THE TRANSFORMERS SUMMIT SENEGAL 2019

Goal 11: Sustainable Cities and Communities

9th December, Dakar, Senegal

ENGLISH

WELCOME TO THE TRANSFORMERS SUMMIT

Welcome to the second annual Transformers Summit, held in partnership with the Government of Senegal.

Following last year's successful Summit in Cambridge, UK, we are this year welcomed to Senegal, the first member country to host the event. Today, we will hear from decision makers, scientists, innovators, investors and global leaders from around the world, united by a shared goal: to advance progress in achieving Sustainable Development Goal 11 (SDG11) and make our cities safe, resilient and sustainable.

The Islamic Development Bank (IsDB) is committed to providing funding that will foster innovation to help our member countries meet the Sustainable Development Goals. In order to keep up with the world's ever-expanding population, we must adopt a new and innovative approach to development. As part of this, the IsDB is investing in a Science, Technology and Innovation department through our $500 million Transform Fund, as part of my Five-Year Plan. The Fund provides seed money for start-ups and SMEs to develop their ideas, as well as to support the commercialisation of technology to address the issues that our cities and communities face.

There remains a huge funding gap of $2.5 trillion to the SDGs and progress must be accelerated to meet 2030 and 2050 targets. Compared to the other goals, SDG11 is relatively poorly funded – yet, issues relating to affordable housing, safe and sustainable transport, mass migration, climate change and pollution affect us all. I am pleased to be here in Senegal, where we will discuss the challenges facing the country, Africa and beyond.

It's no secret that cities across the world are facing complex economic and social challenges. To add to these challenges, our member countries' population is expected to increase by 35 percent in the next 11 years, rising from 1.7 billion in 2015 to 2.2 billion by 2030, with the working youth population expected to increase by a 100 million. Africa will see this increase most significantly: the continent's population is growing at such a pace that it will be home to one billion children by 2050.

Since launching the Transformers Fund, we've supported entrepreneurs across the world, this year holding events in Uzbekistan, Pakistan, Niger, Bosnia and Herzegovina, and Egypt, helping the best innovations scale their solutions to advance the SDGs. It is with great pleasure to present to you today 34 distinguished entrepreneurs selected to attend the Summit today. The work of these entrepreneurs address the most critical issues that their respective communities face all across the globe.

The IsDB is dedicated to providing investment that will accelerate commercialisation of ideas that solve specific real-world problems, and I hope to see the innovations from these entrepreneurs inspire today's conversation.

Finally, a word of thanks. Thank you to the Transformers who have travelled here to join us today, and to our fantastic roster of speakers for taking the time to share their ideas with us. A huge thank you to President Macky Sall and the country of Senegal for welcoming us here today and hosting us in such a spectacular venue that truly showcases the potential that this country has. Here today, we will make the impossible possible.

The IsDB believes in a future in which all people live in dignity and prosperity, with no one left behind; a future in which the public and private sectors work in partnership to enable economic development; and a future in which people and communities are empowered to participate, influence, and shape the events that affect their lives, enabling them to fulfil their potential to create a sustainable future for all.

I look forward to seeing how the ideas presented and topics discussed at the Transformers Summit today will move the needle in advancing SDG 11.

His Excellency Dr. Bandar M. H. Hajjar,
President, Islamic Development Bank Group

WELCOME TO SENEGAL

Following the first edition held on 8 December 2018 in Cambridge in the UK, Senegal is honored to be the first IsDB Member Country to host the Transformers Summit, held at the International Conference Center Abdou Diouf (CICAD) on December 9, 2019.

The main objective of the Transformers Summit is to discuss best practices for achieving the Sustainable Development Goal 11 “Making cities and human settlements inclusive, safe, resilient and sustainable” through Science, Technology and Innovation (STI).

Moreover, the leading experts participating in this year’s summit will, also, discuss ways to promote access to finance and find complementary resources to support innovation.

I am elated to chair this summit, which will be held in the city of Diamniadio, which symbolises the cities of the future that we want, of the Senegalese cities namely SMART, offering services within a modern urbanism framework encompassing health services, water and sanitation, transportation, clean energy, education and training underpinned by science, technology and innovation.

This ambition, which is reflected in the Emerging Senegal Plan (PSE) coming into force by 2035, corresponds to that of Dr. Bandar Hajjar, President of the IsDB, to promote STI in order to solve problems related to sustainable development in African cities as well as in other IsDB Member Countries.

I congratulate H.E. Dr. Hajjar for establishing a US$ 500 million Fund to provide Start-ups and SMEs capital to develop their ideas and facilitate the commercialization of technology in IsDB Member Countries.

His Excellency President Macky Sall
President of the Republic of Senegal

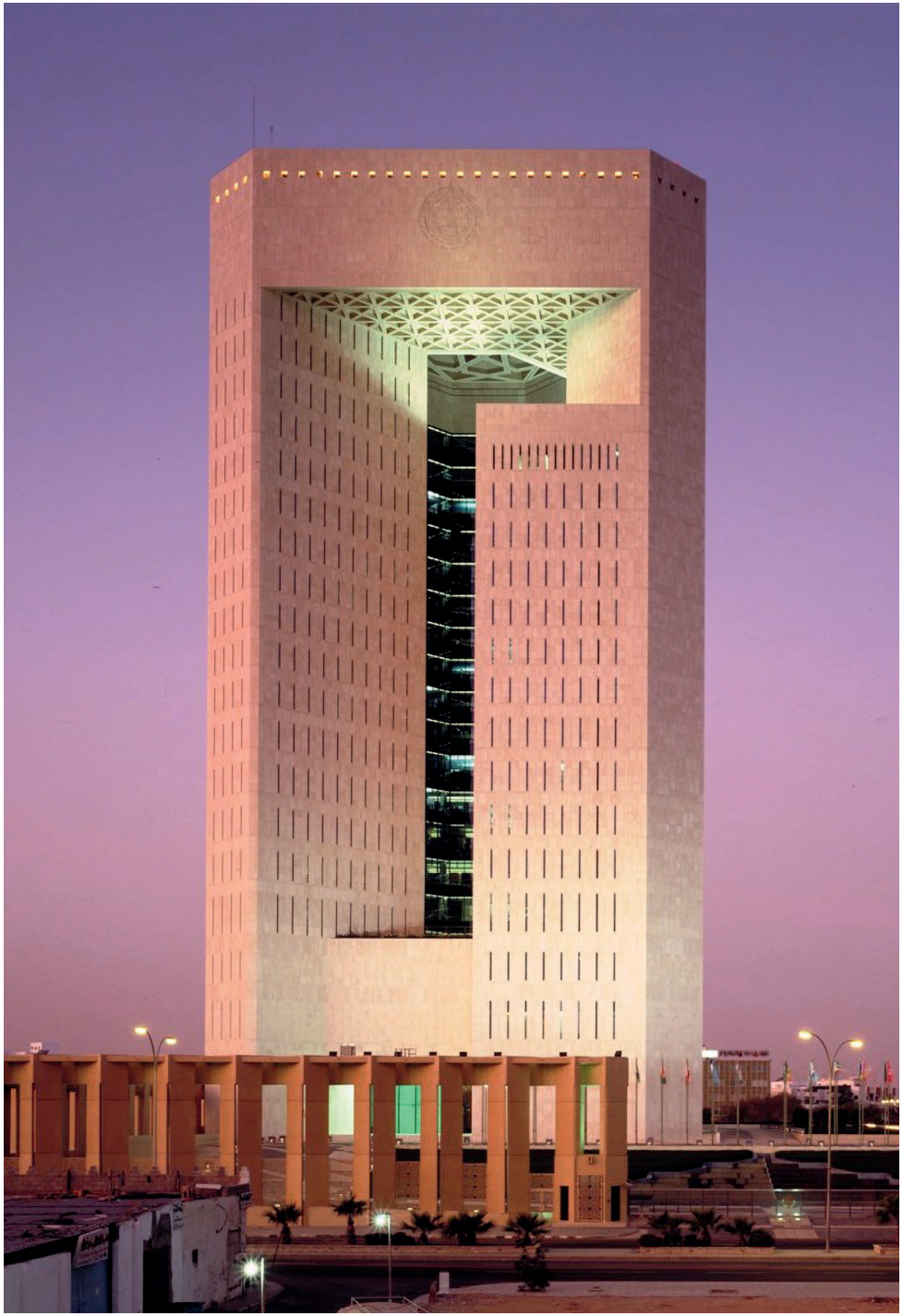
THE ISLAMIC DEVELOPMENT BANK

The Islamic Development Bank (IsDB) is a multilateral development bank that has been working for over 40 years to improve the lives of the communities it serves by delivering impact at scale.

We bring together 57 member countries across four continents, touching the lives of 1 in 5 of the world's population. We are one of the world's largest multilateral development banks, with an annual volume of operations above $10 billion and subscribed capital of $70 billion.

The IsDB is headquartered in Jeddah, Saudi Arabia, with major hubs in Morocco, Malaysia, Kazakhstan and Senegal, and gateway offices in Egypt, Turkey, Indonesia, Bangladesh and Nigeria.

Our mission is to equip people to drive their own economic and social progress at scale, putting the infrastructure in place to enable them to fulfil their potential. We build collaborative partnerships between communities and nations, and work towards the UN Sustainable Development Goals by harnessing the power of science, technology and innovation, and by fostering ethical and sustainable solutions to the world's greatest development challenges.



DIGITAL TRANSFORMATION OF SENEGAL

Digital Transformation of the National Economy

The Government of Senegal, as part of the implementation of the Emerging Senegal Plan (PSE) for the achievement of strong and sustainable growth targets, in particular, embarked on a digital transformation of the national economy. For this purpose, the strategy titled "SENEGAL NUMERIQUE 2025" or "SN2025" was developed by the Ministry of Digital Economy and Telecommunications, based on the priorities set by the Emerging Senegal Plan (PSE). It embodies Senegal's ambition to maintain an innovative leading country position in Africa. It is built on a vision: "In 2025 Senegal, digital for all and for all uses with a dynamic and innovative private sector in an efficient ecosystem".

The strategy consists of three (3) prerequisites and four (4) strategic priorities for intervention. The prerequisites consist of the following:

1. "Legal and Institutional Framework",

2. "Human Capital", and

3. "Digital Trust".

The strategic axes revolve around the following:

1. "Open and affordable access to digital networks and services",

2. "An administration connected to the service of citizens and businesses",

3. "Promoting an innovative and value-creating digital industry", and

4. "Digital diffusion in priority economic sectors".

This strategy will, also, enable by 2025, the creation of 35,000 jobs and a contribution of 10% to GDP.

Digital Transformation of the Health System

The Minister of Health and Social Action and the Minister of the Digital Economy and Telecommunications presided over the launch of the operationalization of the Strategic Digital Health Plan (PSSD) for the period 2018-2023 in January 2019. On this occasion, they have signed a partnership agreement for the development of digital health. The operational implementation of the PSSD is underway with the start-up of the digital projects relating to the patient's health record, télé@ccessanté (Project for achieving universal access to health) and the platform for digital health: Architecture

ENGAGE AND TRANSFORM

We work to give people the tools they need to help themselves, their communities and their countries, restoring their pride and fulfilling their potential. We believe that by building the right infrastructure, we can enable our member citizens to drive their own economic and social development in the future.

That is why the Islamic Development Bank launched the Transform Fund.

Transform is a new $500 million fund to support science, technology and innovation initiatives in our member counties. It will drive meaningful change to millions of people by giving every scientist, technologist and innovator the opportunity to make a difference to the world around them.

Transform will run in tandem with Engage, an online hub, which is designed to connect innovators in the world's developing communities with market opportunities and funding.

The world is developing faster than ever before, with science and technology offering innovative solutions to major economic social and health challenges.
With the right tools and a supportive environment, innovators and businesses can harness the great potential of Science, Technology and Innovation as strategic drivers for economic growth among their local communities.

Engage is a digital hub, which will create a global innovation ecosystem for the world's developing communities: connecting innovation with market opportunities and funding.

Closely aligned to the Sustainable Development Goals, Engage will focus on accelerating progress towards achieving greater food security, healthier lives, inclusive and equitable education, sustainable management of water and sanitation, access to affordable and clean energy, and sustainable industrialisation across the developing world.

