



Assessment of Vulnerability Index on Climate Variability in the East of Thailand

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Introduction

- Southeast Asia, including Thailand is facing new climate challenges e.g. flood, drought, sea level rise and increase in intensity of tropical cyclones.
- The east of Thailand, where is a major economic tree plantation zone especially fruits and rubber tree, is affected by Climate variation.
- Understanding the pattern, extent and driving factors of vulnerability is effort to facilitate climate adaptation plan.

Objectives

- To assess the vulnerability index in the east of Thailand as well as farm-households.

Vulnerability analysis

Provincial Level

- The vulnerability indexes were analyzed following ICRISAT/ADB guideline.

Indexes, which are related positively to the vulnerability, are calculated by

$$\text{index}_i = \frac{S_i - S_{\min}}{S_{\max} - S_{\min}}$$

Where : S_i is the indicator for district I
 S_{\min} is the minimum values
 S_{\max} are the maximum values

Indexes, which are related negatively to the vulnerability, are calculated by

$$\text{index}_i = \frac{S_{\max} - S_i}{S_{\max} - S_{\min}}$$

Data source

- Department of Disaster Prevention and Mitigation, Thailand
- National Economic and Social Development Board , Thailand
- The Community Development Department , Thailand
- The Thai Meteorological Department , Thailand

