



Economics of  
Climate  
Adaptation

## Report 01

May 2020



# Inception Report

## Flood and Heatwave Risk in Cần Thơ, Vietnam



UNITED NATIONS  
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## List of Acronyms

BMZ	German Ministry for Economic Cooperation and Development
CCA	Climate Change Adaptation
CCCO	Climate Change Coordination Office
CRO	Climate Resilience Office
ECA	Economics of Climate Adaptation
ISF	InsuResilience Solutions Fund
KfW	German Development Bank
NAP(s)	National Adaptation Plans
NGO(s)	Non-Governmental Organization
UNU-EHS	United Nations University – Institute for Environment and Human Security
100RC	100 Resilient City Programme



## 1. Context

Global mean temperatures are constantly raising and already predicted risks associated with extreme events will continue to increase<sup>1</sup>. Among several countries worldwide, Vietnam is adversely affected by climate change and its effects through extreme weather events. According to the Global Climate Risk Index Report (2020), Vietnam has been identified as one of the ten most affected countries to extreme events within the last two decades<sup>2</sup>. An often recurring event in Vietnam are floods. Flood risk is expected to increase, particularly in coastal areas in which population growth, urbanization and rapid socio-economic development are most abundant<sup>3</sup>. The Mekong River Delta is Vietnam's most important and largest region with respect to agricultural and aquacultural production systems, whereas a large extend of the delta is just under two meters above sea level<sup>4</sup>. A key concern in this region are the climate change impacts on existing flood regimes. The City of Can Tho, also referred to as the economic centre of the Mekong Delta, is at high risk of flooding invoked by a combination of three different flood regimes comprising of tidal floods from the Eastern Sea, increased precipitation and the Mekong River's flow variation<sup>5</sup>. The growing intensity and frequency of flooding, inundation and tidal surges of Can Tho City stresses the need to better assess the risks and to identify appropriate measures to build resilience pathways for the city's critical infrastructure, its people and economic development.

The United Nations University - Institute for Environment and Human Security (UNU-EHS) in cooperation with and funded by the InsuResilience Solutions Fund (ISF) is implementing the Economics of Climate Adaptation (ECA) methodology in Can Tho province, to identify the most cost-effective measures to address natural hazards, such as floods. The ISF is funded by KfW (German Development Bank) and commissioned by the German Ministry for Economic Cooperation and Development (BMZ). The BMZ explicitly expressed its interest in the results of the ECA studies being used to expand and further develop projects of the bilateral portfolio between KfW and its partners. Currently, ECA Studies are being implemented in three countries (Vietnam, Honduras and Ethiopia).

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<sup>1</sup> IPCC 2014. Retrieved from [https://www.ipcc.ch/site/assets/uploads/2018/02/SYR\\_AR5\\_FINAL\\_full.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf)

<sup>2</sup> D. Eckstein, V. Künzel, L. Schäfer, M. Winges. (2019). *Global Climate Risk Index 2020* (Briefing Paper), Germanwatch e.V. ISBN 978-3-943704-77-8. Retrieved from [www.germanwatch.org/en/cri](http://www.germanwatch.org/en/cri)

<sup>3</sup> Do, T.C., Nguyen, D., Gain, A.K., Kreibich, H. (2017): Flood Loss Models and Risk Analysis for Private Households in Can Tho City, Vietnam. - Water, 9, 5.

<sup>4</sup> Tuan L.A., Chinvanno S. (2011) *Climate Change in the Mekong River Delta and Key Concerns on Future Climate Threats*. In: Stewart M., Coelhanis P. (eds) Environmental Change and Agricultural Sustainability in the Mekong Delta. Advances in Global Change Research, Vol 45. Springer, Dordrecht.

[https://doi.org/10.1007/978-94-007-0934-8\\_12](https://doi.org/10.1007/978-94-007-0934-8_12)

<sup>5</sup> Ibid.



The main objectives of the ECA methodology are to support decision-makers in developing their adaptation strategy and climate change adaptation (CCA) investment portfolios, including risk transfer. The ECA methodology offers a systematic and transparent approach that fosters trust and initiates in-depth inter-sectoral stakeholder discussions. The methodology can be flexibly applied from the national down to the local level to different stakeholder groups and different hazards. It further gives guidance on aspects to focus on during a feasibility study. It provides key information to better manage risk through adaptation strategies including insurance approaches and supports the formulation of National Adaptation Plans (NAPs).

ECA offers a unique approach towards the flexible identification of cost-effective CCA measures for a variety of projects and sectors. It addresses, in particular, the following questions:

- 1) What is the potential climate-related damage over the coming decades?
- 2) How much of that damage can be averted, using what type of CCA measures?
- 3) What investments will be required to fund those measures - and will the benefits of these investments outweigh the costs?

A plethora of approaches has already been designed to respond to the complexity and the uncertainty of climate change-related projects. With regard to the implementation of climate change adaptation strategies, they range from climate vulnerability assessments, risk assessments, economic and/or sustainability impact assessments to decision making support tools. Among these, none has been integrating the full range of processes from risk assessment to a feasibility study of CCA measures. Integration is the strength of ECA; it is linked to the open-source software CLIMADA. The latter, by using available data, calculates the potential impact of current and future hazards on several selected assets, including the cost/benefits of selected measures.

This report is intended to present the main results of the Economics of Climate Adaptation (ECA) inception workshop on the 10<sup>th</sup> of January 2020 organised by UNU-EHS, ISF, the Can Tho Climate Resilience Office (CRO; initiated by the 100 Resilient Cities (100RC) programme of the Rockefeller Foundation), the Can Tho Climate Change Coordination Office (CCCO) and the People's Committee of the City of Can Tho.

## 1.1 General Information about Can Tho

Can Tho City is located in the centre of the Mekong Delta, about 80 kilometres from the Eastern Sea and around 170 kilometres south from Ho Chi Minh City, Vietnam's largest city. Can Tho lies on the western bank of the Hau River, a branch of the Mekong River<sup>6</sup>. While Can Tho is still Vietnam's largest production area for agriculture, aquaculture and fishery, the economy is increasingly moving to different sectors such as commerce, service and construction<sup>7</sup>. Can Tho's population counts approximately 1.35 million inhabitants as of 2018 and consists of five urban districts (Ninh Kieu, Binh Thuy, Cai Rang, O Mon and Thot Not) and four rural districts (Phong Dien, Thoi Lai, Vinh Thanh, Co Do)<sup>8</sup> (see Figure 1). However, the population is projected to grow to up to 1.7 million by 2020 due to inward migration to urban areas and

<sup>6</sup> Do, T.C., Nguyen, D., Gain, A.K., Kreibich, H. (2017): Flood Loss Models and Risk Analysis for Private Households in Can Tho City, Vietnam. - Water, 9, 5.

<sup>7</sup> Ibid.

<sup>8</sup> Frouws, E., Frölke, R., Maarse, N., van den Heuvel, O., & Meijer, B. (2019). Polder system Can Tho City: Impact of the urban polder on Can Tho City.



industrial zones<sup>9</sup>. Ninh Kieu district is the city centre and hosts governmental institutions, businesses, financial institutions, educational and health services. The rural districts are dominated by agricultural land use. The areas north and west of Can Tho are mainly used for extensive rice production and the south is characterized by orchards and annual crop cultivation. Fish farms are found along the Hau River and close to the irrigation channels of rice fields, where inland fish farming is possible<sup>10</sup>.

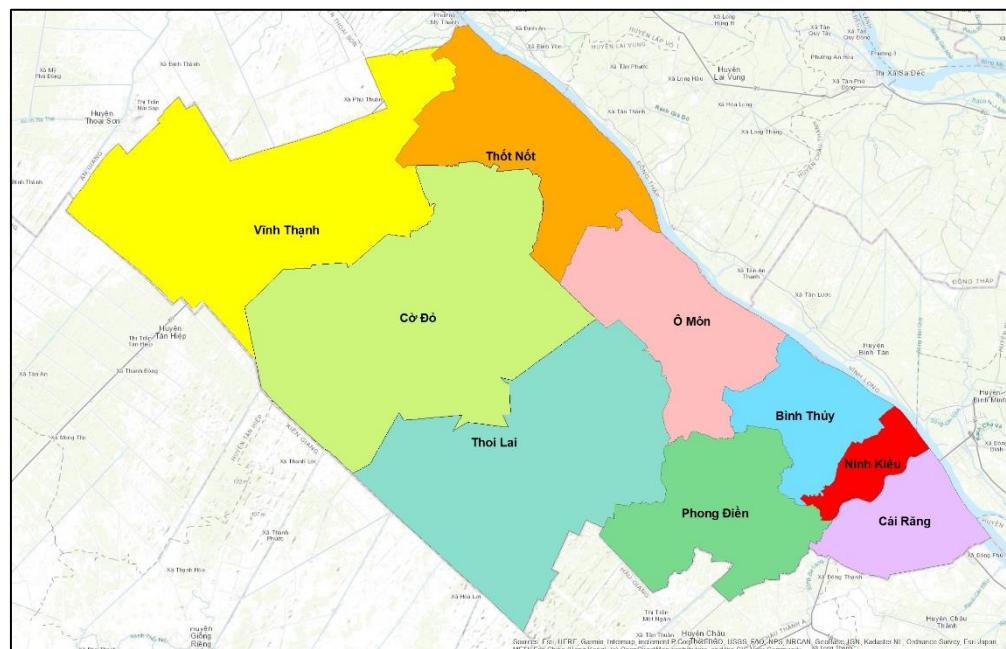


Figure 1: Map of Can Tho Province including district boundaries (own source)

Can Tho's topography altitudes between 0.6 to 1.2 m above sea level<sup>11</sup>. The central region of the Delta around Can Tho faces every year seasonal flooding events, often caused and influenced not only by a single flood regime but also by a combination of tidal floods from the sea, riverine floods from the upstream Mekong and strong precipitation (pluvial floods)<sup>12,13</sup>. Historically, people and their livelihoods were capable in adapting and coping with seasonal flooding, pursuing the strategy of '*living with the floods*'<sup>14</sup>. Nonetheless, the occurrence of floods with increasing severity become more damaging and

<sup>9</sup> World Bank. 2012. *City Development Strategy for Can Tho (English)*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/495701468319757095/City-Development-Strategy-for-Can-Tho>

<sup>10</sup> Siddiqua, A. (2019) Emergence of Water Urbanism for Water Born "Can Tho". *Journal of Water Resource and Protection*, 11, 166-180.

<sup>11</sup> Ibid.

<sup>12</sup> Do, T.C., Nguyen, D., Gain, A.K., Kreibich, H. (2017): Flood Loss Models and Risk Analysis for Private Households in Can Tho City, Vietnam. - *Water*, 9, 5.

<sup>13</sup> Hung, N.N.; Degado, J.M.; Tri, V.K.; Apel, H. Floodplain hydrology of the Mekong delta, Vietnam. *Hydrol. Processes* 2012, 26, 674–686.

<sup>14</sup> Cần Thơ Resilience Strategy 2030 (2019). Rockefeller Foundation. 100 Resilient Cities. Retrieved from <https://www.100resilientcities.org/wp-content/uploads/2019/06/Resilience-Strategy-Can-Tho-English.pdf>



unpredictable for the people and local governments, due to a multitude of factors such as climate change and rapid urban development<sup>15</sup>.

In general, the socio-economic development of Can Tho City is linked to its geographical position at the Mekong River and its delta. Can Tho is the centre for trade within the delta and between regions of the lower Mekong River basin. Particularly of interest are planned investments into transportation infrastructure to improve the city's connectivity to the South East of Vietnam and its national road networks<sup>16</sup>. Besides Can Tho's growing commerce, tourism and service sector, an intended growth point represents the educational sector with the establishment of new universities and colleges but also the support into new educational levels, especially vocational training<sup>17</sup>.

