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Korea's CTCN pro bono activities: experiences and lessons learned

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Highlights

- This brief describes the Republic of Korea's seven (7) pro bono technical assistances (TAs) already completed or near completion; one (1) adaptation, four (4) mitigation and two (2) cross-cutting.
- Through such experiences, best practices of scale-up opportunities were identified. In such cases, the distinctive role of the intermediaries and the NDEs were defined as the key feature of Korea's CTCN pro bono support.
- Korea seeks to continue its efforts to scale up its pro bono support to strengthen the linkages between the Technology Mechanism and the Financial Mechanism and gain insights from its past experiences through developing a feedback loop for future pro bono support.

Keywords

- Korean NDE, pro bono, Climate Technology Centre and Network, Technical Assistance, international cooperation

Korea's CTCN pro bono support

Background

- Since its assignment as the National Designated Entity (NDE) of the Republic of Korea (hereinafter ROK) in November 2015, Korean NDE, the Ministry of Science and ICT (MSIT), has become a notably active participant of the CTCN activities.
  - Highest number of network members (75 as of December 2020)[1)]
  - Director-General of the R&D Policy Bureau of MSIT was elected as the CTCN Advisory Board member (December 2018)[2)]
  - Home to the CTCN Partnership and Liaision Office that aims to strengthen the links between climate technology and finance[3)]
- One of its distinctive activities is its active pro bono support. Korean NDE secured a dedicated budget in 2018 for the first time as a donor country to plan and implement TA projects through the pro bono process.[4)]

Progress

- Korean NDE, jointly with the Green Technology Center (GTC), supported various activities to expand pro bono support. The activities include;
  - establishing the institutional arrangements, procedures and annual timeline to support operations
  - organizing the 'Korean CTCN pro bono Committee'
  - diversifying pro bono activities and introducing the counter proposition of pro bono support to promote participation.
- As of 2020, a total of thirteen (13) pro bono projects worth 1.87 billion KRW have been implemented, five (5) adaptation, five (5) mitigation and three (3) cross-cutting.
  - The 3rd Korean CTCN pro bono Committee identified new pro bono support participation for the year 2021

Korea's CTCN pro bono experiences ('18~'19)

Adaptation

- **Kurunegala as a climate smart city for climate change adaptation, Sri Lanka**[5)]
  - **(Background/challenges)** Kurunegala city faces climate change issues such as extreme heat conditions and decreasing drinking water supply mainly due to drought and gradually diminishing urban biodiversity. The city needs a comprehensive and feasible climate adaptation measures within the integrated city planning to account for climate change adaptation.
  - **(Objective)** The objective of this pro bono TA was to develop an adaptation plan for heat waves and water management sector by formulating an urban action plan based on the vulnerability and risk assessment.
  - **(Korean expertise/technology supported)** Korean experts assessed the climate change risk and vulnerability using the indicator and survey based approach. Moreover, drinking water purification technology known as the Gravity-Driven Membrane (GDM) was installed as a pilot for households without access to adequate drinking water.
  - **(Anticipated impact)** The action plan developed from this pro bono TA is expected to guide policymakers and stakeholders in Kurunegala city on how to increase the climate resilience of the city. Their increased capacity will enable them to conduct assessments on other issues and

reflect climate adaptation aspects to urban development planning. The direct beneficiaries of an updated urban plan with adaptation measures will be the 40,000 citizens in Kurunegala.

Mitigation

- **Innovative renewables and waste heat technologies in Belgrade's district heating system**[6)]
  - **(Background/challenges)** The District Heating System (DHS) for the City of Belgrade connects upto fifty percent (50%) of all households. However, limited investment and maintenance for DHS resulted in the gradual deterioration of the DHS and the insulations of buildings. There was a need to identify renewable and waste heat sources and assess the feasibility to attract additional financing for renewable energy projects.
  - **(Objective)** The objective of this pro bono TA was to conduct a feasibility study on renewable (RE) and/or low-carbon District Heating demonstration projects for potential scale-up in the City of Belgrade.
  - **(Korean expertise/technology supported)** Six (6) renewable technologies; combined heat and power, district heating boiler, geothermal, waste heat recovery, heat pump, solar thermal were assessed according to their fuel source, benefits and impact on climate change.
  - **(Anticipated impact)** The reports and action plan developed from this pro bono TA are expected to assist the City of Belgrade in setting a long-term plan for the uptake of the renewable and waste heat energy sources in their DHS. This will allow the continuous provision of efficient heating to the communities, reduce GHG emissions and improve energy efficiency.

- **Financing strategy for transit oriented development in Addis Ababa**[7)]
  - **(Background/challenges)** Addis Ababa, the capital of Ethiopia, and its fast growing urban population are experiencing a lack of public infrastructure leading to limited access to public transportation services. Although a Transportation Oriented Development (TOD) strategy was planned to be implemented for the existing 35-km Light Rail Transit (LRT) system, there were financial challenges including high investment costs and low fare levels.
  - **(Objective)** The objective of this pro bono TA was to support the climate-vulnerable areas of Ethiopia by assisting the Government of

Ethiopia to devise a suitable financing instrument to fund the incremental cost of the urban infrastructure and to leverage sources of private capital required for the development of the TOD.

