

CLIMATE TECHNOLOGY CENTRE & NETWORK



CTCN

2020 Annual NIE Seminar for accredited NIEs

Transformative technologies for adaptation

2 September 2020

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- Technologies defined in climate change adaptation
- Access to technology for climate change adaptation: Introduction to the CTCN technical assistance
- Example of technology implementation for climate change adaptation: Cases of the CTCN's intervention in Asia-Pacific



Overview of technology trends in climate change adaptation



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Technology trends in climate change adaptation

Innovation

Ecosystem-based
adaptation (EbA)

Urban adaptation
/ resilience

Cross-sectoral
(multi-sectoral)
approach

Bottom-up
approach

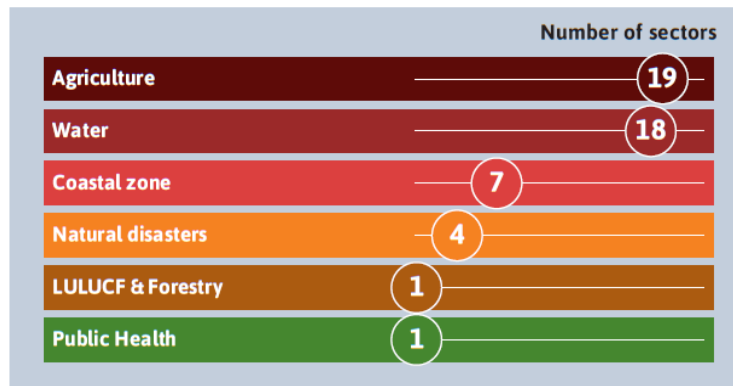
Women & gender,
youth, indigenous
community

SDGs, COVID-19,
Build Back Better

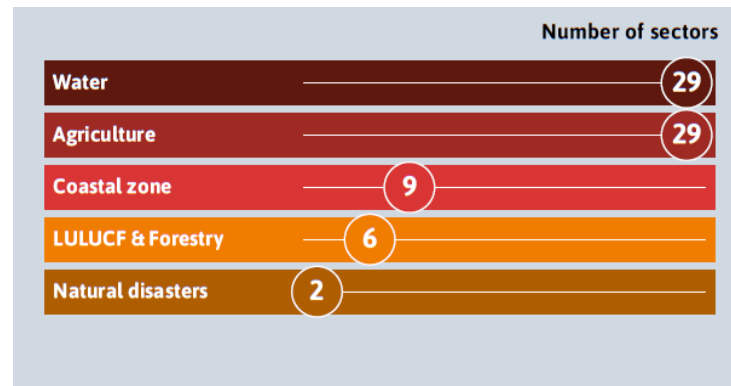
Technology trends of developing countries in climate change adaptation – Technology Needs Assessment (TNA)

- Global TNA project supports developing countries to **identify and prioritise their technology needs** and **develop their action plans on climate technologies** in their effort to pursue the targets under the Paris Agreement.
 - UNEP through UNEP-DTU Partnership administers the project with funding from Global Environment Facility (GEF).
 - Technical assistance, capacity building and guidance are provided by UNEP and UNEP-DTU Partnership in collaboration with its regional centres for the project.

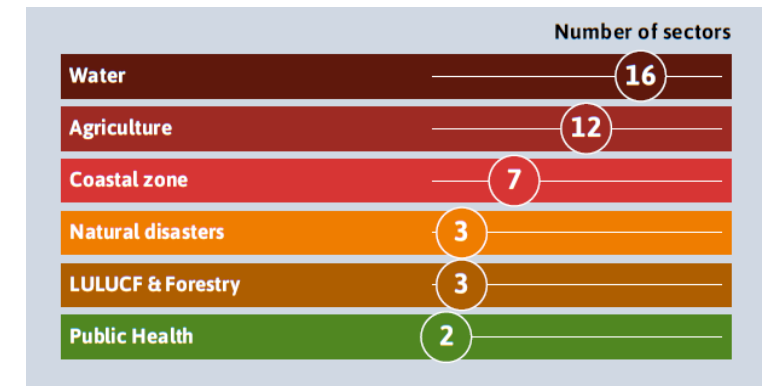
< Adaptation priority sectors in Asia-Pacific, Africa and LAC >



(a) 21 countries in Asia-Pacific



(b) 31 countries in Africa

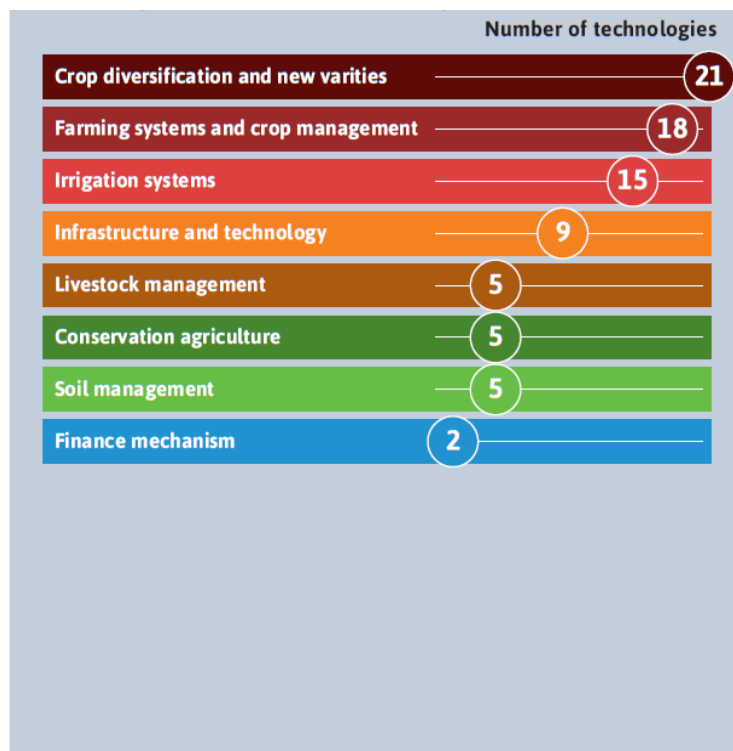


(c) 18 countries in LAC

Source: <https://tech-action.unepdtu.org/>

Technology trends of developing countries in climate change adaptation – Technology Needs Assessment (TNA) (cont.)

