

Asia's Harmonious Economic Cooperation for Common Prosperity: Strategies for Developing and Emerging Economies and Green Growth Potential on the Korean Peninsula

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Republic of Korea: an economic development success story, demonstrating the importance of “growth”



Economic growth-energy linkage

Korean Peninsula Seen From the Space Station(NASA, 2014)



Ulaanbaatar – air pollution state of emergency

UNICEF: 300M children affected, 600K die annually



Quality of Growth Matters



Why green growth?

New development approach that delivers economic growth that is both environmentally sustainable and socially inclusive.

Through the green growth model, countries seek economic growth that is:

- low-carbon and climate resilient;
- prevent or remediate pollution;
- maintain healthy and productive ecosystems; and
- create green jobs, reduce poverty and enhance social inclusion.

Global Green Growth Institute at a Glance



28 member countries plus another 20 on the road to membership

26 Country programs now, moving to 30+ in 2018

\$55/annum budget and >300 staff, 200 in country

Maximizing Impact through Four Thematic Priorities:

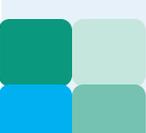
- Sustainable Energy
- Water & Sanitation
- Sustainable Landscapes
- Green Cities

Multi-Sectoral

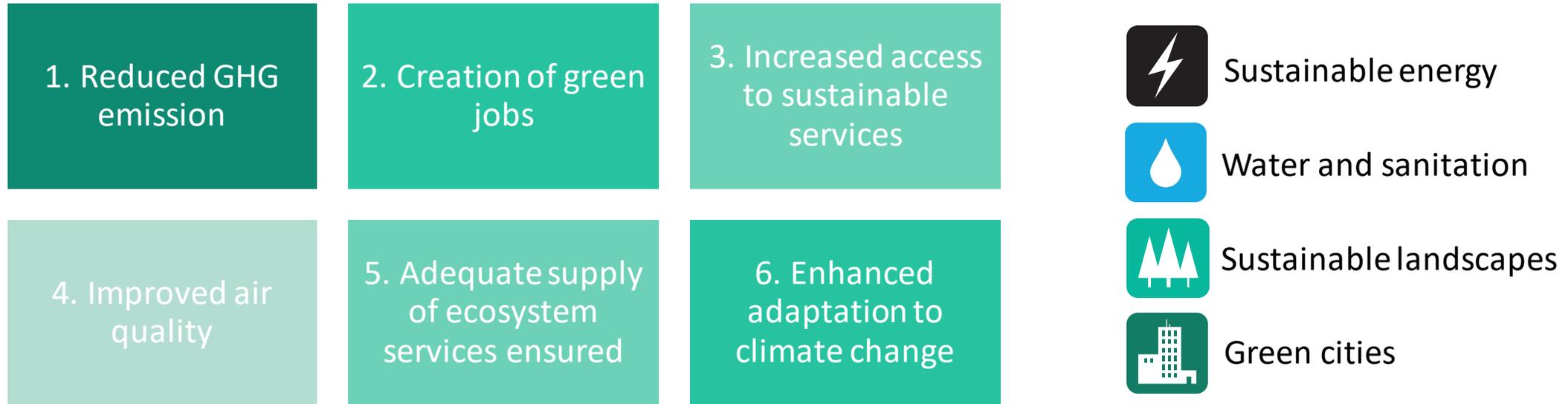
Member Countries



26 country programs at a glance for 2017-2018

	Asia and the Pacific	Large Emerging Economies	Africa and the Middle East
	Fiji, Vanuatu, Mongolia	India, Indonesia,	Mozambique, Senegal, Uganda
	Cambodia, Vietnam		
	Vietnam	Colombia, Indonesia	Ethiopia
	Cambodia, Lao PDR, Mongolia, Nepal, Vietnam	Mexico,	Morocco, Rwanda, Senegal, Uganda
	Cambodia, Kiribati, Lao PDR, Mongolia, Myanmar, Nepal, Philippines, Thailand, Vietnam	China, Colombia, Indonesia, Mexico, Peru, UAE	Ethiopia, Hungary, Jordan, Rwanda, Senegal, Uganda
New countries under discussion			
	Pakistan, Papua New Guinea, Tonga	Costa Rica, Guyana, Qatar, Caribbean	Burkina Faso

GGGI is in pursuit of 6 Strategic Outcomes in 26 country programs with 4 thematic priorities