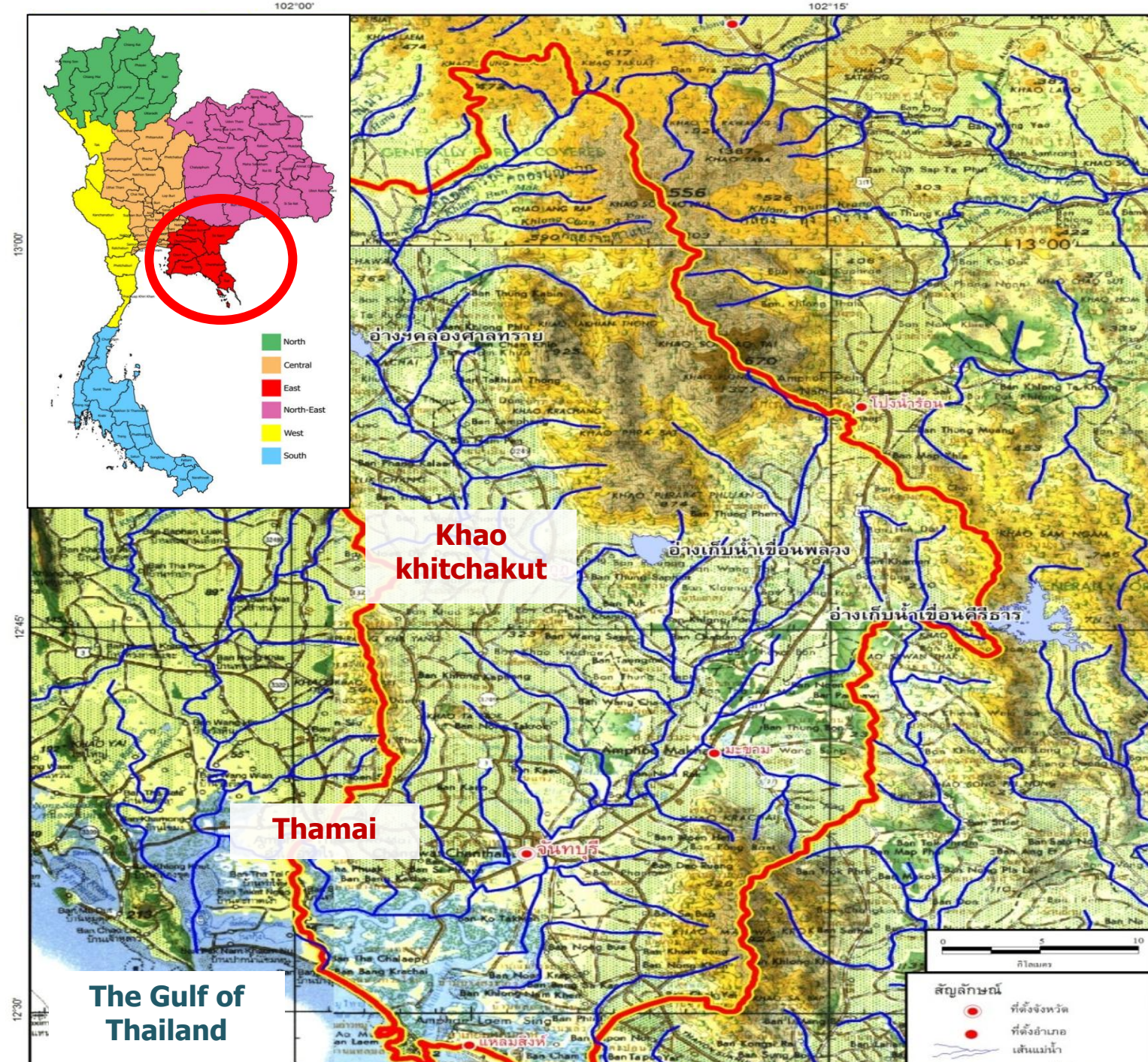


Figure1: Study Area

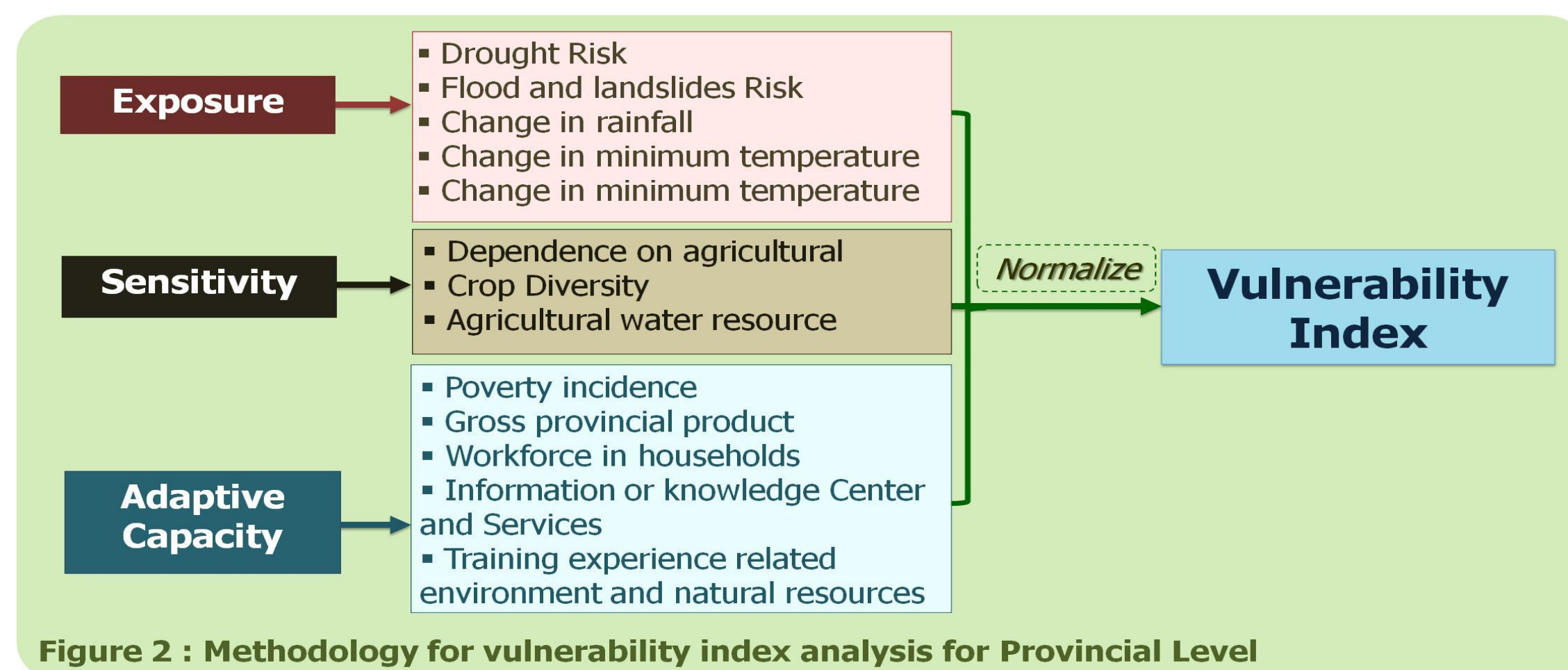


Figure 2 : Methodology for vulnerability index analysis for Provincial Level

Household Level

- The Likelihood Vulnerability Index (LVI) is utilized and aggregated according to IPCC's three contributing factors: 1) Exposure 2) Sensitivity and 3) Adaptive capacity.
- The Likelihood Vulnerability Index -IPCC (LVI-IPCC) is achieved by employing the formula;

$$\text{LVI-IPCC} = (\text{exposure} - \text{adaptive capacity}) * \text{sensitivity}$$

