFS can help us not only in terms of the technology development, but also in exploring diversification and the commercialization of the technology.



Abdul Latif Jameel Energy's FRV announces 5th large Australian solar project

Fotowatio Renewable Ventures (FRV), a leading global developer of renewable utility-scale projects and part of Abdul Latif Jameel Energy, is to develop an 85 MWac solar project in the Australian state of Victoria.

The project was awarded through its subsidiary Winton Asset Trust with the support of the State Government in the Victorian Renewable Energy 2017 Reverse Auction Scheme aimed at supporting the achievement of the Victorian Renewable Energy Targets ([VRET](#)),

Covering approximately 250 hectares, the 85 MWac [Winton Solar Farm](#) near the town of Benalla is due to start construction in early 2019. Once operational, it will supply enough electricity to power around 50,000 homes and deliver an annual reduction of 150,000 tons of CO₂.

The solar farm will create job opportunities during both construction and operation phases, including an estimated 150 workers required to build the plant, and the development of a local employment and procurement program that will create indirect economic opportunities for local businesses and the [community](#).

In line with [Victorian State Government](#)'s goal to strengthen community support of renewable energy projects, FRV's Community Engagement and Social Benefit Sharing Plan aims to meet the needs of the local community and includes a two-year pilot partnership with the [Regent Honeyeater Project](#), one of the most active volunteer conservation projects in Australia. FRV is also exploring support of the [Benalla Sustainable](#)



[Futures Group](#), helping to deliver key aspects of their three-point plan to position Benalla as one of the first 'zero net energy' towns.

Winton Solar Farm is FRV's fifth large-scale solar project in Australia since it entered the market in 2010, and the first in the State of Victoria. The other projects are Royalla (20 MWac) in the Australian Capital Territory; Moree (56 MWac) in New South Wales and Clare (100 MWac) in Queensland. In addition, FRV is about to finish the construction of the Lilyvale solar plant (100 MWac) in Queensland.

These five developments, when all operational, will generate around 365 MWac of clean energy capacity, bringing the total value of FRV's solar investments in the Australian renewable energy sector to around A\$ 850 million.



"With this, our fifth major project in Australia, Abdul Latif Jameel Energy is proud to continue to be a part of the development of a sustainable energy and economic future of Australia."

Daniel Sagi-Vela
Chief Executive Officer of FRV, solar and wind renewable energy company
and part of Abdul Latif Jameel Energy



This wearable water quality test kit provides a simple, accessible way to test the presence of *E. coli* in drinking water. Photo: Susan Murcott/MIT D-Lab



J-WAFS in action: A wearable testing kit to check for *E. coli* in water

Jeffrey Ravel, Professor and Head of the MIT History Faculty, and Susan Murcott, an environmental engineer and Lecturer in MIT's D-Lab, are leading a project to develop and market simple, low-cost kits to test for the presence of *E. coli* in drinking water. The initial focus is on communities in Nepal, with a medium-term goal of distributing the kits in other markets.

Opening Doors spoke to Jeffrey (JR) and Susan (SM) about the project and its aims.

Q. What is the title of your research project?

JR: The project is called "Manufacturing and marketing *E. coli* test kits to promote safely managed drinking water and improved public health in Nepal."

Q. What issue are you seeking to address?

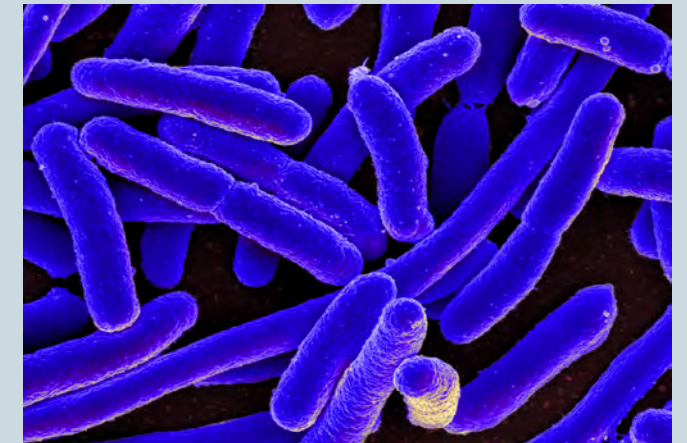
SM: To provide some context, one of the UN's Millennium Development Goals was around access to "improved" water.



Susan Murcott is a water/wastewater engineer and mentor to a generation of MIT students whose creative innovations are at the interface of water, sanitation and hygiene solutions for the bottom billion.

It's important to understand, however, that the term "improved" refers to the infrastructure that delivers the water – like a household connection, a public standpipe, a bore hole or a protected well – not the quality or safety of the water. So in India, for example, there is five hours of piped water supply a day, on average, but that doesn't mean the water is safe to drink. The only way to determine water safety is to test it.

The UN's Sustainable Development Goals took this ambition one step further and set a target to improve access to "safely managed drinking water" by 2030. One of the criteria that defines water safety is whether it has been tested for *E. coli*.



That's where our project to produce and distribute a simple, low-cost *E. coli* test fits in to the global picture.

There are already other kits that perform a similar task, but for one reason or another, they are not always suitable for different contexts, such as remote off-grid locations that don't necessarily have electricity or high-quality testing labs. Some of the reasons for this include portability, complexity, cost, ease of use, accuracy and so forth.

Our kit is designed to overcome these challenges by being portable, low cost at under at most US\$1 per test, easy to use and highly accurate.

Q. In simple terms, can you briefly describe your proposed solution?

SM: The testing kit actually performs two tests. One is a simple presence/absence test for *E. coli*. It simply tells you if there is *E. coli* present in the water or not. The second element is a quantitative test, which gives us much wider information on the nature of any water contamination.



Jeffrey Ravel,
Professor and Head of the MIT History Faculty

JR: The really innovative bit of our kit, though, is the body belt incubator. Once the water has been mixed with the test, the phials are incubated in a special body belt incubator that users wear for 24 hours. The users’ body heat provides the heat required for the chemical process of the testing. This means you don’t need to rely on an external power source to test the safety of the water. It can literally be done anywhere.

SM: That’s right. The tests themselves are not new. The innovation is in bringing together these existing elements into a wearable, low-cost testing kit and then, crucially, distributing it to the regions in Nepal where water safety is a priority issue.

Q. What are your priorities over the next 12 months?

JR: Our project is called “Manufacturing and Marketing *E. coli* Kits in Nepal”, so a big part of it is to figure out how to manufacture the kits and get that price point down below US\$1 per test. The other part is to figure out the

marketing strategy - which communities, what kind of packaging, and so on. The market for these kits could range from individual consumers and private groups, to NGOs and government entities. We need to think about those different constituencies and their differing needs as part of the marketing strategy.

Q. Are your kits aimed at individuals, or at the village and community level?

SM: The aim is that anybody can use the kit and do the tests. If you wanted further verification, if you found out your well was contaminated, you could tell your local government official and hopefully they would do some further testing.

Q. Are the kits suitable for use in other environments, or just in Nepal?

JR: That’s another of the issues we plan to look at - the durability and versatility of the kit. Nepal has a great deal of geographic diversity. One of the things that we hope to address with the J-WAFS grant is to send prototype kits to communities in different parts of the country, from the foothills of the Himalayas down to the sea-level tropical climate of the southern part of the country, to test both the durability of

the kit, the packaging materials, and the chemicals within the tests themselves. We’ll start in Nepal and move into Bangladesh next year, we hope, and then out from there into the wider South Asia region.

Q. How will J-WAFS funding enable you to take your research further?

SM: Until now, we’ve been putting the kits together ourselves on pretty much an ad hoc basis. In 2016, we shipped 2,000 of them to Nepal for the Nepali non-governmental organization, Environment and Public Health Organization (ENPHO), to test water found in food trucks and mobile water tanks in the Kathmandu Valley in the wake of the April 2015 earthquake. They proved highly effective in testing for the presence of *E. coli*. Following this success, the J-WAFS Solutions grant will enable us to partner with ENPHO and its business subsidiary EcoConcern, to refine the design of the kits based on feedback from users in Kathmandu and my subsequent work on kit design and application in Ghana, the Philippines and Puerto Rico.

Once the design is complete, we intend to partner with MIT’s Sloan School of

Management and with MIT’s Technology and Policy Program to develop an economically feasible production plan for manufacturing the kits, and a sales plan to commercialize them and bring them to market. So, there are a lot of elements to what we’re hoping to accomplish over the next 12 months, and we wouldn’t have been able to do it without the funding from J-WAFS.



Water testing kit assembly at EcoConcern



Nepali classroom learning about Piyush EcoConcern chlorine solution product



The Abdul Latif Jameel World Water and Food Systems Lab (J-WAFS) is to fund two more innovative research projects that aim to address food and water challenges facing communities across the globe.

The two technologies are being commercialized by teams at the Massachusetts Institute of Technology (MIT), with support from the J-WAFS Solutions program, which aims to support breakthrough technologies to improve access to food and water.

One project is developing a low-cost, portable reactor unit that enables farmers to turn agricultural waste into an inexpensive fertilizer product. This material, when added to soils, promotes plant growth, increases crop yields, and reduces irrigation needs compared to conventional farming methods.

The second project aims to enable rural communities in developing countries to test *E. coli* levels in drinking water via an affordable and accessible mobile kit. The technology has already been successfully piloted in Nepal. With this latest grant, the team hopes to improve the test kit's design and create a marketing and distribution plan to reach communities at risk of water-related diseases from unsafe drinking water.

Both these technologies aim to address issues that can be particularly relevant to communities that face food supply and water safety challenges.

According to a report released by the World Health Organization (WHO) in 2017, approximately 2.1 billion people lack access to safe, readily available water. And according to the Food and Agriculture Organization of the United Nations (UNFAO), 70% more food will be needed by 2050. Developing technologies that are accessible and relevant to the people most affected by these challenges can help reduce these statistics.

Both new technologies have the potential for high impact in the Middle

East and North Africa region. The risk of *E. coli* in particular has been felt acutely in Saudi Arabia and other countries of the Gulf Cooperation Council (GCC). A 2016 paper in the Saudi Medical Journal published in participation with the GCC's Centre for Infection Control issued an urgent call for action against antimicrobial resistance in Saudi Arabia, noting the rise of *E. coli* in Saudi Arabia.



With rising populations, climate change and urbanization, we need to start taking action now to meet the world's future needs for food and water.

Community Jameel is proud to be a key partner of MIT in tackling some of the most pressing issues related to food and water safety and security in the Middle East and around the world."

Fady M. Jameel
President, Community Jameel
International

Launched in 2014 by MIT and Community Jameel, J-WAFS Solutions grants provide one year of financial support. This is accompanied by mentorship from industry partners and additional networking and guidance, supporting project teams as they advance their technologies toward commercialization. Last year, J-WAFS announced support for other new technologies that use wood as a low cost water filter; apply smartphone technology to detect harmful bacteria in food; and test the quality of milk via a handheld device.

J-WAFS Solutions continues to drive innovation: Agrowaste to fertilizer and safe drinking water in rural communities



Leading from the front: Our first female of finance



At a time when women are starting to make an ever-increasing contribution to Saudi Arabian society, one woman is demonstrating that when it comes to corporate success, gender is no barrier at Abdul Latif Jameel.

Nilüfer Günhan is recently appointed Chief Financial Services Officer, at Abdul Latif Jameel, and was previously Chairman of ALJ Finans, which provides financial services products to consumers looking to purchase a car from Abdul Latif Jameel's Toyota and Lexus distributorships in Turkey.

