Technical Assistance Response Plan – Terms of Reference

Country	**Thailand**
Request ID#	AF-2022000120 / 2023000006
Title	Feasibility and viability study of using Blockchain Technology for a real-time climate risk insurance system in Thailand's agricultural sector
NDE	The Office of National Higher Education Science Research and Innovation Policy Council (NXPO) Surachai Sathitkunarat, Ph.D., Vice President Email: surachai@nxpo.or.th, chanida@nxpo.or.th Address: 319 Chamchuri Square Building 14th Fl., Phayathai Rd., Patumwan, Bangkok 10330 Thailand
Proponent	The Office of National Higher Education Science Research and Innovation Policy Council (NXPO) Surachai Sathitkunarat, Ph.D., Vice President Email: surachai@nxpo.or.th, chanida@nxpo.or.th Address: 319 Chamchuri Square Building 14th Fl., Phayathai Rd., Patumwan, Bangkok 10330 Thailand

Summary of the CTCN technical assistance

The summary should provide a brief description of the problem (barrier to climate technology deployment) and how the technical assistance will address it (brief summary of outputs and activities). Please also briefly indicate national actors involved and the anticipated timeline. Please note this summary will be used for public communication purposes so it is important that it is well written. (maximum 1250 characters including spaces)

Thailand's agricultural sector is exposed to increasingly frequent climate change related extreme weather events. The fragility of the farmers being exposed to climate risk poses a threat to livelihoods and food security. Besides concrete risk mitigation measures, Thai farmers are in need of financial instruments that reduce the exposure to the economic impact of climate-induced agricultural losses. Several crop insurance products are existing on the Thai market, but these seem inaccessible to a large number of farmers for multiple reasons (lack of transparency, high transaction costs, slow indemnity payments, etc.).

This technical assistance aims to develop a technical and economic feasibility study for using blockchain technology for an improved parametric crop insurance product. Using blockchain technology has the potential to reduce transaction costs and automatize transparent indemnity payments, thus making crop insurance more attractive and accessible to farmers whilst remaining economically viable for insurance providers. Beyond the feasibility study, an implementation roadmap will support the national stakeholders in the subsequent steps of developing, testing and implementing such a blockchain-based product beyond this technical assistance. The ultimate aim will be to increase resilience of Thai farmers to climate-induced extreme weather events.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

National Designated Entity to the UNFCCC Technology Mechanism
Name: Dr. Surachai Sathitkunarat
Title: Vice President
Date: 2 June 2023
Signature:

Proponent (signature of the Proponent is optional)
Name: Dr. Surachai Sathitkunarat
Title: Vice President
Date: 2 June 2023
Signature:

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rajiv Garg
Title: CTCN Director (a.i.)
Date:
Signature: 2 June 2023

Technical Assistance Response Plan – Terms of Reference

1. Background and context

Please provide a brief description of the background and context for the CTCN Response Plan. Please include national and sectoral information using recognized and publicly available sources. (maximum 2500 characters including spaces).

According to the World Bank's latest report on Thailand's climate risk[1], the changing climate strongly affects the agricultural sector, influencing Thailand as a food producer. Some of the harmful effects are rising temperatures that reduce the amount of water resources with changing seasons, changing mineral levels in the soil, an increase in insects and plant diseases and the emergence of new species invading productive crops. In particular, it was found that the amount of rainfall during rice planting, which is September-October, has decreased. while the temperature increased, affecting rice yield.

The current climate, and in particular drought, that are threatening the agricultural sector show the fragility of the livelihoods of Thai farmers and the necessity of developing financial instruments for them.
Crop insurance is one of the key measures used as a tool to assist farmers in organizing their financial and production costs in the event of a disaster. Crop insurance by The Bank for Agriculture and Agricultural Cooperatives (BAAC) currently supports only rice and maize farmers:

- Rice insurance for smallholder farmers (Microinsurance)[2] is an insurance that provides coverage for loss or damage to the rice planting area arising from natural disasters, fires, pests, or epidemics. The insurer will pay compensation when the provincial governor has declared an emergency assistance area for disaster victims during the insured period. However, rice insurance for smallholder farmers (Micro Insurance) from BAAC does not use the climate index.
- Maize Insurance Using Raindrop Index and Drought Index for smallholder farmers (Micro Insurance) is an insurance that protects cultivated corn from drought. (Climate index as an indicator.)

Every year, 0.5–1.4 million farmer households (or about 10–30% of farmers nationwide) suffer from catastrophic declines in productivity.[3] Therefore, the Draft Agricultural Climate Change Action Plan 2023–2027 of the Ministry of Agriculture and Cooperatives includes as development Issue 1: Upgrading the adaptability of farmers and businesses that are involved throughout the agricultural supply chain and establishes a target of 50% of farmers having access to the agricultural product insurance system.[4]

Traditional insurance policies are centralized, and farmers must follow various terms and conditions to get insured. Parametric insurance models were introduced to insure a policyholder (farmer) against the occurrence of a specific event by paying a set amount based on the magnitude of the event, as opposed to the magnitude of the losses in a traditional indemnity policy. This has already improved the accessibility of insurance products.

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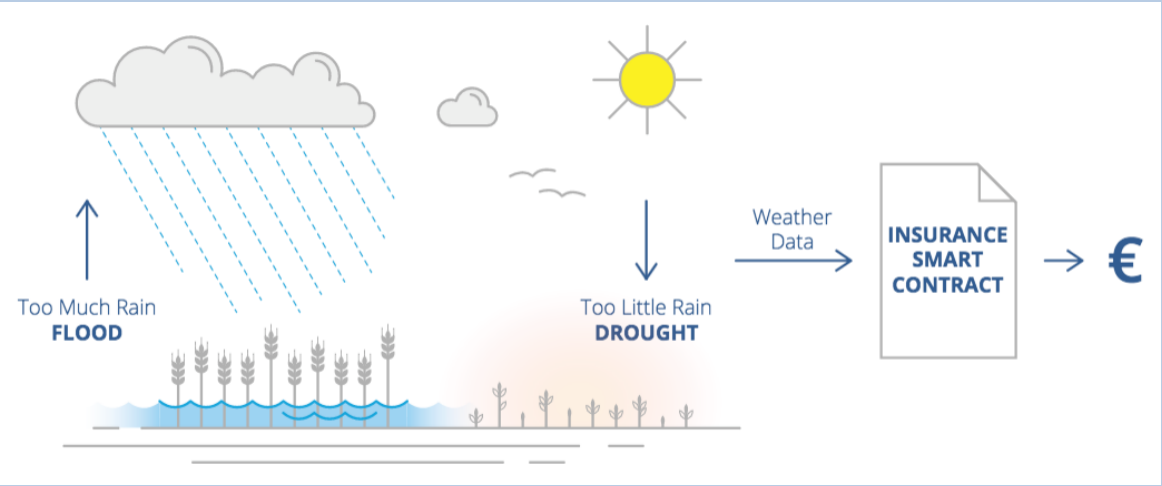
[1] https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15853-WB_Thailand%20Country%20Profile-WEB_0.pdf
[2] https://www.oic.or.th/th/education/insurance/miscellaneous/crop
[3] https://www.pier.or.th
[4] https://www.oae.go.th (Agricultural Strategic Plan for Climate Change: ASPCC 2023-2027)

