



Alliance



Climate change impacts on sugar cane and other crops in Latin America

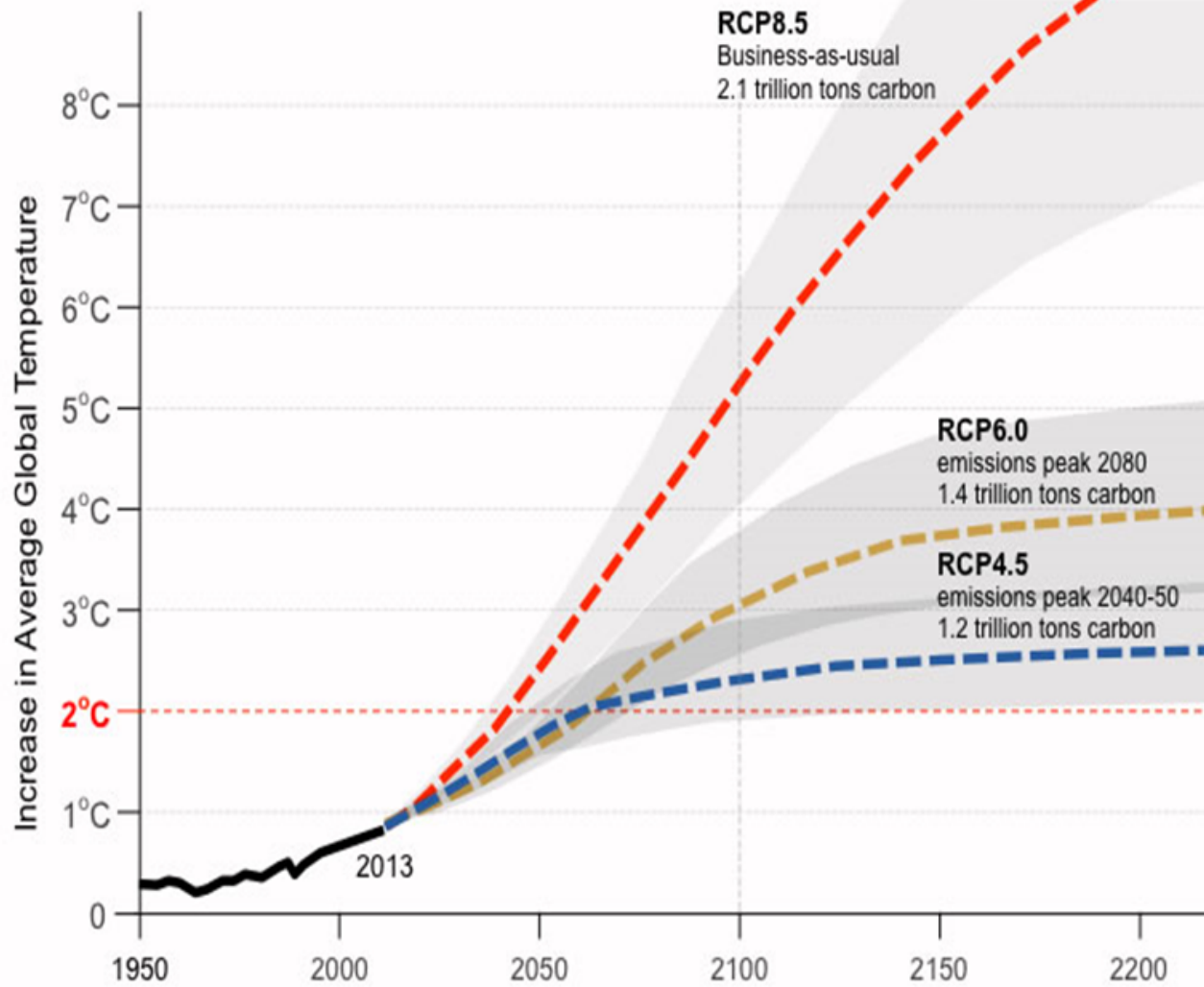
Steve Prager, Benjamin Schiek, Carlos Gonzalez

Jennifer Wiegel
j.wiegel@cgiar.org

ISCC Regional Stakeholder Dialogue Latin America
Antigua, Guatemala
January 21, 2020



Future climate trajectories



Global Temperature Projections for various RCP Scenarios

Source: Architecture 2030; Adapted from IPCC Fifth Assessment Report, 2013
Representative Concentration Pathways (RCP), temperature projections for SRES scenarios and the RCPs.