To find out more visit: www.isdb-engage.org

ENGAGE TRANSFORM

PARTNERS

We are delighted to be supported by a number of international and multilateral organisations, global corporations, innovators and entrepreneurs in advancing the future of cities.

IsDB
البنك الإسلامي للتنمية
Islamic Development Bank

SUSTAINABLE DEVELOPMENT GOALS

ENGAGE

TRANSFORM

WHITAKER PEACE & DEVELOPMENT INITIATIVE

CNBC AFRICA

PROJECT EVERYONE

BADEA

SUSTAINABLE DEVELOPMENT GOAL 11

Goal 11: Make cities inclusive, safe, resilient and sustainable

More than half of the world's population now live in urban areas. By 2050, that figure will have risen to 6.5 billion people – two-thirds of all humanity. Sustainable development cannot be achieved without significantly transforming the way we build and manage our urban spaces.

The rapid growth of cities in the developing world, coupled with increasing rural to urban migration, has led to a boom in mega-cities. In 1990, there were ten mega-cities with 10 million inhabitants or more. In 2014, there were 28 mega-cities, home to a total 453 million people.

Extreme poverty is often concentrated in urban spaces as local and national governments struggle to accommodate the rising population in these areas. The future of our cities relies on addressing population challenges, creating financial and environmental sustainability, providing green transport, as well as education, good health and wellbeing for all.

3.5 BILLION PEOPLE

Half of the world's population, live in cities. By 2050, the urban population is expected to reach 6.5 billion

3%

Cities occupy just 3 percent of the Earth's land but account for 60 to 80 percent of energy consumption and 75 percent of carbon emissions

828 MILLION

Currently 828 million people live in slums, and the number is rising

28

In 1990, there were 10 cities with 10 million inhabitants or more; by 2014, the number of "mega-cities" had reached 28

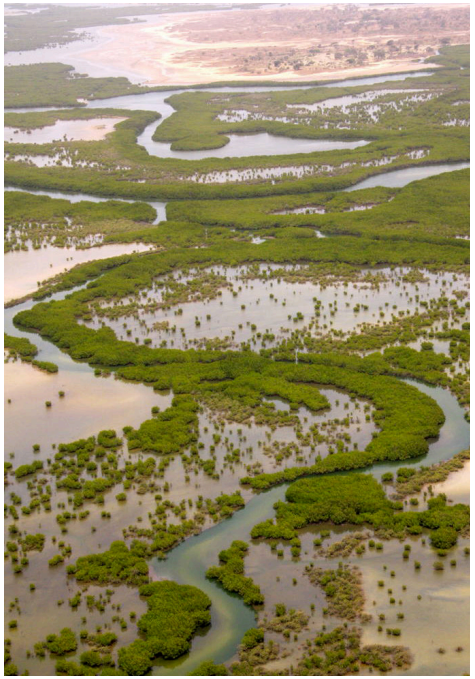
95%

In the coming decades, 95 percent of urban expansion will take place in the developing world

1.2 BILLION

1.2 billion jobs depend on a healthy and stable environment

SDG 11 AMBITIONS AND TARGETS



Cities are hubs for ideas, commerce, culture, science, productivity, social development and much more.

At their best, cities have enabled people to advance socially and economically. With the number of people living within cities projected to rise to 5 billion people by 2030, it's important that efficient urban planning and management practices are in place.

to deal with the challenges brought by urbanization. The global targets, set by the United Nations, to achieve the SDG 11 include:

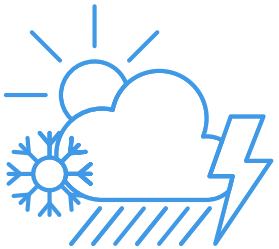
- By 2030, ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums
- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
- By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

- Strengthen efforts to protect and safeguard the world's cultural and natural heritage
- By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
- By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities
- Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
- By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels
- Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

KEY CHALLENGES

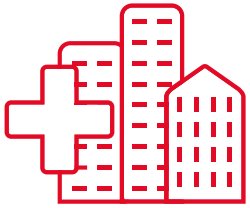
Today, through a number of panel discussions, speeches and interactive debates, speakers and guests will discuss a number of sustainability factors influencing and affecting the future of cities, guided by the following key drivers of the conversation on the future of cities.

EDUCATION AND INSPIRING THE EVER-GROWING YOUTH POPULATION



HOW CLIMATE CHANGE IS IMPACTING URBANIZATION AND HOUSING IN GROWING CITIES

TRANSPORT AND PUBLIC SPACES: CONNECTING THE WORLD'S CITIES AND COMMUNITIES



IMPROVING THE HEALTH OF CITY-DWELLERS

KEYNOTE SPEAKERS

The Transformers Summit brings together a powerful coalition of entrepreneurs, innovators and global leaders to discuss the role of science, innovation and technology in achieving SDG 11.

H.E. Dr. Bandar Hajjar | *President, Islamic Development Bank*

Dr. Hajjar is President of the Islamic Development Bank (IsDB); a multilateral development bank that fosters the economic development and social progress of 57 member countries and Muslim communities

He served as Minister of Hajj and the Minister of Culture and Information in the Kingdom of Saudi Arabia and was the founder of the Saudi National Society for Human Rights. Dr. Hajjar formed a coordinating council of seven NGOs under the umbrella of the National Society for Human Rights to monitor the first municipal elections held in Saudi Arabia in 2005. The Council deployed approximately 1,500 volunteer citizens to all cities in the Kingdom and issued daily statements in both Arabic and English explaining the election instructions, regulations, and outcomes.

Dr. Bandar Hajjar was awarded a bachelor's degree with First-Class Honours in Economics and Political Sciences from King Saud University, Riyadh, and a master's degree in Economics from Indiana University, USA. He also has a PhD in Economics from Loughborough University. The Republic of Senegal awarded Dr. Hajjar the National Order of the Lion, the highest national order awarded by the Republic, in recognition of his efforts in supporting the development projects and programs carried out by the Islamic Development Bank in Senegal.

H.E. President Macky Sall | *President of the Republic of Senegal*

President Macky Sall was elected fourth President of the Republic of Senegal in March of 2012, he took office on April 2, 2012. President Macky Sall also holds the position of Chairperson of the New Partnership for Africa's Development (NEPAD), Heads of State and Government Orientation Committee.

President Sall was Prime Minister for three years from 2004 to 2007, thus becoming the longest-serving Prime Minister at that time under the President. Initially little-known, he made his mark from his first keynote speech addressing the leaders of the opposition to introduce his general policy. Mr. Sall then proceeded to work on the implementation of State projects that had been shelved: highways, Dakar's "Corniche" (coastal line of the Capital), the new airport, etc. Additionally, as Chief of Cabinet he ran the campaign for the President's re-election in 2007.

President Macky Sall is also a member of several national and international associations of geologists and geophysicists, having trained as a geological engineer and geophysicist at the Institute of Earth Sciences of Dakar (IST), and the National School for Petroleum and Engines (ENSPM) of the French Petroleum Institute of Paris (IFP).

Dr. Hayat Sindi | ***Chief Advisor to the President, Science, Technology and Innovation, Islamic Development Bank***

Dr. Hayat is a leading biotechnologist and a champion of science and technology in the Middle East. In 1995, she became the first woman from the Gulf to obtain a Ph.D. in biotechnology from Cambridge. With a team from Harvard, she co-founded Diagnostics For All to create affordable diagnostic devices for people in impoverished regions. She has launched the i2 Institute for Imagination and Ingenuity to encourage innovation among young scientists, technologists and engineers. Dr. Sindi is a Goodwill Ambassador for Sciences at UNESCO; one of 25 global experts selected by UN Secretary General Ban Ki Moon to the UN Scientific Advisory Board; and a member of the Ten Members Group to support the technological facilitation mechanism (TFM) for the SDGs.

Forest Whitaker | ***Founder and CEO, Whitaker Peace & Development Initiative***

Forest Whitaker, artist and social activist, is the founder and CEO of the Whitaker Peace & Development Initiative (WPDI), whose mission is to empower young women and men to become leaders, peacemakers and entrepreneurs in their communities through a unique conflict resolution and peace building program, combined with innovative use of technology and skills building. Mr Whitaker is also the UNESCO Special Envoy for Peace and Reconciliation, and a member of the United Nations Sustainable Development Goals Advocacy Group. In 2014, he started collaborating with the Special Representative of the UN Secretary-General for Children and Armed Conflict, a topic on which he was invited to speak before the Security Council in September of that year. Whitaker is also one of Hollywood's most accomplished and versatile figures, having received the 2007 Academy Award for Best Actor. Through WPDI, he has developed the Youth Peacemaker Network, a global peacebuilding social network with hubs in South Sudan, South Africa, Uganda, and Mexico. He and WPDI are committed to providing educational tools and economic opportunities to young women and men in regions touched by violence and armed conflict.

Chief Facilitator:

Ibrahima Cheikh Diong | ***Founder and CEO, Africa Consulting and Trading***

Mr. Ibrahima Cheikh Diong is the Founder and Chief Executive Officer of the Dakar- based pan-African management consulting and commercial facilitation firm, Africa Consulting and Trading (ACT).

Prior to that he was Minister, Senior China Adviser to the President of the Republic of Senegal on Chinese affairs and financing of large projects, Ambassador and Director General of the International Cooperation Department of Senegal.

He served in 2009 as the first Chairman of Senegal Airlines (SAL), for which he coordinated the steering committee that helped set up the airline from a conceptual phase to a full implementation, leading to the launch of the first flight of the airline in January 2011.

Prior to this he was a Manager at IFC where he led e orts to provide financing and advisory services to African SMEs through one-stop shops referred to as SME Solutions Centers. Mr. Diong has also held the position of Regional Coordinator for Africa of the World Bank-managed multi-donor facility, the Public Private Infrastructure Advisory Facility (PPIAF) where he assisted African governments in attracting private investments and management into their infrastructure.

He has been a Manager of the Environment Unit of the Dakar-based Pan-African Agency for Research and Consulting (PARC) and the Water Department of the African Network for Integrated Development (ANID). While living in Taipei, he had established a consulting firm, Africa Consulting in Taiwan (ACT), whose main purpose was to advise Taiwanese businessmen on investment opportunities in Africa.

Youth Ambassador:

Magdalena Nandege | ***WPDI Ambassador***

Magdalena Nandege is 23 years old, from South Sudan. She was born in Homiri, a village in Kapoeta State, in Chukudum county.

Through WPDI, Magdalena has learned to promote peace in the community and has learned to use a computer and social media. This has given her a lot of confidence –as a young person and especially as a woman. In her country, many people believe that a women's only place is at home. She wants to prove that this is not true. She does this when she trains seasoned officials in peacebuilding or when she teaches the human rights to children. She does this when she leads peace processes among villages in conflict. Recently, she worked with two communities that had been fighting for years in her county, Chukudum. There had been cattle raids, abductions, beatings and killings. She went to them, spoke to them and get them to speak to each other – translating the teachings of WPDI into words and ideas they could understand. And it worked. They signed a peace agreement that was sanctioned by the State and covered in the media. There was a picture of her in a paper. It pleased her because it was not just her on this picture. It was a message that women can be leaders and have a real role to play to make peace happen.

Moderator :

Bukky Shonibare | ***Founder, Girl Child Africa***

Bukky Shonibare is the Founder of Girl Child Africa, Coordinator of #ChurchMeToo movement, and one of the leaders of the #BringBackOurGirls movement in Nigeria. She is a peace and security expert, and a human rights advocate with focus on women and girls. Bukky hold a Bachelor of Laws (LL.B) with First Class Honours, B.Sc in Business Administration (First Class), and Master's in Managing Peace and Security in Africa (A). She also hold dual Certificates in Journalism, and Creative Writing from the London School of Journalism; and dual Certificates in Social Sector Management, and Entrepreneurial Management from the Pan Atlantic University, Nigeria. Bukky has received some awards and recognitions, including being named a 'Nigerian Star' by the US Embassy in Nigeria (May 2019), Glazia's Person of the Year in the Philanthropy and Advocacy category (January 2018), one of the 100 Most Inspiring Women in Nigeria (March 2018), and one of Quartz Africa's Innovators at the World Economic Forum (May 2017). Bukky is a 2016 Mandela Washington Fellow, an initiative of the United States Department of States.