However, current parametric insurance approaches still lack reliability and efficiency because of technology limitations. Blockchain technology has the potential to create a more effective parametric insurance model for farmers. With smart contracts and IoT sensors, parametric insurance could become increasingly autonomous, transparent, and efficient. The use of blockchain technology could integrate farmer risk data and climate indexes to provide real-time information on the volatility of agricultural yields. It thereby becomes possible to automate claims handling by configuring smart contracts to execute terms based on a predetermined set of parameters like rainfall amount and other weather conditions. Rainfall data can be obtained from IoT-enabled sensors and/or from publicly available weather APIs.



Source: Etherisc Blog

With such a framework in place, a claimant does not have to wait for an insurer to manually process claims and can be confident that he or she will immediately get paid if contract conditions are met. On the other hand, it allows insurance companies to have access to risk information that accurately and transparently indicate the risks and possibilities of changing the behavior of individual farmers. Insurance companies can charge premiums based on risk-based pricing, eliminating the need to charge premiums that are higher than what most farmers will accept. This could help increase the efficiency of the crop insurance system, both for farmers and insurers in Thailand, and make parametric insurance more accessible.

2. Problem statement

Founded on the national and sectoral context as detailed in the section above, please include a brief problem statement clarifying the main problems and barriers for climate change mitigation and/or adaptation in terms of climate technologies that the CTCN Response Plan will address and overcome. (maximum 1250 characters including spaces).

Key barriers for climate risk insurance in the market include limited demand and limited supply, and lack of trust between insurers and farmers due to delayed pay-outs or absence of pay-outs to the insured. Setting up an effective crop insurance in Thailand's agricultural sector faces the following limitations:

- lack of access to risk information and knowledge, which are climate change concerns for smallholder farmers.
- Lack of forecast data for insurance system

- Lack of intensive and environmental awareness in farmers' behaviors
- Lack of a real-time early warning and insurance system
- Insufficient weather data for production planning

The usage of blockchain technology has the potential to solve some of the above challenges. However, some of the limitations of blockchain technology must be considered as part of its feasibility:

- Lack of blockchain standards and interoperability between different systems
- Lack of regulatory clarity
- Security and privacy challenges
- Maintenance costs
- Energy consumption

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
***Objective**: To evaluate the technical and economic feasibility and viability of using blockchain technology for a real-time parametric crop insurance system for farmers in Thailand*												
Outcome: *The technical assistance targets the following outcomes:* 1. *Transparency on the feasibility and viability of using blockchain technology for a real-time parametric insurance system* 2. *Clarity on the roadmap for implementation of a proof-of-concept of a blockchain-enabled real-time parametric insurance system* 3. *Enhanced access of farmers to transparent and efficient parametric insurance if the blockchain-enabled system will be implemented* 4. *Enhanced institutional capacities of key stakeholders (including NXPO, BAAC, Ministry of Agriculture, etc.) on the relevance of blockchain technology for parametric insurance and agriculture at large, and related considerations for technology implementation.*												
Output 1: Development of implementation planning and communication documents												
Activity 1: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* i) A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan; ii) Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan); iii) A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided); iv) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided). v) A project webinar held at the end of the technical assistance that demonstrates the project outcomes to a larger												

stakeholder audience (the webinar will be hosted through the CTCN)												
Deliverable 1: i) Detailed work plan ii) Monitoring and evaluation plan iii) CTCN Impact Description iv) Closure and Data Collection report v) Project webinar	X X X X X											X
Output 2: Preparatory analysis for blockchain-based parametric crop insurance in Thailand												
Activity 2.1: Analysis of the agricultural sector, crop insurance market and farmer experience in Thailand This activity aims to analyze the agricultural sector and existing environment for crop insurance in Thailand to understand the market status, trends and underlying problems and drivers. **Analysis of the agricultural sector and climate risk impact in Thailand** A general overview of the agricultural sector in Thailand will be developed, mapping some of the key figures, land use and crop production distribution, and farmland distribution by number of farmers. Furthermore, an assessment of the vulnerability and climate risk impact will be conducted, identifying key climate risks and geographies of vulnerability. **Mapping of crop insurance product landscape** Existing products in Thailand will be mapped and analyzed with regards to their coverage of crop types, geographic coverage, target audience, costs, terms and conditions, disbursement mechanism, usage of data (crop, weather, etc.) and level of automation / digitalization. If available, data on the number of insured farmers, level of insurance payments and market size will be collected. **Farmer survey on climate impact and interest in crop insurance** A farmer survey will be conducted to understand their exposure to climate-related impacts, their experience with crop insurance products, and their readiness for a blockchain-based parametric crop insurance. Depending on the type of crop they plant, exposure to different climate hazards will be mapped. Farmers will be surveyed with regards to their past experience with crop insurances and the perceived/actual benefits and limitations that farmers met who have a crop insurance, as well as the reasons of farmers who have no crop insurance. Lastly,												

some factors for their readiness to benefit from a blockchain-based parametric crop insurance will be identified (incl. holding a bank account, access to mobile phone, access to mobile money, financial management in case of risk). Farmers should be classified along different segments, including female farmers, large-field farmers, smart farmers, agricultural entrepreneurs, and cooperatives. Particular attention should be given to the specific experiences, interest and requirements of female farmers. A representative share of female farmers should be targeted with the survey.												
Activity 2.2: Mapping of blockchain-based crop insurance products internationally This activity will map successful and failed blockchain-based crop insurance products/initiatives internationally in order to identify best practices. The analysis will look at, among other, products and services, geographic coverage, crop coverage, stage of development/operation, blockchain infrastructure, level of automation, and data usage. Reasons for success or failure will be identified in order to create a catalogue of best practices.												
Deliverable 2: - Deliverable 2.1: Report on agricultural sector, crop insurance market and farmer survey - Deliverable 2.2: Map of blockchain-based crop insurance products internationally		X	X									
Output 3: Stakeholder engagement												
Activity 3.1: Stakeholder mapping and establishment of a project working group A stakeholder mapping and analysis will be conducted, enabling the identification of key stakeholders (up to 15) who will be invited to integrate the project working group. The working group will include representatives from the public sector (Ministry of Agriculture, NXPO, Ministry of Finance, etc.), financial institutions (BAAC, insurance companies, etc.), private sector (farming cooperatives, farmers, etc.), research organizations, NGOs and more. Attention will be given to gender balance and vulnerable farmer groups in terms of representation. The project working group will be officially formed with Terms of Reference and will provide technical overview and high-level guidance throughout the implementation of this Technical Assistance.												
Activity 3.2: inception workshop for the technical and economic feasibility of blockchain-based parametric insurance in Thailand A 2-day in person inception workshop will be conducted, aiming to raise awareness of the project and gathering												