ALJ Finans in Turkey was barely two years' old when Nilüfer joined the company in 2011. Since then, she has guided it to become one of the biggest and fastest growing automotive loan providers in the market.

Such has been her success that in September 2018, Nilüfer was ranked 37 in a list of Turkey's 50 most powerful women CEOs, compiled by Capital and Ekonomist magazines.

The list, first published in 2012, aims to highlight

the challenges women face in the business world, and recognizes the achievements of those who are successfully overcoming them.

Education ambitions

Nilüfer's success is no accident. She had ambitions to be a successful business leader from an early age. Eager to broaden her education outside Turkey, she successfully applied for a scholarship to study for an MBA at the University of West Georgia in Atlanta, USA. After completing her MBA, she was determined to put her new knowledge to good use back home.

"Throughout my time in the United States, I was thinking 'how can I put this knowledge to use in Turkey'. It's in my character to challenge the accepted ways of seeing and doing things, and I came back with many ideas of ways to do that," she recalls.

It did not take long for her to start putting that knowledge into action. On her return to Turkey, she joined the newly-established Volkswagen distributor as finance and treasury manager,

working closely with the senior management team to develop and grow the business.

After five years, she was asked to manage the launch of Volkswagen's captive automotive finance provider in Turkey, a joint venture between Volkswagen AG and the Turkish distributor, and became its sales and operations director.

A three-year stint in the UK to help establish Volkswagen's finance business was followed by a return to Turkey as general manager of the Turkish subsidiary of BNP Paribas, where she transformed a struggling consumer finance business into the third biggest automotive finance company in the market.

"It's a pattern throughout my career. I've worked mainly in newly-established companies, helping to position them, grow them and transform them in their respective markets. I got used to the adrenaline, I think!" says Nilüfer.





Seizing the opportunities

When the offer came to join ALJ Finans in 2011, she'd already been working with Abdul Latif Jameel for two years, as BNP Paribas in Turkey was its automotive financial services partner. Despite the challenges that commonly face female business leaders, particularly in traditional cultures like many in the MENAT region, she already knew the senior management team at ALJ International and Turkey and was excited by what she'd seen.

"We already had a good synergy as we'd been working together successfully for two years. We'd helped them launch their automotive finance proposition in Turkey and they had subsequently doubled their sales. I was excited by the opportunities I saw to take it further," she says.

Nilüfer spent seven years as CEO at ALJ Finans, before her promotion to Chairman in April 2018. During that time, she established the business as a leader in innovation in the Turkish automotive financing sector, with revolutionary services such as robotic process automation, decision support automation, customer e-care, KredimOL mobile app and e-contract, plus a number of industry awards.

She says that the trust and support she received gave her the confidence to launch the bold initiatives that turned ALJ Finans into a market leader in digitalization. It's an approach she takes with her own team, too, regardless of gender.

"Gender shouldn't be important in business. To be efficient, we need people who add value to the company, be it men or women. I have been so fortunate that all my executives throughout my career have been so supportive. They have given me big responsibilities, sent me abroad, asked me to manage large projects, and these have all strengthened my position. As a business leader, I try to follow the same policy," she says.

Excited for the future

Has it been harder for her to make an impact as a woman in a traditionally male-dominated industry? Possibly, which makes her success all the more impressive. But Nilüfer is optimistic that things are changing. She may be one of the first women to rise to the very top of the automotive finance sector in the MENAT region, but she is confident she will not be the last.

"Historically, you don't find many women at senior levels in the automotive sector, either in Turkey or anywhere else. But this is changing, as education levels and urbanization increase. Women want to work and they are getting more opportunities to do so.

Vision 2030 states a target of a 30% female workforce in Saudi Arabia by 2030. At Abdul Latif Jameel, we are hiring a lot of young, talented women and we expect that to continue. It's very exciting to see these changes occurring."

Her latest challenge with ALJ Finans will see her transferring her experience and expertise from Turkey and elsewhere to drive forward Abdul Latif Jameel's finance services in other markets, such as Saudi Arabia, Egypt and in North Africa.

Says Nilüfer: **"The challenges are different in these markets. They are younger, the regulatory regimes are still evolving, the infrastructure is still developing. There is an opportunity for us to build a totally new business based on innovation, efficiency and technology. But it is achievable. We have very motivated, experienced teams in these markets. I'm looking forward to working with them to turn these opportunities into reality."**





Revolutionizing disease prevention, detection, and treatment through Machine Learning

Community Jameel and MIT have announced their fourth major collaboration that aims to help revolutionize the future of health care - the Abdul Latif Jameel Clinic for Machine Learning in Health, or 'J-Clinic'.

J-Clinic, a key part of the MIT Quest for Intelligence, will focus on developing machine learning technologies to revolutionize the prevention, detection, and treatment of disease. It will concentrate on creating and commercializing high-precision, affordable, and scalable machine learning technologies in areas of health care ranging from diagnostics to pharmaceuticals, with three main areas of focus:

- **Preventative medicine** methods and technologies with the potential to change the course of non-infectious disease by stopping it in its tracks.
- **Cost-effective diagnostic** tests that may be able to both detect and alleviate health problems.
- **Drug discovery and development** to enable faster and cheaper discovery, development, and manufacture of new pharmaceuticals, particularly those targeted for individually customized therapies.

J-Clinic's holistic approach will

utilize MIT's strong expertise in cellular and medical biology, computer science, engineering, and the social sciences, amongst other areas.

J-Clinic will capitalize on MIT's strong relationship with industry and health care providers to test, integrate, and deploy new technologies. It will also seek to advance patentable research that could be commercialized and spun-out through licensing to startups and pharmaceutical companies.

"Channeling MIT's machine learning expertise into healthcare will transform medical outcomes for people around the world," said Hassan Jameel, President of Community Jameel International. **"Healthcare has been an important sphere of activity for Community Jameel since our earliest days. J-Clinic continues our journey of supporting cutting-edge research and driving innovation in healthcare."**

Anantha P. Chandrakasan, dean of the MIT School of Engineering and Vannevar Bush Professor of Electrical Engineering and Computer Science, who will serve as J-Clinic's chair, commented: "J-Clinic will positively impact the world by accelerating the creation of machine learning technologies and algorithms that will make preventing, detecting, and treating disease more precise, affordable, and personalized."

The Abdul Latif Jameel Clinic for Machine Learning in Health at MIT aims to revolutionize disease prevention, detection, and treatment.

Our core mission is to incubate research at the intersection of computer science, big data, and the life sciences, and to drive the creation and commercialization of high-precision, affordable, and scalable machine-learning technologies to health care.

Earlier collaborations between MIT and Community Jameel include the Abdul Latif Jameel Poverty Action Lab (J-PAL), established in 2003, which seeks answers to poverty in a changing world; the Abdul Latif Jameel Water and Food Systems Lab (J-WAFS), created in 2014, which addresses food and water scarcity and safety issues as the result of population rises and climate change; and the Abdul Latif Jameel World Education Lab (J-WEL), launched in 2017, which pursues innovative, scalable, and sustainable educational innovation.

Community Jameel and MIT have also collaborated in the Abdul Latif Jameel-Toyota Endowed Scholarship since 1994 and the MIT Enterprise Forum Arab Startup Competition and a Saudi Start-up Competition.

To keep up to date with the work of J-Clinic, sign-up for the newsletter [here](#).





Can renewable energy help answer water scarcity?

Could joined-up thinking on energy and water scarcity help to propel Saudi Arabia and other countries towards a cleaner, bolder, healthier future?



¹ Which countries could gain the most from renewable energy? World Economic Forum, 17 May 2018
² These 20 Water-Stressed Countries Have the Most Solar and Wind Potential, World Resources Institute, 10 May 2018
³ Parched Power: Water Demands, Risk, and Opportunities for India's Power Sector, World Resources Institute, January 2018

⁴ Renewable Energy Market Analysis: The GCC Region, International Renewable Energy Agency, 2016
⁵ Assessment of solar radiation resources in Saudi Arabia, Solar Energy (vol. 119, pg 422-438), September 2015

As Saudi Arabia continues to advance towards a clean energy future by investing in solar and wind energy, analysis from the World Resources Institute (WRI) suggests it could be a strategic decision with profound consequences.

The WRI has named Saudi Arabia as third in its list of the world's top 20 water-stressed countries with the most solar energy potential¹. Other MENAT countries to feature in the list's top 10 include Yemen (1), Oman (4), Libya (5), Algeria (6), Morocco (7), United Arab Emirates (8) and Jordan (9)².

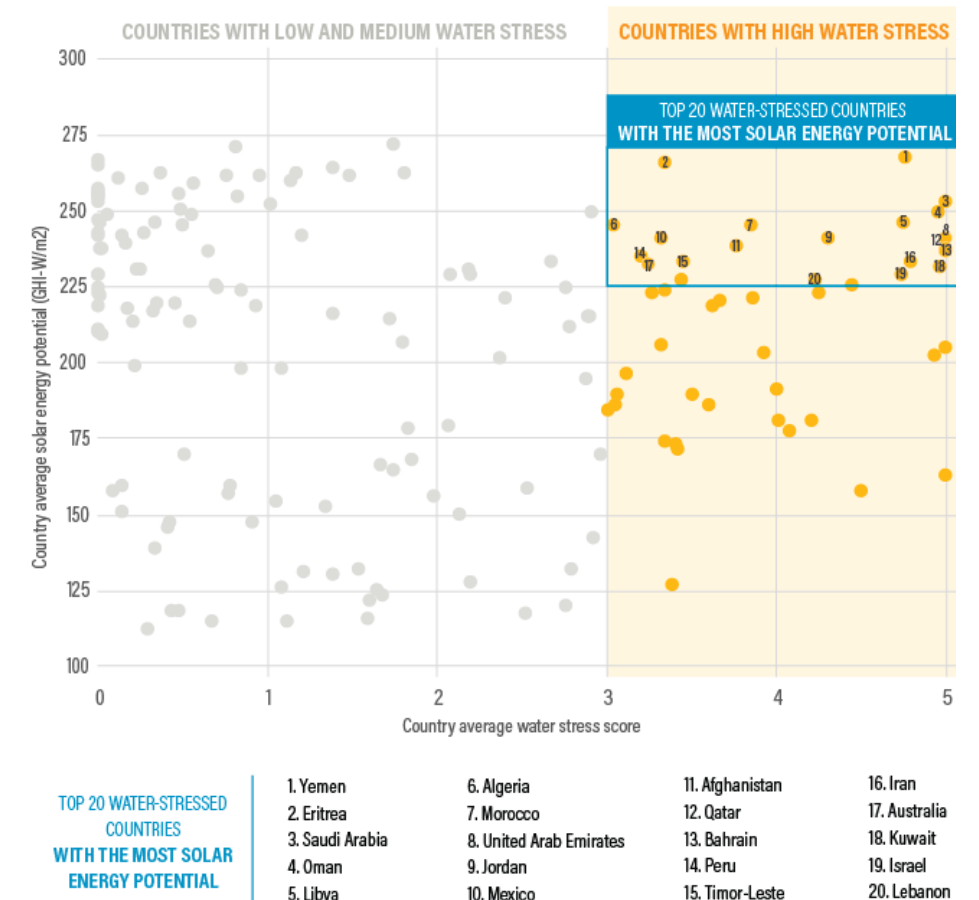
The implications of this finding are significant: most traditional power production uses vast amounts of water to cool steam or power turbines, adding to the huge pressures on already scarce water resources. Solar power production, on the other hand, poses no such challenges to water-scarce environments.

For countries like Saudi Arabia, where severe water scarcity is compounded by the expectation that energy consumption will treble by 2030, the need is particularly pressing. Water supplies are under pressure due to higher than average per person use and rapid growth in industrial water demands.

