Country:	Thailand
Request Identification Number:	2015000084

Title:	Enhancing Climate Information for Adaptation Decision Making in Thailand with High Resolution Climate Modeling

Summary of the CTCN Technical Assistance

Thailand needs high-resolution climate data and impacts analysis to design targeted climate adaptation interventions, including policies and investment decision making, to adapt to a changing climate. The proposed CTCN Technical Assistance will contribute to this need through technology transfer, demonstration and training program to help with dynamical downscaling of climate change information to improve decision-making. This will help Thailand better predict the nature of climate impacts with greater certainty. The technical assistance will contribute to the establishment of an online Graphical User Interface that provides high-resolution climate data and visualisation tools for well-informed decision-making. Stakeholders from various sectors will be able to make use of this facility and utilise the data for decision making by government officials and the private sector. Further, the technical assistance will bring additional skills and competences to the researchers of Chiang Mai University (CMU), researchers from the hydrology and agriculture sectors across the country and officials at different levels of government in Thailand.

1. Overview of the CTCN technical assistance

1.1 Technology aspects

At present, the proponent institute (Chiang Mai University [CMU]) has the capacity to produce climate simulations with low resolution data. These data are spatially too coarse to account for small scale changes that impact Thailand and are therefore underutilized by planners and policy makers from various sectors that need near-future climate impacts assessments to inform decision making. The CTCN technical assistance will help Thailand:

a) Identify the data/knowledge gaps
b) Facilitate the transfer of high-resolution climate downscaling and analysis tools expertise to fill the above-mentioned gaps
c) To enhance local skill sets on climate modelling capacity in relevant fields (e.g. climate models, generation of high resolution climate data, dynamical downscaling techniques etc.)

With support from CTCN assistance, the steps mentioned above will enable the CMU to develop a climate database, computational infrastructure and strengthen the ability of CMU to produce more localised climate scenarios, which can be useful for designing local adaptation strategies if the information is used by the appropriate stakeholders climate change adaptation strategies

1.2 Objectives (outcomes)

The main outcomes of this technical assistance will be:

a) Improved decision making, by key actors due to access to improved climate information.
b) Strengthening of skill-set and modeling capacity of stakeholders involved in agriculture and hydrology on assessing the impact of climate change on those respective sectors
c) Strengthening the national climate model with the produce high- resolution climate data generated under this Technical assistance. This climate model will be used by sectoral experts, as well as national, subnational and urban planners, for selecting and designing adaptation investments.

One of the outcomes of the TA will be to strengthen the national climate model with the produce high- resolution climate data generated under this Technical assistance. This climate model will be used by sectoral experts, as well as national, subnational and urban planners, for selecting and designing adaptation investments.

1.3 **Results (outputs expected from CTCN assistance)**

a) 1-day kick-off meeting with around 35-50 stakeholders (local, regional and National) from Agriculture and Hydrology
b) Report on the knowledge gained from visit to implementing organisation
c) High resolution (12km/4km) downscaled climate model data (for the baseline period and near-future (2006-2040) in different climate change scenarios) for Thailand
d) Tailored climate data products in desired formats as requested by the sectoral(agriculture and hydrology sector) stakeholders
e) 3-day training workshop for same stakeholders (as participated in kick off meeting) on analysis of generated climate data
f) 1-day multi-stakeholders (involving policy makers, researchers, practitioners) national dissemination workshop to disseminate the results and findings of the technical assistance and way forward

1.4 **Expected use of outputs**

Dynamic downscaling using boundary conditions from CMIP-5[i] model (CESM) simulations will lead to the generation of high-resolution climate data for Thailand.

The training workshop will help different sectoral stakeholders to familiarize with different techniques to handle large climate datasets, prepare the necessary input data for the model simulations and to do sectoral model simulations (hydrology, crop yield) with different configurations and use optimum methods to generate and fine-tune the simulations further.

The national level workshop to disseminate the data and information generated with CTCN technical assistance will aim at policy makers and stakeholders from within the agriculture and hydrology sectors. The climate data generated will provide two different extreme climate

change scenarios – one projecting extremely high emissions and the second on projecting extremely low emissions. Understanding how the climate (for e.g. changes in precipitation intensity, spatial distribution; daily minimum and maximum temperatures in different seasons etc.) is likely to change in the near-future within these two extreme emission climate change scenarios will help the government to plan for worst case scenarios and aid the government in disaster preparedness.