Achime Malick Ndiaye | ***Director of Information and Communication Technologies***

Achime Malick NDIAYE is Director of Information and Communication Technologies at the Ministry of the Digital Economy and Telecommunications. He is also an Engineer, holding a Master of Sciences in Telecommunication Engineering and specializing in Network Design and Architecture (CAR). In addition, he has a variety of skills in Digital Financial Services in the Institute of Electrical and Electronics Engineers (IEEE) Standards, E-Currency, in Rural Telephony and Universal Telecommunications Services Solutions TEMIC -CANADA, Expert Study Commission 3 (SG3) on the financial aspects of ITU-T, Certified Expert enPON (Passive Optical Networks). Previously, he was a Vice President of the Regional Group of Studies 20 on the Internet of Things and Smart and Sustainable City (IoT & SSCC), a Vice President of Study Group 20 on the Internet of Things and City Smart and Sustainable (IoT & SSCC) -International. Currently, he serves as National Coordinator of the Working Group on Electronic Commerce. Finally, he is a trainer in Telephone Applications; Editor of ITU Resolution 89 namely "Promoting the Use of Information and Communication Technologies to Reduce Disparities in Financial Inclusion." (Rev. Hammamet, 2016) - Rules of Procedure of the ITU Telecommunication Standardization Sector.

Beaugas Orain Djoyum | ***General Manager of ICT Media STRATEGIES***

Beaugas Orain Djoyum is the General Manager of ICT Media STRATEGIES (www.ictmedia.africa), an e-reputation and personal branding firm that also offers Business intelligence services in the sectors of ICT, Telecoms and Digital in Africa.

The firm also proposes training in e-Reputation and digital communication. Moreover, ICT Media Strategies produces specialized media contents for specialized media.

Beaugas Orain DJOYUM has become over the years the consultant you need when you think about personal branding and digital communication strategies. Not only in Cameroon, but also in many African countries where he helps individuals, administrations and companies. He is also the editor of Digital Business Africa (www.digitalbusiness.africa), the best-specialized French web platform that produce daily strategic news on ICT, Telecommunications and Digital in Africa.

Yacine Barro Bourgault | ***Acting Country Manager for West & Central Africa, Microsoft***

Yacine grew up and followed her primary and secondary studies in Senegal. Then graduated from INSEEC Paris (a French Business school) and began her career as Sales Manager at CISCO SYSTEMS in Paris. She then returned to Senegal in 2004 to open the first representation of MICROSOFT as Business Development Manager for West and Central Africa. In 2008, Yacine joined the headquarters of the Celtel Group (now Bharti) in Amsterdam to launch the corporate segment of the mobile phone operator in 21 African countries. With her experience, which enabled her to acquire a proven versatility in strategy, project management and business development, Yacine embarks on the Africa24 adventure and launched the first international news channel on Africa. She held the position of CEO and led the daily deployment of Africa24 in the global media landscape.

In July 2017, Yacine returns to MICROSOFT as General Manager of the West and Central Africa Region, based in Dakar. A year later, she was very quickly promoted to the position of Director of the Small and Medium Business Segment for Emerging Markets in the Africa and Middle East region.

Tidjane Deme | ***General Partner, Partech***

Tidjane Deme is General Partner at Partech, co-leading Partech Africa Fund, Partech's multi-stages tech fund exclusively dedicated to Africa digital markets. He joined in May 2016.

Prior to joining Partech, Tidjane has worked for 15+ years in the tech industry in Africa, as an entrepreneur, a consultant as well as a senior business manager. He worked for 7 years as a senior manager at Google, leading activities in Africa. He started the Google Francophone Africa office in Dakar in 2009, led ecosystem efforts to support developer communities and tech startups across 15+ countries, led Google's Africa Content Strategy, launching and growing YouTube in 6 markets. He also led business development for Google's Infrastructure investments in Africa. Prior to Google, Tidjane was a tech entrepreneur who founded and led CommonSys, a consulting and integration company deploying e-gov platforms and enterprise solutions in west Africa. He also cofounded 2 startups, an e-reputation platform in Europe and a SaaS platform for African SMEs.

Tidjane grew up in Senegal until age 18, then moved to France to attend Ecole Polytechnique (Msc Physics), did an exchange program at Imperial College London, and attended Ensta-Paritech (Telecom and IT Engineering).

PANEL 2: HOW CLIMATE CHANGE IS IMPACTING URBANIZATION AND HOUSING IN GROWING CITIES

Moderator :

Marieme Jamme | *CEO, iamtheCODE*

Marieme Jamme is an award-winning technologist and pioneer in system change and a Young Global Leader of the World Economic Forum. In Sept 2017, she won the Innovation Award at the Global Goals Award 2017 by UNICEF and the Bill and Melinda Gates Foundation as a GoalKeeper for her work in advancing the United Nations Sustainable Development Goals, supporting globally young women and girls and governments. A BBC 100 Women nominee, she was named twice on the UK Powerlist 2017 and 2018 of Britain's 100 most influential people of African and African Caribbean Heritage.

She also recently joined forces with a group of African leaders to create Accur8Africa, a new platform aiming at enabling governments, businesses, entrepreneurs and the civil society in Africa at measuring the success of the Sustainable Development Goals by 2030 with Accurate Data.

Marieme's latest venture includes the launch of IAMTHECODE, as the first African- led global movement aiming at mobilising governments, businesses and investors to support girls and young women in STEAMD.

Her goal is to empower 1 million young women and girls globally to become coders by 2030 and to align with the United Nations 2030 Agenda. Mariéme is the newest board member of the Worldwide Web Foundation. She will be supporting the foundation in the area of gender and digital equality. Mariéme is the first black woman to be named and invited to be part of the UBS Group Global visionaries' program.

In 2018, Mariéme became a founding member of the Future Talks Expedition, which gathered 100 global leaders from 42 countries to visit the Arctic (North Pole.) She is the first Senegalese woman who made it to the Arctic.

Mauricio Cordova | *Founder, Fair Cap*

MMauricio Cordova is the founder of Faircap, a social company that develops affordable products to address clean water shortages using technology and design. The first product is the Faircap Mini, a small portable, low-cost water filter that can be screwed onto any soda plastic bottle to provide clean drinking water during emergencies and in developing countries. Faircap has received grants from the Humanitarian Innovation Fund and UKAid. Originally from Peru, he promotes open innovation as a means of solving some of the world's most critical problems. Selected as one of MIT Solve 2019 winners, Mauricio has an MSc in operational research from the London School of Economics and Political Science and a BA in economics from the University of Texas.

Dr Flavia Schlegel | *Special Envoy for Science in Global Policy, International Science Council*

Dr Flavia Schlegel has had a distinguished international career which includes positions at UNESCO and as a Science Diplomat in Washington DC, USA and Shanghai, China. Before joining the ISC, Dr Schlegel was the Assistant Director General for UNESCO's Natural Sciences sector. During her tenure, she oversaw UNESCO's response to multilateral development agendas such as the Sustainable Development Goals, the Paris Agreement, the Sendai Framework on disaster risk reduction and the Samoa Pathway. Prior to her time at UNESCO, Dr Schlegel established swissnex China – the Swiss house for science, technology, innovation, and culture in Shanghai – a trans-disciplinary institution supported by public and private funding. She also served as Vice-Director for Public Health at the Swiss Federal Office of Public Health. Dr Schlegel holds a Medical Doctorate and a Master's Degree in Organizational Development.

Since April 2019, Dr Schlegel serves as the ISC Special Envoy for Science in Global Policy. The appointment of a Special Envoy aims to strengthen ISC's vision to advance science as a global public good. One of Dr Schlegel's key roles is to strengthen relations and cooperation between the ISC and the UN family.

Abdoulaye SENE | ***President of the Organizing Committee and Executive Secretary of the 9th World Water Forum "Dakar 2021"***

Abdoulaye SENE is the President of the Organizing Committee and Executive Secretary of the 9th World Water Forum "Dakar 2021". He is the founding President of the International Reflection Group "Global Local Forum", former President of the Regional Council of the Fatick Region (2002-2009), former Deputy and President of the Commission on Development and Spatial Planning of the National Assembly of Senegal (2007-2012), in charge of the water, energy, environment and sustainable development sectors in particular.

Abdoulaye SENE was Chairman of the Board of Directors of SOGEM/OMVS (in charge of the management of hydroelectric dams of the Organization for the Development of the Senegal River) from 2013-2017. He was Senior Technical Advisor to the Minister of Mines, Energy and Hydraulics of Senegal (2001-2002), Head of the Mission for the Study and Development of Fossil Valleys (1994-2000), Director of Rural Engineering and Hydraulics of Senegal (1990-1994), Director of the Maintenance and Care of Hydraulic Works (1984-1990). Abdoulaye SENE is a Civil Engineering Engineer (École Polytechnique Thiès, 1978), specialized in hydraulics (Master's degree from École Polytechnique de Montréal, 1981).

Anna Ba Dia | ***CEO, Sipres ENGLISH***

Anna is among the 50 most influential women in Africa, as established by the Jeune Afrique magazine ranking of July 2019 . Anna BA is a very discreet person, little known of the general public. She's the CEO of the SIPRES, a housing development company that specializes in single detached houses. She is the majority shareholder of her company where, in 2016, women represent 65% of employees.

The eldest of 8 children, Anna was lucky to have parents who were educators. "They raised us without gender discrimination."

After her baccalaureate, she began studying architecture in Senegal, before moving on to France after earning a scholarship. That she then continued in France via a scholarship. She returned to live abroad through her marriage, then returned to Senegal to work in an architecture firm. Fate and hard work combined with faith did the rest : "I had a land opportunity that led me to create Sipres. It was in 1989!" It took some time, but some 30 years later, her company is now among the leaders in the real estate.

PANEL 3: TRANSPORT AND PUBLIC SPACES: CONNECTING THE WORLD'S CITIES AND COMMUNITIES

Selim Bora | *President, Summa*

Selim Bora holds a Bachelor of Science degree in Metallurgical Engineering, from the Middle East Technical University of Ankara, as well as a Master of Science degree in Industrial Engineering from the Alfred University of New York. In 1993, Mr. Bora joined the Summa International Construction company as Business Development Manager, first in Turkmenistan and then in Kyrgyzstan. In 1995, he was named Regional Manager of Summa for the Russian Federation, based in Moscow. Mr. Bora became President of Summa in 1999 after holding the position of Vice-President for 3 years.

For the last nine years, Summa operates in Sub-Sahara Africa namely; Equatorial Guinea, Senegal, Rwanda, Congo Brazzaville, Niger, Benin. Under the leadership of Mr. Bora, the Group was ranked within Top 225 International Construction Companies by Engineering News Record- a prominent publication. Today Summa has diversified business interest and operations in BOT Airports, Hospitals, Shopping Malls, Hotels and similar infrastructure projects as an Investor/EPC Contractor globally. Selim Bora acting as Chairman of non-profit "Akyurt Foundation" also chairs in several economic boards.

Thierno Birahim Aw | *Technical Advisor, Ministry of Infrastructure, Land Transport and Access to Senegal*

Thierno Birahim AW is the Managing Director of Dakar Urban Transport Council (Conseil Exécutif des Transports Urbains de Dakar, the Urban Transport Authority for Dakar metropolitan area) since September 2016. He worked as research assistant from 2004 to 2007 and as research engineer from 2007 to 2008 at the City, Mobility and Transport laboratory (École Nationale des Ponts et Chaussées).

His PhD thesis in transport economy focused on the design and assessment of integrated urban development and transport scenarios. From 2008 to 2014, he worked as engineer in the French engineering company SETEC International in Paris, in charge of general and economic transport studies. He was then appointed primary technical advisor to the Minister of Infrastructure, Land Transport, and Opening-Up in Senegal from 2014 to 2016.

Dr. Jainaba M. L. Kah | *Associate Professor, American University of Nigeria*

Jainaba M.L. Kah has a Ph.D. in Urban Planning and Policy Development from the Edward J. Bloustein School, Rutgers – The State University of New Jersey, USA.