inputs to assist in the preparation of the technical and economic feasibility study on a blockchain-based parametric insurance in Thailand. Day 1 will focus on summarizing the agricultural sector and its' vulnerabilities, the current crop insurance market and farmer survey (Activity 2.1) and providing an introduction to blockchain-based parametric insurance through the presentation of successful and failed blockchain-based crop insurance products/initiatives internationally (Activity 2.2). Day 2 will consist of interactive sessions to define high-level product and service elements of the planned blockchain-based parametric insurance in Thailand and walk through the planned activities for the technical and economic feasibility study to collect preliminary inputs. The inception workshop will also include a closed session (e.g. as a last session of the programme) to be attended by project working group members, so they can review/agree on the group's TORs and meeting calendar. This will constitute the first meeting of the project working group. This workshop will include as participants, at a minimum, the members of the project working group, but may also include other key stakeholders identified in the mapping undertaken in activity 3.1.												
Activity 3.3: Regular meetings of the project working group Regular meetings will be organized by the implementer with the project working group in order to present project progress and collect feedback at important milestones of implementation. Minutes of these meetings (including materials shared) will be prepared and circulated for comments from members no later than 3 days after the meetings take place and should be finalized within max. 2 weeks.												
Deliverable 3: - Deliverable 3.1: ToRs and list of members of the project working group - Deliverable 3.2: Inception workshop materials and report - Deliverable 3.3: Minutes of the first project working group meeting - Deliverable 3.3: Minutes of subsequent project working group meetings	X	X X										X

Output 4: Technical feasibility study												
Activity 4.1: Assessment of extreme weather events and availability of localized climate data in Thailand This activity will include a historical analysis of extreme weather events and their frequency, magnitude and impact on farming activities. Furthermore, available data sources and points on weather events will be identified and evaluated on their usefulness for a parametric insurance model. Localized climate data are essential for the technical viability of a parametric insurance system. The data from breached parameters form the 'oracles' that activate the smart contract to issue cash pay-outs. The available data vary in granularity (from one national data point right down to individual property-level data points). For the programme, availability is more relevant than granularity; however, granularity will significantly impact the structure and complexity of the delivered scheme. Data sets could include ERA5 weather data, CHIRPS data, IBTrACs and others. Support from the project working group and other institutions with data availability/access will be required.												
Activity 4.2: Availability of data on theoretical loss exposure, average indemnity costs and aggregation risk A parametric insurance product for crop requires the availability of data on theoretical loss exposure, average indemnity costs (aligned to parametric pay-outs) and aggregation risk (e.g., for flooding, landslides etc.). With parametric insurance, several factors drive exposure to catastrophic weather events. The effect of weather on crop yields can be estimated using various open-source models. These models generally use historical data and biological characteristics of the specific crop to evaluate the likely impact of different weather variables on crop output. This information provides the input for estimating exposure from various weather perils, such as excessive rain or high temperatures. The availability of these data sets will be mapped within this activity. Support from the project working group and crop insurance institutions with data availability/access will be required.												

Activity 4.3: Assessment of the optimal level of granularity in location, peril coverage and 'sums insured' This activity will assess the optimal level of granularity in location, peril coverage, 'sums insured' etc. that can (a) be built into a technical solution; and (b) be clearly understood, communicated and sold by local agents administering the insurance service. 'Granularity' in this context refers to the space between gridlines. For example, a high granularity temperature dataset may refer to the average temperature measured across a 2 km2 grid, while a low granularity temperature dataset could measure average temperatures on a 100 km2 grid. This is a decisive factor for data accuracy as everyone living within a cell is assigned the same average data for a pay-out. If the cell is too large, individual experiences may vary considerably. On the other side, more granularity also means more policy-holders are treated differently and receive different outcomes[5]. This activity will examine the feasibility of implementing a solution that contains 100 different trigger locations, versus 10 or 1, within Thailand as well as different data points in the 'oracle'. Assessing the optimal level of location and peril coverage and 'sums insured' is connected to the economic feasibility assessment (Output 5) because such granularities are some of the determining factors leading to a sustainably profitable insurance product.												
Activity 4.4: Evaluation of the existing digital infrastructure for disbursing payments This activity will assess the capability of the digital infrastructure in Thailand to digitally and automatically disburse payments at the local level, such as to collect premiums from the policy-holder and send payments, upon a trigger event, to the policy-holder. This issue is key to customer satisfaction as it creates convenience and immediacy in the transfer payments.												
Activity 4.5: Assessment of the regulatory and commercial information requirements This activity will assess legal and regulatory requirements related to know-your-customer, reinsurance and												

[5] All parametric solutions have issues with fairness. There will be some policy-holders without damage who receive pay-outs and others with damage who do not. The excessive granularity of location could exacerbate this problem in some cases. A parametric programme aims to reduce basis risk by ensuring that the available data and the customer experience correlate as much as possible.

swaps, claims processing, etc. against the specific value-add of the blockchain-based parametric crop insurance. The insurance sector is highly regulated and subject to significant oversight, so a blockchain-based parametric crop insurance product will need to follow detailed rules as licensed insurers and insurance contracts will need to be valid under Thai insurance law. Further, agreements executed automatically using smart contracts must be legally binding. This platform may also raise competition law or data protection concerns. Legal barriers could significantly impede the implementation of a blockchain-based parametric crop insurance. So, the legal element is vital to the product's success.

Depending on the use cases of the insurance product, the following questions may be relevant[6]:

- Is there any difference in legal considerations (e.g., data privacy, e-commerce law) between a consumer using the blockchain platform, rather than another aggregator or insurance platform?
- Are providers of blockchain-based parametric crop insurance also subject to any existing specific regulation enforced by financial regulators?
- Are the terms of a parametric insurance agreement consistent with existing insurance law?
- Is the management of encrypted data considered a matter under the right to privacy?
- Who is the controller of (personal) data uploaded by the policy-holder?
- How can the risks and responsibilities of the parties to these insurance contracts be managed?
- Is a smart contract (existing purely in code and not in natural language) legally binding and enforceable, according to the law on contracts in Thailand?
- What standard information should insurance providers give policy-holders in accordance with Thailand's Insurance Act, etc.?
- What should be the standard of clarity in the contract terms communicated via natural language in the context of a blockchain-based parametric crop insurance?
- What happens if there is a dispute between the insurer and the policy-holder? That is, if the smart contract has not been written clearly or if design flaws cause the smart contract not to function as expected.
- How are insurance pay-outs and the income of insurance providers taxed?