2. Description of the Assistance

CESM (CMIP-5)[1] model output data will be used as input data for the regional climate model (using the regional climate model (WRF[ii]). CMU has already developed and validated the WRF downscaling processing over the baseline period. The technical assistance from CTCN will help CMU to run the regional climate model for the near-future for different emissions scenarios.

Baseline climate simulation for the period 1976-2005 will be done by taking inputs from historical simulations of CMIP-5 (CESM) and near-future projections in two IPCC[iii]AR5[iv] scenarios (RCP[v]4.5 & RCP8.5).

The downscale/high-resolution climate data and the information from the analysis will be made available to different sectoral stakeholders (such as Agriculture, water resource management in desired formats as per their requirement and as requested by them prior to the generation of high resolution climate data. For this purpose, one-day kick off meeting will be organized with climate modelling group and sectoral experts such as provincial and national agricultural and hydrology departments, agricultural research institutions, urban planners, farmers associations if any, so that the requirement and format at which the sectoral experts need data can be well understood by the climate modeller. That will help the modelling team to generate the required climate information.

Subsequently, the 3-days training workshop will be conducted for stakeholders and policy makers to familiarise them with handling large-scale climate data (generated as per their requirement) sets and draw inference and identify the relevant climate variables for application in their field of expertise and inform them how they are able to gain access to the localized climate scenario that will be generated by this TA

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[1] 1 CMIP-5 - Coupled Model Inter-comparison Project-Phase-5: Under the World Climate Research Programme (WCRP) the Working Group on Coupled Modelling (WGCM) established the Coupled Model Intercomparison Project (CMIP) as a standard experimental protocol for studying the output of coupled atmosphere-ocean general circulation models (AOGCMs). CMIP provides a community-based infrastructure in support of climate model diagnosis, validation, inter-comparison, documentation and data access. This framework enables a diverse community of scientists to analyze GCMs in a systematic fashion, a process which serves to facilitate model improvement (source: http://cmip-pcmdi.llnl.gov/).

[ii] WRF : Weather Research and Forecasting Model

[iii] IPCC : Intergovernmental Panel on Climate Change

[iv] AR-5 : IPCC Assessment Report-5

[v] RCPs: Representative Concentration Pathways are four greenhouse gas concentration trajectories adopted by the IPCC for AR-5 in 2014.

[1] CESM: Community Earth System Model: CESM is a fully-coupled, community, global climate model that provides state-of-the-art computer simulations of the Earth's past, present, and future climate states.

2.1 Activities

Activity 1 – High-resolution dynamic climate change downscaling scenarios

Applying appropriate tools (such as Matlab or Fortran), will help CMU to make the needed climate datasets and information using the CMIP-5 CESM simulations. Baseline simulations and near-future climate projections will be performed in two emission scenarios (RCP[vi]4.5 & RCP8.5)..

Activity 1.1 Project kick-off meeting
A meeting with participants (max 50 in Number) from the implementer organisation, proponent institute (CMU), Government department and institutions working on Agriculture and Hydrology, the CTCN and the NDE team will be organized in Chiang Mai. The sectoral stakeholders/users will explain their data requirements in the 1-day workshop.

Activity 1.2 Technology exchange with relevant High Performance Computing (HPC) facility
Site based and/or virtual visit(s) of relevant technology practitioners to the implementer organisation, to improve the understanding on optimal use of High Performance Computers (HPCs), their maintenance and downscaling techniques.

Activity 1.3 Pre-processing input data for model simulations and Dynamical downscaling
Boundary conditions data for dynamic downscaling will be generated using CESM[vii] outputs. Historical climate simulations (1976-2005) will be performed using inputs from the CESM model. Also, climate projections will be done for the period 2006-2040 in two AR5 scenarios (RCP4.5 & RCP 8.5) which will provide high resolution climate data in two extreme climate change scenarios. Climate data will be used by sectoral stakeholders for analysis during activity 3.

Activity 1 – Deliverables

Deliverables	Delivery date
Activity 1.1: Report on kick-off meeting	Week # 8
Activity 1.2: Report on visits	Week # 20
Activity 1.3: List of high resolution climate data set (WRF-CESM)	Week # 30

Activity 2 – Knowledge sharing and interactive workshop for agriculture and hydrology sector stakeholders

The required data for different agriculture and hydrology sector stakeholders will be extracted from high- resolution regional model datasets for the baseline period and near-future projections and shared in the prescribed format as required by the sectoral experts (Agriculture and Hydrology) at the stakeholders' workshop on Climate data analysis and visualisation and their applications in different sectors.