WRI analysis of the similar situation in India, however, demonstrates the potential gains that could be achieved by switching power production to renewable energy: the WRI found that if India meets its renewable energy targets, it could reduce its water consumption by more than 25%³. So the opportunities to ease the water stresses being placed on Saudi Arabia and other countries across the MENAT region are clear to see.

With a Vision 2030 target of generating 9.5GW of renewable energy by 2023, which has already been brought forward by seven years from its initial date of 2030, the Saudi Arabia government is moving fast to maximize the potential benefits its natural environment presents. This is reinforced by its stated goal of generating 54GW of renewable energy by 2040⁴.

Solar Energy Can Help Water-Stressed Countries Meet Power Needs While Saving Water



Powered by RESOURCEWATCH

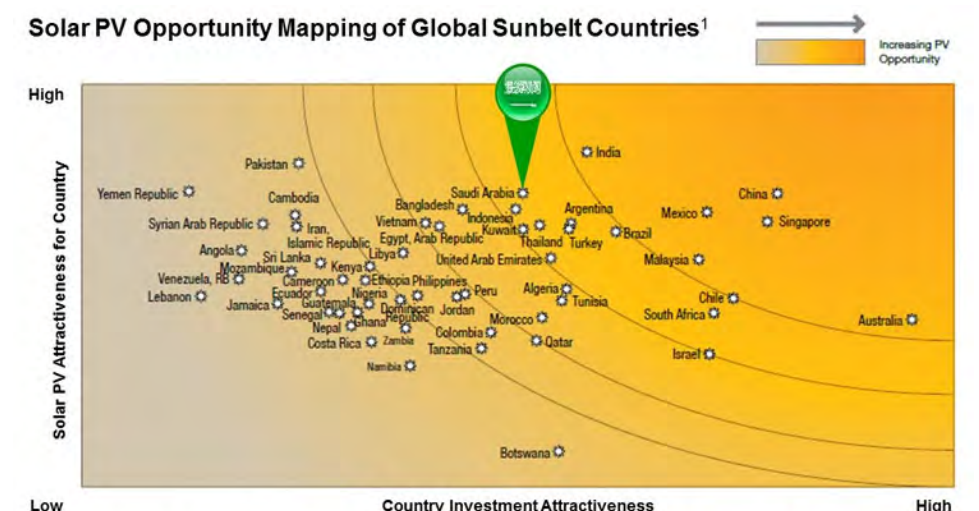
WORLD RESOURCES INSTITUTE

Furthermore, Saudi Arabia's position in the 'Global Sunbelt' gives it an envious advantage over many other water scarce countries. With some of the highest solar irradiances in the world (annual average daily global horizontal irradiance (GHI) is measured at 5700 WH/m² to

6700 Wh/m²)⁵, Saudi Arabia has the potential to dominate the solar energy landscape in the same way it has been a global superpower in oil.

Through its wholly-owned renewable energy business Fotowatio Renewable

Solar PV Opportunity Mapping of Global Sunbelt Countries¹



¹ The following countries are not shown due to poor availability of data: Chad, Côte d'Ivoire, Congo Dem. Rep., Cuba, Iraq, Madagascar, Mali, Myanmar, Somalia, Sudan & Uganda.
Sources: EPIA Global Market Outlook to 2014, IAE Technology Roadmap, A.T. Kearney analysis, NASA.

Ventures, (FRV) Abdul Latif Jameel Energy is already working to help countries such as Saudi Arabia to capitalize on their enormous renewable energy potential. Its leadership team can call on knowledge and best practice gained from installations as far afield as Chile and Australia, delivering a world-leading solution to some of Saudi Arabia’s most pressing natural resources issues.



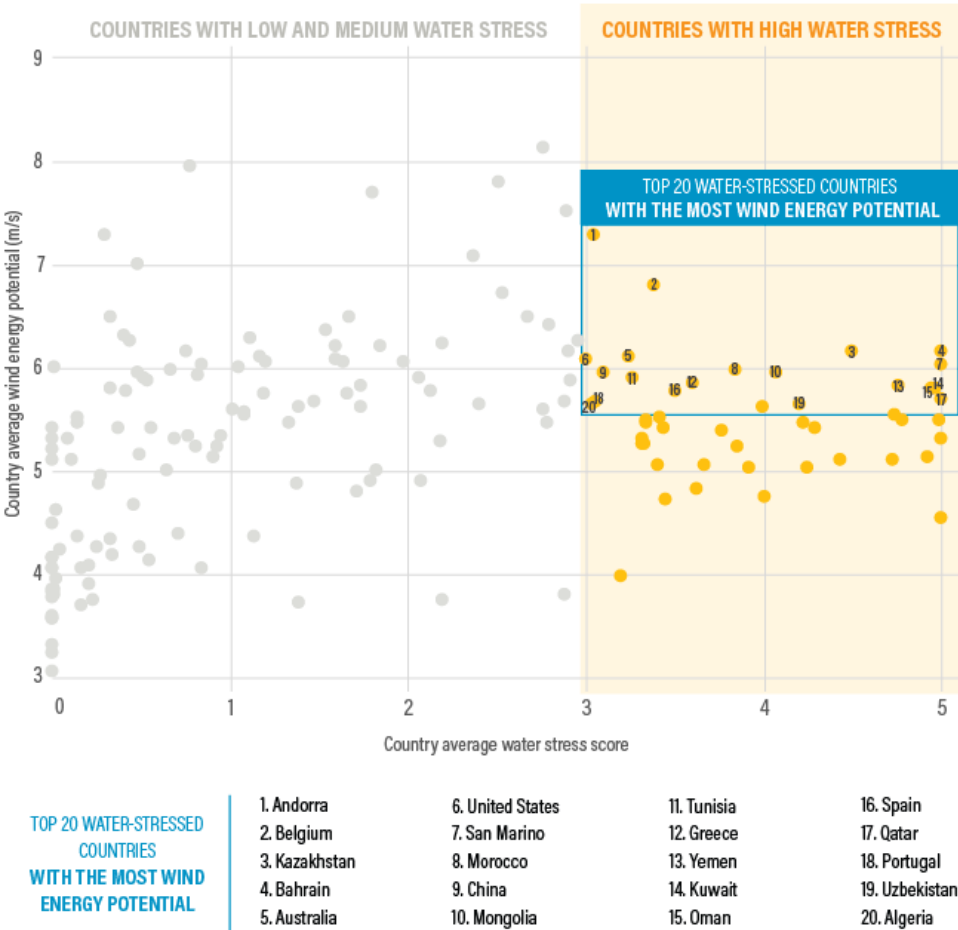
Daniel Sagi-Vela
Chief Executive Officer, FRV

Daniel Sagi-Vela, Chief Executive Officer of FRV, solar and wind renewable energy company and part of Abdul Latif Jameel Energy said: **“Abdul Latif Jameel Energy has been leading the way on developing solar projects in the region [and] ... we remain committed to being the leading solar PV development company in the Middle East and beyond.”**

It is not only solar power that could help to ease Saudi Arabia’s water scarcity issues. It is also well placed to make use of the falling costs of wind power, ranking as the 24th water-stressed country with the highest wind energy potential⁶ (Andorra, Belgium and Kazakhstan make up the top three).

⁶ [These 20 Water-Stressed Countries Have the Most Solar and Wind Potential](#), World Resources Institute, 10 May 2018

Wind Energy Can Help Water-Stressed Countries Meet Power Needs While Saving Water



Powered by RESOURCEWATCH

WORLD RESOURCES INSTITUTE

Three Saudi Arabian regions hold average wind speeds of eight meters per second – 33% higher than the point at which wind energy becomes commercially viable.

With this combination of natural resources, together with commitment at the highest levels of Government and the expertise of industry leaders such as Abdul Latif Jameel Energy, Saudi Arabia has the potential to turn the challenges of water scarcity into an integrated sustainable-energy driven future.

In doing so, it can drive forward a precedent that could transform other water-scarce economies and deliver an enhanced quality of life for Saudi Arabia’s citizens.



Abdul Latif Jameel
Water & Food Systems Lab
Securing humankind’s vital resources



New name; next chapter: J-WAFS changes name to reflect breadth of capability and impact

The Abdul Latif Jameel Water and Food Security Lab at MIT (J-WAFS) has changed its name to the Abdul Latif Jameel Water and Food Systems Lab. A new tag line, “Securing humankind’s vital resources” accompanies the new name.

The change, announced in September, is to reflect the broader range of food and water challenges the lab’s research focuses on.

The terms “food system” or “water system” refer to the diverse array of activities, resources, and technologies—as well as policies and economics—involved in the production, processing, transport, and consumption or use of food and water.

This includes water and food security, generally defined as providing people with access to sufficient clean water

and safe and nutritious food, as well as issues such as food and water safety, access to fertilizer, water purification, climate change, and the sustainability of our water supplies and food production systems.



“Our goal in this name change is to even more accurately represent what we already do,” said J-WAFS’ director, Professor John Lienhard.

We considered various terms that reflect the range of water and food sector issues that we focus on: supply, safety, solutions, sustainability... ‘systems’ was a

clear winner for conveying the comprehensive perspective and breadth of our work across the Institute.”

Established in 2014, J-WAFS works to advance knowledge and innovation to build resilient systems that can deliver safe and adequate supplies of water and food for our changing world.

It has funded innovative research projects from all five schools at MIT. Well over 10% of all MIT faculty—from disciplines as diverse as mechanical engineering, chemistry, and anthropology—have submitted proposals for J-WAFS funding.

To date, two companies have spun out of MIT as the result of J-WAFS support, and millions of dollars of follow-on funding have been raised by the recipients of J-WAFS’ seed grants.



Real people, real stories – a diverse family working together

Staff development is key across all departments in the Abdul Latif Jameel business. However, we do not just focus on professional growth: we are committed to creating a supportive and constructive environment that enables our team to flourish both professionally and personally.

Alec Derkaloustian, General Manager in Abdul Latif Jameel's Facilities, Development, Health, Safety and Environment department, grew up in Lebanon. His father owned a fire protection business, prompting an interest in Alec that has stayed with him throughout this career.

In the early 1990s, Alec studied at the University of Illinois and the University of Maryland before joining his father's business. However, in 2007, he made the decision to join Abdul Latif Jameel in our Dubai offices. Now, more than a decade later and surrounded by friends from around the world, Alec says he could not be happier with his chosen path.

"My entire professional life has been devoted to fire protection, but it is during the last 10 years, when I have been working with Abdul Latif Jameel, that my confidence has really developed. Working here gives you the skills, expertise and self-belief to feel that you can survive in any situation.

"My role is incredibly varied, and the range of people I meet and work with is extremely rewarding. It's a diverse group and you have to be aware of cultural sensitivities – how you liaise with an engineer from one part of the world can be very different to how you liaise with another from the opposite side of the globe. But that diversity is our strength: we work with architects, consultants and engineers from around the world to ensure every project is delivered to the highest of Abdul Latif Jameel's expectations.

"I came to the UAE from Lebanon, and there's a thriving community of Lebanese workers within Abdul Latif Jameel. That all adds to the feeling that the company is one giant family. We spend time together every day and that shared sense of spirit and teamwork is one of the biggest advantages of working for Abdul Latif Jameel. It's an amazing environment in which to spend your working life."

