CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Instructions to lead Implementers for drafting the Technical Assistance Closure and Data Collection Report

Objective of the technical assistance (TA) Closure Report:

- To communicate publicly in one synthesis document a summary of progress made and lessons learned under the technical assistance (TA) towards the anticipated impact (main template).
- Compile TA-specific information required for internal use in donor and UN reporting (annex 1).

Steps for completing the TA Closure report:

1. The lead TA implementer drafts the report at the end of the assignment as a final deliverable /product. The TA Closure report will capture all activities conducted under the TA hence it is expected that duplication of information will occur from earlier documents. Please copy and summarize relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
2. A CTCN Manager will review and revise the TA Closure Report before final approval by the CTCN Director.

Important note on public and internal use of the closure report:
Once approved by the CTCN Director, the TA Closure report will be a public document available on the CTCN website. Annex 1 is for internal use only and will not be publicly available.

Closure and Data Collection Report for CTCN Technical Assistance

1. Basic information

Title of response plan	City climate Vulnerability Assessment and Identification of Ecosystem based Adaptation interventions Reference number 2016000024
Country / countries	Lao PDR
NDE focal point and organization	**Mr. Syamphone Sengchandala** Director of Management and Coordination Division Department of Disaster Management and Climate Change Ministry of Natural Resources and Environment Tel: 856 20 55508961 Email: syamphone.s@gmail.com Address: Building No. 100, 2rd Floor, Department of Disaster Management and Climate Change Ministry of Natural Resources and Environment, Lao PDR
Proponent focal point and organization	1. **Vientiane Capital** Mr. Ounla THAMMAVONGSA Deputy Head, Meteorology and hydrology Unit, PONRE Tel: 856 20 5885 9779 Email: ounla791@yahoo.com

	2. **Luangprabang Province** Mr. Phetbandith SOUKKAPONE Officer, PONRE Tel: 856 20 9987 1916 Email: soukapone@yahoo.com 3. **Bolikhamxay Province** Mr. Vilaphonh OUDOM Deputy Head, Planning and Administrative, PONRE Tel: 856 20 5401 3371 Email: vilaphonh73@gmail.com **4. Khammouan Province** Mr. Phonevisith KHOUNBORLOM Head, Disaster Management and Climate Change, PONRE Tel: 856 20 5560 7575 Email: ph.khounborlom@gmail.com **5. Savannakhet Province** Mr. Souvanh VOLASOUKHA Head, Disaster Management and Climate Change, PONRE Tel: 856 20 5595 7406 **6. Champasak Province** Mr. Sayasith VILAPHAT Head, Disaster Management and Climate Change, PONRE Tel: 856 20 5531 9871 Email: vilaphat@gmail.com
Sector(s) addressed	Agriculture Fisheries and aquaculture Forestry Water Ecosystem/biodiversity Infrastructure/human settlement Early warning/disaster reduction
Technologies supported	From response plan: - Re/afforestation and forest conservation - Riparian buffers - Wetland restoration or conservation - Constructing wetlands - Reconnecting rivers to floodplains - Establishing flood bypasses - Water harvesting - Green roofs - Green spaces/areas - Permeable pavements - Connecting existing green spaces - Mixed solutions - combining green and built infrastructure to maximize flood protection

<table>
<tr><td></td><td>From solutions/projects proposed (Annex C of the Final Technical Report):
- Drainage system provision, upgrade and maintenance
- Stream construction, upgrade and maintenance
- Protective dikes and ponds construction
- Enhance control over land use and watershed management upstream
- Development of regulations for forest conservation and wildlife hunting prohibition for catchment area conservation
- Creating a provincial/district/village committee for flood management and/or for conservation
- Training activities for all level committees on disaster management and response with EBA approach for the villagers of the target villages
- Transform small concrete catchments into natural looking, larger catchments
- Establishment of electrical pump stations
- Installation of water pumps and facilities
- Improvement of flood gates
- Upgrading of existing roads and channels
- Development of floating dams
- Bank stabilization along streams and restoration activities in the wetlands
- Installation of flood gates for better management of water flows via improved release-close mechanisms.
- Protection and restoration of ecosystems near streams

<u>Instruction</u>: Please indicate the type of technologies supported by this assistance, referring to the CTCN taxonomy of climate technologies available here: http://vocabulary.ctc-n.org/CTCNSemanticSearch.html</td></tr>
<tr><td>Implementation period and total duration</td><td>Expected timeframe (from request): May 2016-December 2016

Actual timeframe (from final technical report): May 2016 - December 2017</td></tr>
<tr><td>Total budget for implementation</td><td>Total budget: 245,179USD

Budget authorized for quick response as part of framework PCA with DHI: 47,616USD