The objective of the workshop is to introduce adaptation planning practitioners, scientists, sub-national and local government officials and research scholars from different sectors to regional climate data visualization and application in their field using the high resolution climate data generated with the technical assistance. At the end of the workshop participants will know how to use this information to inform improved decision making to adapt to climate change impacts.

During the 3-day workshop in Chiang Mai, the participants will understand the datasets and apply them to real and current climate impact challenges that the agriculture and hydrology planners are dealing with. In order to make the workshop more useful and effective, it will be proposed that the agriculture and hydrology planners come to the workshop with already identified climate impact challenges (one each), so the workshop can focus on applying the near term climate scenarios to these specific and practical climate impacts and begin to define the applications of the climate scenario information. It will help ensure the climate scenario information is really used for planning and decision making in analyzing climate data.

Venue: Chiang Mai
No. of workshops -1
No. of participants – 40
Type of participants: Officials/researchers/ Practitioner for agricultural and hydrology sectors, Local decision maker/policy makers, NDE team
Duration of workshop - 3 days

Activity 2 – Deliverables

Deliverables	Delivery date
Climate data in user-friendly format	Week # 36
Report on the knowledge sharing workshop	Week # 40

Activity 3 – National Dissemination workshop

A national level dissemination workshop will be conducted in Bangkok involving policy makers and participants from different sectors and stakeholders. The Thailand NDE and CMU will support the implementer in identifying the relevant participants.

The targeted participants will be informed in details about

(a) The high-resolution climate data generated with this technical assistance and the possible derived climate products which can be used for sectoral research and analyses
(b) Findings on sectoral analysis by using the climate data as generated from the high-resolution climate models, based on the list of high resolution model data produced in activity 1.3.

(c) How to access these scenarios information in the future

Venue – Bangkok
No. of workshops -1
Type of participants: Decision/policy makers, Government departments and experts from Agriculture and hydrology, private sectors
No. of participants – 70
Duration of workshop – 1 day

The proponent institute with inputs from the implementing institute will submit a final project report to CTCN. This report will provide description of the deliverables of the technical assistance, the methods used in the study, the knowledge gained through interactions with the implementing institute, infrastructure developed with the CTCN assistance, the projected change in near-future climate and the high resolution data provided to various stakeholders for sectoral analysis. The experience gained in capacity building training workshops will be detailed in the report. The report will also include a description of the processes involved and suggestions for its further improvement.

Activity 3– Deliverables

Deliverables	Delivery date
Report on national dissemination workshop	Week # 48
Final report to CTCN	Week # 52

2.2 Synergies and Baseline Setting

Completed scientific research projects in the field

- Climate Change Impact on Air Pollution Problem in Upper Northern Thailand, Chiang Mai University. 2013-2015.
- The effects of atmospheric aerosol on solar radiation and climate over Northern Thailand. Phase I : A case study of forest fire season 2013. National Astronomical Research Institute of Thailand. 2015.
- Changes in Temperature and Precipitation Extremes in Northern Thailand. Faculty of Social Science. Chiang Mai University. 2014.
- Design and development of risk assessment model for cities in Thailand and decision support system for climate change adaptation: Phase I – Prototype development and proof of concept. Thai Research Foundation. 2014.
- Fuel Reduction by Participatory Action-based Management to Decrease Forest Fires: A Case Study of Soptia Sub-district, Chom Thong District, Chiang Mai Province. Thai Universities for Healthy Public Policies, 2013.
- Air Pollution Potential and Warning in Chiang Mai. Thai Universities for Healthy Public Policies, 2010.

- Simulation of climate change for Thailand using MM5 regional climate model. Thailand Research Fund, 2009.
- Weather analysis for air quality monitoring in Chiang Mai - Lamphun basin, Thailand Research Fund, 2008.
- Simulation of Particulate Matter on Weather Variability in Chiang Mai – Lamphun basin, Office of the National Research Council of Thailand, 2009.
- Relationship between surface temperature and land use from remote sensing data in Chiang Mai – Lamphun basin, Faculty of Social Science, Chiang Mai University, 2008.
- The Application of Remote Sensing Data and GIS to Study the Relationship of Forest Fire and Air Pollution in Chiang Mai-Lamphun Basin, Geo-Informatics and Space Technology Development Agency (Public Organization), 2008.
- Project of management ecosystem in Ping basin. Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment, April-December 2007.