Climate change in Latin America and the Caribbean

December

March

June

September

October

Pre

Tem

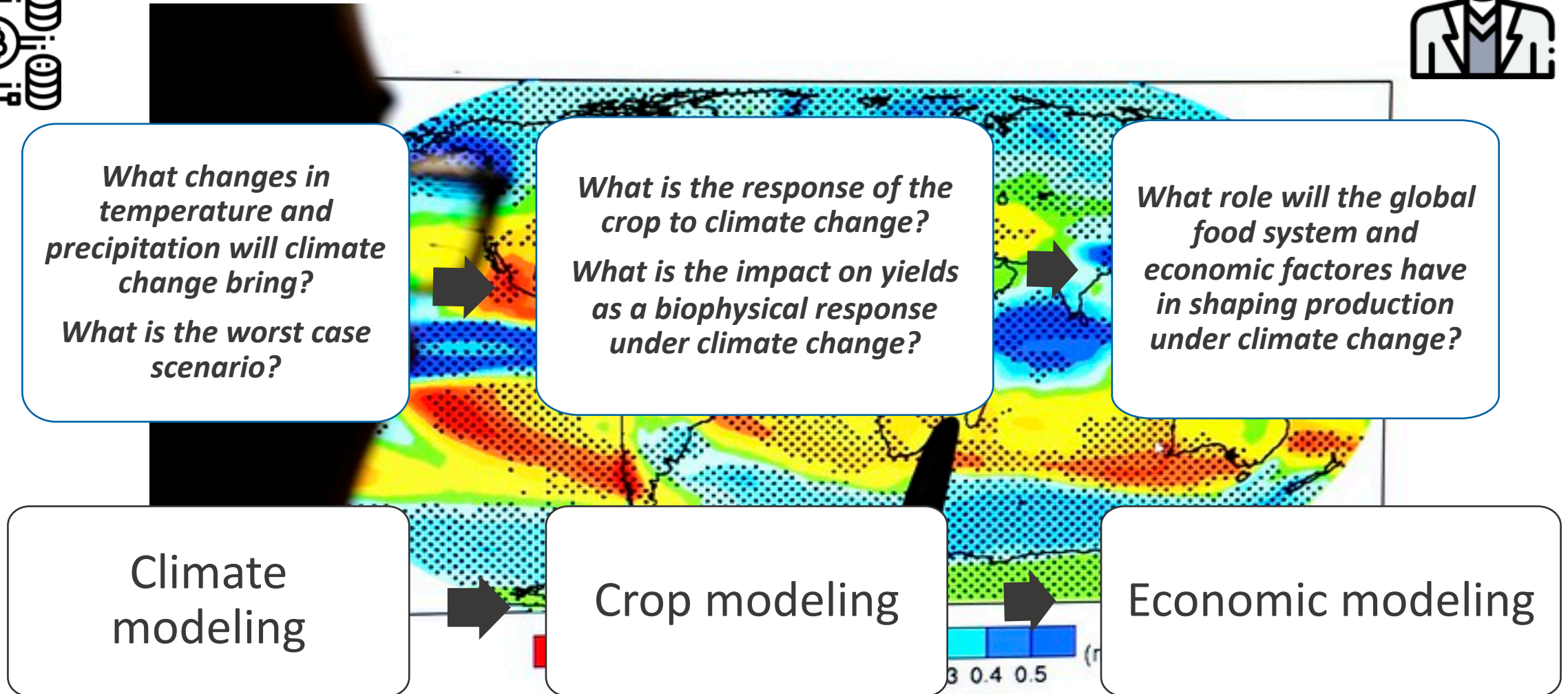
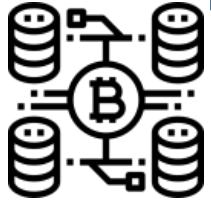


All 9 climate models project:

- A. **Temperature** increases of between 1°C y 3.4°C
- B. Changes in **precipitation** in the range of $\pm 30\%$











The complex block features a circular graphic with a map of Latin America and the Caribbean in the background. The map is color-coded to show projected temperature increases (ranging from 1.0 to 2.8 degrees Celsius) and precipitation changes (ranging from -10% to 30%). To the right of the map are two vertical color scales: one for precipitation percentage (10% to 30%) and one for temperature increase (1.0 to 2.8 degrees Celsius). Above the precipitation scale is a cloud with rain icon, and below the temperature scale is a sun icon.

We can use science and estimations based on economic models to help reduce uncertainty about the future



