

Climate change and adaptation strategies for coffee growers

Better resilient than impacted.

4C Regional Stakeholder Conference, Antigua, Guatemala

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Jenny Wiegel, Scientist, Sustainable Food Systems, Alliance of Bioversity International and CIAT

ALLIANCE FOR RESILIENT COFFEE PARTNERS



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



Hanns R. Neumann Stiftung





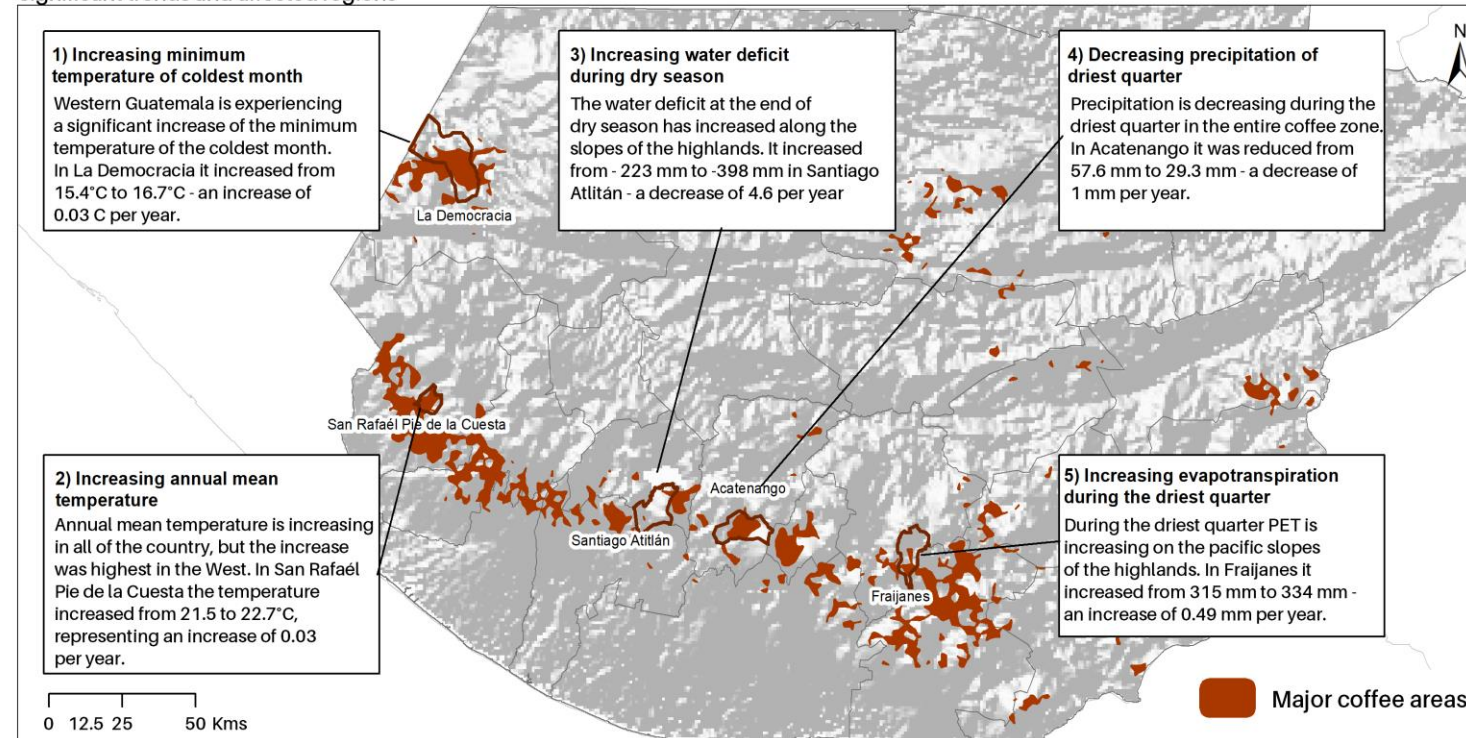
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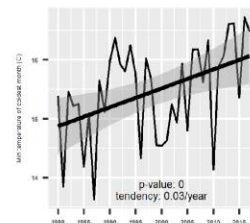
Climate change is happening already

Climate trends in Guatemala (1980 - 2017)

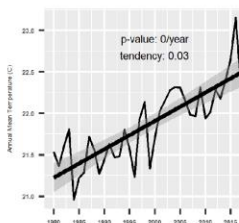
Significant trends and affected regions



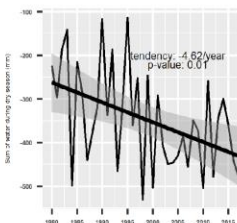
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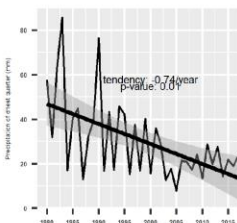
1) La Democracia