Dr. Kah has extensive practitioner experience having worked for the World Bank as an Urban/Transport Specialist and also served as a consultant for the USA Federal Transit Administration; Financial Analyst for Amnesty International; and Audit Senior at KPMG. Dr. Kah served for four years as the Chairperson of the Adjudication Committee of the All Africa Public Sector Innovation Awards (AAPSIA), which is the first Africa wide ministerial initiative celebrating innovation in the Public Sector. She spent six (6) years as the Director General of the Management Development Institute (MDI) in The Gambia and was also the Acting Dean of the School of Business and Public Administration at the University of The Gambia. Dr. Kah was an Assistant Professor of Public Policy and Administration and Director/Coordinator of the International Public Service and Development Track (IPSD) at Rutgers, The State University of New Jersey, USA for six (6) years.

Dr. Jainaba M.L. Kah returned to the American University of Nigeria (AUN) in September, 2017 as an Associate Professor and Coordinator of Graduate Programs, where she had won the "Outstanding Faculty Award in SBE" in November 2008. Dr. Kah was conferred a National Merit Award – Insignia: Member of The Republic of The Gambia (MRG) in 2014 in recognition of her contribution to higher education.

Marjoie Saint-Lot | *Country Manager, Uber Cote d'Ivoire*

Marjorie Saint-Lot is the Country Manager for Uber Cote d'Ivoire. In this role, Marjorie focuses on building the country strategy with a focus on growth and sustainability.

Marjorie has been with the Uber since November 2019 and previously worked in strategy and development for Orange Cote d'Ivoire with key achievements in leading their external growth and diversification program. She has acquired more than 13 years of international professional experience in various sectors and with a recent focus on market intelligence and strategy. Born in Côte d'Ivoire, she has a passion for disruptive technology and business models made for Africa's sustainable development. She has completed a Master 2 in Economical and Financial Engineering from l'Universite de la Reunion.

PANEL 4: IMPROVING THE HEALTH OF CITY-DWELLERS

Moderator :

Godfrey Mutizwa | ***Anchor, CNBC Africa***

Godfrey Mutizwa is a freelance financial journalist based in Johannesburg. He has covered African business for the past 34 years across print and broadcast media working for both regional and international media.

Previously, Godfrey was Chief Editor of CNBC Africa and before that spent a decade at Bloomberg News and Reuters. He currently writes for publications including City Press and Acumen. He presents Power Lunch and Closing Bell on CNBC Africa and also occasionally presents business on Johannesburg-based radio station Power FM.

Godfrey has covered and moderated debates at international conferences like the World Economic Forum in Davos and annual meetings of the African Development Bank and the Africa Export-Import Bank.

Dr. Elvis Eze | ***Consultant - Malaria and Health Systems Strengthening, Malaria No More UK***

Elvis Eze grew up in Nigeria and started out his career as a medical doctor at the Lagos University Teaching Hospital. He has since continued his clinical practice in London most recently working as an emergency medicine doctor within the United Kingdom National Health Service.

Elvis also has experience in global health understudying health systems and providing technical support through his work at the Commonwealth Secretariat.

This year, Elvis launched the voice petition with David Beckham to support the successful replenishment of the Global Fund for HIV, Tuberculosis and Malaria. He was most recently recognized and featured by Bill Gates for his ongoing work on ending malaria.

He is currently focused on malaria elimination and health systems strengthening working on initiatives with Malaria No More UK, Results UK, Gates Foundation and the Global Fund to achieve the Sustainable Development Goal 3.

BA Housseynou | ***Technical Officer, World Health Organization Regional Office for Africa***

BA has worked since late 2014 as an expert in HSS Cluster at WHO/AFRO. This was done in connection with the promotion and development of the use of eHealth services in the African Region. In this context, BA supports countries to develop and implement eHealth strategies and then he follows the trends and evidence of these technologies within the African Health System.

Between 2001 and 2006 he was appointed National Director of ICT. During this period he developed a national ICT strategy, which he deployed at the E-GOV project. He also drove the implementation of the national telemedicine project in collaboration with ITU and the University Hospital of Geneva.

Between 2007 and 2010, BA occupied the posts of Secretary General of Ministry of Employment and Professional Training, the Ministry of Telecommunications and the Ministry of Modernization of Administration.

From 2010 to 2013 he occupied function of Minister of the Environment and Sustainable Development and the Minister of Health. Along with his administrative duties he chaired the Mauritanian Internet Society section and he taught at the Nouakchott University.

Ibrahima Khaliloulah DIA | ***Head of Digital Health Department, Ministry of Health and Social Action, Government of Senegal***

Dr. Ibrahima Khaliloulah DIA, is a geographer of health, has an IUD in eHealth and also has a qualification in Information System Management (health and geography). Ibrahima is an International expert in digital health and the organization of healthcare supply. He is currently the coordinator of the Department in charge of digital health and health card at the Ministry of Health and Action in Senegal. From 2008 to 2016, he coordinated the Ministry's Health Card Office. In 2016, he was appointed coordinator of the Health and Social Card Unit, Digital Health and Health Observatory (CSSDOS) which is attached to the Secretary General of MSAS.

Ibrahima is an associate professor at the African Center of Studies and Management (CESAG of Dakar), at Alioune DIOP University of Bambey. He teaches at the Public Health Institute of Dakar (ISED) and at the Department of Geography of UCAD. He conducted his academic research in the areas of the Health Information System, Geo-information and Environment and Health.

Dr Patrick Singa | ***Medical Director, Babylon Health Rawnda***

Patrick is the Medical Director for Babylon Health Rwanda, a private and global company specialized in digital healthcare and artificial intelligence. He has a passion for healthcare innovations that can bring about a social impact. He has experience in project management, hospital administration, public health, research, human resources management and hands on medical practice for more than 10 years.

MEET THE TRANSFORMERS

In the following section you can meet the Transformers: the inaugural recipients of funding from the Transform Fund.

The Transformers have been selected from all parts of the world, from Pakistan to Uganda. By connecting Transformers with thought-leaders, their solutions have the potential to scale and flourish, and we hope you will be able to find time to meet with them in person at the marketplace exhibition.

WELCOME FROM DR HAYAT SINDI

In September 2015, at the UN headquarters in New York, 193 world leaders committed to the 17 Sustainable Development Goals (SDGs) - a series of ambitious objectives and targets to achieve three extraordinary things by 2030: end poverty, fight inequality and injustice, and fix climate change.

In an era of international uncertainty, the SDGs offer us a practical vision. A roadmap to the future. They give us hope, opportunity and direction.

However, while there has been good progress since 2015, with many sectors and leaders embracing the SDGs, evidence shows that at the current rate of progress the Goals will not be achieved in time. We need a step change.

Next year, 2020, will be what many are calling a 'Super Year' – a year when it is vital to translate the intention of the Goals into action. Pivotal to achieving the aims of the next decade will be the decisions made at conferences and Summits such as this one.

As His Excellency Dr. Bandar Hajjar, President of the IsDB regularly reminds us, with only 10 years left until 2030 it's time to shift our development model – from treating the symptoms of poverty to tackling root causes of poverty to ensure no one is left behind.

The IsDB has put Science, Technology and Innovation at the heart of this new development model. We have also committed to investing in the next generation of global innovators who are bringing new solutions to global development challenges daily.

We created the Transform Fund, and subsequently the Transformers Summit to celebrate those who are helping us achieve the world we want to see in the future. I'm delighted that, alongside our VIP speakers and expert panelists, we are joined today by members of our second Transformers Academy – innovators and researchers from all corners of the world who are harnessing science and technology to drive new solutions linked to SDG11.

This inspiring group of changemakers is proof that good ideas can come from everywhere. And when they do, we need to be ready to support and catalyse them. That is why we are offering them a whole ecosystem of support ranging from intellectual property guidance, financial advice and legal support to communications tips, networking and mentoring opportunities through our Engage platform and crowdfunding access via IsDB Innovate.

Having witnessed some of these innovations first-hand over the last 18 months through our seven Transformers Roadshows and last year's Transformers Summit in Cambridge, UK, I am truly optimistic about the opportunity innovation presents to drive people out of poverty and achieve progress at scale.

At IsDB, we are helping connect investors to innovations and encouraging the next generation of sustainability entrepreneurs to drive meaningful change to millions of people in the communities around them. These are the people whose ideas will help Governments, multinational organisations and the private sector reach our collective ambitious targets by 2030.

Please make sure you spread the word about the Transform Fund among your respective professional networks and encourage innovators and entrepreneurs to apply via the Engage website:

(https://www.isdb-engage.org).

Dr Hayat Sindi,
Chief Advisor to the President of the Islamic Development Bank, Science Technology and Innovation

EXHIBITION AREA

Please take time to explore our Marketplace Exhibition. Here, you will be able to find presentations from all of the recipients of grants from the Transform Fund, showcasing the remarkable and inspiring projects that they have been undertaking. Alongside our Transformers, the marketplace will also showcase the work of a number of Senegalese businesses, highlighting some of Senegal's most impressive innovation projects.

We know that real financial support in the science and technology sectors is needed in order to drive inclusive and sustainable development.

The Transform Fund is providing seed money for start-ups and SMEs to develop their ideas, facilitate the commercialization of technology, and promote joint activity among member countries, researchers and entrepreneurs.

Innovators, scientists, SMEs private companies, NGOs, Governments and academic institutions were invited to apply for funding under the following four categories:

1 Proof of Concept

To support scientists and innovators who have a proven concept and who are in need for initial funding to develop their ideas into a pilot project/development solution and a business proposal.

2 Start Up

To support applicants who have successfully piloted a project which involves innovative technologies and are in need for additional funding to replicate or scale up the project.

3 Commercialization

To support candidates who have already implemented and successfully scaled up an innovative project and are in need of additional funding for the commercialization of the services and products developed for a project.

4 Capacity Building

To support Governments of member countries in developing their technical and functional science, technology and innovation capacity to address major development challenges.

1 AMARI

A mobile Autism Risk Initiative (AMARI) to detect autism spectrum disorder in Bangladeshi children under the age of 4.

Stanford University and the Bangladesh Protibondhi Foundation have developed a mobile machine learning solution for rapid behavioural identification of Autism Spectrum Disorder (ASD). This solution is based on research repositories to diagnose autism cross-culturally, starting in Bangladesh. "A Mobile Autism Risk Initiative" (AMARI) is a mobile app that collects a short parent-directed, questionnaire-based assessment, which is combined with a brief video observation of the child at risk. The combined analysis attains around 84 percent accuracy and takes minutes to complete, compared to the hours required to administer gold standard diagnostic tools. This will impact several thousand families in Bangladesh who lack access to paediatric neurodevelopmental services.

Dennis Wall,
United States

Dennis P. Wall, PhD, received his Ph.D. in Integrative Biology from the University of California, Berkeley. He also gained a National Science Foundation postdoctoral fellowship in Computational Genetics at Stanford University before joining the faculty at Harvard Medical School. He is now Associate Professor of Paediatrics, Psychiatry and Biomedical Data Sciences at Stanford Medical School. He leads a lab in Pediatric Innovation focused on developing methods in biomedical informatics to disentangle complex conditions that originate in childhood and perpetuate through the course of life, including autism and related developmental delays. Dr. Wall has innovated, adapted and deployed bioinformatic strategies to enable precise and personalized interpretation of high resolution genetic, microbiological and phenotypic data. Dr. Wall has pioneered the use of machine learning and artificial intelligence for fast, quantitative and mobile detection of neurodevelopmental disorders in children, as well as the use of machine learning systems on wearable devices, such as Google Glass, for real-time "exclinical" therapy. These same precision health approaches enable quantitative tracking of progress during treatment throughout an individual's life enabling big data generation of a type and scale never before possible and have defined a new paradigm for behavioural detection and therapy. Dr. Wall has founded several companies, including the digital paediatric health company, Cognoa.com and serves as advisor on several others in working on genomic and precision health. In addition, Dr. Wall has won several awards including a spot in the top ten of the World's autism researchers, the Vice Chancellor's Award for Research, three awards for excellence in teaching, the Harvard Medical School Leadership award, and the Slifka/Ritvo Clinical Innovation in Autism Research Award for outstanding advancements in clinical research translation.