## 1.2 Environmental hazards in Can Tho

As a rapidly growing city, Can Tho faces multiple threats such as recurring (seasonal) flooding, sea-level raise, tidal surges land subsidence, salinization and extreme heat waves. Factors causing urban flooding in Can Tho City are Mekong River upstream floods combined with the high-tide regime of the Eastern Sea, which occurs at the start and middle of the lunar month<sup>18</sup>. These factors can often occur combined with a third flood regime caused by rain. Rainfall in Can Tho City usually lasts from 30 minutes to 2 hours with precipitation at 40–70 millimetres. In the middle of the rainy season, from August to October, urban flooding usually occurs right after the rain, especially in the lower areas inside the city<sup>19</sup>. Commonly, river discharges in Can Tho are high every season from September to November, whereas tidal flood often occur from October to January<sup>20</sup>. In 2008, 21 main streets were inundated to a depth up to 50 centimetres by high tides and a combination of heavy rains<sup>21</sup>. In October 2011, Can Tho faced a severe peak flood with a water level of 2.15 meters, inundating almost the whole city causing sensitive damages to the city's infrastructure, businesses and agricultural areas<sup>22</sup>. Some parts of the city, close to the river, were inundated for several months, with the consequence that about 27,000 houses were inundated and a

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<sup>15</sup> Ibid.

<sup>16</sup> World Bank. 2012. *City Development Strategy for Can Tho (English)*. Washington, DC: World Bank.  
<http://documents.worldbank.org/curated/en/495701468319757095/City-Development-Strategy-for-Can-Tho>

<sup>17</sup> Ibid.

<sup>18</sup> Danh, V. T. (2019). Household economic losses of urban flooding. In *Groundwater and Environment Policies for Vietnam's Mekong Delta* (pp. 119-146). Springer, Singapore.

<sup>19</sup> Ibid.

<sup>20</sup> Chinh, D. T., Gain, A. K., Dung, N. V., Haase, D., & Kreibich, H. (2016). Multi-variate analyses of flood loss in Can Tho City, Mekong Delta. *Water*, 8(1), 6.

<sup>21</sup> Danh, V. T. (2019). Household economic losses of urban flooding. In *Groundwater and Environment Policies for Vietnam's Mekong Delta* (pp. 119-146). Springer, Singapore.

<sup>22</sup> Ibid.

total economic loss of 11.3 million USD towards occurred towards the city's infrastructure, businesses and agriculture<sup>23</sup>.



**Figure 2:** Mau Than street in Can Tho city's Ninh Kieu district is flooded during high tides (Source: VNExpress)

Besides rapid urbanization, one important factor which influences floods in Can Tho is the water-system infrastructure. The different flood types increase the already high pressure on water supply-, sewage and drainage systems even further, while the sewer system is only partially capable of draining flood either from the river or from rain<sup>24</sup>. Sewer overflows induced by floods also present an increased health risk to the general population<sup>25</sup>. A need to re-route and re-design sewage and drainage networks and their interconnection has been recognized but represents a continuous challenge in the process of urbanization and new residential clusters. Another challenge is the lack of a standardized approach for flood loss assessments in the Mekong Delta, including Can Tho City<sup>26</sup>. Flood hazard and risk assessments are typically only restricted to a single flood type.

A more increasing hazard occurring in Can Tho City and its surroundings are heatwaves. Heatwave spells are considered as three consecutive days of extreme heat (maximum shade temperature reaches or exceeds 32.2°C) and the number is projected to increase in most areas of Central and South Vietnam<sup>27</sup>. Nonetheless, there is a challenge in recording and reporting statistics on damages due to heatwaves, leading to the difficulty to appropriately evaluate the effects and introduce control measures. Forecasting and warning systems of heatwaves become more sophisticated but often the effectiveness of

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<sup>23</sup> Chinh, D. T., Gain, A. K., Dung, N. V., Haase, D., & Kreibich, H. (2016). Multi-variate analyses of flood loss in Can Tho City, Mekong Delta. *Water*, 8(1), 6.

<sup>24</sup> Neumann, L., Nguyen, M., Moglia, M., Cook, S., & Lipkin, F. (2013). Urban Water Systems in Can Tho, Vietnam: Understanding the current context for climate change adaptation.

<sup>25</sup> Ibid.

<sup>26</sup> Chinh, D. T., Gain, A. K., Dung, N. V., Haase, D., & Kreibich, H. (2016). Multi-variate analyses of flood loss in Can Tho City, Mekong Delta. *Water*, 8(1), 6.

<sup>27</sup> IMHEN and UNDP. 2015. Viet Nam Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Retrieved from:

[https://www.vn.undp.org/content/vietnam/en/home/library/environment\\_climate/viet\\_nam\\_special\\_report\\_on\\_managing\\_the\\_risks\\_of\\_extreme\\_events\\_and\\_disasters.html](https://www.vn.undp.org/content/vietnam/en/home/library/environment_climate/viet_nam_special_report_on_managing_the_risks_of_extreme_events_and_disasters.html)



preparedness and coping measures are still limited<sup>28</sup>. One study indicated that heatwave events caused a 12.9% increase in risk of hospitalization due to cardio-vascular diseases in Ho Chi Minh City<sup>29</sup>. Statistics on the affects from heatwaves on urban infrastructure and people in Can Tho are not available. However, physical infrastructure such as energy systems, water storage, and transport could be affected by extreme heat both directly and indirectly, e.g. increased water and electricity demand during a heatwave, straining existing systems and potentially leading to shortages<sup>30</sup>.

### 1.3 Policies and strategies to address Climate Change in Can Tho

The Government of Vietnam has recognized the country's high vulnerability to the impact of climate change and reacted with the following initiatives and policies<sup>31</sup>:

#### National focus:

- *National Target Program to Respond to Climate Change (Decision No. 158/2008/QĐ-TTg dated December 2, 2008), and the subsequent National Strategy to implement some of its provisions (2139/2011/QĐ-TTg), all updated for the period 2012-2015 in Decision 1183/2012/QĐ-TTg)*
- *Ministry of Construction, has requested all provinces to consider the impacts of climate change when planning and approving urban development (Decision 2623/2013/QĐ-TTg dated 31/12/2013)*
- *Ministry of Planning and Investment, has prepared guidelines to support prioritization of climate adaptation actions in preparation of SEDP (Decision 1485/2013/QĐ-BKHĐT dated 17/10/2013)*
- *Ministry of Agriculture and Rural Development: Disaster Risk Reduction (DRR) policy (GoV Decision 1002/2009/QĐ-TTg on CBDRM dated 13/07/2009) and urban DRR guidelines*
- *Vietnam's National Adaptation Plan (NAP) for the period 2021-2030, Vision 2050 (ongoing process)*
- Intended Nationally Determined Contribution (INDC) of Vietnam (2016-2050) to meet the needs of the Paris Agreement<sup>32</sup>

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<sup>28</sup> Ibid.

<sup>29</sup> Phung, D., Chu, C., Rutherford, S., Nguyen, H. L. T., Do, C. M., & Huang, C. (2017). Heatwave and risk of hospitalization: A multi-province study in Vietnam. *Environmental Pollution*, 220, 597-607.

<sup>30</sup> Singh, R., Arrighi, J., Jjemba, E., Strachan, K., Spires, M., Kadrihasanoglu, A., Heatwave Guide for Cities. 2019. Red Cross Red Crescent Climate Centre.

<sup>31</sup> IMHEN and UNDP. 2015. Viet Nam Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Retrieved from:

[https://www.vn.undp.org/content/vietnam/en/home/library/environment\\_climate/viet\\_nam\\_special\\_report\\_on\\_managing\\_the\\_risks\\_of\\_extreme\\_events\\_and\\_disasters.html](https://www.vn.undp.org/content/vietnam/en/home/library/environment_climate/viet_nam_special_report_on_managing_the_risks_of_extreme_events_and_disasters.html)

<sup>32</sup><https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Viet%20Nam%20First/VIETNAM'S%20INDC.pdf>

### Sub-national focus:

- Can Tho's (100RC's) Resilience Strategy Framework (2030), 2019<sup>33</sup>
- Master Plan for Socio-Economic Development of Can Tho City through 2020 with vision towards 2030 (Decision No. 1533/QD-TTg)<sup>34</sup>
- Master plan of the Can Tho City till 2030 and with a vision to 2050 (Decision No: 1515/QD-TTg)<sup>35</sup>
- Government Resolution 120 /NQ-CP on Sustainable and Climate-Resilient Development of the Mekong Delta of Viet Nam<sup>36</sup>
- Can Tho Climate Change Activities Strategy in the Period 2015-2030, Can Tho's People's Committee, 2015<sup>37</sup>

National policies also require subnational governments to plan and manage for climate change, but no local government body has been established to mandate urban climate resilience planning. For this reason the Asian Cities Climate Change Resilience Network (ACCCRN), launched by the Rockefeller Foundation in 2008 provided funding and technical support to create provincial Climate Change Coordination Offices (CCCO's) in three Vietnamese cities – one of them being Can Tho City, who's CCCO was established in 2011. The role of Can Tho's CCCO is threefold: firstly, it provides and improves knowledge of local climate change impacts and interprets climate data for the use of other city departments; secondly, it coordinates climate action plans across sectors and identifies climate risks; and lastly, the CCCO intends to build capacity of other provincial government bodies to better understand and apply resilience plans<sup>38</sup>. In Can Tho the CCCO has coordinated the development of a climate change information database, including socio-economic data, which can be accessed by different city departments and agencies<sup>39</sup>.

Can Tho also has been engaged in the 100 Resilient Cities (100RC) programme supported by the Rockefeller Foundation<sup>40</sup>. The 100RC programme supported 100 cities worldwide to develop resilience strategies against the impacts of climate change. For this purpose, a local **Climate Resilience Office (CRO)** has been established in Can Tho to mandate and execute the 100RC programme. However, after three years, in July 2019 the programme was concluded with the creation and delivery of a *Can Tho Resilience Strategy (2030)*, focusing on four resilience dimensions: leadership and strategy, infrastructure and

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<sup>33</sup> <https://www.100resilientcities.org/wp-content/uploads/2019/06/Resilience-Strategy-Can-Tho-English.pdf>

<sup>34</sup> <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC164832>

<sup>35</sup> <https://vanbanphapluat.co/decision-no-1515-qd-ttg-the-project-on-adjustment-of-the-master-plan-of-can-tho-city-till-2030>

<sup>36</sup> <https://www.mekongdeltaplan.com/regional-coordination/government-resolution-120>

<sup>37</sup> <https://www.acccrn.net/sites/default/files/publication/attach/150526-canthoresilienceactivitiesstratrgy-15-30f.pdf>

<sup>38</sup> Institute for Social and Environmental Transition (ISET)-International. 2017. *The Role of Climate Change Coordination Offices in Building Resilience. Lessons from the Asian Cities Climate Change Resilience Network (ACCCRN)*. Retrieved from:

[https://www.preventionweb.net/files/56917\\_cccolessonlearnedsten170526v2.pdf](https://www.preventionweb.net/files/56917_cccolessonlearnedsten170526v2.pdf)

<sup>39</sup> Ibid.

<sup>40</sup> <https://www.100resilientcities.org/>

environment, economy and society, and health and well-being<sup>41</sup>. Despite the end of the 100RC programme, the Rockefeller Foundation continues its support to the CRO's through the Global Resilient Cities Network<sup>42</sup>.