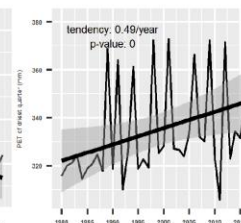
2) San Rafael Pie de la Cuesta



3) Santiago Atitlán



4) Acatenango



5) Fraijanes



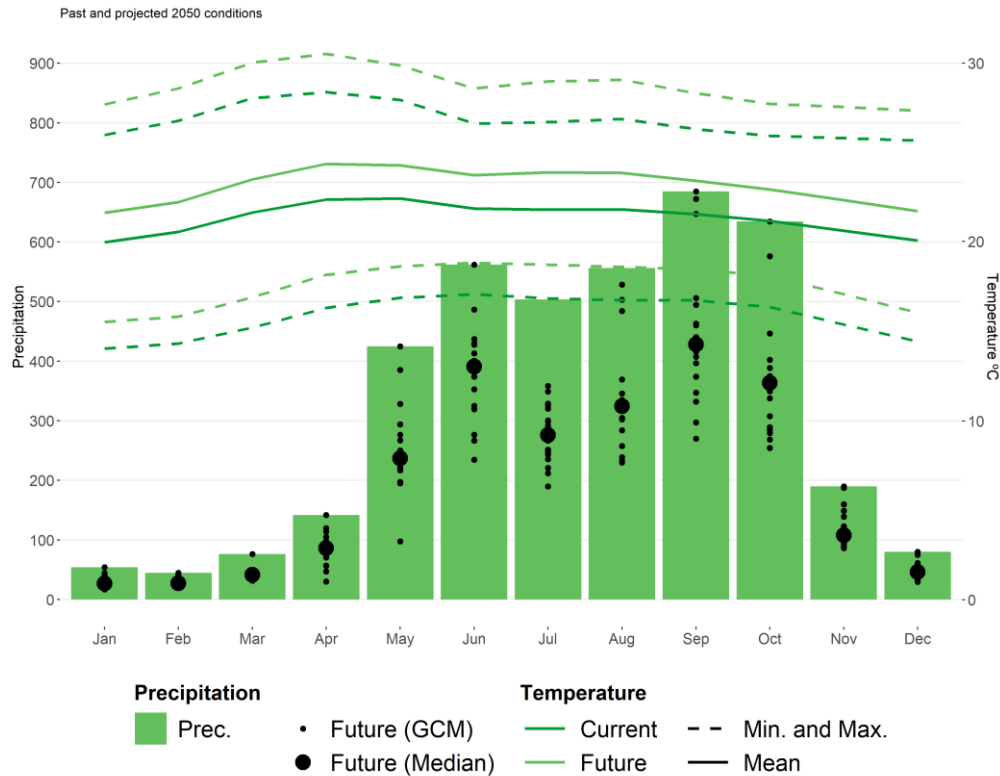


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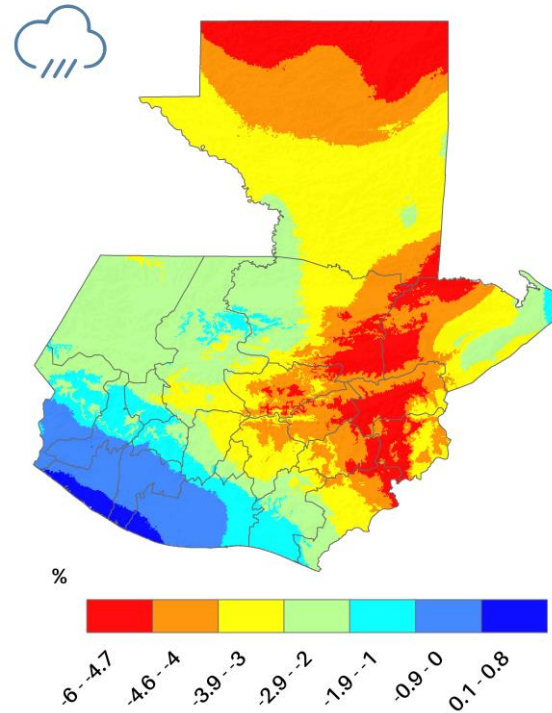
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Change will continue and can be anticipated