GGGI's delivery model is a "one-stop shop"



Inter-Korea Collaboration: Potential Ideas and Approach

Potential areas to promote green growth (responsible ministries)

1. Afforestation/agroforestry (KFS/MOU/MOFA)
2. Renewable energy (solar rooftop/off-grid) (MOTIE/MOU/MOFA)
3. Water management (MOTIE/MOE/MOU/MOFA)
4. Monitoring methodology of GHG emissions (MOE/MOFA)
5. Support for NK climate change actions listed in INDC (MOE/MOFA)

Approach

1. Careful consideration is needed (U.S./UNSC sanctions, US-NK relationships, regional/peninsular geopolitics, etc.)
2. “Desk study” could be considered to examine projects and methodology, in particular at early stages and possibility of collaborating with other organizations

Power supply issues in North Korea

1. In 2015, the electricity power generation capacity in NK was 7,427MW (Energy mix status in NK(2016): Coal(43.2%), Petroleum(11.8%) and Hydro-power(32.3%)). (*The capacity of the Republic of Korea(ROK) is 97,649MW, around 8% against total capacity of ROK.)
2. People are still using firewood for heating and cooking.
3. In order to overcome the power shortage, NK enacted “the Renewable Energy Law” in 2013 and promoted renewable energy, especially in rural area with wind power generators and solar rooftops.
4. NK’s RE potentials are limited by low tech. level, reluctance and inability due to intl. sanctions to import foreign capital and technology.



Installation of wind power plants in Pyonganbukdo(Yonhap, Jul. 2017)



Producing wind power generator in NK (Yonhap Jul. 2017)

Power supply solutions for North Korea

1. Renewable energy prices have dropped to become competitive with fossil fuels for electricity generation – for countries with low supply, solar PV and wind are attractive expansion options.
2. To increase access, rather than expanding the grid to rural areas, off-grid energy and mini-grids have become attractive options.
3. First obstacle to private investment is government policy on enabling environment - PPAs, FiTs and net-metering – second is access to finance (*Pending lifting of intl's sanctions).
4. ***Priority options: solar PV and wind mini-grids, rooftop solar, and biomass waste to energy (where available) – affordable, rapid to deploy, easy to scale up***

Fiji: Solar Project on Taveuni Island

Current Gap

The Green Growth Framework for Fiji aims to reach 99% share of renewable electricity generation by 2030 while the island is highly dependent on diesel for electricity production

Project Overview

- GGGI is working with Fiji's Ministry of Economy and KOICA to develop a 1.6 MW solar PV on Taveuni Island. Investment size is US\$ 3 million and a Letter of Intent from KOICA has been received.
- The project aims to replace diesel-based electricity generation with solar PV, and ultimately help Fiji achieve its goal of 100% electricity generation from renewables.
- GGGI is developing a small-scale solar PV project, which will provide a blueprint for the wider Pacific Islands context.



Impact

Contribute to Fiji's NDC by:

- reducing energy poverty (34% of households lack access to electricity);
- reducing dependence on diesel for electricity generation;
- increasing renewable electricity generation to 65% from 50%.

Project Status & Next

- Q2-4: GGGI technical feasibility
- **Received Letter of Intent from KOICA in September 2017**
- Q4: Feasibility finalized, proposal submitted to KOICA (potential financier)



Indonesia: Solar PV Project in NTT Province – Island Solution

Current Gap

Most of the installed power plants operating in NTT are diesel fueled and hence the cost of electricity is high, power generation is polluting and supply not self-sufficient.

Project Overview

- GGGI is working in 8 locations in NTT to bundle small scale solar PV grid connected projects.
- Implementing the project will help PT PLN meet its solar PV target for the NTT province.
- Investment size: US\$15 million

Project Status & Next Steps

- Pre-feasibility assessment has been completed. The document was shared with the NTT government. Governor approved the assessment.
- Letter of Intent between investor and governor (November 2017).
 - ✓ Engie + Developer
 - ✓ NVV + Private equity

Impact

- Size of the impact: The PT PLN RUPTL (planning document) targets 15MW of solar PV, this project will help meet at least 15% of that target.
- Nature of the impact: 32% of households in NTT do not have electricity; this solar PV bundle of projects will contribute to PT PLN's RUPTL to provide clean electricity to the NTT population



Vanuatu: National Green Energy Fund

A consolidated fund for fostering rural energy access

Current Gap

Vanuatu is highly dependent on imported fossil fuels to power its economy and the cost of energy is very high.