[6] As per Commonwealth Secretariat (2022): Parametric Climate Insurance Using Blockchain Technology - A Feasibility Study on Technical and Economic Viability in Fiji

Activity 4.6: Definition of the product structure and system architecture

This activity will detail the product structure and system architecture of the blockchain-based parametric crop insurance system.

Based on the defined product and service elements (Activity 3.2) and the technical feasibility considerations (Activities 4.1 – 4.5), the product structure will be defined with its use cases and the system and service architecture will be sketched.

The structure will involve the following parties and product elements:

- Insurance service provider that will design the insurance product and devise a risk model in line with the Thai context.
- Insurance company that will manage the risk pool and perform pay-outs via mobile money. After verifying the pay-outs, the insurance company will reimburse the technology platform.
- A mobile money provider to facilitate financial transactions between end users and insurance products
- A user interface where insurance policies are registered as smart contracts on a blockchain, grouping payment processing, farmer data and policy information.
- An application layer that links the smart contract infrastructure to the blockchain layer.
- Thai government for which the different line departments associated with the insurance sector will act as the regulator for this product

Furthermore, the standard of the smart contracts facing the policy-holder and insurer will be developed. Smart contracts can comprise the entire agreement among parties or simply express a subset of enforceable promises (or 'clauses'). They should comprise at least the following[7]:

[7] As per Commonwealth Secretariat (2022): Parametric Climate Insurance Using Blockchain Technology - A Feasibility Study on Technical and Economic Viability in Fiji

- Type of risk covered (rainfall, drought, etc.) - Dataset to call for the smart contract - Back-up dataset in case main dataset fails - Maximal possible payment for a policy, also called 'limit' - Formula to determine payment to the policyholder based on input data (e.g. $10 payment per mm of excess rainfall) - Time period of policy (e.g. 1 June to 30 November) - Premium payment by the policy-holder Preliminary thoughts on the ideal implementation option will be given, whether internal, semi-internal or external (Blockchain-as-a-Service or off-the-shelf) development.												
Activity 4.7: Assessment of the trade-offs of blockchain design against the existing 'business-as-usual' scenario This activity will assess the trade-offs of blockchain design against the existing 'business-as-usual' (BAU) scenarios (traditional insurance and ordinary parametric insurance). Information will be drawn from Activity 2.1 on existing crop insurance products in Thailand.												
Activity 4.8: Mapping of technical risks and mitigation actions This activity will map technical risks for administering a parametric insurance programme and identify mitigation steps that minimise the risks. Risks may include: - Data errors - Calculation errors - Payment errors - Data security - Immutability challenges												
Deliverables 4: - Deliverable 4: Technical feasibility study report						X						

Output 5: Economic feasibility study												
Activity 5.1: Definition of the business model of the blockchain-based parametric crop insurance This activity will focus on the definition of a business model for the blockchain-based parametric crop insurance system. The business model includes descriptions of the customer audience and challenge, solution, the value added, required capital and revenue model, including considerations for go-to-market and growth trajectory. These elements will be further defined along the completion of Output 5.												
Activity 5.2: Economic assessment of potential demand, pricing and revenue This activity will assess the potential demand, pricing and revenue for a blockchain-based parametric crop insurance in Thailand. For that purpose, farmer surveys will be conducted to assess their interest as well as ability and willingness to pay. The survey may include questions on farming business performance, income levels, costs, their assessment of climate risk, interest and willingness to purchase a parametric insurance product, etc.). Particular attention should be given to the interest and ability/willingness of female farmers in such a product. A representative share of female farmers should be targeted with the survey. Once the data has been collected, the ability-to-pay and willingness-to-pay will lead to an adequate pricing scheme. This pricing scheme will be used to create revenue projections.												
Activity 5.3: Assessment of development, maintenance and running costs Based on the chosen system architecture and operation, a cost evaluation along the building, maintaining and running of the blockchain-based parametric crop insurance will be conducted. These costs may differ considerably depending on: ▪ Scope and complexity of the solution ▪ Size of the network, number of nodes and plug-ins/required interfaces ▪ Number of transactions/data volume and storage requirements												

In the building phase, budgets are allocated to the design, development and testing of the blockchain-based parametric crop insurance. Depending on whether internal capacities will be used/built up to assume all or some of these activities or whether activities will be outsourced, these costs may vary. Maintenance and running costs also vary depending on whether the solution is managed internally or externally. If externally, pricing models usually include monthly subscriptions and pay-per-use elements. Some of the decisions on system architecture and implementation option will only be taken at a later stage of product development. Therefore, the cost analysis will remain preliminary and should be updated at a later stage.												
Activity 5.4: Development of a cost-revenue analysis Based on Activities 5.2 and 5.3, a cost-revenue analysis will be conducted in order to understand the financial sustainability of a blockchain-based parametric crop insurance system. This includes break-even point, pay-back time, etc.												
Deliverable 5: - Deliverable 5: Report on business model with cost-revenue analysis									X			
Output 6: Implementation roadmap for a blockchain-based parametric crop insurance in Thailand												
Activity 6.1: Development of an implementation roadmap This activity will target the development of an implementation roadmap that will facilitate the development and piloting of a blockchain-based parametric crop insurance in Thailand. It will be developed in close coordination with potential implementers (including BAAC and other crop insurance providers). The roadmap will detail implementation steps along three (3) phases: 1. **Refinement of market needs and use-cases:** Confirming product requirements and demand, and validating relevant use-cases												

2. **Delivery of a proof of concept:** Planning and developing the system architecture to test the blockchain-based crop insurance product locally; collecting feedback and validate proof-of-concept 3. **Implementation at full scale:** Refining the system architecture and developing the operating models and governance; piloting the product in a user environment and integrating it with the existing system This implementation roadmap will detail the scope of work, estimated timelines and budget requirements. In addition to the implementation roadmap, recommendations on favorable policies and regulatory changes for the adoption of blockchain-based parametric crop insurance will be given.												
Activity 6.2: Development of a concept note for implementation of blockchain-based parametric crop insurance product Based on the implementation roadmap, a concept note for submission to financial institutions will be developed. This concept note will include sections on the context, project description, expected objectives, activities and results, financial plan, monitoring and evaluation plan, sustainability and replicability considerations, gender assessment and plan, and risk evaluation. It will be decided together with the project working group, whether the concept note will be generic or specific to a financial mechanism.												
Deliverable 6: - Deliverable 6.1: Implementation roadmap with financing plan - Deliverable 6.2: Concept note										X	X	
Output 7: Capacity building on blockchain technology for crop insurance												
Activity 7.1: Capacity building workshop on blockchain technology for crop insurance and final conference/webinar												