- **(Korean expertise/technology supported)** Based on the South Korean experience in implementing the TOD, the Korean experts team identified the Bust Information and Management System (BIMS) as the best suitable technology, analyzed the initial cost for development and evaluated the potential environment impact.
- **(Anticipated impact)** When the TOD plan is implemented, it will contribute to the mitigation of GHG emissions and traffic congestions from private vehicles. The direct beneficiaries of the TOD plan are the 120,000 daily passengers that use the LRT. The increased utilization of public transportation will expand the relevant market and attract potential private investors such as IT solution/system providers in the transport sector.

• **Development of low-emission mobility policies and financing proposals for Cambodia**[8)]

- **(Background/challenges)** The Government of Cambodia seeks to reach its NDC target of 27% reduction of emissions compared to its BAU by 2030, of which 3% accounts for the transport sector. There is a high potential for a positive impact on GHG emissions by switching conventional vehicles to e-mobility. Therefore there is a need for developing an e-mobility policy action plan to boost action and investment for electric transportation in Cambodia.
- **(Objective)** The objective of this pro bono TA was to support the implementation of E-mobility in Cambodia through developing a policy action plan and project proposal on sustainable and low-emissions transport.
- **(Korean expertise/technology supported)** Korean experts derived a BAU and two (2) alternative policy option scenarios by analyzing the GHG emission reduction impact, lifecycle cost, environmental and health impact, socio-economic impact and gender assessment. They mapped the three (3) scenarios through the multivariate comparative analysis to identify the key barriers and enabling conditions.
- **(Anticipated impact)** The action plan implemented by this pro bono TA is anticipated to provide scenarios for CO2eq emissions reduction or avoidance by switching to e-mobility. It will also contribute to achieving

the NDC target of 3% emissions reduction in the transport sector. Also, the project concept note may leverage funding or investment for future e-mobility projects.

- **Technical assistance for the development of a climate smart city in Kurunegala, Sri Lanka (mitigation elements)**[9)]
  - **(Background/challenges)** Kurunegala is one of the fastest developing economic and administrative city of Sri Lanka. Its high population growth rate and increased traffic volume have led to increases in energy consumption, waste generation and severe traffic congestion. The city requested for a roadmap to convert into a climate smart city focused on the transport, energy and waste sectors, which are the major causes of increased GHG emissions.
  - **(Objective)** The objective of this pro bono TA was to develop a pathway for the transition to a low emission municipality in Kurunegala by analyzing the status quo of the city in energy, transport and waste sectors, providing capacity building for city planners in the aforementioned sectors.
  - **(Korean expertise/technology supported)** The Korean experts set specific goals in the roadmap through collecting primary and secondary data from literature review, on-site survey and tools such as Analytic Hierarchy Process (AHP). They also supported a toolkit for developing a GHG inventory.
  - **(Anticipated impact)** The roadmap developed from this pro bono TA includes climate technology DB, which is expected to guide policymakers and stakeholders in Kurunegala city in selecting the best available climate technologies for mitigation. It can also be replicated for other cities to reflect mitigation measures in climate smart city planning. The direct beneficiaries of this mitigation roadmap will be the 40,000 citizens in Kurunegala.

Cross-cutting

- **Technology assistance to supply domestic solar water pump in Tanzania**[10)]
  - **(Background/challenges)** Tanzania has prioritized water resources as rural water supply and sanitation is one of the three main areas for its Water Sector Development Program 2006-2025. This TA seeks to improve such conditions in semi-arid regions of Tanzania through solar photovoltaic conversion of its abundant solar renewable energy potential into electricity to run a sustainable water pumping system.

- **(Objective)** The objective of this pro bono TA was to develop a domestic solar photovoltaic water pumping system through a small scale demonstration. The pilot installation was used to develop a business model for scale-up/replication.
- **(Korean expertise/technology supported)** The Korean experts developed a solar water pumping system, and modified in consideration of the local procurability of the parts. The technologies applied to the pilot system are direct-current submersible pump, variable type system and reverse osmosis system for desalination of the drinking water.
- **(Anticipated impact)** The business model developed from the pilot testing of this pro bono TA will contribute to the replication and up-scaling of the solar water pumping system at off-grid regions of Tanzania. The installed filter will increase sanitation, health and wellbeing. The direct beneficiaries of the pilot installation are 12,000 people living in the Nghambi village.