Project

- GGGI is developing National Green Energy Fund to push forward the nation's ambitious target of 100% electricity access to households and improvement of energy efficiency by 2030.
- \$370K readiness proposal has been accepted by GCF for National Green Energy Fund development.

Partners

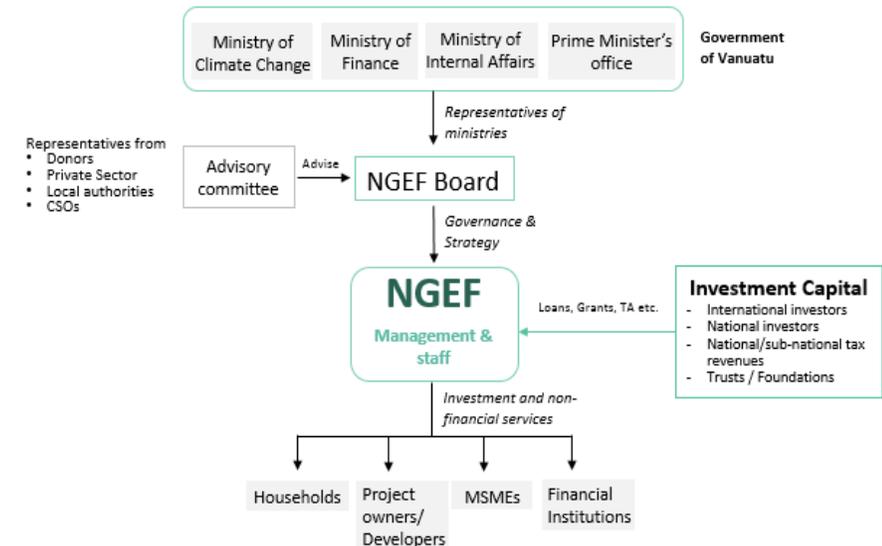
- Ministry of Climate Change (MoCC)
- Ministry of Finance (MoF)
- GCF readiness funding of US \$ 370K mobilized

Project Status & Next Steps

- June 2017: fund unit setup, initial fund transfer
- Q4: NGEF official launch event & investor forum

Impact

- Size of the fund: US \$15,000,000
- Targets **63% of total 35K households** without electricity.
- Will reach **30,000 rural clients**.



India: \$120M ACE Fund

An innovative financial instrument for enhancing financing for off-grid energy

Current Gap

Electrification is national priority. Off-grid sector lacks access to capital; companies/sector unable to grow. Banks unwilling to lend; no suitable product in the market.

Project Overview

- GGGI designed an innovative financial instrument – a \$120 Million debt fund with credit enhancement - to increase off-grid energy access in India.
- Letter of commitment by IREDA of USD 70 million received. GCF being targeted for the rest.

Partners

- Indian Renewable Energy Development Authority (IREDA)
- Ministry of New and Renewable Energy (MNRE)
- National Bank for Agricultural and Rural Development (NABARD)

Project Status & Next Steps

- Apr. 2017: GCF full funding proposal submitted to government and NABARD
- NABARD submitted the proposal to GCF in July 2017

Impact

- National impact: **5 million households** obtains access to electricity.
3% of NDC and Government of India targets.
- Sectoral impact: **5%** of capital required for the off-grid energy sector (total \$ 7 billion).
- **Fund is catalytic:** encourage domestic FIs to lend to off-grid companies



Mongolia(1): \$50M Green Credit Fund

First and only dedicated financial vehicle for climate finance in the country

Impact

Current Gap

No line of credit or facility in Mongolia for green financing; credit is too expensive 18-25% for green projects.