#### 1.4 Selection of projects relevant to the ECA Study

This section lists projects by international donor organisations that are currently implemented in Can Tho City in Vietnam. This list is not exhaustive and reflects the best of our knowledge.

**Table 1:** Projects currently implemented in Can Tho City with relevance to the ECA Study

Donor	Project Name	Timeline	Budget	Scope
World Bank Group <sup>43</sup>	Can Tho Urban Development and Resilience Project	2016 - 2022	US\$ 250.00 Million	The aim of the project is to reduce flood risk in Can Tho's urban core area (Ninh Kieu and Binh Thuy districts) and enhance the capacity of city authorities to manage disaster risk.
GIZ <sup>44</sup>	Mekong Delta Climate Resilience Programme (MCRP)	2019 - 2021	N/A	The project aims to establish an institutional framework for the regional coordination of climate-resilient development in the Mekong Delta.

**NOTE:** A *Scoping Consultancy* (see ANNEX 10) plans to deliver an “Investment Atlas”, which provides an inventory of past, current and planned climate adaptation investments, projects and initiatives in Can Tho Province. It is intended to have this “Investment Atlas” available by August 2020.

<sup>41</sup> <https://www.100resilientcities.org/wp-content/uploads/2019/06/Resilience-Strategy-Can-Tho-English.pdf>

<sup>42</sup> <https://www.preventionweb.net/news/view/70490>

<sup>43</sup> <https://projects.worldbank.org/en/projects-operations/project-detail/P152851?lang=en>

<sup>44</sup> <https://www.giz.de/en/worldwide/73408.html>

## 2. Preparation of the workshop

### 2.1 Summary of meetings

On the 9<sup>th</sup> January 2020, UNU-EHS and ISF held a meeting with representatives of the Can Tho Climate Resilience Office (CRO) and Can Tho Climate Change Coordination Office (CCCO) to discuss the climate change adaptation situation in Can Tho city and the role of ECA. The meeting concluded the importance and need for a quantitative approach to climate change adaptation and to further investigate the role of insurance within municipal adaptation strategies.

A joint discussion on how to define key stakeholder groups for the inception workshops' session on '*Stakeholder Roles & Expectations*' resulted in the following grouping: (1) Academia, (2) International Organisations/NGOs, (3) Rural Stakeholders (Government representatives & Private sector) and (4) Urban Stakeholders (Government representatives). The rural and urban stakeholder groups mainly consisted of municipal representatives from diverse city departments and members of the respective People's Committees from Can Tho's districts (see [ANNEX 1](#) for the Workshop Participant List).

The official invitation letter for the ECA Inception Workshop has been sent prior to the stakeholders by the CRO.. A sample of the invitation letter can be found in [ANNEX 2](#). A conference room at the premises of Can Tho People's Committee has been chosen to host the ECA Inception Workshop on the 10<sup>th</sup> of January 2020. Photos of the venue can be found in [ANNEX 3](#).



## 3. Workshop

### 3.1 Objectives & Outline of the Workshop

The objectives of the ECA inception workshop are threefold. First, it is crucial to define a common understanding of the ECA study, the method and the expected results between all participants. Second, the scope of the study should be defined using a participative approach. The scope of the study determines what hazards are selected, which area(s) will be studied, and what categories of assets are relevant. Time horizons, climate- and socio-economic scenarios are also discussed. The third objective of the inception workshop is to identify what datasets are available and where. To achieve these objectives the workshop is divided in **three different sessions**.

**The first session** contextualised the ECA Study with the work of the municipality, especially with regards to present priorities for climate change adaptation (CCA). The ECA methodology was presented in detail, with an example from former studies. Space for questions was allocated. Eventually, different stakeholder groups were formed (Academia, International organizations/NGOs, Rural Stakeholders & Urban Stakeholders). Each group was tasked with three different questions:

- What are the stakeholder group's main concerns regarding CCA?
- What is the respective role of the stakeholders group for CCA?
- What role can the stakeholder group play in promoting CCA?

Participants were subsequently invited to present their answers in a plenary session. At the end of the activity, the main concerns and roles of each stakeholder group regarding CCA were articulated and understood among all participants.

**The second session** aimed to define the scope of the study. To achieve this objective, participants were allocated to four different tables. Care was taken that each stakeholder group from Session 1 was represented at each of these tables, to guarantee a balance of different perspectives and interests. Each table had the following theme with guiding questions:

- Table 1 - Hazards: Which climate threats are of the greatest importance for the study?
- Table 2 - Assets: Which asset groups require greater protection?
- Table 3 - Adaptation: What are the challenges/opportunities in implementing CCA measures?
- Table 4 - Time Horizon & Socio-Economic Scenarios: What time horizon will the study cover?  
What are the socio-economic trends?

Participants were subsequently invited to report back their results in a plenary session.

**The third session** of the workshop was dedicated to explain what data are necessary and to identify which institutions are able to provide them. The method used includes discussions about required data to



conduct the study with the scope agreed upon during Session 2. Subsequently, a so-called “*Data Gallery-Walk*” was open to participants, who were asked to write institutions and contacts for every type of dataset identified on a poster (e.g. Where to find meteorological data for the identified hazard?). Potential pathways for data acquisition were discussed with and among participants.

A detailed agenda of the whole inception workshop can be found in [ANNEX 4](#).

### 3.2 Participants

In total, 33 participants attended the inception workshop in Can Tho City (members of the organising team from CRO, CCCO, UNU-EHS & ISF were not counted). Participants were representatives from the various city departments, members of districts’ People’s Committees, members of Can Tho University, NGOs, financial development institutions, and international organisations. A list of participants is available in [ANNEX 1](#), along with a copy of the sign-in sheet from the registration desk (see [ANNEX 5](#)). See Figure 3 below for a group photo of all workshop participants.



**Figure 3:** Group photo of workshop participants - 10th January 2020, Can Tho City.



## 4. Results

### 4.1 Opening Statements

The ECA inception workshop was officially opened by Mr. Truong Quang Hoai Nam, Vice Chairman of Can Tho City People's Committee. He pointed out that a vibrant city like Can Tho, will face some challenges regarding climate change. Nonetheless, transformative pathways towards climate change adaptation will consider the city's and peoples' well-being, strengthen the economy, infrastructure and environment, and proactively transform Can Tho into a river city where people enjoy prosperity and safety from shocks and stresses. Followed by this, Ms. Simone Wunsch, Country Director of KfW Development Bank in Vietnam, highlighted KfW's engagement in the province of Can Tho and pointed out a recently made investment into wastewater treatment plants. She explained that urban infrastructures are a key priority area for investments into climate adaptation, especially in economically vibrant cities like Can Tho. At the end, Dr. Annette Detken, Head of the InsuResilience Solutions Fund (ISF) explained the structure and role of ISF in funding the ECA study. Ms. Detken highlighted, that a systematic climate risk analysis for climate change adaptation including risk transfer solutions is an integral element within financing developing.

### 4.2 Defining expectations

The first session of the workshop focused on climate change adaptation in Can Tho City and the associated roles and expectations of different stakeholder groups (as defined in 2.1). Each stakeholder group was seated at a specific table to answer the following questions:

- What are the stakeholder group's main concerns regarding CCA?
- What is the respective role of the stakeholders group for CCA?
- What role can the stakeholder group play in promoting CCA?

The answers of each stakeholder group for the respective questions are presented in the following sub-sections. See [ANNEX 6](#) for photos of the original flipcharts.

#### 4.2.1 What are the stakeholder group's main concerns regarding CCA?

Table 2 below states each stakeholder group's concerns regarding CCA. The table presents the comments without any further interpretation. The format or structure of answers has been chosen by the groups individually.



**Table 2:** Overview of each stakeholder group's concerns regarding CCA.

URBAN (Table 1)	RURAL (Table 2)	NGO's/INTL. ORG. (Table 3)	ACADEMIA (Table 4)
<ul style="list-style-type: none"> <li>Flooding affects the traffic and the daily work of the people, resulting in constraints on economic development</li> <li>Rising air temperatures are posing a threat to the city's population</li> <li>The change of hydrological regimes has had a major impact on the loss of land close to the river</li> <li>There is no comprehensive database on impacts from climate change on urban areas</li> <li>There is a lack of drainage systems or incomplete drainage facilities/systems</li> <li>The lacks of regulations (<i>no mention on which</i>) are still high and have not been thoroughly overcome</li> <li>Urban salinity situation is increasing due to the impact of climate change</li> <li>Insufficient funds for responding to climate change</li> </ul>	<p>Rural farmers are a very vulnerable group and they will be impacted by climate change. Concerns regarding CCA were grouped as follows:</p> <p><b>Infrastructure</b></p> <ul style="list-style-type: none"> <li>Transportation (land &amp; water)</li> <li>Domestic water supply systems</li> <li>Irrigation</li> </ul> <p><b>Agricultural Products</b></p> <ul style="list-style-type: none"> <li>Reduced production and yields</li> </ul> <p><b>Social Structure</b></p> <ul style="list-style-type: none"> <li>Illiteracy</li> <li>Health</li> <li>Accommodation</li> <li>Low income</li> </ul> <p><b>Public Policies</b></p> <ul style="list-style-type: none"> <li>CC amendment to policies needed</li> <li>Emergency fund to repair damage from CC impacts</li> </ul>	<ul style="list-style-type: none"> <li>Coordination between stakeholders</li> <li>Sharing information, results, issues, outcomes and differences among projects (from International Organisations)</li> <li>Creating open-source databases to support decisions on evidence</li> <li>Expert cooperation between government and communities</li> <li>Finding mutual scales for different projects</li> <li>Clarify impacts and causes of CC</li> <li>Raising the citizen's awareness about climate change. Government also should cooperate with local citizens</li> </ul>	<ul style="list-style-type: none"> <li>It is necessary to clearly state the difference between climate change and natural disasters</li> <li>[Climate Change] has a long time horizon and consequences will occur maybe in the next 20 years</li> <li>Natural disasters: the consequences are more serious to the people than climate change (short-term perspective)</li> <li>Climate change adaptation involves many complex processes and requires multidisciplinary work. It requires financial resources also provided by the government</li> <li>It is challenging to proof and verify different methods and data for CCA</li> <li>Finding more suitable and flexible solutions for adaptation to most vulnerability groups</li> </ul>

#### 4.2.2 What is the respective role of the stakeholder groups for CCA?

Table 3 below states each stakeholder groups' perception of its respective role regarding CCA. The table presents the comments without any further interpretation. The format or structure of answers has been chosen by the groups individually.



**Table 3:** Overview of each stakeholder group's respective role regarding CCA

URBAN (Table 1)	RURAL (Table 2)	NGO's/INTL. ORG. (Table 3)	ACADEMIA (Table 4)
<ul style="list-style-type: none"> <li>• Development of solar energy facilities (Deputy Director of Department of Industry and Trade)</li> <li>• Overcoming landslides: Riverbank floods in the rainy season, storms, floods (<i>no role defined</i>)</li> <li>• Advocate policies for coping with climate change</li> <li>• Promote scientific research and propose measures to reduce the impact of climate change</li> <li>• Foster green growth and sustainable development</li> </ul>	<ul style="list-style-type: none"> <li>• Provide human resources and finance for CCA projects</li> <li>• Apply the new technologies for CCA</li> <li>• Raise awareness and provide</li> <li>• Disseminate knowledge about climate change for the local people</li> <li>• Launch a campaign about CCA with call for communities to join</li> <li>• Set up pilot projects/models/frame works</li> <li>• Connect different authorities which make a contribution to CCA</li> </ul>	<p><i>(This question has not been answered by the representatives of NGOs and International Organisations)</i></p>	<ul style="list-style-type: none"> <li>• Evaluate the different climate change impacts on different sectors to develop CCA models in Can Tho city</li> <li>• Give recommendations about climate change to raise awareness of people</li> <li>• Set up practical technique to evaluate, predict and reduce the impacts of climate change</li> <li>• Improve the analysis and interpretation of local climate change</li> <li>• Government should organize capacity building about CC for local people and other government agencies</li> </ul>

#### 4.2.3 What role can the stakeholder group play in promoting CCA?

The table below (Table 4) states each stakeholder groups' perception of its respective role regarding promoting CCA and its implementation in Can Tho City. The table presents the comments without any further interpretation. The format or structure of answers has been chosen by the groups individually.