Budget authorized under separate PCA with DHI, for the implementation of the large response: 197,563USD
<table>
<tr><th>Activities</th><th>Budget (USD)</th></tr>
<tr><td>Activity 1 (and part of activity 2 – framework PCA budget</td><td>47.616</td></tr>
<tr><td>Activity 2</td><td>14.212</td></tr>
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	<table><tr><td>Activity 3</td><td>27.694</td></tr><tr><td>Activity 4</td><td>51.400</td></tr><tr><td>Activity 5</td><td>63.399</td></tr><tr><td>Activity 6</td><td>16.350</td></tr><tr><td>Activity 7</td><td>24.508</td></tr><tr><td>**Total**</td><td>**245.179**</td></tr></table> *Instruction: In addition to financial value of the technical assistance, please also include if any pro bono or in-kind support has been provided by both the implementer and/or the national counterparts.*
Designer of the response plan	CTCN, DHI – the expert in water environments
Implementer of response plan	DHI – the expert in water environments

2. Summary of all activities, outputs and products that contribute to the expected impact of the technical assistance.

Description of delivered outputs and products as well as the activities undertaken to achieve them. In doing so, review the log frame of the original Response Plan and refer to it as appropriate.	In 2016 Laos PDR requested CTCN to assist the country to find new ways to cope with climate changes and especially changes to flooding and droughts. Through CTCN, DHI was invited to develop an approach to engage with the Government of Laos and the six designated cities. The aim of the project was to enable Laos to work with green infrastructure elements as tools to create resilience in the urban and peri-urban areas. Special focus was put on identifying and using ecosystem services as tools, accepting that some ecosystem services are damaged by floods but can at the same time provide other services to the society. The implementation plan comprises of seven main activities which followed the: - **Inception workshop and visit** through a scoping mission and meetings with a broad set of relevant national, state and city planners and representatives from the 6 cities. As part of this mission was also organized the inception workshop. Outputs: Scope, deliverables, time-plan, and expectations are aligned within the broad set of stakeholders - **Assessment of Climate Change impacts** through the provision of meteorological and hydrological data basis for assessing and quantifying the exact vulnerabilities stemming from CC, based on data collected and consolidated from local data holders. Outputs: key data sets gathered from governmental and regional institutions and key climate change data quantifying various scenarios of possible hydrological changes. - **Ecosystem Services Assessment** through the identification, assessment and prioritization of affected ecosystem services and of adaptation interventions for their enhancement and protection. Outputs: list of prioritized ecosystem services (including specific locations and quantified indicators) for urban and peri-urban areas in the selected cities.

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Vulnerability Assessment to assess the adaptive capacity of ecosystems and people, to identify specific adaptation options that can either reduce the sensitivity of the ecosystems or increase the adaptive capacity of the infrastructure and livelihoods of the people in the selected cities.
Outputs: maps showing the physical extent and possibly depth and duration of flooding, maps and tables of the adaptive capacity to the flooding hazards for people and ecosystems, vulnerability assessment maps to show the levels of vulnerability for the climate effects considered, combining the above information of hazards and adaptive capacity for the selected cities.
Identification, prioritization and initial design of Ecosystem Based Adaptation options, based on the combined analysis of the ecosystem service prioritization and vulnerability from previous activities.
Outputs: catalogue of ecosystem-based adaptation interventions and their overall costs, a ranked list of ecosystem based adaptation interventions, prioritized in dialogue with local stakeholders and training reports for activities conducted.
Input to GCF Project documents, to support a GCF proposal with the collected data and to enable implementation of ecosystem based adaptation activities.
Outputs: written inputs to GCF proposal, including potential data and map inputs, lists of adaptation options and methodological approach descriptions for upscaling of the used method.
Finalization and approval of results through final reporting activities.
Outputs: final report

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<td>Partners organizations</td>
<td>
<table>
<tr><th>Stakeholder (Lao PDR’s government and administrative bodies)</th><th>Role to support the implementation of the assistance</th></tr>
<tr><td>Ministry of Natural Resources and Environment/Department of Disaster Management and Climate Change</td><td>National focal and coordinating institution (NDE)</td></tr>
<tr><td>Municipal Authority Representatives at each of the 6 cities</td><td>Coordinate the TA at each city

Participation to training:

Champasak:
- Division of environment and natural resources
- Division of Agriculture and forestry
- Division of Public Works and Transportation</td></tr>
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		Savannakhet: - Division of environment and natural resources - Division of Agriculture and forestry - Division of Public Works and Transportation Thathek: - Division of Agriculture and forestry - Division of Environment and natural resources - Division of Public Works and Transportation Paksan: - Agriculture Division - Division of environment and natural resources - Division of Public Works and Transportation Vientiane Capital: - Division of Natural Resources and Environment - Division of Public Works and Transportation - Division of Agriculture and Forestry Luang Prabang: - Division of Environment and Natural Resources - Division of Public Works and Transportation - Division of Agriculture and Forestry
	Department of Housing and Urban Planning	Urban development planning
	Department of Land Planning and Development	Reduce impacts on the water supply systems during flooding
	Department of Water Resource	Management of water resources
	Department of Meteorology and Hydrology	Weather changing record provide basic hydro meteorological services for disaster reduction purposes
	Department of Forest Resource Management	Management of protection and conservation forest, define deforestation and restoration forest areas