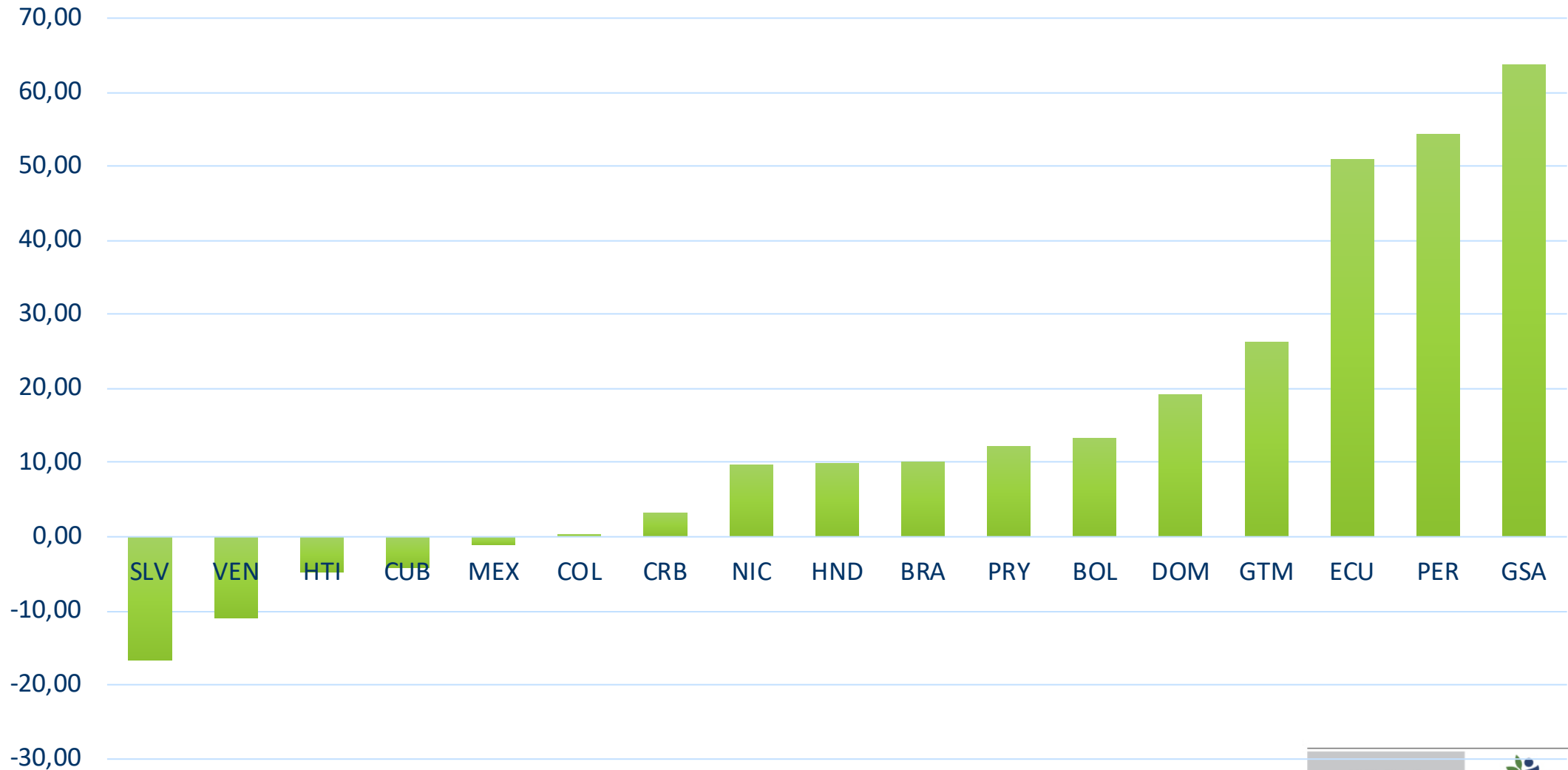
Crops, models and attributes



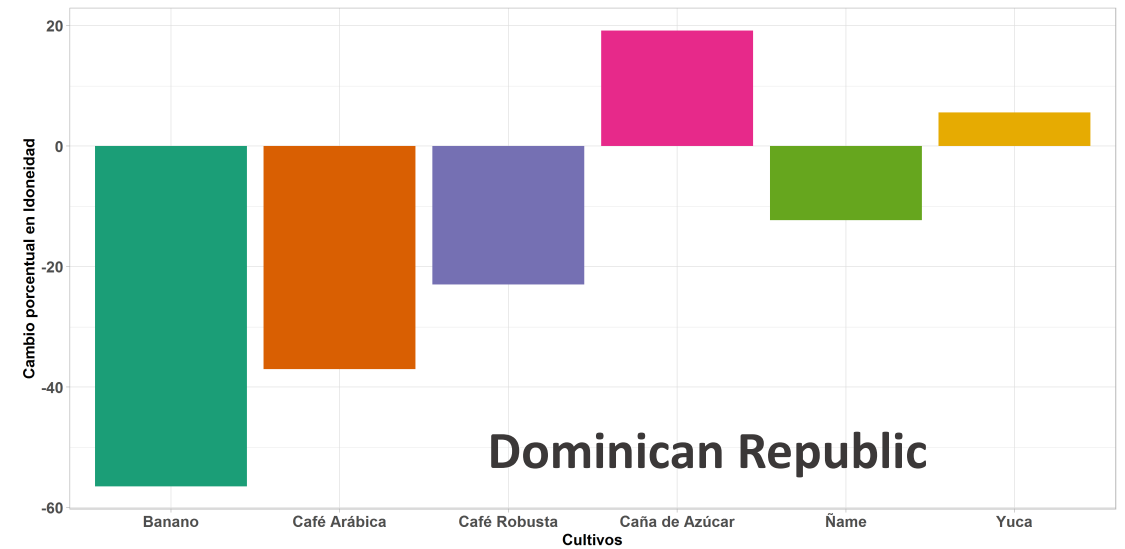
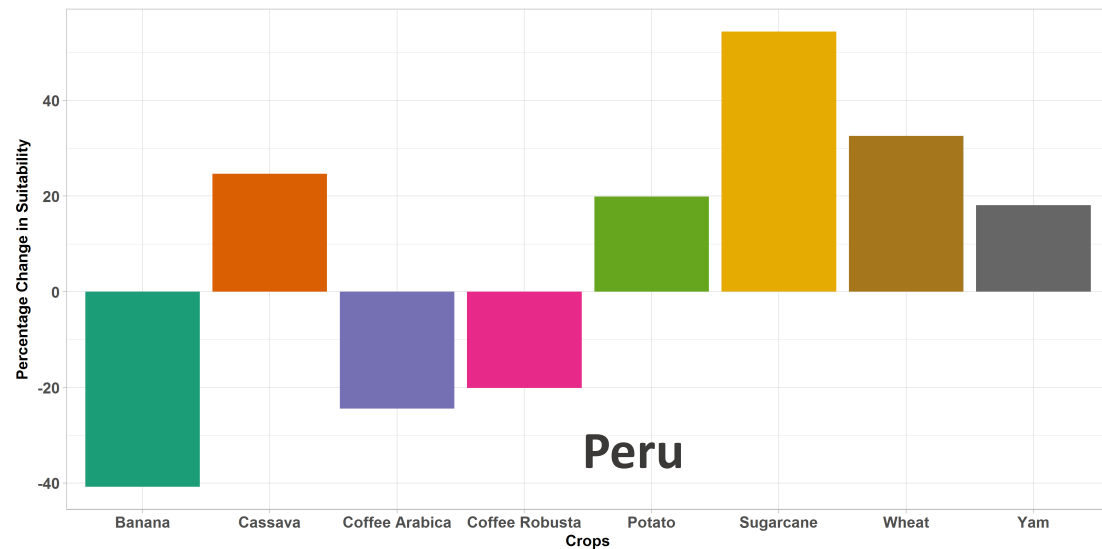
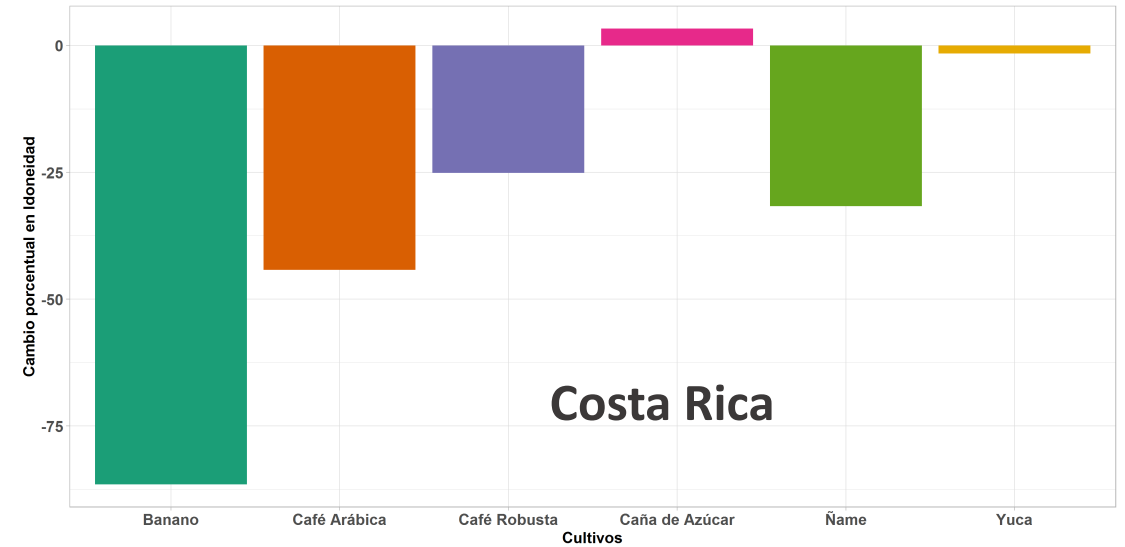
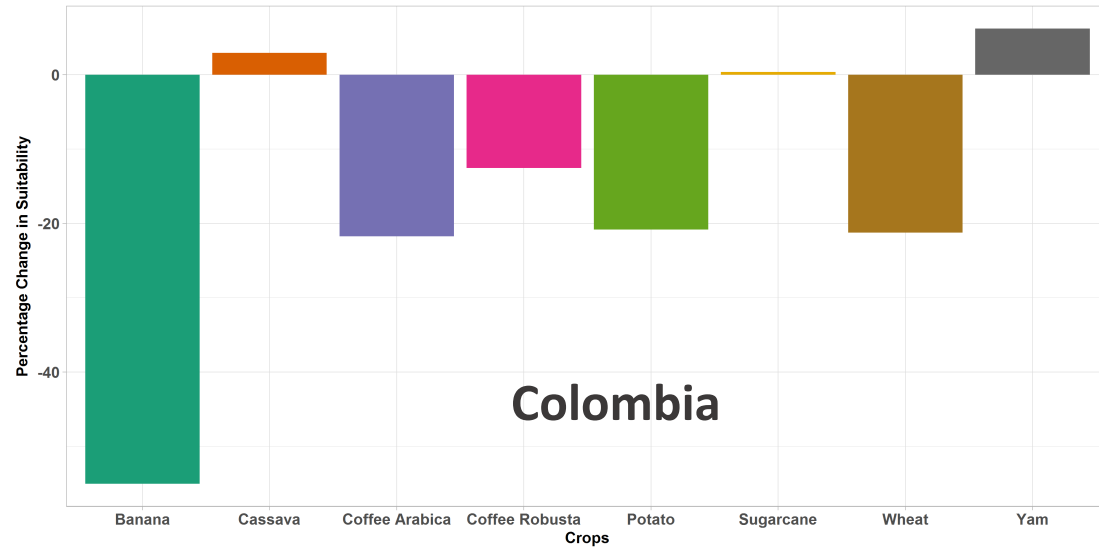
Crop	Tipo de Modelo	Modelo	Atributo modelado
 Maiz	Modelo de cultivo-mecanístico	DSSAT	Rendimientos
 Arroz			
 Trigo			
 Soya			
 Frijol			
 Banano		EcoCrop	
 Ñame			
 Yuca	Modelo de Nicho		Aptitud
 Papa			
 Caña de azúcar			
 Café Arabica		Machine Learning	
 Café Robusta			