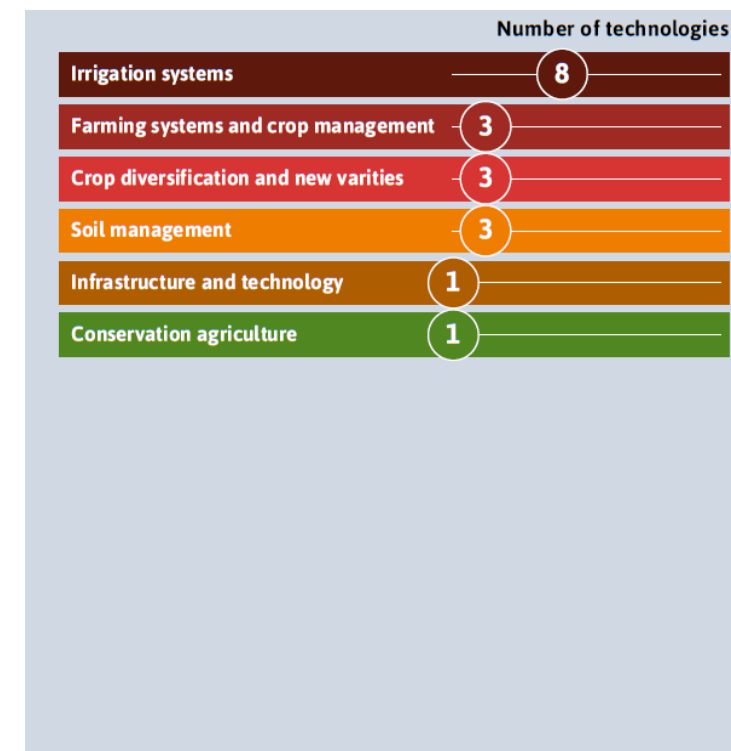
< Technology needs for adaptation in agriculture sector in Asia-Pacific, Africa and LAC >



(a) 21 countries in Asia-Pacific



(b) 27 countries in Africa



(c) 18 countries in LAC

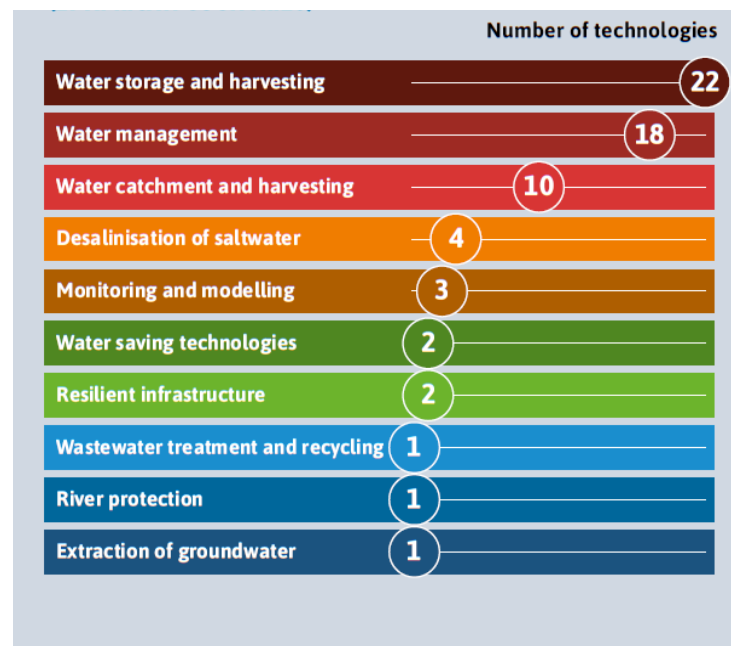
Source: <https://tech-action.unepdtu.org/>

Technology trends of developing countries in climate change adaptation – Technology Needs Assessment (TNA) (cont.)

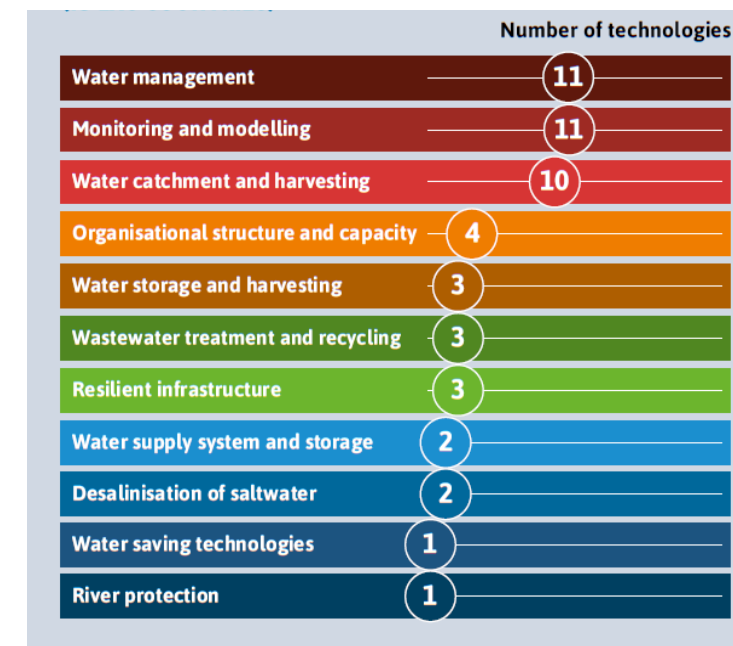
< Technology needs for adaptation in water sector in Asia-Pacific, Africa and LAC >



