

FINAL KNOWLEDGE DISSEMINATION WORKSHOP

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

9-10 February 2023

AIT Conference Center,  
Asian Institute of Technology, Thailand

## BRIEF REPORT





## Table of Contents

1	Introduction .....	4
2	Technical Session - Presentation and Discussion on Regional and National Perspectives.....	5
2.1	Livelihood Security and Resilience Assessment in the Lower Mekong Basin Communities .....	6
2.2	Adaptive water governance in political and socio-economic paths of the Lower Mekong Region .....	7
2.3	Livelihood Security and Resilience Assessment (LiSeRA) Toolkit .....	8
2.4	Enhancing Climate Adaptability and Resilience of Transport Sector in Thailand .....	9
2.5	Livelihood resilience of rural communities under multi-hazard in Sakon Nakhon Province, Thailand .....	9
2.6	Livelihood security and resilience in Vietnam: Case Studies .....	11
2.7	National Perspectives of Livelihood Security and Resilience in Cambodia and Way Forward for Policy Recommendations.....	11
3	Group Activities .....	12
3.1	Weightage and Ranking of LiSeRA indicators .....	13
3.2	SDG Mapping of LiSeRA indicators .....	13
4	Key Takeaways.....	14
4.1	Risk drivers in the LMB.....	14
4.2	Impacts of risk drivers on the communities .....	14
4.3	Challenges in livelihood security and resilience .....	15
4.4	Interlinkages between livelihood impacts and resilience .....	16
4.5	Interventions for risk management.....	16
4.6	Way forward and recommendations .....	16
5	Evaluation and Feedback.....	17
6	Conclusion .....	17

## 1 Introduction

The “Capacity building for measuring multi-hazard livelihood security and resilience in the lower Mekong basin” project developed a tool for measuring livelihood security and resilience to multi-hazards. In the first phase, the project developed the 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. In the second phase, the project conducted national level workshops in the three project countries; Cambodia, Thailand and Vietnam to enhance the capacities of local stakeholders in using the toolkit to conduct resilience assessment. The workshops also helped identify the synergies of the tool and the proposed indicators in the LMB communities, and compute the relative weightage and ranking of the indicators for robust assessment process.

In the final phase, a “Final Knowledge Dissemination Workshop” was conducted at the Asian Institute of Technology on 9-10 February 2023. The regional level workshop included discussions on the regional, national and local perspectives of disaster risk, climate change, livelihood impacts and resilience in the LMB communities and the utilization of the LiSeRA framework and toolkit in assessment process.

The workshop was conducted in-person, with a total of 25 participants including researchers and practitioners within the LMB countries involved in disaster risk management and development planning. The two-day workshop consisted of interactive presentations from notable experts, group discussions and exercises.

*Table 1: Division of sessions in the workshop*

<b>Session I</b>	Opening remarks from Prof. Kazuo Yamamoto, President, AIT Opening remarks from Prof. Sangam Shrestha, Member, Scientific Planning Group, Asia-Pacific Network for Global Change Research Welcome remarks and project overview by Dr. Indrajit Pal, Project Lead
<b>Session II</b>	Perspective of Multi-hazard Livelihood Security and Resilience in the LMB by Dr. Indrajit Pal
<b>Session III</b>	Adaptive water governance in political and socio-economic pathways of the Lower Mekong Region by Dr. Thi Phuoc Lai Nguyen
<b>Session IV</b>	Livelihood Security and Resilience Assessment (LiSeRA) Framework & Toolkit by Dr. Parmeshwar Udmale
<b>Session V</b>	Enhancing Climate Adaptability and Resilience of Transportation Sector in Thailand by Dr. Nuwong Chollacoop, Director, Low Carbon Energy Research Group, ENTEC Thailand

- Session VI** Group Activity: Determining weightages of indicators in the LiSeRA toolkit library
- Session VII** Livelihood resilience of rural communities under multi-hazard in Sakon Nakhon Province, Thailand by Dr. Puvadol Doydee
- Session VIII** Livelihood security and resilience in Vietnam: Case Studies by Dr. Dr. Thanh Nguyen
- Session IX** National Perspectives of Livelihood Security and Resilience in Cambodia and Way Forward for Policy Recommendations by Dr. Seak Sophat
- Session X** Group Activity: SDG mapping of LiSeRA indicators
- Session XI** Closing Remarks and Vote of Thanks from Dr. Indrajit Pal