Tala Samar awarded FRV 'Young Talented Leaders' scholarship at IE University



Left-to-right: Daniel Sagi-Vela, CEO, FRV, Estela de Diego, Marketing Manager FRV, Tala Samar, new FRV Young Talented Leader and Salvador Carmona, Rector of IE University

The CEO of Fotowatio Renewable Ventures (FRV), Daniel Sagi-Vela, welcomed the latest FRV scholar to IE University, Madrid, at the opening ceremony for the new academic year at the Segovia Campus.

Tala Samar, from Jordan, has been awarded an FRV 'Young Talented Leaders' scholarship to the university. The scholarships are given as part of FRV's commitment to developing communities in which it operates. Tala's scholarship relates to FRV's 66.69 MW dc Al-Safawi Project in Jordan.

This is the fourth scholarship that FRV has given in collaboration with IE, and the third for a project in Jordan - a key market for the business and a country where FRV has a strong social commitment.

During the ceremony at the university and the reception that followed, Mr Sagi-Vela had the chance to meet Tala and her family, as well as previous FRV scholars. Also in attendance were Rafael Benjumea, Chairman of IE University Foundation Advisory Board; Salvador Carmona, Rector of IE University; and Geoffroy Gérard, Managing Director of IE's Foundation.



Al-Ahsa is one of the greenest areas in Saudi Arabia (Photo credit © Saudi Tourism)

Saudi Arabia targets cultural tourists with major investment program

With new recognition from UNESCO and investments across the country, Saudi Arabia is aiming to become a cultural tourism hotspot.



¹ Saudi Arabia's Al-Ahsa desert oasis becomes UNESCO World Heritage site, Arab News, 30 June 2018.

² Al-Ahsa Oasis, an Evolving Cultural Landscape, UNESCO, accessed October 2018

³ UNESCO World Heritage listing to support Saudi cultural tourism, Oxford Business Group, 14 August 2018

⁴ Al-Ahsa Oasis, an Evolving Cultural Landscape, UNESCO, accessed October 2018

Few areas of Saudi Arabian life are untouched by the country's bold transformation program outlined in Vision 2030. From business through to healthcare, social developments and education, the country's ambitious reforms are attracting worldwide attention and helping to deliver a bright future for all its citizens.

Among the often-cited commercial and investment aims laid out in Vision 2030 is the development of the country's tourist and cultural sector, where significant progress is already being made.

In June 2018, the Al-Ahsa oasis in the eastern Arabian Peninsula was revealed as one of the three new UNESCO World Heritage sites, giving it equal status to the likes of Westminster Abbey (UK), Grand Canyon National Park (USA), The Great Wall (China) and Memphis and its necropolis, including the pyramid fields from Giza to Dashur (Egypt).

In fact, over the last decade, five Saudi Arabian sites have been added to UNESCO's World Heritage list: as well as the Al-Ahsa oasis, the rock art in the Hail region (2015), historic Jeddah (2014), the

Tarif neighborhood in Diriyah (2010), and Madain Saleh (2008)¹ have all been recognized as heritage sites of global importance.

Al-Ahsa, which as one of the country's greenest regions contains gardens, canals and springs alongside historical buildings, urban fabric and archaeological sites, is also home to 2.5 million date palms². There is evidence of human settlements from as far back as the Neolithic period – considered to be between 9,000 and 11,000 years ago³, while the city of Al-Ahsa itself dates back to 5,000 BCE and is, according to UNESCO, "a unique geocultural landscape and an exception example of human interaction with the environment"⁴.

Following UNESCO's decision to recognize Al-Ahsa, the Saudi Commission for Tourism and National Heritage (SCTH) unveiled several investment programs in and around the region, including the restoration and rehabilitation of nearby heritage sites and buildings, and the construction of a regional museum.

Saudi Arabia joined UNESCO in November 1946, yet it is not just external recognition that is powering Saudi Arabia's growing importance as a major MENAT cultural tourism destination. Significant government and private sector investment have also been harnessed to help fulfil the goals of Vision 2030 and drive a renaissance in Saudi Arabia's cultural attractions.



In the tourism and leisure sectors, we will create attractions that are of the highest international standards... and prepare and develop our historical and heritage sites."



Historic Jeddah: added to the UNESCO World Heritage list in 2014



Hills overlooking Al Hasa (Photo credit © Saudi Tourism)

Delivering a world-class experience

In September 2018, a 334km² entertainment, sports and cultural site only 40 km from Riyadh was opened by King Salman. Crown Prince Mohammed Bin Salman was also in attendance for the official launch of Qiddiya, which has been supported by Saudi Arabia’s Public Investment Fund (PIF) and aims to attract 17 million visitors by 2030⁵. By providing world-class entertainment options to Saudi citizens, it is hoped that Qiddiya will attract billions of tourism dollars that would previously have been spent abroad.

Other cultural developments are occurring elsewhere at an equally impressive rate. Under a 10-year partnership with the government of France, archaeological digs, transport infrastructure and the construction of museums and hotels will all be completed in what is estimated to be a US\$ 20 billion investment designed to

turn the Al Ula region into a “**cultural tourism hub**”⁶.

A further US\$ 2 billion is expected to be invested into a 10,000,000m² Souq Okaz City development designed to support the annual cultural and art festival at Taif⁷.

Enhancing Saudi Arabia’s rich heritage

In Jeddah, Abdul Latif Jameel and its social enterprise organization Community Jameel are working hard to enhance the country’s rich cultural attractions through Hayy: Creative Hub, a 17,000 m² arts center that will form a shared environment for Saudi Arabian artists, playwrights, photographers, filmmakers and entrepreneurs to support, advise and collaborate with each other.

Both local and international exhibitions in modern art will be staged at the venue, which, alongside the Jameel House of Traditional Arts (Al Balad) and the Jeddah Sculpture Museum, will form part of a trio of cultural destinations in Jeddah – helping to deliver on the government’s targets to provide new cultural resources to a vibrant, young population and visitors from around the globe.

“We will establish more museums, prepare new tourist and historical sites and cultural venues, and improve the pilgrimage experience within the Kingdom.”

- Vision 2030

Antonia Carver, Director of Art Jameel, said: **“There have been enormous**

strides in recent years, especially by the Saudi Arts Council, the General Entertainment Authority, the General Cultural Authority, the MiSK Foundation, and the Ministry of Arts, but the number of international practitioners coming to Jeddah is still relatively low. That’s one of the things Hayy hopes to do: we want to create a local-international exchange.”

Community Jameel, and the wider Abdul Latif Jameel organization, is committed to supporting Saudi Arabia’s ongoing transformation, recognizing the eternal importance of a strong and vibrant cultural scene alongside robust economic infrastructure and healthy living environments.



Antonia Carver, Director of Art Jameel

⁵ Saudi Arabia’s Qiddiya project to create a self-sustaining ecosystem, Thomson Reuters Zawya, 23 September 2018

⁶ UNESCO World Heritage listing to support Saudi cultural tourism, Oxford Business Group, 14 August 2018

⁷ UNESCO World Heritage listing to support Saudi cultural tourism, Oxford Business Group, 14 August 2018



Car buyers in Morocco now have access to a new premium automotive brand after Abdul Latif Jameel Motors, through Toyota Du Maroc, launched Lexus at the 2018 AutoSalon (Moroccan International Motorshow) in Casablanca earlier this year.



Toyota Du Maroc, Casablanca

Abdul Latif Jameel Motors, which is the exclusive distributor of Lexus vehicles in Morocco, will see its efforts supported by a new Moroccan Lexus showroom.

At the April event, it revealed the four models available across Morocco. It also unveiled details of its best-in-class showroom, which features a welcoming visitors' lounge, private negotiation and configuration rooms, and a special orders simulator.

Lexus buyers in Morocco can choose from the NX300h, a compact SUV with 197hp; the RX450h, a large SUV with 313hp; the LX450d; and the top-of-the-range LS500h sedan, a 5.24-metre-long vehicle with 359hp. Test drives are available on the NX300h and the RX450h.



The new luxury Lexus flagship showroom in Casablanca includes stylish lounges and private areas for clients to configure their dream Lexus.

Extraordinary emotions

With a vision to "create exceptional experiences by transforming functional into emotional, performance into passion and technology into imagination", the launch of Lexus promises to "create the most extraordinary emotions" in Moroccan buyers and each model is equipped with the highest quality fittings and finishes, guaranteeing the luxury experience expected from one of the world's leading car manufacturers and one of the world's leading and most respected independent distribution partners of Toyota Motor Corporation with over 60 years together.

"Omotenashi" or "the art of hospitality" in Japanese

Omotenashi is an ancient concept of the Japanese tradition meaning "hospitality and politeness in the service". Omotenashi goes beyond an irreproachable service; it is the ability to anticipate the needs of a host before he or she is aware of it. Hospitality towards guests is a common trait linking both Japanese and Moroccan cultures.

The values of Omotenashi are reflected in both the brand as in the new showroom experience. At Abdul Latif Jameel Motors, we receive every customer as if he or she were a guest of honor in our own home.



Making a stylish entrance:

Abdul Latif Jameel Motors brings Lexus luxury to Moroccan motorists

The Greatest Challenge We Face?

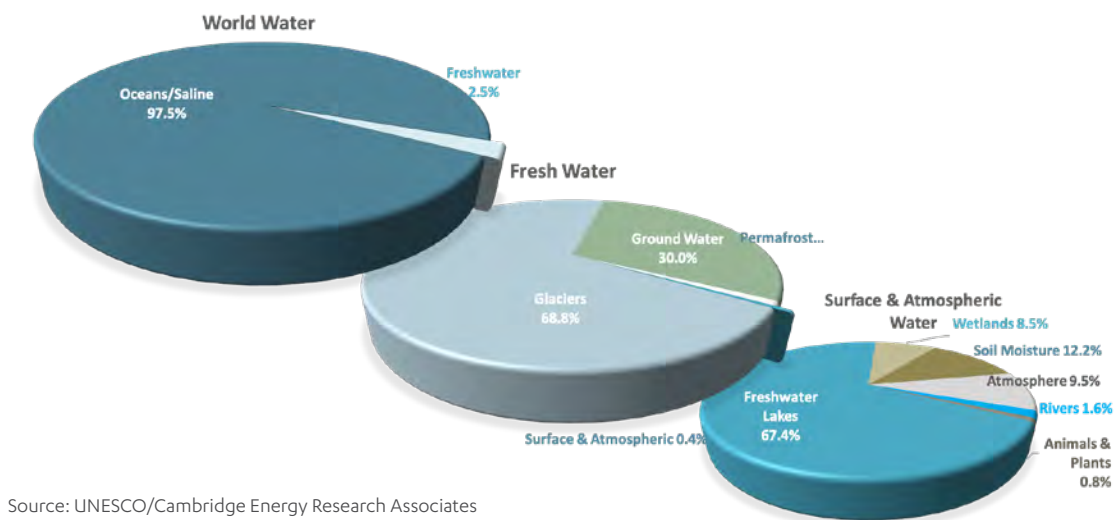


It may be hard to imagine today, but a world without water – at least water for human use – is not such a far-fetched scenario as you might think.

Across the planet, water security, safety, supply and sustainability are becoming increasingly problematic. Strain is being put on resources and reserves like never before, and a growing proportion of the global population is already facing significant difficulties. Today, an estimated 3.6 billion people (nearly half the global population) live in areas that are potentially water-scarce for at least one month per year. Top-end estimates suggest that figure could reach 5.7 billion people by 2050¹.

To the casual observer, issues over global water supplies may appear difficult to understand. When 70% of our planet is covered by water, what is the problem? However, freshwater – the kind of water that we drink, bathe in and irrigate our crops with – is incredibly rare. Just 1% of the world's water is accessible freshwater. Another 2% is freshwater, but it is locked in inaccessible location, such as frozen glaciers².