(a) 21 countries in Asia-Pacific



(b) 27 countries in Africa



(c) 18 countries in LAC

Source: <https://tech-action.unepdtu.org/>

Technologies defined in climate change adaptation



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Climate change adaptation technology

“Application of technology in order to reduce the vulnerability, or enhance the resilience of a natural or human system to impacts of climate change”

Source: UNFCCC (2005)

- Three categories of climate change adaptation technology (Christiansen et al., 2011)
 - **Hardware:** Hard technology
 - **Software:** ① Capacity and processes involved in the use of technology, ② Knowledge and skills and ③ Education and training
 - **Orgware:** Ownership and institutional arrangements of the community or organisation where the technology will be used

Sector / Technology type	Hardware	Software	Orgware
Agriculture	Crop switching	Farming practices, research on new crop varieties	Local institutions
Water resources and hydrology	Ponds, wells, reservoirs, rainwater harvesting	Increase water use efficiency and recycling	Water user associations, water pricing
Coastal zones	Dykes, seawalls, tidal barriers, breakwaters	Development planning in exposed areas	Building codes, early warning systems, insurance
Health	Vector control, vaccination, improved water treatment and sanitation	Urban planning, health and hygiene education	Health legislation
Infrastructure	Climate proofing of buildings, roads and bridges	Knowledge and know-how	Building codes and standards

Source: Christiansen et al. (2011) *Technologies for adaptation - perspectives and practical experiences*

Scope of climate change adaptation technology

- UNEP-DTU Partnership – *Taxonomy in consideration with technology needs from developing countries*

Agriculture & forestry

- Agro-forestry, silviculture & mixed farming
- Farming systems and crop management
- Forest management
- Increasing crop resilience
- Irrigation systems
- Land management training
- Livestock management
- Seed, grain & food storage
- Terrestrial ecosystems management

Coastal zone

- Integrated coastal zone management
- Protection (hard engineering)
- Protection (soft engineering)

Cross-sectoral enablers & approaches

- Capacity building & training
- Communication & awareness
- Economics & financial decision making
- Ecosystems & biodiversity
- Governance & planning

Early warning & environmental assessment

- Early warning systems & forecasting
- Hazard mapping
- Monitoring systems

Human health

- Healthcare equipment
- Public health services

Infrastructure & urban planning

- Building design & material
- Resilient infrastructure
- Urban planning

Marine & fisheries

- Fisheries management

Renewable energy

- Bioenergy

Water

- Alternative water sources
- Integrated planning
- Limiting nutrient leaking
- Riverine flooding protection
- Water augmentation (increasing capture and storage of surface run-off)
- Water conservation
- Water efficiency & demand management
- Water management
- Water supply system & storage
- Water treatment

Scope of climate change adaptation technology (cont.)

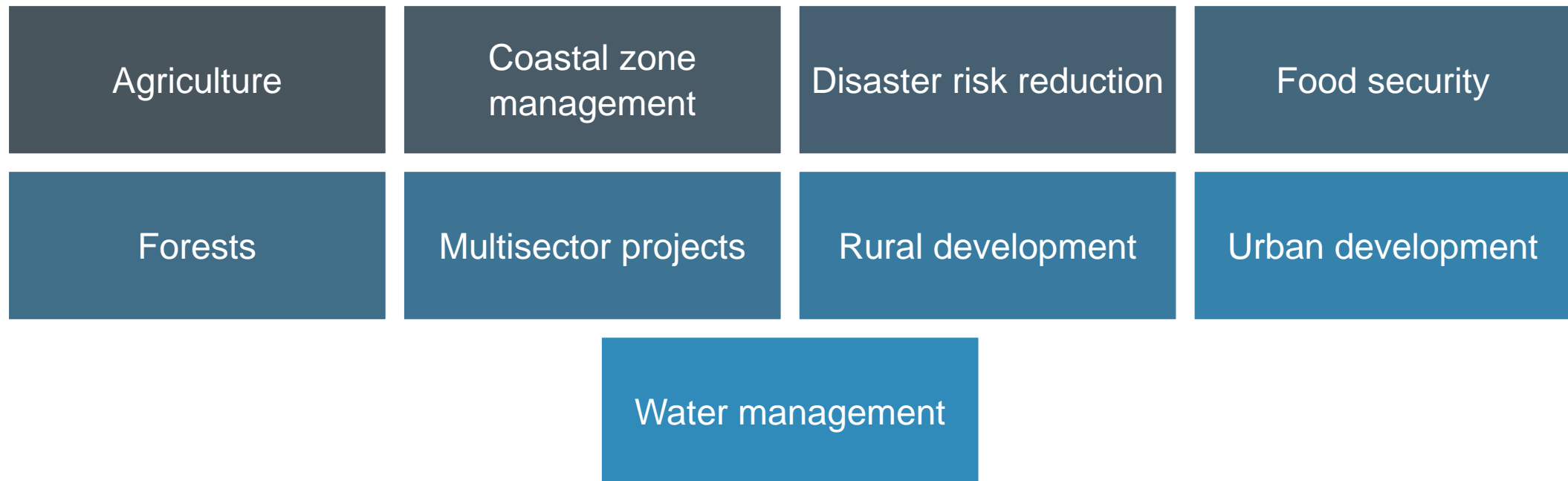
- Green Technology Center, South Korea – *Taxonomy in consideration with research and development (R&D) of technology*