Ongoing research projects

- The Impacts of Climate Change on Hydrology and Water Resources of the Upper Ping River Basin. Thai Research Foundation. 2014-2016.
- Monitoring of Open Burning in Northern Thailand for Assessment of Air Pollutant Emission and Transport for Smoke Haze Management Planning. Thai Research Foundation, 2015-2017.
- Seasonal Climate Forecasting Model for Rice Yield Modeling over Thailand. Thai Research Foundation. March 2016- March 2018.

The proposed CTCN assistance will enable the proponent institute to improve their skills in climate downscaling and build their capacity in tailoring the climate data into user-friendly formats for sectoral users and which in turn will result in the establishment of a decision support system for the planners and policy makers. Further, it will be helpful in designing more research projects on regional climate variability so that the infrastructure established with the CTCN support can be sustained.

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i CMIP-5 - Coupled Model Inter-comparison Project-Phase-5: Under the World Climate Research Programme (WCRP) the Working Group on Coupled Modelling (WGCM) established the Coupled Model Intercomparison Project (CMIP) as a standard experimental protocol for studying the output of coupled atmosphere-ocean general circulation models (AOGCMs). CMIP provides a community-based infrastructure in support of climate model diagnosis, validation, inter-comparison, documentation and data access. This framework enables a diverse community of scientists to analyze GCMs in a systematic fashion, a process which serves to facilitate model improvement (source: http://cmip-pcmdi.llnl.gov/)

ii WRF : Weather Research and Forecasting Model

iii IPCC : Intergovernmental Panel on Climate Change

iv AR-5 : IPCC Assessment Report-5

v RCPs: Representative Concentration Pathways are four greenhouse gas concentration trajectories adopted by the IPCC for AR-5 in 2014.

vi RCPs: Representative Concentration Pathways are four greenhouse gas concentration trajectories adopted by the IPCC for AR-5 in 2014.

vii CESM: Community Earth System Model: CESM is a fully-coupled, community, global climate model that provides state-of-the-art computer simulations of the Earth's past, present, and future climate states.

2.3 Timeline

Activity	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12
1												
1.1												
1.2												
1.3												
2												
3												

2.4 Expertise required

Activity 1: High-resolution Dynamical Downscaling of climate	
Expert 1 – programmer/database manager	Create input data for the regional model from the global climate model data (30 days).
Expert 2 and 3 – Climate modelling (one for Agriculture one for Hydrology)	Downscaling techniques and assistance in regional model simulations (30 days X 2 experts).
Event1: Kickoff meeting (Expert 3)	One expert from implementing organization for the stakeholder interaction workshop at Chiang Mai.
Activity 2: 3 days interactive workshop	
Event 2 –3 days interactive workshop **(Expert 1, 2, 3)**at Chiang Mai	3-day interactive workshop at Chiang Mai. with around 40 participants (12 days total for 3 senior experts to attend plus 5 days total to prepare; 8 days logistics specialist to organise workshop; venue; catering; travel for 10 national participants and 3 international experts).
Activity 3:National Dissemination workshop	
Event 3 National level workshop (Expert 1-3)	One expert from the implementing organization participating in the national workshop. Expert 1, 2 and 3 will be involved in finalizing the project report to be submitted to CTCN (6 days each X 3 experts to plan and participate; venue; catering; travel for 10 national participants and 3 international experts)

2.5 Main partners

Stakeholder	**Role to support the implementation of the CTCN assistance**
CMU	Overall facilitator of the execution of the activities and provider of logistics support. Will also provide support in the identification of relevant participants.
Information Technology Service Centre – ITSC – Chiang Mai University	ITSC provides space and maintenance support for the HPC and storage of data.
Thai Meteorological Department	Provides observational climate data.
National Science Technology and Innovation Policy Office (STI), Ministry of Science and Technology, NDE, Thailand	Supports the execution of the activities.

2.6 Indicative budget

Activities	**Estimated Budget (USD)**
Activity 1	105k USD
Activity 2	40k USD
Activity 3	35k USD
Measures, evaluation and learning as per section 3.4	10k USD

Total	190,000USD

Implementation of this Response Plan will be led by the Climate Technology Centre (including selection, contracting, supervision and monitoring of implementation partners) in close coordination with the corresponding National Designated Entity and relevant national actors. Implementation will be led by an International Consortium or Network Partner of CTCN.