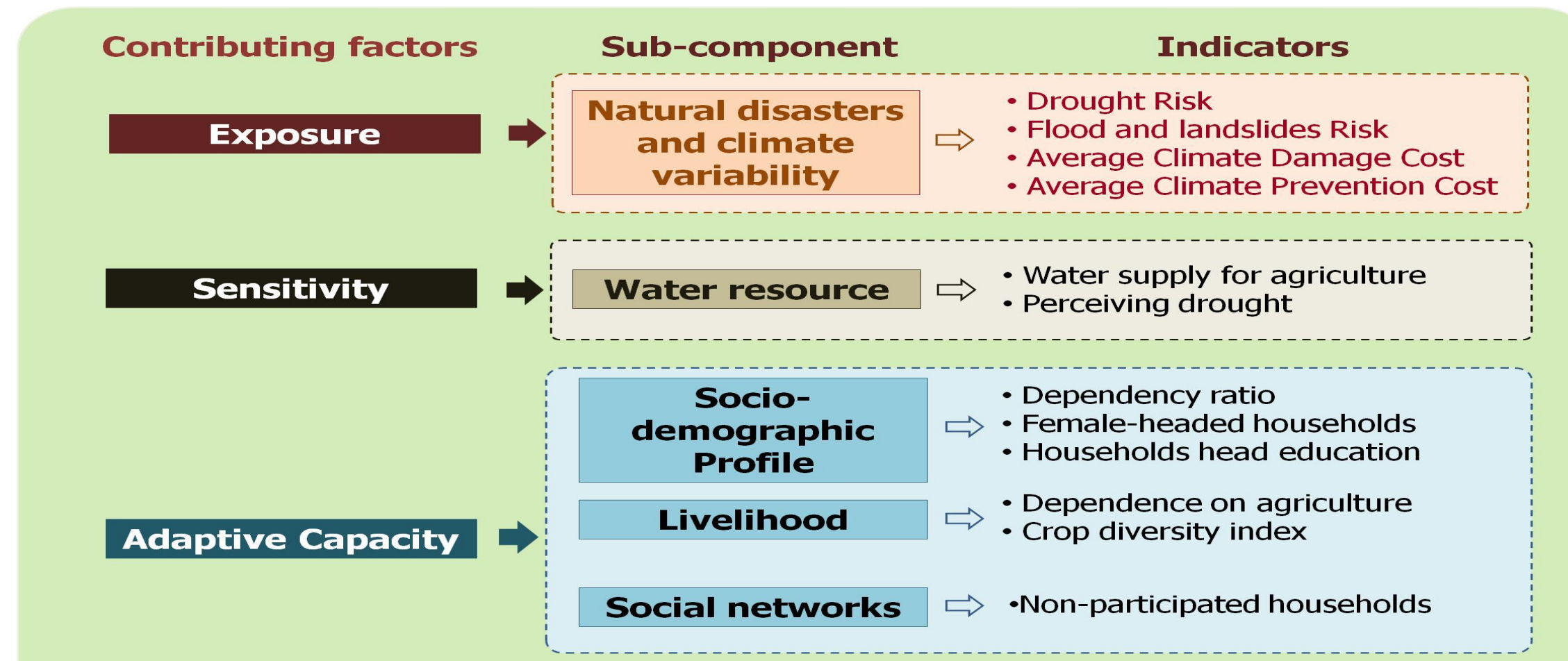


Figure 3 : Methodology for Likelihoods Vulnerability Index analysis

Results

Provincial Vulnerability

Table1: Vulnerability index and ranks for different provinces in the East

| Province | Determinants of vulnerability | | | |
|--------------|-------------------------------|-------------|-------------------|-------|
| | Exposure | Sensitivity | Adaptive Capacity | index |
| Chonburi | 0.45 | 0.41 | 0.38 | 0.41 |
| Rayong | 0.39 | 0.44 | 0.34 | 0.39 |
| Chanthaburi | 0.38 | 0.51 | 0.50 | 0.46 |
| Trat | 0.61 | 0.47 | 0.55 | 0.54 |
| Chachoengsao | 0.53 | 0.46 | 0.45 | 0.48 |
| Prachinburi | 0.36 | 0.48 | 0.49 | 0.44 |
| Sa Kaeo | 0.35 | 0.49 | 0.62 | 0.49 |