## 2 Opening Session

The in-person workshop was flagged off with the Opening Remarks from Prof. Kazuo Yamamoto, President of Asian Institute of Technology. He discussed the role of AIT in resilience and sustainable development in the region, and expressed hope that the project outcomes would serve further in the path towards achieving the SDGs. Prof. Sangam Shrestha, member of Scientific Planning Group of Asia-Pacific Network for Global Change Research highlighted the role of APN in addressing global change and sustainability through innovative and transdisciplinary research and capacity development activities.



*Figure 1. Prof. Kazuo Yamamoto (left) and Prof. Sangam Shrestha (right) delivering their opening remarks during the workshop*

Dr. Indrajit Pal, Principal Investigator and Project Lead welcomed the experts and scholars and provided a brief overview of the project, its methodology and the expected deliverables and outcomes. In his presentation, Dr. Pal highlighted how multiple hazards impact people's livelihood

in LMB and the need for robust risk and resilience assessment for informed decision-making by the stakeholders.

### 3 Technical Session - Presentation and Discussion on Regional and National Perspectives

Technical sessions included presentations and discussions on regional and national perspectives of disaster risk, climate change impacts, livelihoods and resilience. The technical sessions were delivered by notable experts, both in research and practice from different institutions and organizations working in the Lower Mekong Region. After each presentation, participants immersed in floor discussions on relevant and pertinent themes of resilience in the LMB.

A brief description of the technical presentations are given below.

#### 3.1 Livelihood Security and Resilience Assessment in the Lower Mekong Basin Communities



*Figure 2. Dr. Indrajit Pal presenting on the regional perspective of livelihood security and resilience assessment in LMB communities*

In the first session of the workshop, Dr. Indrajit Pal, Project Lead and Associate Professor at the Asian Institute of Technology provided a presentation on the regional perspectives of livelihood security and resilience in the Lower Mekong Basin. In his presentation, Dr. Pal introduced the key issues in resilience faced by communities in the LMB, such as heavy reliance on the river basin for food and livelihoods, the variability in climate and ecosystem within the region due to natural and anthropogenic activities and the relatively lower levels of attention given to the impacts of hazards and stressors on the livelihoods of the people and interventions for resilience.

He further discussed how disaster risk, resilience and livelihoods are interlinked in the region, where ecological stresses such as rise in temperature, sea-level rise, overexploitation of ground

water and pollution and contamination have led to disruption of livelihood activities. He presented the multi-hazard scenario of LMB, and discussed the existing gaps in assessment frameworks that do not adequately incorporate the linkages between livelihood security and resilience. He further introduced the participants to the methodologies used in developing the Livelihood Security and Resilience Assessment (LiSeRA) framework and toolkit. He concluded his presentation by posing two questions for floor discussions,

1. What capacities are important for communities to attain transformative positive changes in livelihood security to enhance resilience?
2. How can assessment tools such as LiSeRA framework be incorporated into regional, national and local level planning to ensure evidence-based decision making by governments and development agencies?

Following the presentation, participants shared their own research findings and experiences of livelihood and resilience in the LMB and provided opinions on the questions.

### 3.2 Adaptive water governance in political and socio-economic paths of the Lower Mekong Region



Figure 3. Dr. Nguyen presenting on adaptive water governance in LMB

Dr. Thi Phuoc Lai Nguyen, Assistant Professor in the Department of Development and Sustainability of Asian Institute of Technology presented on the challenges of water governance in the Lower Mekong Basin region and the principles of adaptive water governance in political and socio-economic pathways in the region. Dr. Nguyen emphasized on the need for flexibility, collaboration, inclusiveness, transdisciplinary approach, learning and innovation and resilience in developing adaptive policies and interventions for sustainable water governance in the region.

