

Assessing the resilience of organic, climate-smart and conventional cocoa systems to drought in Ghana

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1: Introduction

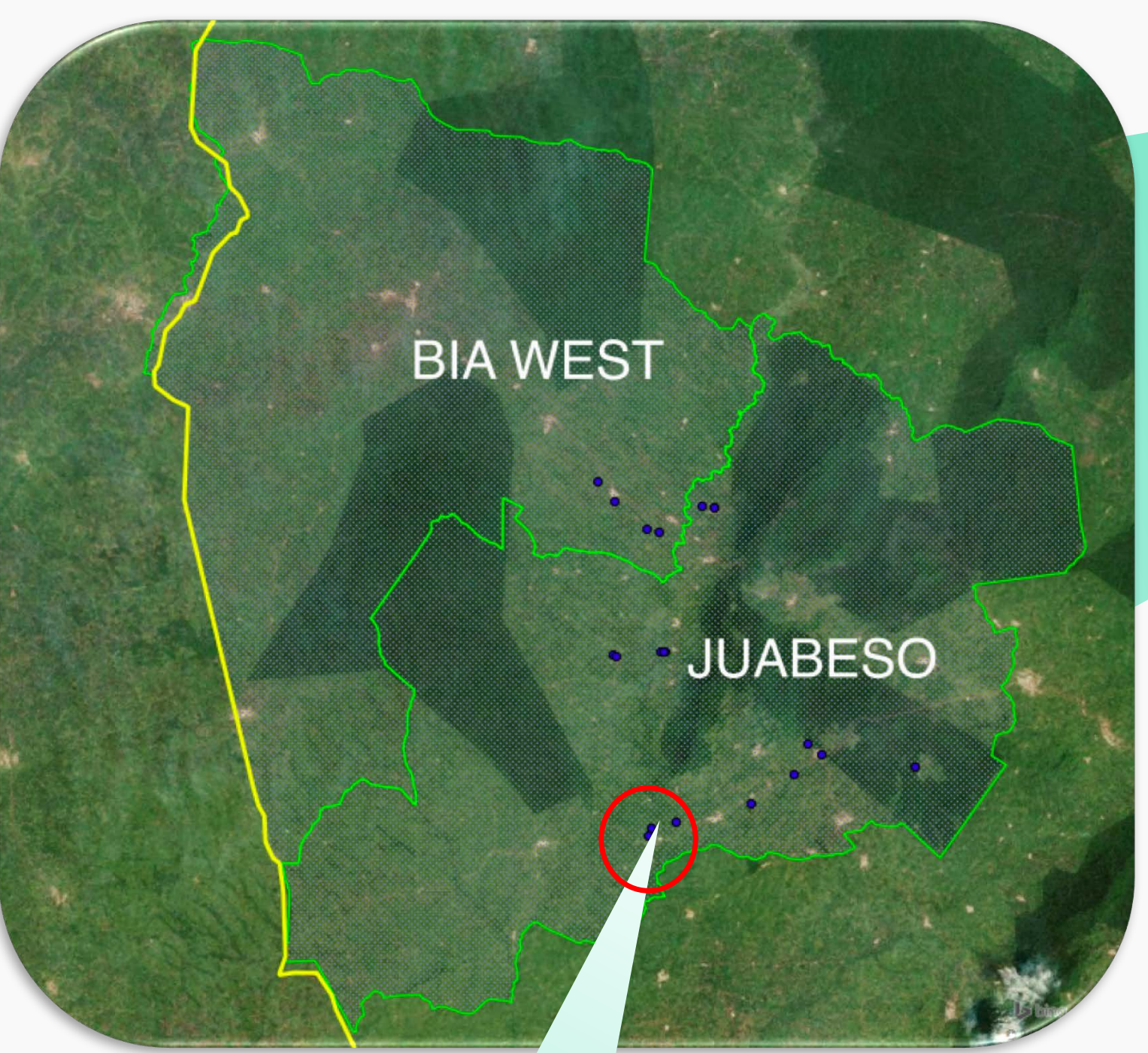
Climate related shocks to food systems are predicted to increase in the future. These shocks cause food insecurity and cement poverty traps for vulnerable smallholder producers. In Ghana, more than 6 million people depend on cocoa for their livelihood and it generates up to 3.4% of the country's GDP.

This research compares the ability of different production systems of cocoa in Ghana, namely; organic, "climate smart" and conventional, to deliver resilience against drought. This assessment uses a producer survey (n=480) and biophysical on farm assessments (n=70) to make the comparison. The methodology and next steps are presented here.



