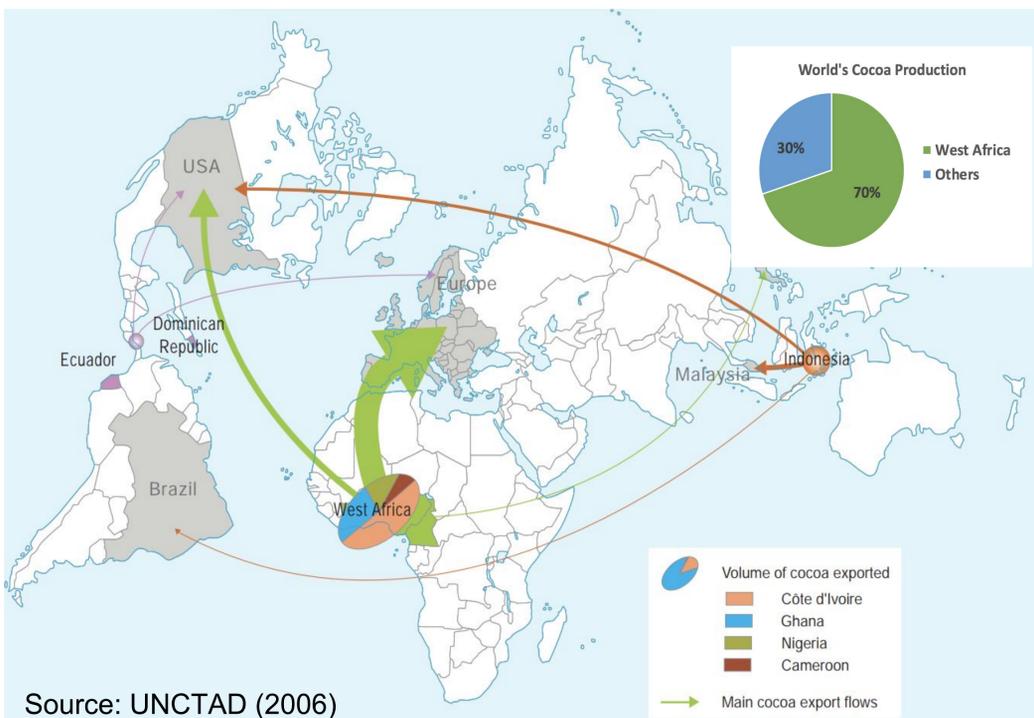


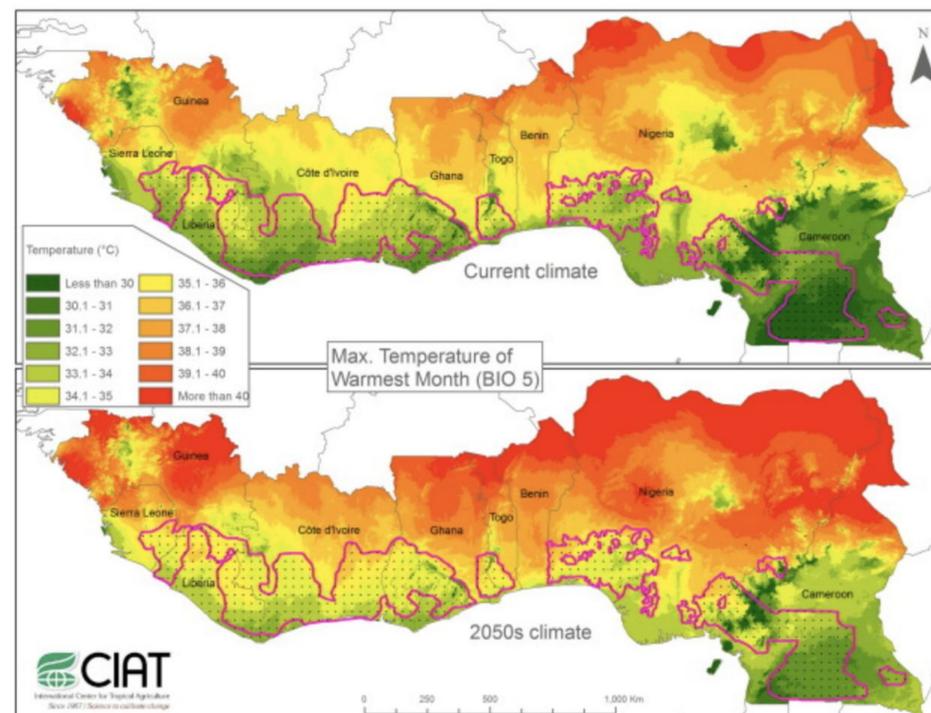
Cocoa Production & Climate Change in West Africa