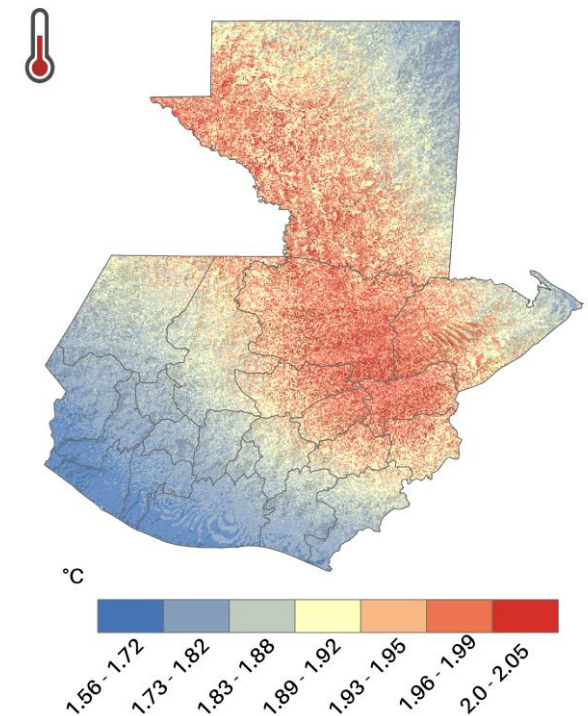
Changes in annual precipitation and annual mean temperature for coffee presences
1970 - 2000 & 2040 - 2069



Changes in annual annual precipitation (%)
1970 - 2000 Vs 2040 - 2069



Changes in annual annual mean temperature (°C)
1970 - 2000 Vs 2040 - 2069



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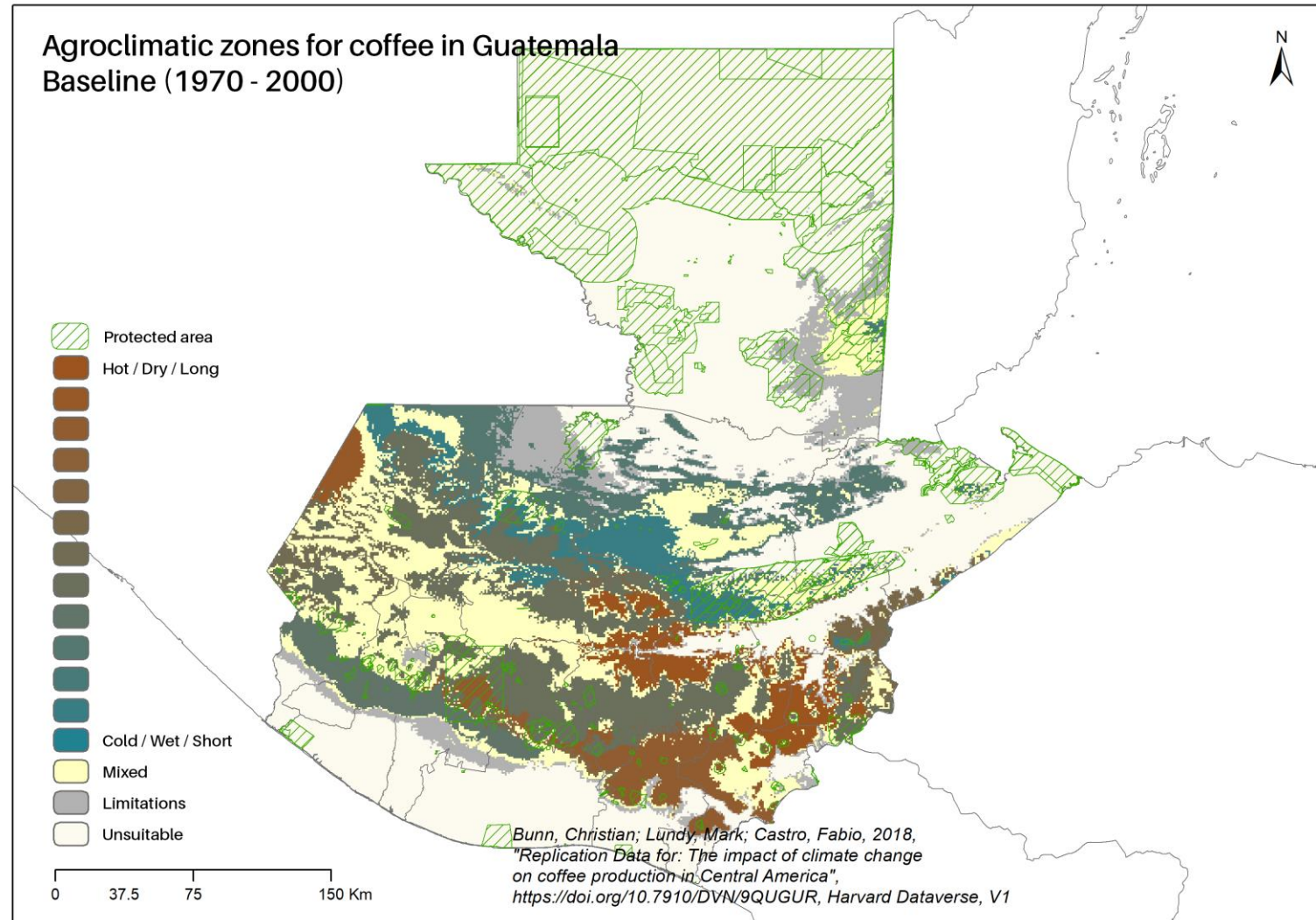