Agriculture / livestock	Water	Climate change prediction and monitoring	Ocean / fishery / coast	Health	Forest / land
<ul style="list-style-type: none">• Genetic resources and gene improvement• Crop cultivation and production• Livestock disease management• Processing, storage and distribution	<ul style="list-style-type: none">• Water system and aquatic ecosystem management• Securing and supplying water resources• Water treatment• Water disaster management	<ul style="list-style-type: none">• Climate prediction and modelling• Climate information alarm system	<ul style="list-style-type: none">• Marine ecosystem• Fishery resources• Coastal disaster management	<ul style="list-style-type: none">• Infectious disease management• Food safety and preventative healthcare	<ul style="list-style-type: none">• Promotion of forest production• Reduction of forest damage• Ecology, monitoring and restoration

Source: Green Technology Center (2019) White paper 2019 on Green Climate Technology

Scope of climate change adaptation technology (cont.)

- Project sectors in the Adaptation Fund



Source: <https://www.adaptation-fund.org/projects-programmes/project-sectors/>

Access to technology for climate change adaptation:

Introduction to the CTCN technical assistance



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Climate Technology Centre & Network (CTCN)



Mission: To promote *the accelerated development and transfer of climate technologies at the request of developing countries* for energy-efficient, low-carbon and climate-resilient development

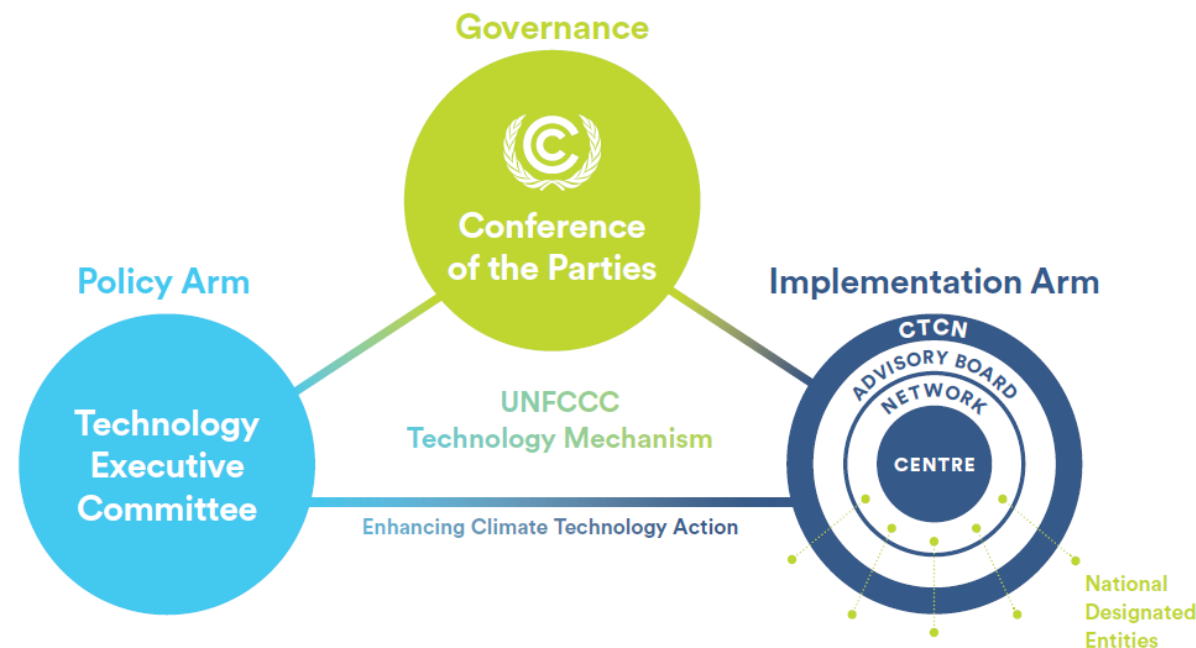


UN Framework Convention on Climate Change Technology Mechanism

Hosted by:



< UNFCCC Technology Mechanism >



Climate Technology Centre & Network (CTCN) (cont.)



Agriculture
Carbon Fixation & Abatement
Energy Efficiency
Forestry
Industry
Renewable Energy
Transport
Waste Management

CTCN Services

TECHNICAL ASSISTANCE

KNOWLEDGE SHARING

COLLABORATION & NETWORKING



Agriculture & Forestry
Coastal Zones
Early Warning & Environmental Assessment
Human Health
Infrastructure & Urban Planning
Marine & Fisheries
Water

Countries Receiving Technical Assistance

- 100 countries
- 206 technology transfer interventions (as of 28 Aug.2020)
- Increasing multi-country requests

< Type of the assistance >

- Decision-making tools and/or information provision
- Feasibility of technology options
- Financing facilitation
- Piloting and deployment of technologies in local conditions
- Private sector engagement and market creation
- Recommendations for law, policy and regulations
- Research and development of technologies
- Sectoral roadmaps and strategies
- Technology identification and prioritisation

Process of the technical assistance (TA)



Interested parties in developing countries contact their national focal point (National Designated Entity, NDE) to request technical assistance.

