



FOURTH ANNUAL  
KOREA GREEN  
INNOVATION DAYS  
2017

WORKING  
TOGETHER  
TO MAKE  
**GREEN  
GROWTH**  
HAPPEN



APRIL 4-6, 2017  
DAR ES SALAAM  
TANZANIA

WORLD BANK  
GROUP  
KOREA GREEN  
GROWTH TRUST  
FUND

URBAN

GLOBAL

ENVIRONMENT

ENERGY

REGIONAL

ICT WATER

NATIONAL

TRANSPORT

MUNICIPAL

CLIMATE

CHANGE

WELCOME  
TO THE  
4TH ANNUAL  
KOREA  
GREEN  
**INNOVATION**  
DAYS 2017

APRIL 4-7, 2017

DAR ES SALAAM, TANZANIA





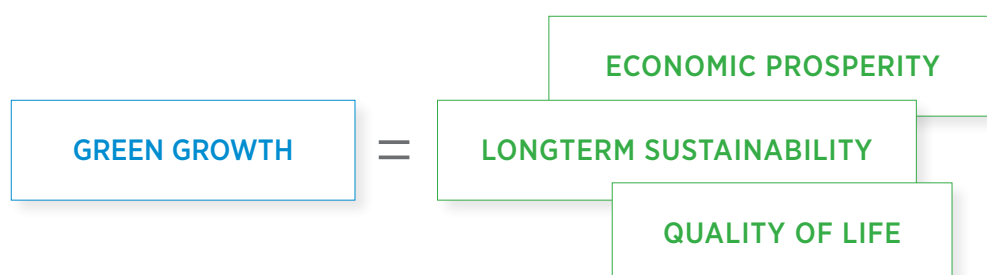
# VISION

# WHAT IS THE KOREA GREEN GROWTH TRUST FUND?

**The Korea Green Growth Trust Fund** (KGGTF) is a partnership between the World Bank Group (WBG) and the Republic of Korea (RoK), established in 2011 to support client countries as they shift to a green development path. Both partners share a common goal to reduce poverty and promote shared economic prosperity in an environmentally responsible and socially inclusive way.

The Trust Fund finances on-the-ground programs as well as knowledge exchange activities, and to date has approved 101 programs in the urban, transport, information and communication technology, energy, environment, water, and climate sectors. Based on strong performance, as well as increasing demand for collaborative development implementation programs, the fund was replenished at the end of 2015 and today has grown from US\$40 million to a US\$88 million WBG program through 2021.

## ...AND WHAT DOES GREEN GROWTH MEAN TO YOU?



## WHAT IS KOREA GREEN INNOVATION DAYS?

**Korea Green Innovation Days** (KGID) is the World Bank Group's flagship Green Growth knowledge sharing event organized and funded by the Korea Green Growth Trust Fund.

The purpose of KGID is for multiple global partners to share practical tangible examples, and holistic innovative approaches, to achieving sustainable development. The event features the WBG's leading experts in climate change and economic development, as well as officials and green growth practitioners from the Republic of Korea, representatives from key government ministries, institutes, and private companies.

KGID showcases the progress and impact of KGGTF programs and operations around the globe. It embeds a Green Growth agenda into the Bank's operational model, influencing thinking and investments in many of the client countries it reaches. For example, KGGTF knowledge programs led to new Bank financing of US\$200 million respectively for Lebanon and Mexico, for a bus rapid transport system, and affordable housing renovation programs in inner cities.

KGID facilitates in-depth discussions on major issues surrounding green growth and long term climate smart development, and provides a platform for WBG staff, client countries and green growth experts to network and exchange technical and operational knowledge.

## WHAT WE HOPE YOU WILL GAIN FROM KGID 2017

- Learn how Korea, the WBG and other countries are sharing Green Growth technical knowledge globally.
- Learn about climate smart and green technologies, policies, and methods from other countries that may support your country's sustainable development growth plans and actions.
- Make new contacts that can help you better implement Green Growth and climate smart actions.
- Build a global community of experts engaging in dialogue on green innovation and implementation long after the event.





**DAY 1**



# DAY 1 TUESDAY, APRIL 4

8:00–9:00am

## Registration

9:00–9:20am

OPENING CEREMONY

## Welcome to the World Bank Group Korea Green Growth Trust Fund 4th Annual KGID 2017 Africa

### SPEAKERS:

Tanzanian Government Official

Song Eon-seog, 2nd Vice Minister of Strategy and Finance

Bella Bird, Country Director for Tanzania, Burundi, Malawi & Somalia, WBG

9:20–9:30am

## Integrated and Multi-Sector Solutions: World Bank Group Korea Green Growth Trust Fund

### SPEAKER:

Eun Joo Yi, KGGTF Program Manager, WBG

9:30–10:30am

OPENING PANEL SESSION

## Designing for Green Investment: Today for Tomorrow

Green Growth investment is a powerful approach and can be an effective road map for making innovative, long-term investments. This session demonstrates how Green Growth is already being applied by African leaders and communities to influence thinking and investments. Panel discussion will highlight how the assessment of relevant environmental factors and conditions, and the integration of sectors can help decision makers to achieve long term green economic growth.

### SESSION LEAD

Jie-Ae Sohn, KGGTF, WBG

### KEYNOTE SPEAKER

Marianne Fay, WBG

### PANELISTS

Bella Bird, WBG

Carter J. Brandon, WBG

Boutheina Guerhazi, WBG

Aurelio Menendez, WBG

10:30–10:40am

## Coffee Break

10:40am–  
12:00pm

URBAN PLANNING AND MOBILITY: PART 1

## Urbanization as a Driver of Green Growth

This is the first of two sessions on two inseparable areas that are critical to Green Growth: Urban Planning and City Mobility.

World Bank activities in East and West African cities demonstrate how instruments such as policy and regulation that link municipal and central level planning, can, together with institutional strengthening, lead to better planning outcomes. This session highlights World Bank engagement with countries to effect rapid, sustainable economic growth by developing inclusive plans that support secondary urban areas.

### SESSION LEAD

Narae Choi, WBG

### PRESENTATIONS AND PANEL DISCUSSION:

**Rwanda Secondary Cities: Economic Viability in Secondary Cities**

**Kenya Secondary Cities Program**

**Nigeria: Ibadan Flood Management Project**

Jonadab William Metibaiye, Hydraulic Consultant  
Jaebin Lim, Land and Housing Institute (LHI)

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12:00–1:00pm

Lunch

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1:10–2:20pm

URBAN PLANNING AND MOBILITY: PART 2

### Getting to, and around Green Cities

This is the second of two sessions on two inseparable areas that are critical to Green Growth: Urban Planning and City Mobility.

Urban economies depend on mobility and transportation systems for growth. In this session, panelists will share cases from a range of countries and discuss how Green Growth thinking and innovative approaches are influencing the design and implementation of urban services for improved city mobility.

**SESSION LEAD:**

Haileyesus Adamtei Mengesha, WBG

**PRESENTATIONS AND PANEL DISCUSSION:**

**Africa Sustainable Transport Forum  
Mobility Maps for Dar es Salaam**

**Transport Systems Improvement Project**

Josphat O. Sasia, WBG  
Sangbum Kim, University of Seoul (SMG)

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2:20–3:10pm

### Green Mobility: the Foundation for Green Cities

Urban development and transport must go hand in hand. Urban transport development can be complex, involving a combination of factors such as economic growth, urban sprawl, road safety, energy consumption, climate change and many more. The challenge is finding sustainable solutions. How can new technology play a role in improving accessibility and effective city mobility? This session will discuss green growth and long term climate smart planning and investment for city mobility.

**SESSION LEAD:**

Yonas Eliesikia Mchomvu, WBG

**PRESENTATIONS AND PANEL DISCUSSION:**

**Urban Mobility Issues, the Revised Master plan,  
and Other Ongoing Initiatives in Addis Ababa**

**Kolkata Metropolitan Transport Efficiency  
Improvement India**

Narayan Nigam, Kolkata transport and WBG  
Seunghwan Lew, Seoul Metropolitan Government (SMG)

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3:10–4:10pm

### Technology and Governance as Catalysts for Green Growth

Harnessing new technologies to support Green Growth solutions requires policy-enabled environments. In this session World Bank activities highlight the importance of policy and governance to facilitate the effective use of integrated technologies to generate opportunities, jobs, innovation and growth. Panelists will share first-hand experiences and achievements, demonstrating how Green Growth policy and ICT can work together to amplify the impact of innovative technologies, and achieve positive change.

**SESSION LEAD:**

Boutheina Guermazi, WBG

**PRESENTATIONS AND PANEL DISCUSSION:**

**West Africa Fishery Partnership for Competitiveness  
and Sustainability**

Saliou K. Sankoh, West Africa Regional Fisheries Program  
in Sierra Leone

Kane Demba Yeum, Sub-Regional Fisheries  
Commission (SRFC)

Taehi Ri, Fisheries Monitoring Center (FMC)  
Ministry of Oceans and Fisheries, Republic of Korea

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4:10–4:20pm

**Coffee Break**

4:20–5:30pm

**Supporting Industrial and Economic Growth: Innovative Approaches**

Industrial sectors can extract long-term and sustainable benefits from implementing Green Growth solutions. This session sheds light on various innovative green solutions to boost production through improved efficiency and market development. Panelists will share perspectives from different industrial backgrounds, including fishery, logistics, and cadaster that can be used to mainstream green growth investment.

**SESSION LEAD**

Anna Lerner, WBG

**PRESENTATIONS AND PANEL DISCUSSION:****Mauritania Sustainable Fisheries Work**

Sinem Demir, WBG

**Green Cement Industries**

Alexander Larionov, WBG

**Greening the Transport and Logistics Sector in Uganda: Policy and Strategy Initiatives**

Stephen Muzira, WBG

Youn Gil Song, Land and Housing Institute (LHI)

5:30–6:00pm

**Mali: Disaster Risk Management and Access to Green Growth Investment**

Facing challenges in relation to drought, food security, flooding and management of related disaster risks, Mali is taking an innovative approach by developing and implementing Green Growth activities. This session will introduce the country's approach and share its case study.

**SESSION LEAD**

Jean Baptiste Migraine, WBG

**PRESENTATIONS AND PANEL DISCUSSION:****Real Time Urban Flood Risk Management and Decision Support Tool for Bamako Greater Area Based upon Analysis of Attenuation of Cellular Phone Network Signals**

Cheick Fanta Mady Kone, the Mali GCF Funding Proposal

Ismahila Koumaré, Mali-Météo

Frédéric Cazenave, French Institute for Research and Development

**Synergies Between Climate Innovations Supported by KGGTF and Climate Investments Financed by GCF**

Jean-Baptiste Migraine, WBG

6:00–6:10pm

**KGID Day 1 Wrap-Up  
Reflections and Key Takeaways****SPEAKERS:**

Boutheina Guermazi, WBG

Closing Message

**Announcements**

7:00pm

**Opening Day Networking Dinner Reception**

Featuring Local Arts &amp; Craft Gallery



# DAY 2

# DAY 2 WEDNESDAY, APRIL 5

9:00–9:15am

## Opening Remarks:

Hassan Mshinda, Director General, COSTECH

### KEYNOTE SPEAKER

Park Myoung Sik, Korea Land and Geospatial Informatix Corporation (LX)

9:15–10:35am

FOCUS SESSION: TANZANIA

## Working Together to Make Green Growth Happen in Tanzania: An Integrated Approach to Long-Term Success

### SESSION LEAD

Andre Bald, WBG

### PRESENTATIONS AND PANEL DISCUSSION

#### BRT in Tanzania

Ronald Lwakatare, Dar Rapid Transit Agency  
Yonas Eliesikia Mchomvu, WBG

#### Digital Data, Smart Water Tanzania

Dar Water Company  
Edward Charles Anderson, WBG

#### Impact and Effectiveness of Urban Planning on Spatial Development of Tanzania Secondary Cities

MaryGrace Weber, WBG

#### Korea's Development Using Cadaster

Beckhee Cho, Korea Land and Geospatial Informatix Corporation (LX)

#### Korea's Integrated Water Resource Management

Ju Hwan Kim, Korea Water Resources Corporation (K-Water)

10:35–10:50am

## Coffee Break

10:50am–  
12:00pm

## Addis Ababa: Long-Term Capacity Building Initiative for Green Growth Cities

Successful urban service delivery is a key factor in determining the prosperity of metropolitan economies. In this session panelists will share a new innovative capacity building approach under implementation by the Addis Ababa City Government in partnership with the Seoul Metropolitan Government.