**Table 4:** Overview of each stakeholder group's respective role regarding the promotion of CCA

URBAN (Table 1)	RURAL (Table 2)	NGO's/INTL. ORG. (Table 3)	ACADEMIA (Table 4)
<ul style="list-style-type: none"> <li>• Saving clean water is essential right now</li> <li>• Adaptive infrastructure in Can Tho is growing. Building infrastructure needs to consider peoples' issues and serve as well as a central place for people when environmental incidents occur (e.g. shelter, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Develop training skills for locals and stakeholders</li> <li>• Sector planning and better prioritization of investments.</li> <li>• Better coordination and collaboration of existing CCA projects</li> </ul>	<ul style="list-style-type: none"> <li>• More precise targeted funding</li> <li>• NGOs/Organizations become a bridge between the private sector and the government</li> <li>• Building an economic database of Mekong Delta in 10 years</li> <li>• Building policies addressing climate change to support the business community</li> <li>• Learning from the international experience</li> <li>• Capacity building for citizens</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain relationships between researchers, authorities, people and companies to adapt to climate change</li> <li>• Development of capacity building training to rise the capacity for officials</li> <li>• Research on adaptive farming systems to ensure the income of farmers</li> <li>• Having a wide vision on climate change in the Mekong Delta.</li> </ul>

#### 4.3 Scope of the study

One of the foremost advantages of the ECA methodology is its flexibility. It can be applied for a wide range of climate-related hazards including floods, droughts, tropical storms, and storm surges and can cover different scales varying between countries, regions or cities. But given time constraints and the high data requirements, the project needs a clear scope before any further step is taken and it must be defined by the stakeholders as it will shape the final results that they should expect after the study has concluded.

For this purpose, participants were randomly assigned to four tables, each with the task to work on an element of the scope. There are four elements needed to define the scope of the study (see Table 5 for further descriptions).

**Table 5:** Overview of scoping elements incl. description and tasks for the participants

Element for scoping	Description of task
1. Hazard (past & present)	Participants were asked to identify climate-related hazards, rank the severity of impacts (social, physical, environmental & financial) and their frequency. A ranking allowed to identify the most pressing hazards.
2. Assets (incl. population)	At this table, participants were asked to define the assets that can be damaged by climate-related hazards. Assets are defined as persons and physical economic assets, such as housing and household assets, infrastructure, public buildings, or agriculture.
3. Local challenges/opportunities for adaptation measures	Participants were tasked to answer the following question: What are the biggest challenges/opportunities in implementing climate adaptation measures locally? Participants were asked to consider different perspectives on local climate change adaptation: physical/technical, social, and political.
4. Time-horizon & socio-economic scenarios	Climate adaptation consists of long-term planning and therefore a time-horizon for the ECA study needs to be defined, and ideally aligned to existing national strategies. In addition, participants were tasked to sketch and indicate a socio-economic scenario for the defined time-horizon.

Each table summarized the discussion on a poster, followed by a presentation to the whole group of workshop participants. The reason behind the presentation of posters in plenary was to achieve consensus on the four scoping elements within the whole group. This involves a final decision on the selected hazard, assets, time-horizon and challenges/opportunities for CCA.

The results of this scoping session are summarized in Table 6 below. For each element, the considerations taken by each group are shown, as well as the final decision taken by the whole group. Pictures of each groups' posters can be found in [ANNEX 7](#).



**Table 6:** Results of the scoping session.

Scoping Element	Considerations	Decision taken
<i>Hazard (present &amp; past)</i>	<ul style="list-style-type: none"> <li>• Heat waves</li> <li>• Flood</li> <li>• Riverbank erosion</li> <li>• Storm surge</li> <li>• Tropical cyclones</li> <li>• Land subsidence</li> <li>• Drought</li> <li>• Saline intrusion</li> </ul>	<p>Based on the groups' ranking, the plenary decided to focus in the ECA study on:</p> <ul style="list-style-type: none"> <li>• Flood*</li> <li>• Heat Waves</li> </ul> <p>*we recommend <i>tidal, pluvial and fluvial flood</i>.</p>
<i>Assets (incl. population)</i>	<p><b>Assets along riverbanks</b> (upstream to downstream)</p> <ul style="list-style-type: none"> <li>• Dykes</li> <li>• Aquaculture</li> <li>• Plants/crops</li> <li>• Raw material of rice sector</li> </ul> <p><b>Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Transportation</li> <li>• Urban roads, rural roads, airport</li> <li>• Ô Môn Power Plant</li> <li>• Hospital</li> <li>• Schools</li> <li>• Industry parks</li> <li>• Drainage &amp; sewage systems</li> </ul> <p><b>Individual assets</b></p> <ul style="list-style-type: none"> <li>• Houses and boats</li> </ul> <p><b>People</b></p> <ul style="list-style-type: none"> <li>• Poor and vulnerable people settled along the riverbanks are most impacted</li> </ul>	<p><i>A final decision could not be made. Further investigation is required to define the asset groups for the ECA study. Although, the issue of improved sewage &amp; drainage systems to prevent and better control flooding remains urgent.</i></p>
<i>Local challenges/opportunities for adaptation measures</i>	<p><b>Challenges:</b> 4 main challenges are finance, society, economy and infrastructure</p> <ul style="list-style-type: none"> <li>• Finance <ul style="list-style-type: none"> <li>◦ More awareness raising projects needed to raise the residents' awareness on CC.</li> <li>◦ The expenses and human resources are limited for CCA projects</li> <li>◦ Investments &amp; projects need to be considered carefully to respond to the development of the city</li> </ul> </li> <li>• Society <ul style="list-style-type: none"> <li>◦ Government cannot give farmers substitute policies to insure their livelihood, e.g. for agriculture, the government requires farmers to reduce the number of crops per year to 2 crops instead of 3 crops but do not establish any policies to ensure their income</li> </ul> </li> </ul>	<p><i>A consensus on local challenges/opportunities for adaptation could not be reached due to ongoing discussions.</i></p>



	<ul style="list-style-type: none"><li>○ Migration is causing uneven population distribution</li><li>● Economy<ul style="list-style-type: none"><li>○ Shift of economic sectors, i.e. lower agricultural proportion in Can Tho city, while the service &amp; industry sector grows constantly</li><li>○ Difficult to assess the CC risks agricultural value chains</li><li>○ Public infrastructure does not have climate risk insurance coverage</li></ul></li><li>● Infrastructure<ul style="list-style-type: none"><li>○ Flooding causes disruption in transportation, water supply and functioning drainage/sewage systems.</li><li>○ Projects for urban planning needed</li><li>○ Lack of damage database for flooding</li></ul></li></ul> <p><b>Opportunities:</b></p> <ul style="list-style-type: none"><li>● Flooding can also be beneficial for agricultural production</li><li>● Can Tho city improves its planning about climate change; coordination between and among projects is needed</li></ul>	
<i>Time-horizon &amp; socio-economic scenarios</i>	<ul style="list-style-type: none"><li>● In 2030: Develop new socio-economic development plans</li><li>● Develop eco-tourism services and plans for clean agricultural production</li><li>● Population increase by 2030 due to migration</li><li>● In addition, it is necessary and advisable to initiate surveys (district level) as a basis for scenario development</li></ul>	<p>It has been advised to focus on a time-horizon dating from 2030-2050 (according to Master plan of Can Tho City until 2030 with vision to 2050)</p>



#### 4.4 Data needs and sources

The third session of the workshop was dedicated to, firstly, explain what kind of datasets are needed to conduct an ECA study and, secondly, to identify which institutions are able to provide them. A so-called “*Data Gallery-Walk*” was set-up with different posters of listed data requirements. Workshop participants were asked to write institutions and contacts for every type of dataset identified on a poster (e.g. where to find meteorological data for the identified hazard?). Three different categories of data tables were used for the *Data Gallery-Walk*:

- 1) Adaptation Measures (National/Regional Strategies & Policies)
- 2) Hazards (Historical Events, Photogrammetry, Hydrology, Institutions & Governance)
- 3) Assets & Communities (Cadastre & infrastructure, GIS Data, Socio-economic data)

The purpose of this *Data Gallery-Walk* was to take the opportunity of including different stakeholder groups in data acquisition. Participants committed to the ECA methodology and offered contact details and therefore actively contributed to the quality and realisation of the future ECA study.

Pictures of the respective posters with the listed data requirements can be found in [ANNEX 8](#).

It is important to note that a specified ECA data inventory will be carried out and be part of the *ECA Data Report*.

#### 4.5 Satisfaction from participants and feedback

Given the participatory design of the workshop, participants’ feedback on the relevance of the sessions, discussed subjects and the use of time and other resources, is key to improve the workshop design for the ECA methodology. For this reason, at the end of the workshop, participants were asked to fill in an online survey.

In total, 11 (out of 33) workshop participants (excluding the UNU-EHS, ISF, CRO & CCCO team) answered the questions of the survey. It can be seen, that the overall concept of the workshop was appreciated and the quality was considered as very good. In addition, the feedback revealed that a one-day workshop may not be sufficient to cover all aspects and does not allow for enough room for discussions, especially since the applied workshop design requires high engagement of the participants e.g. for setting the scope of the planned ECA study. Further results of the online survey are found in [ANNEX 9](#).



## 5. Conclusions and Next Steps

### Conclusions

This report describes the Economics of Climate Adaptation (ECA) inception workshop as organised and implemented by the InsuResilience Solutions Fund (ISF) and UNU-EHS for Can Tho City in Vietnam in January 2020. The ECA studies main objectives are to support decision-makers of Can Tho in further developing their adaptation strategy and to develop climate change adaptation (CCA) measures investment portfolios. The results shall help therefore to assess relevance and potential of possible risk transfer solutions and adaptation measures. Such solutions shall be embedded into existing policies and plans of the province and city of Can Tho and contribute to a more informed decisions regarding climate adaptation. Direct benefits of ECA for Can Tho include but are not limited to i) a better risk analysis, ii) a detailed assessment of potential damages on selected assets, iii) a ranking of adaptation measures, including risk transfer, ecosystem based adaptation, and already planned measures, iv) a detailed and spatial visualisation of benefits (as compared to costs) for Can Tho.

The overall results of the inception workshop, based on a participatory approach developed by UNU-EHS, include:

1. A shared understanding of the ECA methodology, its added value and potential as well as limitations for Can Tho. This shared understanding is documented in the feedback form filled by participants, as well as by a large attendance of the workshop activities.
2. A decision by stakeholders regarding the scope of the study could not be finalised and consensus couldn't be achieved. It has been advised to further include existing plans and strategies for resilience and adaptation planning and to extend the perspectives of the scoping. Nonetheless, decision could be made on the following scoping elements:

**Hazard:** Flooding (tidal, pluvial, fluvial) and heatwaves have been recognised as the hazard to be included in the scope of the ECA study. Several criteria were applied to reach this decision (see Annex 7, Table 1).

**Focus Area:** After discussion with different groups of stakeholders subsequent to the workshop, it has been decided to focus on Can Tho Province, which consists of five urban districts and four rural districts.