Table 1: Challenges of water governance in Lower Mekong Region presented by Dr. Nguyen

<p><b>Cultural and Political Challenges</b></p> <ul style="list-style-type: none"> <li>• Political instability</li> <li>• Human right abuses</li> <li>• Border disputes</li> <li>• Corruption</li> <li>• Authoritarianism</li> <li>• Ethic and religious tensions</li> </ul> <p><b>Socio-Economic Challenges</b></p> <ul style="list-style-type: none"> <li>• Hydropower dam development</li> <li>• Water scarcity (tropical climate and high population density → high water demand)</li> <li>• Climate change (droughts and floods)</li> <li>• Transboundary water management</li> <li>• Lack of data and information</li> <li>• Limited stakeholder engagement</li> </ul>
--

### 3.3 Livelihood Security and Resilience Assessment (LiSeRA) Toolkit

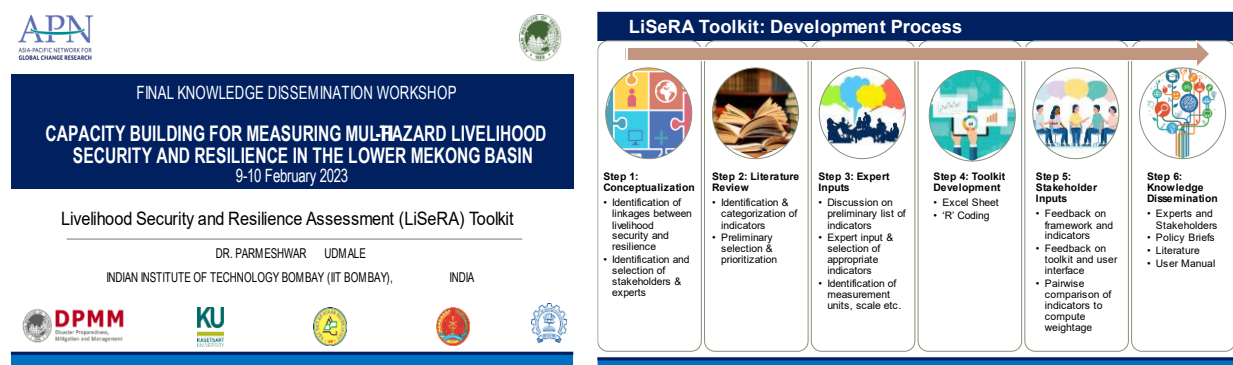
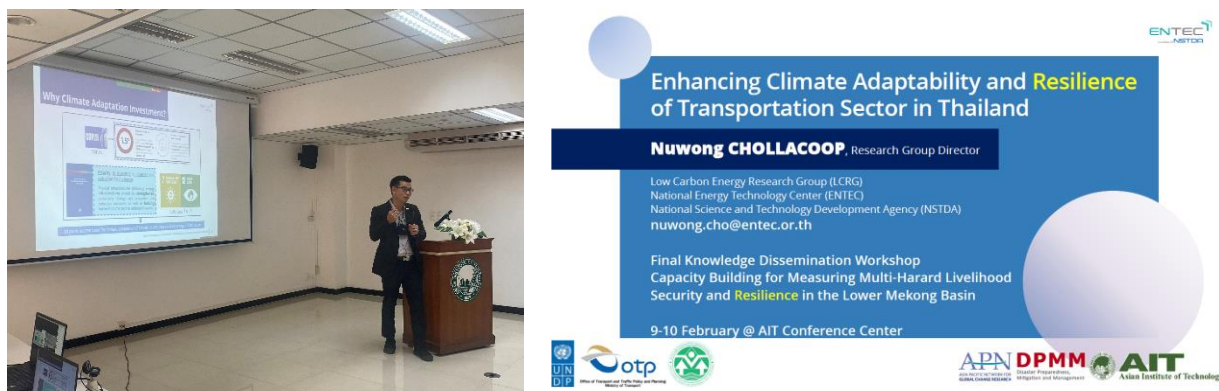


Figure 4. Excerpt of presentation on LiSeRA toolkit by Dr. Parameshwar Udmale

In the third session, Dr. Parameshwar Udmale, Assistant Professor at the Indian Institute of Technology – Bombay and project collaborator shared about the Livelihood Security and Resilience Assessment (LiSeRA) toolkit developed as part of the project. He discussed the methodological process involved in development of the toolkit, the dimensions, sub-dimensions and indicators synthesized in the toolkit library and provided a hands-on demonstration of the use of LiSeRA excel and ‘R’ programming package toolkit to the participants. He also discussed the sample outputs of the tool and how to interpret the results for assessment process.



