



Climate Change Vulnerability Assessment for Coffee Farmers in North Sumatra and Aceh

Conservation International (CI) and Starbucks Coffee Company have been working in North Sumatra and Aceh, Indonesia for three years to understand both the threats and opportunities climate change presents for local coffee farmers and their unique environments.

Through this important partnership, we are testing approaches to manage risks and developing new strategies for addressing climate change that will benefit both farmers and the ecosystems upon which they depend.

The concept of vulnerability has been used for more than 20 years to help governments and businesses manage the impacts of climate change. The basic definitions in the context of farm productivity and climate change are as follows:

Vulnerability is when farmers are unable to cope with the likely impacts of climate change. They experience reduced yields and incomes as a result of new climate conditions. For example, coffee production in some villages has become more vulnerable to pests and diseases due to climate change.

Adaptation is the approach farmers use to reduce this vulnerability. They change their practices to help maintain their yields and incomes in new climate conditions. For example, to adapt to pests and diseases, farmers can improve their management of the coffee borer by using traps.

CLIMATE CHANGE AND COFFEE

As coffee is only grown in tropical areas, farmers expect a wide range of climatic conditions, but there are many ways in which climate change can affect coffee production. The areas that are currently suitable for coffee production may become less suitable due to changes in temperature and rainfall profiles while other locations may become more suitable. In addition, farmers may be exposed to new pests and diseases or changes in the profile of extreme events, such as floods and droughts.




CLIMATE CHANGE PROJECTIONS FOR NORTH SUMATRA AND ACEH

Climate modeling suggests that the primary changes to North Sumatra and Aceh's climate for the next 30 years will be:

- The average daily temperature will become higher
- The mean annual amount of rainfall is not expected to change significantly
- The wet season will likely become drier (particularly January and February)
- The dry season will likely become wetter (particularly June, July and August)

CLIMATE CHANGE RISKS AND ADAPTATION OPTIONS FOR NORTH SUMATRA AND ACEH

To identify and understand the specific risks to the incomes of coffee farmers in northern Sumatra, CI conducted a vulnerability assessment. The following table demonstrates the primary risks identified for the next 30 years of farming and opportunities to manage these risks.

AREA OF PRODUCTION RISK	RISK LEVEL	ADAPTATION OPTIONS
Drought/Fire	 Low	Follow existing drought/fire management procedures
Storms/Flood	 Medium - Increased risk of flooding	Shade trees for coffee berry protection Vegetate boundaries and slopes
Changing Suitability	 Medium - Risk of suitability at lower altitudes decreased	Change coffee varieties (e.g. Tim-Tim to Bor Bor) Create alternative livelihoods
Changing Seasonality	 High - Risk of more rain in the 'dry' season	Combine coffee with other crops Use drying sheds
High/Low Temperatures	 Medium - Risk of higher maximum daily temperatures	Shade trees to regulate temp Change coffee varieties
Change in Pest/Diseases	 High - Risk of new pests in higher altitudes.	Improve tree maintenance Pest management (e.g. traps) Change to pest/disease resistant coffee varieties

If farmers employ adaptation practices that allow them to maintain production in existing farms, they will be less likely to abandon these farms and clear forest in new areas that they believe are likely to become more suitable for coffee production in the future, such as higher altitude locations.

CI created maps of both the likely changes in coffee suitability and pest distribution associated with climate change in North Sumatra and Aceh. These maps can be used to target training and support programs in communities that are likely to have the highest vulnerability to climate change.



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