Project Overview

- GGGI designing the Mongolian Green Credit Fund, a national financing vehicle to bring long-term finance to projects/companies
- Immediate priority is to address the air pollution problem
- MGCF to i) provide medium and long term credit, ii) lower credit cost to borrowers, and iii) support project pipeline development.
- Potentially underpinned by Govt. of Mongolia Fx guarantee

Partners

- Mongolian Bankers Association (MBA),
- Ministry of Environment and Tourism (MET)
- Ministry of Finance (MoF)
- GCF readiness funding of US \$ 350K mobilized

Project Status & Next

- Q3: Launching the fund in 14 September 2017 (GGGI, MET, MOF, MBA to sign the Joint Commitment Statement)
- Q4: Development of pipeline work & expanding investors

- Size of impact: 230K tCO₂
- Enabling new green financing in support of National Green Development Policy.
- Capable of blending international climate finance and local capital



Mongolia(2): Energy Standards & Labelling

Promoting energy efficient appliances & protecting consumers

Targeted Outcome

- Size of impact: 200K tCO₂ and 160GWh savings per year by 2020
- Equivalent emissions 40,000 cars off the road

Project Overview

- Current Gap: Anything goes! No energy performance restrictions on imported equipment
- worked with Energy Regulatory Commission of Mongolia to develop the first National Energy Efficiency Action Plan, adopted in 2017.
- designed first S&L program design, regulation to be passed 2018

- ✓ Mandatory regulation
- ✓ Consumers protected
- ✓ Real influence on market outcomes
- ✓ Provides framework for incentives
- ✓ Responsible recycling



What Next?

- Get standards implemented one regulation passed
- Tie into investments - design and implement incentive scheme
- Targeting new and second hand appliances
- Financial incentive for EE appliances and scrap value of old appliances



Senegal(1): \$200M Renewable Energy Fund (REEF)

An emerging partnership between AFDB, Senegal wealth fund (FONSIS), GGGI and the Govt of Senegal

Impact

Current Gap

Renewables capacity is very high; however, few projects on the ground. No access to suitable finance to meet the needs of small projects.

Project Overview

GGGI with others designing and structuring a subordinated debt fund with initial capitalization of USD 50 million. The fund will provide junior debt for renewable energy (solar) and become USD 200 million ultimately

Program will add pipeline to the market, capacity to Govt, and market development for the country.

Fund co-financed by the AFDB and FONSIS; GGGI tasked with helping raise international funds

GGGI's Added Value

- GGGI is working with FONSIS and AfDB in designing and developing the REEF by providing Technical Assistance including: Assessment (policy, market, legal), business plan/model development, fundraising (GCF and other financiers), set-up and support for the operationalization of the REEF.
- GGGI has been appointed to provide its expertise in fund structuring, fundraising and operationalization for the REEF.

- Size of the impact: 300 MW of installed solar power at lower cost, reduction of spending for oil imports for electricity generation
- 65% of the total market
- Nature of the impact: NDC/SDG/contribution to country target of 20% of RE in energy mix, GHG emissions reduction of 1.5 million tCO₂e/year

Project Progress/Plan

- Q3: Approval of the of Concept Note by the GoS and other stakeholders (including AfDB)
- Q4: Assessment studies (market, legal) and structuring



Senegal(2): Biogas Cogeneration Project

Current Gap

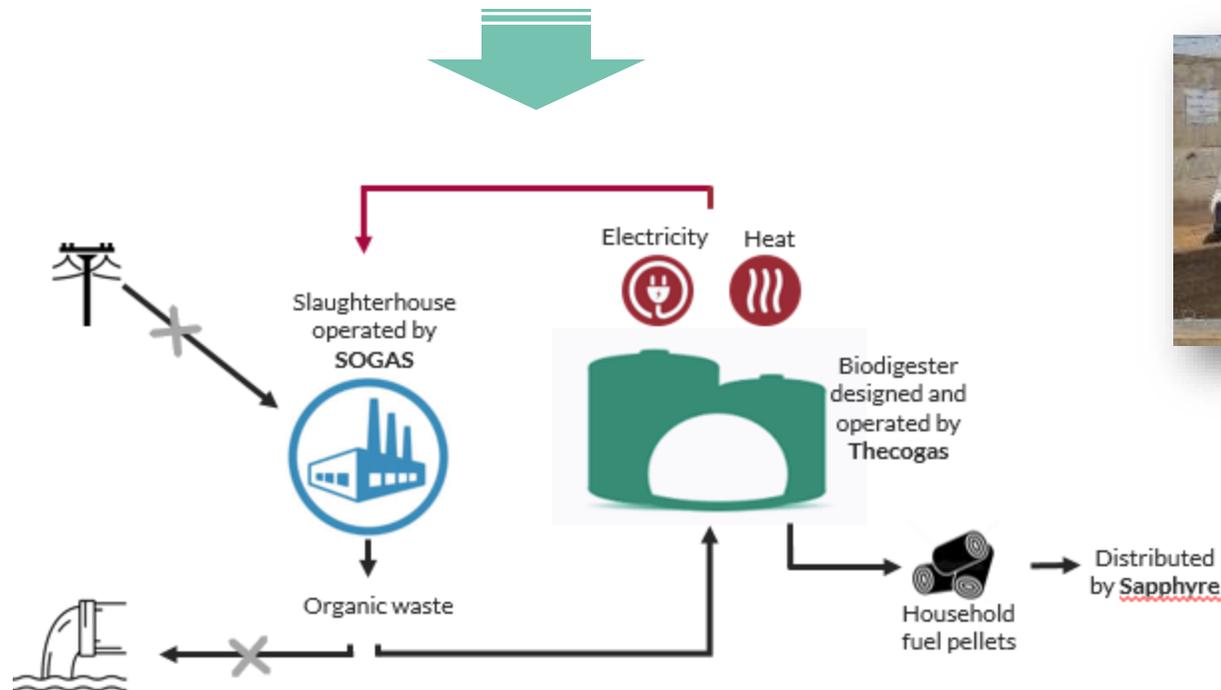
Waste residues in Senegal disposed in an unorganized manner.