2 Water Greenhouses

Food production in arid regions, where salinity and drought are major problems, is hampered by the need for large quantities of fresh water for cooling and irrigation purposes. Fresh water is a scarce resource and growing competition from other economic sectors is further reducing availability for use in agriculture. To combat these problems, this project proposes to use saline water for greenhouse food production. Most of the fresh water used in arid regions is produced using desalination, which is expensive - however, this new innovative concept creates a suitable microclimate for plant production and generates irrigation water in a sustainable manner. The innovation is a collaboration between ICBA and Mr. Nassar Al-Madhoun, the inventor of the pozzolan cooling wall. The goal of this innovation is to make greenhouse crop production sustainable, productive and profitable.

Dr. Habtamu Giday Gebraegziabher joined ICBA in February 2019 as Post-Doctoral Fellow (Urban and Vertical Farming). Before joining ICBA, he worked at Wageningen University as a post-doctoral fellow in the horticulture and product physiology group. His main line of research was studying plant-environment interactions in controlled environments such as greenhouses and vertical farming.

Habtamu Giday Gebraegziabher,
United Arab Emirates

3 Colo-MeltDx

Affordable and robust molecular diagnostics tool for colorectal cancer.

Colorectal cancer (CRC) – or, bowel cancer - is among the top three most prevalent cancers in Indonesia. Colo-MeltDx is a simple diagnostic kit which gathers molecular data to improve cancer management. Colo-MeltDx will allow use of the correct drugs in treatment, identify patients with hereditary cancer (such as Lynch Syndrome) and allow early-stage detection of recurrence. These techniques will improve the outcome for patients suffering with CRC. Through its high-resolution melting analysis, Colo-MeltDx will be a diagnostic product that is cheap, yet robust, and can be used by point-of-care services throughout the archipelago.

Asep Muhamad Ridwanuloh is a researcher at the Research Centre for Biotechnology - Indonesian Institute of Sciences and a member of the International Association for Study of Lung Cancer. Asep's intrigue into how cancer management can be improved, has grown since he completed his bachelor's degree in Indonesia. He is experienced in the process of synthesizing chemical compounds into a drug to inhibit tumour cells. As well as that, in the last five years he has developed nucleotide-based methods for cancer detection. He was awarded research grants from The Ministry of Research, Technology and Higher Education of Indonesia, International Toray Science Foundation and Indonesian Institute of Sciences. He has collaborated with hospitals, universities and private companies in Indonesia.

Asep Muhamad Ridwanuloh, Indonesia

4 Prognostic reporting system for hormone receptor testing in breast carcinoma patients

The current clinical practice for hormone receptor testing in breast cancer patients is still based on manual counting and estimation of positive cells in ER-stained slides. This approach is tedious, time consuming, and prone to errors and inaccuracies. This project proposes to develop an automated system for prognostic reporting of hormone receptor testing which can improve the quality of diagnosis and prognosis, benefiting both pathologists and patients. In the long term, the project will help create awareness and nurture interest in this important field of digital pathology among Muslim researchers, which can benefit Muslim countries greatly in the near future.

Mohammad Faizal Ahmad Fauzi, Malaysia

Mohammad Faizal Ahmad Fauzi (MIEM, SMIEEE) received his B.Eng. in Electrical and Electronic Engineering degree from Imperial College London in 1999 and his Ph.D. in Electronics and Computer Science degree from the University of Southampton in 2004. He is currently an Associate Professor at the Faculty of Engineering, while also serving as the Deputy Director for the Collaboration and Innovation Center (CIC) at Multimedia University, Malaysia. Previously he was the Director for the Center for Quality Assurance and Academic Excellence (CQAAE) from August 2012 to April 2013.

Mohammad Faizal has published more than 80 journal and conference articles to date. His main research interests are in the area of signal and image processing, pattern recognition, computer vision and biomedical informatics. From May 2013 to June 2014, he was attached to the Clinical Image Analysis Lab (CIALab) at the Ohio State University Wexner Medical Center where he worked on cancer diagnosis and prognosis in digital pathology. In 2017 he received the prestigious Fulbright Award as well as the MCMC Senior Researcher Award to further his research on digital pathology at CIALab.

Mohammad Faizal is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). He was the chair for the IEEE Signal Processing Society Malaysia Chapter from 2008 to 2013, and the Chair for the IEEE Malaysia Section from 2017 to 2018. Under his stewardship, the chapter won the inaugural IEEE SPS Chapter of the Year Award in 2011. He has delivered keynote and invited speeches at several international conferences such as DPCA2016 (Kuala Lumpur, Malaysia), AMS2017 (Kota Kinabalu, Malaysia), ICCCSP2018 (Chennai, India), ICCSN2018 (Chengdu, China), and DPCA2019 (Tokyo, Japan).

5 INUMA groundwater solar kiosks

Millions in Africa still lack access to safe water. This leads to lost time, ill health and opportunity loss for women and children who spend many hours looking for water. There are 580 boreholes in Rwanda which are equipped with handpumps that are currently non-functional and are limited in capacity to serve growing rural communities. INUMA Groundwater Solar Kiosks proposes a project to rehabilitate existing boreholes into INUMA™ systems and facilitate more houses to obtain water at home. INUMA™ is an affordable micro-grid water infrastructure where treated water is sold at public kiosks and then piped to private home connections, schools and clinics.

Christelle Kwizera,
Rwanda

Christelle Kwizera, 25, is a Rwandan mechanical engineer and social entrepreneur. In 2014, Christelle founded Water Access Rwanda, an award-winning, innovative social enterprise offering tailor-made solutions in the field of collection, distribution and purification of water. The enterprise has provided water to over 150,000 Rwandans through a network of 93 boreholes and INUMA™ purified clean water microgrids. Water Access Rwanda is the only Rwandan enterprise to ever be awarded the prestigious Africa Entrepreneurship Award. Recently Christelle emerged 3rd on the inaugural Africa Nepreneur Prize where Jack Ma, Strive Masiyiwa, Awesuri and Joe Tsai selected amongst 10 finalists, the top 3 African business heroes. Her work in water and geophysics has also seen her train and support the development of social water businesses across the African continent.

With her strong academic background and deep commitment to environmental, youth and gender issues, Christelle has managed to get the attention of development leaders and enablers who have awarded her with fellowships and awards for her various initiatives and volunteering efforts. In her home district, she was elected to be the economic commission head in the Joint Action Development Forum. Christelle is a regular speaker and activist on the national and international stage and is involved at a high-level in keeping leaders accountable to their people, especially in promoting youth initiatives. A faithful steward, Christelle lives to see her God-given gifts multiplied through service.

Her colleague, **Christian Hirwa**, 28, is ambitious, skilled and hard working, currently working with Water Access Rwanda as technical director since 2016. He started in the company as a program assistant and drilling technician when it was founded in 2014. Christian has an associate mechanical engineering background and holds a degree in Water and Sanitation Technology.

With various training in borehole drilling, hydrogeology and geophysical surveys, he has learned the trade by doing. Christian is a member of the Association of Environmental and Engineering Geologists and has executed the majority of the Water Access Rwanda's 92 geophysical surveying projects. Christian is pursuing his career in ending water scarcity in Africa through simple, affordable and durable solutions

Christian Hirwa,
Rwanda

6 Skin barrier repair therapy for prevention of serious infections and atopic diseases in young children in Bangladesh

This optimally formulated, inexpensive skin barrier therapy can transform health and well-being for hundreds of millions of children worldwide. Topical products can be effective for improving skin barrier function and child health but are unavailable and unaffordable in low-resource settings, while local products are almost uniformly harmful. This product is markedly less expensive, yet more effective in animal models than comparator products. It seeks to conduct early-stage clinical and market studies of this product in the prophylactic treatment of young children at risk of serious infections and chronic atopic diseases in rural Bangladesh.

Gary Darmstadt, United States

Gary L. Darmstadt, MD, MS, is Associate Dean for Maternal and Child Health, and Professor of Neonatal and Developmental Pediatrics in the Department of Pediatrics at the Stanford University School of Medicine. Previously Dr. Darmstadt was Senior Fellow in the Global Development Program at the Bill & Melinda Gates Foundation (BMGF), where he led a cross-foundation initiative on Women, Girls and Gender, assessing how addressing gender inequalities and empowering women and girls leads to improved gender equality as well as improved health and development outcomes. Prior to this role, he served as BMGF Director of Family Health, leading strategy development and implementation across nutrition, family planning and maternal, newborn and child health.

Darmstadt was formerly Associate Professor and Founding Director of the International Center for Advancing Neonatal Health in the Department of International Health at the Johns Hopkins Bloomberg School of Public Health. He has trained in Pediatrics at Johns Hopkins University, in Dermatology at Stanford University, and in Pediatric Infectious Disease as a fellow at the University of Washington, Seattle, where he was Assistant Professor in the Departments of Pediatrics and Medicine. Dr. Darmstadt left the University of Washington to serve as Senior Research Advisor for the Saving Newborn Lives program of Save the Children-US, where he led the development and implementation of the global research strategy for newborn health and survival, before joining Johns Hopkins.

7 Handheld device for rapid cholera detection in water

Annually, 41 countries and an estimated five million people are affected by cholera, resulting in treatment costs of USD2 billion. These costs that could be avoidable through early detection; yet, current water-based cholera pathogen detection takes five days and is costly and imprecise, exacerbating wide-scale disease outbreaks.

OmniVis has developed a technology that accurately and affordably reduces cholera detection time to 30 minutes. The company has also developed data gathering and reporting tools that can provide them with insights over disease hotspots. In 18 months, Katherine and her team aim to improve 3.2 million lives in conflict-affected communities, as well as provide access to safe water, and hopes to prevent 90 percent of cholera cases by 2030.

Katherine Clayton, born and raised in San Francisco, California, Katherine pursued a BS degree in Biomedical Engineering at California Polytechnic State University, San Luis Obispo because she dreamed of having a career where she could change health outcomes. In her undergraduate years she did a study abroad trip to Thailand, where she noticed how healthcare changed drastically from urban areas to rural regions. This led her to get her master's at Cal Poly, and then move onto Purdue for her PhD in Mechanical Engineering where she tailored her theses toward appropriate technology with an emphasis on disease diagnostics.

In 2017, she and her co-founders started the company, OmniVis. OmniVis designs field deployable technology to detect the cholera pathogen in water samples in under 30 minutes to prevent wide scale outbreaks. When Katherine is not working with the awesome OmniVis team, she likes to travel, cook, read, and hike.

Katherine Clayton, United States

8 Innovation of a low-cost, earthquake-resilient, photochromic and eco-friendly housing model for displaced population in Cox's Bazar

Farjana Jahan leads the project to help houses in the Rohingya refugee camps which have poor air condition, no electricity supply and are vulnerable to natural disasters. The plan is to develop a low-cost, portable, photochromic, earthquake resilient and eco-friendly housing model for refugee camps. It will be resistant to earthquake, bio-acceptable and recyclable with a life span of 50 years. The photochromic roof will store the solar energy which will be supplied to a battery storage area and will be converted to household electricity. This project aims to collaborate with Bangladesh Jute Mill Corporation who will develop the prototype and will assess the innovation's acceptability and feasibility.

Dr. Farjana Jahan is a registered physician in Bangladesh and now works as a Research Investigator at Environmental Intervention Unit of International Centre for Diarrhoeal Disease Research, Bangladesh. Her interest in public health research evolved after graduating from medical school, when she was placed in a public hospital as an intern doctor. She subsequently completed her Master's degree in Public Health (MPH) at National Institute of Preventive and Social Medicine.

During her MPH, she received a unique opportunity to integrate her academic knowledge with field-level experiences and has grown her interests in environmental research and innovation. She also had the opportunity to interact with Ministry of Health, Bangladesh Government. She subsequently accepted a position in the icddr,b, where she is currently employed. She currently resides in Dhaka, Bangladesh with her husband and two amazing children.

Farjana Jahan, Bangladesh

9 AI and robust instant response technology-based electrosurgical generator

The Muslim world imports USD2.5 billion worth of electrosurgical units every year. APRUS Technologies is working on manufacturing the world's safest and smartest electrosurgical units using neural networks in Pakistan – making healthcare more affordable and reliable in the Muslim world, with significantly decreased patient recovery time. Its AI and robust instant response technology is ten times better and ten times cheaper than market leaders Bovie and Valleylab. Its first goal is to make the 66 million surgeries performed in Pakistan safe and affordable.

