

EXPERT WORKSHOP

CAPACITY BUILDING FOR MEASURING MULTI-HAZARD
LIVELIHOOD SECURITY AND RESILIENCE IN THE LOWER
MEKONG BASIN

30 - 31 MAY, 2022

ASIAN INSTITUTE OF TECHNOLOGY, THAILAND



DPMM
Disaster Preparedness,
Mitigation and Management



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EXECUTIVE SUMMARY

Expert Workshop for the project “Capacity building for measuring multi-hazard livelihood security and resilience in the lower Mekong basin” supported by Asia-Pacific Network for Global Change Research (APN) was successfully organized on 30 – 31 May, 2022 by Disaster Preparedness, Mitigation, and Management (DPMM), Asian Institute of Technology, Thailand. The hybrid workshop was flagged off with the opening remarks from Dr. Linda Anne Stevenson, Head of Knowledge Management & Scientific Affairs and Deputy Head of Development & Institutional Affairs and Research, APN.

Dr. Indrajit Pal, Principal Investigator of the project welcomed the experts and scholars and briefed them about this multi-country project and regional perspectives on "Multi-Hazard Livelihood Security and Resilience in Lower Mekong Basin". In his presentation, Dr. Pal highlighted how multiple hazards impact people's livelihood in LMB and how communities are adapting to it. Dr Puvadol Doydee from Kasetsart University, Thailand shared the national perspective of Thailand, with the fact that 11 million people who work in farming and crop production are expected to suffer in the future due the climate change and associated hazards. Dr. Chau Tran from Vietnam shared some of their studies on the impacts of drought, flood, thunderstorms, and landslides on peoples' lives and livelihood in An Giang Province, Vietnam. Further, she also presented how these hazards are impacting agriculture sectors, especially aquaculture and forestry. Dr. Seak Sophat, from the Royal University of Phnom Penh, shared a case study of Kandel Province, Cambodia, and shared the challenges faced by the provinces located in the flood plain due to frequent flood events. He also discussed how this frequent flooding is damaging agricultural production and increasing farmers' debts.

Located in one of the most hazard-prone areas, the Mekong river basin countries are frequently exposed to hydrometeorological hazards, and managing these hazards is becoming a key challenge. The APN supported a capacity development project addressing the emerging issues of multi-hazard livelihood security and resilience in the Mekong region. As mandated by the project, the expert workshop has finalized and validated the Livelihood Security and Resilience Assessment (LiSeRA) Framework co-developed by Dr. Indrajit Pal (Project Leader) and collaborators Dr. Parameshwar Digamber Udmale, Dr. Puvadol Doydee, Dr. Piyanuch Jaikaew, Dr. Tanh Nguyen and Dr. Seak Sophat along with project research scholars Mr. Ganesh Dhungana and Ms. Mayuri Gadhav. The development of the novel LiSeRA framework is relevant to a number of Sustainable Development Goals 1, 2, 3, 6, 10, 11, and 13. The developed framework is expected to support policymakers, academia, and development practitioners in assessing multi-hazard livelihood security and resilience in the lower Mekong basin.

The expert workshop participants also benefitted from the insights of Prof. Vilas Nitivattananon, Dean, School of Environment, Resource and Development, AIT.

1. INTRODUCTION



The “Capacity building for measuring multi-hazard livelihood security and resilience in the lower Mekong basin” project aims to create a tool for measuring livelihood security and resilience to multi-hazards, including the COVID-19 pandemic. It focuses on building the capacities of the stakeholders for evidence-based decision-making and interventions. In the first phase, the project is developing a Livelihood Security and Resilience Assessment (LiSeRA) framework and tool for measuring multi-hazards perspectives of the selected communities in selected lower Mekong river basin countries. The second phase will emphasis on capacity building through training workshops for adopting the tool in the multi-hazard risk management context. Thus, a two days workshop was organized to finalize and validate the framework developed by the project team.

The expert workshop was divided into eight sessions and was organized in a hybrid model. Experts from Cambodia, Vietnam, and Thailand participated virtually, whereas experts from India joined the workshop online.