### 3.4 Enhancing Climate Adaptability and Resilience of Transport Sector in Thailand



*Figure 5. Dr. Nuwong Chollacoop presenting on climate adaptability and resilience in transportation sector in Thailand*

Dr. Nuwong Chollacoop, Research Group Director at National Energy Technology Center (ENTEC), Thailand presented his study on the climate change adaptation in the transportation sector in Thailand to enhance resilience. He presented a case study of a research that conducted a cost-benefit analysis of ‘climate-proofing’ investment in road and rail transport sector in Thailand and the assessment of investment and financial flows to develop policy options and strengthen national capacity of developing countries in infrastructure resilience.

He suggested that climate-resilient investment in the transportation sector may be through different funding sources, including national budget, public-private partnerships, bonds and financings, carbon taxes and credits and international donor funds. He also emphasized on the need of collaboration across multiple sectors and stakeholders and the implementation of a pilot demonstration project to showcase the actual cost-benefits of climate-proofing transport infrastructure in Thailand.

### 3.5 Livelihood resilience of rural communities under multi-hazard in Sakon Nakhon Province, Thailand

Project collaborators Dr. Puvadol Doydee and Dr. Thodsapol Chaturabul of Kasetsart University Sakon Nakhon Province Campus, Thailand presented a case study on livelihood resilience among rural communities in Sakon Nakhon Province. They discussed the impacts of climatic hazards in the province, such as floods in 2011 and 2017 and drought in 2020 that resulted in large economic losses. Such hazards in the province were discussed to result in loss of assets, damage to

infrastructure and decreased accessibility to resources further hindering the economic activities in the region and directly impacting the livelihood and income of the people.



*Figure 6. Dr. Thodsapol Chaturabul presenting the case of livelihood impacts in Sakon Nakhon Province (left) and the image of flooding in the province in 2017 [© Thodsapol Chaturabul]*

The presenters also discussed various initiatives that have been undertaken at the province to reduce the potential impacts of hazards and enhance resilience. Early warning systems have been developed to warn people of severity levels of hazards through a network of local governments, community leaders and media channels. Improvement and expansion of water drainage and retention infrastructure, optimization of groundwater utilization, insurance for crops and land suitability mapping and advisory have helped reduce the impacts of floods in the region. Similarly, the community in the province have implemented several adaptation measures, including use of sandbags to divert water flow, elevating houses and cleaning drainage canals, diversification of crops to increase yields and developing emergency shelters within community for safeguard during hazard events.

The presenters emphasized on the further need of collaborative action to mitigate trans-boundary hazards and water governance issues and use of robust assessment products such as those obtained through the LiSeRA toolkit in developing integrated development and disaster risk management plans.

### 3.6 Livelihood security and resilience in Vietnam: Case Studies

Dr. Thanh Nguyen, Dean of College of Engineering, Technology, and Environment, An Giang University and Project Collaborator in Vietnam presenting case studies on livelihood security and resilience perspective in Vietnam.



*Figure 7. Dr. Thanh Nguyen presenting case studies of livelihood security and resilience in Vietnam*

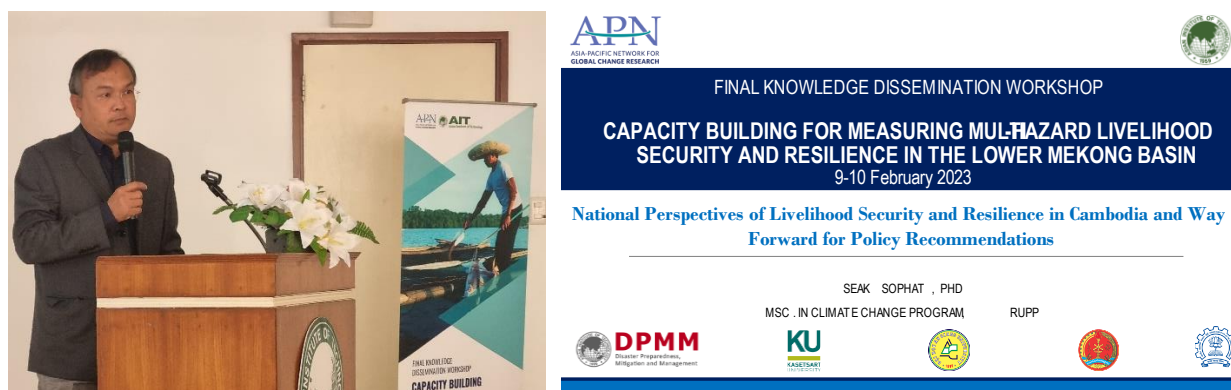
He first presented a case study of the socio-ecological system of mangrove-shrimp farming in the Ca Mau area in the Vietnam Delta region. Communities in the delta region are largely dependent on mangrove forests and its resources for livelihood and economic activities. With the changing ecological system, these communities have diversified their livelihood towards shrimp farming. However, water pollution, drought, salination, and diseases often hamper the production, resulting in low yields and directly impacting their livelihoods. The presenter emphasized on the need of an integrated approach, through balanced water management and control system, quality control and yield maintenance to support such communities.