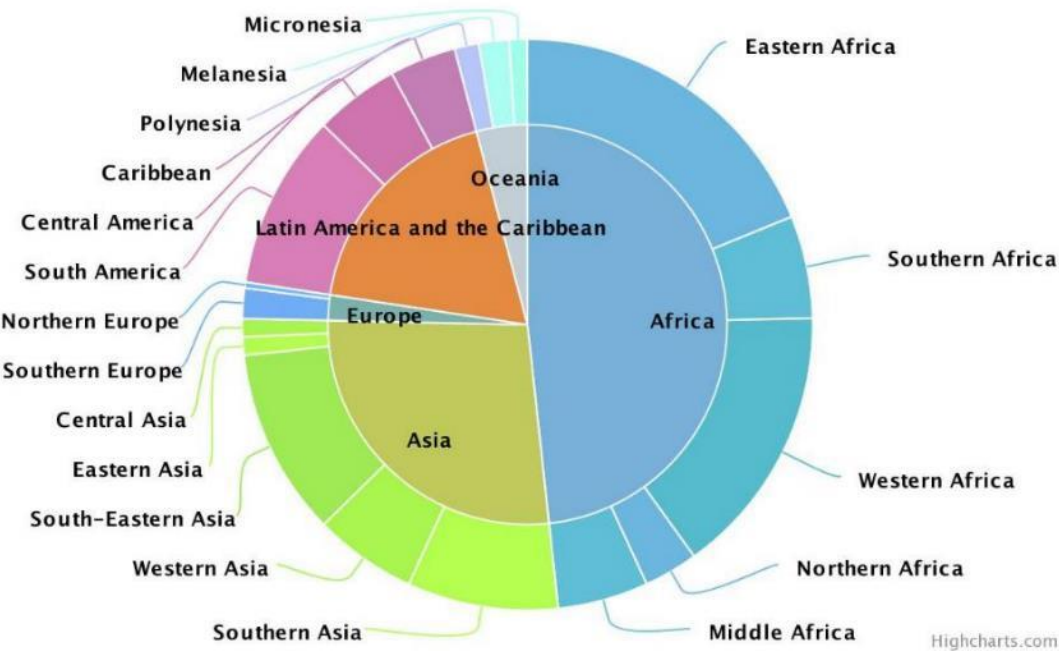
The NDE confirms the alignment of the request with its national climate priorities and passes it along to the CTCN.

The CTCN collaborates with the NDE and applicants to develop a tailored technology transfer plan.

The Climate Technology Centre selects a Network member to implement the technology solution.

TA requests at a glance

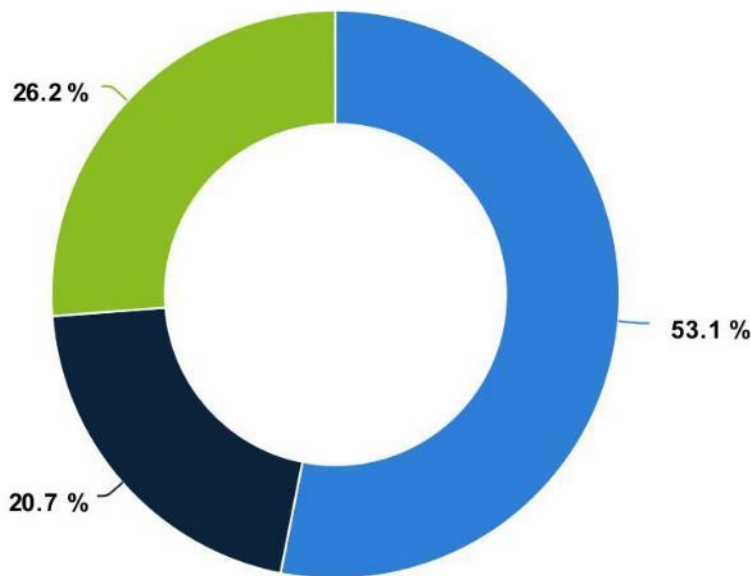
< TA requests by region >



Highcharts.com

Source: CTCN website (as of 28 Aug. 2020)

< Distribution of TA requests by objective >



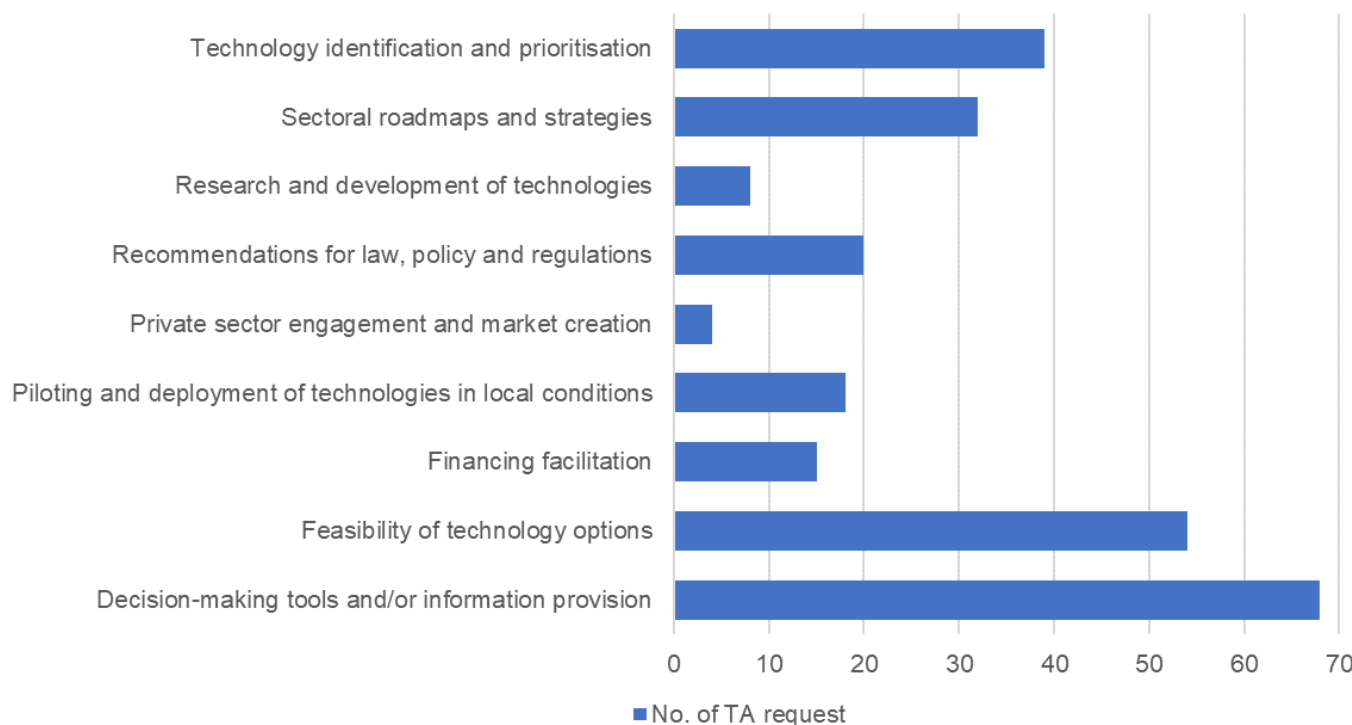
 Mitigation  Adaptation and mitigation  Adaptation