### SESSION LEAD:

Abebaw Alemayehu, WBG

### PRESENTATION AND DISCUSSION:

#### Aspirations for Addis Ababa in the Coming Decades— Vision, Development Strategies and Implementation Arrangements for the Revised Master Plan

Mathewos Asfaw, Commissioner, Addis Ababa Planning Commission

Myounggu Kang, University of Seoul (UoS)

Sun Ki Kwon, Seoul Metropolitan Government (SMG)

City Planning Project Office

Josphat O. Sasia, WBG

Dinkneh Tefera, WBG

12:00–1:00pm

## Lunch

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1:10–2:40pm

LAW, REGULATION AND POLICY: PART 1

## Does Green Growth Need Laws? Focus: Solid Waste Management

This is the first of two sessions that focus on how laws, regulations and policies at national level are critical to implementing a green growth approach.

Municipal level public investments such as solid waste management (SWM) need national policy and institutional support. This can have long-term economic advantages for the city as well as a positive impact on the economic growth of the nation. Panelists will share and discuss specific challenges and green approaches to SWM policy-making from a number of countries.

### SESSION LEAD

Harinath Sesha Appalarajugari, WBG

### PRESENTATIONS AND PANEL DISCUSSION

#### **Solid Waste Management Policies and Technologies**

Farouk Banna, WBG

Ibrahima Diagne, Ministry of Local Governance, Senegal

#### **Solid Waste Management Strategy of the Country**

Berhanu Teshome, Ministry of Urban Development and Housing, Ethiopia

#### **Outline the Ministry of Urban Development and Housing Strategy**

Amlaku Adamu Ayele, Ministry of Urban Development and Housing, Ethiopia

#### **Korea's Green Solid Waste Management Story**

Gyeesoo Jung, Korea Environment Corporation (KECO)

Hee-dong Kwon, SLC Sudokwon Landfill Site Management Corp (SLC)

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2:40–3:40pm

LAW, REGULATION AND POLICY: PART 2

## Does the Law Drive Transport and Growth? Focus: Transportation

This is the second of two sessions that focus on how laws, regulations and policies at national level are critical to implementing a green growth approach.

This session will showcase Africa's policy initiatives to operationalize green growth in the transport sector. Discussion will focus on how national policy, law and regulation are critical for the successful development and implementation of core transport infrastructure for social and economic growth.

### SESSION LEAD:

Aurelio Menendez, WBG

### PRESENTATIONS AND PANEL DISCUSSION:

#### **Managing Motorization in Developing Countries: East African Case Studies**

Roger Gorham, WBG

#### **World Bank Financed Road Projects in East Africa**

Haileyesus Adamei Mengesha & Josphat O. Sasia, WBG

Jeong Gyu Kang & Hong Sang Yeon, Korea Expressway Corporation (EX)

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3:40–4:00pm

Coffee Break

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**4:00–4:40pm****The Institutional Role in Achieving Green Growth: Moving Air, Water and Earth!****SESSION LEAD:**

Carter J. Brandon, WBG

**PRESENTATION AND PANEL DISCUSSION:**

Seong-il Yoon, Korea Environmental Industry and Technology Institute (KEITI)

Minji Kim, Ministry of Environment (MoE),  
Republic of Korea

Harinath Sesha Appalarajugari, WBG

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**4:40–5:40pm****A Different Way of Powering Africa**

Africa suffers from a severe power shortage. To address this issue, there is an urgent need for smart energy solutions and innovative financing. Based on regional resources, African countries can deploy new technologies to develop self-sustaining energy sources and store renewable energy through regional collaboration. Panelists will share experiences and discuss innovative approaches to utilizing wind, water, solar, and ICT to overcome vulnerabilities and create climate resilient energy programs that provide jobs to drive green growth.

**SESSION LEAD:**Eun Joo Yi, KGGTF, WBG  
(for Franklin Koffi S.W. Gbedey, WBG)**Energy Storage Application Studies and Knowledge Exchange Framework for Sustainable Green Growth in WAPP****PRESENTATIONS:****The Negawatt Challenge for Energy Efficiency**  
Anna Lerner, WBG**National Energy Efficiency**  
Huseok Seo, Korea Energy Agency (KEA)

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**5:40–6:10pm****KGID 2017 Africa Closing Ceremony****SPEAKERS:**Marianne Fay, WBG  
Aurelio Menendez, WBG

Clients

Beckhee Cho, Korea Land and Geospatial Informatix Corporation (LX)

# DAYS 3 & 4





# DAY 3 THURSDAY, APRIL 6

On Day 3, two sets of three concurrent sessions will be held over the morning (9:00-11:30) and the afternoon (1:00-3:30). One session is composed of roughly 1 hour of presentation, 1 hour of discussion, and 30 minutes of networking time.

## 9:00-11:30am

- Capacity building: an investment worth making
- BRT, ITS & data analytics
- Smart Energy

## 1:00-3:30pm

- Land Digitization in Tanzania
- Environment SWM
- How to speak Green Growth

## 9:00-11:30am

### Capacity Building: An Investment Worth Making

Building long-term sustainable infrastructure, and establishing new industries to facilitate economic growth is a daunting task. The case for hiring external experts for speed and efficiency is compelling, but continual outsourcing of operations is a missed opportunity for job creation and up-skill a country's workforce. Examine the elements needed for successful capacity building and discuss how connecting with international partner institutions, developing technical training, and establishing internal expertise creates jobs, builds skill sets and promotes inclusive economic growth.

#### PRESENTATION, DISCUSSION AND NETWORKING

#### SESSION CO-LEADS

Haileyesus Adamtei Mengesha, WBG  
Sun Ki Kwon, Seoul Metropolitan Government

#### ETHIOPIA CASE

Mathewos Asfaw, Commissioner,  
Addis Ababa Planning Commission  
Dinkneh Tefera, WBG

#### KOREA CASE

**Sharing Capacity Building Experience  
with the Seoul Metropolitan Government**  
Myounggu Kang, University of Seoul

### BRT, ITS & Data Analytics

Transportation and the ability for people to efficiently maneuver around cities have a direct impact on economic activity. Transportation also provides an opportunity, and often a benchmark, for governments to demonstrate effectiveness. Learn about the integration of Bus Rapid Transport (BRT) and data analytics, and how, deployed together they can help citizens to experience their government as dynamic, technologically sophisticated and positively impacting their lives.

#### PRESENTATION, DISCUSSION AND NETWORKING

#### SESSION CO-LEADS

Yonas Eliesikia Mchomvu, WBG  
Raman Krishnan, WBG

#### AFRICA CASE

**BRT in Africa: Status and Prospects**  
Josphat O. Sasia, WBG  
Addis Ababa City  
Tanzania Transport Authority

#### INDIA CASE

**Kolkata Case Study**  
Narayan Nigam & Rakhi Basu,  
Kolkata Transport

#### KOREA CASE

**BRT & ITC Seoul Metropolitan Government**  
Sangbum Kim, Seoul Metropolitan  
Government

### Smart Energy

Energy shortages and instability across power supplies have knock-on effects that stifle economic growth. A reliable electricity supply at an accessible cost is essential to increase productivity, create jobs and generate higher GDP. Smart energy sources, such as Energy Storage Systems (ESS), allow renewable energy to be accessible and reliable. Assessing how ESS and micro grid technologies can stabilize renewable energy in Sub-Saharan Africa is an important step towards building long-term, integrated energy infrastructure across the region. Explore the importance of smart energy technologies in Africa to realize a greener, more resilient and accessible energy system.

#### PRESENTATION, DISCUSSION AND NETWORKING

#### SESSION CO-LEADS

Anna Lerner, WBG  
KEA

#### TANZANIA CASE

**The Negawatt Challenge  
for Energy Efficiency**  
Anna Lerner, WBG

#### KOREA CASE

**National Energy Efficiency:  
Private and Public Sector**  
Youngman Woo & Kyoungboon Kim, KEA

# DAY 3 THURSDAY, APRIL 6

11:30am–1:00pm Lunch

1:00–3:30pm

## Land Digitization in Tanzania

Recent technological advances in high-resolution cameras, light-weight drones and sophisticated software now provide the opportunity for urban leaders to support city development by establishing city districts and commercial centers, deciding on appropriate transport routes, and integrating ICT for advanced warning and evacuation for natural disasters. View a demonstration and explore how inexpensive technology can be creatively applied to support green economic development and quality of life.

**PRESENTATION, DISCUSSION AND NETWORKING**

### SESSION CO-LEADS

Edward Charles Anderson, WBG  
Jonghyun Yoon, LX

### TANZANIA CASE

**Land Digitization in Tanzania**  
Edward Charles Anderson, WBG

### KOREA CASE

**Korea Land Mapping Case Study**  
Jonghyun Yoon, LX  
**Case Study, Disaster Risk Management as Part of Green Growth**  
Namsu Lee & Ju Hwan Kim, K-Water

## Environment Solid Waste Management

Explore recent SWM projects across Africa and gain insights about the potential impact of technical and environmental factors when considering SWM policy decisions, investments and implementation methods. Examine the potential for cross-sector partnerships and integrated investments, and consider potential synergies and concerns when building capacity and investing in long-term SWM and green growth.

**PRESENTATION, DISCUSSION AND NETWORKING**

### SESSION CO-LEADS

Farouk Ban, WBG  
SLC

### ETHIOPIA CASE

**Sharing Solid Waste Management Progress in Africa**  
Abebew Alemayehu, WBG

### INDIA CASE

Harinath Sessa Appalarajugari, WBG

### KOREA CASE

Gyesoo Jung, KECO  
Seong-il Yoon, KEITI  
Sang-Hyun Park, SLC

## Communicating Green Growth

How should we talk about Green Growth? How can we communicate and engage stakeholders with the concept and principles of Green Growth? The World Bank External Communications & Relationship Team will share concrete examples of Green Growth in Action and discuss ideas and strategies for communicating Green Growth to a broad range of stakeholders.

**PRESENTATION, DISCUSSION AND NETWORKING**

### SESSION CO-LEADS

Jie-Ae Sohn, KGGTF, WBG  
A'Melody Lee, Africa Communications and Partnerships, WBG

### WORLD BANK GROUP

A'Melody Lee, WBG  
Eun Joo Yi, KGGTF, WBG

### KOREA CASE

Dong A Ilbo, Journalist

# DAY 4 FRIDAY, APRIL 7

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## 10:00am–3:00pm Optional Site Visits