Project Overview

- GGGI arranged the financial structure to scale up a biogas cogeneration project that utilizes waste residues from slaughterhouse as feedstock.
- Guarantee was provided for the load in June 2017.
- Investment size: US\$ 1.5 million

Impact

- Demonstrated waste valorization in the agro-industrial sector (biogas)
- Utilizes 52% of the total slaughter house waste in the whole country
- Increased 3 times the capacity of affordable, reliable and renewable electricity and heat that will supply the SOGAS industrial facility, utilizing waste residues that were previously disposed of in an unorganized manner.



Vietnam: Biomass to Energy Project

Potential to leverage up to \$60M in private capital

Current Gap

There are 41 sugar factories in Vietnam that produce about 7.8 million tons of waste bagasse per year that is not being utilized economically.

Project Overview

- Pre-feasibilities for currently inefficient selected Vietnam sugar mills to retrofit them with efficient biomass utilization for combined heat and power (CHP) generating up to 45MW, partly to feed to the Vietnam grid, to reduce costs and enhanced revenues.
 - Lam Son Sugar Factory
 - Vi Thanh Sugar Factory
- Investment size: US\$ 50-60M

Impact

- Potentially increasing the number of sugar mills that feed electricity to the grid by 29%, increasing renewable energy within Vietnam, in line with gov't targets for biomass power production.

Project Status & Next

- Pre-feasibility for two sugar mills are finalized (Lam Son Sugar Factory & Vi Thanh Sugar Factory)
- Next step: Investor workshop on Pre-feasibility reports (early October)



Deforestation issues in North Korea

1. It is estimated that more than 80% of North Korea is mountainous with cultivation largely confined to coastal strips in the east and west. According to a 2003 UNEP report, forest covers over 70% of the country, mostly on steep slopes. Other studies have suggested only about 50%.
2. In total, between 1990 and 2005, North Korea lost 24.6% of its forest cover, or around 2 million hectares, which is highest among countries in East Asia. This trend continues today.
3. In response, North Korea has taken steps in recent years.
 - In 2016, the Korean Central News Agency (official outlet of the DPRK) reported that the Central Nursery under the Ministry of Land and Environment Protection had produced 90 million saplings over the past five years.
 - Numerous official pronouncements have mentioned a forest restoration campaign.
 - Kim Il Sung University announced the opening of a new Forest Science Department.
 - The North Korean government seeks to invest in the development of solar and other renewable energy technology.
 - The North Korean government ratified the Kyoto Protocol.



Planting trees in NK (ILF Apr. 2015)

Deforestation solutions for North Korea

1. Addressing energy shortage in North Korea would be a solution.
2. Some attempts to prevent flooding and stop soil erosion have been made but assistance has been hindered due to political and geopolitical issues. There also seems to be a need for environmental laws and regulations.
3. GGGI's Strategy centers on sustaining healthy and functioning forests, agrarian landscapes, waterways, coastal and marine ecosystems.
4. In the implementation of the Strategy, GGGI takes on a "landscape approach" which moves away from project and sector specific interventions to holistic, cross-sectoral and multi-disciplinary transformational and scalable solutions.
5. GGGI is talking with ROK entities including KFS on :
 - Collaboration to train NK forestry experts;
 - Learning and receiving support from GGGI regarding financing of projects on international banks and other institutions.