	Instruction: Implementers and other partner organizations are defined as the people and institutions engaged in the implementation of the TA
Beneficiaries	Benefits of CTCN assistance include **state and municipal authorities in Laos** being able to address national and sub-national adaptation priorities as a result of using the VA data to inform the design of on-the-ground adaptation action. About 160 participants have received capacity building and training through the three workshops conducted by DHI. Direct beneficiaries of the technology transfer include **the inhabitants of the cities targeted by DHI - CTCN assistance**. For example, the technology transfer would inform the development of long term adaptation plans at each of the six cities by focusing on securing access to ecosystem goods and services for up to **820,000 people** (total population of 6 cities). Direct social benefits can also be derived from securing adequate access to environmental goods and services to large numbers of people living in cities. The total population of the targeted cities is as follows: - Vientiane capital: 197.000 - Pakse: 88.000 - Thakhek: 85.000 - Luang Prabang: 47.000 - Kaysone Phomvihane (Savannakhet): 67.000 - Pakxan: 28.000 - Total: 512.000 inhabitants *Instruction: Beneficiaries are defined as people and institutions benefitting from the TA*
Methodologies applied to produce outputs and products	**- Direct involvement of the authorities** from the six cities and the ministry was necessary to develop a proper baseline for the project. From the first workshop in August 2016, representatives from the authorities participated in the identification of positive and negative impacts from floods and droughts. All visits to Laos included visits to relevant authorities on both national and regional scale. - **Climate Change Assessments**: DHI estimated impacts of climate change at city level in the six CTCN cities, along with associated upland catchment areas that may contribute to urban flooding in the cities. In addition, DHI developed estimates of climate change impacts on headwater catchment areas in the Mekong River basin. The purpose of the climate change assessment was to develop quantitative estimates of changes to meteorological and hydrological variables, in order to inform the vulnerability assessment and prioritization of ecosystem-based adaptation measures. The **climate change impact analysis** estimated changes to three meteorological variables: rainfall, evaporation, and temperature. Because the primary climate-related focus of this CTCN assistance is flooding, the analysis of changes to rainfall included an approach for estimating changes to extreme precipitation. The approaches used to estimate changes to evaporation and temperature estimated changes to average values.

	- **Vulnerability Assessments**: the vulnerability assessment has been performed through a number of steps, where each step has been evaluated individually and results from each step has been combined to create the vulnerability assessment. The steps have been: • Assessment of extent of flooding • Assessment of the land cover • Development of a sensitivity analysis • Combining the three above to reach a vulnerability assessment - **Ecosystem-based adaptation identification:** The identification of ecosystem-based adaptation interventions necessary and suitable for each city and selected flood site, builds on the work carried out in the earlier stages of the project. These include two key analysis outcomes from the first two workshops of the project, namely a) the assessment of key damages resulting from floods and b) key ecosystem services damaged by floods. For identification of the specific ecosystem-based adaptation options for each site, participants were introduced to, and asked to evaluate a range of possible EBA interventions for the flood response in the key sites in their city. The selection and prioritization of the EBA interventions was linked to the previous assessments of the ESS, ensuring that the EBA interventions address the specific ESS damages in the site. - **Workshops, methods and content** **Preliminary visit and first workshops (August 2016)** DHI made a preliminary visit to the country in August 2016 and 3 identical workshops in Vientiane, Luang Prabang and Pakse were organised to help to identify positive and negative impacts during floods. Various authorities and ministries were also visited to identify availability of data, master plans and other sources of information to support the project. The approach used during the workshops was to a large extent based on **plenum and group work** to gradually create a mutual understanding of the potentials to work with ecosystem-based adaptation interventions. Specifically, the participants were organised in groups and discussed the topic flood-related problems and damages. The main flood damages that the participants could think of were all noted in terms of headlines. Hereafter, the participants ranked the various damages in terms of importance with 'high' and 'low' being the outer bonds. The participants did a similar exercise to identify damages to ecosystem services and subsequently prioritized them. **Second workshops and city visits (January 2017)** The outcome of these workshops provided the solid basis for the project and also provided the necessary basis for the Response Plan and for the interim workshops, held in January 2017, where all six cities were visited individually. Sites identified by the cities were visited and conditions on the site were discussed. The use of specific sites has enabled the participants from the six cities to concentrate on the relevant ecosystem services within the project areas and also to get a better understanding of what ecosystem services are and how they can be utilised to benefit the society.