The accelerating impact of climate change is also reshaping some of the biggest water issues



Source: UNESCO/Cambridge Energy Research Associates

facing communities across the world. We are facing a growing challenge of too much water in some places and not enough water in others. And climate change “is and will worsen the situation in most cases,” says Professor Arjen Joekstra from the University of Twente in The Netherlands³.

So serious is the water problem that UN Secretary-General Antonio Guterres and World Bank Group President Dr. Jim Yong Kim issued an unprecedented joint warning in March 2018: “... Some parts of our planet are suffering

from the misery of drought while others endure the destruction of floods.

Climate change is exacerbating natural variability of the water cycle, increasing water stresses that constrain social progress and economic development.

Our health, food security, energy sustainability, jobs, cities, and the ecosystems on which all life is based are all being influenced by the way water is being managed in different parts of the world.⁴”

¹ The United Nations World Water Development Report 2018, UN Water, March 2018
² Earth Observation of Water Resources, World Bank Group – Environment & Natural Resources
³ From Not Enough to Too Much, the World's Water Crisis Explained, National Geographic, 22 March 2018
⁴ Making Every Drop Count: An Agenda for Water Action, United Nations, 14 March 2018



World Bank Group President Dr. Jim Yong Kim (Left) and UN Secretary-General Antonio Guterres (Right)

Water issues facing the Middle East

The Middle East, North Africa and Turkey (MENAT) region is at the nexus of some of the world's most challenging conditions in terms of water availability.

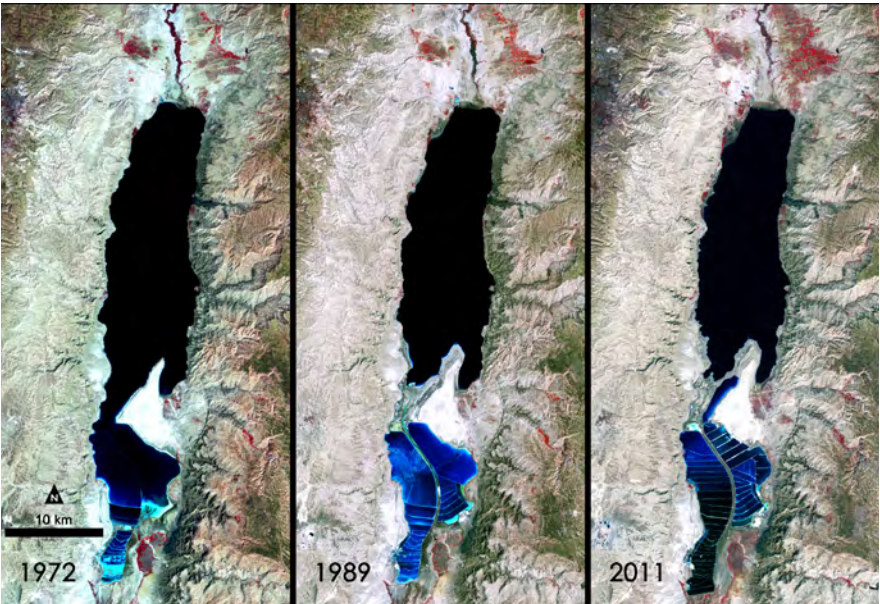
Despite being home to 6% of the global population, it survives on just 1% of the world's freshwater resources⁵.

Daniel Sagi-Vela, Chief Executive Officer of FRV, solar and wind renewable energy company and part of Abdul Latif Jameel Energy says **"Because we often look at sustainability from the standpoint of developed countries, water is often not perceived as a big issue.**

But from the standpoint of developing countries, water is much more important than power."

The World Water Forum states that 40% of the Arab population is already living in conditions of absolute water scarcity⁶. More worryingly, during the decade between 2005 and 2015, per capita freshwater availability in the region dropped by about 20%, from about 990 cubic meters to 800 cubic meters⁷.

In 2013, a study conducted by NASA and the University of California Irvine showed the Middle East losing the equivalent in freshwater resources of the entire Dead Sea during a seven-year period between 2003 and 2009⁸. And the Dead Sea itself is shrinking. Nineteen countries, including Bahrain, Jordan, Kuwait, Qatar, United Arab Emirates and Saudi Arabia, have total renewable water resources (TRWR) of less than 500m³ per person per year⁹.

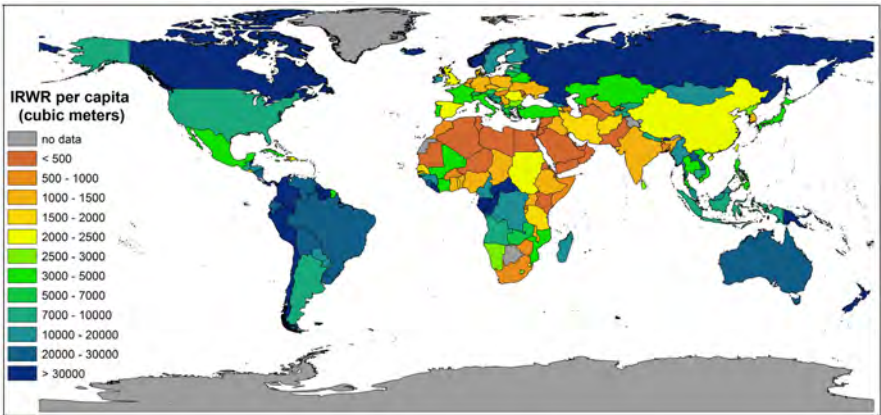


False-color image captured by Landsat 1, 4 & 7 satellites. The Lisan Peninsula (bottom center) forms a land bridge through the Dead Sea. Deep waters = dark blue; pale blue = salt ponds/shallow waters to the south. The pale pink and sand-colored regions are desert lands. Denser vegetation appears bright red. Credit: NASA/Landsat

With the pressure on water supply set to increase yet further as population growth and the effects of global climate change take their toll, water availability per capita in the MENA region is expected to halve by 2050¹⁰.

Exploring the Saudi situation

In Saudi Arabia, falling water supplies are compounded by high levels of personal use – stretching an



per year) in 2016, recording a decline of 1.7 percent for the first time since 2013 according to the General Authority for Statistics –however, this is still double the average of European Union citizens¹¹.

About 49% of the water consumed domestically came from desalinated water with 2017 consumption estimated at 1.55 million cubic meters, versus 1.38 million cubic meters a year earlier, a growth of 12.8% and growing for the seventh consecutive year from 2011.

It is not only at an individual level that water resources are under pressure. The country's growing economy also has increasing water requirements. Industrial water demand, for example, has grown 7.5% per year in recent years and is set to increase by 50% by 2032¹².

The agricultural sector is another major factor in high water consumption in the Middle East, frequently accounting for 80 percent of annual demand in the region¹³.

Experts worry that overuse during the second half of the twentieth

century and the mounting demographic and economic pressures of more recent decades could push Saudi Arabian water supplies to their breaking point¹⁴.

Some studies suggest that 80% of Saudi Arabia's stored freshwater beneath the desert has been used for agriculture in the space of one generation¹⁵. In addition, by some estimates, natural water resources in parts of the country are in danger of disappearing within the next 20 years¹⁶.

There are clear signs that a corner has been turned, however, and the situation is slowly improving in the region. Saudi Arabia, in particular, has received international recognition for its commitment to addressing this situation, in order to ensure its growing economy and thriving population have access to the water resources they need to prosper.

The respected academic journal, 'Annals of Global Health', says: "By developing desalination plants, expanding water recycling processes and infrastructure, transitioning from domestic agriculture to outsourcing food products, and now taking the reins on solar development and beginning to phase out fossil fuels, Saudi Arabia is doing just about everything it can to ensure domestic water resources will be available and accessible, and that it will be able to sustain these practices¹⁷."

Saudi Arabia already has the largest desalination capacity in the world, producing over 5 million cubic meters per day of desalinated water.

It has announced plans to increase this figure further, with another nine desalination plants being developed on the Red Sea coast at Jeddah – a clear sign of its intent to face the water challenge head-on. But to meet the industrial and manufacturing growth targets outlined in Vision 2030, it is expected that much more investment in this area will be needed in coming years.



Image courtesy SWCC

Understanding the key water difficulties

In the World Economic Forum's Global Risks Report 2018, water crises were named as the fifth biggest threat facing our planet over the next decade, with three areas of particular concern:

1. Water scarcity
2. Desalination
3. Water quality

Addressing water scarcity

Water scarcity is not limited to certain areas of the planet: it affects every continent and is being exacerbated as rapidly growing urban areas place heavy pressure on neighboring water resources¹⁸.

Fourteen of the world's biggest cities – including Tokyo, Mumbai, New York, London and Rio de Janeiro – are

⁵ Can the Middle East solve its water problem? CNN, 12 July 2018
⁶ Arab Regional Report 2018, World Water Forum, March 2018
⁷ Arab Regional Report 2018, World Water Forum, March 2018
⁸ As water disappears from the Arab world, data is falling from the sky. The World Bank, 20 March 2013

⁹ Water Scarcity and Future Challenges for Food Production, Water, 10 March 2015
¹⁰ <http://blogs.worldbank.org/arabvoices/numbers-facts-about-water-crisis-arab-world>
¹¹ Saudi Arabia is running out of water, The Independent, 19 February 2016
¹² A Saudi Water Crisis Lurks Beneath the Surface, Stratfor, 5 January 2017
¹³ <http://www.waterworld.com/articles/wwi/print/volume-25/issue-1/regional-spotlight/>

middle-east-africa/quenching-the-middle-east-s-thirst.html
¹⁴ A Saudi Water Crisis Lurks Beneath the Surface, Stratfor, 5 January 2017
¹⁵ Saudi Arabia's Great Thirst, National Geographic, accessed September 2018
¹⁶ A Saudi Water Crisis Lurks Beneath the Surface, Stratfor, 5 January 2017
¹⁷ Climate Change and Water Scarcity: The Case of Saudi Arabia, Annals of Global Health, Vol

81, May-June 2015
¹⁸ Water Scarcity, UN Water, accessed September 2018
¹⁹ From Not Enough to Too Much, the World's Water Crisis Explained, National Geographic, 22 March 2018

Drinking Water Key Facts

- In 2015, 71% of the global population (5.2 billion people) used a safely managed drinking-water service – that is, one located on premises, available when needed, and free from contamination.
- 89% of the global population (6.5 billion people) used at least a basic service. A basic service is an improved drinking-water source within a round trip of 30 minutes to collect water.
- 844 million people lack even a basic drinking-water service, including 159 million people who are dependent on surface water.
- Globally, at least 2 billion people use a drinking water source contaminated with faeces.
- Contaminated water can transmit diseases such as diarrhoea, cholera, dysentery, typhoid, and polio. Contaminated drinking water is estimated to cause 502 000 diarrhoeal deaths each year.
- By 2025, half of the world’s population will be living in water-stressed areas.
- In low- and middle-income countries, 38% of health care facilities lack an improved water source, 19% do not have improved sanitation, and 35% lack water and soap for hand-washing.

Source: World Health Organisation

already experiencing water scarcity¹⁹ and nearly half the global population live under conditions of severe water scarcity at least one month of the year²⁰. In summer 2018, following years of low rainfall, South Africa’s second city, Cape Town, was just days away from running out of water.

In some areas, a lack of rainfall means groundwater tables are reducing and becoming saltier.

In 2015, some of the 20 million residents of São Paulo even began drilling through basement floors and car parks to try to reach groundwater²¹ – a particularly alarming turn of events for a place once given the nickname in Brazil of ‘The City of Drizzle’.