2.7 Gender considerations

Gender related inputs in during the technical assistance: Women participants will be involved in the research team of the CTCN technical assistance. Gender balance will be kept up in all the workshop participation.

Gender related outcomes of the technical assistance: Based on the technical assistance, policy makers will be able to plan better for climate related disasters, which will reduce vulnerability of both women and men. However, adaptation to climate change is closely related with access to essential resources, such as land, money, healthcare and food security; and women's capabilities are often compromised in that regard in a very traditional society such as Thailand, making them more vulnerable than men. Hence women will particularly benefit from better planning for climate change hazards.

2.8 Risk identification and risk mitigation

Risk	Consequence	Probability	Mitigation measure
Infrastructure: The existing computational system at CMU will not be able to complete the proposed activities in time.	Timely execution of the proposed activities will be compromised.	Medium	Engage with relevant institution at the beginning of the technical assistance and receive support from the NDE and CMU in getting access to advanced computational system
Challenges in the coordination between data entities	The different entities holding the necessary data for the climate downscaling are not coordinating and sharing the information impairing the implementation of the response plan	Medium	The CTCN implementer will involve these entities from the beginning of the activities. The visit described in Activity 1 was also designed with this purpose

3. Long-term impacts of the assistance

3.1 Expected climate change-related benefits

	CTCN climate technology impact	Anticipated contribution from CTCN assistance
1	Climate technologies adapted to national context are identified and prioritized to enable their deployment and/or transfer in the requesting countries	Experience of international expert to be shared to Thailand on preparation of input data from Global climate model to force the regional climate model.
2	Progress made against mitigation objectives (i.e. energy and carbon intensity reduction) as a result of the response	Generation of near-future high resolution climate simulations which will enable the policy makers to make appropriate decisions (for e.g. rain water harvesting, urban planning, better preparedness for flash floods and extreme rainfall events).
3	Progress made against adaptation or resilience objectives (e.g. climate vulnerability index improvement) as a result of the response	Defining more accurate climate indices based on high resolution climate simulations.
4	New mitigation or adaptation technology projects/initiatives implemented as a result of the response	
5	New or strengthened policies/ laws developed, approved and enacted as a result of the response	
6	New policies/laws where climate change was mainstreamed as a result of the response	
7	Country integrating climate change mitigation and/or adaptation issues into its planning and policies as a result of the response	New research projected based on the outputs of the present proposed project with CTCN assistance. Projects on extreme event analysis and their return periods will be of great assistance to the planners.
8	New or strengthened Public-Private Partnerships (PPP) and/or twinning arrangement created directly as a result of the response	
9	New or strengthened twinning arrangement created as a result of the response	The CTCN assistance will bring together the research community (CMU and other Government agencies), which eventually will lead to better utilisation of the scientific research output in societal betterment.

10	Capacities to access and attract public and private finance increase to enable financing of technology deployment
11	Post-response intervention funding attributable to the response.
12	Framework and analysis of local production developed to enable deployment of national production of climate technologies

3.2 Co-benefits

	Sustainable Development Goal	Contribution from CTCN assistance
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	The outcome of the CTCN assistance will help in framing new policies for food security. Realistic simulations of high resolution near-future climate projections will help the policy makers and planners. Projections on emission levels and air quality will support promulgating new health policies.
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	There will be sufficient women participation in all the three proposed workshops and women experts/scientists will be involved in the research team of CTCN technical assistance.
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all	
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	
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	This technical assistance aims to project

	and its impacts	climate change impacts in the near-future in different emission scenarios.
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	

3.3. Post-assistance plans and actions

The outputs and outcomes produced by CTCN assistance must be utilized in sectoral development of Thailand.The following activities are envisioned to be implemented:

a) The information generated by various sectoral expert with the high resolution climate data generated with the CTCN assistance is expected to be assimilated by the policy makers in their decision making.

b) The high-resolution regional climate model data should be critically analysed and efforts should be made to fine-tune the regional climate model with user community support for more realistic weather predictions/climate projections.

c) Maintenance/enhancement of the existing computational infrastructure improved with CTCN assistance through funds generated by research projects.

d) Capacity building workshops and research schools to train people/research scholars in climate modelling

After validating the projected climate data and applying proper data bias-corrections (if any) the climate information generated from the data for the near future may be utilised for effective planning by the concerned sectoral authorities.

