Climate change and cocoa on the Guadalcanal Plain



Growing cocoa is a valuable industry for smallholder farmers in the Guadalcanal Plain and more generally it provides a significant national social and economic benefit. The climate conditions of Guadalcanal Plain are currently suitable for growing cocoa. However, national reports and farmers' experience says that tropical cyclone events, flooding and prolonged heavy rainfall have significant negative impacts on the industry. The concern is these climate risks have the potential to become worse in the future in a changing climate, and other related climate-related risks may also arise.

Experts at the Solomon Islands Meteorological Service and Ministry of Agriculture and Livestock collaborated with climate scientists from CSIRO to assess the possible impact of climate change on cocoa in the Guadalcanal Plain. The assessment demonstrated how a new guideline called *Developing* climate change information for the Pacific can be used to develop specific climate risk information for growing cocoa in Guadalcanal Plain under possible future climate change. Future climate change information is very useful for decision makers in agriculture and the climate change sectors to make practical climate change adaptation plans and practices for growing cocoa in Guadalcanal Plain.

This fact sheet provides a summary of a rapid assessment of future climate change impacts on cocoa farming in the Guadalcanal Plain. Please refer to the full case study report for more information.

Current climate and cocoa

Guadalcanal currently has suitable climate conditions for growing cocoa. The literature demonstrates that annual temperature and rainfall variability is suitable for growing cocoa in most of Guadalcanal Plain.

However, higher and prolonged rainfall events can lead to spread of black pod disease that destroys cocoa fruits, eventually resulting in low yield.

Floods periodically have large impacts on cocoa farms. They are linked to seasonal variability of rainfall and are associated with tropical cyclones in the Solomon Islands territory.

Future climate risks to cocoa

This rapid assessment examined the key climate factors that are affecting cocoa in Guadalcanal Plain:

- Temperature
- Rainfall and dry season, and black pod disease (*Phytophthora palmivora*, related to high rainfall)
- Flooding due to tropical cyclones.

The assessment used open source and recommended climate change projections datasets in the PACCSAP reports for Pacific Island Countries. While there will be ongoing variability from year to year and decade to decade, some long-term changes in climate are expected.

Guadalcanal could become too warm to grow cocoa by about 2050 and beyond, with a very high chance it would be too warm by the end of the century under a high (carbon dioxide) emission scenario.

It is known that climate models (projection tools) are better at predicting long-term temperature changes than changes in rainfall. There is low confidence about rainfall risk in the future, that is, whether it will be too wet or too dry. Some climate models suggest that parts of Guadalcanal may become less suitable for cocoa, while others do not. However, this study suggests a considerable future rainfall risk for Guadalcanal Plain. According to the PACSSAP report, extreme wet days and seasons, and more intense tropical cyclones are projected to increase. This will potentially increase the risk of spreading black pod disease and of flooding.

Take note that, humidity and solar radiation are important climate conditions for growing cocoa but were not examined in this case study. This is partially because they are likely to broadly follow the changes to rainfall, where more rainfall is linked to decreased radiation and increased humidity. Besides that, only average climate conditions were considered while climate variability, including high and low years, was not included. Apparently, there is no detailed crop modelling analysis, but the rapid assessment that only looked at climate thresholds and rules of thumb to produce useful and specific products.

Implications for adaptation

The Ministry of Agriculture and Livestock (MAL) will take the lead and re-visit existing and past cocoa program activities in the Solomon Islands, to identify applicable and non-applicable practices in response to the study findings. This can possibly happen with the help of the Climate Change Division.

To illustrate, possible climate change adaptation options include:

- Selecting and planting heat-tolerant plant varieties and clean and healthy cocoa planting material that is resistant to black pod disease
- Changing growing locations (e.g. further up the slope) to deal with rising temperature

- Changing growing locations and crop management practices to reduce the impact of floods on crops, as well as securing the supply chain (e.g. off-farm warehouses so crops are not lost)
- Looking at ways to improve crop management to better manage black pod disease (e.g. pruning).

However, cocoa farmers are highly encouraged to seek relevant advice from MAL before any climate change adaptation actions are taken on the ground. MAL has been working closely with all cocoa farmers in the Solomon Islands, as the legitimate government body that oversees agricultural development in the country, hence the ultimate decision will be from MAL and most importantly with the Ministry of Environment, Climate and Disaster Management engagement.

Implications for mitigation

The results (e.g. temperature changes) show that after 2050 there is a large difference between a low and a high emission scenario - under a low emissions scenario (greenhouse gas) the impacts will be lower and there is more chance they can be managed, whereas under a high emissions scenario the impacts are much larger. Similar to many other impact areas, this is motivation to mitigate our global emissions and follow a low pathway. This is very useful for presentation during climate change international negotiations.

Any questions about the case study can be obtained from the Solomon Islands Meteorological Service Research Team!



For more information contact: Director

Solomon Islands Meteorological Service Ministry of Environment, Climate Change, Disaster Management and Meteorology PO Box 21

Ph: 20332/24218 Email: david.hiba@met.gov.sb











www.pacificclimatechangescience.org

Pacific Met Desk Partnership Email: PacMetDesk@sprep.org Telephone: +685 21929 Visit: www.sprep.org