In the second case study, Dr. Nguyen presented about a community engagement and capacity building program, especially targeted towards youths and young leaders in the Mekong region to empower them to tackle and take action on the environmental issues and contribute to sustainable development in the region.

### 3.7 National Perspectives of Livelihood Security and Resilience in Cambodia and Way Forward for Policy Recommendations

Dr. Seak Sophat, Vice Dean, Faculty of Development Studies, Royal University of Phnom Penh and Project Collaborator from Cambodia presented on the multi-hazard scenario, impacts and challenges in livelihood resilience in Cambodia and sustainable solutions during his presentation.

He presented on the various legal framework and institutions supporting resilience building to climate-induced hazards in Cambodia, such as the National Adaptation Program of Actions, Cambodia Climate Change Strategic Plan, Strategic Program for Climate Resilience and the institutional structure for disaster risk management within the country.



*Figure 8. Dr. Seak Sophat presenting the national perspectives of livelihood security and resilience in Cambodia*

Dr. Sophat highlighted that flood and drought affect the country, resulting in decline in agricultural productivity, bio-diversity and natural resources. This has a direct impact on the livelihoods and economic activities within the region, often triggering increase in out-migration among youths in search of sustainable economic activities.

The presenter highlights the lack of financial resources to support strategies and action plans in building livelihood security and resilience in the vulnerable communities as a critical challenge, along with absence of best practice models, low accessibility to information and lack of continued support and engagement. He recommended frequent update of policies, strategies and action plans, implementation of pilot programs, enhancement of awareness, increased community participation and engagement and application of robust assessment tools such as LiSeRA to aid the implementation of risk management and resilience interventions.

#### **4 Group Activities**

In addition to technical presentations from experts, the workshop also consisted of two group activities. For the group activities, participants were divided into four groups consisting of researchers and practitioners from different organizations and representing different countries.



#### 4.1 Weightage and Ranking of LiSeRA indicators

The first group activity was targeted to developing the relative weightage and ranking of the dimensions, sub-dimensions and indicators in the LiSeRA toolkit library. For this purpose, pair-wise comparison matrices were developed and provided to the participants. The participants discussed on the significance of each indicator in the library and compared it with the remaining, providing relative rankings on a scale of 1-9. These comparative rankings were then used to determine the weightages of the dimensions, sub-dimensions and indicators through the Analytical Hierarchical Process. The group activity provided the participants with an opportunity to undertake in-depth discussions regarding of the dimensions and indicators in the LiSeRA library.



*Figure 9. Participants involved in group activity on weightage and ranking of LiSeRA indicators*

#### 4.2 SDG Mapping of LiSeRA indicators

The second group activity of the workshop consisted of mapping of the LiSeRA indicators with respect to their relevant Sustainable Development Goals (SDGs). Participants were asked to discuss the linkages of the indicators to the 17 UN SDGs and map out which of the SDGs did each of the indicators in the LiSeRA library focused on. The objective of the exercise was to familiarize the participants with the UN SDGs, and develop an understanding of the interlinkages of indicators across various disciplines.