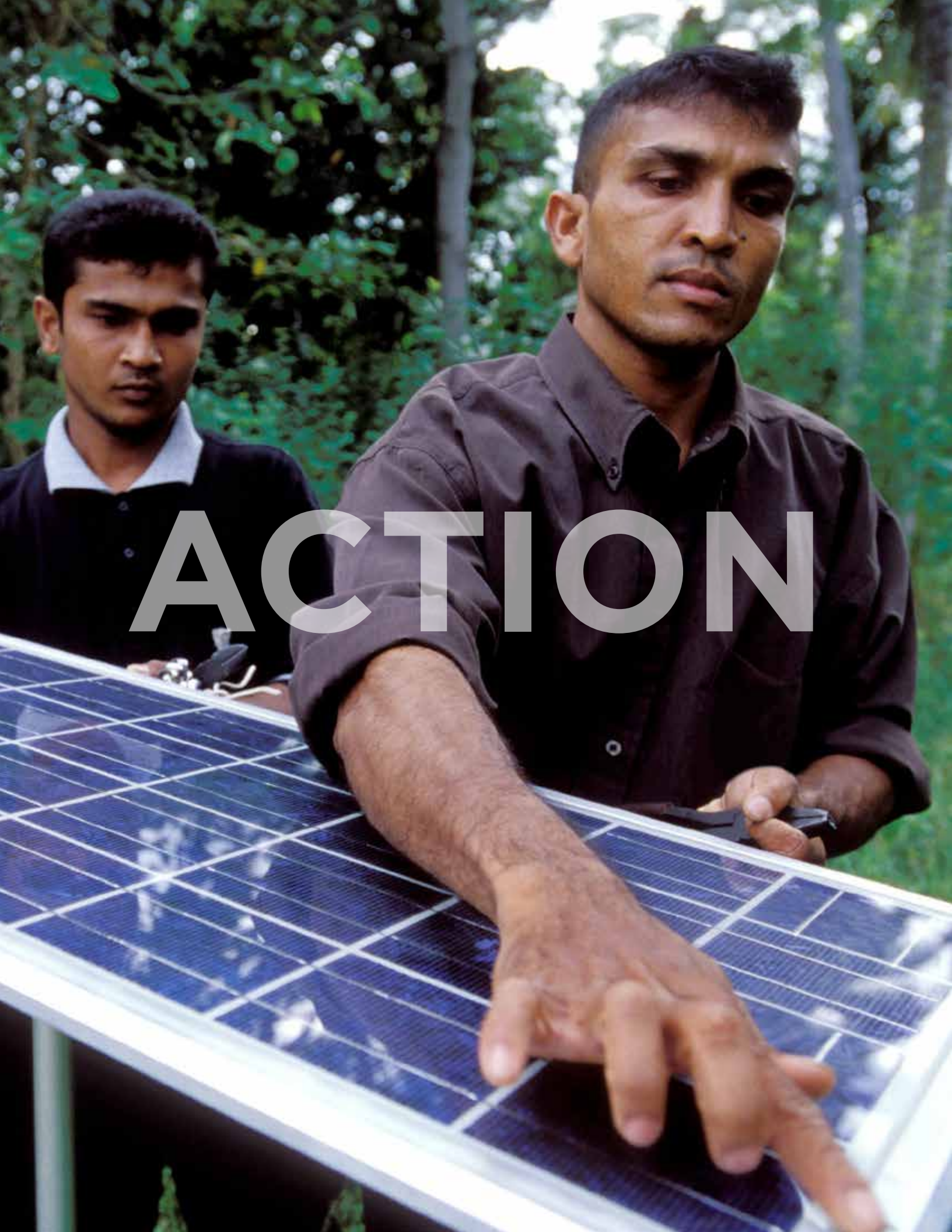
Outdoor Drone Demo  
(in Continuation of Land Digitization  
in Tanzania)



Smart Water Sites



Urban Site Visits in Dar es Salaam



ACTION

# KGTF FEATURE STORIES



# TECHNOLOGY-DRIVEN CLIMATE CHANGE RESILIENCE IN TANZANIA

## CONTEXT

By 2025, Tanzanian officials, under the Tanzania Development Vision, aim to see the majority of the country's citizens earning middle incomes, with access to education, sustainable economic opportunity, security, and peace. In order to achieve this, the Tanzanian government is seeking to leverage digital technologies and applications to accelerate its economic transformation.

## CHALLENGES & OPPORTUNITIES FOR GREEN ECONOMIC GROWTH

The Tanzanian government sees opportunities in leveraging digital technologies for citizen engagement, low cost mapping and surveying, risk assessment, smart mobility and smart delivery. In particular, the government is looking at a number of emerging technology fields such as development of electric unmanned aerial vehicles (UAVs), expected to be used both for sensing and delivery, and well as facilitating citizen engagement with improved data, interface standards and mobile access. The government is also seeking to develop shared business models in transportation which are expected to reduce congestions and fuel consumptions as well as emissions and support new livelihoods.

## KGGTF IN ACTION

This KGGTF activity will support digital development solutions that aid in stakeholder engagement, low-cost mapping and surveying, risk assessment, and service delivery in several economic sectors. Transportation systems as well

as urban, water, environment, land, and health systems will get a green growth boost, as will Tanzania's climate-informed development efforts.

In particular, Tanzania's partnership with the KGGTF and the Korea Land and Geospatial Informatix Corporation will advance mapping, surveying, flood response, environmental management, and risk assessment with the use of UAVs. It will also make citizen engagement more available and attractive with improved data and interface standards and mobile access. Lastly, through a transport infrastructure and mitigation assessment of Dar es Salaam, the activity will assist the government in evaluating new transportation business models.

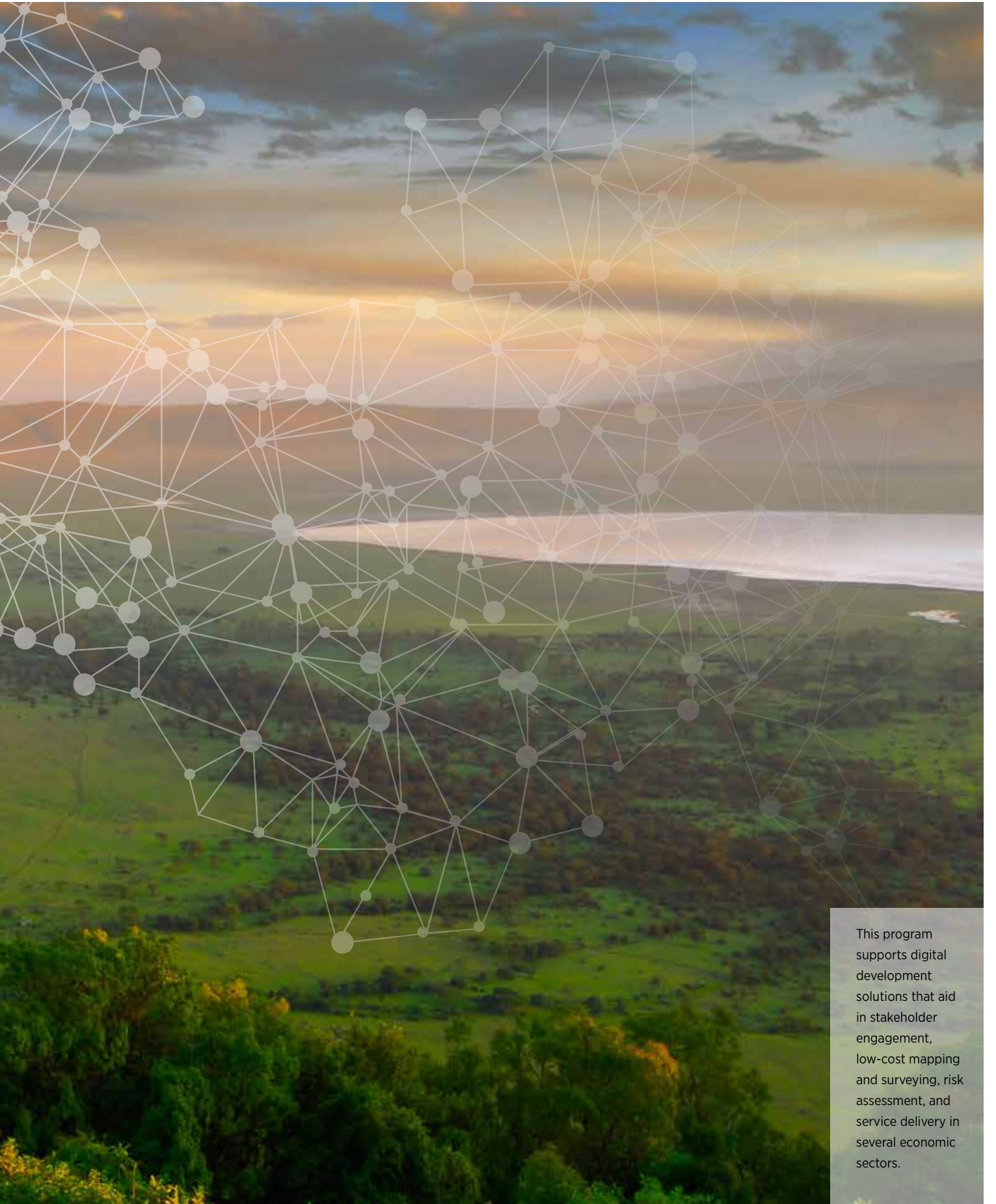
The goal of this program is to fund digital development solutions in Tanzania across multiple economic sectors, which then can be mainstreamed into the processes of industrialization sought by Tanzania

## GREEN GROWTH SCALE & IMPACT

This KGGTF program would help bring World Bank-funded climate technology innovation projects and green growth in Tanzania to scale, while addressing rapid urbanization and youth employment challenges. Overall, data and tech-driven solutions are expected to improve efficiency, resilience, competitiveness, and land management, helping Tanzania include underserved communities in decision-making, foster an innovative spirit, and attract sustainable and smart business.



The government is looking at a number of emerging technology fields such as development of electric unmanned aerial vehicles (UAVs).



This program supports digital development solutions that aid in stakeholder engagement, low-cost mapping and surveying, risk assessment, and service delivery in several economic sectors.

# ENERGY STORAGE SYSTEMS AND GRID STABILITY IN WEST AFRICA

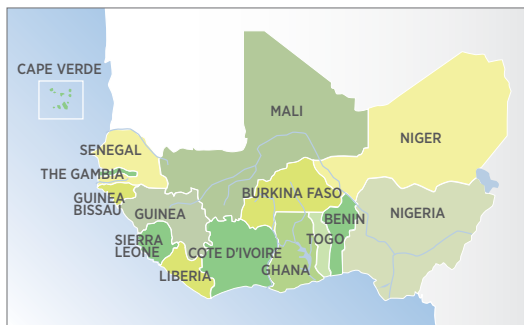
## CONTEXT

Providing stable and reliable electricity supply at a cost that is accessible to all is a major challenge for many developing countries. The Economic Community of West African States (ECOWAS) is seeking to utilize green growth strategies based on innovative technologies to collectively address these issues for the citizens of the ECOWAS member states.

## CHALLENGES & OPPORTUNITIES FOR GREEN ECONOMIC GROWTH

The Economic Community of West African States (ECOWAS) is a union of West African countries established to foster collective self-sufficiency for its member states.

Fourteen of the 15 members of ECOWAS, Benin, Cote d'Ivoire, Burkina Faso, Ghana, Gambia, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo have formed the West Africa Power Pool (WAPP).



15 members of ECOWAS, Benin, Cote d'Ivoire, Burkina Faso, Ghana, Gambia, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo







Energy Storage Systems (ESS) will be studied to understand how they can be beneficial for upscaling solar electricity generation, and to enable inter-regional electricity trading while maintaining system reliability.



The main vision of the WAPP is to integrate the operations of the individual national power systems into a unified regional electricity market. But these efforts are hampered by the imbalance in supply and demand between countries and the lack of visibility and policy for these inter-regional connections. In addition, WAPP faces the challenge of meeting the ECOWAS target to increase the share of renewable energy in the overall electricity mix to 35% in 2020 and 48% in 2030 (including large hydro), which will require not only the strengthening of their grid, but also developing a framework and master plan for a more sustainable and reliable way of delivering electricity.

### KGTF IN ACTION

In support of these efforts, the WBG KGTF program is funding WAPP countries to conduct feasibility studies assessing the energy storage in the region's power systems. These studies are expected to provide strategies in the efficient operation of the WAPP power system and identify areas that need reinforcement. Financial assessment is also expected to be conducted on energy storage technology applications in the WAPP countries. Energy storage technologies such as the use of battery-operated Energy Storage Systems (ESS) will be studied to understand how they can be beneficial to upscaling of solar electricity generation and enable inter-regional electricity trading while maintaining system reliability.

Program funding will also support a study exchange for ECOWAS utilities operators to increase awareness through best practices in other countries.

### GREEN GROWTH SCALE & IMPACT

Energy grid storage systems as an option for flexibility is expected to allow WAPP nations to incorporate long-term planning of the energy sector. This facilitates the region's efforts at integration and provides better access to more renewable sources. Such access to more reliable and affordable electricity is expected to promote sustainable growth in this region.

PHOTOS: ARNE HOEL / WORLD BANK (TOP RIGHT), DOMINIC CHAVEZ / WORLD BANK (MIDDLE LEFT), JONATHAN ERNST / WORLD BANK (BOTTOM RIGHT)

West African countries are expanding capacity and learning to support the fishing economy and safeguard its survival, which will allow current and future generations to maintain local food production.