2. SESSION PLAN

| | |
|---------------------|---|
| Session I | Opening Remarks from Dr. Linda Anne Stevenson (Head of Knowledge Management & Scientific Affairs and Deputy Head of Development & Institutional Affairs Asia-Pacific Network for Global Change Research) |
| Session II | Regional Perspective on “Multi-Hazard Livelihood Security and Resilience in Lower Mekong Basin” by Dr. Indrajit Pal |
| Session III | National Perspective on “Multi Hazard Livelihood Security and Resilience in Thailand” by Dr Puvadol Doydee and Dr. Piya Jaikeaw |
| Session IV | National Perspective on “Multi-Hazard Livelihood Security and Resilience in Vietnam” by Dr. Nguyen Tanh and Dr. Tran Ngoc Chau |
| Session V | National Perspective on “Multi Hazard Livelihood Security and Resilience in Cambodia” by Dr. Seak Sophat |
| Session VI | Brief presentation on LiSeRA Framework by Dr. Parameshwar Digamber Udmale and Ms. Mayuri Gadhawe |
| Session VII | Details presentation of dimensions and indicators Prioritization of the Hazards and Livelihood determinants - Based on the LiSeRA Framework |
| Session VIII | Closing Remarks from Prof. Professor Vilas Nitivattananon, (Dean, School of Environment, Resource and Development, AIT) |

3. KEY ACTIVITIES

3.1 REGIONAL PERSPECTIVE

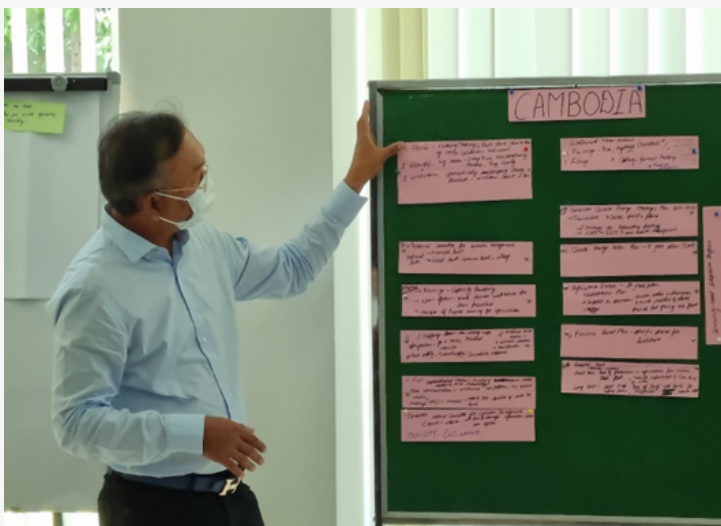


Dr. Indrajit Pal sharing his presentation highlighting the regional perspective on multi-hazard livelihood security and resilience of the lower Mekong basin.

Dr. Indrajit Pal, Team leader of the project, presented the regional perspective on “Multi-Hazard Livelihood Security and Resilience in Lower Mekong Basin”. In his presentation, he shared critical issues of the region based on the fact that 80% of the region’s population relies on the Mekong river for food and livelihood. He then highlighted how the increasing anthropogenic activities, global climate change, and sea-level rise are impacting lower Mekong wetlands and how they have undergone significant changes. As a way forward, he then pitched the need for a comprehensive multi-hazard livelihood and resilience assessment system as the policies and implementation in the lower Mekong basin region are yet to be achieved. Following the critical issues presented by Dr. Pal, participants and experts were divided into three groups (based on country). They were asked to discuss key concerns of their country regarding livelihood security and resilience.

KEY QUESTIONS DISCUSSED

- What type of hazards to consider in our study area?
- What type of livelihood is impacted by hydrological hazards?
- What type of livelihood securities are considered mostly for the current policies in practice?
- In the past few hazards, how were livelihoods impacted? Short and Long term
- How is the community adapted to the changing climate, which is impacting livelihoods?
- How are the early warning systems in place?
- What is the information dissemination process for awareness and capacity development?



3.1.1 LIVELIHOOD SECURITY AND RESILIENCE CONTEXT IN CAMBODIA

Dr. Seak Sophat, sharing the livelihood security and resilience scenario in Cambodia

RANKING OF HAZARDS IN TERMS OF IMPACT

- Flood- riverine (Mekong), flash flood (due to heavy rain)
- Drought- Dry season- Svaay Rieng, Kampong Chang, Kandaal, Prey Veane
- Windstorm -Sporadically. Kampong Chaang, Kandaal- windstorm impact in 2021

LIVELIHOOD IMPACTED

- Farming (Rice Crops)
- Horticulture
- Clothing-Garment Industry

SHORT TERM AND LONG-TERM IMPACTS ON LIVELIHOOD

- Short term- Loss of production in agriculture, less income, loss of flood, lack of clean drinking water, impact on health
- Long-term- Debt trap, loss of land- sell land to repay loan, migration, health impacts.