A final decision on focus asset groups and a time-horizon could not be made. Further investigation is required to define the asset groups. It has been advised but not decided to focus on a time-horizon dating from 2030-2050 for the ECA study.

3. Baseline data availability and location could only be partially identified, taking into account the incomplete scoping. Nonetheless, stakeholders have shown a significant commitment to further support and provide all available data necessary to the study. The baseline data collection will continue once the scoping is finalized.

## Next Steps

- **Scoping Consultancy (June 2020):** The scoping consultancy in Can Tho province will support the application of the Economics of Climate Adaptation (ECA) framework. It follows up on gaps identified during the Inception Workshop held on January 10, 2020 in Can Tho City. The scoping consultancy aims to synthesize and validate evidence to further examine the extent and value of undertaking a comprehensive ECA study. See [ANNEX 10](#), for an overview of the consultancy's framework conditions.
- **Data report (July/August 2020):** A data report is expected to be circulated in July/August 2020. It will include all available data as well as existing data gaps. Solution and proxies shall be proposed in order to address these data gaps.
- **Vulnerability workshop** (December/January 2021)
- **Feasibility Workshop** (March/April 2021)

## Updated Project Schedule

Due to the actual COVID19 situation, an updated project schedule has been created, presenting the projects delay when compared to the original planning. New tentative dates for workshops and deliverables are indicated respectively. The Schedule can be found in [ANNEX 11](#).

## **ANNEXES**



Economics of  
Climate  
Adaptation



## ANNEX 1: Workshop Participant List

#	Institution	Name	Position
<b>Can Tho City Departments</b>			
1	Department of Transport (DOT)	Võ Minh Nhã	Staff
2	Department of Science and Technology (DOST)	Hoàng Phương	Vice Director
3	Department of Science and Technology (DOST)	Phạm Hoàng Dũng	Head of Division
4	Department of Industry and Trade (DOIT)	Nguyễn Hoàng Quốc Vũ	Staff
5	Department of Agriculture and Rural Development (DARD)	Mai Hiếu Hiền	Deputy of Irrigation Agency
6	Department of Agriculture and Rural Development (DARD)	Hoàng Vị	from Irrigation Agency
7	Department of Natural Resources and Environment (DONRE)	Châu Thị Kim Thoa	from Climate Change Coordination Office
8	Department of Construction (DOC)	Nguyễn Kim Hoàng	Head of Division
9	Department of Construction (DOC)	Diệp Ánh Dương	Staff
10	Department of Foreign Affairs (DOFA)	Quách Thanh Trúc	Head of Division
11	Department of Planning and Investment (DPI)	Lưu Hồng Hải	Deputy of Division
12	Can Tho City Institute for Socio - Economic Development Studies (CISED)	Võ Minh Cảnh	Deputy Director
13	Can Tho City Institute for Socio - Economic Development Studies (CISED)	Lê Hữu Nghĩa	Researcher
14	Can Tho Farmer Association	Lê Thị Hoa	
15	Can Tho Women Union	Nguyễn Thị Châu Mỹ	Head of Board
16	Can Tho Business Associations	Lưu Thành Hùng	Vice President
17	Can Tho city Union of Science and Technology Associations (CUSTA)	Kỷ Quang Vinh	Executive committee member
18	Viet Nam Chamber of Commerce and Industry, Can Tho branch (VCCI Can Tho)	Võ Thị Thu Hương	Vice Director
<b>District's People's Committees</b>			
19	Ninh Kieu district's PC	Nguyễn Việt Cường	Head of Natural Resource and Environment Division
20	O Mon district's PC	Nguyễn Mạnh Việt	Deputy of Natural Resource and Environment Division
21	Thot Not district's PC	Lê Trung Kiên	Vice President
22	Vinh Thanh rural district's PC	Phan Văn Năm	Head of Agriculture and Rural Development Division
<b>Academia</b>			
23	College of Agriculture, Can Tho University	Assoc. Prof. Dr. Chau Minh Khoi	Vice Dean
24	Mekong Delta Development Research Institute (MDI)	Dr. Nguyen Thanh Binh	Lecturer
25	Research Institute for Climate Change	Assoc. Prof. Dr. Nguyen Hieu Trung	Director
26	Research Institute for Climate Change	Assoc. Prof. Dr. Le Anh Tuan	Deputy Director
<b>International Organizations / NGOs</b>			
27	ADB	Thomas Kessler	Sustainable Development and Climate Change Department



28	ADB	Nguyen Quynh Anh	National Project Analyst - Asian Development Bank
29	ADB/Hue City	Phan Canh Huy	Dept for Planning and Investment in ThuaThien Hue province and Green city project funded by ADB (SCDP II)
30	Seco	Tran Van Giai Phong	National Programme Officer SECO
31	WWF	Nguyễn Thị Thanh Phương	Project officer
32	GIZ	Mr. Timm Walker	Technical Advisor, Mekong Delta Climate Resilience Programme (MCRP)
33	Economic Division	Phạm Hồng Diệp	



## ANNEX 2: Invitation Letter



The KfW Development Bank, the Insuresilience Solutions Fund (ISF), and the United Nations University – Institute for Environment and Human Security (UNU-EHS), in collaboration with the Can Tho 100 Resilient City Office and the Can Tho Climate Change Coordination Office would like to invite you to participate at the inception workshop of the

### **Economics of Climate Adaptation (ECA) study in Can Tho City**

**On January 10<sup>th</sup> 2019, 7.30 am – 3.30 pm**

**At the 02 Hoa Binh venue of Cần Thơ People's Committee, Can Tho City**

The Economics of Climate Adaptation (ECA) methodology represents a unique approach towards the flexible identification of cost-effective climate change adaptation measures for a variety of projects and sectors thus ensuring a fully integrated process from risk assessment to the feasibility of concrete climate change adaptation measures. ECA allows identifying possible risk mitigating adaptation measures and risk transfer solutions as well as the quantification of costs and benefits of the respective measures.

A successful ECA study can be a crucial element to render and support future initiatives and projects based on the outcomes of the study, providing a solid ground for investment decisions. It enables governments, local authorities, communities and businesses through its unique quantitative and integrative approach to identify and consider suitable and cost-efficient climate change adaptation measures in the first stages of their climate change management and climate adaptation planning processes. The methodology can be flexibly applied and replicated from the national down to local level to different sectors and different hazards.

The InsuResilience Solutions Fund (ISF) in cooperation with the United Nations University – Institute for Environment and Human Security (UNU-EHS), aims to coordinate and conduct an ECA study in collaboration with Can Tho 100 Resilient City Office.

The inception workshop will introduce the methodology in greater detail according to the attached tentative agenda. Your participation in the workshop will provide valuable information and insights defining boundaries and foci reflecting needs and opportunities to boost climate resilience in Can Tho City.

In case of any remaining questions, please do not hesitate to contact Ms. Sen La ([lasosen@gmail.com](mailto:lasosen@gmail.com); cell phone: 0939199912) from Can Tho 100 Resilient City Office or Ms. Lena Laux from the InsuResilience Solutions Fund ([lena.laux@insuresilience-solutions-fund.org](mailto:lena.laux@insuresilience-solutions-fund.org)).

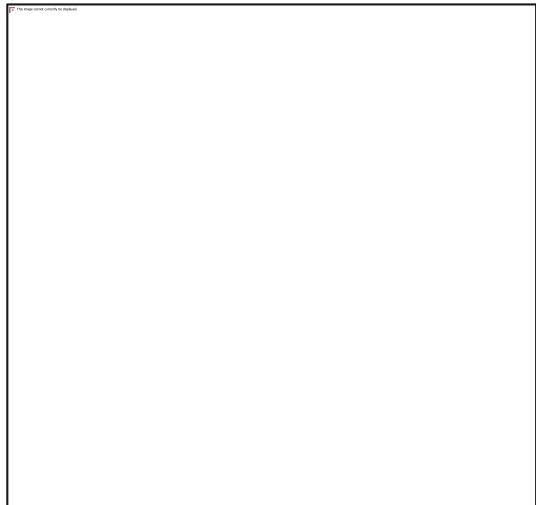
Please confirm your availability to Ms Sen La by January 3 2020.

Yours sincerely,

Dr. Annette Detken

Head InsuResilience Solutions Fund

## ANNEX 3: Photos of the Venue



## ANNEX 4: Agenda of Inception Workshop



### Inception Workshop

10<sup>th</sup> January 2019, 02 Hoa Binh venue of Cần Thơ People's Committee, Can Tho City, Vietnam

### **"Economics of Climate Adaptation (ECA)"**

Application of the ECA methodology to identify and select cost-effective climate change adaptation measures in Can Tho.

Time	Activity	Expected outcomes
07:30 - 08:00		Registration
08:00 - 08:45	Welcome Address Can Tho People's Committee Welcome Address KfW Welcome Address InsuResilience Solutions Fund Welcome Address UNU-EHS	
	<b>Common Understanding</b>	
08:45 - 09:30	Introduction to the ECA methodology and ECA Studies	Understanding of the ECA methodology and its benefits
	Tea Break/Group Picture	
10:00 - 11:15	Session 1 - Focus groups: roles and expectations of the sectors represented in the room	Role and expectation of various stakeholders are expressed
	11:15 - 12:15 Lunch Break	
	<b>Setting the scope of the study</b>	
12:15 - 13:30	Session 2 - Focus groups: Discussing the priority areas and target group of the study	What are the main climate risks/natural hazards for Can Tho to be addressed in the study (e.g. floods)?  Which are the population and assets at risk?  What are the biggest challenges/opportunities for implementing adaptation measures in the city?  Time horizon and scenarios definition
13:30 - 13:45		Agreement on the Scope
	<b>Tea Break</b>	
	<b>Data needs of ECA</b>	
14:00 - 14:15	Data Needs and Data Gaps	Provision of focal points
14:15-15:00	Gallery Walk	Data Availability identified
	<b>Next Steps</b>	
15:00 - 15:15	Next steps and timeline	Wrap-up and way forward
15:15 -15:30	Closing Remarks	CRO, KfW, ISF, UNU



## ANNEX 5: Registration Desk (Sign-In Sheet)

Economics of Climate Adaptation Inception Workshop					
10 <sup>th</sup> January 2020, 02 Hoa Binh venue of Cần Thơ People's Committee, Cần Thơ City, Vietnam					
Registration					
#	Name	Organisation	Role/Position	E-Mail	Signature
1	LƯU THANH LƯNG	HỘI VIỆT NAM XÃ HỘI HỌP	PHÓ CHỦ	luu thanh lung@gvau.com.vn	
2	Nguyễn Hoàng Quang Vũ	SỞ CÔNG THÔNG	CHỦ	nhquang@cantho.gov.vn	
3	Quách Thành Trí	Sở Nông Nghiệp	CHỦ TỊC	qtruc@cantho.gov.vn	
4	Đinh Văn Nho	Phòng Nông Nghiệp và Phát Triển nông thôn	Trưởng phòng	ndinhvnn@cantho.gov.vn	
5	Nguyễn Thị Châu Ng	Mỗi LHPN. TCT	Thường Ban	chauhung10@gmail.com	
6	Lê Trung Kiên	UARD Q. TIN	PCF		Kien
7	Phan Cảnh Huy	GPI - TT-H	HEAD	phancaanhuy@gmail.com	
8	Hàng Vĩ	CCTL	PP PCF	vihang1411@gmail.com	
9	Kỳ Quang Vinh	HTH Cần Thơ	WBCH	kqv@ctu.edu.vn	
10	Chân T. C. Thảo	Sở TNMT		chanh.001@soi.gov.vn	
11	phùng TRẦN	SEco	WFO	phungtrann@yaho.com	