Highcharts.com

Source: CTCN website (as of 28 Aug. 2020)

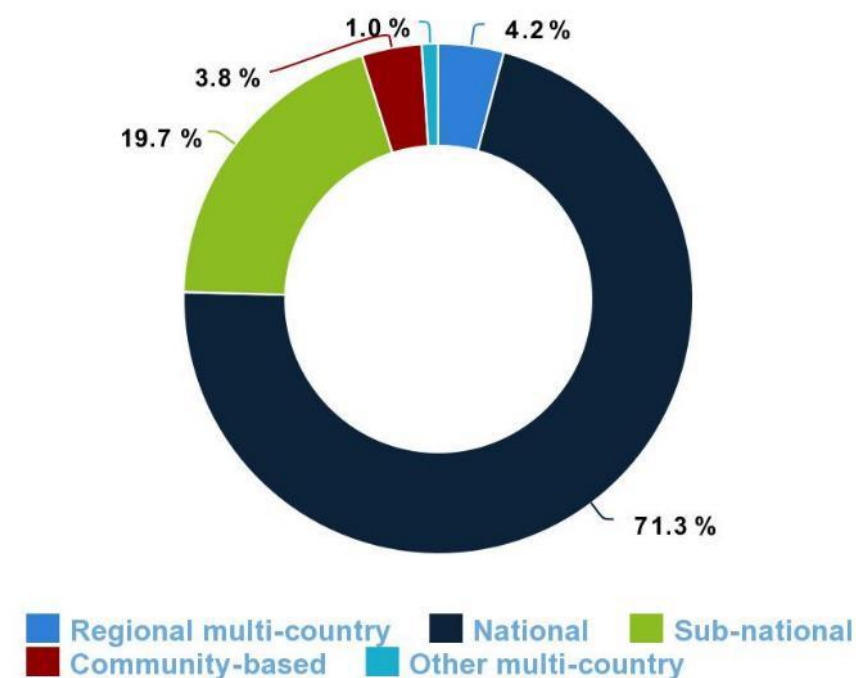
TA requests at a glance (cont.)

< Distribution of TA requests by type of assistance >



Data source: CTCN website (as of 28 Aug. 2020)

< Distribution of TA requests by geographical scope >



Highcharts.com

Source: CTCN website (as of 28 Aug. 2020)