ADAPTATION BY COMMUNITY

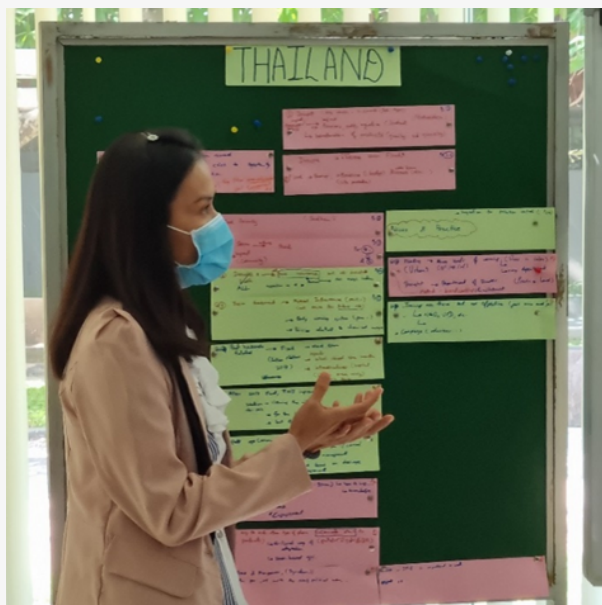
- Cropping varieties- short term varieties
- Livelihood diversification- contract workers, taxi drivers
- Migration- inbound and outbound
- Food supply and support
- Medical supply and support

EARLY WARNING SYSTEMS

- Meteorological station-Ministry of Water Resources and Meteorology
- Mass communication- announcements in papers, tv, social media. Mekong River Commission-Website for the update of the river level.

**INFORMATION
DISSEMINATION
PROCESS FOR
AWARENESS AND
CAPACITY
DEVELOPMENT**

- National Committee for Disaster Management (CAMDI website) -all loss and damage information, database system EWS website-ews1294



3.1.2 LIVELIHOOD SECURITY AND RESILIENCE CONTEXT IN THAILAND

Dr. Piya Jaikeaw sharing the scenario of livelihood security and resilience in Thailand.

**RANKING OF
HAZARDS IN
TERMS OF
IMPACT**

- Drought [Dry season (2~3 months, Feb ~ April)]
- Floods (Flash)
- Tropical storms (induce flood)

**LIVELIHOOD
IMPACTED**

- Farming (Paddy)
- Aquaculture
- Transformation of products (quality and quantity) (e.g., the smell and taste of rice change)

**POLICIES IN
PLACE FOR THE
LIVELIHOOD
SYSTEM**

- Insurance of products (but it is insufficient.)

**SHORT TERM AND
LONG-TERM
IMPACTS ON
LIVELIHOOD**

- Schools, hospitals, the economic zone, and urban areas are mainly affected [closed for one month (2017 flood, Sakhon Nakhon Province)].

ADAPTATION BY COMMUNITY

- Damage to transportation infrastructures (bridge, road).
- Water-borne disease
- Prepare and protect themselves, using sandbags, elevating the area, cleaning the canal, improving the drainage system, and becoming more focused on waste management.
- Farmers are trying to find and adapt to alternative planting patterns like season-based crops

EARLY WARNING SYSTEMS

- In urban areas, there are three levels of warning signs (strong, moderate, and weak) shown in color. Most departments have a warning system.
- For rural areas, using broadcasting systems (for drought as well
- local ways (e.g., sharing news from person to person).
- Warning from the Department of Disaster Preparedness and Management (Provincial Level)

INFORMATION DISSEMINATION PROCESS FOR AWARENESS AND CAPACITY DEVELOPMENT

- There is training, campaigns, and volunteering for each tambon from NGOs, UNSDR, etc., but not sufficient and adequate.



3.1.3 LIVELIHOOD SECURITY AND RESILIENCE CONTEXT IN VIETNAM

Mr. Bui Phan Quoc Nghia sharing the scenario of livelihood security and resilience in Vietnam.