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#	Name	Organisation	Role/Position	E-Mail	Signature
12	Trần Huy Phong	SKILL-CA	PCA		
13	Phạm Huy Nh	- nt -	TP	phamhuynhof@zalando.com	
14	Mai Hiếu Hiện	Chi Cục Thủy lợi-Sở NN&PT	Phó Chủ	mhiem@cantho.gov.vn	
15	Võ Thị Thu Thủy	VEST cần tho	PCA	vtthuthuy@yahoo.com	
16	Nguyễn Văn Cửu	Sở TNMT Q. NĂM	Trưởng phòng	nvnucuu@cantho.gov.vn	
17	Vi Minh Nh	Sở Giao	OR	minhnha@cantho.gov.vn	
18	Z. M. Grath	CIZ	Director.	timm.grath@giz.de	
19	Nguyễn Minh Việt	Phòng TNMT Q. Ô Môn	PEP	mnhanh@cantho.gov.vn	
20	Le Thuy Anh	KPV		le.thuy.anh@fpt.edu.vn	
21	Nguyễn Văn Duy	KFW	Coordinator.	nguyenv.duy@kfw.de	
22	Lê Giả Thông	Phòng CATP Cần Thơ	P. Giả Thông	le.gia.thong.phuong22@gmail.com	
23	Nhóm Công Trình	PROG (ATP Cần Thơ)	P. Công Trình		

2



#	Name	Organisation	Role/Position	E-Mail	Signature
24	Le Anh Tuan	Truong Chinh	Vice Pres	tuanan@ctu.edu.vn	
25	Nguyen Thuy Trang	ATT Can Tho	Vice Pres	thuytrang@ctu.edu.vn	
26	Simone Wunsch	WU	Director	simone.wunsch@wu.ac.at	
27	Tran Ngan Ha	SOPHIE	H	trannganh@eandtgroup.vn	
28	Graham Hrieg Drip	Ghosp	Ph.D. Office Phg	dripgh@earth.gov.vn	
29	Thomas Kessler	AfDB	Disaster Finance	tkessler@afdb.org	
30	Timmy Walker	GIZ	Technical Advisor	timmy.walker@giz.de	
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32	Le Muoi Nguen	Vietnam IRM	NCV	lehungnghia@gmail.com	
33	Le Thanh	ATT Phu Nhieu	BTW	tanlamtbt@gmail.com	
34	Nguyen Thanh Binh	ATT Can Tho	GV	nbinh02@ctu.edu.vn	
35	Nguyen Kim Hang	SIRD	TP	kimhang@ccrka.gov.vn	

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#	Name	Organisation	Role/Position	E-Mail	Signature
36	Kamala Thu Thach Phatny	UNDP	Project Officer	phatny.kamala@undp.org.vn	
37	Le thi Hoa	Truong Chinh		litho.taydo@gmail.com	
38	Dang Anh Nhung	SIRD	official	danganh@ccrka.gov.vn	
39	Chau Minh Khoa	ATT Can Tho	P.Training Khoa	cmkhoa@ctu.edu.vn	
40					
41					
48					

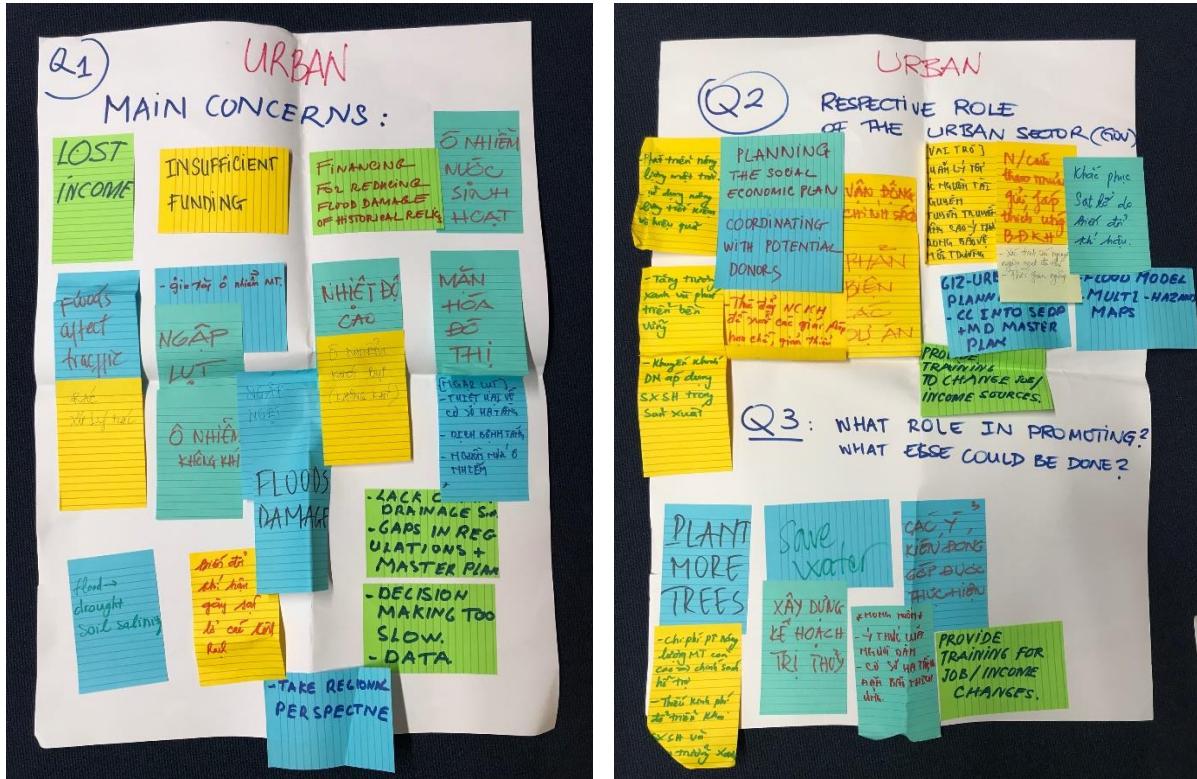
#	Name	Organisation	Role/Position	E-Mail	Signature
54	Ms Nien Cao	Vietnam IRM Can Tho	SVT	niencaoh@vietnamirm.com	
55					
56					

**NOTE:** In total, 40 people signed-in at the registration desk, including some people of the organising team consisting of members from UNU-EHS, ISF, CRO and CCCO.

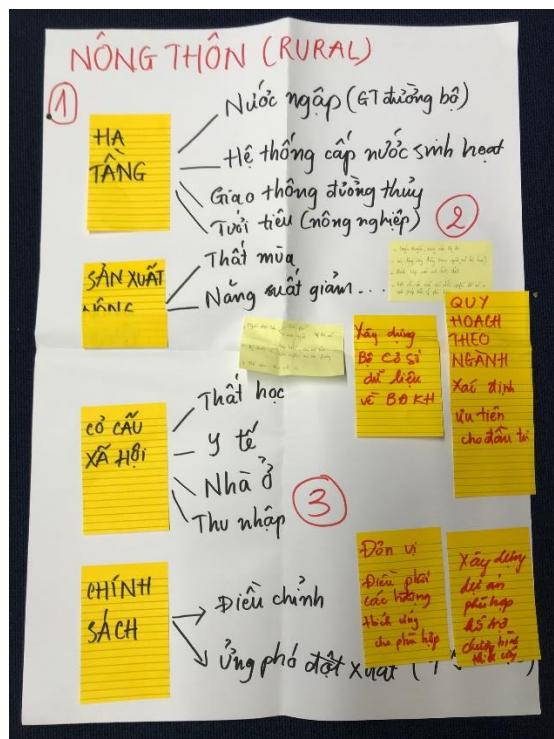


## ANNEX 6: Session 1 - Roles & Expectations (Flipcharts)

Urban (Table 1)

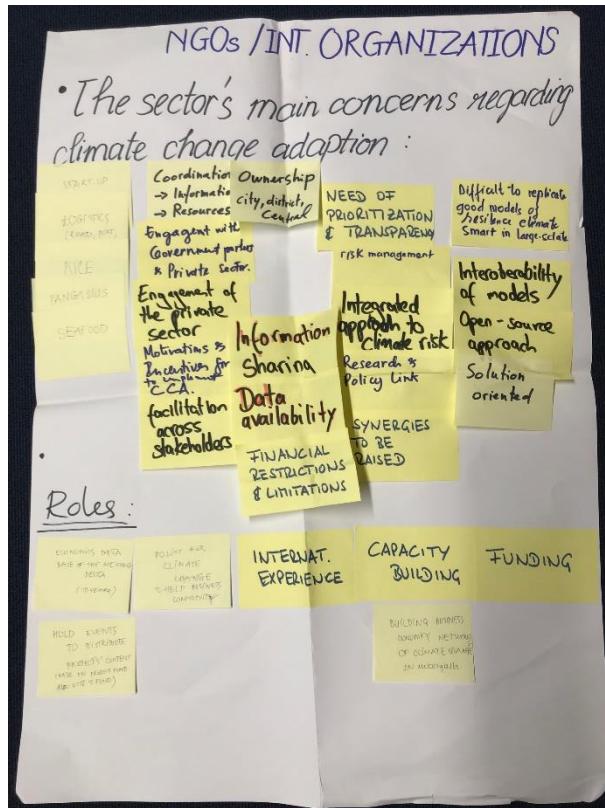


Rural (Table 2)

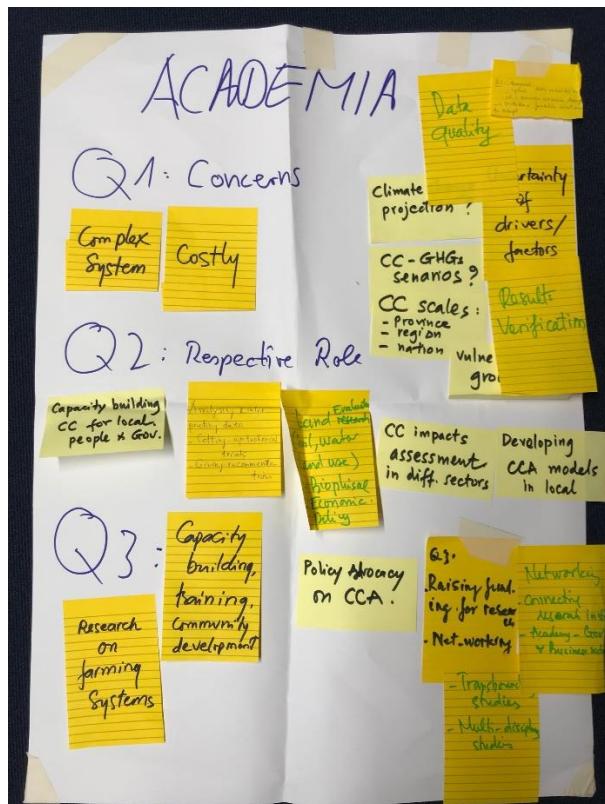




### International Organizations / NGOs (Table 3)



### Academia (Table 4)





## ANNEX 7: Session 2 - Scope of the Study (Flipcharts)

**Table 1: Hazards**

TOTAL HAZARDS	CRITERIA	LE 1. HAZARDS					
		HUMAN IMPACT	SOCIAL IMPACT	PHYSICAL DAMAGE	FINANCIAL LOSS	ENVIRONMENTAL IMPACT	FREQUENCY
1A FLOOD	3	3	3	3	1	2	2
2A STORM SURGE	1	1	1	1	1	1	1
6 TROPICAL CYCLONES	1	1	1	1	1	1	①
12 COASTAL EROSION (RIVER BANK?)	3	3	3	3	2	3	0
18 HEAT WAVES	3	3	3	3	3	2	1
12 LAND SUBSIDENCE	2	1	3	3	1	2	0
19 DROUGHT	2	2	1	1	2	2	②
6 SALAR INTRUSION	1	1	1	1	1	1	0

**Table 2: Assets**

TABLE 2: ASSETS	
Individual Assets	Basic Infrastructure
Boats.	RIVER BANKS EROSION DEFENCE, GATES, BREAKWALLS, MANGROVES
SMON POWER PLANT	RIVER POINTS INDUSTRY PARKS
INDIVIDUAL HOUSES (NINH KIEN)	AQUACULTURE Assets (erosion)
DRAINAGE SYSTEM (Flood, Heavy Rain)	RAW MATERIAL OF AGUA SECTOR (CHOTONG).
INDUSTRIAL PARK IN Flood DANTHO.	plants/crops (drought)
AIRPORT (By Cyclone)	URBAN ROADS
HOSPITALS SCHOOLS	Rural roads (floods, erosion)
LAST BUT NOT LEAST	
Residents (life, livelihoods)	

**Table 3: Adaptation**

TABLE 3 ADAPTATION	
FLOOD GATES, DYKES, EMBANKMENT	STORM WATER RELEASE DRAINAGE/WATER STORAGE
PROVIDE TRAINING FOR JOB CHANGES	REGULAR SEWERS, PUMPING, MAINTENANCE
Human Database (with risk)	

**Table 4: Time-Horizon & Climate Scenarios**

2030 urban SEDP + MP + resilience strategy	2050 vision
higher migration if sea-level rise	water management (upstream) → livelihoods
increase population in Can Tho	
+++ eco./agri./tourism hub	- - - pollution, flooding less export
lack of HR in environment, agri., water mangt.	