A 1-day capacity building workshop on the results of the feasibility study on blockchain technology for crop insurance and the implementation roadmap will be delivered, including considerations of blockchain technology for agriculture at large. The workshop will include up to 50 attendees from the public sector (Ministry of Agriculture, NXPO, Ministry of Finance, etc.), financial institutions (BAAC, insurance companies, etc.), private sector (farming cooperatives, farmers, etc.), research organizations, NGOs and more. This workshop will also serve to connect relevant stakeholders around the next steps of the implementation roadmap for potential development, funding and support of activities. The lead implementer will also organize a final conference/webinar on blockchain technology, aiming at the dissemination of the results of this technical assistance to broader audiences, in the region and elsewhere.												
Deliverable 7: - Deliverable 7.1: Capacity building material and report - Deliverable 7.2: Final conference/webinar report												X X

4. Resources required and itemized budget:

Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 1% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

Activities and Outputs	**Input: Human Resources** *(Title, role, estimated number of days)*	**Input: Travel** *(Purpose, national vs. international, number of days)*	**Inputs: Meetings/events** *(Meeting title, number of participants, number of days)*	**Input: Equipment/Material** *(Item, purpose, buy/rent, quantity)*	**Estimated cost** *Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan*	
					Minimum	**Maximum**
Output 1: Development of implementation planning and communication documents	*IE1: 8* *NE1: 8*				***4,000 USD***	***4,400 USD***
Activity 1.1: Formulation of i) Detailed work plan, ii) Monitoring and evaluation plan, iii) CTCN Impact Description, iv) Closure and Data Collection report.					*4,000 USD*	*4,400 USD*

Output 2: Preparatory analysis for blockchain-based parametric crop insurance in Thailand	*IE1: 3* *IE2: 5* *IE3: 10* *IE4: 6* *NE1: 10* *NE3: 3*				***16,600 USD***	***18,260 USD***
Activity 2.1: Analysis of the agricultural sector, crop insurance market and farmer experience in Thailand		*Local travel of 10 days for NE1 for farmer surveys and interviews*			*13,200 USD*	*14,520 USD*
Activity 2.2: Mapping of blockchain-based crop insurance products internationally					*3,400 USD*	*3,740 USD*
Output 3: Formation and regular meetings of project working group	*IE1: 12* *IE2: 5* *IE3: 5* *IE4: 5* *IE5: 5* *NE1: 17* *NE2: 7* *NE3: 7*				***36,400 USD***	***40,040 USD***
Activity 3.1: Mapping of relevant					*1,400 USD*	*1,540 USD*

stakeholders and formation of project working group						
Activity 3.2: 2-day kick-off and preparation workshop for the technical and economic feasibility of blockchain-based parametric insurance in Thailand		*International travel for IE1*	*2-days kick-off and preparation workshop in-person of the project working group*		*15,960 USD*	*17,556 USD*
Activity 3.3: Regular meetings of the project working group		*International travel for IE1*	*In-person and hybrid project working group meetings*		*19,040 USD*	*20,944 USD*
Output 4: Technical feasibility study	*IE2: 29* *IE3: 31* *IE4: 23* *IE5: 11* *NE1: 44* *NE2: 15* *NE3: 6*				***58,500 USD***	***64,350 USD***
Activity 4.1: Assessment of extreme weather events and availability of localized climate data in Thailand					*9,500 USD*	*10,450 USD*
Activity 4.2: Availability of data on					*9,500 USD*	*10,450 USD*

theoretical loss exposure, average indemnity costs and aggregation risk						
Activity 4.3: Assessment of the optimal level of granularity in location, peril coverage and 'sums insured'					*5,000 USD*	*5,500 USD*
Activity 4.4: Evaluation of the existing digital infrastructure for disbursing payments					*5,600 USD*	*6,160 USD*
Activity 4.5: Assessment of the regulatory and commercial information requirements					*7,400 USD*	*8,140 USD*
Activity 4.6: Definition of the product structure and system architecture					*15,800 USD*	*17,380 USD*
Activity 4.7: Assessment of the trade-offs of blockchain design					*2,600 USD*	*2,860 USD*

against the existing 'business-as-usual' scenario						
Activity 4.8: Mapping of technical risks and mitigation actions					*3,100 USD*	*3,410 USD*
Output 5: Economic feasibility study	*IE1: 8* *IE2: 28* *IE4: 13* *NE1: 23* *NE3 : 2*				***30,200 USD***	***33,220 USD***
Activity 5.1: Definition of the business model of the blockchain-based parametric crop insurance					*11,000 USD*	*12,100 USD*
Activity 5.2: Economic assessment of potential demand, pricing and revenue		*Local travel of 10 days for NE1 for farmer surveys and interviews*			*9,000 USD*	*9,900 USD*
Activity 5.3: Assessment of development, maintenance and running costs					*4,600 USD*	*5,060 USD*
Activity 5.4: Development of a					*5,600 USD*	*6,160 USD*

cost-revenue analysis						
Output 6: Implementation roadmap for a blockchain-based parametric crop insurance in Thailand	*IE1: 15* *IE2: 8* *IE3: 3* *IE4: 13* *IE5: 1* *NE1: 10* *NE2: 3* *NE3: 2*				***22,800 USD***	***25,080 USD***
Activity 6.1: Development of an implementation roadmap					*16,100 USD*	*17,710 USD*
Activity 6.2: Development of a concept note for implementation of blockchain-based parametric crop insurance product					*6,700 USD*	*7,370 USD*
Output 7: Capacity building on blockchain technology for crop insurance	*IE1: 5* *IE2:2* *IE3:2* *IE4:2* *IE5:2* *NE1:10* *NE2: 2* *NE3 :2*				***17,880 USD***	***19,668 USD***

Activity 7.1: Capacity building workshop on blockchain technology for crop insurance, and final conference/ webinar		*International travel for IE1*	*Capacity building workshop in-person*		*17,880 USD*	*19,668 USD*
Estimated range of costing for the entire Response Plan					***186,380 USD***	***205,018 USD***

5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.

Experts required	Brief description of required profile
	International experts
Project manager (IE1)	• Master's degree or higher in economics, project management, engineering, environmental studies or a related field • At least 10 years of experience in a lead role in implementing national and international development projects related to emerging digital technologies such as blockchain, artificial intelligence, remote sensing, etc. • Experience in carrying out or having been directly involved in at least one assignment of similar nature and complexity close to the present assignment • Experience with coordinating and liaising with multiple national and international stakeholders • Experience in South-East Asia highly desirable
Parametric insurance specialist (IE2)	• Master's degree or higher in economics, finance, business, mathematics or a related field • At least 10 years of experience in the insurance market with focus on the agricultural sector and parametric insurance products • Experience in carrying out evaluations of insurance products and requirements, and designing parametric