Sugarcane

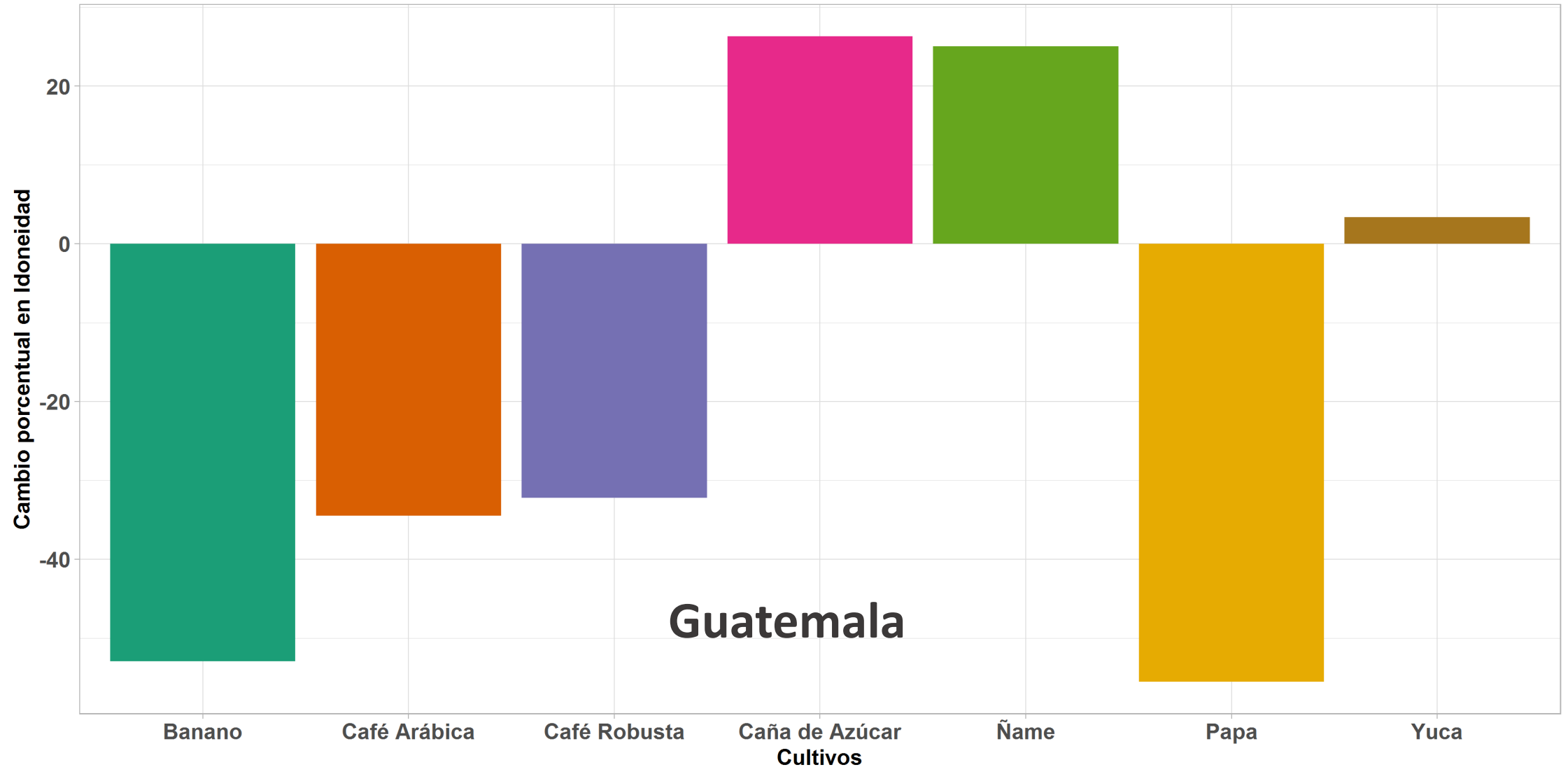
Average change in suitability for sugarcane (%)