## ANNEX 8: Session 3 - Data Requirements (*Gallery-Walk Sheets*)

### Assets and Communities

Assets and Communities					
Cadastral and Infrastructure (GIS)					
Document / Database Name	Organisation	Contact Person	Email	Phone	Phone
Land use	Ministry of Natural Resources and Environment Land use department	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Population density	Ministry of Natural Resources and Environment Population and Environment Department	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Construction and cultivation density	Ministry of Natural Resources and Environment Land and Building Department	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Proposed/ planned land use	Ministry of Natural Resources and Environment Land and Building Department	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Industry	Ministry of Natural Resources and Environment Industry and Trade Department	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Agriculture / Fishery	Ministry of Natural Resources and Environment Agriculture and Forestry Department	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Assets and Communities					
Public Infrastructure (GIS)					
Document / Database Name	Organisation	Contact Person	Email	Phone	Phone
Health	Ministry of Health	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Education	Ministry of Education and Training	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Recreation	Ministry of Culture, Sports and Tourism	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Administration and Government	Ministry of Natural Resources and Environment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Markets	Ministry of Natural Resources and Environment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Cultural heritage	Ministry of Culture, Sports and Tourism	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Assets and Communities					
Socio-economic Factors					
Document / Database Name	Organisation	Contact Person	Email	Phone	Phone
Socio-economic census	Ministry of Statistics	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Employment/ Occupation	Ministry of Labour, Invalids and Social Affairs	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Wealth development (e.g. GDP per capita...)	Ministry of Planning and Investment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Access to health services	Ministry of Health	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Access to education	Ministry of Education and Training	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Housing	Ministry of Natural Resources and Environment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Type of housing (Informal, formal)	Ministry of Natural Resources and Environment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Type of housing (HH size, conditions, building material...)	Ministry of Natural Resources and Environment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		
Studies on low-income settlements	Ministry of Natural Resources and Environment	Mr. Pham Van Nhieu	nhieu@moit.gov.vn		



## Hazards

Hazards (Flood)						
Historical Events						
<b>Document / Database Name</b>	<b>Organisation</b>	<b>Contact Person</b>	<b>Email</b>	<b>Phone</b>	<b>Document / Database Name</b>	<b>Organisation</b>
Basic aerial photogrammetry	DRONE E	email: G17			Impact of past flood events (financial losses and damages)	Rural D&D Urban DOC AFRICA
Satellite images	DNI E	e:1 (G2)			Recovery costs of past events	
					Photo documentation of flood events	CPO (G12)
					Locations of past flood events (e.g. GIS data)	GeoInfo Platform, GeoFIS, Plan No: 09/13775007,
					Flood Risk Management plans	Department of Planning, Ms. P. Tricot, Navigating borders - 031 749 4949

Hazards (Photogrammetry)						
Photogrammetry						
<b>Document / Database Name</b>	<b>Organisation</b>	<b>Contact Person</b>	<b>Email</b>	<b>Phone</b>	<b>Document / Database Name</b>	<b>Organisation</b>
Basic aerial photogrammetry	DRONE E				Topographic data in different points of the municipality (temperature, RH, wind speed, atmospheric pressure, flows, etc.).	Geophysical Survey Institute, Ms. N. M. Tsvetkova
Satellite images	DNI E				Inundation	DRONE E

Hazards (Hydrology)						
Hydrology						
<b>Document / Database Name</b>	<b>Organisation</b>	<b>Contact Person</b>	<b>Email</b>	<b>Phone</b>	<b>Document / Database Name</b>	<b>Organisation</b>
Topography / Slopes					Institutional organization chart of government sectors involved in climate change adaptation and risk prevention.	R.D.A. / Ministry of Environment
Surface Hydrology					Political-Administrative Division (communes, districts)	(C) (City + District)
Water bodies						
Soil types						
Land use (GIS)						
Drainage, irrigation canals, (Canal, water system, ...)						
Parks and recreation areas (GPs)						
Department of Environment, Environment, Environment						

Hazards (Institutions and Governance)						
Institutions and Governance						
<b>Document / Database Name</b>	<b>Organisation</b>	<b>Contact Person</b>	<b>Email</b>	<b>Phone</b>	<b>Document / Database Name</b>	<b>Organisation</b>
Identification of key social and community organizations (urban and rural)	VO (G11) TIC (G12)	Mr. Ch. (W5, Thay)			Climate Change Observatory of Society of Engineers	Ms. A. T. T. (W6, Thay) Tackling local problems
Climate Change Observatory of Society of Engineers						



## Adaptation Measures



Please use CAPITAL LETTERS !

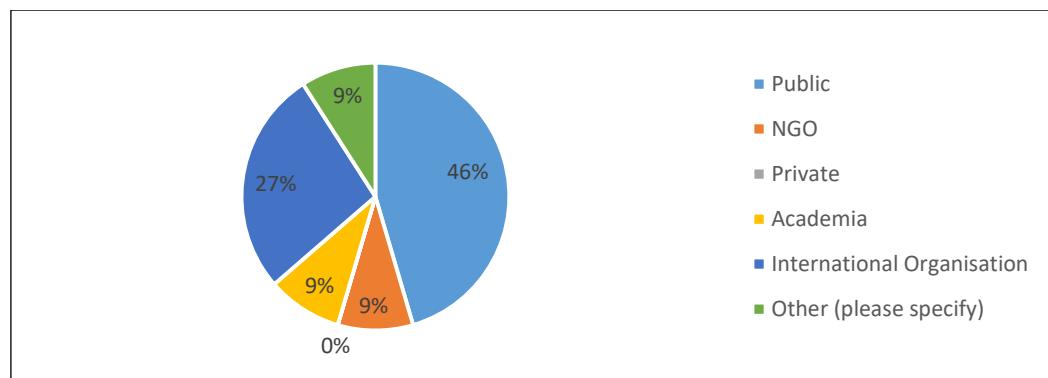
Document / Database Name	Organisation	Contact Person	Email	Phone
National/Regional Climate Adaptation Plans and/or Strategies (focus on Urban Areas)	VDA - GIZ Dragon - GTI	Mrs. Lam Anh Tran Le Anh Tuan	tim.walker@giel.de leanh.tuan@gti.edu.vn	
Municipal Climate Adaptation Plans/Strategies	VOORC CCCO	Mr. Trung Ms. Thoa (CCCO)		
Zoning of protected areas (ecosystems, water bodies, green areas, etc.)	DURE GIZ	Ms. Thoa (CCCO)		
Inventory of prevention and preparation measures for extreme events	VOORC GIZ	Dr. Trung Tim Walker		
Existing adaptation plans + List of measures	VOORC CCCO	" Tran Vesta		
	DOC	Mrs. Kim Hoang	kimhoang107@gmail.com	0913 656 778



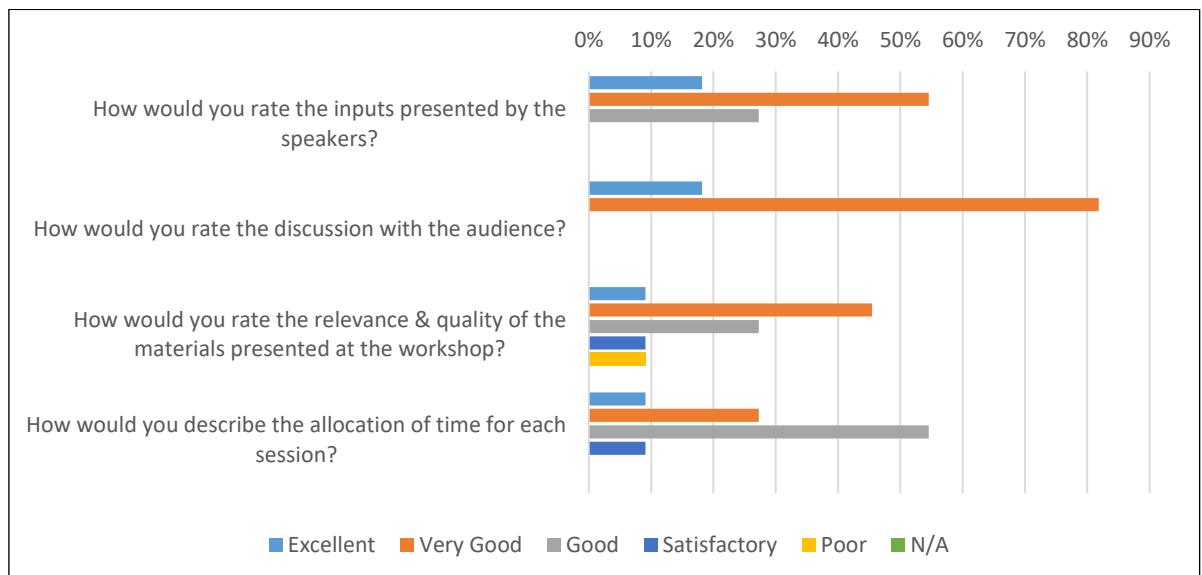
## ANNEX 9: Workshop Online Survey (Results)

**NOTE:** 11 out of 33 workshop participants (excluding the UNU-EHS, ISF, CRO & CCCO team) answered the questions of the survey.