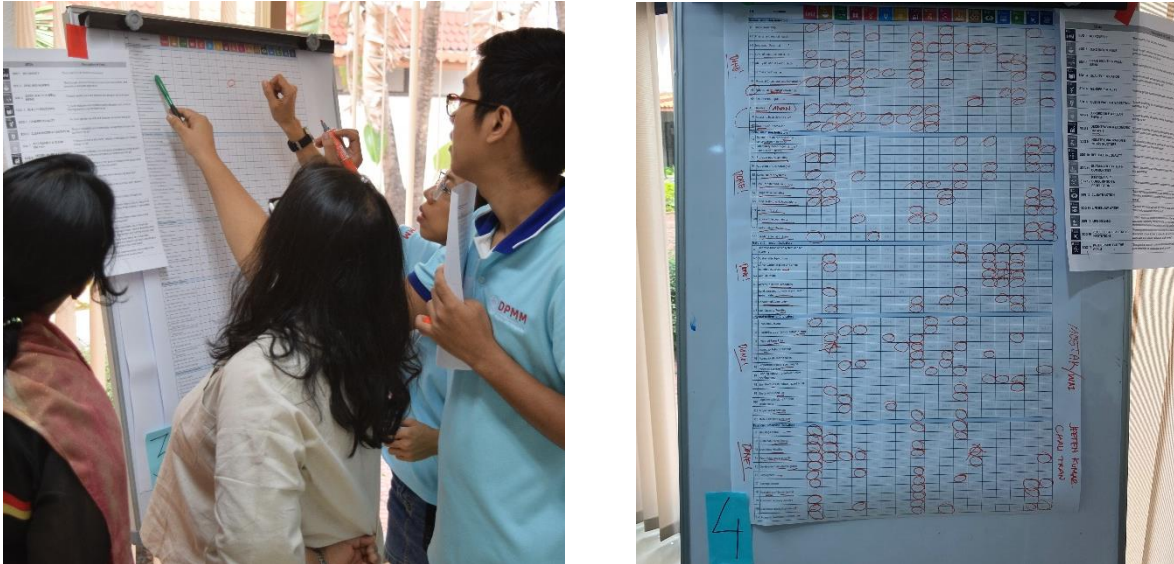


Figure 10. Participants involved in group activity on SDG mapping of LiSeRA indicators during the workshop

## 5 Key Takeaways

Following the presentations, discussions and group activities conducting during the two-day workshop, the key takeaways are as follows:

### 5.1 Risk drivers in the LMB

- Natural hazards such as floods and droughts
- Anthropogenic activities such as infrastructure development, urbanization, deforestation and pollution
- Climate change and erratic weather patterns
- Loss of bio-diversity and natural resources

### 5.2 Impacts of risk drivers on the communities

- Decline in agricultural productivity:
  - Drought destroys crops, and their yield
  - Increased flooding and soil saturation in the wet season causing damage to crops may lead to changes in pollination and flowering, spread and incidence of disease, pandemic;
  - Reducing habitats and increased reliance and pressure upon NTFPs if agricultural production is impaired,
  - Increased drought, reduced land cover, and changes in soil quality and structure may affect the quantity and quality of water.

- Changes in surface water temperature, sedimentation and flood regimes will impact on water quality and aquatic systems generally.
- Loss of economic activities
  - Floods cut off road transportation, and connection to market, hospitals, etc
  - Losses of crop production due to heavy flood and drought
- Land use change
  - Loss of natural resources such as forests and wetlands
  - Displacement due to urbanization / establishing a conservation area.
  - Changes in economic activity: food service and production
  - Increased vulnerability: droughts, floods, changes in precipitation patterns
- Socio-economic influence
  - Limit access to resources and opportunities
  - Limited access to education, healthcare, and other services
  - Recessions and changes in the demand for goods and services
  - When losses of agricultural production, local communities are forced to leave home for job migration in city, neighboring and other countries

### **5.3 Challenges in livelihood security and resilience**

- Lack of financial resources to support the strategies and action plans for building livelihood security and resilience for affected communities
- Lack of best practice models of building livelihood security and resilience for affected communities
- Economic losses and increase in the number of affected people by the climate change (hazards)
- Impacts of disasters deeply related to socio-economic conditions, traditions, culture and climate of the communities
- Local community people still have little access to information and have limited knowledge about the climate change disasters, resilience
- Building livelihood security and resilience programs failed to be sustainable at local level because no regular and continued support and demonstration.