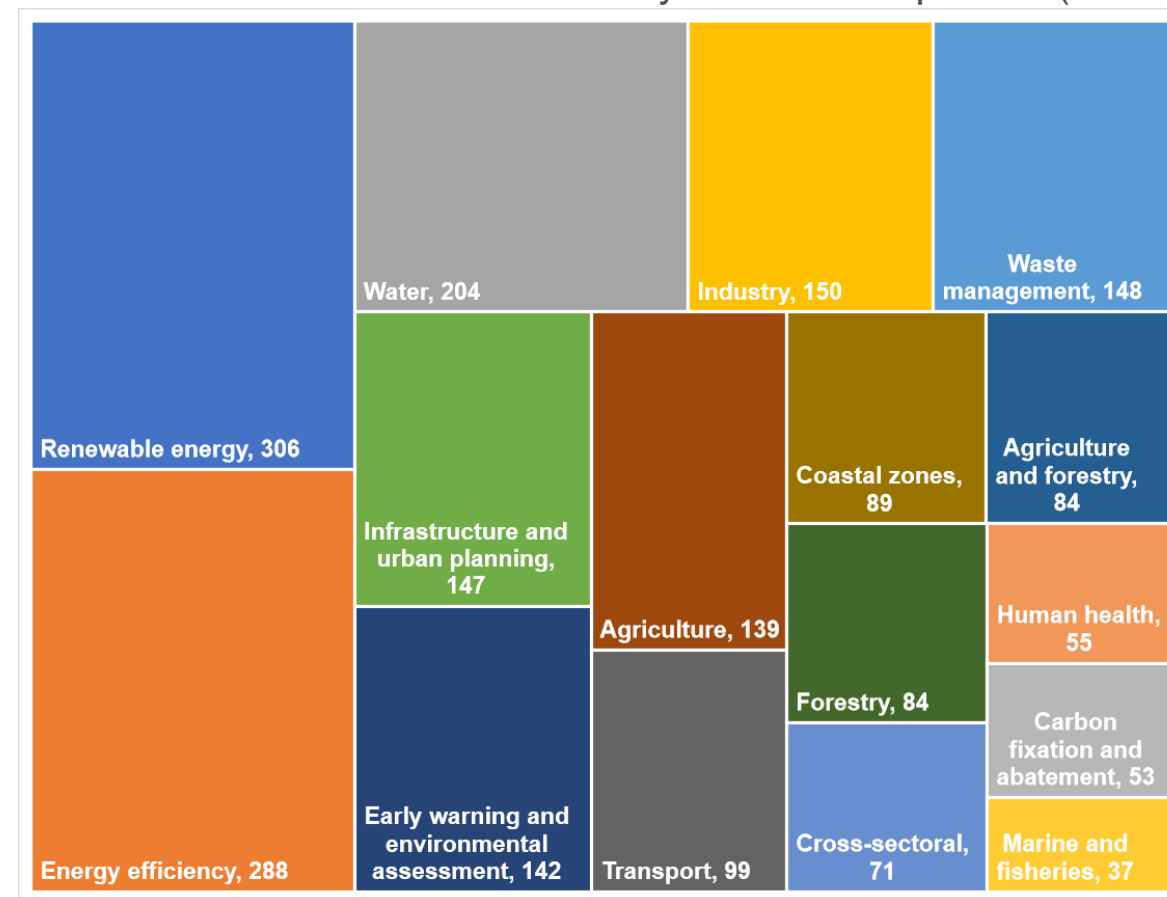
Engagement of the Network Members

- 592 organisations work with the CTCN as Network Members (as of 28 Aug. 2020).

Type of Network Members	Percentage (%)
Private sector organisation	48.6
Research and academic institution	21.3
Non-governmental organisation	11.2
Not for profit organisation	7.2
Public sector organisation	6.9
Intergovernmental organisation	2.0
Partnership	1.4
Financial institution	0.7
Initiative	0.5
Regional organisation	0.2

Data source: CTCN website (as of 28 Aug. 2020)

< Distribution of Network Members by technical expertise (sector) >



Data source: CTCN website (as of 28 Aug. 2020)

Up-scaling financial opportunities through TAs

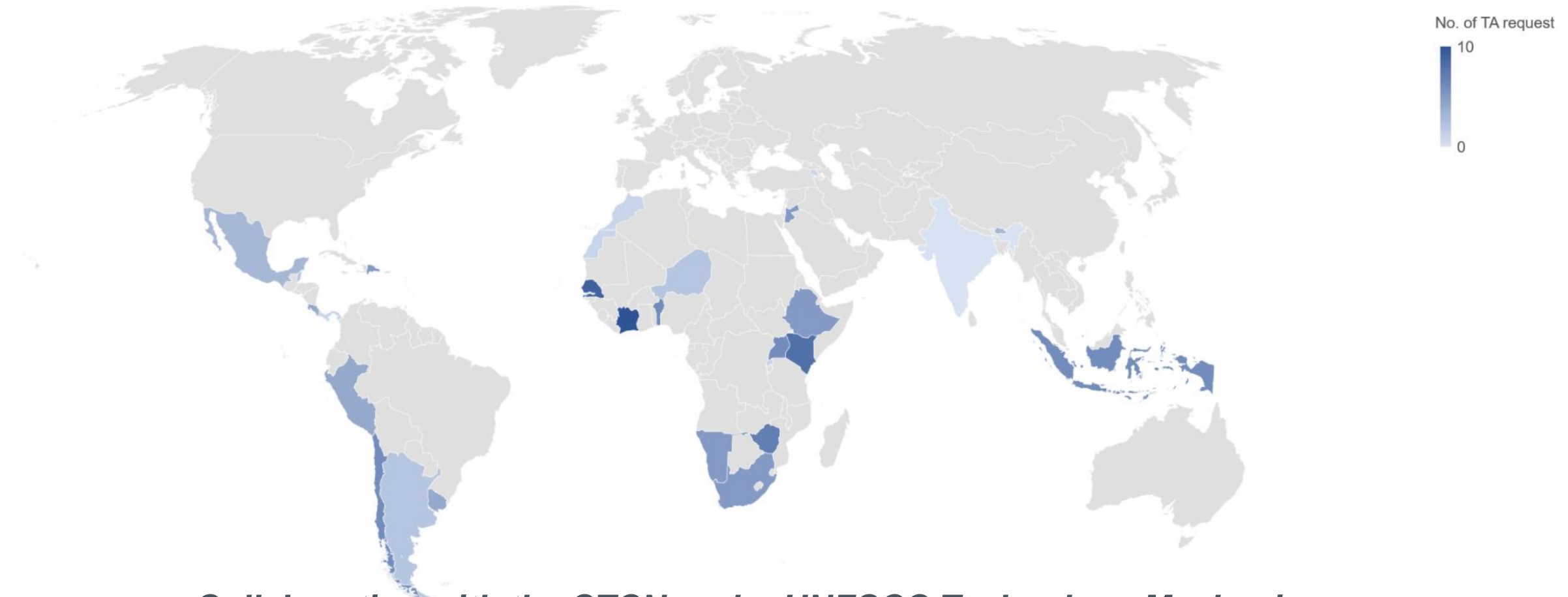
- The CTCN can support National Implementing Entities (NIEs) in preparation and design of the project.
 - Provide technical support required at early stage of project development cycle (e.g. feasibility assessments of technology options, recommendation for law, policy and regulations, etc.)
 - Address specific challenges and technology barriers
 - Deploy adaptation-related technical solutions (pilot study)
- Outputs from the TAs can be used as inputs in developing and submitting a funding proposal to the Adaptation Fund Board, etc.
- As a country-driven process, TA requests are signed and submitted by the national focal point (NDE) to the CTCN.