In other regions, a different issue is at play. According to the World Economic Forum, Dhaka, Houston, Jakarta and Mexico City are among a number of cities around the world that are pumping so much groundwater from the earth around them that the very land they sit on is collapsing²².

The impact and potential consequences of water scarcity are difficult to overstate. Not only is a huge proportion of the world’s population already living in water-scarce regions²³ it is estimated that



by 2050, as much as half of the world’s grain production could be under threat.

Mircea Dincă, Associate Professor in the Department of Chemistry at Massachusetts Institute of Technology (MIT) and a member of the Abdul Latif Jameel Water & Food Systems Lab (J-WAFS) team at MIT, researching innovative water harvesting technology for use in water-stressed areas, said: **“Many people are aware of the energy challenges facing our societies, and the need to focus on more sustainable sources of energy. Fewer people are aware of the challenges around water scarcity and water stress that face many regions of the world; challenges that are only going to get more and more serious. It is projected that in a few years over 30% of the world’s population will not have access to a sustainable source of fresh water.”**

For the MENAT region, the outlook for water scarcity is particularly stark. The World Bank estimates that without a significant change in either water use habits or the development of new resources, by 2040, some 60% of the region could face either high or extremely high water stress. By 2050, it believes water scarcity could cost the region between 6% and 14% of its GDP²⁴.

Promoting changes in the agricultural sector, which remains the region’s largest user of water, will be key. Some progress has already been made through the promotion of nature-based solutions – a collection of strategies the UN says can help to address contemporary water management challenges, including agriculture, sustainable cities, disaster risk reduction and water quality²⁵.

It is urging governments to better identify and promote the win-win outcomes of nature-based solutions. It insists: **“There is great potential for nature-based solutions to make significant, and in many areas unique and essential, contributions to achieving sustainability of water resources and meeting various water management objectives. This fact is currently widely underappreciated²⁶.”**

The growing focus on desalination technologies

Seven years ago, General Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, said of the water challenges facing the region: “We are preoccupied by this major issue²⁷.” It remains just as relevant today.

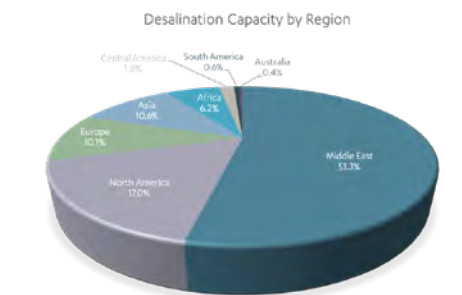
While the world’s freshwater supplies remain limited, the demands on it are only increasing and are expected to increase by nearly one-third by 2050²⁸.

With dwindling freshwater reserves unable to meet a rising demand, and with “swathes of (Middle East) countryside ... reduced to desert because overuse of water²⁹”, the region is increasingly turning to desalination plants and waste water treatment units.

Desalination involves removing the salt from sea water to make it fit for human consumption, agricultural and industrial use. More than 150 countries use desalination and more than 300 million people rely on desalinated water every day.

The MENAT region is one of the pioneers in the use of desalination. The International Energy Agency (IEA) calculates that almost 60% of the world’s total desalination capacity is located

in the Middle East³⁰. Saudi Arabia, the UAE and Kuwait are among the world’s top four countries in terms of desalination capacity, with these three countries alone representing more than a third of global capacity. Furthermore, desalination capacity in the Middle East is set to increase six-fold between 2007, and 2030³¹.

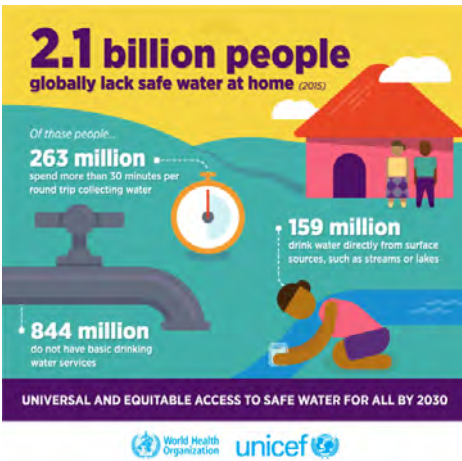


Source: International Desalination Association

Dirty water and the re-use of wastewater

According to the latest figures from the World Health Organization (WHO), dirty water remains a huge challenge for a substantial part of the world’s population.

More than two billion people “use a drinking water source contaminated with faeces” and almost 850 million people lack even a basic drinking-water service³² (defined as an improved drinking-water source within a round trip of 30 minutes).



Among the diseases listed by WHO that are spread through contaminated water and poor sanitation are cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio. This is despite the human right to water and sanitation that is safe, accessible and affordable, being recognized by the UN General Assembly in 2010.

The failure to provide clean water does not just violate an individual’s human rights. It also compounds significant economic problems, according to the World Bank:

“Inadequate water supply and sanitation cost the (MENAT) region some US\$ 21 billion per year in economic losses. Mortality due to unsafe water supply and sanitation in a few countries in the Middle East and North Africa, especially those affected by conflict, is greater than global averages. Inadequate water supply and sanitation cost about 1 percent of regional GDP annually, with conflict-affected countries losing as much as 2–4 percent annually³³.”

There is some positive news on the horizon, however, as governments and organizations wake up to the challenges of water scarcity and focus more attention and resources on addressing the challenges this creates.

In particular, ground-breaking research, innovative technology and technical advances around water scarcity, desalination and water quality are creating much-needed opportunities to make a step-change in the global response to water availability.

²⁰ The United Nations World Water Development Report 2018, UN Water, March 2018

²¹ Why fresh water shortages will cause the next great global crisis, The Observer, 8 March 2015

²² Water crises are a top global risk, World Economic Forum, 16 January 2015

²³ Progress on Drinking Water, Sanitation and Hygiene, World Health Organization, 12 July 2017

²⁴ Can the Middle East solve its water problem? CNN, 12 July 2018

²⁵ The United Nations World Water Development Report 2018, UN Water, March 2018

²⁶ The United Nations World Water Development Report 2018, UN Water, March 2018

²⁷ Water is more important than oil for UAE: Mohammed bin Zayed, Emirates 24/7, 13 December 2011

²⁸ The United Nations World Water Development Report 2018, UN Water, March 2018

²⁹ Why fresh water shortages will cause the next great global crisis, The Observer, 8 March 2015

³⁰ Energy Efficient Desalination, International Water Summit, 15-18 January 2018

³¹ Hybrid technologies to power innovation in water desalination, Opening Doors, Winter 2017

³² Drinking-water, World Health Organization, 7 February 2018

³³ Beyond Scarcity: Water Security in the Middle East and North Africa, The World Bank, 2018

Water Quality & Wastewater

- Globally, 80% of wastewater flows back into the ecosystem without being treated or reused (UNESCO, 2017).
- The opportunities from exploiting wastewater as a resource are enormous. Safely managed wastewater is an affordable and sustainable source of water, energy, nutrients and other recoverable materials. (UNESCO, 2017).
- The costs of wastewater management are greatly outweighed by the benefits to human health, economic development and environmental sustainability – providing new business opportunities and creating more ‘green’ jobs. (UN-Water, 2011)
- Water availability is also affected by pollution. Most problems related to water quality are caused by intensive agriculture, industrial production, mining and untreated urban runoff and wastewater. (UN-Water, 2011)
- By 2050, close to 70% of the world’s population will live in cities, compared to 50% today. Currently, most cities do not have inadequate infrastructure and resources to address wastewater management in an efficient and sustainable way. (UNDESA, 2014)
- 1.8 billion people use a source of drinking water contaminated with faeces, putting them at risk of contracting cholera, dysentery, typhoid and polio. (WHO/UNICEF 2015)
- Since the 1990s, water pollution has worsened in almost all rivers in Africa, Asia and Latin America (UNEP, 2016a).
- The greatest increases in exposure to pollutants are expected to occur in low - and lower-middle income countries, primarily because of higher population and economic growth in these countries, especially those in Africa (UNEP, 2016a), and the lack of wastewater management systems (WWDR, 2017).

Source: United Nations (unwater.org)

Transforming the future for water

With the UN warning of conflict and civilizational threats unless actions are taken to reduce the stress on rivers, lakes, aquifers, wetlands and reservoirs³⁴, it’s clear that urgent action is required across the world’s most pressing water challenges.

There is no ‘magic bullet’ to solve the world’s water crises. Instead, a combined approach will need to be adopted, bringing together world leaders, governments, the latest developments in research and technology, and significant infrastructure investment. The UN says: “The urgently required change will be complex, multi-faceted and challenging, and often controversial.”³⁵

One sector where major advances could be forthcoming is desalination. Currently, 90 million cubic meters of desalinated water is produced around the world every day.

More than 18,000 desalination plants produce drinking water³⁶ in a process that requires vast amounts of energy. But the use of huge amounts of fossil fuels to provide the energy to power desalination plants is simply replacing one environmental problem with another. Currently, traditional carbon-powered desalination plants emit 76 million tons of carbon dioxide (CO₂) globally. One forecast, working on a business-as-usual scenario, puts that figure at 218 million tons of CO₂ by 2040³⁷.

That is changing, however, and the Middle East is at the forefront of innovations to use renewable energy to reduce the CO₂ emissions caused by desalination. One such innovation is solar-powered desalination. “We believe the future is solar desalination,” says Daniel Sagi-Vela,

Chief Executive of solar-photovoltaic and renewable energy developer Fotowatio Renewable Ventures (FRV) sister company in Abdul Latif Jameel Energy to desalination and water treatment plant developer Almar Water Solutions.

Some markets are already taking steps to improve the energy efficiency of desalination plants. In Western Australia, for example, the state government requires all new desalination plants to use renewable energy³⁸ – with the result that the Perth Seawater Desalination Plant (SWRO) is powered by electricity generated by a wind farm.

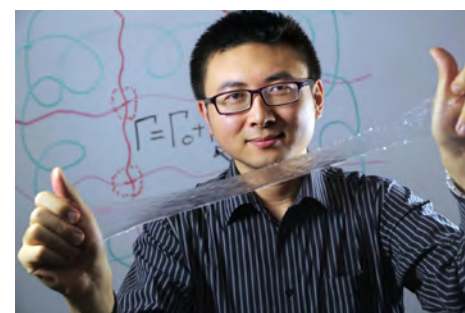
As the costs associated with renewable technologies continue to decrease, further advances in the technologies used both for generating renewable energy and the process of desalination will combine to make renewable desalination much more accessible.

A combined approach

While desalination based on renewable energy is a clear route forward, this transformation cannot be done in isolation. There remains a need to continuously develop new and innovative approaches to confront the world’s water challenge, with governments, industry, science and society all playing their part.

Scientific development is also key. Fostering partnerships between industry and academia, through initiatives such as the Jameel Water and Food Systems Lab (J-WAFS) at MIT, is crucial to help translate pioneering research into practical solutions for communities around the world.

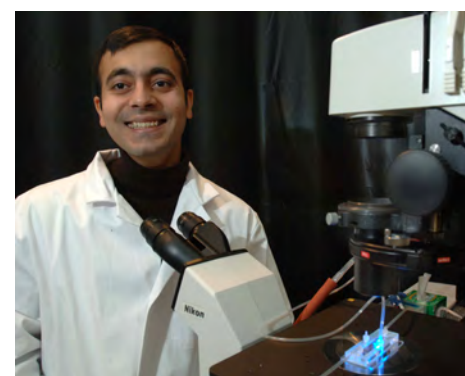
J-WAFS was established in 2014 with the aim of bringing together the world’s leading minds and facilitating research



Xuanhe Zhao, Noyce Career Development Prof., Dept. of Mechanical Engineering, MIT

of effective technologies, programs and policies relating to water and food security. It has already provided millions of dollars through its Annual Seed Grant Program for research funding in these crucial areas.