#### **5.4 Interlinkages between livelihood impacts and resilience**

- Losses of financial and human resources to adapt and apply the resilience practices in their communities after disasters
- Increase of diseases and pests to damage agricultural crops
- Increase job migration to cities and foreign countries
- Low prices of local products when transport roads are cut off due to intense flood
- Decreased access to services and infrastructure such as education, healthcare, and other services
- Increased conflict as individuals and communities

#### **5.5 Interventions for risk management**

- Seeking off farm jobs, and relief from government and humanitarian
- Exploring new adaptation measures to secure their livelihoods like crop diversification and intensification, etc
- Seeking technical support and financial support
- Awareness raising on living, working and earning with disasters to local communities affected by climate change hazards
- Local community driven programs and projects so that they feel ownership of the interventions for continued engagement and sustainability
- Community-based initiatives, supported by the government and partnership with international agencies and private sector for collaborative action.

#### **5.6 Way forward and recommendations**

- Continued and fair implementation of existing policies and strategies on disaster management, and supporting livelihoods of affected communities.
- Update the strategies and action plans on disaster risk management
- Piloted programs on building livelihood security and resilience for most affected communities in climate change induced impacts
- Awareness raising on livelihood security and resilience building
- Approach seeks communities at risk to get engaged in all of its phases – prevention, mitigation, preparedness, response and recovery.
- In order to build disaster-resilient communities, they need to be empowered so that community members can cope with the adverse effects of hazards.



- Conduct the pilot project of application of LiSeRA toolkit with affected communities so that we can learn its utility and application, user friendly.

## 6 Evaluation and Feedback

At the end of the workshop, the participants were asked for feedback through a google form. Participants were asked to rate the workshop across three themes (figure 10) and for feedback on the LiSeRA framework and toolkit.

One participant stated, *‘The dimensions and indicators chosen in the LiSeRA Toolkit have covered most of the aspect of topic. As a researcher, we can use it for disaster research. The methodology of selection of indicators and giving weights are useful.’* Similarly, another participant stated about the utilization of the toolkit in practice, *‘The toolkits will be useful to conduct assessments and generate important information for decision making process. But whether or not it will be useful for development planning depends upon the actors and institutions involved in planning and making decisions. Adequate engagement with stakeholders would be necessary for implementation.’*

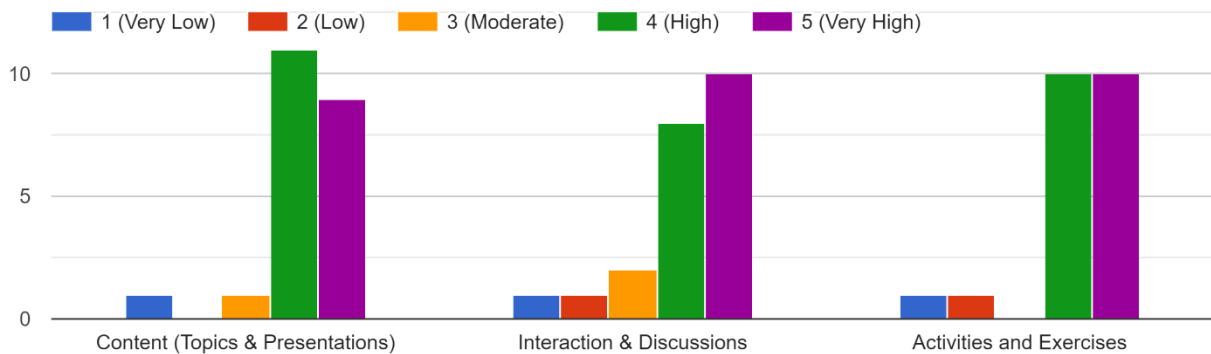


Figure 11. Summary results of feedback received from participants

## 7 Conclusion

The workshop concluded with a brief vote of thanks and closing remarks from Dr. Indrajit Pal, Principal Investigator and Project Lead. The presentations from the experts were useful for the participants to gather a holistic understanding of the risks, livelihood impacts and resilience challenges in LMB communities. The discussions during the presentation and group activities provided further support to the project team in finalizing the LiSeRA toolkit and relevant publications.