# WEST AFRICA FISHERY PARTNERSHIP FOR COMPETITIVENESS AND SUSTAINABILITY

## CONTEXT

The West African marine fisheries provide direct and indirect employment to over 3 million people and have a wholesale value of more than \$3 billion a year. Fish is an important export commodities: for example it represents over 30% of the export revenues in Mauritania and Senegal. Fish also provide over 50% of the animal protein for the region's inhabitants. Currently the capacity to realize the full economic value of fishery resources is severely constrained due to factors such as weak governance arrangements, limited management capacity, and rampant illegal, unreported, and unregulated (IUU) fishing in the region. The recent World Bank estimates suggest that, while African marine fisheries generated a loss of \$200 million in 2012, it has a potential to generate over \$10 billion each year in perpetuity.

## CHALLENGES AND OPPORTUNITIES FOR GREEN ECONOMIC GROWTH

To help reverse this trend, in 2009 the World Bank established a nine-country, multi-phase West Africa Regional Fisheries Program (WARFP) in close collaboration with the West African Sub-Regional Fisheries Commission (SRFC). The first phase focused on governance reforms while the second phase is expected to target improving value chains and strengthening regional coordination. IUU reduction is a WARFP program component that is considered essential for enhancing West African marine economies and the livelihoods they provide. While the program has already initiated active steps in this respect, further efforts are needed to utilize technology innovations to overcome the prohibitive costs of conventional IUU surveillance and enforcement.

## KGGTF IN ACTION

This KGGTF-funded Green Growth activity is about to create efficient and effective, regionally

connected monitoring and surveillance systems that will help coastal communities grow green economies and improve the health of fish stocks while improving safety at sea which is an increasing concern due to the higher frequency of storms. The program is currently testing an affordable and effective tracking system appropriate for small scale boats, and include knowledge sharing with partners in Korea, Europe and Northern America. More specifically, this program includes developing an integrated sub-regional monitoring, surveillance and control ICT strategy and implementation plan; strengthening the countries' joint vessel traffic monitoring and information systems and interoperability capabilities for identifying and managing infraction vessels; identifying and testing cost-effective new ICT systems for IUU monitoring, surveillance and control; and strengthening knowledge exchange on IUU surveillance.

## GREEN GROWTH SCALE & IMPACT

West African countries are expanding capacity and learning to support the fishing economy and safeguard its survival, which will allow current and future generations to maintain local food production. Additionally, the increased competitiveness is expected to arrest and reverse the unsustainable IUU levels in the region. Establishing a comprehensive and sustainable fishery management system will allow the region to strengthen local fish stock and ensure food security in a time of increasing climate volatility.



West African marine fisheries provide direct and indirect employment to over 3 million people and have a wholesale value of more than \$3 billion a year.

# GREEN LOGISTICS AND STRATEGY IN UGANDA

## CONTEXT

Transportation infrastructure and fleet improvements have been instrumental in successful climate-resilient development and green growth strategies around the globe, but those successes can be amplified by complementary transportation logistics efforts that lower costs and minimize environmental footprints. Such a plan is in the works in Uganda, where major transportation corridors and logistics face climate risks and over-use.

## CHALLENGES & OPPORTUNITIES FOR GREEN ECONOMIC GROWTH

For Uganda, a landlocked country in Sub-Saharan Africa that lies nearly 800 km from the Indian Ocean, the challenge is to enhance the competitiveness of the logistics sector, while encouraging the adoption of green technologies. Providing regional connectivity within Uganda, and between Uganda and the rest of the region, is critical to its development, especially for the oil, agriculture, fishing and tourism sectors. The rise in intra-regional trade in the East African Community (EAC) could allow it to leverage its central location



Uganda is a landlocked country in Sub-Saharan Africa that connects South Sudan, Rwanda, Burundi and the Eastern Democratic Republic of Congo.



This program aims to support Uganda to develop a logistics sector and program that will spur green transportation growth, incentivize the use of green technologies, and improve the quality and efficacy of the country's transportation system.



and position as a major transit country connecting to South Sudan, Rwanda, Burundi and Eastern Democratic Republic of Congo, to serve as a hub for logistics in general and distribution in particular.

### KGGTF IN ACTION

Building on a 2014 KGGTF grant that facilitated a knowledge exchange between Uganda and Korea, this new KGGTF funding aims to support Uganda to develop a logistics sector and program that will spur green transportation growth, incentivize the use of green technologies, and improve the quality and efficacy of the country's transportation system.

The new logistics strategy will lower greenhouse gas (GHG) emissions, minimize the sector's environmental footprint, and save the country and its citizens money, all while creating jobs and economic stability. Areas that will be ironed out or improved upon with the refreshed KGGTF funding include: identifying how government can support sector growth domestically and internationally; supporting logistics and shipping companies and industry growth through regulatory reform and tax incentives; supporting education, research, and development; developing an emissions-reduction scheme; and prioritizing short-term investments. The policy will utilize successful experiences from many countries and will be built on principles such as: incrementalism, the use of technological advances; continuous up-skilling of an efficient labor force; evidence based policy based on robust data and solid analysis; and appropriate institutional arrangements at the highest level to provide vision and course correction as needed.

### SCALE & IMPACT OF GREEN GROWTH

Ultimately, this partnership is expected to result in a pilot project that can serve as a framework for other World Bank programs in Africa and South Asia seeking to assess and reduce GHG emissions and promote green growth.

This Green Growth strategy dovetails with other World Bank lending efforts in Uganda, including the sustainability of Lake Victoria project and the Uganda oil infrastructure project. Both projects aim to reduce environmental footprints and protect resources into the future, while contributing to economic growth.

# INNOVATIVE AND GREEN GROWTH FOR RURAL KOSOVO: INVESTING AND SCOPING

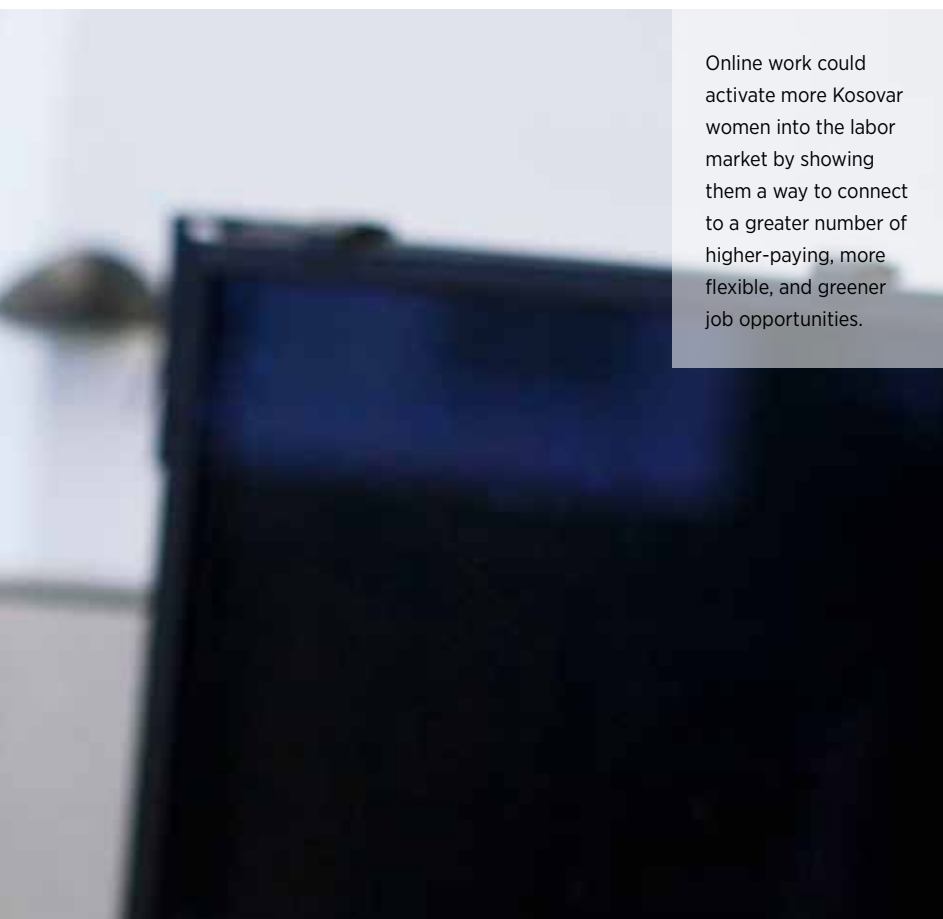
## CONTEXT

Developing economies face hurdles supporting green growth across their rural areas. In Kosovo, this issue is particularly exacerbated due to patchy telecommunications infrastructure, resulting in underdeveloped broadband internet coverage affecting as many as 30% of households, mainly in rural and remote areas. Another issue affecting economic growth in the country is low labor force participation and high unemployment among women, especially rural inhabitants. Only 1 out of every 8 women is formally employed, compared to 2 out of every 5 men. Thus, providing more, better and inclusive economic opportunities in rural areas presents another challenge for the Government.



WoW graduates compete globally for contracts in IT, graphic design, digital marketing, writing and research, data entry, and other areas. To date, 81 of them have collectively earned close to \$30,000.





Online work could activate more Kosovar women into the labor market by showing them a way to connect to a greater number of higher-paying, more flexible, and greener job opportunities.

## CHALLENGES & OPPORTUNITIES FOR GREEN ECONOMIC GROWTH

The Government of Kosovo recognizes broadband connectivity as one of the enabling infrastructures for green growth and proposes a rural broadband program modeled on a public-private partnership to improve broadband coverage in all of the country. While doing so, it seeks to create significant economic, environmental and social benefits, including for un-/underemployed female rural inhabitants.

### KGGTF IN ACTION

The KGGTF's two-year activity aimed to improve access to high-speed and affordable broadband Internet services in the underserved rural areas of Kosovo as a platform for enabling innovative and green growth in the country. It did so by producing design of an inclusive and high-impact rural broadband program and by piloting a green jobs intervention to showcase importance of broadband internet for inclusive job creation. The intervention included an innovative IT training pilot program called Women in Online Work (WoW) which supported 150 women residing across five rural and urban municipalities to engage in green, ICT-enabled jobs offered through a global online work marketplace.

### GREEN GROWTH SCALE & IMPACT

Upon completion, and based on the promising results from the WOW pilot, the Government of Kosovo recognized its impact and expanded the activity through additional donor funding. The Government also listed rural broadband program implementation as one of its key forthcoming investment projects. Currently, the World Bank is working with the Government on the preparation of the Kosovo Digital Economy (KODE) initiative, which envisages support to rural broadband deployment, digital skills development, and digital businesses. Furthermore, Kosovo's Deputy Minister for Economic Development has conducted visits to neighboring Albania and Montenegro to rally support from peer line ministries for the scaling up of WoW on a regional level. The interest of Albanian and Montenegrin counterparts led to discussions that could lead to the regional scaling-up of WoW in the Western Balkans.

# KOLKATA METROPOLITAN TRANSPORT EFFICIENCY IMPROVEMENT

## CONTEXT

The existence of numerous and congested traffic systems inhibits the growth of cities. Not only does heavy congestion hinder efficient economic activities, it produces pollution and unpleasant living conditions for city inhabitants. Kolkata has taken the initiative to reverse this trend utilizing state-of-the-art transport modules.

## CHALLENGES & OPPORTUNITIES FOR GREEN ECONOMIC GROWTH

Kolkata is a culturally rich and economically vibrant city, with a history that supports a prominent future for the city, but it has seen an explosion in the population in the Kolkata Metropolitan Area (KMA). In 1947 there were just 0.6 million residents, compared to a projected 21 million by 2025, and the city continues to struggle to recover from and manage this extreme growth. Over this period, KMA, unlike other mega cities in India, has established a large number of public transport modes, from rickshaws and buses to trams and ferries. This has resulted in a transportation network which is ill equipped to serve its rapidly increasing population living in a modern age and facing a high-tech future.

## KGGTF IN ACTION

The KGGTF action focused on the integration of these transport systems to aid the decongestion of the KMA. Funding supported the development of low-carbon solutions through a combination of smart urban planning, technology use, bus reform, pricing policies, and open space and land use planning. The driving principle was that bringing these factors together would improve service, facilitate economic activity, make the city more livable, and support its growth in a sustainable way. It also allowed for the transfer of knowledge on effective and ineffective approaches in relation to design, phasing, and implementation of green development initiatives, including policy reforms, investments, and private sector engagement.