	<u>Third and fourth workshops (September and December 2017)</u> The workshop carried out in September 2017 focused on linking identified ecosystem services to ecosystem-based interventions and each city had to consider which services were most relevant for their specific sites. It was up to the cities to pick the most relevant services and also to put an overall financial frame for the interventions, with DHI guidance. **A capacity building session** in September 2017 workshop was devoted to strengthening the understanding of participants of the dual role of ecosystem services in the selected sites. Firstly, that key ecosystem services are being damaged by floods, but also that ecosystem services provide increased resilience to floods and key socioeconomic benefits. This step has been important part of the project development, in order to increase the participants understanding of the importance of ESS and to translate the conceptual understanding of the ecosystem services to pragmatic examples of how ecosystem services interact with local socioeconomic activities (such as fishing, agriculture, irrigation, grazing, etc.). The final workshop in December 2017 provided an end to the project and delivered data to the cities and to the NDE. All cities were given detailed hazard maps, land cover classifications and vulnerability maps and the cities went through their sites to assess whether the information provided in the final report was in line with local observations. The process of developing the different types of maps was based on publicly available data and it was up to the cities to assess the quality of the data provided. *<u>Instruction:</u> Examples of methodologies: E.g. Cost-benefit analysis; surveys and structured interviews with key stakeholders; etc.*
Deviations	- The initial timeframe described in the request form was modified and prolonged for an additional 12 months. The expected time frame (assistance request form) was in fact May to December 2016, while the actual timeframe was May 2016 to December 2017 (final report). - DHI estimated impacts of climate change at city level in the six CTCN cities, along with associated upland catchment areas that may contribute to urban flooding in the cities. In addition, DHI developed estimates of climate change impacts on headwater catchment areas in the Mekong River basin. The purpose of the climate change assessment was to develop quantitative estimates of changes to meteorological and hydrological variables, in order to inform the vulnerability assessment and prioritization of ecosystem-based adaptation measures. - Overall data from the authorities in Laos were not at a precision level that could be used directly. Therefore, it was decided to make use of internationally recognised public data. - During the final workshop in December 2017, one of the cities suggested a change from one site to a new site, but it was considered being a task during the GCF project and not a subject for the present

<table>
<tr><td></td><td>project. However, the principles for changing sites were discussed and it was agreed that there were no obstacles to change a site to a new site, if it was properly documented.

- In the course of the project a wide range of available data sets with different levels of precision have been utilised. It was therefore necessary for the team to utilise the available data with caution and several assumptions had to be made, in order to make proper use of the data. However, despite of the variation in data quality, the various methods and approaches have provided a coherent and sufficient knowledge basis for establishing the project results and assessments.

- The analytical work in creating sensitivity maps has shown that although public data are available, there is a limit to how precise e.g. the digital elevation models are for the selected sites and cities. However, despite imprecise data, the development of the method to use public data, involving hazard mapping, land-cover classification and finally the vulnerability mapping, has shown that reasonable results can be obtained, but it has also shown that when it comes to the actual implementation of specific interventions, there may be a need for more precise assessment, involving development of e.g. local digital elevation models.

- Because of data and resource constraints, the climate change analysis did not estimate changes to river flows or catchment runoff. Developing quantitative estimates of changes to river flows and runoff would have required developing calibrated hydrological and hydraulic models of the Mekong River basin, along with side catchment areas with the potential to contribute to flooding in the six cities. This would have required data and resource inputs that are outside the scope of this project. Instead, estimates of changes to meteorological inputs in the headwater catchments of the Mekong and important side catchments are provided as a proxy for estimates of changes to flows and runoff.

<u>Instruction</u>: Please describe any deviations from the response plan against the actual implemented activities, outputs and products.</td></tr>
<tr><td>Achieved or anticipated gender benefits from the TA</td><td>As anticipated by the response plan, there is no particular attention to gender aspects in the technical assistance. However, the establishment of ecosystem based adaptation interventions, which this TA will ultimately provide the basis for, will likely benefit the people who are particularly vulnerable the most.

<u>Instruction</u>: Please describe expected gender benefits as described in the response plan.</td></tr>
<tr><td>Achieved or anticipated co-benefits from the TA</td><td>
<table>
<tr><th>Sustainable Development Goal</th><th>Contribution from CTCN assistance</th></tr>
<tr><td>1. End poverty in all its forms everywhere</td><td>Reduce impacts on private property and on small-scale peri-urban farmers.</td></tr>
<tr><td>2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture</td><td>Improve use of land in the zone between the rural and the peri-urban area for e.g. food production.</td></tr>
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	3. Ensure healthy lives and promote well-being for all at all ages	Reduce the flooding-related water borne diseases by reducing impacts from flooding.
	6. Ensure availability and sustainable management of water and sanitation for all	Reduce impacts on the water supply systems during flooding.*
	7. Ensure access to affordable, reliable, sustainable, and modern energy for all	Reduce impacts from power cuts.
	8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	By promoting EbA to reduce the vulnerability of city populations a better foundation of economic growth is provided for.
	9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	The TA promotes the usage of EbA which includes the usage of Green Infrastructure as part of the urban planning, which increases resilience.*
	10. Reduce inequality within and among countries	By decreasing the vulnerability, the poor part of the city populations will benefit in particular, wherefore inequality will reduce.
	11. Make cities and human settlements inclusive, safe, resilient and sustainable	Reducing damages from floods will make the 6 cities more resilient.*
	12. Ensure sustainable consumption and production patterns	The TA determines the ecosystem services provided to the city populations and how these can be sustained under a future climate.
	13. Take urgent action to combat climate change and its impacts	Reduction in flood patterns will help combatting impacts from Climate change.
	15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Improve conditions for ecosystem services as they will play an important part of flooding resilience.*
	16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	All city population groups will benefit from the TA.
	17. Strengthen the means of implementation and revitalize the global partnership for sustainable development	By reducing climate vulnerability in the cities using EbA, a sustainable development is promoted in Lao PDR which could spread to the region and globally.