One of the projects funded by J-WAFS saw Xuanhe Zhao, a Professor in the Department of Mechanical Engineering at MIT, research a vibration-based membrane cleaning technology that had the potential to improve the efficiency, and therefore reduce the costs, of the reverse osmosis process most commonly used in desalination.



Rohit Karnik, Associate Professor of Mechanical Engineering at MIT

Rohit Karnik, Associate Professor of Mechanical Engineering at MIT, was another to benefit from J-WAFS Annual Seed Grant Funding. He led a group of researchers attempting to provide safe drinking water for the world’s poorest

citizens. Their work focused on the use of xylem membrane structures in sapwood that could be harnessed to filter water and remove bacteria, potentially providing safe drinking water in rural areas of developing countries for just a few cents per week.

A third project, which is still underway and has funding until August 2019, aims to have a viable, proven prototype of a remarkable technology that could have huge implications for water scarce regions. Led by Mircea Dincă, Associate Professor, Department of Chemistry at MIT and Evelyn Wang, Gail E. Kendall Associate Professor in the Department of Mechanical Engineering, it involves developing a water harvesting technology that uses metal organic framework (MOF) materials to draw water from the air. Mircea Dinca says: “There is enormous potential for this technology to make a big difference in water scarce regions like the Middle East and North Africa.”

In September 2018, seven more projects were funded through the J-WAFS Program.

MENAT can lead the way

The MENAT region has access to the skills, resources and knowledge to be a global pioneer in water availability – and benefit from the huge commercial opportunities it presents.

By prioritizing the water challenge and encouraging investment, innovation and partnerships across society, the region can put itself at the forefront of a fast-growing, innovative industry that will become increasingly vital to global development in the coming years.

³⁴ [Water shortages could affect 5bn people by 2050, UN report warns](#), The Guardian, 19 March 2018

³⁵ [Making Every Drop Count: An Agenda for Water Action](#), United Nations, 14 March 2018

³⁶ [Energy Efficient Desalination](#), International Water Summit, 15-18 January 2018

³⁷ [Energy Efficient Desalination](#), International Water Summit, 15-18 January 2018

³⁸ <https://www.irena.org/DocumentDownloads/Publications/IRENA-ETSAP%20Tech%20Brief%2012%20Water-Desalination.pdf>



Children inside a classroom at Za'atari refugee camp, host to tens of thousands of Syrians displaced by conflict, near Mafraq, Jordan.
UN Photo/Mark Garten.

Losing out on learning:

J-WEL and Save the Children collaborate to tackle refugee education in the Middle East

The Abdul Latif Jameel World Education Lab (J-WEL) and Save the Children have partnered in an attempt to deliver a scalable and adaptable program addressing teacher wellbeing and teaching quality in crisis settings.

Initially the two organizations will work together in Jordan, one of several countries across the Middle East where the education system is strained following the Syria conflict. They aim to integrate social and emotional wellbeing into teacher professional development programs, strengthen the capacity of teachers, and create a pilot program that can be used, adapted and scaled in other emergency contexts.



Helle Thorning-Schmidt
CEO, Save the Children
International

Helle Thorning-Schmidt, CEO of Save the Children International, said: **"Jordan has shown great compassion by offering refuge to hundreds of thousands of children who have fled the brutal war in Syria. Many of these children have seen and experienced things that no child ever should."**

"What they need most is to return to the normality that education and a good teacher can offer."

Our programme will aim to help teachers support these children so they can recover from the invisible wounds of war, and get the quality education that every child should have."

Almost six million people have fled Syria since 2011. More than a million now reside in Jordan, where teachers have worked exceptionally hard to maintain an internationally recognized education system.

Hassan Jameel, President of Community Jameel, said: **"Community Jameel sees education as a tool for people to improve their lives and the lives of those around them. This is what perfectly ties the work of**

Community Jameel, J-WEL and Save the Children. **"We recognise that teachers need compassion and empathy to support children with their emotional development – especially in a crisis setting. As such, improving quality teaching practices and student learning, through a blended approach to teacher professional development, is fundamental."**

Save the Children's Invisible Wounds report – the largest study of its kind conducted during the course of the Syria civil war – revealed a terrifying mental health crisis among Syrian children. Children they spoke to described increases in self-harm, suicide attempts, bedwetting, speech problems and aggressive or withdrawn behaviour.

Mental health experts have also warned that Syrian children are showing signs of 'toxic stress', which can lead to developmental issues.

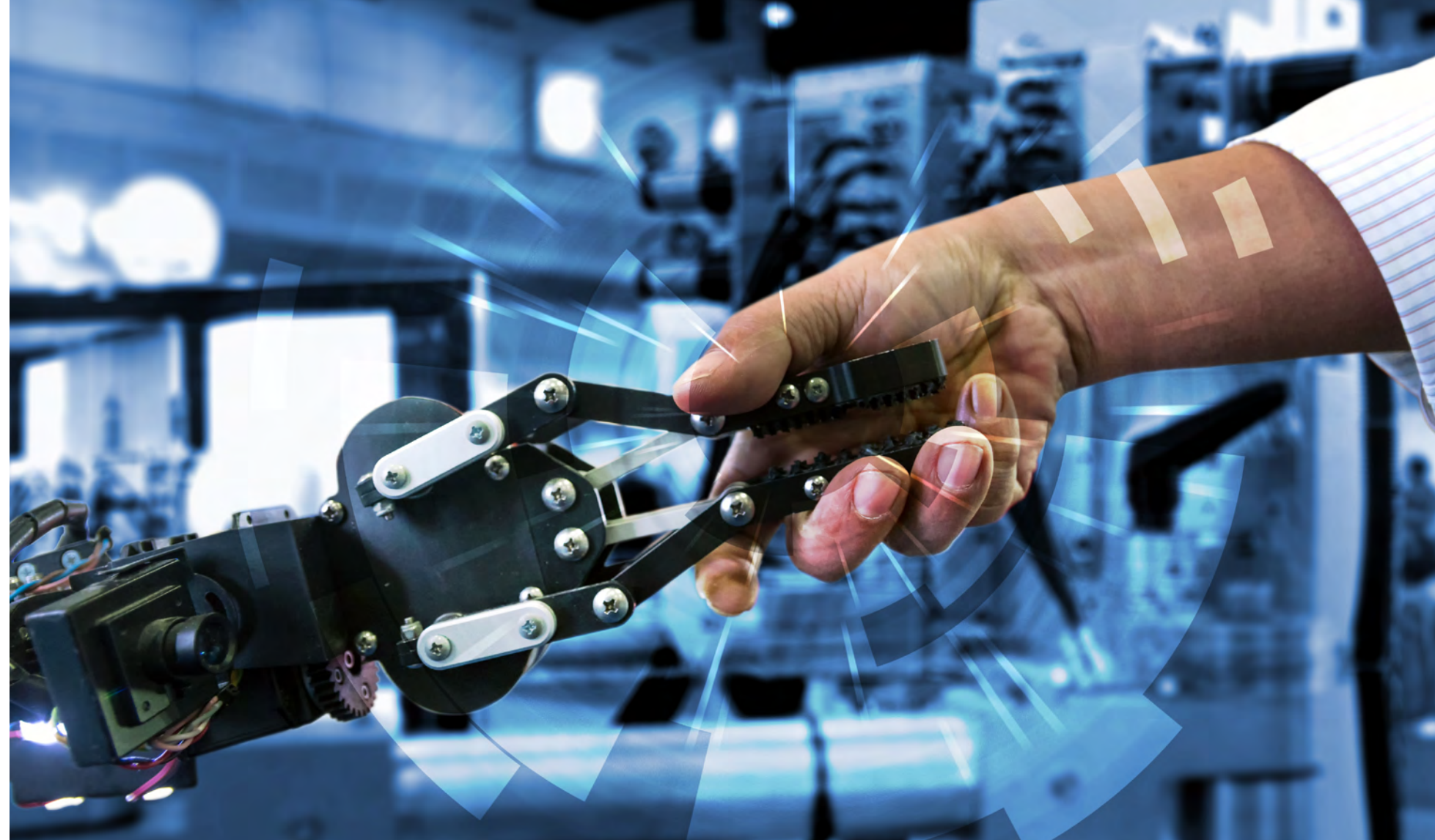
The recent collaboration was announced during a high-level meeting that took place during the United Nations General Assembly, calling on world leaders to accelerate and improve long standing commitments to deliver on education for refugees.



J-WEL

Abdul Latif Jameel World Education Lab

Unlocking Digital Success: Combining Industry 4.0 and Lean Management



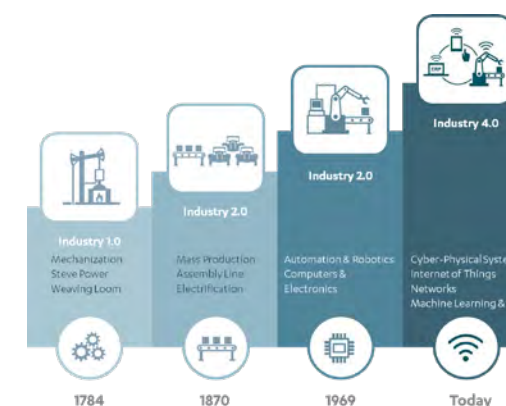
What are the key elements of Industry 4.0, how can Lean digitalization provide a better business environment for all? What are the common pitfalls for businesses embarking on digital transformations? We talk to the consultant team from Lean Management experts, Four Principles, to take a closer look.

Successful businesses continually strive to boost speed, efficiency and profits by optimizing their increasingly complex operations — regardless of industry.

But to stay ahead in today's fiercely competitive business environment, firms face ongoing pressure to deliver gains in productivity, quality and, probably most importantly, customer service delivery. In recent years, the term 'Industry 4.0' has come to represent the next wave of opportunities for the most ambitious businesses looking to leverage new technologies to optimize their performance.

What is Industry 4.0?

Industry 4.0 represents the fourth significant upheaval in modern manufacturing, following the introduction of mechanical manufacturing systems in the late 18th Century, mass production and electrical energy in the 20th Century, and electronics-driven automation in the 1970s. The vast majority of the disruptive trends encapsulated in Industry 4.0 are related to advances in digital technologies. It is driven,



according to McKinsey, by "four disruptions":

- The rise of computing power, data volumes, and connectivity
- The emergence of analytics and business-intelligence capabilities
- The development of new ways of interacting with tech, including touchscreens and augmented reality
- The introduction of robotics, 3D printing, and other ways of moving digital instructions into the physical world

Industry 4.0 represents a step-change in the way businesses view and implement technology in every sphere of their operations, with the potential to deliver considerable gains in efficiency and performance. But that's not the end of the story. By combining the technology-driven potential of Industry 4.0 with performance-focused Lean Management principles, businesses can potentially unlock even greater improvements and considerable competitive advantages.

¹ [Manufacturing's next act](#), McKinsey, June 2015

The Boston Consulting Group (BCG) recommends that a combined approach is by far the most beneficial: while independent or sequential introductions of Industry 4.0 and Lean principles carry some benefits, “in most cases, the integrated application of lean management and Industry 4.0 — which we call Lean Industry 4.0 — is the most effective way to reach the next level of operational excellence”.

That difference is “because the integrated approach allows lean management and Industry 4.0 to be mutually enabling,” meaning its improvement potential is greater than the sum of the improvements achieved by either approach on its own³.