The program tapped into the experiences of cities which faced similar challenges and overcame them by building state-of-the-art transportation modules utilizing ICT technology. It used examples of modern cities that accumulate and facilitate data collection, and nurture an open data system that allows local industry and entrepreneurship to utilize that data for the public good.

## GREEN GROWTH SCALE & IMPACT

A major outcome from the program has been the development of three apps that will be used at various levels of the transport eco-system in KMA. The apps were developed to support a major route rationalization targeting the bus routes which carry more than 70% of the population. Better utilization of bus resources through service and frequency improvement, route adjustments, etc is expected to reduce the number of bus trips along already busy corridors, and hence provide some relief to traffic congestion. Improving service delivery through data collection and using analytics (big data) to understand travel behavior and trends led to the development of smart apps that are changing how commuters make travel decisions. Besides more common features like ETA, the apps can tell the commuter the level of crowdedness in a bus, allow commuter to communicate hazards or unsafe incidents, and will soon make possible end to end trips with greater ease. In addition, a route creation app will allow any city to create or validate public transport the city.

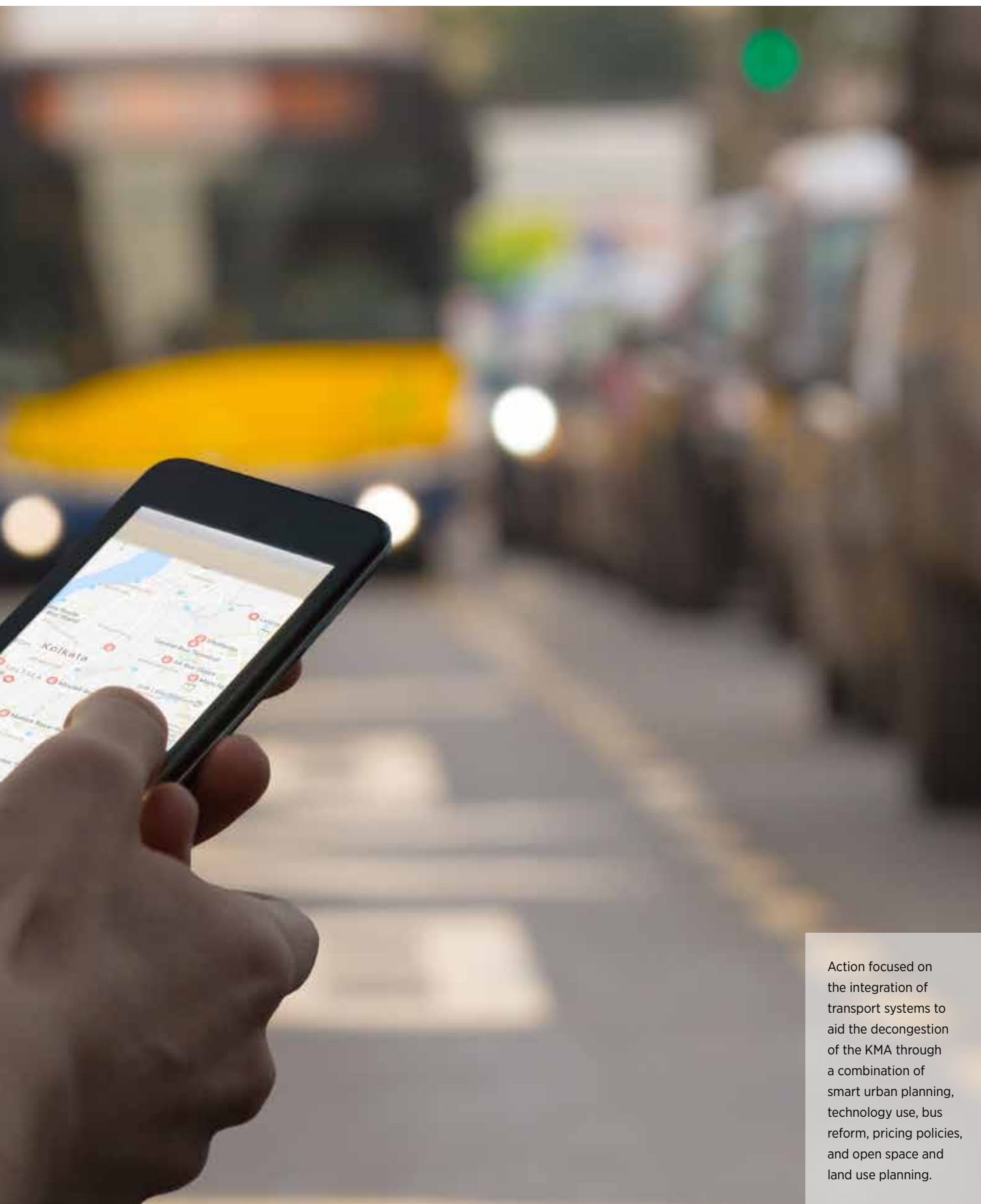
With such developments, Kolkata is initiating the transformation of its transport system and inspiring other cities facing similar challenges.



A major outcome from the program was the development of three apps that will be used at various levels of the transport eco-system in KMA.







Action focused on the integration of transport systems to aid the decongestion of the KMA through a combination of smart urban planning, technology use, bus reform, pricing policies, and open space and land use planning.



# PROFILES

## ALEXANDER LARIONOV

Alexander Larionov joined the IFC in 2006 to work on Sustainable Energy Finance solutions in Europe and Central Asia (ECA). Since 2012, he has worked with the Energy and Water Advisory team in Sub-Saharan Africa, based in Johannesburg. Alexander's expertise includes finance, private equity and development of clean energy solutions in various sectors, including agribusiness, manufacturing and construction materials, with focus on economic and financial modeling. Prior to joining IFC, Alexander worked for a private equity fund in Russia. He holds a Master's in International Economics from the Ural Federal University (Russia) and the University of Ghent (Belgium).

## A'MELODY LEE

A'Melody Lee is a multimedia producer with the Africa Region of the World Bank. She creates videos, photos, slideshows and podcasts and a host of other development communications products that disseminate World Bank corporate and regional priorities to a global audience. She's been an on-air television reporter in Cape Town South Africa, Lead Producer for a network news service and holds an MA in Broadcast Journalism from New York University.

## A. S. HARINATH

Harinath is a Senior Environmental Specialist with the Environmental and Natural Resources Global Practice of the World Bank. Based in the New Delhi office, he manages pollution management projects and provides environmental safeguards support to urban and infrastructure projects in South Asia Region. Some notable projects that he is currently supporting include 'Ganga River Basin Project' and 'Contaminated Sites Clean Up Project' in India and 'Clean Air and Sustainable Environment' Project in Bangladesh. During his 20 year career in environmental engineering, Mr. Harinath lead development and implementation of urban environmental management and municipal solid waste management programs in number of cities in India, and industrial pollution management initiatives in Tannery, Textile, Bulk Drug and Pulp & Paper sector. Mr. Harinath is a Civil Engineer with a Master's Degree in Environmental Planning and a PG Diploma in Environmental Economics.

## BECKHEE CHO

Beckhee Cho is General Director of the Global Business Department at LX. Previously Ms. Cho worked as foreign press spokesman of the Democratic Party (2009) and the Uri Party (2004-2005), as political specialist of the Embassy of the USA in the Republic of Korea (2000-2001), and as Chief of Public

Affairs at the Embassy of Australia in the Republic of Korea (1998-2000). Prior to that Ms. Cho served as Protocol Officer for Inter-Parliamentary Affairs at the National Assembly (1985-1998). Ms. Cho received the Master of Public Administration from Harvard University, Kennedy School of Government (2005-2006).

## BOUTHEINA GUERMAZI

Boutheina Guermazi is a Practice Manager for Information and Communication Technologies (ICT) in the Transport and ICT Global Practice of the World Bank, based in Washington DC. Her unit designs and implements activities and programs aimed at supporting developing countries unleash digital opportunities for inclusive development. These include policies and programs relating to broadband infrastructure, mobile networks, digital government, ICT skills and industry development. Before joining the ICT unit, Boutheina was a Lead Operations Officer in the Regional Integration Unit, supporting regional projects in Africa. She has written and published a number of articles and book chapters on trade law, telecommunications policy and regulatory reform.

## CARTER BRANDON

Carter Brandon is the World Bank's Global Lead Economist for the Environment and Natural Resources Global Practice. His primary interests are in the linkages among the environment, welfare and growth. Over his 20 years at the World Bank, he has held lead positions in both headquarters (Latin America and South Asia regions) and in the field (Beijing and Buenos Aires). Prior to joining the World Bank he ran the Development Economics Group, an economics consulting firm specializing in trade and sector policy analysis. Early in his career, he also made a documentary film on political unrest in Chiapas, Mexico, and played in the Paris Symphony. He graduated from Harvard University (BA) and Oxford University (MS and DPhil, ABD, Agricultural Economics), where he was a Rhodes Scholar.

## CHEICK FANTA MADY KONE

Lieutenant Colonel Cheick Fanta Mady Kone holds a PhD in General Medicine and a Capacity in medicine in emergency and disaster situations. He is a national expert in disaster risk management and has been the National Focal Point for disaster risk reduction in Mali since 2012. In this capacity, he coordinated the Disaster Risk Reduction and Adaptation to Climate Change project (2012-2015) and is now coordinating the preparation of the 'Hydromet and Early Warning' project funded by the Green Climate Fund (in pipeline). He participated in the development of the Mali National Strategy for Disaster Risk Reduction, the National Emergency Plan (ORSEC) and in the update of the

National Contingency Plan. He is Co-Founder of Sud-Santé Magazine, Coordinator of the NGO “Solidarité Sida”, member of the PDNA Platform (Post Disaster Needs Assessment) and Permanent Secretary of the National Platform for Disaster Risk Reduction.

### **DAESEONG CHOO**

Daeseong Choo is a Manager in the UAV Business Department at Hojung Solutions Co. Ltd. He is a licensed UAV pilot holding more than 5000 hours working experience in UAV operation. He is a leader of the biggest UAV fleet in Korea involved in various UAV projects such as corridor, topographic and cadastral mapping. He has provided photogrammetric solutions with his technically skilled team in Japan, Tanzania, Uruguay, Philippines, Papua New Guinea, and across South Korea. He majored in cadastral surveying in Mokpo National University. He is a licensed civil engineer and UAV technician.

### **DEMBA KANE**

Dr. Demba Y. Kane is a veterinary doctor specializing in fisheries. He is also a graduate of the Centre for Financial, Economic and Banking Studies (CEFEB) in Paris. He was successively: Head of the Division of Infrastructure and Industrial Fisheries; Deputy Director of Fisheries at the Department of Maritime Fisheries of Senegal; Director of the Artisanal Fisheries Development Project in Ziguinchor (PAMAEZ – funded by EU-AFD-CCFD); Fisheries specialist Deputy Director of the single-access window at the Ministry of Economy and Finance of Senegal; Director of the Technical Secretariat of the Programme on “Developing artisanal fisheries catches in West Africa for ECOWAS countries” funded by EU-Abidjan, and Executive Secretary of ADEPA-Abidjan. He was appointed WARFP Regional Coordinator for the Sub-Regional Commission (SRFC) in 2010. These various positions have helped him gain important insights into areas relating to fisheries management including the development, planning and implementation of fisheries policies, and providing support to civil society at the national and regional levels.

### **DINKNEH TEFERA**

Dinkneh Tefera joined the World Bank in 2011 as a short-term consultant and started working in the Urban and Water Unit Africa Region. He is currently working on the Second Urban Local Government Development Program (ULGDP II), a US \$380 million IDA Program for Results, which is under implementation in 44 cities and nine regions of Ethiopia. He had provided implementation support for the first phase of ULGDP (US \$300million), which was successfully closed on December 31, 2014. He also worked on a number of initiatives, activities, and

studies such as the Ethiopia Local Government revenue study, energy efficiency, disaster management and City Strength. He also participated in the Ethiopian Urbanization Review. Dinkneh has extensive experience in Urban Development, working at different organizations for over 15 years. Before joining the World Bank, he worked on an Urban Governance and Decentralization Program that was financed by German International Cooperation (GIZ). He has a BA in Economics and a Post Graduate Diploma in Urban Development studies.