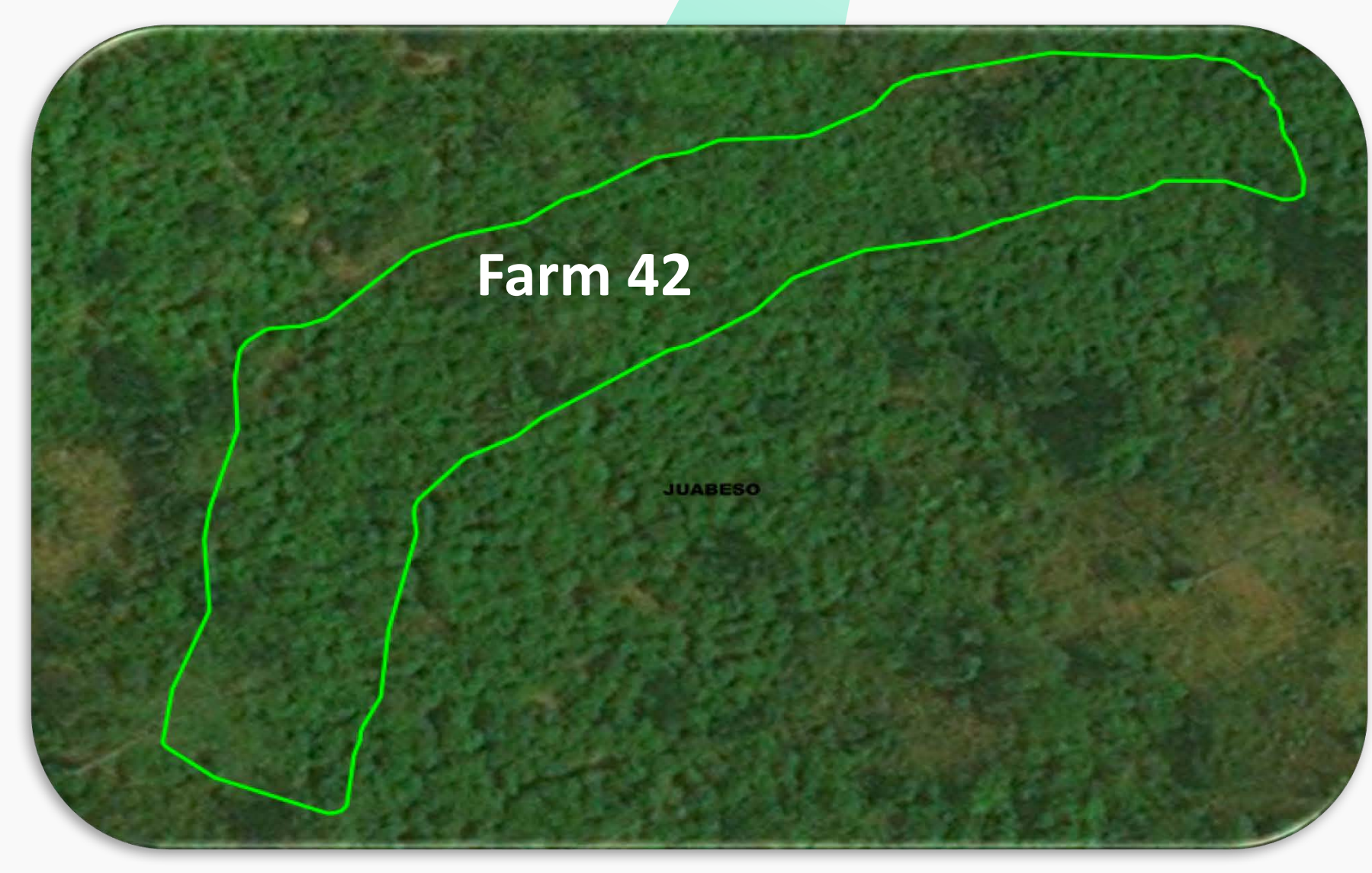
4: Next Steps: Value chain actor resilience assessment

- In the next phase of the research we will assess the resilience of downstream value chain actors such as cocoa Licence Buying Companies in Ghana, via the following process:
- Determine producer footprint:** Define the geographical locations and area that Firm X sources cocoa from in Ghana.
 - Determine weather-driven production variability in Firm X producer footprint:** Historical variations in production will be analysed using datamining techniques to generate indices that describe the weather driven variability.
 - Forecasting of future production variability:** Weather within climate projections will be linked to the weather indices generated to analyse future production climate risk exposure.
 - Analysing sourcing performance - production variability relationship:** Historical sourcing data will be analysed to understand the influence of weather variability on sourcing performance of Firm X.
 - Assessing future sourcing performance in the face of extreme weather:** Forecasts of future weather driven production variability will be linked to Firm X's producer footprint and used to assess future sourcing performance



2: Producer resilience assessment methodology

- A cocoa value chain stakeholder workshop (farmer, buyers, processors, agro-dealers, government) and a series of focus groups were used to design a resilience assessment tool, adapted specifically to the Ghanaian cocoa case
- 6 districts were selected based on the presence of organic, climate smart (Rainforest Alliance), UTZ and conventional farmers. Villages from the 5 different treatments were selected at random from these districts.
- A biophysical assessment, of farm area, soil quality (C, N, water holding capacity) cocoa tree density, shade tree density and species diversity, was carried out for a subset of farmers