3.4 Monitoring and Reporting of technical assistance results and impacts

Technical assistance meetings/conference calls will be conducted on a monthly basis. It is the responsibility of the lead implementer to organize these meetings/conference calls. The NDE will be invited to attend the monthly technical assistance meeting.

Expected activities and deliverables under this assistance are explicitly described in various sections of this response plan and the performance indicators table below (see also log frame in annex). Activities progress and deliverables will be monitored closely by the Lead Implementer of this Response Plan with the collaboration of the NDE in Thailand, the request proponent (CMU) and CTCN. The Lead Implementer is responsible for verifying project progress against timeline, associated milestones, and communicates these results to the NDE and CTCN. All suggested changes to the activities, processes and/or approaches as outlined in current response plan must be accepted by the CTCN and NDE before they can be applied. At the end of the assistance, the Lead implementer will produce a technical assistance report communicating the lessons learned, challenges and good practices.

Response output *(linking to sec 1.2)*	**How output will be used to ensure creation of result**	**Expected result**	**Expected outcome of result** *(linking to sec 1.1)*	**Anticipated impact that outcome will produce** *(linking to section 3)*
Downscaling	High resolution climate data will be generated for the baseline period and near future in different scenarios.	Policy makers and officials at different levels of Government will be able to frame new laws/policies based on realistic high resolution climate projections for the near-future.	A sustainable development oriented laws and policies.	A responsible society that follows sustainable development practices.
Training workshop	Enhanced knowledge of the stakeholders is key in the sustainability of the modelling generated	Trained personnel for climate modelling	Fine-tuning of climate modelling skills and climate analysis is improved.	The climate monitoring and projection/prediction program can be sustained and improved with more number of trained professionals
National Level workshop for data dissemination	Dissemination of high-resolution data and derived products, climate indices for stake holders	Planners are equipped with much needed climate information	Improved decision making	Better preparedness for extreme climate events and disasters

4. Signatures

Signatures of the requesting country

NDE

Name: Dr. Surachai Sathithumarat
Title: Senior Director
Date: 19 Oct 2016
Signature:

Request Proponent

Name: Dr. Chakrit Chotamonsak
Title: Head of RCCES research center
Date: 26 Oct 2016
Signature: Chakrit Chotamonsak

Signatures of the CTCN

CTCN Director

Name: JUKKA UUSIVAINEN
Title: DIRECTOR
Date: 31/10/2016
Signature:

Climate Technology Manager

Name: JASON SPENSLEY
Title: CLIMATE TECHNOLOGY MANAGER
Date: 31/OCT/2016
Signature:

workshop	dissemination workshop. Final Report to CTCN.	planners are familiarised with the high-resolution climate data generated for the near-future.	STI, NDE	including sectoral stakeholders and planners/policy makers were trained in a one-day workshop.	CTCN evaluates the final report submitted.

Annex 1: Response Logframe

Activity *(link to sec 2)*	**Description of sub-activities conducted by the CTCN**	**Output/ Deliverable** *(link to sec 2.9)*	**Expected Outcome** *(link to sec 3)*	**Main national partners involved**	**Objectively Verifiable Indicator** *(see Annex 5 guidance)*	**Means of Verification** (data source, method of collection, responsibility and periodicity)
Activity 1:	*Activity 1.1 Project kick-off meeting* *Activity 1.2 Technology exchange with relevant High Performance Computing (HPC) facility* *Activity 1.3 Pre-processing input data for model simulations and Dynamical downscaling*	Report on kick-off meeting. Report on visits. List of high resolution climate data set (WRF-CESM).	Enhanced capacity to work with High Performance Computers. Trained manpower on dynamic downscaling of climate.	CMU, ITSC	Fellows from proponent institute got trained in dynamical downscaling of climate	During the sectoral stakeholder interaction workshop
Activity 2:	*Knowledge sharing and interactive workshop for agriculture and hydrology sector stakeholders*	Climate data in user-friendly format. Report on the knowledge sharing workshop.	Sectoral stakeholders are equipped with much needed high resolution climate data for the near-future. Sectoral stakeholders are familiarised with the climate data and are capable of data analyses and draw inference relevant to their sector.	CMU, STI, ITSC	40 participants got trained for 3 days.	Climate data generated for the baseline period is validated with climate observations.
Activity 3:	*National Dissemination*	Report on national	Policy maker and	CMU, ITSC,	70 participants	