	*The TA can lead to **environmental co-benefits**, such as water availability and waste management. For example, ecosystems provide cities with freshwater for drinking and other human uses; vegetation cover and forests in the city catchment influences the quantity of available water; ecosystems filter out and decompose organic wastes from urban effluents by storing and recycling waste through dilution, assimilation and chemical re-composition. *Instruction: Please describe expected co-benefits as described in the response plan.*
Anticipated follow up activities and next steps	Based on the identified city specific ecosystem based adaptation (EBA) interventions, responses and cost estimations, the beneficiaries should explore the possibilities of actual implementation of such interventions. For this purpose, the city administrations will explore the opportunities with GCF and other District Development Funds available for the cities. One of the post TA plans is the dissemination of the findings to other urban areas and at the national level so that such strategies and interventions can be scaled up in future and development of an Urban EbA capacity building plan. Throughout the technical assistance, 16 project ideas have been developed to tackle flooding issues in the targeted sites. The full description is to be found in Annex C of the Final Technical Report. *Instruction: Please describe how the Proponent and wider beneficiary country will use outputs and products and how these will contribute to the expected impact of the TA.*

3. Lessons learnt

Instruction: Per lesson, indicate which stakeholders would benefit most from what you have learned. In formulating your lessons, see them as recommendations for those that will be put in a similar situation like yourselves in the future. What would they need to do (or not do) based on your learning? This will enable CTCN to incorporate your lessons in other technical assistances.

	Lessons learnt	**Recommendations**
Lessons learnt in the area of the TA *Instructions: Indicate essential factors contributing to successful implementation, as well as specific challenges. Recommendations include considerations on what would need to be in place for increasing success of similar efforts (i.e. regulatory, legal, stakeholders, communication, etc.)*	The initial timeframe described in the request form was modified and prolonged for an additional 12 months. The expected time frame (assistance request form) was in fact May to December 2016, while the actual timeframe was May 2016 to December 2017 (final report).	
Lessons learnt related to climate technology transfer *Instructions: Indicate*	Overall data from the authorities in Laos were not at a precision level that could be used directly.	It was decided to make use of internationally recognised public data.

Opportunities, challenges and barriers for the use and deployment of the technology or technologies supported by the TA. The objective is to identify specific success factors for technology transfer. This information will feed the CTCN technology library and will contribute to increase learning on specific technologies	DHI estimated impacts of climate change at city level in the six CTCN cities, along with associated upland catchment areas that may contribute to urban flooding in the cities. The analytical work in creating sensitivity maps has shown that although public data are available, there is a limit to how precise e.g. the digital elevation models are for the selected sites and cities. Because of data and resource constraints, the climate change analysis did not estimate changes to river flows or catchment runoff. Developing quantitative estimates of changes to river flows and runoff would have required developing calibrated hydrological and hydraulic models of the Mekong River basin, along with side catchment areas with the potential to contribute to flooding in the six cities. This would have required data and resource inputs that are outside the scope of this project. The initial focus in the cities was on the urban areas exclusively. However, from the very first workshop and visit to the cities made it was evident that focus should rather be on the peri-urban areas. It is in the peri-urban areas that the future city expansions will take place and also where ecosystem-based solutions prove most efficient. Common practice is to favour either green or grey infrastructure. From the first site visit, it became clear that in order to have certain ecosystem based adaptation options in place, it was	DHI also developed estimates of climate change impacts on headwater catchment areas in the Mekong River basin. The purpose of the climate change assessment was to develop quantitative estimates of changes to meteorological and hydrological variables, in order to inform the vulnerability assessment and prioritization of ecosystem-based adaptation measures. However, despite imprecise data, the development of the method to use public data, involving hazard mapping, land-cover classification and finally the vulnerability mapping, has shown that reasonable results can be obtained, but it has also shown that when it comes to the actual implementation of specific interventions, there may be a need for more precise assessment, involving development of e.g. local digital elevation models. Instead, estimates of changes to meteorological inputs in the headwater catchments of the Mekong and important side catchments are provided as a proxy for estimates of changes to flows and runoff.

	necessary to combine such options with grey infrastructure solutions. In other words, grey and green infrastructure can beneficially work together. This twist in focus was fed back to CTCN who accepted the approach.	
Lessons learnt related the CTCN process for TA		

4. Illustration of the TA and photos

Instruction: For communication purposes, please provide 2-4 Power Point slides with illustrations or charts showing the TA process, applied methodology, activities, outputs and achieved results. The illustrations must be copied into the TA Closure report but must also be delivered as power point files. Also, please provide at least five high-resolution pictures in jpg format, capturing technical assistance (to be used as communication materials on the website, in progress report, etc.). The pictures should illustrate how the TA has impacted the lives of the beneficiaries in particular and the communities in general.