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Current potential area for coffee



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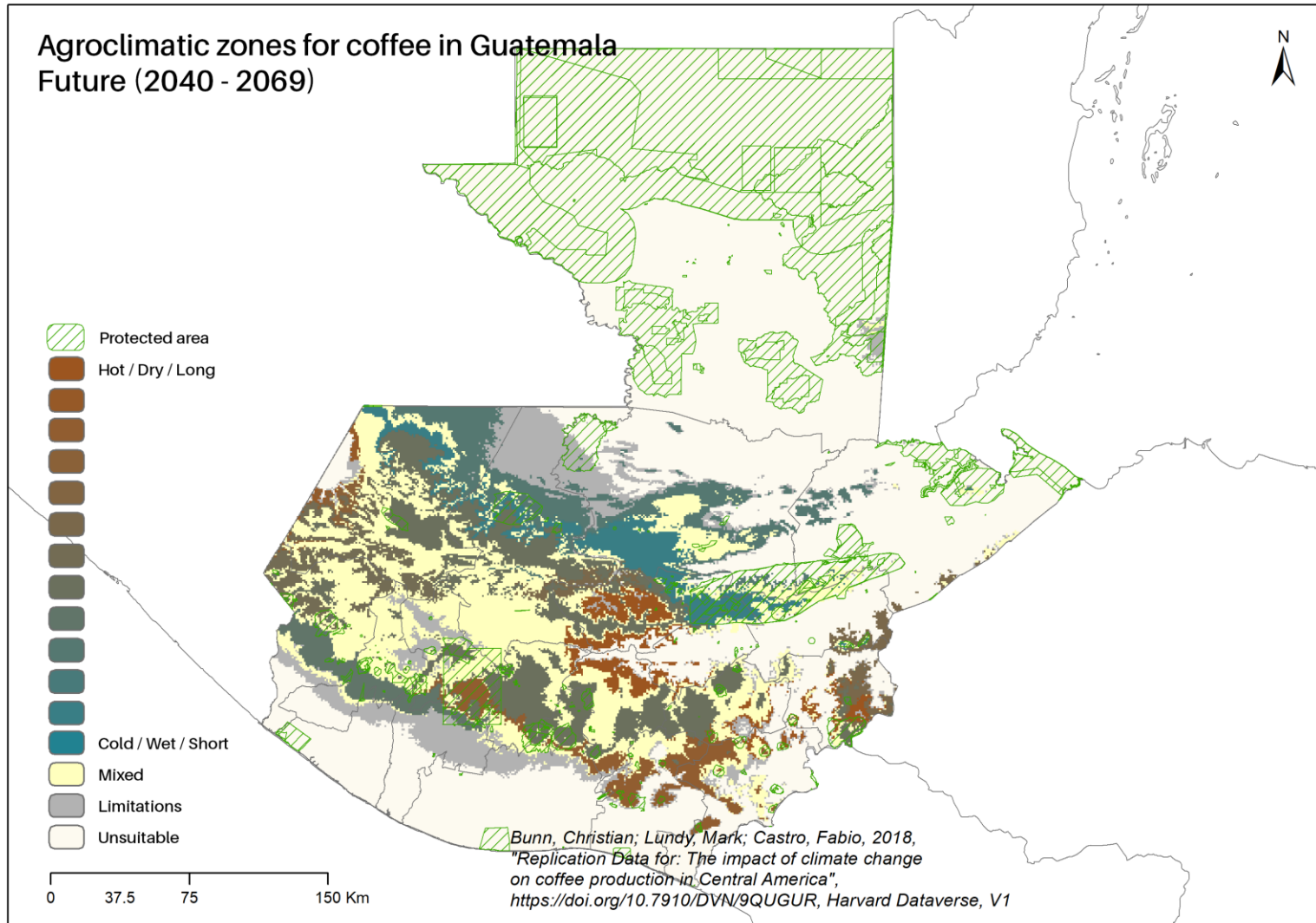




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Future potential area for coffee