RANKING OF HAZARDS IN TERMS OF IMPACT

- Riverine/coastal erosion
- Flood
- Drought
- Salt Water intrusion

LIVELIHOOD IMPACTED

- Agriculture: product loss, cultivated area loss
- Small businesses owned by communities: properties/building/house loss and damage (mostly because of riverine erosion)
- Aquaculture: product loss, cultivated area loss
- Eco-tourism.

POLICIES IN PLACE FOR LIVELIHOOD SYSTEM

- Change to hazards tolerant crops/aquatic species
- Support research projects
- Build/Improve early warning system
- Community training & awareness raising
- Clearly assign responsibilities to the authorities
- Policy: Based on national plans, the central government gives decisions/guidelines to provinces. Provincial-level government builds policies based on the decisions/guidelines of the central government and the local context.

SHORT TERM AND LONG-TERM IMPACTS IN LIVELIHOOD

- Riverine erosion: properties/building/house loss and damage (mostly because of riverine erosion)
- Agriculture: product loss, cultivated area loss
- Drought + saltwater intrusion: lack of water supply for agriculture and daily activities.

ADAPTATION BY COMMUNITY

- Riverine erosion: Build dykes/embankments at the riverbanks, and resettlement for households living in vulnerable areas.
- Flood: Government supports renovating houses or building floating houses to adapt to floods. Changing to flood-tolerant rice species. Build/Renovate irrigation system.
- Drought: Water restoration in the rainy season. Water pumping. Buy water from other areas.
- Saltwater intrusion: Develop water treatment systems. Change to saltwater tolerant plants/aqua species.

EARLY WARNING SYSTEMS

- In each province, the Department of Science and Technology and the Department of Natural Resources and Environment receive support from the Central government and other organizations to invest in science and technologies to build the early warning system.
- These departments also get support to do research projects in early warning.
- These departments associate with other organizations to distribute information to local communities.

INFORMATION DISSEMINATION PROCESS FOR AWARENESS AND CAPACITY DEVELOPMENT

- The process is top-down. From the central government to the Provincial government to the district government to the Commune government to the residents.
- This process has pros and cons:
- Pros: Information is clear and in order. Clear about the responsibilities of each organization and level.
- Cons: Time cost. Communities' awareness is not high so they do not believe in information from the government. Sometimes, information is distributed, but what to do next to prepare, adapt and mitigate the disaster is not instructed specifically.

3.2 NATIONAL PERSPECTIVE ON "MULTI-HAZARD LIVELIHOOD SECURITY AND RESILIENCE" IN THAILAND

National Perspective on “Multi Hazard Livelihood Security and Resilience in Thailand” was presented by Dr Puvadol Doydee and Dr. Piya Jaikeaw where they highlighted how multi-hazards are impacting and forcing transformative changes in livelihood with a specific case from Sakon Nakhon Province, Thailand

MULTI-HAZARD SCENARIO

Drought

- In 2020, about half of the major reservoirs in the country stand below 50 percent of capacity.
- River levels are so low that saltwater from the ocean is creeping upstream and affecting drinking water supplies.
- And in a country where 11 million people work in farming, crop production and the economy are expected to suffer.
- By April 2020, 25 provinces declared drought disaster areas, covering 146 districts, 6,846 villages.
- Thai Meteorological Department (TMD) declared the worst drought in 40 years, Thai government declared a drought emergency.
- Economy: Losses of \$312,000 due to lost crops from rice, corn, sugar cane and cassava.

Flood

- The prolonged flood 2011 in Thailand caused more than 800 deaths and extensive damage and losses, which amounted to THB 1.43 trillion. Out of this, THB 1 trillion fell on manufacturing.

NOTICEABLE TRANSFORMATIVE CHANGE IN LIVELIHOOD

- Agriculture is the primary source of livelihood/income in Sakon Nakhon Province, Thailand.
- Water scarcity has a huge impact on the health and livelihood of the community.
- Alternative livelihood is important for vulnerable communities.
- Drought contributes to malnutrition and famine that affects the most vulnerable communities, especially women, children the elderly.
- Drought could result in famine throughout the region.
- Improving the livelihoods of people meaning to increase the adaptive capacity to cope with disasters.
- The poor communities with low adaptive capacity and weak recovery tend to experience severe impacts on livelihoods and daily income.
- Prolonged and severe droughts adversely impact agricultural productivity, threatening the food security and livelihood of rural households and poor communities.