5. Information for TA impact description (for public use)

Instruction: The information in the table below will be used by the CTCN to produce the CTCN TA Impact Description. The TA Impact description is a 2-page summary document for communication purposes. Please copy information from sections above and technical delivery reports as required.

Challenge (approx. 500 characters with spaces)	Floods, droughts, extreme temperatures and soil erosion are just some of the climate-change related threats in Lao People's Democratic Republic. In a country with increasing rates of urbanization, data is lacking on the how urban populations and ecosystems are being impacted by climate change. Vulnerability and ecosystem assessments are therefore required at six of Laos' most socio-economically important cities, to determine local climate impacts to identify ecosystem based adaptation responses and prioritize on-the ground actions.
CTCN Assistance (2 to 4 bullet points. Approximately 450 characters with spaces)	- City level vulnerability assessments to provide information on the impacts of climate change on urban populations. - Ecosystem services assessments to know what ecosystem goods and services can be improved or provided by cities to adapt to climate change. - Collect knowledge and data for cities to formulate ecosystem based adaptation (EBA) responses to climate change threats and accelerate the start-up of the GCF project.

	- Assessment results integrated into a large-sale GCF project proposal.
Anticipated impact (2 to 4 bullet points. Approximately 250 characters with spaces). As a minimum, please include one of the following: i) Quantity of greenhouse gas emissions reduced, avoided or sequestered; or ii) Number of people with increased capacity to adapt to the impacts of climate variability and change.	Data, knowledge and capacity gained through the assistance can inform the design of long term ecosystem based adaptation plans in the six cities and increase climate change resilience for up to 820,000 people living in the six cities.
Linkages and contribution to NDC (2 to 4 bullet points. Approximately 350 characters with spaces).	- Filling knowledge gaps on adaptation technologies, fore mostly ecosystem-based adaptation technologies. - Contributing to capacity building efforts in impacts and vulnerability assessments. - Strengthening knowledge and data collection on climate change impacts and establishing information management systems.
The narrative story (Approximately 1200 characters with spaces)	Climate change impacts, including floods, are threatening the livelihoods of hundred thousands of people in Lao PDR. Therefore, six city administrations requested assistance to the CTCN to address their lack of data and knowledge on climate change impacts and to identify ecosystem based adaptation solutions to strategically address these impacts. The CTCN assistance carried out trainings and workshops to gather data, introduce the technologies to practitioners, and help them identify and prioritise ecosystem based technologies to be implemented. By the end of the project, all cities were given detailed hazard maps, land cover classifications and vulnerability maps. A catalogue of ecosystem-based adaptation interventions was developed, and used as technical inputs to inform a large scale project proposal to be submitted to the Green Climate Fund. This work also contributed to increase the understanding of ecosystem services and how they interact with local socioeconomic activities. This assistance supported Lao PDR in implementing its Nationally Determined Contribution (NDC) through strengthen the capacity of the six most socio-economically important and climate-vulnerable cities in Lao PDR.

Contribution to SDGs (to the extent possible, please include contribution to +/- 3 SDGs, describing the contribution with a few sentence for each SDGs concerned). A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.	**8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all** By promoting EbA to reduce the vulnerability of city populations a better foundation of economic growth is provided for and millions USD in climate change related damages can be saved annually. **11. Make cities and human settlements inclusive, safe, resilient and sustainable** Reducing damages from floods will make the 6 targeted cities more resilient while human settlements safer and more sustainable. **15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss** The EBA technologies will create, restore and/or improve conditions for ecosystem services as they will play an important part of flooding resilience.

Note: Please see example of a TA Impact Description at the following link: https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf

Annex 1 (for internal use in donor and UN reporting)

A. Standardised CTCN performance indicators for donor and UN internal reporting

Instruction:

Please add quantitative values for indicators relevant to the particular TA in the list below. Non-relevant indicators should be left blank.

Please only fill in the table for activities and outputs conducted or produced directly by the CTCN assistance, and that are verified by the end of the assistance.