Colombia

Financial Instrument
Sustainable Productive Livestock Transformation (ITPS)

Problem

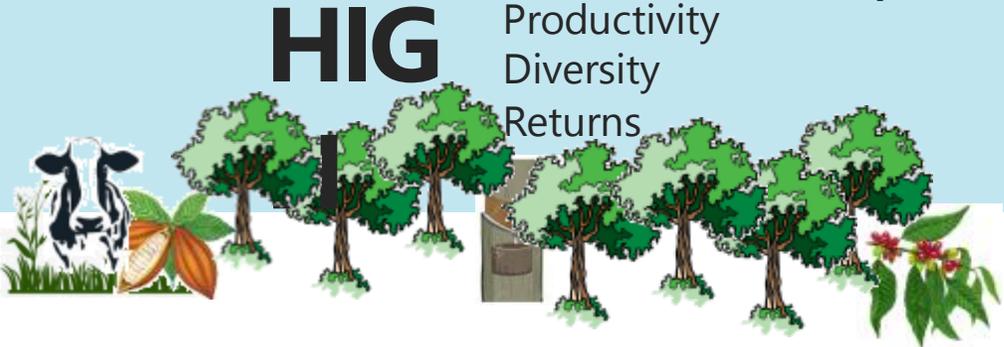
- 35M ha grassland (almost 1/3 country)
- 22M cows
- 20M ha with land use conflict
- Main driver of deforestation
- Limited credit access
- Low technical capacity
- Inefficient activity lead to land use change
- 18.48% of GHG



Productivity
Diversity
Returns

ITPS Pilot Proposal

- Access to credit with 100% of guarantee coverage for the banks
- **Technical assistance** based on farm and financial planning for each productive unit according to its potential,
- Integration to formal market **supply chains** (e.g. Nestlé) in **better conditions** for producers
- **Support in access to credit** process by financial experts case by case
- **Low payable interest rate and incentives for reconversion of grasslands to forests or agro-forestry**
- Transitional (improve productivity and also encourage **diversification** to activities **in accordance with land aptitude**)



Productivity
Diversity
Returns

Indonesia(1)

Project Development and Investment Mobilization Business-based Peatlands Restoration

Challenges: Negative impact of deforestation and peat development on climate change and biodiversity loss, resulted in the extent of fires, haze and flooding.

Severe impacts of 2015 forest fires in Indonesia



Proposed Solutions

- Ecosystem based restoration is the best way to success in reducing forest/peat related fires.
- An integrated approach through peatland zonation to address peatland restoration and public-private investment opportunities

Peatland zonation based on hydrology, restoration and community livelihoods

Zone 1: Deep peatlands forest zone

- Tengkawang (Illipe nut) business
- Carbon credits business
- Eco-tourism



Zone 3: Mineral soils around peatlands

- Sengon-wood business
- Rubber plantation business
- Agri-business



Zone 2: Shallow peatlands zone

- Gelam wood, honey, oil, agroforestry business
- Aquaculture business
- Carbon credits business



Indonesia(2)

Forest Management Investment

A new business model for active and inactive concessions

- **Active concessions:** international certification for sustainable forest management in production concessions, based on established reduced impact logging practices
- **Inactive concessions:** a model in which an active concessionaire is able to extend its existing operations to encompass a previously inactive concession of 25,000 ha, and restore this area to a healthy multiple purpose production forest, through engagement with private sector and local communities.

Key assumptions for forest restoration in inactive concession

Nominal operating parameters	Value	Units
Nominal area for inactive, logged over concession	25,000	ha
- Highly degraded forest, to be replanted	5,000	ha
- Moderately degraded forest, to be replanted	5,000	ha
- Area suitable for community plantations	5,000	ha
- Area suitable for responsible harvesting	5,000	ha
Average annual replanting rate, over first 10 years	900	ha
Average annual cost of replanting	450,000	USD
Average annual harvest rate with available area	333	ha/year
Average annual harvest revenues	820,000	ha
Average annual total costs	(1,200,000)	USD
Grant funding required to support restoration model	425,000	USD/year