### **EUJIN KWON**

Eujin Kwon is a Manager at the Korea Environment Corporation in Korea. She is currently in charge of waste statistics for Korea. She previously performed a major role as an ODA project manager, which established an IT based waste management system in Vietnam for three years from 2010 to 2013. She was also a manager of Seoul Initiative Pilot projects, which support environmental improvement of developing countries and joint environmental research projects with China, Vietnam and the Netherlands from 2014 to 2015. She participated in various international environmental forums and exhibitions presenting the waste management system in Korea. She majored in political science and diplomatics in Ewha Women's University.

### **EUN JOO A. YI**

Eun Joo A Yi is a Senior Operations Officer at the World Bank Group and serves as the Partnership Program Coordinator and Technical Advisor for the Korea Green Growth Trust Fund. Previously she worked with IFC Advisory Services focused on private sector resource efficiency and clean energy initiatives. Before joining the World Bank Group she lived in Norway and Russia where she specialized in international science diplomacy, climate, energy, and environmental issues. Yi's experience spans the public, private and multilateral sectors. She has worked with clients including tech companies, a Norwegian engineering firm, the State Department and Pfizer Inc., amongst others. She received her BS in Biology from State University of New York at Stony Brook and holds a Master of International Affairs degree from Columbia University School of International and Public Affairs, with concentrations in International Energy Management and Environmental Policy Studies.

### **FANTA ROKIATOU COMPAORE KAFANDO**

Fanta Compaore is an Environmental Specialist and has been serving as the director of the subdivision in charge of Environmental Preservation in Burkina Faso since 2016. This subdivision is nested within the Ministry in charge of the

Environment, the Green Economy, and Climate Change. From March 2013 to March 2015, she worked solely as an Environmentalist. From March 2015 to March 2016, she served as the technical director of the National Bureau of the Assessment of the Environment. This bureau is also a subdivision of the Ministry in charge of the Environment, the Green Economy, and Climate Change. Her duties included conducting studies and strategic assessments of the environment in Burkina Faso, as well as providing statements pertaining to environmental impact evaluation activities.

From April 2009 to November 2012, she served as a team member specialized in the assessment of the environment with the Millennium Challenge Account project implemented in Burkina Faso. Upon becoming a staff member of the Ministry in charge of Environmental issues in 2004, she first worked within the direction of Environmental Regulations and Inspections. She then worked with the direction of Environmental Assessment until 2009. Fanta Compaore holds an advanced graduate degree in Environmental Sciences with a specialization in Environmental Economics from

the University of Ouagadougou. She also holds a Master's in Economics with a specialization in Political Economy Analysis from the University of Cheick Anta Diop in Dakar.

**FAROUK BANNA**

Farouk Banna is an Urban Specialist with the Urban and Disaster Risk Management in the Africa Region at the World Bank, where he works on solid waste management projects. Prior to this, he was an Urban Specialist at the Global Urban and resilience Unit, where he worked on investment projects and advisory services on solid waste management for World Bank clients all over the World. Prior to joining the World Bank, he worked between 2006 and 2012 as an Environmental Engineer and Consultant for Camp Dresser & McKee and as a Solid Waste Engineer for Orange County, North Carolina, USA. He holds a Master's degree in Environmental Engineering from North Carolina A&T State University in Greensboro, and a Master's degree in civil engineering from the University of Lome, Togo.



## FRÉDÉRIC CAZENAVE

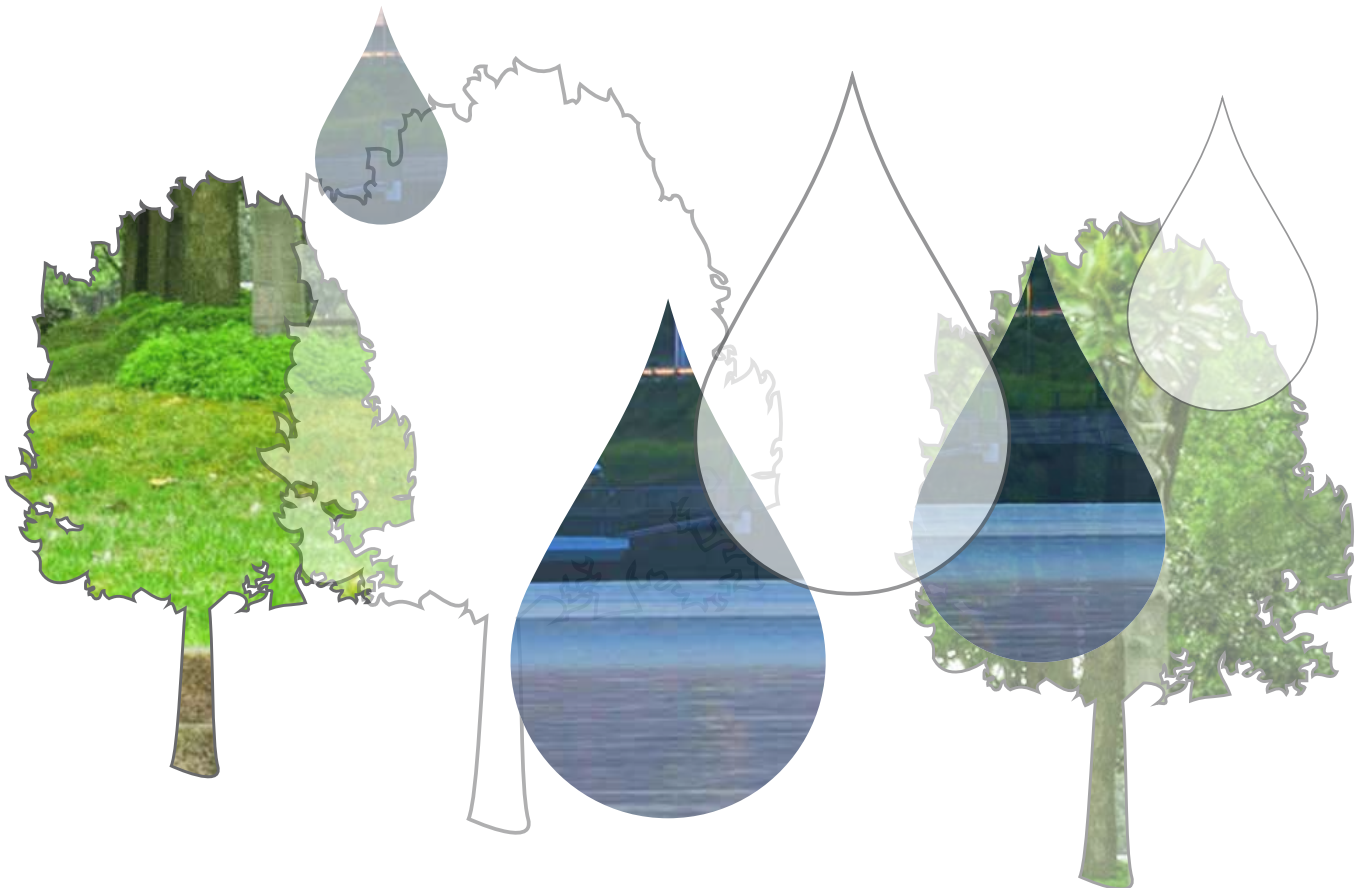
Frédéric Cazenave (IRD) is a Research Engineer at the Geosciences and Environment Institute (IGE) of Grenoble. An engineer in industrial computing, specialized in meteorological radar, Frédéric Cazenave developed the Xport radar, a research tool for the exploration of precipitating systems. He participated in several surveys in West Africa (AMMA 2005-2007 in Benin, MTGV 2010 in Niger, MTGV 2012-2013 in Burkina Faso) and was responsible for the Super Site for Ground Validation for the validation program for the Megha Tropiques satellite (MTGV) in West Africa. A specialist in hydrometeorology, he studies the distribution of precipitating particles in the heart of the Sahelian rainy systems to contribute to a better estimation of the rains by satellite. He is one of the main leaders of the Raincell Africa project. Since September 2015, Frédéric Cazenave is technical director of the Laboratory of the study of Transfers in Hydrology and Environment (LTHE) of Grenoble and now of the IGE.

## GYESOO JUNG

Mr. Jung is an Assistant Manager at Korea Environment Corporation in Korea. He is in charge of supporting the development of policies and businesses for eco-friendly sustainable cities in Korea. Prior to this role, he worked for the management of eco-friendly energy towns in Korea for 5 years. His forthcoming projects include "Development of Future Models of Eco-friendly Sustainable Cities in Korea" He majored in Environmental Engineering in University, and completed his Master's degree in Environmental System Engineering from Changwon National University, Korea in 2003.

## HEE-DONG KWON

Hee Dong Kwon works in the climate change business department as a Deputy General Manager in charge of overseas business. He has worked in this area since 2000. He has participated in many overseas projects in developing countries including Vietnam, Sri Lanka and Indonesia.



## HUSEOK SEO

Huseok Seo is Senior Manager of the Renewable Portfolio Standard Division at the Korea Energy Agency and his main area of interest is bioenergy. Bioenergy accounts for about 40% out of total renewable energy in Korean RPS, and the Korean government is working to reduce the bioenergy ratio and increase the photovoltaic and wind power ratio. Huseok Seo devotes himself to policy management related to energy saving and GHG reduction through ETS, as well as labelling programs for energy efficient household appliances in Korea. He accomplished a Wi-Fi smart plug R&D project to measure instantaneous power and cumulative power consumption for household appliances in real time.

## HYUN-SOOK YU

Yu, Hyun-sook is a Deputy Director working in the International Cooperation Division of the Ministry of Oceans and Fisheries, Republic of Korea. He is in charge of bilateral cooperation and ODA in the marine and fisheries sector.

## IBRAHIMA DIAGNE

Ibrahima Diagne is the Director of the coordination unit of the National Solid Waste Management Program in Senegal. Prior to this, he was respectively a site engineer for the consulting firm VERITAS, Coordinator of Urban Programs at AGETIP Senegal, manager of public work for the city of Dakar, and technical director for Entente CADAK, an inter-communal organization of Dakar Metropolitan Area. He has extensive experience in the area of urban development and environment. He managed, among others, the lighting project for the city of Dakar, multiple investment and maintenance projects for the city of Dakar; the rehabilitation of the Mbeubeus dumpsite near Dakar; the construction of the solid waste transfer station in Mbao near Dakar; the construction of the engineered landfill in Sindia in Dakar and the coordination of the national solid waste management program. Mr. Diagne is a Civil Engineer by training, specialized in building, bridge and road construction. He also holds a Specialized Master's degree in Project Management as well as a Master of Business Administration from the Paris Dauphine and the Sorbonne Universities.

## JAEBIN LIM

Jaebin Lim is an Assistant Research Fellow at Land and Housing Institute (LHI) in South Korea. His research consideration is International Urban Development, Sustainable Development, Korea Peninsula Development Partnership, and GIS. In recent years he has

participated in research on Sustainable Development Goals in Urban Affairs, Korean Town Development History for Developing Countries, Korea New Town Guideline, and Myanmar Town Development Cooperation in LHI. Prior to joining LHI, he worked at University of Seoul in South Korea for 2 years as a manager of the International Urban Development Program, which is a Master course for public officials from developing countries. He received a Ph.D. in Urban and Regional Planning at Seoul National University for a dissertation on "The Effect of Spatial Configuration of Cities on Transportation Carbon Emissions".

## JEAN BAPTISTE MIGRAINE

Jean-Baptiste Migraine is a Senior Disaster Risk Management Specialist with the Africa Region, World Bank. An engineer in economics, international development and water resource management, he started his professional career by developing a distributed model for runoff and erosion based upon observed rainfall in South East Asia. He later contributed to the setup of the Disaster Risk Education Programme within the World Meteorological Organization, to the development of a European network of practitioners on disaster risk management on behalf of the French Government, and joined the World Bank in 2011 in the Mali country office to ensure consideration for climate adaptation and disaster risk management across the project portfolio. Since February 2014, Jean-Baptiste Migraine leads disaster risk management projects in Sahel, Democratic Republic of Congo and Burundi.