CTCN standardised performance indicators	**Quantitative value**	**Qualitative description** *List the various elements corresponding to the quantitative value*
1. Overview		
Number of active person-days (not full duration) of assistance provided to counterparts or stakeholders by international experts and consultants (complete list of tasks in annex 4)	6 Total of 141 days	International senior expert: Project Manager (29 days) International advisor: Climate Data Expert (8 days) International senior expert: Ecosystem Expert (45 days) International advisor: Ecosystem Services Expert (14 days) International Senior Engineer: EbA Expert (13 days) International specialist: Topodata and mapping expert (32 days)
Number of active person-days (not full duration) of assistance provided to counterparts or stakeholders by national experts and consultants (complete list of tasks in annex 4)	1 Total of 44 days	Local ecosystem expert (Level C of UN fee table) (44 days)
Number of for external communication and outreach activities conducted to showcase the assistance (news release, newsletters, articles on website, etc.)	**2**	
2. Events (other than trainings) held as part of the assistance		
Number of international and multi-country (at regional or sub-regional level) technology and knowledge sharing events		
Number of participants in the events above		
Number of national technology and knowledge sharing events	2	1-6 August 2016 19 December 2017
Number of participants in the events above	113	113 local participants
Number of public-private events related to technologies		
Number of participants in the events above		
3. Training and capacity building activities conducted during the assistance		

Number of training sessions and capacity strengthening activities	1	13-15 September 2017
Number of people who received the training	46	45 ca. local participants
Number of men	35	
Number of women	11	
Total number of organizations trained	7	
Number of research organizations, laboratories and universities		
Number of private companies		
Number of cities and local government	6 local governments	Champasak: - Division of environment and natural resources - Division of Agriculture and forestry - Division of Public Works and Transportation Savannakhet: - Division of environment and natural resources - Division of Agriculture and forestry - Division of Public Works and Transportation Thathek: - Division of Agriculture and forestry - Division of Environment and natural resources - Division of Public Works and Transportation Paksan: - Agriculture Division - Division of environment and natural resources - Division of Public Works and Transportation Vientiane Capital: - Division of Natural Resources and Environment - Division of Public Works and Transportation - Division of Agriculture and Forestry Luang Prabang: - Division of Environment and Natural Resources - Division of Public Works and Transportation - Division of Agriculture and Forestry

Number of communities		
Number of ministries		
Number of specialized governmental institutions	1	Department of Disaster Management and Climate Change (6 people)
Number of non-profit organizations		
Level of satisfaction of participants after the training (from training feedback form). *From very satisfied, satisfied, not really satisfied, not satisfied at all*		
Percentage of participants that increased their capacities thanks to the training (from training feedback form) *From significantly, very, moderately, to none*		
Percentage of men	60	
Percentage of women	60	
4. Tools, technical reports and information material supported by the assistance		
Total number of tools, technical reports and information material supported by the assistance (excluding mission, progress and internal reports)	11	
Number of tools strengthened, revised or developed	6	A set of maps is provided for each city (so 6 sets in total), including 4 maps in each set: - Google map with sites - Hazard map (flooding) - Land cover classification - Vulnerability map
Number of technical reports strengthened, revised or created	1	1 Final Technical Report
Number of other information materials strengthened, revised or created	4	4 Workshops Reports
5. Policies, laws and regulations supported by the assistance		
Number of policies, strategies, and plans drafted addressing climate change adaptation	16	16 projects/plans to adapt to flooding risks in selected sites (Annex C Final Technical Report)
Number of policies, strategies, and plans drafted addressing climate change mitigation		
Number of documents developed to inform other policies, strategies, and plans on climate change adaptation (sectoral strategies, national development plans, etc.)	2	1 Final Technical Report 1 Training report (September 2017)
Number of documents developed to inform other policies, strategies, and plans on climate change mitigation (sectoral strategies, national development plans, etc.)		
Number of laws, agreements, or regulations drafted addressing climate change adaptation		
Number of laws, agreements, or regulations drafted addressing climate change mitigation		

Number of documents developed to inform laws, agreements, or regulations on climate change adaptation		
Number of documents developed to inform laws, agreements, or regulations on climate change mitigation		
6. Institutional strengthening supported by the assistance		
Number of institutional arrangements in place to coordinate near and long-term national adaptation plans (NAPs)		
Number of organizations with increased technical capacity to advance near and long term national adaptation plans (NAPs) which integrate EbA		
Number of organizations with increase awareness and knowledge among countries to better own and drive national adaptation planning processes	6 local governments	Champasak: - Division of environment and natural resources - Division of Agriculture and forestry - Division of Public Works and Transportation Savannakhet: - Division of environment and natural resources - Division of Agriculture and forestry - Division of Public Works and Transportation Thathek: - Division of Agriculture and forestry - Division of Environment and natural resources - Division of Public Works and Transportation Paksan: - Agriculture Division - Division of environment and natural resources - Division of Public Works and Transportation Vientiane Capital: - Division of Natural Resources and Environment - Division of Public Works and Transportation - Division of Agriculture and Forestry Luang Prabang:

		- Division of Environment and Natural Resources - Division of Public Works and Transportation - Division of Agriculture and Forestry
7. Partnerships and cooperation		
Number of private companies directly engaged in the assistance (that partnered with the proponent, the beneficiaries or the CTCN to implement the assistance)		
Number of South-South collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance		
Number of North-South collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance	1	City administrations in LAO - DHI
Number of Triangular collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance	1	CTCN - city administrations in LAO - DHI