IMPACT ON LIVELIHOOD SECURITY OF COMMUNITIES RESIDING IN THE RIVER BASIN

- Under the context of climate change adaptation research, vulnerability assessment should take into consideration the interaction among natural processes, socio-economic conditions, and the mechanisms of the response of the integrated ecological-economic system.
- Pressure from urban development, land use, and land cover change in Thailand not only has caused the loss of ecosystem services in peri-urban environments but has also resulted in an increase in urban flooding vulnerability.
- However, cities with higher potential impact do not necessarily lead to higher vulnerability for urban flooding because adaptive capacity can also mitigate the vulnerability of cities to extreme climate events.
- Increased population and urban growth have made converting open spaces that can cause flooding.

SUGGESTIONS AND WAY FORWARD

- Technical Working Group on Adaptation to multi-hazard and livelihood resilience is the key recommendation
- Action plan (What, When, Who) for implementation of multi-hazard and livelihood resilience at the national level and regional level.
- People adapt to disaster better than reaction or response.

3.3 NATIONAL PERSPECTIVE ON "MULTI-HAZARD LIVELIHOOD SECURITY AND RESILIENCE" IN VIETNAM

National Perspective on “Multi-Hazard Livelihood Security and Resilience in Vietnam” was presented by Dr. Chau Tran, where she highlighted how multi-hazards are impacting and forcing transformative changes in livelihood with a specific case from An Giang Province, Vietnam

MULTI-HAZARD SCENARIO

- Flood from Mekong River in combination with rain and a high tide of the East Sea causes deep flooding from 1.5m to 3.0m over 60% to 80% of the province’s land area and lasts from 05 to 06 months. depending on the severity of the flood, the intensity is small 5-7 cm/day.
- Floods in An Giang are usually single-peaked floods, reaching the maximum between the end of September and the first half of October; August also often has a “sub-peak”.
- The total length of the landslide-risk sections is about 171.58 km (out of a total of 400 km of shoreline), affecting more than 20,000 households, of which more than 5,380 households need emergency relocation.
- All areas in communes, wards and towns in the province are likely to be affected by thunderstorms. Of which, 95/156 communes, wards and towns are frequently affected by tornadoes in recent years.
- Areas likely to be affected by salinity in extreme cases are including Thoai Son, Tri Ton. the average time of being affected is 2 months (from the beginning of March to the end of April of the solar calendar) and the population likely to be directly affected by domestic water is about 20,000 residents.

NOTICEABLE TRANSFORMATIVE CHANGE IN LIVELIHOOD

- To reduce minimizing the impacts of floods on people's living, the central government supported in building flood-proof foundation construction clusters of residential lines in deep-flooded areas in the Mekong Delta.
- The management and operation of the system of sewers, dams, and pumping stations basically ensure the fight against floods and waterlogging to serve the production of the annual autumn-winter crop, contributing to increasing annual food production, developing farming, fisheries, transportation and domestic water service.

IMPACT ON LIVELIHOOD SECURITY OF COMMUNITIES RESIDING IN THE RIVER BASIN

- Impact on cultivation
- Impacts on livestock production
- Impacts on aquaculture
- Impacts on forestry

SUGGESTIONS AND WAY FORWARD

- Enhance the capacity of risk assessment.
- Studies on risk adaptation.
- Enhancing the role and capacity of state management on natural disaster prevention
- Raise awareness about disaster risks, and strengthen community-based disaster risk management
- Upgrade equipment and facilities to serve the prevention of natural disasters
- Improve capacity in natural disaster warning, forecasting, monitoring and supervision.

3.4 NATIONAL PERSPECTIVE ON "MULTI-HAZARD LIVELIHOOD SECURITY AND RESILIENCE" IN CAMBODIA

National Perspective on “Multi-Hazard Livelihood Security and Resilience in Cambodia” was presented by Dr. Seak Sophat, where he highlighted how multi-hazards are impacting and forcing transformative changes in livelihood with a specific case from Kandal Province, Cambodia

MULTI-HAZARD SCENARIO

- Floods: As Kandal province is located in the floodplain area of Cambodia, especially the Mekong region, most districts of Kandal province get flooded every year. Normal flood in Kandal province of Cambodia occurs in early July and end in October
- Droughts: As in NAPA 2006, Kandal is also among the provinces impacted by drought
- Wind storm: Occurs sporadically, especially in heavy rain
- Pest endemics: Resistant to pests and more pesticides are used to maintain the production of crops.