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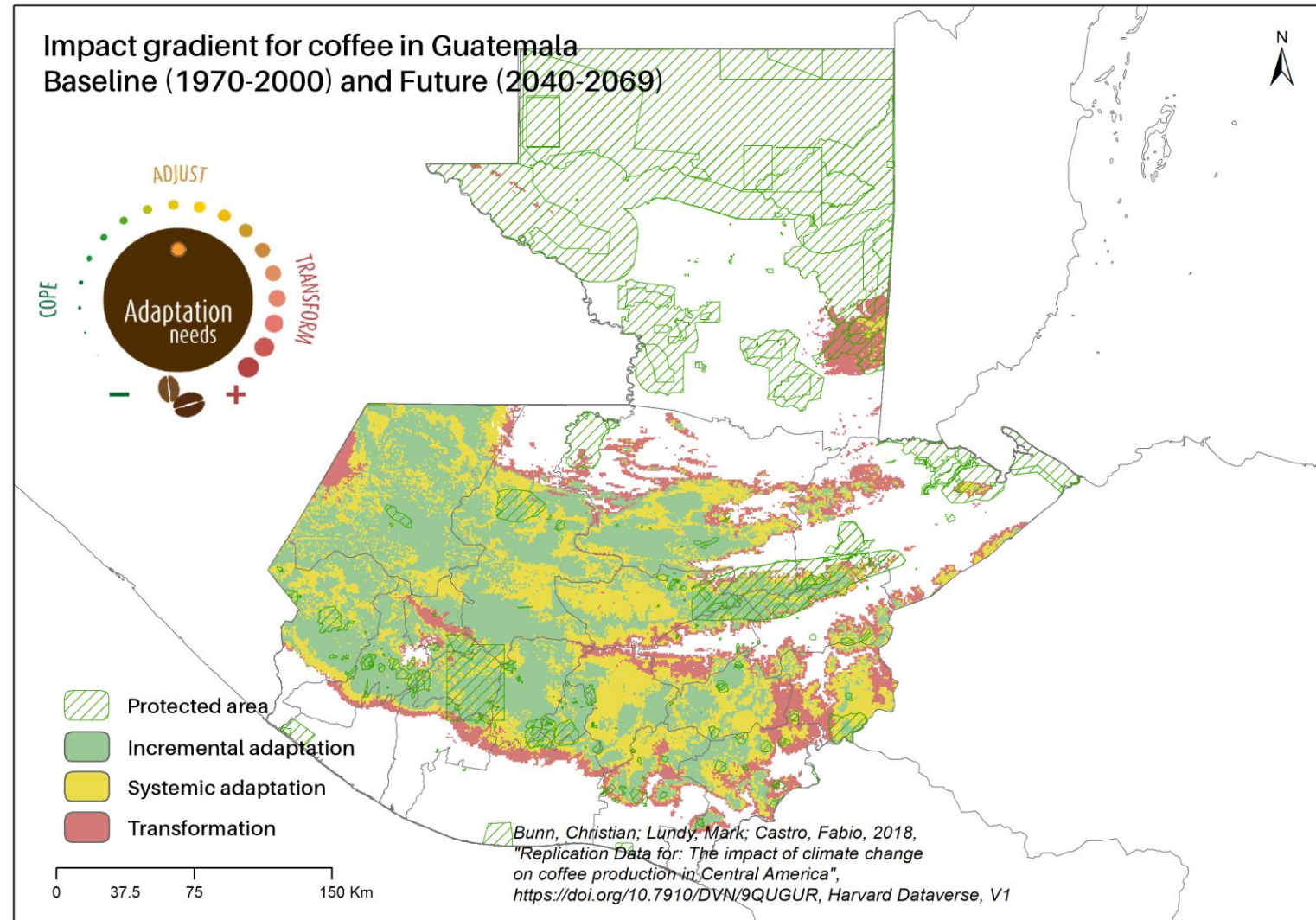




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Gradient of climate change impacts



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So now what?



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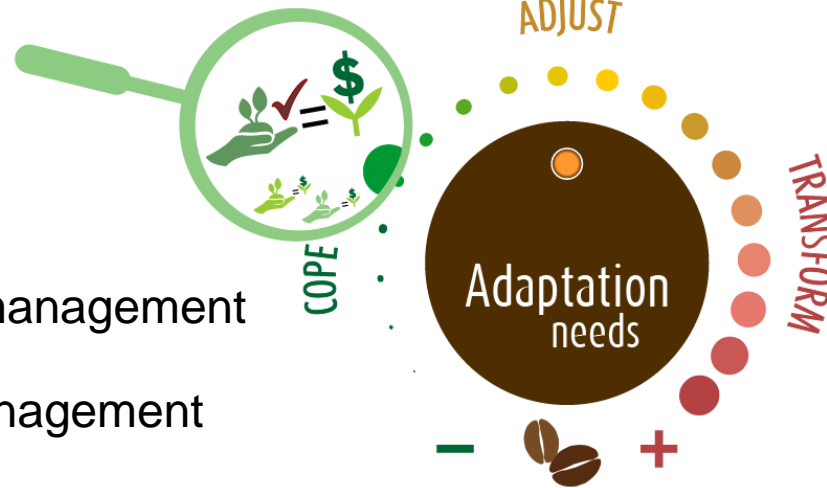
Low impacts– incremental adaptation