Find the NDE of your country through a link as below:

<https://unfccc.int/ttclear/support/national-designated-entity.html>



TA requests from countries that have NIEs



***Collaboration with the CTCN under UNFCCC Technology Mechanism
is ongoing in your countries.***

Data source: CTCN website (as of 28 Aug. 2020)

[TA in Laos] City climate vulnerability assessment and identification of ecosystem-based adaptation (EbA) intervention

- Provision of necessary information to identify a set of suitable EbA options for 6 cities in Laos
 - 6 Cities: Luang Prabang, Vientiane, Paksan, Thakek, Savannakhet and Pakse
 - Assessment of climate change impacts at city levels
 - Assessment of ecosystem services and their vulnerability to climate change (e.g. flood)
 - Identification and prioritisation of EbA options suitable for each city
- Example of the EbA options considered in the TA
 - Reforestation & Forest conservation
 - Wetland restoration or conservation
 - Water harvesting & Establishing flood bypasses
 - Green roofs/spaces & Permeable pavements, etc.
- Development of necessary inputs to the GCF funding proposal



[TA in Laos] Designing ecosystem-based solutions for building urban resilience

- Provision of economic and engineering analyses, the results of which were required to revise and fine-tune the funding proposal to the GCF

Economic analysis	Engineering analysis
<ul style="list-style-type: none">• Conduct a cost-benefit of EbA intervention (6 cities)• Identify expected beneficiaries	<ul style="list-style-type: none">• Describe the topography in each site• Identify potential pollution remediation issues• Describe which flood events the proposed intervention will address• Produce outline design of the infrastructure

- Support for revision/resubmission of the GCF funding proposal
 - 11.5m USD project (10m USD GCF Grant) on ecosystem-based solutions approved
 - Approx. 899,600 beneficiaries expected (12% of country population)
- Contribution to paradigm shift in adaptation from grey to green infrastructure for reducing flood vulnerability at city levels



Example of technology implementation for climate change adaptation:

Cases of the CTCN's intervention in Asia-Pacific



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Technology implementation (CTCN's intervention) for climate change adaptation

- Coastal zones sector
 - **(Kiribati, Marshall Islands, Palau & Solomon Islands)** Capacity development to address risks in coastal zones

*Development of **the bathymetric (standardised bathymetric grids and digital elevation grids) and the wave models** for four Pacific island states would provide a coastal modeling tool that outlines 'high hazard' areas and could be used in coastal zone risk management and planning.*

- **(Bangladesh)** Technology for monitoring & assessment of climate change impact on geomorphology in the coastal areas of Bangladesh

*Development of **the methodology for use of earth observation (EO) tool** would enhance capacity of technical staff and decision makers to utilise modern EO techniques to monitor climate change challenges and provide early warning of bank erosion in the coastal zone of Bangladesh.*



Technology implementation (CTCN's intervention) for climate change adaptation (cont.)

- Early warning and environmental assessment sector
 - **(Myanmar)** Promoting data for climate change, drought and flood management in Myanmar

*Development of **the web portal** would provide free and easy access to data and information for flood and drought management, supporting government officials and stakeholders in Myanmar engaged in climate change adaptation and management of water resources and extreme events.*
 - **(Thailand)** Strengthening Bangkok's early warning system to respond to climate induced flooding

*Development of **the urban flood early warning system (web-based)** would improve municipal planning in Bangkok to reduce loss of economic productivity and property due to flooding (increase in safety and transportation efficiency of the city).*



Technology implementation (CTCN's intervention) for climate change adaptation (cont.)

- Infrastructure and urban planning sector
 - **(Sri Lanka)** Development of Kurunegala as a climate smart city

*Development of **the adaptation action plan (water scarcity and heat stress)** and **the manual for local adaptation planning** would help local government officials in Sri Lanka take action to reduce climate risk at city/local levels.*
 - **(Indonesia)** Hydrodynamic modelling for flood reduction and climate resilient infrastructure development pathways in Jakarta

*Development of **the high-resolution hydrodynamic model** and socio-cultural survey would improve capacity of relevant government agencies to formulate policy and action plans to reduce flooding and support sustainable city planning in Jakarta.*



Technology implementation (CTCN's intervention) for climate change adaptation (cont.)

- Water sector
 - **(Bangladesh)** Saline water purification for households and low-cost durable housing technology for coastal areas of Bangladesh

*Identification and prioritisation of **the technologies for low-cost, domestic, climate resilient housing as well as desalination at household levels** would enhance climate resilience of local communities in the climate-vulnerable coastal areas of Bangladesh.*

- **(Cambodia)** Application of the gravity-driven membrane (GDM) technology for supplying sustainable drinking water to rural communities

*Implementation of **the small-scaled, decentralised, energy-efficient water treatment technology** would supply safe drinking water to communities in rural Cambodia affected by prolonged drought.*



Climate technology knowledge portal

- CTCN website www.ctc-n.org hosts nearly 17,000 publications, case studies, tools and webinars on climate change adaptation and mitigation, women and gender, etc.

Technology Sectors

Sectors

Adaptation



Agriculture and forestry



Coastal zones



Early warning and Environmental assessment



Water

Recorded webinars



CTCN Virtual Regional Meetings: Forum for Annex I NDEs (video)



Highlights from the UNFCCC Technology Mechanism event: Together we can recover better (video)



CTCN Virtual Regional Meetings: Forum for the NDEs in Pacific (video)

Source: CTCN website

Thank you

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