Hira Irshad, Pakistan

Hira Irshad is an emerging entrepreneur, and the founder and CEO of APRUS Tech. APRUS tech is the indigenous manufacturer of the world's safest and smartest electrosurgical units. The company specializes in high tech innovative solutions in the health tech sector of Pakistan, using AI and other cutting edge technologies to make healthcare affordable and accessible for the masses.

Hira also founded 'Kickstart', the first co-working space in Lahore, which has now expanded to three full facility co-working spaces in Lahore and caters to more than 500 clients.

Hira Irshad has been closely linked to the entrepreneurial ecosystem of Pakistan for the past five years and managed the MIT Enterprise Forum's Pakistan chapter for two years under the leadership of Dr. Umar Saif, where she took many successful initiatives and worked closely with tech companies, startups and incubators/accelerators across Pakistan.

Hira also works with the National Incubation Center as 'Startup Growth Advisor'. She is an expert in growth hacking and growing small startups into successful businesses. In her one year engagement with NIC she helped startups raise more than PKR 90 Million in Funds, Investments and Grants. She closed successful investment deals for more than 7 startups.

10 Using artificial intelligence on pulse oximeter waveforms to reduce neonatal mortality

Pakistan has one of the highest neonatal mortality rates worldwide, with the main reported causes being sepsis and congenital heart defects. Despite many efforts to address these issues, the mortality rate has reached an all-time high. Thus, there is a need to institute innovative technology, such as pulse oximetry with machine learning, to screen for neonatal wellness. Machine learning will develop an automated decision-making algorithm on the pulse oximetry data for community health workers to facilitate early diagnosis and appropriate referral for at-risk newborns. Once developed, this algorithm will assist in reducing neonatal mortality by 30 percent, even in the most remote populations.

Zahra Hoodbhoy is a physician trained at The Aga Khan University (AKU). She holds a Masters in Health Education from the University of Cincinnati. She is currently a PhD candidate in the Population and Public Health program at AKU. Hoodbhoy is also an Assistant Professor in the Department of Pediatrics and Child Health at AKU. Her research focuses on the use of artificial intelligence (AI) to improve health indicators in low resource settings and the assessment and prevention of cardiovascular disease in children.

Zahra Hoodbhoy, Pakistan

11 Sabhi: economic identity for all

The lack of a holistic identity infrastructure for micro, small and medium enterprises (MSMEs) is a major roadblock to sustainable industrialisation in emerging markets. Sabhi is the world's first self-sovereign economic identity platform. Sabhi allows MSMEs to curate holistic profiles of their businesses, backed by verification records on the blockchain, while providing institutions and companies with standardized and secure protocol for accessing this information. Sabhi powers inclusive growth by reducing know-your-customer friction in the MSME financing process, enabling innovative data-based products and services facilitating instant MSME digital onboarding for online marketplaces.

Muhammad Hamza is the Co-Founder and CEO of Sabhi.org. Hamza is also the co-founder of Hoola, an emerging technologies venture studio that enables Fortune 500 brands, and international organizations build strategic value through technology. Trained as an Applied Physicist, Hamza has vast experience in Data Analysis and Machine Learning, with an interest in Natural Language Processing (NLP) and Causal Inference.

Muhamad Hamza Ikram, Pakistan

His colleague, **Saad Chaudhry** is a software engineer who started his career in the Video Game Development industry in 2011. With the experience he gained at a large international game company Chaudhry co-founded Enekon, a service-led company that focused on emerging technology startups. As CTO of Enekon, Chaudhry spearheaded the software team to develop cutting edge solutions using Virtual Reality, Augmented Reality, and Projection Mapping technologies. Chaudhry is also the CTO of Hoola Inc, a venture studio that develops emerging technologies to create value for brands and Fortune 500 companies. He also leads the software team for Sabhi. Chaudhry's broad software experience puts him in a unique position in which he has the insight to develop technical solutions that are also user-centric. He is passionate about technology and its potential for positive change.

Saad Chaudhry, Pakistan

12 Preemie Thermal Jacket, a low-cost and re-usable baby warmer for managing premature babies in resource-poor settings

Preterm newborns account for 31 percent of all new-born deaths and 20 percent of total neonatal deaths in Bangladesh. We have challenges of keeping preterm babies warm during Kangaroo Mother Care and transport. The scientists at Subward ICDDR,B Johns Hopkins and George Mason University have developed a re-usable 'PreemieThermal Jacket' designed to keep preterm newborns warm. The company conducted laboratory experiments on the jacket and now propose to build on previous work by systematically testing for safety and efficacy of the jacket on preterm newborns.

Anisuddin Ahmed, Bangladesh

Anisuddin Ahmed has completed his Master of Science in Applied Statistics from the Institute of Statistical Research & Training at the University of Dhaka, Bangladesh. He has been working in the Maternal and Child Health Division at the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) for more than 15 years, having sound research experiences in different public health research fields especially on maternal, neonatal and child health, and environmental health.

Anisuddin is now an Assistant Scientist at icddr,b and has gained considerable understanding on public health issues. He also an author and co-author of 15 scientific papers in publications like The Lancet, WHO's bulletin, BMC, and Contraception. Anisuddin has received several research awards from the Grand Challenge Canada, Swedish International Development Cooperation Agency, Harvard T. Chan School of Public Health through Maternal Health Task Force Innovation Fund, and Fogarty International, National Institute of Health (NIH) research sub-award through the University of Southern California, USA. Anisuddin is involved in different research projects based in icddr,b. including the cluster randomised controlled $100 Kitchen and Improved Cookstove trial. The aim of the trial is to determine effects on adverse pregnancy outcomes.

His colleague, **Sarker Masud Parvez** holds an MPH from the James P. Grant School of Public Health, BRAC University, and is currently working as Assistant Scientist in EIU, icddr,b. During the 6 years working at icddr,b, Parvez has researched diverse environmental issues, including WASH, heavy metals, infectious diseases, and their consequences to human health. He has a substantial number of publications in international peer-reviewed journals and presented several abstracts in international conferences at home and abroad. Additionally, he is a visiting faculty in the James P. Grant School of Public Health.

Having been raised in Bangladesh and witnessing a host of environmental issues from scarcity, salinity, toxicity, and contamination of water to sanitation problem, Parvez has always been motivated to work towards decreasing environmental health problems. He realised that given the dimensions of the water and sanitation problems to be tackled in the developing world, technical expertise, while essential, was not likely to be enough to deliver effective solutions. Parvez is interested in exploring health impacts from technical interventions, through careful evaluation as various factors determine whether a technically efficacious intervention will translate to a practical solution, with actual impact on human health. His experiences include results-based project management, financial awareness, team building, and mentoring young scientists, as well as networking with national and international agencies and collaborating with government and implementation partners. He is passionate about environmental health issues.

Sarker Masud Parvez, Bangladesh

13 Young Explorer app

In the Middle East and North Africa Region (MENA), about half of the 20 million children with physical disabilities and learning difficulties do not receive the care and support they need. The project that Ayah Dajani runs offers support to the children and their families through a mobile app. The app helps to assess the progress of a child's skills, helps to improve their skills, and further helps families spend quality time whilst playing together. The solution is unique because it is the first app in Arabic to provide play plans for each child, customised to fit their needs and offer a system to track progress. This will enhance the health of these children, improve their family's quality of life and positively impact the whole community.

Ayah Dajani is the Founder and CEO of Young Explorer. She has a bachelor's degree focused in Computer System Engineering from Birzeit University. Ayah is an experienced founder, with a demonstrated history of working in the kids' education field. She graduated from 3 strong local and international accelerators: Leaders, Founder Institute and TTA academy. Ayah is skilled in interactive exhibit design, developing kids' activities, STEM, Steam, creative problem solving, and science birthday parties. These skills have enabled Ayah to become founder of 2 startups in the kids' educational field.

Ayah Dajani, Palestinian Territories

14 Attractive sanitation for sub-urban and rural areas in Mozambique

In Mozambique, sanitation is still a big challenge to the government and their stakeholders. Manuel Gungulo and his team have brought to the market a toilet seat that uses as little as 200ml of water for each flush. They then introduced a black soldier fly larva, on the pit to eat the human feces, turning it into a liquid.

The toilet seat is colourful and now is the cheapest solution on the market, being sold for 800Mt (USD12.50) each. The business is also running youth training programs in sanitation entrepreneurship, targeting those whom have a low income and a low access to sanitation.

Manuel Lélio Alberto Gungulo is the founder and CEO of SUSAMATI, a social business providing innovative solutions to the sanitation market, based in Mozambique, Maputo. He is passionate about sustainable development, social impact and sanitation. He is an entrepreneur and since 2015 has started different ventures, including a GPS tracking platform for cars that was considered in 2016 the 3rd best start up in technology by Seed Star Awards.

Manuel has also worked with social development and for three years he managed the implementation of Muva'titude, a social project that provides soft skills and vocational training for vulnerable youth to help them join the job market. Manuel has also been involved in ELEVA, a social project that helps small entrepreneurs improve their business through training and research in human centred design. He studied Environmental Sciences and has experience in business and project management.

Manuel Gungulo, Mozambique

15 VulvaPad – pad-shaped fabric eliminates period poverty in girls

Period poverty has recently become a well-recognised problem across the world. In most rural communities, sanitary products are not readily available and often very expensive. VulvaPad is an innovation that uses fabrics to form pad-shaped textiles that can be safely used in replace menstrual pads. This product costs half the price of traditional liners or wrap around pads and is reusable for 3 cycles. It is perfect for girls living below the poverty line who cannot afford contemporary menstrual care products. With the VulvaPad, girls can manage their menstruation better and take bolder steps to realizing their full potential.

Firdaos Khidir is an innovator and entrepreneur with interests in bridging the development gap between Africa and the rest of the world. She is particularly interested in maternal an child health, and engages innovation and technology to improve health for women and children across Africa.

Firdaos is an avid researcher, constantly seeking out-of-the-box ideas to better the world, and one of which is VulvaPad. VulvaPad was a result of Fidaos' determination to find a healthier alternative to what unfairly avails vulnerable young girls.

She is a Tony Elumelu Entrepreneur, Anzisha Prize Semi-Finalist, a deep thinker and business strategist with certifications from the Central Bank of Nigeria Entrepreneurship Development Centre (CBN - EDC), the United States supported YALI RLC and the Fate Foundation. With VulvaPad, she intends that no girl should ever have to miss out on opportunities that affects her future, simply because she is on her period.

Firdaos Khidir, Nigeria

16 Fuelwater

The Fuelwater project addresses the issue of wastewater, and the issue of those living in rural communities struggling to access energy sources. The team is developing technology that generates a biofuel through photocatalysis of water, which operates using sun rays which generate photoanodes and photocathodes. It is designed for remote villages that don't currently have a sewage treatment system or an electricity source: Fuelwater can provide them with fuel or heating.

Kawtar Belrhiti Alaoui is the Silicon Group leader and Head of Photovoltaic Cell Laboratory at the Green Energy Park, in Benguerir, Morocco. Green Energy Park is a subsidiary of the Research Institute of Renewable Energy and New Energies (IRESEN), which focuses its work on PECVD, PVD and ink jet printing technics for thin films deposition. Kawtar has been the Head of R&D in PV cells at IRESEN and leads the thin film PV cells research road map at the institute. She holds a Masters in renewable energy and energy systems, following graduation from Hassan 2 University of Casablanca Ain Chok. She also prepared a PhD in deposition and characterization of a-Si:H/uc-Si:H thin film PV cells at Cadi Ayyad University. Moreover, Kawtaw has worked on the installation and development of a pre-industrial reactor and vacuum deposition techniques for the characterization of photovoltaic cells bound for the BIPV area.

Kawtar Belrhiti Alaoui, Morocco

17 Hear Me: bridging the communication between the deaf and the hearing

In Indonesia, there are around 11 million people suffering from with complete hearing loss. Since the majority of people cannot speak sign language, a language gap has emerged. The deaf community has been ignored and there is an urgent need to address this. Hear Me is a translation application created to bridge the communication gap between the deaf and the hearing. The app also allows the hearing to become skilled in sign language. Hear Me's core value is to increase awareness of equality rights around the world.