Sugarcane vs other crops - % change in suitability

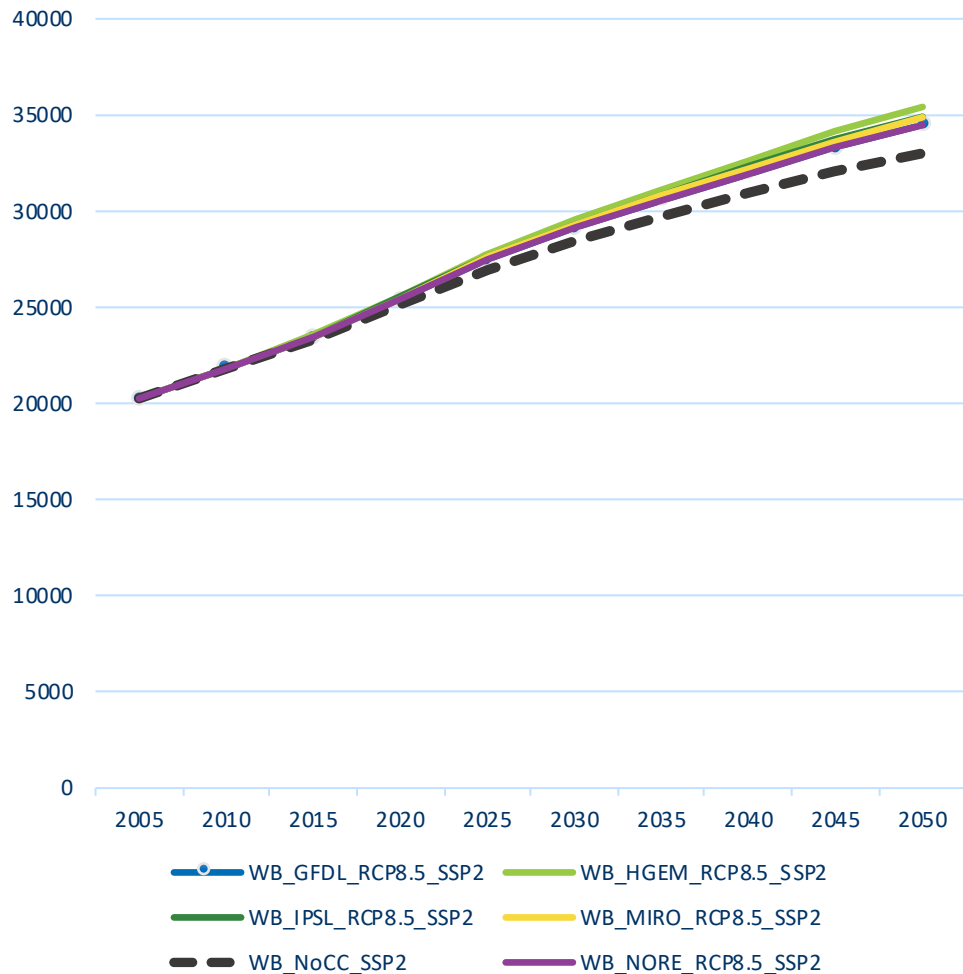


Sugarcane vs other crops - % change in suitability

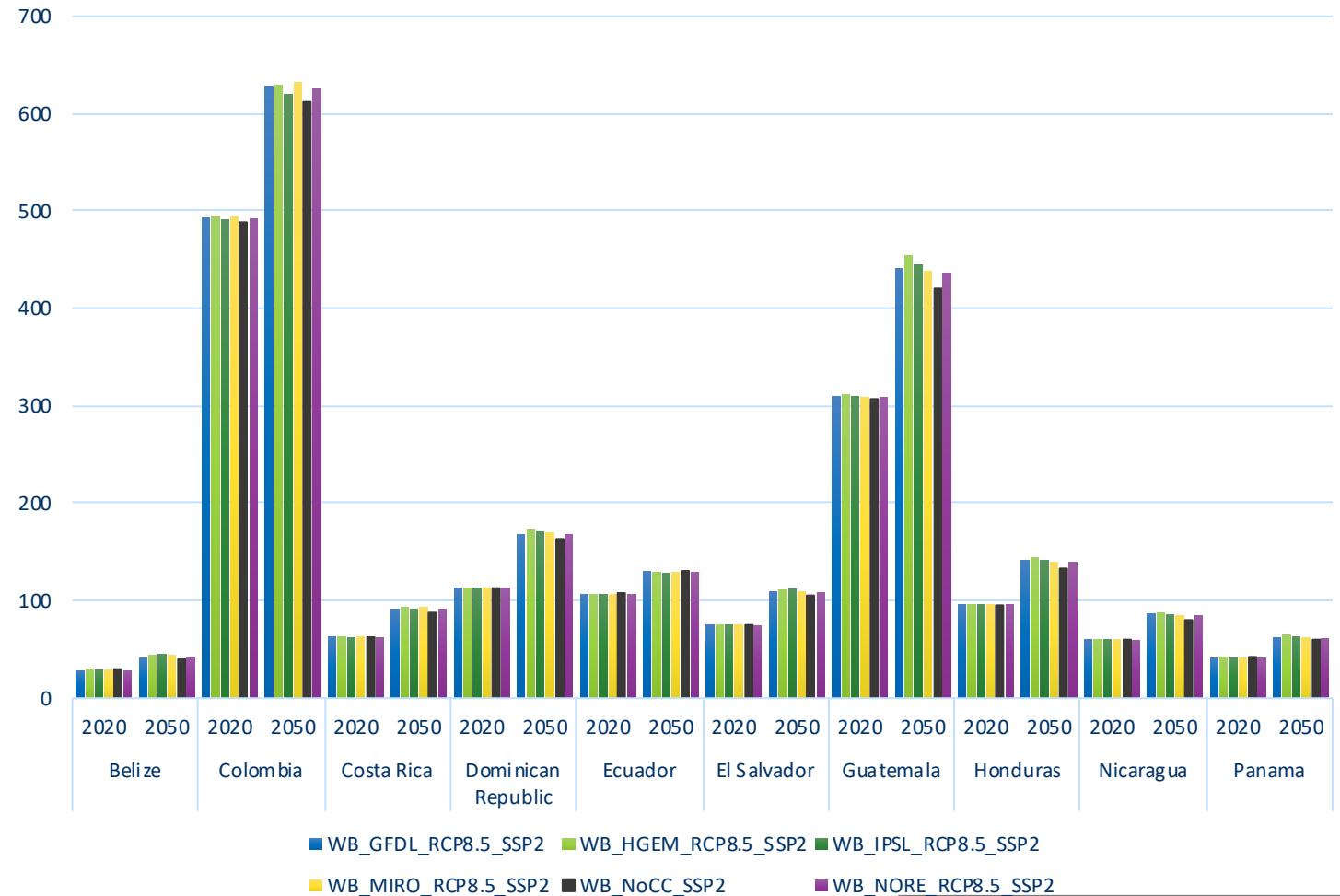


Sugarcane under climate change: Area harvested (000s ha)