### Question 1: Please state your sector



### Question 2: Relevance of the content provided at the workshop

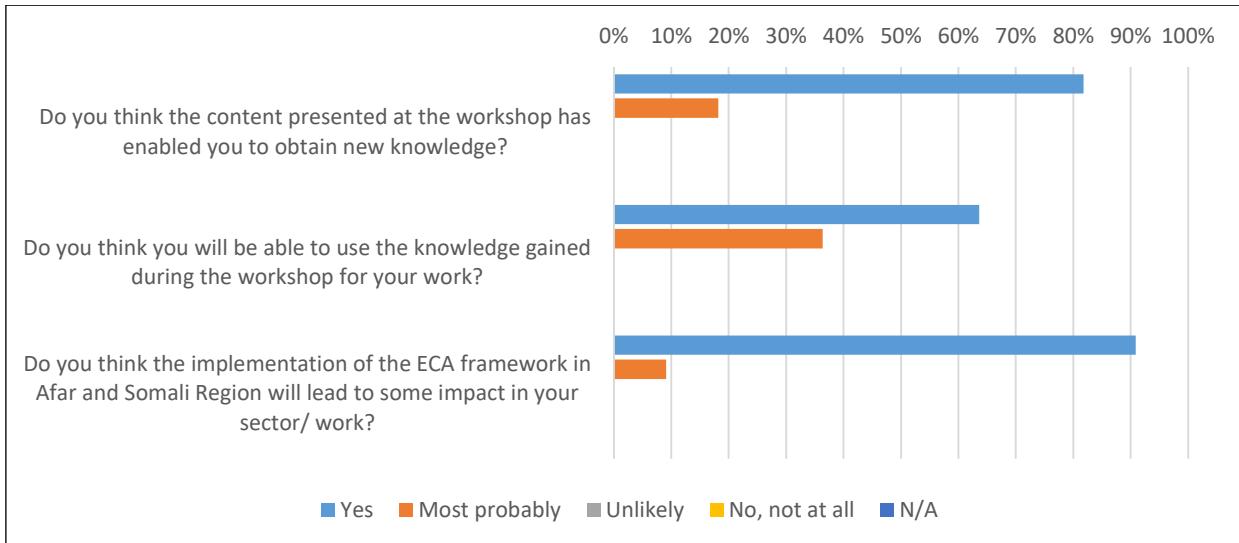


Comments:

- “A bit more time for the session would have been nice”



### Question 3: Impact of the workshop

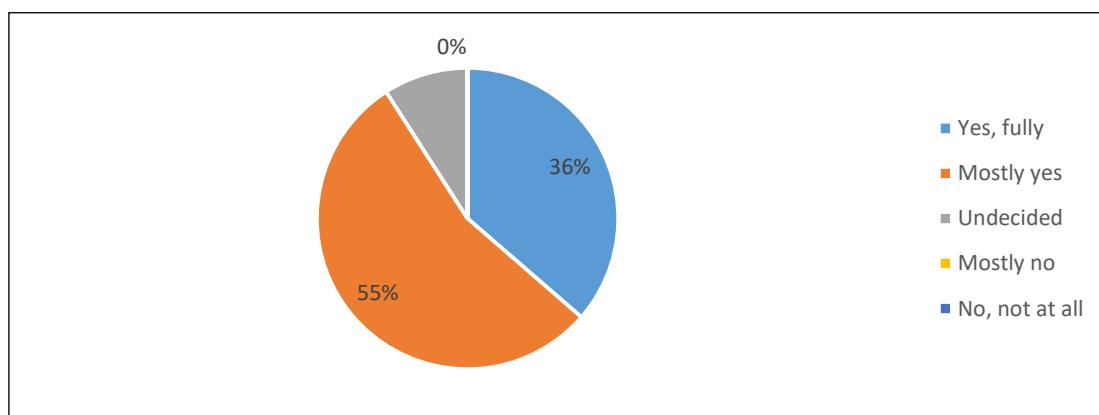


### Question 4: Which session should have been more detailed?

This question did not provide multiple choices, hence all collected responses are listed here.

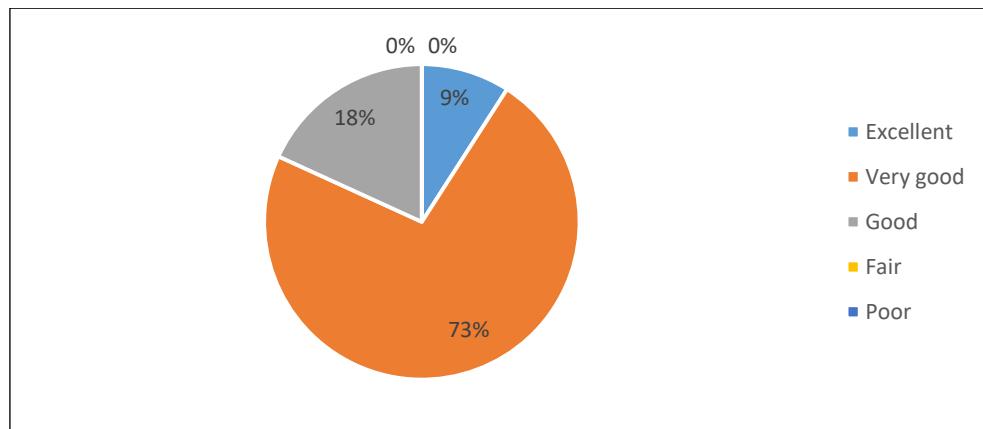
- “Round table discussions”
- “Session 2”
- “Too earl[y] to say”
- “Section 2”
- “ECA methodology”

### Question 5: After this workshop, do you see the potential and added value of applying the ECA framework?

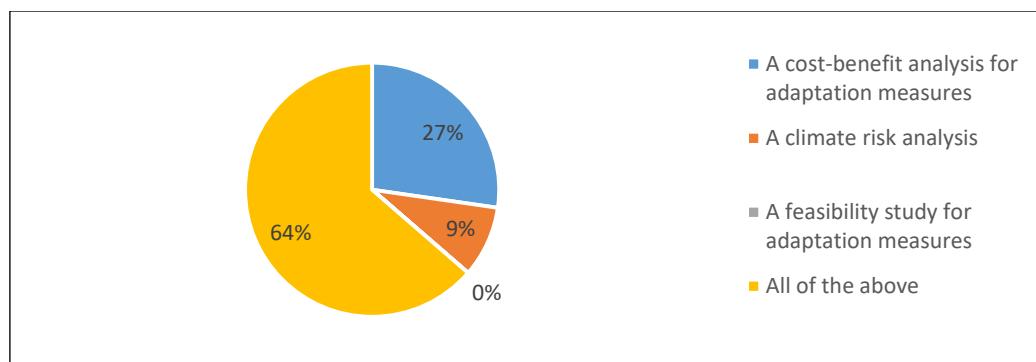




**Question 6: Overall, how would you rate the quality of the workshop?**



**Question 7: What is the final goal of an ECA study?**



**Question 8: Do you have any other comments, questions, or concerns you would like to share with us?**

This question did not provide multiple choice options, hence all collected responses are listed here.

- “Translation coverage in the sessions could be improved”
- “Should ar[r]ange more time for detail discussion”
- “No”
- “Please share information and data collected for this study”



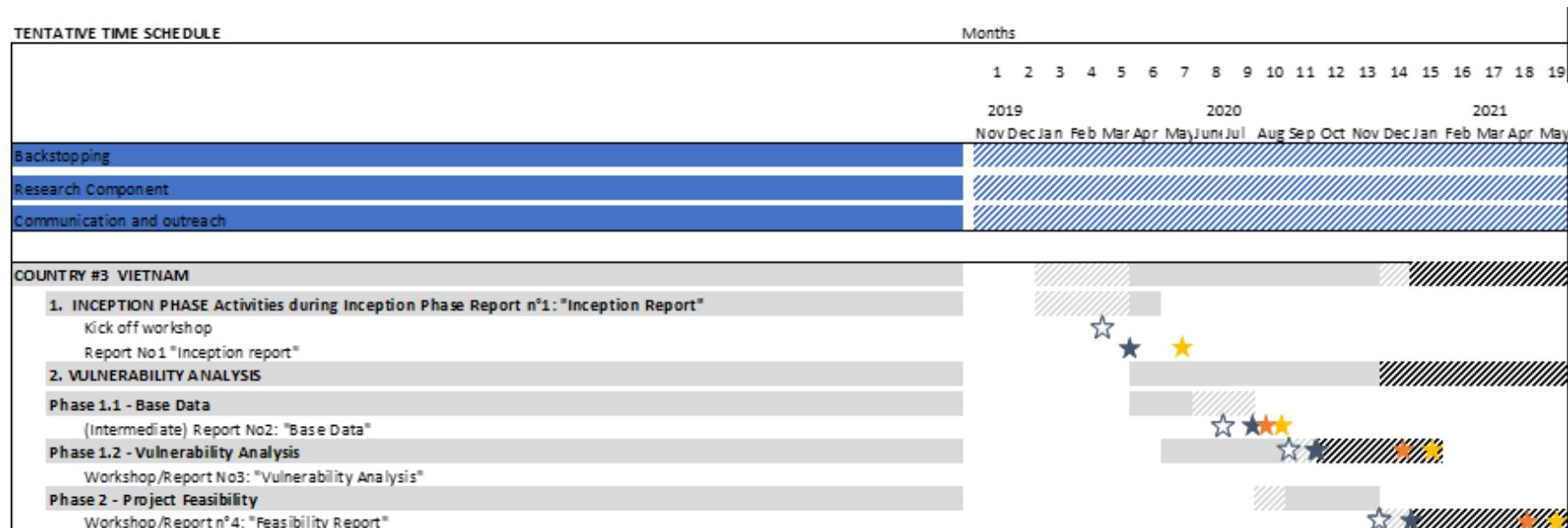
## ANNEX 10: Consultancy Framework for Scoping

The scoping consultancy in Can Tho province will support the application of the Economics of Climate Adaptation (ECA) framework. It follows up on gaps identified during the Inception Workshop held on January 10, 2020 in Can Tho City. **The scoping consultancy aims to synthesize and validate evidence to further examine the extent and value of undertaking a comprehensive ECA study.** The following table provides an overview of the consultancy's framework conditions:

<b>Study Area:</b>	Can Tho Province (9 Districts)
<b>Hazards:</b>	(1) Fluvial and pluvial floods, (2) Tidal floods (from East Sea), (3) Heat waves
<b>Identified Problems:</b>	<ul style="list-style-type: none"><li>• Water system infrastructure &amp; lacking consolidation</li><li>• Flood risk assessments &amp; quantification of damages and losses</li><li>• Reporting on heat waves</li><li>• Uncontrolled urbanization and flooding</li><li>• Poor and vulnerable groups and changing economic conditions</li></ul>
<b>Consultancy Structure:</b>	(1) Pre-diagnostic and inventory (2) Stakeholder Engagement (interviews & field visits) (3) Baseline Data Collection
<b>Methodology</b>	<ul style="list-style-type: none"><li>• Scoping/Diagnostic/Validation Workshops</li><li>• In-person questionnaires/interviews/focus group discussions</li><li>• Online surveys/web-based questionnaires</li></ul>
<b>Timeframe &amp; Personnel:</b>	Starting date is June 2020, encompasses 30 working days, Up to 6 Local Consultants (incl. 1-2 Lead Consultants)
<b>Outcomes &amp; Deliverables:</b>	(1) Stakeholder Map, (2) Investment Atlas, (3) Analysis & inventory of climate adaptation measures, (4) Inventory of assets impacted by floods and heatwaves, (5) Time-horizons for planning, (6) Validate and complete the Investment Atlas, (7) Recommendations for adaptation measures & impacted assets, (8) Recommendations for time-horizons, (9) Inventory of Baseline Data

## ANNEX 11: Updated Project Schedule

In this updated timeplan, hatched dark grey areas represent the project delay when compared to the original planning due to the actual COVID19 situation. New tentative dates for workshops and deliverables are indicated respectively by orange and yellow stars (original dates are white and blue).



**Authors:** Eike Behre, Florian Waldschmidt, Alvaro Rojas, David Daou, Zita Sebesvari, Sönke Kreft  
and Maxime Souvignet

**Design:** Aileen Orate (UNU-EHS)

Articles attributed to named authors do not necessarily reflect the views of the UNU-EHS or ISF.



Economics of  
Climate  
Adaptation