	insurance products, including economic feasibility studies • Prior experience with blockchain-based parametric insurance highly desirable
Climate and agricultural data expert (IE3)	• Master's degree or higher in climate science, agriculture studies, data science or a related field • At least 10 years of experience with climate and agricultural data in a developing country context • Experience in carrying out evaluations of climate and agricultural data sets, and conceptualizing data infrastructure • Prior experience with blockchain technology highly desirable
Blockchain specialist (IE4)	• Master's degree or higher in engineering, data science, economics or a related field • At least 10 years of experience with implementing projects on emerging digital technologies, and at least 5 years of experience with blockchain projects, ideally in the agricultural sector • Experience in carrying out technological and economic feasibility studies of blockchain solutions • Experience in carrying out or having been directly involved in at least three assignments of similar nature and complexity close to the present assignment
Legal expert (IE5)	• Master's degree or higher in law with a specific focus on data, privacy and emerging digital technologies • At least 10 years of experience in a regulatory environment of emerging digital technologies, and at least 3 years of experience with blockchain technology • Prior experience with parametric insurance is desirable
National experts	
Agriculture/ climate adaptation specialist (NE1)	• Master's degree or higher in agriculture studies, environmental science or a related field • At least 7 years of experience with climate adaptation and risk management in the agricultural sector • Experience in carrying out interviews and surveys with farmers and other stakeholders on climate adaptation in the agricultural sector • Extensive knowledge about the agricultural sector in Thailand • Fluent in Thai and English (spoken and written)

Legal expert (NE2)	• Master's degree or higher in law with a specific focus on data, privacy and emerging digital technologies • At least 7 years of experience in the Thai regulatory environment for emerging digital technologies • Knowledge of legislative and legal requirements in the insurance sector in Thailand • Fluent in Thai and English (spoken and written)
Gender expert (NE3)	• Bachelor's degree or higher in gender studies or related fields • At least 7 years of experience in mainstreaming gender benefits in development programs • Knowledge of the agricultural and insurance sector highly desirable

6. Intended contribution to impact over time

Please provide a brief description of the intended contribution to impact over time of the outcome and outputs provided by this technical assistance on resilience to climate change and/or carbon abatement. To the extent possible, please quantify the intended impact contribution, for example by indicated estimated number of people potentially impacted over time, GDP contribution of the focus sector, carbon emissions by the focus sector, etc. This intended contribution to impact is what will happen if the objective (as articulated in section 3) is met. Please ensure relevant complementarity with text in sections 7 to 12. (maximum 1250 characters including spaces)

Farmers in Thailand are exposed to climate-induced extreme weather events such as droughts, storms and heavy rainfalls in an increasing frequency. Crop insurance products have been developed in the past and are offered to Thai farmers, but only a limited number of farmers is able to access these products / is convinced by their effectiveness, and hence an important amount of farmers are exposed to the high risks of extreme weather events that lead to livelihood vulnerabilities and food insecurity.

This technical assistance will prepare the introduction of a blockchain-based parametric crop insurance that will solve some of the current challenges (incl. high transaction costs, unclear terms and policies, long indemnity payment times).

The ultimate outcome of the introduction of a blockchain-based parametric crop insurance will be that a larger number of farmers will be ensured and resilient to extreme weather events, safeguarding economic livelihoods and ultimately improving food security.

Furthermore, a co-contribution of this technical assistance will be an enhanced capacity of understanding and application of blockchain technology of key stakeholders for potential projects beyond this technical assistance.

7. Relevance to NDCs and other national priorities

Please identify relevance and contribution from the technical assistance to the Nationally Intended Contributions (NDC) and other relevant national prioritized efforts (TNAs, TAPs, NAPs, NAMAs, etc.). (maximum 2500 characters including spaces)

As part of its' national adaptation priorities under the updated National Determined Contributions (NDCs), Thailand includes the aim "to maintain productivity and food security by increasing the ability to respond and manage climate risks in the agricultural sector". A blockchain-based parametric crop insurance has the potential to make insurance products more accessible to farmers, hence improving their resilience to climate-induced extreme weather events.

In the (draft) Agricultural Climate Change Action Plan (2023 – 2027), the Ministry of Agriculture and Cooperatives prioritizes the upgrading of the adaptability of farmers and businesses that are involved throughout the agricultural supply chain" under its Development Issue 1. It aims to enable 25% of farmers to have access to the agricultural product insurance system.

8. Linkages to relevant parallel on-going activities:

Please identify relevant previous and ongoing public and private sector initiatives, projects or programmes that the CTCN assistance will specifically build on and contribute to. To the extent possible, please add practical and operational details on the linkages between existing activities and the CTCN assistance. (maximum 2500 characters including spaces)

In the past, the BAAC, working with the Office of Insurance Commission (OIC) and Thai General Insurance Association (TGIA), had academic support from the World Bank. A crop insurance system has been developed using climate indexes, or the amount of rainfall that falls in the area as a measure. by piloting in the maize growing area of Pak Chong District, Nakhon Ratchasima Province since 2005.

At present, BAAC has crop insurance in 2 types. They are as follows: rice insurance and maize insurance for smallholder farmers (Micro Insurance).[3]

- Rice insurance for smallholder farmers (Microinsurance) is an insurance that provides coverage for loss or damage to the rice planting area. arising from natural disasters, fires, pests, or epidemics. The provincial governor has declared an emergency assistance area for disaster victims during the insured period. The insurer will pay compensation.
- Maize Insurance Using Raindrop Index and Drought Index for smallholder farmers (Micro Insurance) is an insurance that protects cultivated corn from drought. (Climate index as an indicator.)

9. Anticipated follow up activities after this technical assistance is completed:

Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed, towards contributing to the anticipated impacts over time articulated in section 6. For example, what organizations or stakeholders will use the outputs of the technical assistance after it is completed, for what purpose, at what scale and scope the outputs and deliveries will be applied, when and what will be the next steps undertaken, etc. (maximum 2500 characters including spaces)

This technical assistance will provide a detailed technical and economic feasibility study for the use of blockchain technology for a parametric crop insurance. Based on the outcomes of this feasibility study and with the use of the detailed implementation plan that will be developed as part of this project, the following activities will be delivered after completion of this technical assistance:

- Dissemination of the feasibility study and knowledge material on blockchain-based parametric crop insurance at national level
- Identification and confirmation of project partners for the testing and implementation of a blockchain-based parametric crop insurance
- Implementation of the set roadmap:
    - **Refinement of market needs and use-cases:** Confirming product requirements and demand, and validating relevant use-cases
    - **Delivery of a proof of concept:** Planning and developing the system architecture to test the blockchain-based crop insurance product locally; collecting feedback and validate proof-of-concept
    - **Implemention at full scale:** Refining the system architecture and developing the operating models and governance; piloting the product in a user environment and integrating it with the existing system
- Development and introduction of regulations and laws that may be required for blockchain technology feasibility, as identified during the project

10. Gender and co-benefits:

Imbedded in design of the activities:	*A gender mainstreaming analysis is mandatory to include for all technical assistances. A gender expert will be assigned to carry out an assessment and evaluation regarding gender mainstreaming during the implementation of the TA.* *In addition, please describe all support to gender aspects, women's equality and other co-benefits embedded into the Response Plan (please include a reference to the actual activities and outputs as described in section 3).* Throughout the technical assistance, gender mainstreaming will be embedded in the activities in the following way: - Farmer interviews and surveys will pay particular attention on the specific experiences, interest and requirements of female farmers. A representative share of female farmers will be targeted with the surveys and interviews - The working group will have an equal representation of women - The service offers and business model of the planned blockchain-based parametric crop insurance product will integrate a gender perspective
Gender and co-benefits intended as result of the activities:	*Please describe all gender aspects, women's equality and other co-benefits expected as a result of the CTCN technical assistance.* The blockchain-based parametric crop insurance product that is planned to be developed as a result of this technical assistance will increase the accessibility of crop insurance to a larger number of farmers, including female farmers. Particular attention in terms of service offering will be given to female farmers.

11. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	**Role in implementation of the technical assistance**
The Office of National Higher Education Science Research and Innovation Policy Council (NXPO) ***CTCN National Designated Entity***	The NXPO will act as the main focal point in this technical assistance with the role to facilitate the implementation, support stakeholder engagement, facilitate data collection, and provide regular feedback on activities and deliverables.
Ministry of Agriculture - Department of Agriculture Extension (DOAE)	- Share documents and data on agricultural sector - Facilitate data collection, including interviews and surveys with farmers - Provide regular feedback on activities and deliverables

	- Provide data on crop insurance measures
Ministry of Finance	- Share information and facilitate research on insurance sector and regulatory requirements - Provide regular feedback on activities and deliverables
Bank for Agriculture and Agricultural Cooperatives (BAAC)	- Share documents and data on existing parametric insurance products - Facilitate data collection, including interviews and surveys with farmers - Act as pilot partner for the planned blockchain-based parametric insurance product - Provide regular feedback on activities and deliverables
DEPA (Digital Economy Promotion Agency)	- Provide data on digital infrastructure
Digital Government Technology and Innovation Center (DGTI, DGA)	- Provide data on digital regulation
Bank of Thailand (BOT)	- Provide data and guidelines on regulatory sandbox for using blockchain in bank services
Geo-Informatics and Space Technology Development Agency (GISTDA)	- Provide data, including Satellite Data
Banks, insurance companies and Thai General Insurance Association (TGIA)	- Share documents and data on existing parametric insurance products - Facilitate data collection, including interviews and surveys with farmers - Provide regular feedback on activities and deliverables
Farming cooperatives and farmers	- Provide interview and survey answers on crop insurance experiences and opinions - Provide feedback on service offering and business model of planned blockchain-based parametric crop insurance

12. SDG Contributions:

*Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.*

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern	

	energy for all (consider adding targets for 7)	
	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	A blockchain-based parametric crop insurance uses emerging digital technologies. As part of this technical assistance, national stakeholders will increase their understanding and innovative capacity on blockchain technology which can be applied beyond the agricultural and insurance sector in the future.
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	*All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).*
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Through the introduction of a blockchain-based parametric crop insurance product, it is assumed that more farmers will be able to access crop insurance against climate-induced extreme weather events, making them more resilient.
	13.2 - Integrate climate change measures into national policies, strategies and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
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	
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	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

Please tick off the relevant boxes below	*Primary*	*Secondary*
☐ 1. Decision-making tools and/or information provision	☐	☐
☐ 2. Sectoral roadmaps and strategies	☐	☐
☐ 3. Recommendations for law, policy and regulations	☐	☐
☐ 4. Financing facilitation	☐	☐
☐ 5. Private sector engagement and market creation	☐	X
☐ 6. Research and development of technologies	☐	☐
☐ 7. Feasibility of technology options	X	☐
☐ 8. Piloting and deployment of technologies in local conditions	☐	☐
☐ 9. Technology identification and prioritisation	☐	☐

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance; and (iii) the CTCN Director about timeliness and appropriateness of the delivery of the activities and outputs.

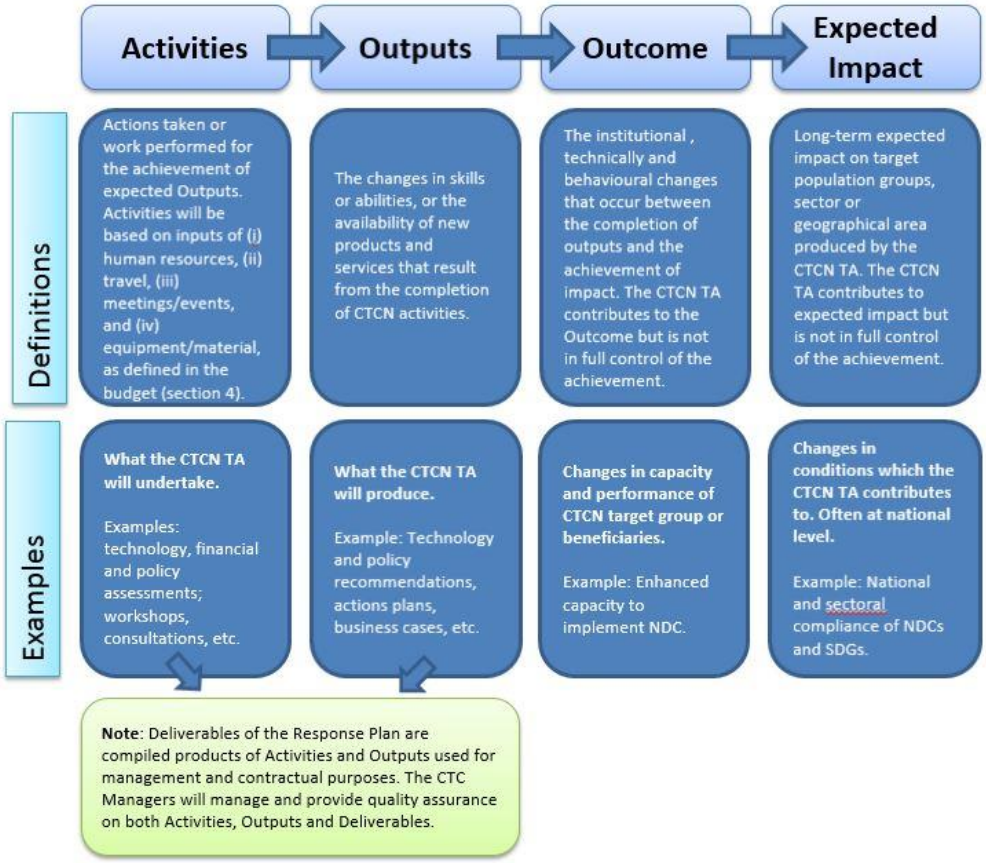
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

1. Objective of the Response Plan

The Response Plan is developed by CTCN specialists in response to a country request for technical assistance. It constitutes the Terms of Reference of the CTCN technical assistance that will be provided to the country and it provides the formulation of and subsequent basis for the monitoring and evaluation of the Response Plan implementation, as well as its expected outcomes and anticipated impacts.