Area harvested for sugarcane under different climate models (world)

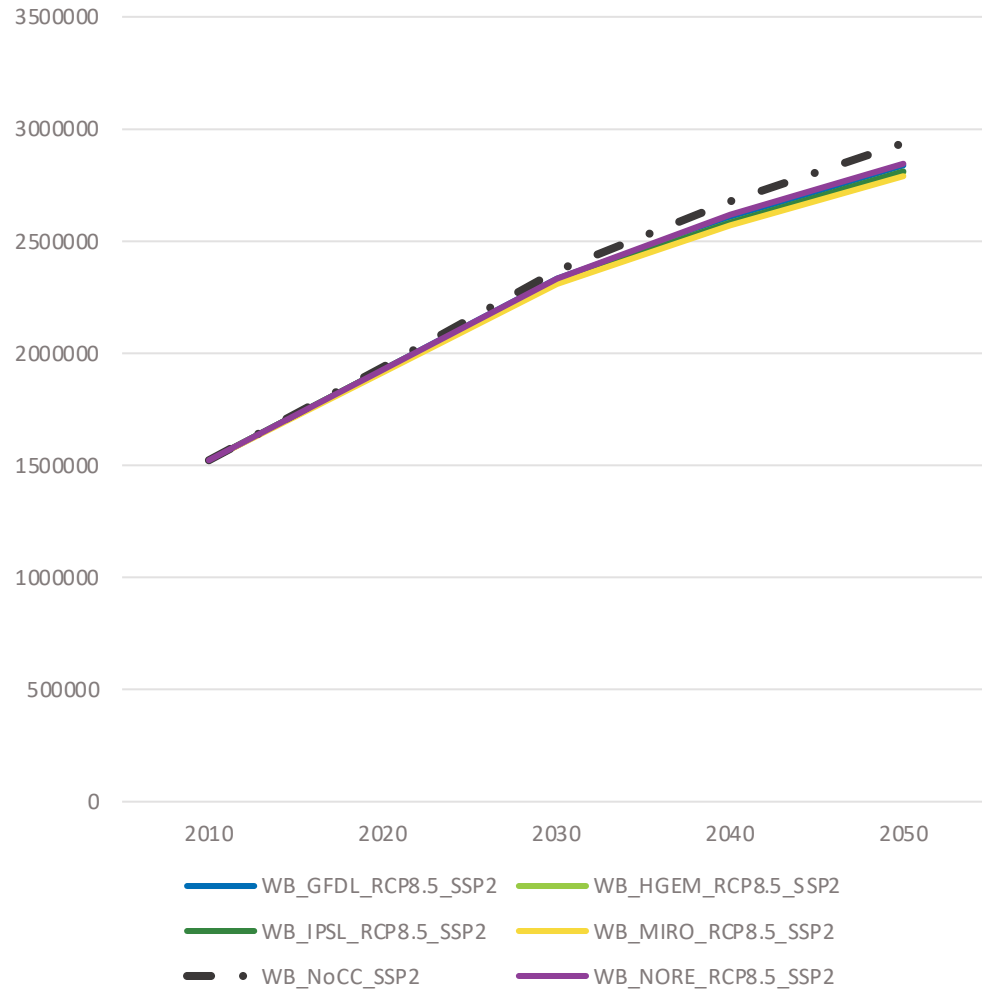


Area harvested under different climate models (selected LAC countries)