Shade or irrigation

Pest and disease management

Soil and fertility management



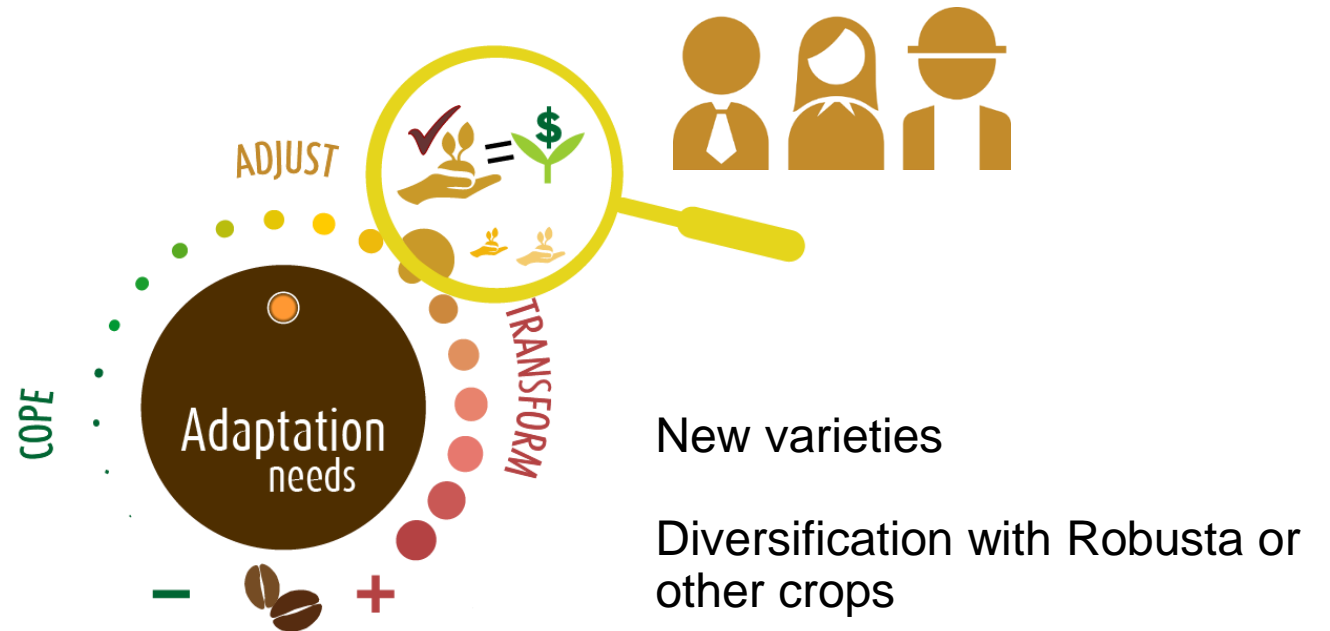
Incremental Adaptation

where climate is most likely to remain suitable and adaption will be achieved through a change in practices and ideally improved strategies and enablers. The altered patterns of pests and diseases, uncertain rainfall, as well as drought and heat, can affect the crop, but coffee production will remain feasible.