NOTICEABLE TRANSFORMATIVE CHANGE IN LIVELIHOOD

- Damage to agriculture production
- Increase debts (as farmers borrow finance for cropping)
- Damage and loss of infrastructure and interruption to economic activities
- Migration for jobs in Phnom Penh city, foreign countries like Thailand, Korea, etc.
- Impact on health like increase of dengue fevers, typhoid, Cholera, etc

IMPACT ON LIVELIHOOD SECURITY OF COMMUNITIES RESIDING IN THE RIVER BASIN

- Less income from agriculture
- Debt trap for farmers
- Job migration to the city and other countries
- Health impacts
- Damage to road infrastructure, and effect on their economic activities.

SUGGESTIONS AND WAY FORWARD

- Review the materials related to our study on Multi-hazard livelihood security and resilience
- Develop the methodology for this study, and it should be based on the country's context
- Conduct a field survey to test the method
- Explore other joint research projects in other related sectors and climate change

3.5 FINALIZATION OF FRAMEWORK



Dr Parameshwar Digamber Udmale briefing on the conceptual layout of LiSeRA Framework.

During the workshop, Dr. Parameshwar Digamber Udmale from the Indian Institute of Technology, Bombay, India, introduced the LiSeRA framework developed by the project team. After the brief introduction, a details discussion was held regarding the prioritization of the hazards and livelihood determinants – based on the LiSeRA Framework.

The layout and templets finalized by experts are attached in this report as an annex,

4. CONCLUSION

The workshop concluded with special remarks from Professor Vilas Nitivattananon, Dean, School of Environment, Resource and Development, AIT, during his closing remarks he appreciated project's contributions to the Sustainable Development Goals.

Annexes

Table 1: Template of LiSeRA Framework for Mekong River Basin

| Dimensions | Sub - Dimensions | Human | Social | Natural | Physical | Economical |
|------------|------------------|-------|--------|---------|----------|------------|
| Absorb | Investment | | | | | |
| | Resistance | | | | | |
| | Adaptation | | | | | |
| | Planning | | | | | |
| | Preparedness | | | | | |
| | Capacity | | | | | |
| | Contingency | | | | | |
| | Management | | | | | |
| Recover | Legislature | | | | | |
| | Economy | | | | | |
| | Reconstruction | | | | | |
| | Resilient | | | | | |

Annexes

Table 2 : Template for identifying data availability for LiSeRA.

| Indicator | Spatial Resolution | Temporal resolution (Daily/ Monthly) | Data source | | | | | |
|-----------|--------------------|--|-------------|-----------|----------|-----------|---------|-----------|
| | | | Thailand | | Cambodia | | Vietnam | |
| | | | Primary | Secondary | Primary | Secondary | Primary | Secondary |
| | | | | | | | | |
| | | | | | | | | |

Annexes

Table 3 : Template for livelihood dimension indicator library

| Dimension | Indicators | Sources | How to measure? | Effects of Livelihood Resilience | Potential Data Sources |
|-----------|------------|---------|-----------------|----------------------------------|------------------------|
| Financial | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Human | | | | | |
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| Social | | | | | |
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| Natural | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| Physical | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |

Annexes

Table 4: Template for Resilience dimension library Indicators

| Dimension | Sub -Dimension | Indicators | Sources | How to Measure ? | Effects on Resilience | Potential Data Sources |
|-----------|----------------|------------|---------|------------------|-----------------------|------------------------|
| | | | | (Variables) | | |
| Absorb | Investment | | | | | |
| | Resistance | | | | | |
| | Adaptation | | | | | |
| | Planning | | | | | |
| Response | Preparedness | | | | | |
| | Capacity | | | | | |
| | Contingency | | | | | |
| | Management | | | | | |
| Recovery | Legislature | | | | | |
| | Economy | | | | | |
| | Reconstruction | | | | | |
| | Resilient | | | | | |