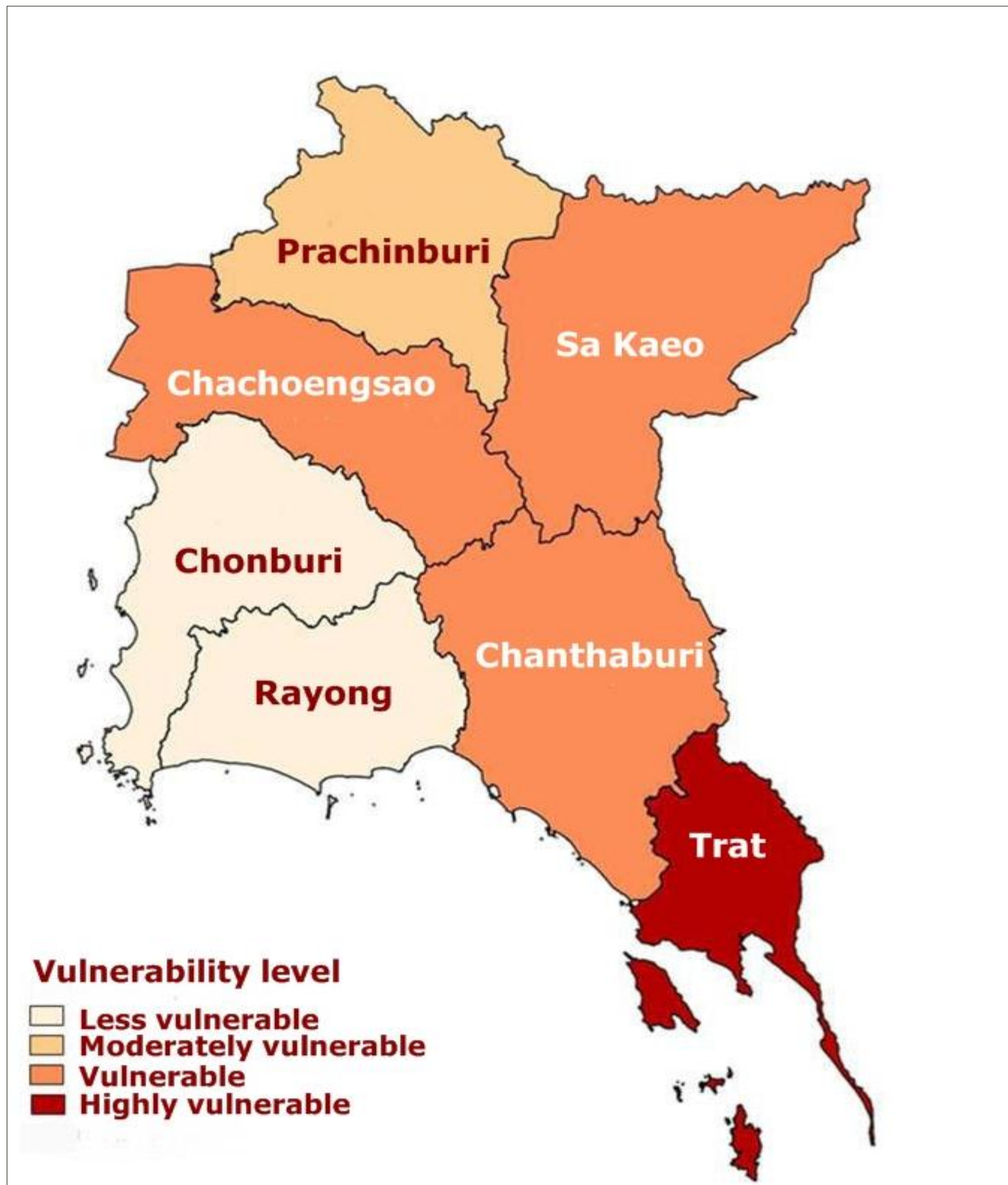


Figure 4: Provincial vulnerability to climate variability in the east of Thailand, 2011

Household Vulnerability

- The households in Khoa kitchakut district showed greater vulnerability on the natural disasters and climate variability component, livelihood component and social network component index than those in Tha mai district.
- When the Likelihood Vulnerability Index -IPCC was calculated, the overall the LVI -IPCC score was higher for Khoa kitchakut than Tha mai.