FSC certification for active concessions

Commitment to a program supporting to working towards FSC certification

Based on reduced impact logging practices

Training and grants provided to support certification process

Restoration of forests in inactive concessions

Commitment to restoration of degraded forests within inactive concessions

Incorporates replanting and other restoration techniques

Private sector requires payment for environmental services

KOICA Project

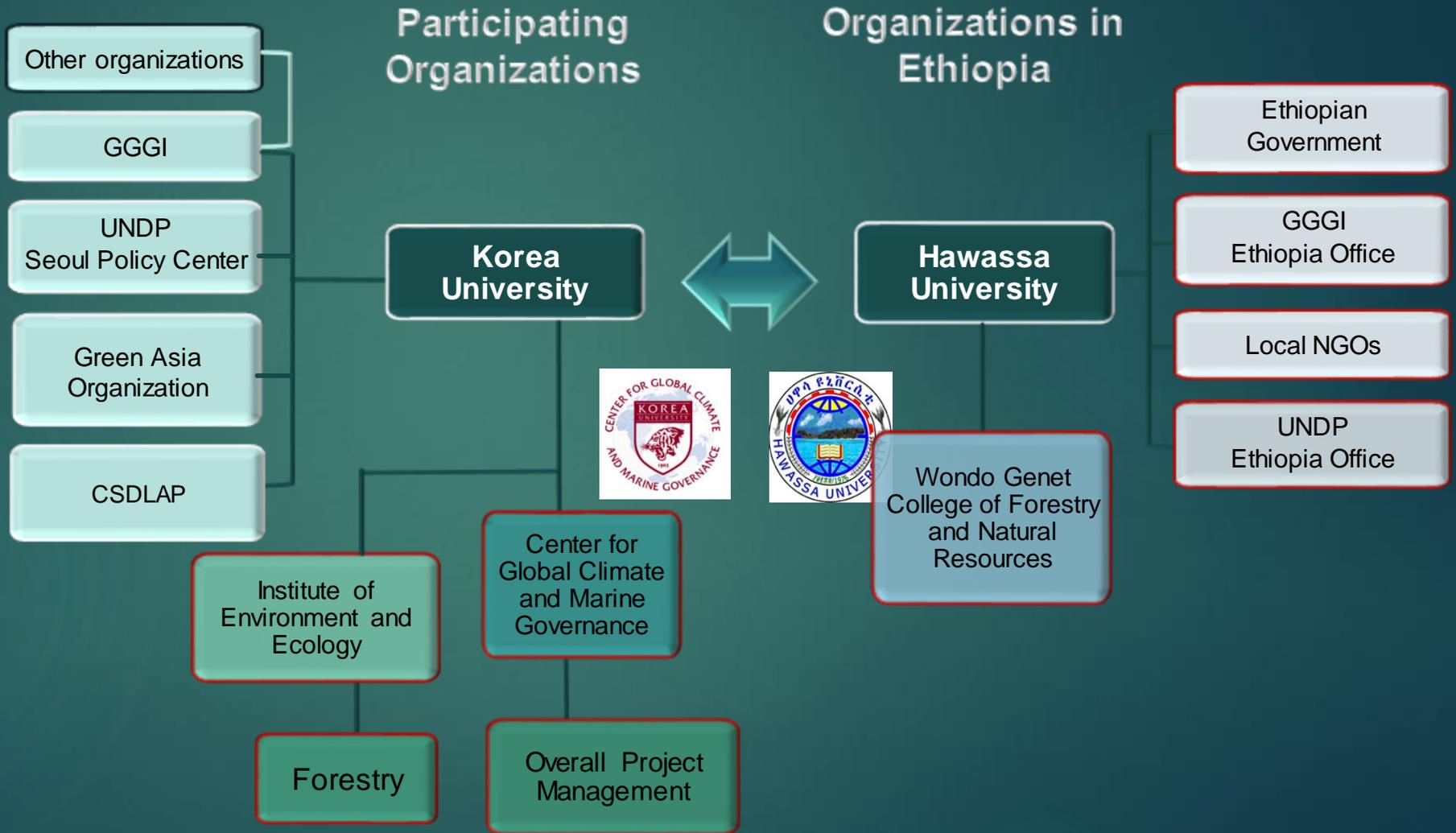


Title

- Capacity building on climate change with a focus on forestry sector in Ethiopia



Organizational Structure



Thank You

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