B. Indicators of anticipated impacts that may occur after the TA is completed

CTCN standardised performance indicators	**Quantit-ative value** *Insert the request value and unit*	**Content** *List the elements included in the number provided*	**Expected timeline** *Indicate when the indicator and value are expected to be achieved*	**Responsible institution** *Indicate the institution(s) that will play leading role in enabling the indicators and anticipated values to be achieved*
16. Anticipated finance mobilised				
a) Anticipated amount of public/donor investment mobilized (in USD) from the beneficiary country for climate change activities as a result of the TA	4,500,000 USD – co-financing (Out of the total: 34,024,165 USD)	'Building resilience of urban populations with ecosystem-based solutions in Lao PDR'	7 year project	UN Environment – GCF
b) Anticipated amount of public/donor investment mobilized (in USD) from international and regional sources for climate change activities as a result of the TA	29,524,165 USD – GCF (Out of the total: 34,024,165 USD)	'Building resilience of urban populations with ecosystem-based solutions in Lao PDR'	7 year project	UN Environment – GCF

		In addition to this, the final technical report identifies 16 potential projects for a total 36.22 million USD, including some that were integrated in the GCF proposal (Annex C of the Final Technical Report)		
c) Anticipated amount of private investment mobilized (in USD) from the beneficiary country for climate change activities as a result of the TA.				
d) Anticipated amount of private investment mobilized (in USD) from international and regional sources for climate change activities as a result of the TA.				
17. Policies				
a) Anticipated number of policies, strategies, plans, addressing climate change mitigation officially proposed, adopted, or implemented as a result of the TA.				
Anticipated number of policies, strategies, plans, addressing climate change adaptation officially proposed, adopted, or implemented as a result of the TA.				
b) Anticipated number of laws, agreements, or regulations addressing climate change mitigation officially proposed, adopted, or implemented as a result of the TA.				
Anticipated number of laws, agreements, or regulations addressing climate change adaptation officially proposed, adopted, or implemented as a result of the TA.				
c) Anticipated laws, policies, regulations, strategies and plans where climate change				

mitigation will be mainstreamed as a result of the TA				
Anticipated laws, policies, regulations, strategies and plans where climate change adaptation will be mainstreamed as a result of the TA		Mainstreaming EBA measures in urban planning of the six targeted cities		
18. Anticipated number of public-private partnerships created				
19. Anticipated twinning arrangements created as a result of the TA				
20. Anticipated number of technology projects prepared and implemented to support action on low emission and climate-resilient development	1 16 suggested projects	'Building resilience of urban populations with ecosystem-based solutions in Lao PDR' Projects outlined in Annex C Final Technical Report, for a total estimated cost of 36.22 million USD	7 year project	UN Environment – GCF Local administrations with the help of international funds and technical assistance
21. Anticipated strengthened National Systems of Innovation and technology innovation centres in CTCN recipient country.				
22. Anticipated Clean Energy Generation Capacity Clean supported by the TA that has achieved financial closure				
23. Anticipated and projected GHG reductions Quantity of greenhouse gas (GHG) emissions, measured in metric tons of CO2e, anticipated to be reduced or sequestered as a result of projects supported by the TA.				
10. Clean Energy Generation Capacity Clean energy generation capacity supported by the TA that has achieved financial closure.				

24. Anticipated and projected GHG reductions to 2030 Projected greenhouse gas emissions reduced or avoided through 2030, in metric tons of CO2e, from adopted laws, policies, regulations, or technologies related to clean energy/sustainable landscapes as a result of the TA.				
25. Anticipated co-benefits Number of people receiving livelihood co-benefits as a result of the TA.	820,000 people	The TA will inform the development of long term adaptation plans at each of the six cities by focusing on securing access to ecosystem goods and services for up to the total population of 6 cities		
26. Anticipated technology types effectively deployed in the country	16 projects in Annex C of the Final Technical Report	E.g.: Drainage system provision, upgrade and maintenance Stream construction, upgrade and maintenance Protective dikes and ponds construction Enhance control over land use and watershed management upstream Development of regulations for forest conservation and wildlife hunting prohibition for catchment area conservation Creating a provincial/district/village committee for flood management and/or for conservation		Local administrations with the help of international funds and technical assistance

		Training activities for all level committees on disaster management and response with EBA approach for the villagers of the target villages Transform small concrete catchments into natural looking, larger catchments Establishment of electrical pump stations Installation of water pumps and facilities Improvement of flood gates Upgrading of existing roads and channels Development of floating dams Bank stabilization along streams and restoration activities in the wetlands Installation of flood gates for better management of water flows via improved release-close mechanisms. Protection and restoration of ecosystems near streams		
27. Anticipated UNFCCC processes implemented as a result of the TA (NAMA, NAPA, NDC, etc.)				
28. Anticipated Technology Needs Assessments (TNA) and technology Action Plans (TAP) as a result of the TA				

29. Anticipated cooperative research, development and demonstration programmes within and between developed and developing country Parties facilitated as a result of the TA				
30. Anticipated improved climate change observation systems and related information management in developing country Parties.	7	Results of downscaled climate change at city level	The coming 5-8 years	The Ministry of Natural Resources The 6 provincial governments