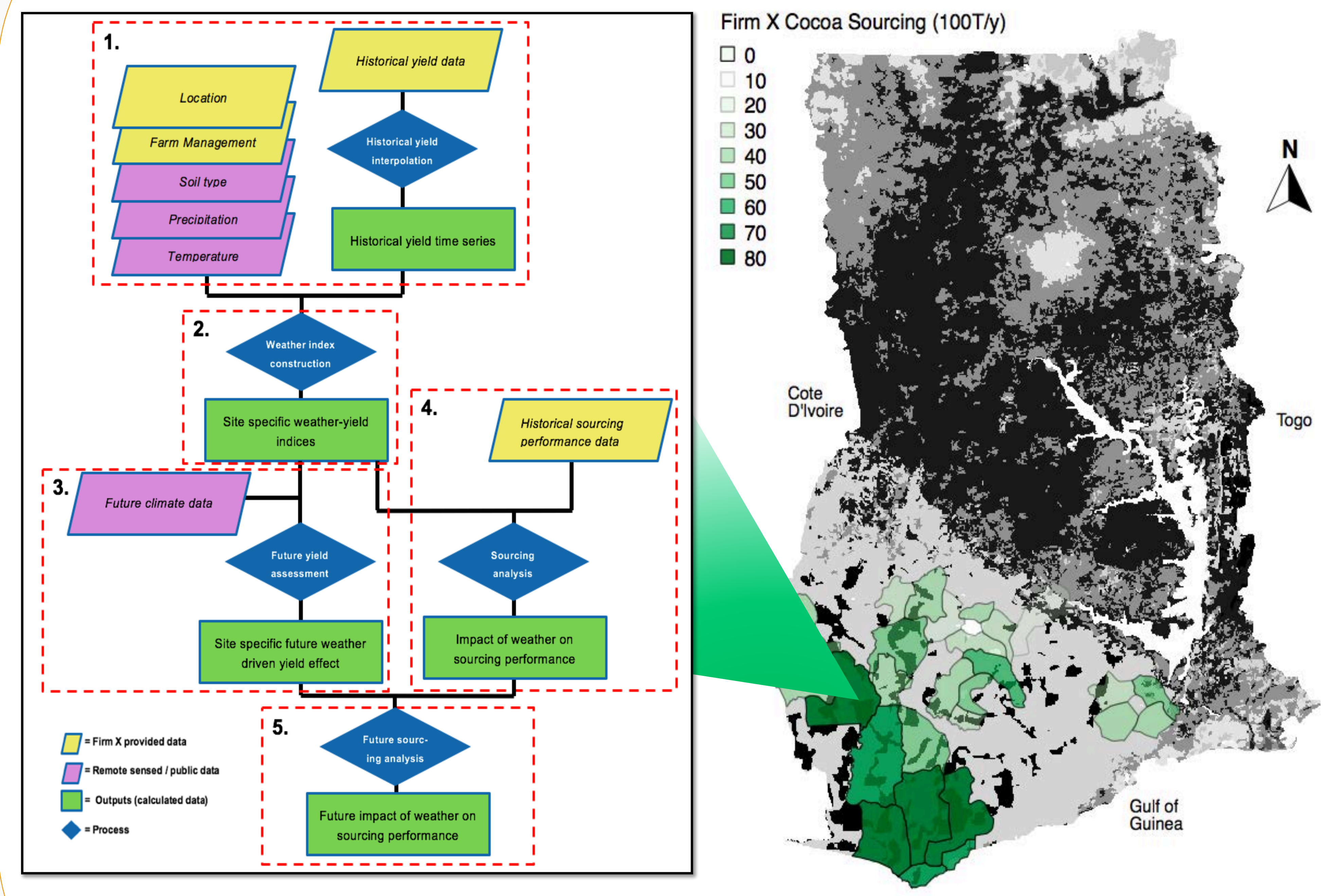


3: Drought resilience assessment framework

Resilience component	Robustness			Recovery	Adaptability
	Preparation	Response	Impact		
Producer characteristic or outcome	Fire belt	Irrigation	Tree death	Sale of physical assets	Social capital
	Water harvesting	Change in pruning	Increased pest and disease due to drought	Financial impact	Natural capital
	Farm inspections	Change in fertilisation	Change in social capital	Shade tree removal	Financial capital
	Drought training	Change in weeding	Change in yield	Extra training	Physical capital
		Change in composting	Change in cocoa income		Human capital

The producer outcomes collected in the resilience assessment will be linked to a shock severity index generated from gridded climate data to allow comparison between production systems.

5: Next steps: Cocoa sourcing firm methodology



The 5 steps in the process to evaluate historical and future impact of drought and heatwave on cocoa sourcing in specific locations of Ghana.

Partners