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World Leading Cocoa Producer

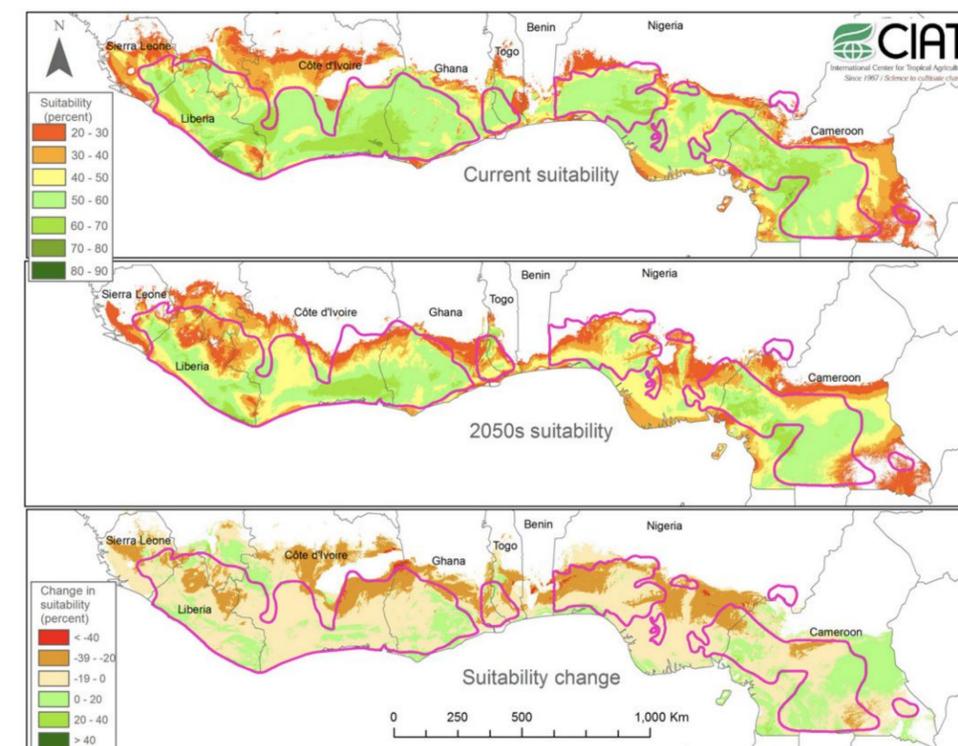


Climate Change Drivers



Drastic Temperature Increase by 2050. Source: Laderach et al., 2013

Climate Change Impacts



Changing Suitability for Cocoa Production. Source: Laderach et al., 2013

Cocoa as a Cash Crop (GDP)