Intermediate impacts– adaptation with large adjustments

Systemic Adaptation

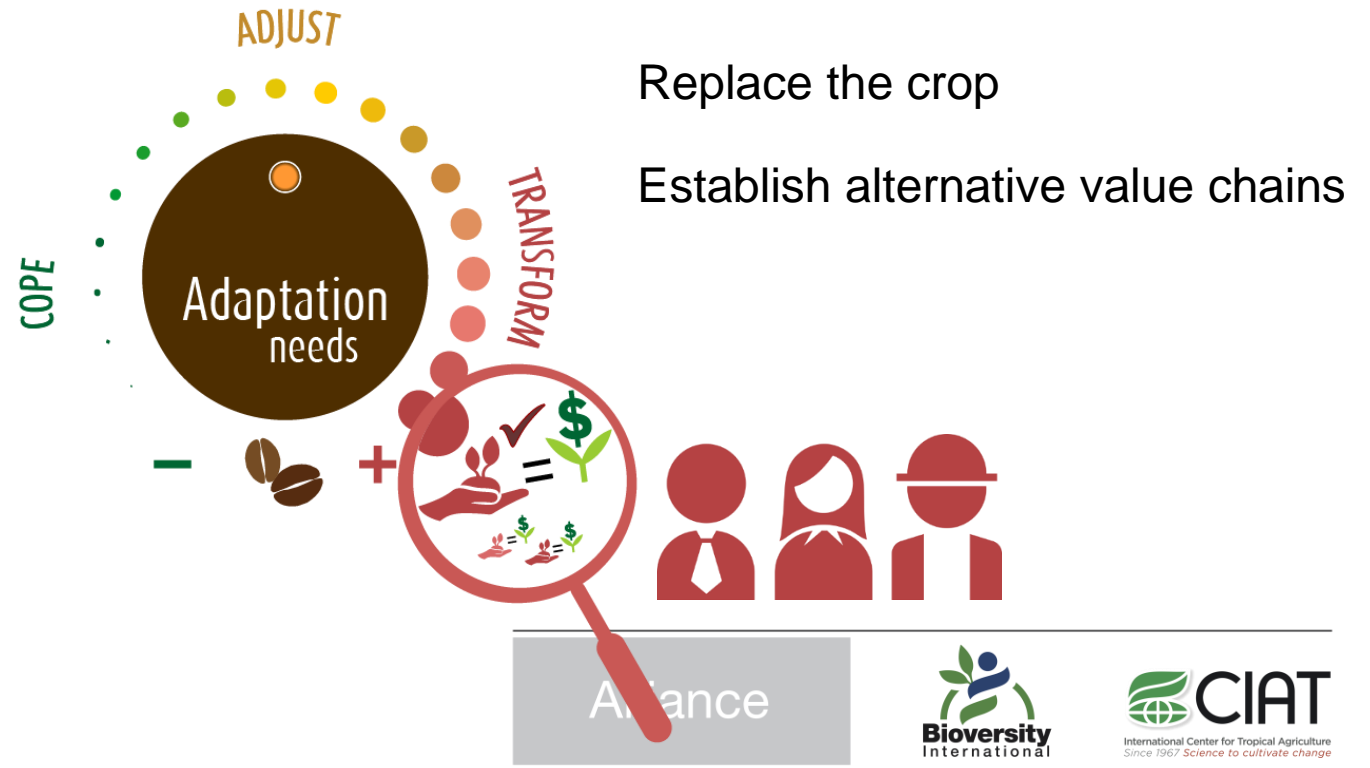
where climate is most likely to remain suitable, but with substantial stress in traditional production systems; adaptation will require a comprehensive change in practices and redesigning the system, along with external support to implement changes. Without changes, the risk for production will be unsustainable. Better adapted varieties, diversification, and financial mechanisms will be necessary to reduce risks.



Serious impacts – adaptation not feasible

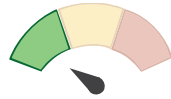
Transformational Adaptation

where climate is more likely to make coffee production unfeasible; adaptation will require redesigning the production system or switching to new crops. External enablers will be crucial to support change, because it will likely be more feasible and cost-effective to switch to other crops than sustain coffee production under these conditions in the future.

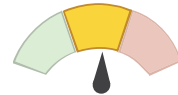




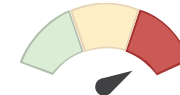
What does CSA look like in practice?



Incremental Change



Systemic Change



Transformative Change



Practices

Cover crops, fertilizers

Irrigation, novel varieties,
novel soil management

Switch to Robusta or
other crops



Strategies

Organic matter
management within the
farm, conservation of
riparian areas

On-farm diversification (e.g. new
crops for subsistence or
commercial use), different
processing methods

Moving away from coffee
farming, or farming
altogether



Enablers

CSA extension, weather
stations for better
forecasting, carbon
insetting, incentives for
process & quality

Crop insurance (drought,
hail), access to finance to
support adaptation, carbon
insetting

Developing new value
chains for new cash crop
systems

In conclusion

- **Take action now** to minimize impacts.
- Spatially heterogenic impacts need **differentiated solutions**.
- Scientific insights can help **design business incentives along the value chain**.
- On-farm resilience needs a **support framework**.
- **Partnerships are critical**.

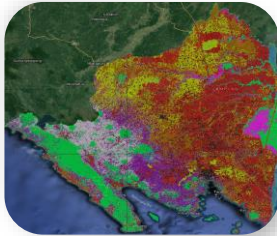


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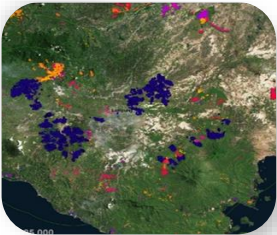
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Other risks we could map – Deforestation?