2. Results chain and Logical Framework Approach to be defined in the CTCN Response Plan

The result chain is the causal sequence that stipulates the necessary flow of actions and processes to achieve desired objectives and results – beginning with inputs, moving through activities and outputs, and culminating in individual outcomes. The outcome will contribute to the desired impact in the society. The Logical Framework Approach is an analytical process used to support objectives-oriented project planning and management. It provides a set of pre-defined concepts which are used as part of an iterative process to aid structured and systematic analysis and management of the CTCN technical assistance.



3. Role of the Response Planning Design Team

The Response Planning Design Team is selected by the Climate Technology Centre (CTC). The composition of the team depends on each particular request but may include the National Designated Entity (NDE), the request Proponent, Climate Technology Manager of the CTCN, experts from the CTCN Consortium, UNIDO and UNEP experts from regional offices and other experts as needed.

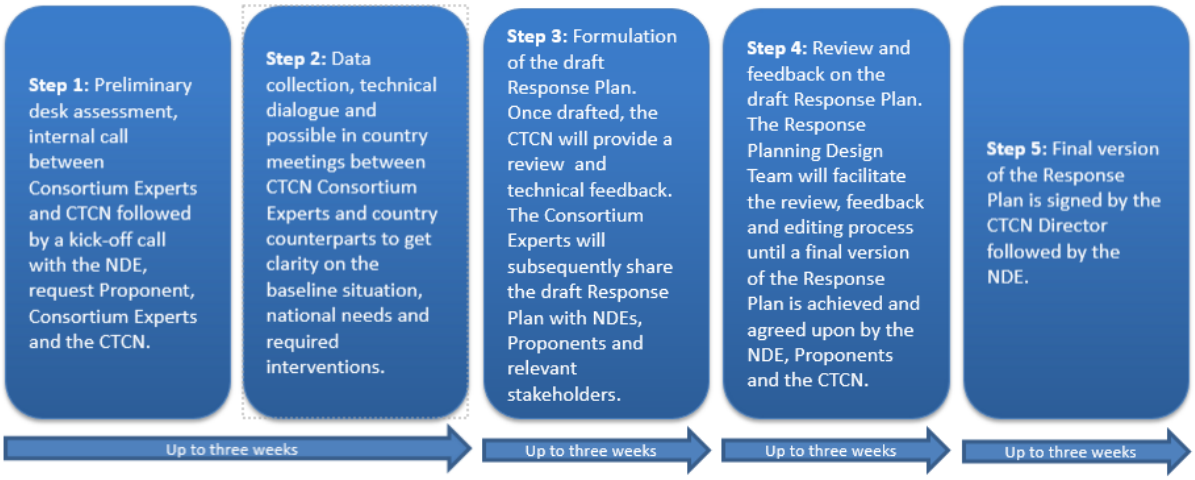
The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager of the CTCN will provide quality assurance of timeliness and appropriateness of the Response Plan.

The Response Planning Design Team will draft all sections of the Response Plan template building on the information contained in the CTCN Request, based on expertise on the given topic and potentially further data collection, as required. This will be done by the CTCN Consortium Experts in consultation with the NDE, request Proponent and relevant stakeholders. The Response Plan has to be agreed to and approved by the NDE and the CTCN Director. This Response Plan will serve as the basis to identify, select and engage an expert institution from the Climate Technology Network or Consortium to lead the implementation of the CTCN Response Plan in the requesting country.

To the extent possible, staff from UNEP and UNIDO Regional, Sub-Regional and/or National Offices should be involve in all stages of formulation of the Response Plan to maximize synergies and avoid overlap with ongoing initiatives, as well as ensure relevance to regional and national context.

4. Process for designing the Response Plan

The Response Planning process should be completed over a period of up to 60 working days (12 weeks). Indicative steps and related timelines are laid out below:



5. Design Considerations

In order to maximize the impact of the technical assistance provided by the CTCN and provide an effective M&E process, the Response Plan should integrate as much as possible the considerations below:

Climate Technology focus: The Response Plan should have a clear focus on climate technologies, and identify activities that enable the identification, development, deployment or diffusion of one or several specific technologies (including equipment, techniques, knowledge and skills).

Barrier removal / Problem solving: The activities should contribute to address the specific problem statement identified in the Request. The barriers identified should be those hampering the identification, development, deployment or diffusion of one or several climate technologies or climate actions. Therefore, it may be necessary to limit the CTCN Response Plan to a set of activities for technical assistance commonly agreed with the NDE (and Proponent when needed) compared to the original request submitted. The CTCN will liaise with NDEs and Proponent in case the scope of the technical assistance deviates from the original request.

Use of the CTCN assistance by stakeholders: The Response Plan should identify clearly how the products of the CTCN assistance will be used in the short term once support is delivered, by who and when, to ensure it will lead to specific impacts in the country. The activities should engage the stakeholders that will use the concrete results of the assistance to deploy the technologies, including from the private sector, the public sector, research institutions, etc.

Within the scope of CTCN resources: The cost of the technical assistance provided by the CTCN cannot exceed USD 250,000 per Response Plan. Therefore, it may be necessary to prioritize activities and limit the CTCN Response Plan to a set of priority activities commonly agreed with the Proponent and the NDE to remain under this value. Under section 4 of the Response Plan template, an indicative activity based budget should be presented. The proposed budget is indicative and should present an estimated costing range per activity, output as well as a total costing range for the delivery of the Response Plan. Once the Response Plan is finalised and published for tendering, interested parties will provide competitive offer against the indicative budget.

CTCN activities and outputs should be linkable to monitoring and evaluation indicators: All proposed activities and outputs must be linkable to monitoring and evaluation indicators that are specific, measurable, achievable, relevant, and time-bound. The monitoring and evaluation process and corresponding indicators will be developed by the Lead Implementer as part of the work plan and will allow the CTCN technology Manager to monitor the timeliness and appropriateness of the implementation.

Synergies with existing efforts: The Response Plan should focus on activities that are not already being fully supported or that are in the process of being fully supported by another national, regional or international organization. Synergies and complementarity also require that the CTCN assistance is not duplicating past activities. It is possible in the Response Plan to indicate co-financing from the government, the Proponent or another stakeholder, that will maximize the effectiveness of the CTCN assistance.

Gender mainstreaming: The CTCN mission is to build or strengthen developing countries' capacities to identify technology needs, to facilitate the preparation and implementation of technology projects and strategies taking into account gender considerations. The Response Plan must therefore describe how gender considerations will be included and monitored within the proposed activities, and any gender co-benefits that will be gained as a result of implementing the CTCN technical assistance.