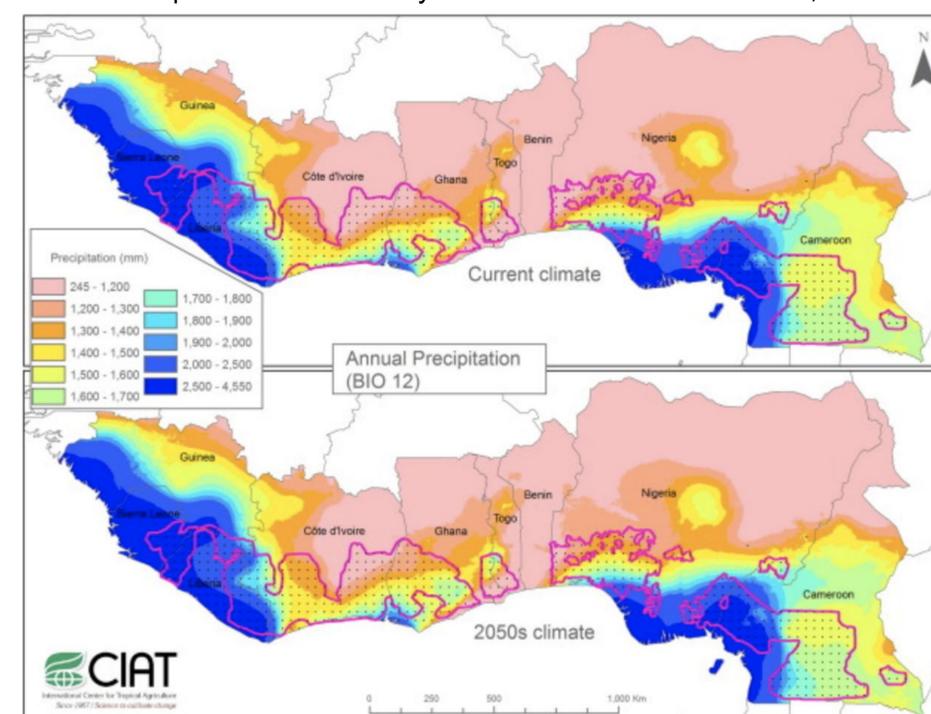


Climate Requirements and Limits for Cocoa Production

Variable	Optimum or tolerance	Value
Annual mean temperature (°C)	Optimum	22–25
	Tolerance	20–27
Minimum-maximum temperature (°C)	Optimum	21–32
	Tolerance	10–38
Annual precipitation (mm)	Optimum	1200–3000
	Tolerance	900–7600
Number of dry months	Optimum	0
	Tolerance	1–3

Source:

The International Center for Tropical Agriculture: Not-for-profit research and development organisation striving to reduce poverty and famine in developing countries while protecting natural resources.



Changing Precipitation Patterns. Source: Laderach et al., 2013

Physical Impacts

The spatially differentiated patterns within the countries of West Africa see the most **negative** effects to be expected near the forest-savanna transition zones, while **neutral** or **positive** effects may be seen at higher elevations and the most humid parts of these countries.

- Relocation of cocoa crops to more suitable regions may cause mass deforestation unless accompanied by effective agricultural and forest conservation policies.
- Maximum temperatures during the dry seasons of the future cocoa belt are projected to resemble those now found in the savanna. This approaches the temperature tolerance for growth of the cocoa bean of 27°C.
- There may be a spread of pests and diseases from degrading soil quality. This could spread throughout West Africa as crops are relocated.

Social Impacts

Coinciding with the physical impacts of rising temperatures and increased precipitation are the social impacts of a disrupted cocoa industry in West Africa.

- Deterioration of crop quality and production levels will impact the Gross Domestic Product. The impact on GDP for such developing countries could lead to increased poverty and raise the potential for famine.
- Increased competition for resources and land as a result of relocation of cocoa crops could result in displacement of those living in more suitable cocoa growing environments.
- Impacted farming cycle will affect the livelihoods of those farming cocoa.

References: Laderach, P., A. Martinez-Valle, G. Schroth, et al. 'Predicting the Future Climatic Suitability for Cocoa Farming of the World's Leading Producer Countries, Ghana and Cote d'Ivoire', *Climatic Change*, vol. 119/No. 3-4, (2013), pp. 841; Ofori-Boateng, Kenneth, and Baba Insah. 'The Impact of Climate Change on Cocoa Production in West Africa', *International Journal of Climate Change Strategies and Management*, vol. 6/No. 3, (2014), pp. 296-314; Schroth, Götz, Peter Läderach, Armando Isaac Martinez-Valle, et al. 'Vulnerability to Climate Change of Cocoa in West Africa: Patterns, Opportunities and Limits to Adaptation', *Science of the Total Environment*, vol. 556/(2016), pp. 231-241.