• **Technical support for the dissemination of Togo's solar energy technology**

- **(Background/challenges)** Togo's limited access to energy has long hindered its economic development. Despite its ambitious goal to achieve 100% energy access by 2030, proper planning and efficient deployment of its resources are imperative. While the government established an institution and launched programs for sustainable rural energy, policy and implementation gaps are prevalent in the solar energy market. This TA seeks to provide solar energy technology and financial options for increased dissemination of and access to solar energy in Togo.
- **(Objective)** The objective of this pro bono TA was to review the solar energy technologies in Togo and suggest options to link resources to enhance the power supply rate in rural areas of Togo.
- **(Korean expertise/technology supported)** Based on economic, environmental and sustainability indicators, Korean experts identified and proritized the solar energy technology options and systems for different regions of the country. The process also included developing a training manual that covers design of solar PV system, solar energy planning and development, RE financing and market linkages.
- **(Anticipated impact)** The reports and training materials developed from this pro bono TA are expected to improve the knowledge and capacity of the relevant stakeholders on planning, deployment and financing for solar energy projects. This may then contribute to the increased adoption of solar energy technologies at households, schools and offices.

Lessons learned

Role of the intermediary

- The presence of the intermediary institutions was the distinct feature of Korea's CTCN pro bono TA. Intermediaries are third parties, bridging institutions, and brokers that facilitate inter-organizational relations[10], playing a role that enables better management of the TA.
  - (Communication) The intermediary organization made interventions to create a solid communication line and facilitate a clearer understanding of the TA by engaging with key stakeholders, the NDE, the CTCN secretariat, the implementer.
  - (Project identification) It identified the need for a CTCN TA by defining the gap in the status quo and helped to secure sustainability in the project by linking with other financial options to create synergy.
  - (Data collection) It provided primary and secondary data which is otherwise not accessible in the local setting.

Role of the NDE

- The NDEs serve as the window for all CTCN-related communications. Thus, it is important for the NDE to fully understand their roles and actively participate for the facilitation of the CTCN.

- The engagement and the solid commitment of the NDE on the TA will allow its outcome to better secure up-scaling and sustainability.
  - NDEs played an active role in communicating with relevant government agencies to quicken the admin process for additional scale-up project.
  - They also played the key role in all climate change related matters throughout the country to identify a potential project for TA. In one case it encouraged the formation of a team within the local government to secure the sustainability of the assistance received

- Korean NDE adopted a programmatic approach to set up an institutional arrangement for establishing inter-country partnerships and providing pro bono support.
  - 'Korean CTCN pro bono Committee', a national platform for pro bono support discussions, facilitates the participation of Korean CTCN network members to provide their financial resources and/or technical expertise.

Limitations

- In the case of the pro bono TAs for the year 2019 and 2020, the pandemic was the major risk in implementing the TA due to travel restrictions and frequent government lock downs of recipient countries.
  - Major communication was made on-line regularly and the situation required the full support from the NDE in opening all relevant channels for stakeholder consultation.
- Data of the recipient country may be poorly managed, lack reliability and documented in the native language, which lowered the accuracy of the assessment results and hindered verification.
- In the case of pilot demonstration using hardware technology, a trial-and-error is inevitable for modification.
  - Hardware parts purchased and assembled in Korea may not function on-site and require additional modification, incurring unexpected expenditure. Whether the arts can be locally produced and manufactured should be adequately considered.

Way forward

Best practices: scale up opportunities based on CTCN pro bono support TA

- Part of the results from the pro bono TA in Serbia was applied to develop an Official Development Aid (ODA) project of the Republic of Korea.
  - It is entitled 'Incorporation of Smart Monitoring System using IoT Technology for District Heating and Establishment of Renewable Energy Integration Network Plan in the District Heating system of Belgrade', with a duration of 24 months and a budget of 550,000 USD.
- The network and data accumulated on e-mobility from the pro bono TA in Cambodia helped to identify the political will and commitment of the NDA in developing a Green Climate Fund (GCF) Readiness proposal.
  - The title of the proposal is 'Climate Technology Deployment Roadmap for E-mobility Ecosystem in Cambodia', with a total requested budget of 199,920 USD and implementation period of 16 months.

Strengthen the linkages between the Technology Mechanism and the Financial Mechanism

- TA allows for network creation between relevant stakeholders and line ministries including the national focal points of operating entities of the Financial Mechanism (i.e. National Designated Authorities (NDAs) of the GCF and focal points (FPs) of Global Environment Facility.
  - The national focal points of the Financial Mechanism should engage in stakeholder consultation from the initial stage of the pro bono TA.

- The new CTCN Partnership and Liaision Office in Korea will open a channel for closer collaboration between the CTCN and the GCF.
  - It will allow the two mechanisms to transcend beyond their boundaries by exchanging technical and financial expertise, enhancing information sharing and coordination between NDEs and NDAs.

Create a feedback loop for future pro bono support

- A completed pro bono TA should be evaluated to collect feedback on the results of its implementation and to check its sustainability.
  - (End-of-project evaluation) The overall satisfaction of the pro bono TA can be evaluated by conducting surveys and interviews with primary stakeholders of the recipient country.
  - (post-closure evaluation) The overall monitoring of the pro bono TA results can be conducted within two (2) years after the completion to identify the barriers to the project sustainability.

- The accumulated feedback can be reflected in Korea's future pro bono support activities.
  - The Korean CTCN pro bono TA guideline can be modified for the improvement of Korea's CTCN pro bono support.
  - Korean CTCN Network members who participated in the pro bono TA can gain experience and lessons which will be then shared with other Korean CTCN network members for future technical assistance.

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