

# Multi-stakeholders' perceptions and knowledge on climatic hazards and the impacts at landscape level

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Seeking greater resilience at landscapes level to climatic hazards including its variability is becoming a priority of many international cooperation programmes that are oriented at supporting forest and agricultural development. In doing so, the programmes need to analyse the sensitivity of local land use systems to the hazards as well as analyse local capacities to cope with the hazards or adapt to the changes caused by those hazards, and eventually to achieve the buy-in of local stakeholders in developing intervention strategies.

Tropenbos Indonesia and Tropenbos International developed a tool to: 1) understand the climatic hazards and impacts on community livelihood aspects, their strategies to respond, and their resulting vulnerability to these hazards (Figure 1), and 2) observe the complementarity of a two-level assessment for the benefit of designing intervention strategies addressing communities vulnerability to climatic hazards. The tool was piloted with focus groups in the Ketapang District, West Kalimantan, at district and at sub-district level<sup>1</sup>.

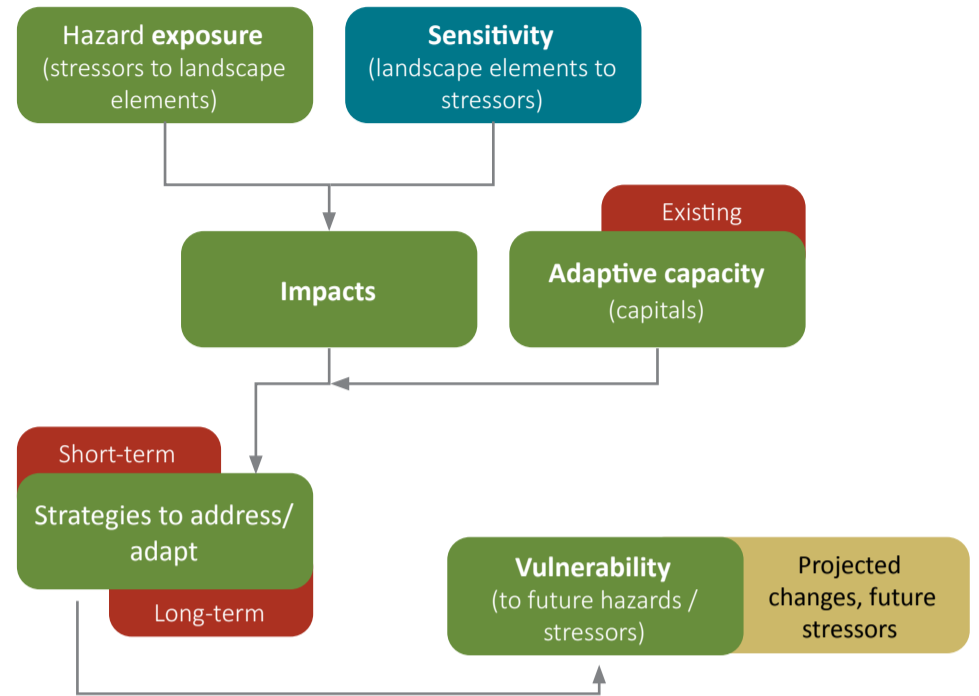


Figure 1. Framework of vulnerability assessments to climatic hazards as the basis of tool development

## Main findings

Table 1. Climatic and other drivers affecting impacts on forest, ecosystem services and crop and farm management

Changes related to climatic hazards	Climatic hazards and other drivers				
	Extreme seasons (dry or rainy)	Fire	Forest loss/ conversion	Market	Peat-/sea-water intrusion
Decreasing CO <sub>2</sub> absorption – increased temperature		✓	✓		
Water shortage		✓	✓		
Decrease of rice production	✓				✓
Decrease of rubber production	✓			✓	

Although climate hazards caused similar changes in the four sub-landscapes, the adaptation strategies varied from one to another (Figure 2). At district level, program and regulatory strategies were also included

as adaptation strategies, while little importance was given to alternative income as an adaptation strategy.

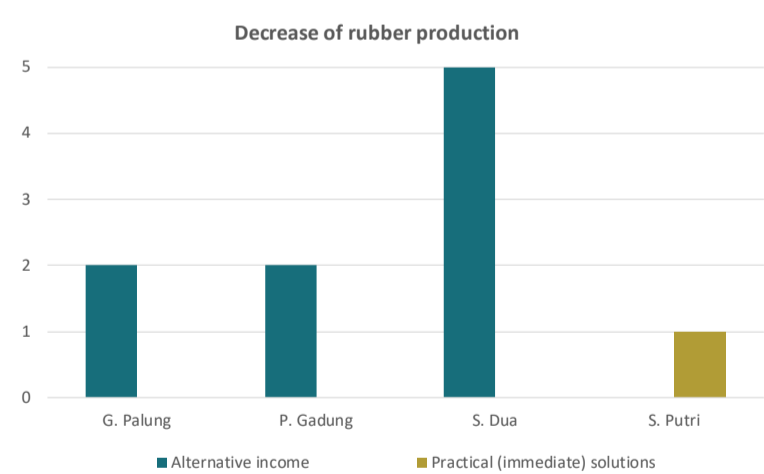
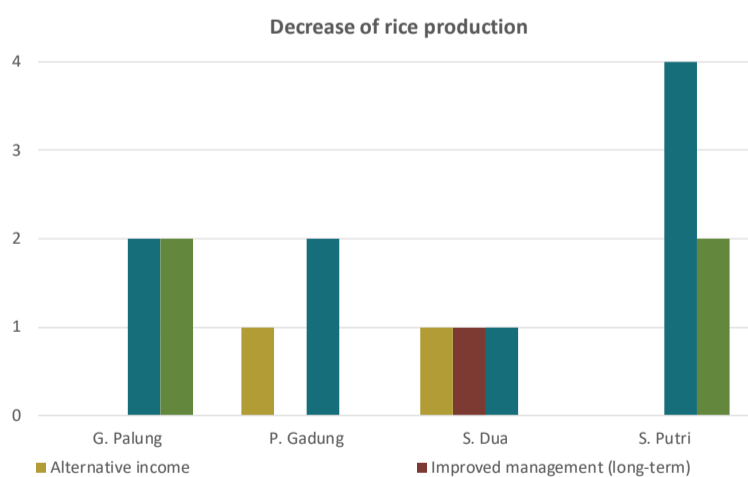


Figure 2. Strategies by communities responding to decrease of rice production (left) and decrease of rubber production (right). Gunung Palung, Palung Gadung, Simpang Dua and Simpang Putri are the names of the sub-landscapes studied

Perceived vulnerability at village level was influenced by the level of application and perceived success of adaptation strategies. These strategies are influenced by type of change perceived and by location, where Simpang Dua is the only sub-landscape where mineral soils prevail. In the other sub-landscapes peat soils are dominant.

climate hazards, but that in the selection of their adaptation strategies other factors also play a major role. Assessments at district level may not necessarily identify these factors (e.g. importance of rubber price, availability alternatives) and therefore lead towards adaptation strategies that do not receive buy-in of local people.

## Conclusions

This application of the assessment tool showed the importance of a two-level approach towards vulnerability assessments, where results at sub-landscape level and at district level are complementary, allowing a more efficient design of programs that support adaptation strategies. It also shows that local people are well aware of the potential impacts of

<sup>1</sup> The report on these assessments will be made available on the tropenbos website: [www.tropenbos.org](http://www.tropenbos.org). Funding for this research came from the Ministry of Foreign Affairs of the Government of the Netherlands through the TBI Working Landscape program.