Commodity-mapping



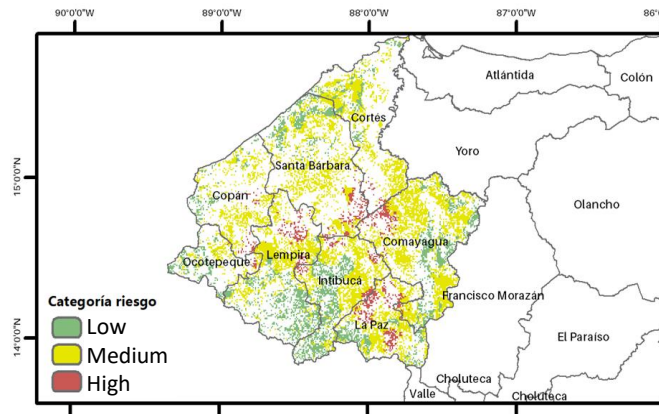
Terra-I
deforestation
alerts



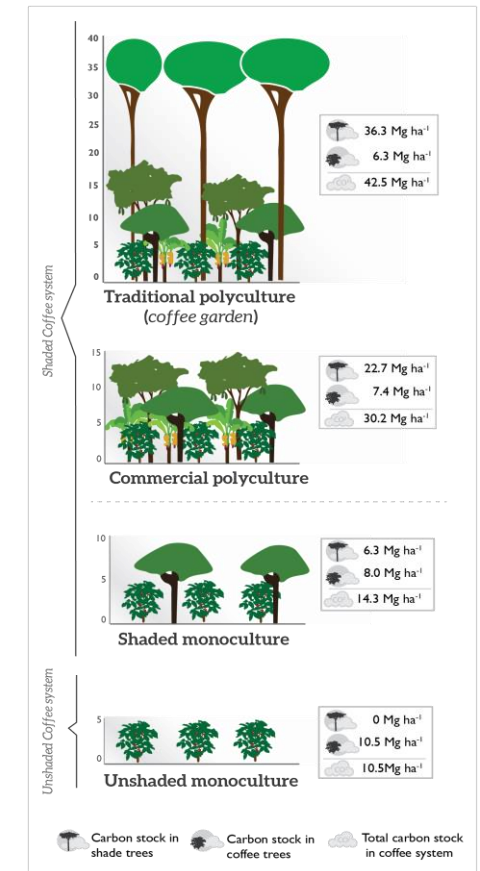
Climate
suitability
assessment



- Deforestation free supply chains is an emerging topic
- New opportunities for agro-forestry on carbon markets



**From coffee driven deforestation
to high carbon stock landscapes**



Living income?



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LINKS to published results

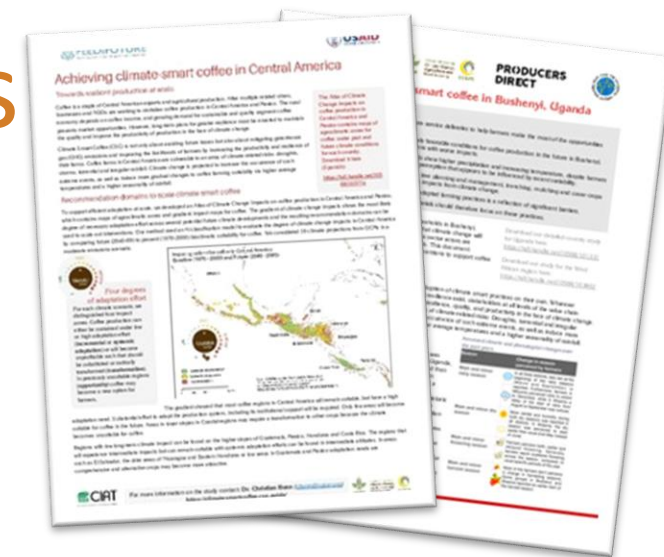
Climate smart coffee in **Central America**: <https://hdl.handle.net/10568/103803>

Central America coffee atlas: <https://hdl.handle.net/10568/104019>

El Salvador: <https://hdl.handle.net/10568/103773>

Guatemala: <https://hdl.handle.net/10568/103771>

Honduras: <https://hdl.handle.net/10568/97530>



Impacto del cambio climático sobre la cadena de valor del café en el **Perú**: <https://hdl.handle.net/10568/93345>

Climate Smart Coffee website: <https://climatesmartcoffee.csa.guide/>

Alliance for Resilient Coffee website: <https://www.allianceforresilientcoffee.org/>

Story Map for Climate Change and **Honduras**:

<https://conservation.maps.arcgis.com/apps/Cascade/index.html?appid=35c4fbf3dd0a4cb0b988717c0cd259e1>.



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Questions?

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