## JIE-AE SOHN

Jie-Ae Sohn is a Senior Communications Consultant to the Korea Green Growth Trust Fund. She is based in Seoul, Korea, and is also an invited Professor specializing in International Communications at Ewha Womans University's Graduate School of International Studies. Previously, she served as CEO at Arirang TV and Radio (2011-2014), and in that role became the first female CEO of a major broadcasting station in Korea. Prior to that, Sohn served as the overseas Public Affairs Secretary to President Lee Myong Bak, whose administration pioneered the area of global Green Growth. She began her career in international journalism as CNN's Seoul correspondent and bureau chief from 1995 to 2010, covering both South and North Korea. She reported for global media outlets including the New York Times and Bloomberg.

### **JONADAB WILLIAM METIBAIYE**

Jonadab William Metibaiye is an Engineering Consultant who has worked in Engineering Consultancy for over two decades. He currently works as a Hydraulic Consultant to the Ibadan Urban Flood Management Project (IUFMP), Ibadan, Nigeria. He is involved in IUFMP to fast track the activities relating to hydraulic engineering and infrastructural aspect of the project. He has worked as a Consultant with many Development Partners (World Bank, EU, DFID and UNICEF) both in Nigeria and Malawi on community based rural and urban infrastructure development projects, and water resources based projects. Engr. Metibaiye is a registered Civil Engineer and holds a Master of Science in Water and Waste Engineering from Loughborough University of Technology, United Kingdom.

### **JONG-HYUN YOON**

Jong-Hyun Yoon is a Manager in the Global Business Department at LX. He has over 12 years professional experience in land management system development, cadastral surveying and mapping. Mr. Yoon has been involved in several land projects in Jamaica, Turkmenistan, Tunis, and Bangladesh with the Asian Development Bank and Korea's Exim-Bank. He worked at the LX as a cadastral surveyor and a researcher on a Cadastral Reform Project and Land Administration Data Model. Mr. Yoon also worked at the World Bank as a Seconded from LX. He holds a Master's Degree in Geo-Information Management from Twente University in the Netherlands.

### **JU-HWAN KIM**

Ju-hwan Kim works as a senior head researcher at K-water Research Institute in Korea Water Resources Corporation (K-water). His work includes technologies development for the implementation of Smart Water Management in water supply systems for water services improvement. Ju-hwan holds a PhD in Engineering from Inha University in Korea. He served as Director General at the Water & Wastewater Research Center for 2014-2016. As a member of the water and waste-water committee in Korea, Water Resources Association, and Korean Society of Civil Engineers etc., he plays an important role in the water supply area and as an advisor to coordinate the Korean Smart Water Grid. His functions consist of development of planning and designing technologies, both hydraulics and water quality aspects, water demand forecasting for water facilities planning and operation, leakage reduction in water distribution systems, decision-making support for rehabilitation and replacement of water pipes, data-mining including time series analysis of water related data information in order to implement Korea smart water.

### **KYOUNGBOON KIM**

Kyoungboon Kim is currently the Deputy Director of the Global Project Division at the Korea Energy Agency focusing on improving energy efficiency in the developing countries. She has 11 years experience implementing policies and measures on energy efficiency, renewable energy, and climate change mitigation. She has managed green ODA programs such as the establishment of energy efficiency labeling scheme in Cambodia, and capacity building for developing countries in climate change mitigation. Previously, she was responsible for planning and evaluating domestic energy efficiency programs implemented at a state level. She is KEA's CDM auditor and has validated and verified various renewable energy CDM projects since 2009. She earned a Master's degree in Sustainable Development from the University of Glasgow and a Master and Bachelor of Environmental Engineering from the University of Seoul.

### **MARIANNE FAY**

Marianne Fay is currently the Chief Economist of the Sustainable Development Vice-Presidency at the World Bank. She previously served as the Chief Economist for Climate Change. She contributed to a number of World Development Reports, notably the World Development Report 2010 on Development and Climate Change which she co-directed, and led a number of recent World Bank reports, such as Inclusive Green growth: the Pathway to Sustainable Development and Decarbonizing Development: Three Steps to a Zero-Carbon Future. She has held positions in different regions of the World Bank (Eastern Europe and Central Asia, Latin America and the Caribbean, Africa), working on infrastructure, urbanization, and climate change. She is the author of a number of articles and books on these topics. Marianne Fay is a founding member of the Green Growth Knowledge Platform. Marianne Fay holds a PhD in Economics from Columbia University.

### **MATHEWOS ASFAW**

Mathewos Asfaw is currently Commissioner of the Addis Ababa Planning Commission. Prior to this, he was the Founder and Managing Director of MATHEWOS Consult, a private firm engaged mainly in the preparation of urban plans, planning manuals, urban regularization, urban governance, surveying and related urban research activities. He was also the general manager of the earlier Addis Ababa Master Plan Project, which was legally adopted and has been under implementation for the last 10 years. His area of expertise covers regional and urban planning and development, local development planning and urban design, and informal settlements regularization and governance. He holds a BS in Architecture and Urban Planning from Addis Ababa University, Ethiopia, and a MS in Planning Studies from Oxford Brookes University, UK.



**MBAGNICK PATAR DIOUF**

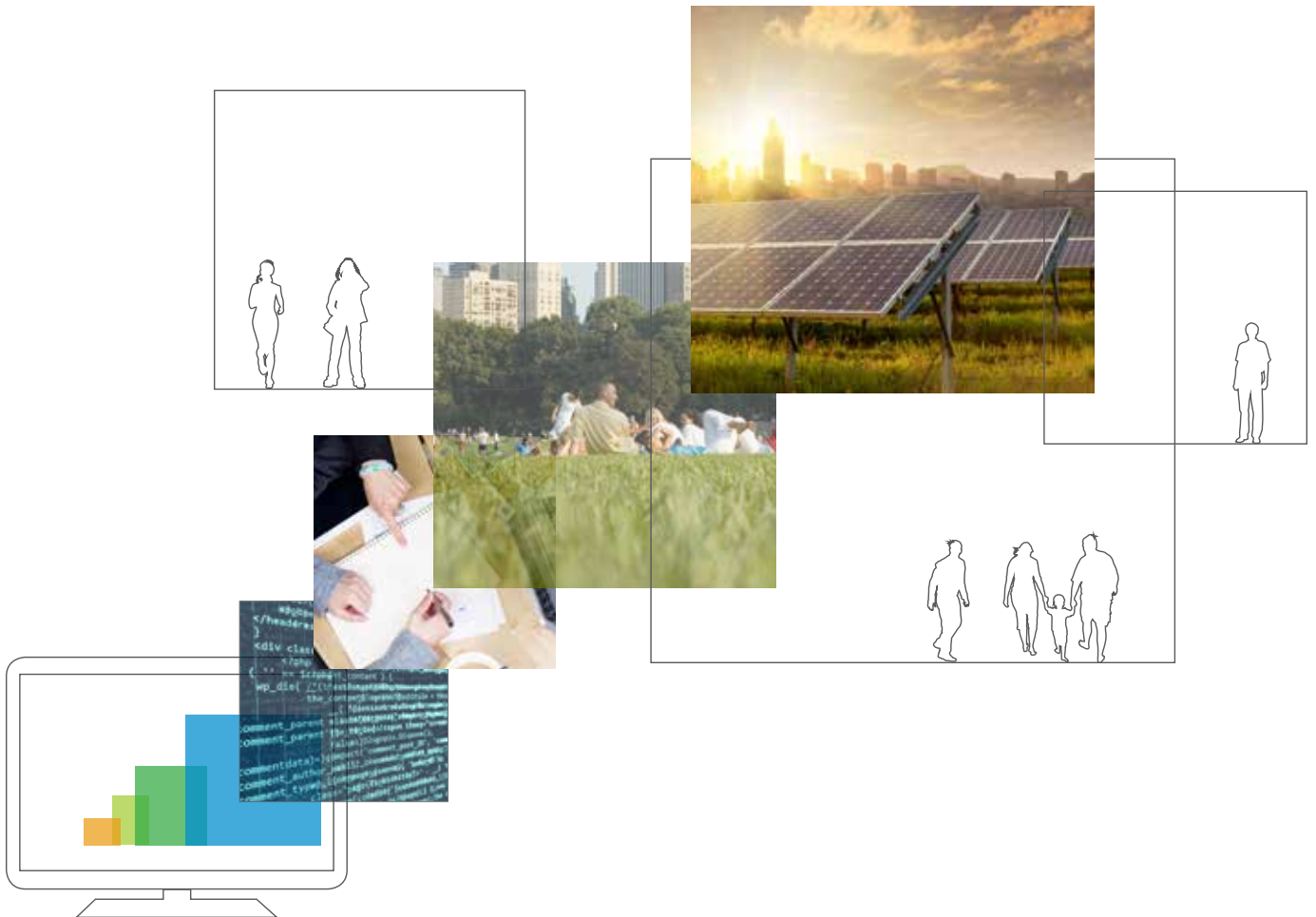
MBagnick Patar Diouf is the technical advisor to the Senegalese Minister of Local Governance and Spatial Development. He is a project auditor and an expert in decentralization, local governance, finances and taxation. From 2005 to 2007 he worked on the regional support project (PAR) financed by the European Union as the expert in charge of the component on “support to central services of the government of Senegal”. From 1999 to 2004 he served as the technical assistant of the decentralization and local development project (PADDEL) financed by the French Development Agency (AFD). From 1994 to 1999 he took part in various auditing missions for projects financed by Senegal's technical and financial partners. Mr. Diouf holds, since 1992, a Master of Advanced Studies in the Management of Local Communities from the University of Lyon 2, France.

**MINJI KIM**

Ms Kim is a Deputy Director at the Ministry of Environment of Korea, working in the Environmental Industry division. Her roles at the ministry include support for domestic environmental companies in developing their overseas business, and cooperation with developing countries in helping them improve their environmental policies and implementation.

**MUNSEOK LEE**

Munseok Lee is CEO of Hojung Solutions Co., Ltd. a private organization with experience in continuous integration of UAV technology, Information technology (IT), remote sensing (RS), GIS Databases and various Applications. He has a broad engineering background as well as teaching experience in social science studies. He has successfully launched a number of UAV applications into the Korean market and his company is one of the biggest UAV service providers in Korea. He studied at the University of Cincinnati School of Planning and has worked as the CEO and Founder of Hojung Solutions Co., Ltd for 6 years.



## MYOUNGGU KANG

Dr. Myounggu Kang is Professor of Urban and Regional Planning at the University of Seoul. He served as Director General of International Urban Development Collaboration for Seoul Metropolitan Government. He also served as a Senior Urban Specialist at the World Bank focusing on urban development strategy in the developing world context. His recent manuscripts on Seoul Development Experience, including Cheonggyecheon stream restoration, Smart and Sustainable City, Metro-governance, Land Supply and Development, Economic Development and Urbanization are highly utilized in building the capacity of developing countries. He is actively sharing Seoul's development experiences with the world in order to improve the quality of citizens' lives and the sustainability of the world. He collaborated with UN-Habitat to publish a UN-Habitat book titled 'Urban Planning for City Leaders, Korea version,' which is an indispensable text in the Urban Planning and Development curriculum. He received Ph.D. and MCP from the Department of Urban Studies and Planning at MIT and Bachelor and M.S. from the Department of Urban Engineering at Seoul National University.

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Namsoo Lee is General Manager at the Water Policy Research Center of K-water Research Institute in Korea Water Resources Corporation (K-water). Her work includes research and studies in water policies and strategies for water services improvement. Namsoo holds a Master's degree in Economics from Korea University. She has worked in diverse business departments of K-water since 1998. Currently a member of the research center, she is involved in the 'Water and Green Growth Research project' and has conducted studies on 'Sustainable waterfront development



strategy', 'how to respond to SDGs in Korea and K-water', and 'water industry & water markets'. She is now playing an important role in Korea – OECD Water Policy Dialogue regarding sustainable water management in Korea.

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Narae joined the World Bank as a Young Professional in 2013 and has worked as a Social Development Specialist at the Jakarta Office supporting the management of the multi-donor trust fund that finances the largest community-driven development program of the Indonesian Government. Since April 2015, she has been working as an Urban Specialist in the Africa Urban and DRM (Disaster Risk Management) team and is the task team leader (TTL) for the Rwanda Urban Development Project and the co-TTL for the Support to Kenya Urban Program.