Understanding the practical impacts

Lean principles advocate “the creation of a strong culture focused on the maximization of client value while minimizing waste, aiming to maintain alignment of efforts toward clear business outcomes through the disciplined use of metrics”.

When this approach is combined with the vast digital levers of Industry 4.0, ranging from digital performance management and remote monitoring to smart energy consumption and predictive maintenance, there is huge potential to create value by generating improvements in quality, asset utilization, time to market, and management of resources and labor. The use of advanced analytics alone, according to McKinsey, could enable most companies to improve gross margin by 30% within just two years⁵.

Key areas where businesses have applied this approach to achieve exponential gains include:

- Big data, which enables organizations to generate significant returns. Examples include an African mining company that saved US\$ 20 million a year after it identified new ways to capture more data from its sensors⁶.
- Advanced analytics, which can be used to drastically improve product development. Examples include an automotive manufacturer that combined online and purchasing data to reduce its options on one model to just 13,000 (its competitor offered 27,000,000).
- Human-machine interfaces, such as the augmented reality headsets used by Knapp AG to help staff find items quicker and reduce error rates by 40%, with an integrated camera capturing serial numbers for real-time inventory tracking⁷. Dubai Electricity and Water Authority (DEWA) is also using similar technology to help monitor its turbines⁸.
- Digital-to-physical transfers, which have been successfully harnessed by Local Motors builds cars “almost entirely through 3D printing” and cut new model development time from six years to one⁹. Unsurprisingly, major manufacturers such as Vauxhall and GM are already exploring the potential benefits of 3D printing.
- Sophisticated sensors – In the pulp and paper industry, remote temperature sensors monitor key indicators, while state-of-the-art tools analyze and automatically adjust the intensity of the kiln flame. The technological advancements

have resulted in fuel savings of up to 6% and a throughput increase of 16%.

Digital transformations often face an uphill battle

The potential benefits of Industry 4.0 are impossible to ignore. Indeed, BCG found that 97% of production managers in the automotive industry believe lean management will be highly relevant in 2030 (compared to 70% in 2017) and 70% believe plant digitalization will be highly relevant in 2030 (compared to 13% in 2017).

Yet the decision to implement Lean Industry 4.0 still requires serious planning. More than eight out of 10 digital transformations fail and only 50% of companies are successfully executing on their digital transformation strategies, despite demonstrated efforts and investments. In monetary terms, the Genpact Research Institute calculates that large enterprises throw away an average of US\$ 400 billion per year on digital transformation projects that fail to deliver promised benefits¹⁰ - and it is not difficult to find high-profile examples of digital transformations gone wrong:

- Danish toy manufacturer LEGO defunded its proprietary Digital Designer virtual building program and stopped providing updates in 2016¹¹. Released in 2004, the program was part of a strategy to improve customer experiences based on automated instructions for customized models.
- Sportswear giants NIKE cut its digital unit in half in 2014, and shut down its wearable-hardware efforts, as the company struggled to create a premium experience that consumers

- would pay for in a competitive field¹².
- British broadcasters BBC abandoned its £100 million digital innovation project,¹³ which was intended to transform the way staff developed, used, and shared video and audio material. The company’s director general admitted it had “wasted a huge amount of license fee payers’ money.”

Getting digital transformation right

To successfully capture the benefits of Industry 4.0 and its related digitalization, companies must transform the way they do business — it is not just a matter of bolting on new technology.



“By the time a transformational force such as Industry 4.0 becomes fully obvious, it’s nearly too late. It’s imperative that companies act now — waiting too long could significantly hinder growth and profitability.”

James Ryan
Principal Consultant Four Principles

“Industry 4.0 requires fundamental changes in infrastructure, project design, business processes, and people operations, which becomes a very complex endeavor when done properly,” says James Ryan, Principal Consultant at Four Principles. **“Benefiting from Industry 4.0 also requires commitment from top leadership, and continuous monitoring and improvement.”**

Lean management is designed to deliver operational excellence and is highly relevant in the context of Industry 4.0. **“Manufacturers striving to optimize their operations by adopting Industry 4.0 trends can do so most effectively by integrating Lean management principles,”** says Stefano Gaspari, Principal Consultant at Four Principles.



“We believe this holistic, two-part approach generates the most impact and captures the greatest benefits. Mutual enablement promotes benefits beyond Industry 4.0 alone.”

Stefano Gaspari
Principal Consultant at Four Principles

Proven principles of Lean thinking are fundamental in effectively implementing Industry 4.0. For example, successful digitalization requires transformational thinking throughout the organization — not just in the IT department. By assessing entire value chains, removing waste, launching and learning from flagship pilot projects, and supporting continuous innovation through the creation of new behaviors, Lean considers the company as a whole.

Combining automation and human intelligence

As companies stand to capture noteworthy benefits from Industry 4.0 advancements in automation, Lean’s deep industry history — tracing back many decades to the Toyota Group, and even before to Henry Ford, who is credited with creating the first rudimentary lean manufacturing process — is particularly relevant.

In the Lean lexicon, ‘jidouka’ represents the combination of automation and human intelligence or, in other words, automation with a human touch.

Jidouka is a key pillar of the Toyota production system and traces its roots to the early 1900s, when Sakichi Toyoda invented a simple mechanism that could detect a broken thread and shut off an automatic loom.

The invention empowered one operator to oversee many looms while upholding high quality standards.

With jidouka in the modern world, an automated machine is enabled to detect a problem, communicate it, and stop the production line.

² When Lean Meets Industry 4.0, BCG, 14 December 2017

³ When Lean Meets Industry 4.0, BCG, 14 December 2017

⁴ A Lean Digital Future for More Tangible Impact – Putting Digital Transformation To Work (& II), Jose de la Rubia, 5 December 2017

⁵ Manufacturing’s next act, McKinsey, June 2015

⁶ Manufacturing’s next act, McKinsey, June 2015

⁷ Manufacturing’s next act, McKinsey, June 2015

⁸ Mixed Reality for Industry 4.0, Forbes, 12 July 2018

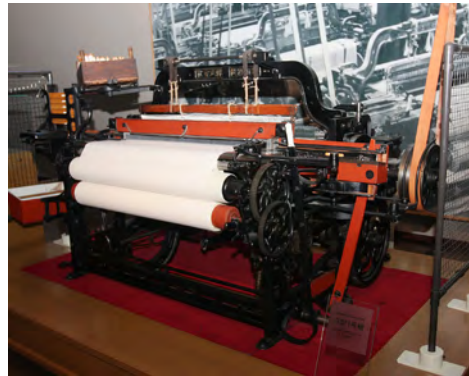
⁹ Manufacturing’s next act, McKinsey, June 2015

¹⁰ Genpact Introduces Lean Digital(SM) – A Unique Approach That Delivers Digital’s Full Potential and Helps Reclaim Over \$400 Billion of Impact, PR Newswire, 16 September 2015

¹¹ <https://www.brothers-brick.com/2016/01/21/lego-digital-designer-officially-defunded-and-unsupported-news/>

¹² <https://www.cnet.com/news/nike-fires-fuelband-engineers-will-stop-making-wearable-hardware/>

¹³ <https://www.theguardian.com/media/media-blog/2014/feb/03/bbc-digital-media-initiative-failed-mark-thompson>



The human manager then fixes the problem, and improvements are incorporated into the standard workflow. Under the jidouka model, no defective products are manufactured, since the line stops — and a single operator can monitor multiple machines, since they are designed to stop automatically, which results in drastic improvements in productivity.

In the digital world, software integration now allows companies to analyze masses of data in real-time, including production status and energy consumption. These advancements in automation mean resources are quickly redistributed, which saves costs and makes production systems more flexible.

For example, mechanical engineering company Bosch Rexroth is building a ‘factory of the future’, where everything is connected from field level to cloud-based IT systems. Sophisticated software solutions collect, transfer and process data from automated manufacturing processes for humans to analyze and optimize. The company places humans at the center of its efforts as users, designers and decision-makers. This constant exchange of information fosters intelligent collaboration and flexibility. Ultimately, this benefits Rexroth customers, who enjoy lower unit costs and the economical production of batch sizes as small as one item.

“I think we can expect superb products of enormous variety and flexibility — not just for manufacturers, but for their customers in turn. What’s more, it will be increasingly possible to make these products to a very high quality and under very economical conditions. One more thing. In a world of up to 10 billion people, customization will be the big unique selling proposition — and the Factory of the Future will make it possible”.

Rolf Najork, Chairman of the Executive Board, Bosch Rexroth

Industry 4.0 and jidouka are not limited to manufacturing settings. Seattle-based nonprofit regional healthcare provider Virginia Mason employed jidouka to integrate barcode medication administration (BCMA) technology into the nursing workflow with minimal disruption. With BCMA, a nurse scans the barcode on a patient’s wristband to verify the patient’s identity, then scans the barcode on the medication to ensure the correct medication is being administered with the proper dosage, technique, and timing. While the barcode provides valuable information, the nurse holds the ultimate decision-making power.

BCMA represents the digital automation, while the nurse’s intelligent human judgment completes the jidouka concept. After BCMA implementation, the number of safe-practice dosage violations decreased from 54.8 to 29 per 100 doses, and the number of medication errors decreased from 5.9 to 3 per 100 doses.

When it comes to adopting Industry 4.0, the time-tested principles of Lean, such as jidouka, offer an important foundation for success. McKinsey argues that “Industry 4.0 will be less a revolution than a valuable (and welcome) evolution, making next-horizon productivity gains possible and mirroring developments that have unfolded in the manufacturing environment for more than a century¹⁴”.

If your company is ready to embark on a transformational digital journey, Four Principles can deliver tangible Lean management expertise that is trusted by business leaders as far afield as Morocco, Egypt, China, Ireland, Spain and Switzerland.

Learn more at fourprinciples.com.

EVENTS

Events round-up

Some of the regional and global events to note in the coming months.

Riyadh Motor Show, Saudi Arabia

November 14-17, 2018

www.riyadh-motorshow.com

The biggest names in the automotive market show off their latest models, ideas, innovations, equipment and accessories, with more than 60,000 visitors expected.

Saudi Renewable Energy Summit, Riyadh, Saudi Arabia,

November 25-26, 2018

renewableenergyksa.com

This two-day event brings together stakeholders from across the globe to explore the latest practices, technologies and products in the renewable energy sector.

Saudi Arabia Renewable Energy – Solar & Wind 2018, Riyadh, Saudi Arabia,

November 26-27, 2018

www.bricsaconsulting.com

Conference on the future of renewable energy in Saudi Arabia, including technological innovations, NEOM smart city, Oman’s Miraa Project, Masdar, the electric vehicle market and prospective development sites.

The Big 5 Show 2018 (inc. The Big 5 Solar), Dubai, UAE,

November 26-29, 2018

www.thebig5.ae

The largest construction event in the Middle East, with 2,600 exhibitors from 137 countries. Over 65,000 visitors come together to discover the latest innovations, meet suppliers, network with distributors and source new products.

Saudi Arabia Smart Grid Conference, Jeddah, Saudi Arabia,

December 11-13, 2018

saudi-sg.com

A unique platform to discuss the latest trends and developments in emerging smart grid technologies, including sustainable energy, grid integration, automation technologies and communications solutions.

Saudi International Motor Show, Jeddah, Saudi Arabia,

December 16-20, 2018

sims-arabia.com

The 40th edition of this exhibition will see 40+ major global brands showing off their latest products, services, ideas and concepts around motor vehicles, SUVs, motorcycles and car accessories.

¹⁴ Industry 4.0 demystified – lean’s next level, McKinsey, March 2017

Abdul Latif Jameel