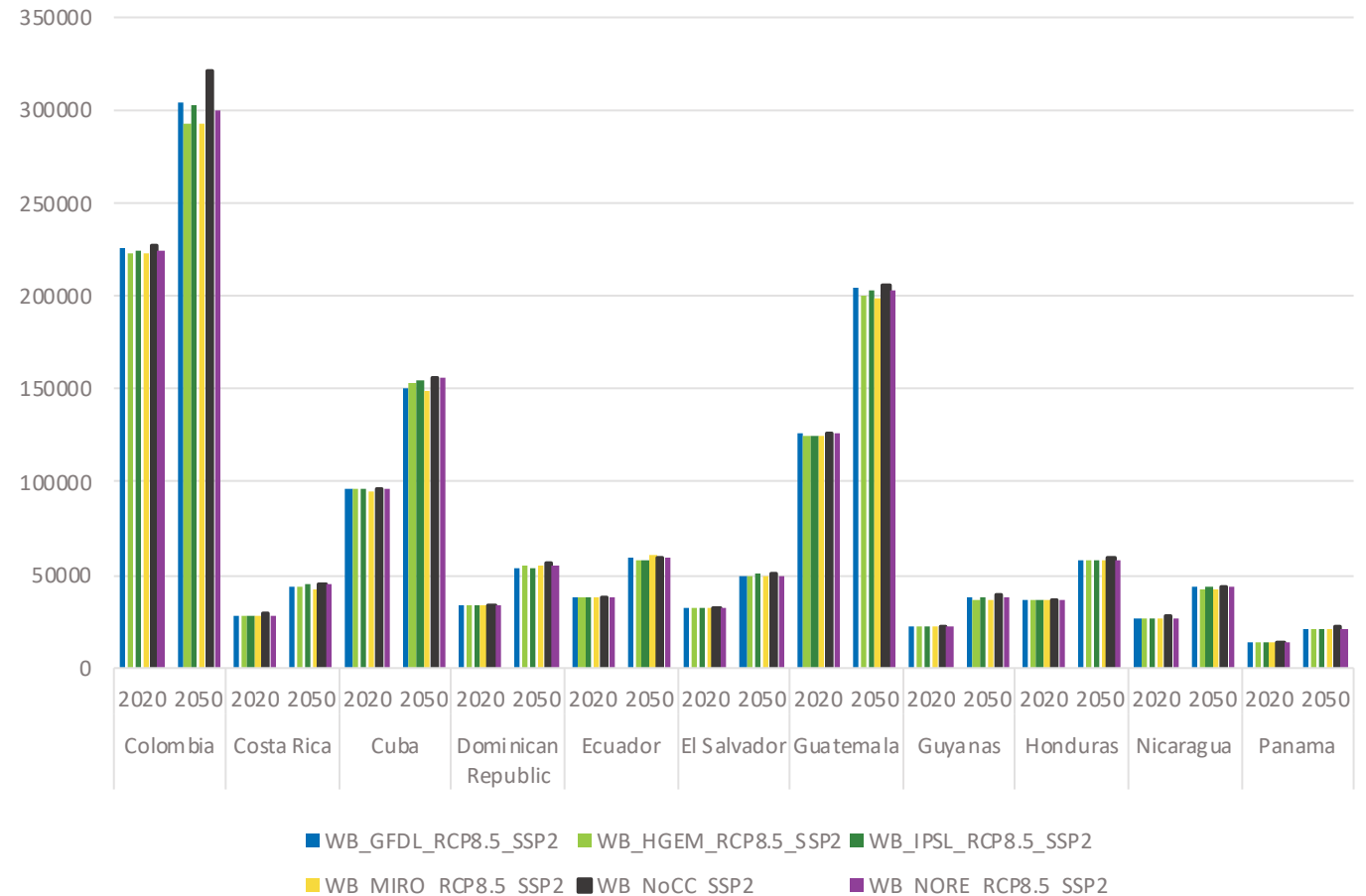


Sugarcane under climate change: Production (000s mt)

Sugarcane production under different climate models (world)

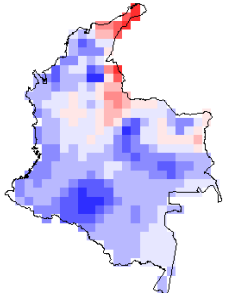


Sugarcane production under different climate models (selected LAC countries)

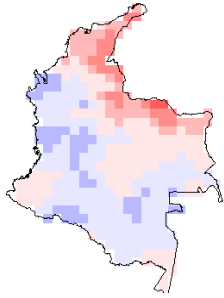


Climate impacts on crops – country level view

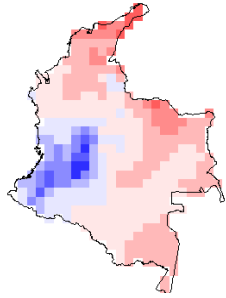
December - February



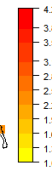
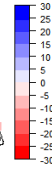
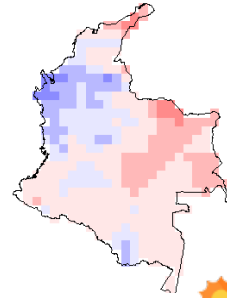
March - May