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Raman V. Krishnan is a Senior ICT Specialist in the Transport and ICT Global Practice and currently provides technical assistance and guidance to country clients in Latin America, Africa, Eastern Europe, and South Asia in the areas of intersection between Transportation and ICT including Intelligent Transportation Systems, Road Asset and Safety Management Systems, Transportation Management Centers, V2V and V2I systems, Transportation Solutions as a Service, Big Data Analytics, and Open Data Policy. With a Master's degree in Electrical & Computer Engineering from University of Illinois at Urbana Champaign, and an MBA in International Finance from the University of Maryland, Raman has over 20 years of experience in developing ICT strategy, policy, and operational solutions for global clients in Transportation, Telecom, Broadband, Energy, Health, Agriculture, and Education sectors. Prior to joining the World Bank, Raman, an American National, was a Director of ICT Strategy Practice at Deutsche Telekom Consulting,

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Dr. Sankoh specializes in Aquaculture and Aquatic Resources Management. Prior to working in the Ministry of Fisheries and Marine Resources as Coordinator of the West Africa Regional Fisheries Programme, he served as Research fellow and Lecturer at the Institute of Marine Biology and Oceanography and Department of Biological Sciences at Fourah Bay College, University of Sierra Leone, for 18 years. His research interest included marine environmental protection and conservation, coastal and marine biodiversity studies, and development of GIS models for aquaculture development and Aquaculture resources management.

In the last seven years, Dr. Sankoh has worked in the Ministry of Fisheries and Marine Resources in support for Fisheries Management in Sierra Leone, and as Regional Fisheries Consultant to the FAO, World Fish Centre, European Union, Stirling Aquaculture, Sierra Rutile Mining Company, the Environment Protection Agency in Sierra Leone, the UNDP's Climate Change Project, and the Catholic Agency for Overseas Development. Currently, Dr. Sankoh is the National Project Coordinator for the World Bank Funded West Africa Regional Fisheries Programme in Sierra Leone and still undertakes his responsibilities as Research Fellow and Lecturer at the University of Sierra Leone.

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Dr. Kim teaches urban solutions at the University of Seoul. Before joining the university, he worked at Seoul City Government for 30 years and retired as Vice Mayor. He was also president of Seoul Institute think-tank of urban solutions for Seoul. His specialist area is transportation and regional industry development. He was involved in most of projects that transformed Seoul into its current shape. Major contributions included financing the subway construction of line 5 to line 8, bus reform, and the DMC project, a high-tech media industrial park developed during 2000 and 2012. Furthermore, ten years of effort replacing diesel bus engines with gas engines greatly contributed to reducing the air pollution level in Seoul. Since retirement, he has been actively involved in sharing his experiences with many foreign cities' employees through lecturing and forums. He also participates in many activities being carried out by UOS, CITYNET and Seoul Training Institution. He always emphasizes the important role of city employees to encourage city center economic prosperity and innovation.

### **SANG HYUN PARK**

Sang Hyun Park, is currently an Environmental Engineer in the leachate treatment division at Sudokwon Landfill Corp in Korea. He has a range of technical consulting experience improving other landfill leachate treatment plants. He led the zero liquid discharge project to ensure that final treated water from the leachate treatment plant discharges zero, by reusing cooling water from a 50MW power generation plant.

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Mr. Kim, Semin is a Manager at the Global Urban Partnership Division in Seoul Metropolitan Government. He is in charge of cooperation with international organizations including Multilateral Development Banks. He studied business administration and journalism at Kyung Hee University and International Relations (MA), specialization in Peace and Global Governance at the Graduate Institute of Peace Studies. Before joining Seoul

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Dr. Seong-il Yoon is a Senior Researcher at the International Environmental Cooperation Office at the Korea Environmental Industry and Technology Institute (KEITI), which is a quasi-governmental organization affiliated to the Ministry of Environment of the Republic of Korea. His mandates include policy planning, establishing road-maps and statistics for environmental economy and technology in international and domestic markets. He worked at the Korean International Cooperation Agency (KOICA), an ODA agency in Korea, as a specialist in the Environmental ODA field for 6 years before joining KEITI in 2013. He holds a Ph.D in Environmental Sciences and Ecology.

### **SEUNGHWAN LEW**

Dr. Seunghwan Lew is a Senior Researcher at the Advisory Group for Urban Planning at Seoul Metropolitan Government. His main role is to examine the agendas that are submitted to The Urban Planning Committee, and to research Urban Planning policies. He earned a Ph.D. in Urban Planning from the University of Hongik. His area of interest in research is national supply of public rental housing. Related to his research, he is now in charge of rental housing policies for Seoul working to vitalize private rental housing in the market due to lack of public rental housing.

### **SINEM DEMIR**

Sinem Demir joined the Climate Competitive Industries (CCI) team of T&C's Competitive Sector unit in November 2015 as an Industrial Resource Efficiency Specialist. Based in the Istanbul Operations Center, Sinem serves as a technical specialist on climate competitive industries projects with a focus on eco-industrial parks, sector specific resource efficiency measures, and industrial resilience. Prior to joining the Bank, she worked for several private companies as an environmental and technical consultant active in the renewable energy and waste management sector. Her CCI project engagements include Mauritania, Pakistan, Ethiopia, Senegal, Nigeria, Kenya and Turkey. She has contributed to a publication on "Mainstreaming eco-industrial parks" and is currently working on a "Global Framework for Eco-Industrial Parks" publication jointly with UNIDO and GIZ.

Sinem earned a Master's degree in "International Management of Resources and Environment" from Technische Universität

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Stephen Muzira is a Senior Transport Specialist with the World Bank based in the Kampala, Uganda office. He has over fifteen years experience in the transport sector having worked on policy, strategy, institutional, planning, design, construction, maintenance and operational issues across the different modes with a strong focus on the road sub-sector. His experience spans transport analytical and operational work as a task team leader in different regions including Africa, Europe and Latin America. He is highly conversant with the different topical issues in the sector including engineering, governance, accessibility, efficiency, value for money, safety, social, environmental, procurement, and contract management. He is a Chartered civil engineer with a Master's degree in transport planning and engineering from the University of Leeds, UK.

### **SUNGYEOP KIM**

Sungyeop Kim is a Manager of the Global Business Department at LX. As a cadastral surveying engineer, he has spent 7 years working on securing land tenure. He is specialized in cadastral surveying and operating GIS and database management for government organizations. Before his responsibilities at LX, he worked at the Headquarters of the Korean Army for 2 years utilizing satellite images. He received a BSc in Geo-Spatial information from the University of Seoul, and holds an MSc in Development Studies at the University of Glasgow in the UK.

### **SUN KI KWON**

Sun Ki Kwon is Director of the Global Urban Partnership Division at Seoul Metropolitan Government. She takes charge of the city's policy-sharing projects, Seoul's urban policies promotion to the global society, and the mission to attract more international organizations to Seoul. Since beginning her public career in 1990, she has held important posts for the city in the areas of human resource capacity building, audit and social welfare. She majored in taxation from the University of Seoul for her Bachelor degree and holds a Master's in public administration from the University of Kentucky. Her key interests include urban diplomacy, sustainable urban development, and urban policy knowledge sharing.

### **TAEHI RI**

Mr. Ri is currently the Director of the Fisheries Monitoring Center of the Ministry of Oceans and Fisheries in the Republic of Korea. He has a Master's degree in Fisheries from the Pukyong National University in Korea. He has served in different government

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### YONGJIN KIM

Yongjin Kim is currently the Executive Director of the Environmental Business Division at the Korea Environmental Industry and Technology Institute (KEITI), which is a quasi-governmental organization affiliated to the Ministry of Environment of the Republic of Korea. Mr. Kim began his career in the environment sector in 2007 as a public servant at the Ministry of Environment and National Institute of Biological Resources. Prior to his service at KEITI, he was the Chief Administrator at Korea Meteorological Administration (KMA) for two years. At KEITI, He currently oversees the entire movement at the Business Division, which enhances the environmental industry - foreign and domestic - certifies environmental technologies, and promotes ecofriendly lifestyles. He holds a Bachelor's degree in economics, Master's degree and Ph.D. in Public Administration.

### YOUNG-HOON LEE

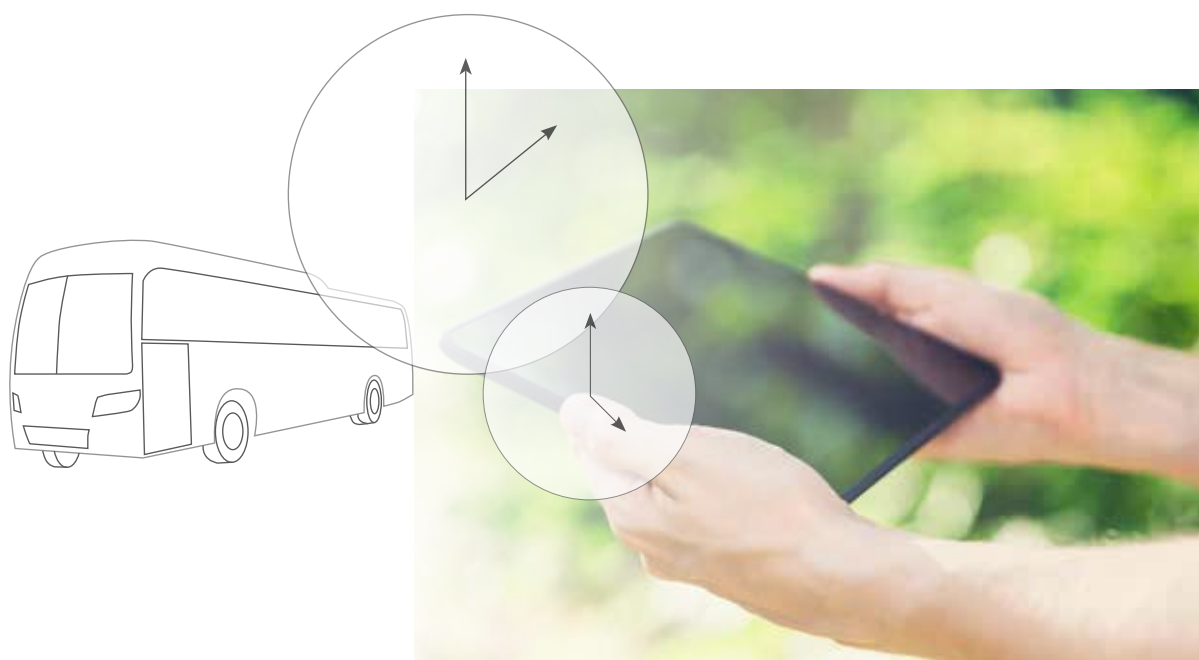
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Youngil Song is a Research Fellow at the Land and Housing Institute (LHI) in South Korea. His research consideration is economy based development & planning such as industrial parks. Recently, he has focused on the urban high-tech industrial park, which has been a hot issue in Korea. To promote business ecosystems and the smart growth of the city, he researched several land-use planning techniques by adopting mixed-use industrial land. His research area also encompasses locational demand of firms by industry. He received a Ph.D. in Urban and Regional Planning at Seoul National University for a dissertation on knowledge spill-over effects among regions.

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Youngman Woo is currently the Director of the Global Project Division at the Korea Energy Agency focusing on improving energy efficiency and mitigating climate change. He has worked in implementing policies and measures on energy efficiency, renewable energy, and climate change mitigation for more than 20 years. He has been managing green ODA programs, which develop and finance CDM projects in developing countries. He has also been directing the cooperation with the World Bank, UNIDO, and Asian Development Bank in providing capacity building to developing countries in Asia and Africa regions. He has rich experience in planning and managing various energy efficiency awareness programs such as 'Energy - and Love +' to decrease energy consumption in a household sector. Previously, he managed a domestic energy efficiency labelling scheme and energy efficiency standards.



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**KGTF** is committed to sharing technical knowledge and first-hand experience of implementing integrated green growth solutions that contribute to sustainable development and shared economic prosperity. To learn more about us, visit [www.wbgkggf.org](http://www.wbgkggf.org)

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