Athalia Mutiara Laksmi is the founder and CEO of Hear Me, a technology and service that can bridge the communication gap between The Deaf and The Hearing. She has high empathy and awareness for problems in her local community. Whilst studying in her final year at the Entrepreneurship Study Program in School of Business and Management of Institute Teknologi Bandung in Indonesia, she ran many businesses including a fashion business, food and beverage company, and a digital businesses. At 20, she likes to participate in both national and international competitions. She has also joined numerous organisations at her university. She has a passion for leading many projects and businesses.

Athalia Mutiara Laksmi, Indonesia

1 Creating a home-based, out-of-practice female doctor tele-health network by training them in maternal and newborn mortality prevention

In Pakistan, there are more than 25,000 female doctors who have left their profession after getting married. The Pakistani Government has spent approximately $45,000 on each of them so they can graduate and do house job training. Consequently, there is a dire need for more female doctors as they can help prevent the growing maternal and infant mortality rates. This project aims to create an online training program for home-based female doctors to get them back into work. This will provide a digital platform which connects the female doctors with remote female patients.

Abdullah Butt is a leading name in Pakistani virtual education and training, with experience working in Pakistan, Saudi Arabia and China. He has with over 25 years of professional experiences in domestic and international ICT projects developing leading innovative solutions. Abdullah is a trained electronic engineer with specialisms in satellite and mobile communication. His works in the field of ICT-enabled healthcare services and has been commended by the Pakistani Government. He now holds the positon of Advisor to the Prime Minister Secretariat, working on innovation relating to Telehealth in disaster management situations. He also works on projects around maternal and newborn mortality using mobile innovation.

Abdullah has developed unique virtual education and training platforms and is currently working on creating virtual training on Belt and Road Initiative scopes with the Beijing Language and Culture University in Pakistan.

Abdullah Butt, Pakistan

2 Localization of probiotic production in Uzbekistan

Helicobacter pylori (h.pylori) is a gastric pathogen that causes peptic and duodenal (stomach) ulcers, which promote the development of stomach cancer. About 95 percent of the Uzbekistan population is infected with h.pylori; yet current treatment with antibiotics is effective in only about 70 percent of cases. To increase the effectiveness of stomach cancer treatment and to prevent this infection spreading across the population of Uzbekistan, Shakhlo Miralimova has developed a biological preparation called “Lactopropolis”. Lactopropolis is highly effective in the treatment of gastric ulcers and is also not a threat to the human body. The aim of this project is to create a small production of the “Lactopropolis”.

Shakhlo Miralimova, Uzbekistan

Shakhlo Miralimova works as the Deputy Director for Science at the Institute of Microbiology of the Academy of Sciences of the Republic of Uzbekistan. She also leads on the scientific project “Obtaining the bacteriocins of Lactic acid bacteria, studies their physic and chemical properties and antimicrobial activity” at the Center for Advanced Technologies, as well as being a lecturer on microbiology at the Tashkent Pharmaceutical Institute. Miralimova is also a scientific secretary at the Scientific and Technical Council on Pharmacology and Pharmacy under the Ministry of Innovative Development of the Republic of Uzbekistan.

Miralimova graduated from the Tashkent Pharmaceutical Institute, then went on to study her postgraduate at the Institute of Microbiology of the Academy of Sciences of the Republic of Uzbekistan. Her Ph.D. thesis focused on the “Antimicrobial properties of propolis. Preparation of anti-Helicobacter pills”. Miralimova received an IDB grant (IDB merit scholarship) for research at the University of North Carolina, USA. As part of this program, she studied the in vivo interaction of L. rhamnosus and H. pylori in the gastrointestinal tract of Special Pathogen Free and germfree mice. The scholarship allowed her to carry out the research that formed the basis of her doctoral dissertation, titled the “Probiotic and bacteriocinogenic properties of lactobacilli, creation of the antiulcer remedy on their base.” The practical result of this work was the biological product “Lactopropolis” for the prevention and treatment of gastric ulcers.

Her colleague, **Sharipov Oybek** graduated from the Westminster International University in Tashkent in Economics with Finance. He then went to join EY, where he worked on gas chemical projects as well as banking projects. Following his time at EY, Oybek went to work as a commercial manager at Egis, a Hungarian pharmaceutical company.

Sharipov Oybek, Uzbekistan

3 AQUADUC: magnetic ioniser manufacturing

Greensol Industry is an environmentally friendly, sustainable solution for the manufacture of magnetic softeners. These softeners intervene in the field of water desalination for agricultural, housing and industrial use. AQUADUC, the commercial name for the patented product, can access and irrigate salt-laden water (up to 9g/l) and improve the quality and quantity of crops in an organic way by limiting the use of chemicals and pesticides. This technology is proposed to be used in all Arab and African agricultures since freshwater water resources have been depleted.

Hichem Jomâa, Tunisia

Hichem Jomâa is CEO and founder of Greensol Industry (SUARL), the first company in Tunisia for the fabrication of water softener for applications in physics.

After achieving his university degree in Physics and Application in 2008, and followed by a master's degree in Electromechanical Engineering in 2010, he began his first job in aerospace domain, with the title of Aerospace Stress Engineer, for Dutch company Global Technics BV (GT), where his principle role was the certification of civil Aircraft (AIRBUS family A320, A330, A340, A320 NEO, A350, A320 SHARKLET), and the design of new areas in aircraft and management. After a five years of experience he become a technical consultant for GT in Tunisia for two years.

Hichem wanted create his own company to resolve a serious problem not only in Tunisia, but also in all the MENA area: the water crisis. He found a local scientific solution based on experimental testing in 2016, and then worked to develop an ecological system that can be produced.

From March 2017, he participated in Boot Camp Ideation from the African Bank of Development and won the contest in November 2018. In 2018 he created his company "Greensol Industry" and made his own band mark "AQUADUC". In July 2019 he started the production and commercialization of the first AQUADUC for agriculture uses. Now he continues to develop research protocols, such as how to make energy and heaters from physics principals to save people around the world.

4 Optimization and reducing the water losses in water infrastructure and a better agriculture irrigation with the LinkH2O+ systems through the use of predictive analytics

This system allows real-time monitoring of water infrastructure and real-time mapping in the agriculture field. This crucial information, with the help of predictive analytics (artificial intelligence), reduces the water loss by 95 percent and strongly improves the crop yield in agriculture. The team proposes to scale-up and test its low-cost, compact, and efficient IoT devices called LinkH2O and LinkH2O+ which monitor in real-time.

Mohammed Zerara is a consultant in software engineering and scientific computing at ABS. He was a research scientist at the University of Darmstadt (Germany) and Molcad GmbH (Germany) where he significantly contributed to Molcad software which is part of Tripos software distributed by Tripos Inc (Saint-Louis, USA).

He got his Ph.D. in Physical Chemistry from the University of Geneva (Switzerland) in 2003. Afterwards, he worked in the field of computer simulation and software engineering in companies such as Dassault Systems Biovia (former Accelrys Ltd, Cambridge, UK), and Illumina Inc (software and algorithms development for data acquisition and analysis). He worked also as a research engineer at the Swiss Institute of Bioinformatics (Geneva), providing software tools and databases in the field of chemistry (Rhea, in collaboration with EBI Cambridge). He published several papers in the field of simulation and applied software engineering. He is currently located near Geneva (Switzerland).

Dr Mohammed Zerara

5 The Revolving Fund Approach for Rainwater Harvesting Tanks and Sanitation Products

The Revolving Fund Approach for Rainwater Harvesting Tanks and Sanitation Products enables beneficiaries who don't have the initial capital to affordably purchase rainwater harvesting tanks or sanitation products. The Uganda Muslim Rural Development Association (UMURDA), in partnership with the Ministry of Water and Environment in Uganda have piloted this approach in one district. The aim is to increase access to safe drinking water and to improve sanitation. The immediate outcomes include; reduced distance covered, time and money spent on water related ailments, as well as increased productivity.

Hajji Sulaiman Walugendo Kyesa, Uganda

Hajji Sulaiman Walugendo Kyesa is the National Coordinator of Uganda Muslim Rural Development Association (UMURDA), a Faith Based NGO founded in 1992 to carry out developmental work impacting on all irrespective of any affiliations.

He majored in Rural Economy and Economics from Makerere University and began his carrier as a Project Coordinator in Young Men's Christian Association (YMCA-Uganda).

He steered UMURDA from a Community Based Organisation (CBO) to a national NGO status; he leads Mosques Islamic holiday studies programme by capacity building of Imams in Uganda; he coordinates over 30 NGOs/ CCBOs as Mid-Eastern Regional Coordinator of Uganda Water and Sanitation NGO Network (UWASNET); and has won awards towards improving people's lives as an outstanding Water, Sanitation and Hygiene (WATSAN) NGO from the European Union and the Ministry of Water and Environment respectively. He is recognized by the Government of Uganda as the innovator of big-size stone masonry rainwater harvesting tanks of 500,000 litres and above for storage of water for domestic use, farming, and as a climate change adaptation and mitigation measure.

David Bogere is an accountant at the Uganda Muslim Rural Development Association. He is a graduate of Makerere University in Uganda, holding a bachelor's in commerce and majoring in Accounting. Before joining UMURDA, he was working as relationship manager in Opportunity Bank after gathering experience in sales promotion at the National Medical Stores.

David Bogere

1 Introduction and local manufacturing of biodegradable, compostable shopping bags in Tanzania

Following Tanzania's ban of petroleum-based single-use plastic bags in June 2019, KilimOrgano will be the first organisation to introduce biodegradable, compostable bags that can decompose 90 percent within 180 days. KilimOrgano is seeking investment to bolster its technology, which will benefit residents in Tanzania who collectively use a minimum of 24 million plastic bags per month, as well as the thirty companies that produce 30 percent of annual demand. It will impose no major differences in usage, meet improved regulations and support plastic bag manufacturers in the transition, to avoid them going out of business. Secondarily, the technology will also create and develop bioplastic and cassava industries.

Ammar Mussaji is a Tanzanian with an MSc in Crop Biotechnology and Entrepreneurship from the University of Nottingham and Executive MBA (undergoing) from the Smartly Institute, Washington DC. He has extensive scientific research and business experience across the past 14 years and has been a serial entrepreneurial for the past seven years, having founded and established three biotech startups including KilimOrgano Limited. Furthermore, Ammar has a strong background in Digital Marketing and has won three awards on innovation management. He is currently responsible for the market strategy development and implementation at KilimOrgano and is heading the ex-Mr. Plastics marketing team who oversaw plastic bag market development and customer relations.

Ammar Abitalib Mussaji, Tanzania

2 Commercialization of patented essential oil-based technology development at King Abdulaziz University, empowering youths and communities in an incubator Muslim Country

The purpose of this project is to support technological enterprises, through the commercialization of patented essential oil-technologies which are developed at King Abdulaziz University (KAU) of Saudi Arabia. These oils offer protection against highly prevalent dental decay, gingivitis and common candidiasis of the female reproductive tract. This project will be managed by young Muslims of both genders. The aim of KAU's short-term strategy (three years) is for these ventures to generate revenues, enabling them to create a steady source of funds so that they can replicate, sustain and improve the R&D departments in Saudi Arabia and other Muslim countries.

Taha A. Kumosani is a professor of Biochemistry and works in the Science Faculty of King Abdulaziz University. He graduated from Miami University, Oxford, OH-USA. He has published more than 200 scientific papers in ISI cited journals and had 11 registered patents and wrote 13 books. Kumosani's research extends to various areas such as biochemistry, molecular biology, and nutrition with interest in Cancer, food science and nutrition, fishery sciences, environmental, physiology, biophysics. His research also encompasses enzymology, fermentation, toxicology, membraneology, microbial biochemistry, neurology, fertilization, and inorganic biochemistry.