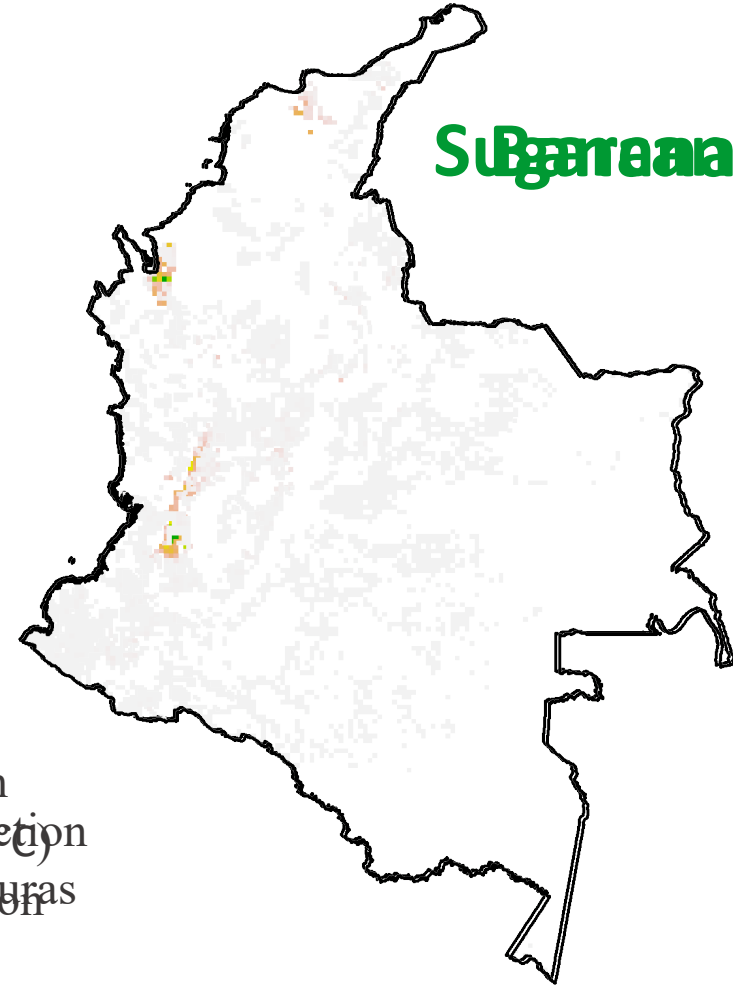
June - August



September - November



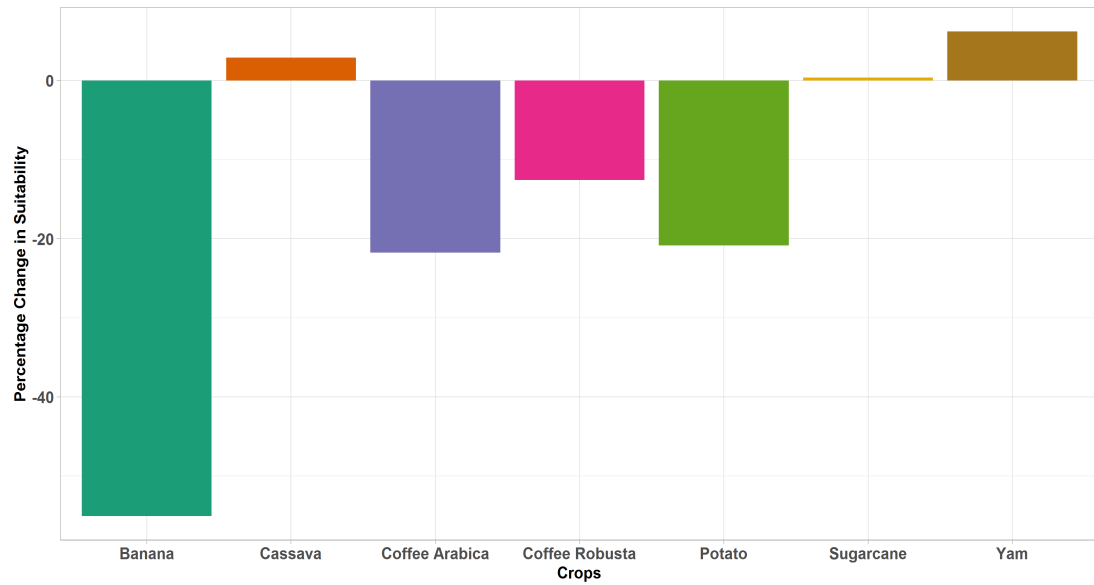
Sugarcane



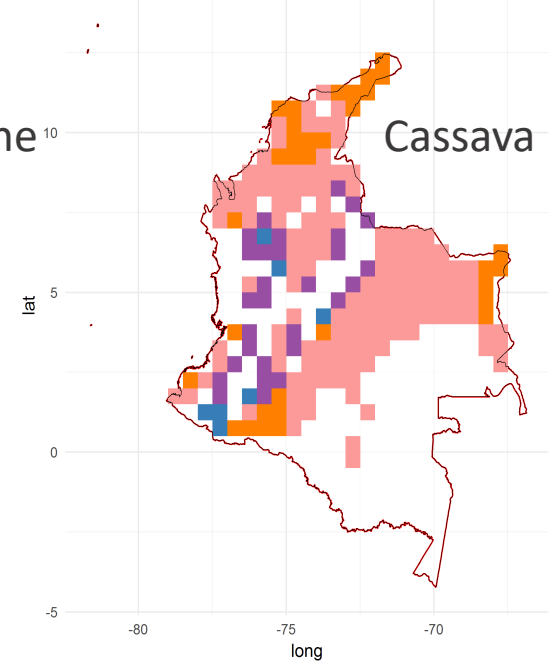
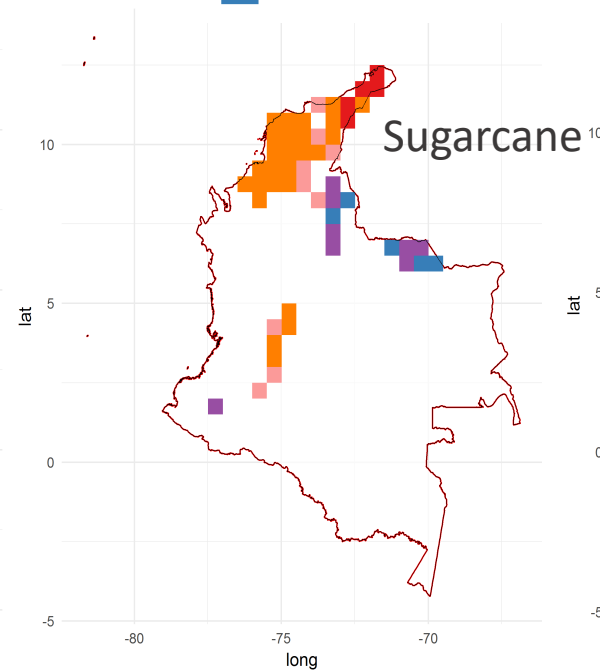
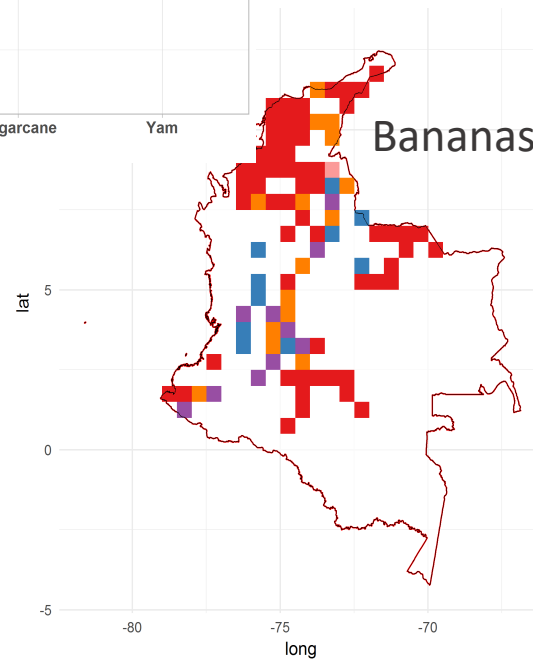
Colombia

Sugarcane may be exposed to high temperatures in some months (+2°C) along with increases in precipitation (20%)
Banana may be exposed to a reduction in precipitation and high temperatures

Changes in suitability – country level view



- Becomes Unsuitable
- Less but Still Suitable
- Remains Suitable
- More Suitable
- Becomes Suitable



Colombia

Further reading –

- Forthcoming publication *Climate Change Vulnerability and Economic Impacts in the Agricultural Sector* funded by IDB (results presented here)
- Climate change vulnerability in the agricultural sector in Latin America and the Caribbean, <https://cgspace.cgiar.org/handle/10568/96121> (Report on which original modeling for this exercise is based, 2015)
- Situación rural de América Latina y el Caribe con 2 grados de calentamiento, <https://blog.ciat.cgiar.org/es/este-es-el-panorama-para-america-latina-y-el-caribe-con-2c-de-temperatura/> (2019)
- Agricultural adaptation to climate change in Latin America and the Caribbean, <https://www.ifpri.org/project/agricultural-adaptation-climate-change-latin-america-and-caribbean> (2018)
- Climate smart coffee in **Central America**: <https://hdl.handle.net/10568/103803> (2019)
- Climate smart cocoa in **Central America**: <https://hdl.handle.net/10568/103775> (2019)



Alliance



Thank you!

Steve Prager

s.prager@cgiar.org

Benjamin Schiek

b.schiek@cgiar.org

Carlos Gonzalez

c.e.gonzalez@cgiar.org