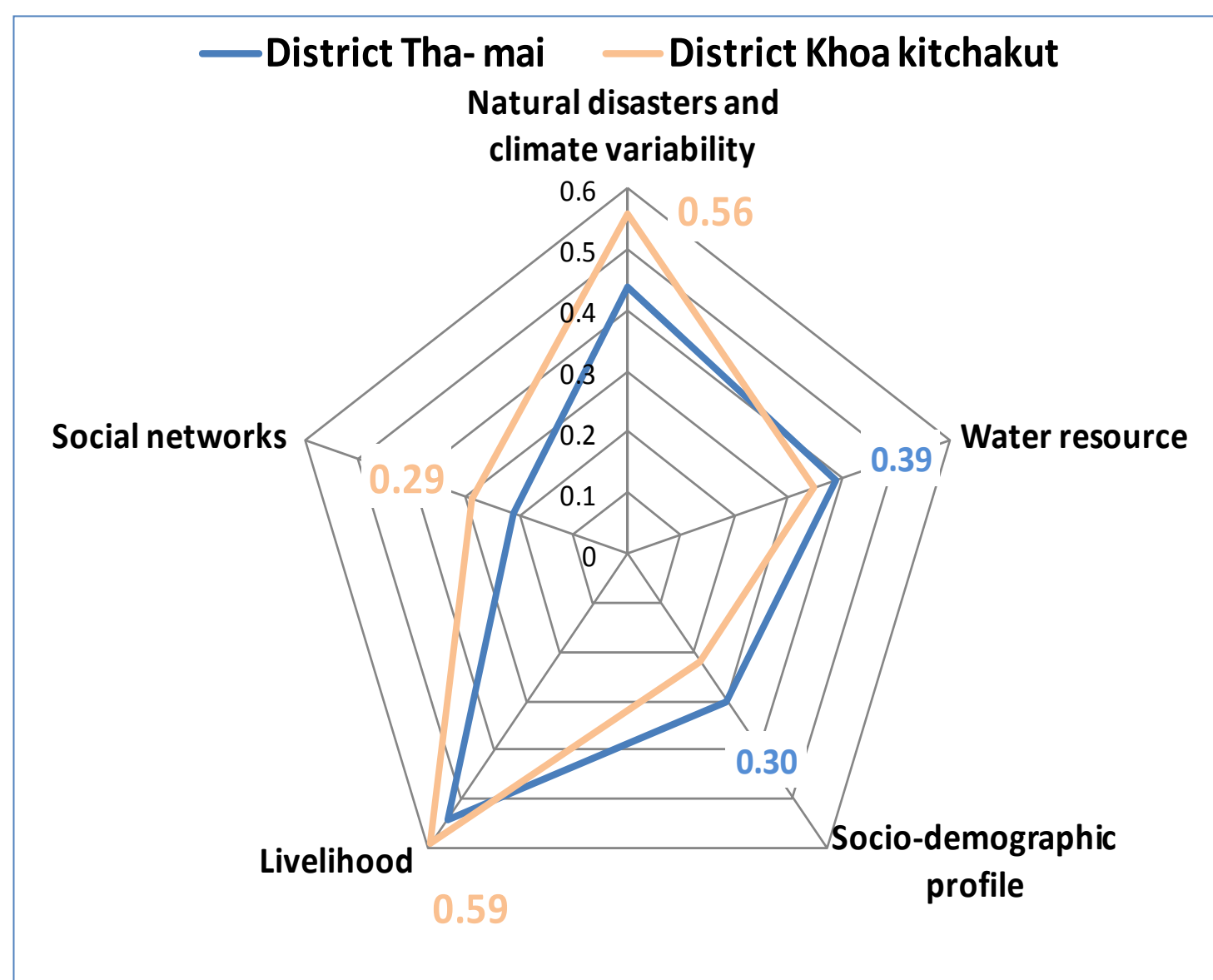


Figure 5 : Vulnerability spider diagram of the major components of the Livelihood Vulnerability Index (LVI) for Tha mai and Khoa kitchakut Districts, Thailand

Table 2: Vulnerability index and ranks for Tha mai and Khoa kitchakut Districts, Thailand

| Contributing Factor | District | |
|--------------------------------------|----------|----------------|
| | Tha mai | Khao kitchakut |
| [1] Adaptive Capacity | 0.35 | 0.37 |
| [2] Sensitivity | 0.39 | 0.35 |
| [3] Exposure | 0.44 | 0.56 |
| LVI-IPCC index $(([3] - [1]) * [2])$ | 0.04 | 0.07 |

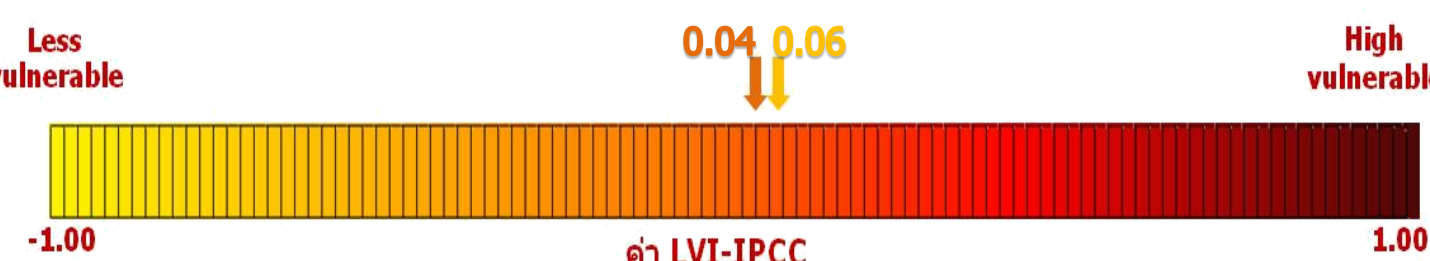


Figure 6: LVI-IPCC index of Tha mai and Khoa kitchakut

Conclusion and Suggestion

Conclusion

- Provinces exposed to climate risk, sensitive in water resources, high poverty incidence and lower adaptive capacity tend to be more vulnerable to climate variation.
- Households located in the flood and landslides risk areas, lower social networks, high dependence on agriculture and less crop diversity are more vulnerable to climate variation and extreme events.

Suggestion

- Increasing household income and crop diversification as well as improving farm water management can reduce vulnerability to climate variation.
- Promoting social integration and climate related information technology can enhance the adaptive capacity at the farm-household level.

Main References

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