Taha Kumosani, Saudi Arabia

3 Easy-to-use industrial digitalization system for low technology level industrial environments

Skysens provides an easy to use industrial Internet Of Things (IoT) solution for manufacturing and other industrial sites. It has unique designed hardware, wireless network technology and an IoT software platform which enables customers to connect the hardware to existing machinery or industrial equipment and monitor its performance, current status, usage and equipment life. With this capability, low technology level manufacturing or industrial sites can easily jump to the digital age which increases traceability of the factory floor, increases efficiency, downgrades the worker accidents and helps the old environment to produce more with less cost. It can also be applied to industrial sites such as airports.

Burak Polat is co-founder and CEO of Skysens, Internet of Things company which focuses on low-cost wireless sensors systems to make legacy systems "Smart" based in Istanbul Turkey. He and his partner are passionate about wireless smart sensor systems, which they believe is the key for developing smart systems which increase the quality of lives of the people whom use them. Burak graduated from Istanbul Technical University as aerospace engineer and works for a global automotive company on their global projects. He is always keen to develop new technologies for the user benefit. His first company was a price analytics company which tried to calculate the best price for the car market so that users can benefit true pricing without any scamming from the dealers. After this company, he started Skysens with his partner in 2015.With Skysens he and Emrah Mercan did multiple projects in industrial monitoring, smart energy grids, water grids, smart agriculture areas with low total cost and long range wireless sensory systems.

Burak Polat, Turkey

1 International Islamic University Malaysia's Integrated Design Project framework for SDG Innovation

International Islamic University Malaysia (IIUM)'s Integrated Design Project framework for SDG Innovation is an education framework, designed to nurture a technopreneurial mindset in engineering students. This framework will be the funnel of innovative technopreneurs in the IIUM startup ecosystem for successful spin-off potential in three identified key industries: renewable energy, affordable healthcare and smart agriculture.

This framework aims to build the right kind of innovation driver capacities that can be achieved through proper alignment of education structure that requires synergistic involvements from the identified industries, entrepreneurs, relevant policy makers, students and well-trained faculty members.

Nabilah Ramli holds a Ph.D. in Vibration and has more than 7 years' experience working with undergraduate and postgraduate students to develop award-winning engineering-based prototypes. She has led an Engineering Capstone Design class, which combined her passion for technopreneurship and education. Ramli believes engineering graduates equipped with techno-preneurial mindset can propel the growth of a country's technological advancement and is very much needed in the era of industrial revolution 4.0.

Nabilah Ramli, Malaysia

2 Development of automatic robot for rail integrity inspection using strain-stress analysis

The main deliverable aim for this project is to set up the first railway asset integrity laboratory in Malaysia. This will enhance university capability in railway research and solve industry problems through research. The primary innovation drive is the creation of full automatic robot inspection for rail integrity and continuous predictive maintenance. One of the biggest challenges commonly faced by rail operators around the world is the lack of time, manpower, and funding to invest in research. The measurement data using IR 4.0 will be collected using the suitable integrity technology, capable of recording the integrity data in the soft copy form.

Azman Senin, Malaysia

Azman Senin is the Director of the Asia Rail Centre, at University Kuala Lumpur. University Kuala Lumpur is a full fledge university registered under the Higher Private Education Act, Malaysia. University Kuala Lumpur's mission is to elevate Malaysian TVET stature globally and to position TVET as a contributor for a high income society. He is currently undertaking a new TVET specialization development project at the UniKL flagship. That project started on the 2 December 2013 and has progressed rapidly. Currently, Asia Rail offers various programs including: academic programs, short courses, professional programs, symposiums and conferences to cater for the immediate human capital demand in the railway industry.

Concurrently, Azman also serves as a lecturer, sharing his knowledge and experience with young talents in areas of Mechanical, Manufacturing, Tooling and Leadership at the University of Kuala Lumpur Malaysia Italy Design Institute (MIDI). Azman started his career 22 years ago in heavy industry and has also served in several positions including Manufacturing Engineer, Project Head, New Model Development Head and Specialised Tooling Head. Currently, he is registered with Board of Engineer Malaysia as a ASEAN Chartered Professional Engineer (ACPE). Azman received his first degree in Mechanical and Material Engineering from University Kebangsaan Malaysia and he also holds a doctorate degree in Mechanical and Material Engineering from University Kebangsaan Malaysia.

3 Capacity development towards establishing a rapid molecular diagnostic method at tertiary healthcare centers to manage the Dengue and Chikungunya epidemics in Bangladesh

Faria Hossain, Bangladesh

Around 20 million people residing in Dhaka, the capital of Bangladesh are at risk of dengue and chikungunya infections. The current health system is not adequate to manage recurrent epidemics of these diseases. To improve this, the team is proposing improvement of the technical capacity of healthcare providers through training and the introduction of the Recombinase polymerase amplification assay. This assay is incorporated in a solar powered mobile suitcase lab which is rapid, feasible, and cost-effective. The outcome of this study will facilitate the establishment of this tool at tertiary hospitals for early detection and management of disease inflicted individuals, reducing case fatality and economic burden.

4 Youth empowerment for water and environmental innovation – a step towards Sustainable Development

The International Centre for Water Management Services (CEWAS), and the Palestine Polytechnic University Hebron are partnering up to deliver the a programme that is fully dedicated to build institutional and individual capacities in the field of water and environmental entrepreneurship – the first of its kind. The programme directly responds to the challenges Palestine is currently facing which include scarce resources, polluted water and limited job opportunities. The programme aims to build up support structures for young start-up talent, foster entrepreneurial solution development and develop the capacity of the respective environmental markets.

Ruweida Aljabali is a regional project officer at CEWAS. Her role includes coordinating activities conducted by CEWAS Middle East programme, coaching start-ups, conducting research for project planning purposes, and managing communications. Aljabali is also doing her Ph.D. in Urban Planning; her research focuses on urban resilience and resilience humanitarianism in Palestinian refugee camps of Jordan. Aljabali studied Architecture and the Built Environment, and for her, Masters studied Technology and Resources Management with a focus on urban and regional management. During her studies, she participated in different environmental design and management classes and initiatives. Aljabali is keen to help promote innovation in the environmental sector in the MENA region and the world. Aljabal is passionate about tackling environmental and development challenges through innovation and entrepreneurship.

Ruweida Aljabali, Switzerland

5 Straightening the integration of science, education and business in biotechnology sector of Uzbekistan

Uzbekistan has some of the most favorable conditions to be a leader in the biotechnology industry in Central Asia. However, development and growth are limited due to outdated technologies, education and research, and weak/absent links between research and businesses. The project will contribute to the competitiveness of Uzbekistan and its economic growth by promoting and strengthening cooperation between businesses, education, and research in biotechnology. It will create favorable environments to develop new biotech products and bring them to market through the modernization of biotechnology research and education, straitening the skill of students and young researchers in biotechnology innovation entrepreneurship.

Yulyia Levitskaya has a Ph.D. degree in biology. She has more than 20 years of experience in scientific and teaching activities at the National University of Uzbekistan, the Centre for Advanced Technologies, and the International Center for Molecular Allergology. The sphere of scientific interests lies in the field of biophysics, including cell signaling, energy metabolism of cells, regulation of cell death. She has experience in international scientific projects. She currently works at the centre for Advanced Technologies as a scientific secretary. Her role at the center includes conducting research in Life Sciences, developing a comprehensive training scheme for Ph.D. students, researchers and scientists to form a strong interface with the industry and to create a science innovation and services platform in Uzbekistan.

Yulyia Levitskaya, Uzbekistan

6 Treasury of BiH innovations

The project is developing the next generation of innovative thinkers in Bosnia and Herzegovina by engaging exceptional young talent with an interest in innovation. Led by local educators and mentors, this project offers programs that promote equal access to science, technology engineering and maths (STEM) education, whilst positioning inventors as role models in order to help reduce disparities in STEM fields. Through programmes, young entrepreneurs are encouraged to explore opportunities and empowered to discover new ways to improve the life of others in their communities. The programme also supports the inventors' Association of Bosnia and Herzegovina and helps to build capacity and support sustainability through the association. This ultimately helps to build a more innovative future.

Nađa Zubčević is an innovator with an MA degree in biochemistry and physiology. Her journey shows why it's important not to give up, and to believe in yourself. When she was with her colleagues, Nađa, like any other young person, talked to them about a lot of topics and identified problems. But what makes her different is that her research spirit has found a solution for one specific problem. Her first innovation that she created is called „Antibacterial toilet seat "which aims to improve hygiene in public toilets. With her innovation, she has won numerous world medals, among which the most important was the Semi Grand Prize from Seoul. In order to launch the serial production of this innovation, she plans to launch a crowdfunding campaign to raise the additional resources she needs.

Nađa Zubčević, Bosnia and Herzegovina

7 Entrepreneur training for disseminating of evaporative cooling devices for improved vegetable storage in rural Mali

Over 80 percent of the communities in Mali rely on agriculture as their main source of income. However, a lack of storage often results in 50 percent post-harvest losses, contributing to food insecurity and high poverty rates. The project provides STI capacity-building for local entrepreneurs on the design, production, and the distribution of electricity-free evaporative cooling devices for produce preservation, such as clay pot coolers. The immediate impact includes the reduction of post-harvest losses, increased income for smallhold farmers and traders (especially youth and women), and increased consumption of nutritious food. In the long term, it promotes sustainable livelihoods in agriculture and greater food security in Mali.

Fatimata Cisse, Mali

Dr. Fatimata Cisse Diallo is a citizen of the Republic of Mali in West Africa. She holds a combined Bachelor and Master Degrees, Food Science, from Moscow State Academy of Food Productions, Moscow, Russia, which she earnt in 1997, as well as a PhD degree in Food Science from Purdue University, West Lafayette, Indiana, USA in 2014.

She has over 17 years' experience working in development of training modules on agri-food processing and preservation, post-harvest losses and their management, and hygiene and quality management for entrepreneurs in the agri-food sector.

Presently, Dr. Fatimata Cisse Diallo is working as PI or co-PI in the implementation of sub-regional projects activities such as ACC project, CSAT-Mali, World Vegetable Center, McKnight Foundation, Aga Khan Foundation, AFRICA RICE – UEMOA, IER / ANSSA convention, and Africa RISING. These projects are focused on aspects of rice post-harvest technologies; development and characterization of a local product to improve the nutritional status of children (Equinut); and the realization of an image based tool kit in the processing and conservation of fruits and vegetables in French and three national languages (Bamanankan, Dogon, and Peuhl) in Mali. She has the expertise, leadership, training and motivation to successfully carry out any sort of research project.

8 Capacity building programme for the scaling-up of wolbachia deployment as innovative technology for dengue control (activate)

The World Mosquito Program (WMP) has introduced a breakthrough dengue control intervention that uses wolbachia. The interim result of the field trial in Yogyakarta, Indonesia, showed that wolbachia reduced dengue incidence by 74 percent. The WMP-Yogya programme prepares to scale-up this intervention. However, there is limited capacity to implement the new technology. The team proposes a two-year program for 12 districts and cities, consisting of capacity-training, needs assessment, innovative end-to-end training supported by the WMP global digital platform (Catalyst), and development of a district implementation plan. The medium impact will be improved capacity of district level implementation of Wolbachia technology, with reduced dengue incidence as a long-term impact.

Adi Utarini, Indonesia

Adi Utarini graduated from the Faculty of Medicine, Universitas Gadjah Mada in 1989. She completed further degrees in Maternal and Child Health from the University of College London (1994; British Council Awards), Master of Public Health (1998; STINT Awards), and Doctor of Philosophy from Umea University, Sweden (2002; STINT and TDR Awards). In 2011 she became a professor in Public Health at the Department of Health Policy and Management, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada. She has been a member of the National Research Council (2015 - ongoing).

Since 2013, she has been the Project Leader for Eliminate Dengue Project-Yogyakarta, a project applying Wolbachia Aedes aegypti intervention to reduce dengue cases in Yogyakarta, funded by Tahija Foundation, Indonesia. Adi provides the overall leadership in all aspects of planning and implementation of the research as well as the high-level liaison with key national level stakeholders. Recently, she received Habibie Award XXI (2019). She published her work in more than 30 international health journals.

Adi's research focuses on infectious disease control and health care quality. She is also passionate in employing qualitative research and mixed-method research in health care. Her teaching activities in the graduate program in Public Health focus on research methodology and health.

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