Collection of Weather Data in São Francisco de Paula

Case Study Background Data		
Tool Category: Adaptation beyond the farm **Variety:** Coffee Arabica L. **Purpose:** • Early warning • Local weather monitoring • Local climate information system **Climatic Hazard:** • Rain • Temperature		**Detail:** Planting Density: 3501-4000 /ha Soil Type: Loam Shade Regime: No shade Farming System: Intensive monoculture system Yield Range (kg cherry / ha): >10000 ⊘ rain : 1400 mm/y
Implementation Date: 01.01.13- 31.12.13	**Altitude:** 1000 mals **GPS:** 20°37'20.78"S 45°2'50.00"W	**Slope of plots**: Small inclination ⊘ **Age of trees:** 5-10 years
No. farmers: 4	⊘ **Area under coffee:** 2,1 ha/farmer	Tasted with smallholders

Results

1. Farmers improve their knowledge of the local climate and understand more about how the coffee system is influenced by rainfall and temperature.
2. Existence of weather expertise in the community able to explain to other farmers the weather events causing variation or climate change.
3. Farmers compare the local information obtained through of data collection with historical data from climate stations and draw conclusions about the local climatic results.

Pros & Advantages + Learnings	**Cons, Disadvantages + Things to take into account**
• Measurement equipment of easy access and use: pluviometer and thermometer. • Data collection realized by the farmers and processed by the technician is quite simple. • Obtaining climatic information helps the community understand how weather and climate change can affect the coffee system. • Facilitates understanding of how climate (rainfall and temperature) relates to production problems such as pests, diseases, weeds, yields, uptake of nutrients from fertilizers, etc.	• Technicians must follow up monthly with farmers to collect and process data and deliver datasheets. • Farmers need to reliably and routinely register the climatic data of rainfall and temperature even during weekends and festivities. • The measurement equipment should be installed taking into account specifications and recommendation for each instrument. • Identify the closest weather station to get historical information to compare the results of each period (monthly, semester or annual) with the data obtained in the community. • Fix periodic meetings to analyze the information and allow discussion about variability and climate change.

Acceptability	High	Effectiveness	High
Affordability	High	Timing / Urgency	Low

How is the adaptation option applied?

Nr.	Step	Picture
1	Through of the “triangulation” method, researchers, extension technicians and coffee farmers identify a set of climate change adaptation practices, where one of them agrees to collect climatic data. The objective is to sensitize to the communities on the local microclimate and monitor change.	
2	Identify volunteer farmers willing to register weather data and inform to the neighbors on the behavior of climate events. Install the measurement instruments according to technical recommendations.	
3	Measure daily rainfall and temperature (maximum and minimum) and fill in the weather datasheets. Deliver the sheets to the technicians to process the information monthly.	

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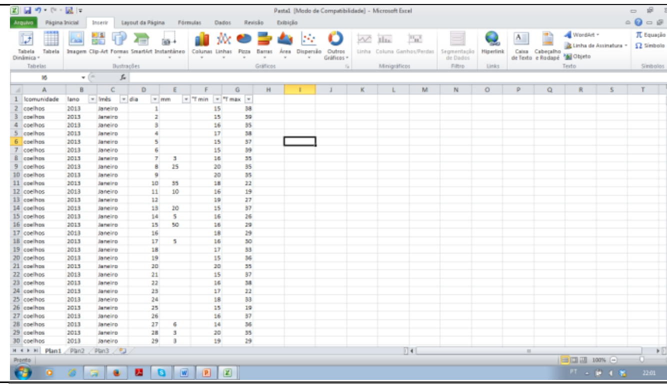
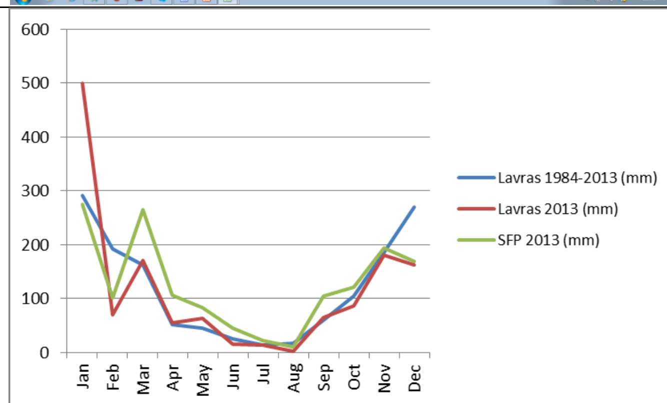
4	Elaborate database with the field information to be processed and analyzed periodically (season, year, semester or crop). This target should be done by project personnel (secretary and monitoring and evaluation official).	
5	Process the information and create tables, graphics or some illustration that aids visualization and explanation of results.	
6	Organize feedback meetings to analyze and discuss the results of measurements and relate these to weather events in the community and in the coffee system.	

Appendix

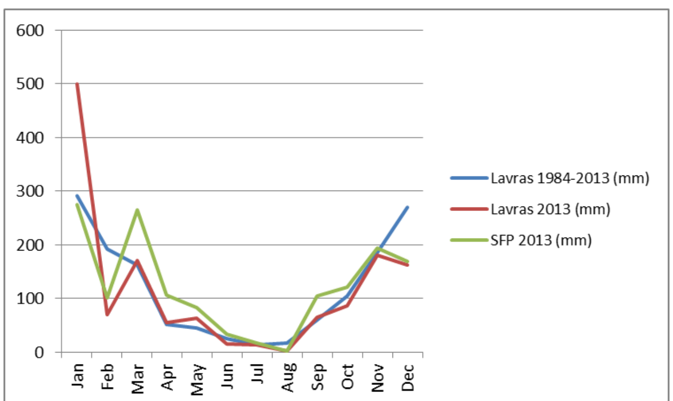
Implementation Framework

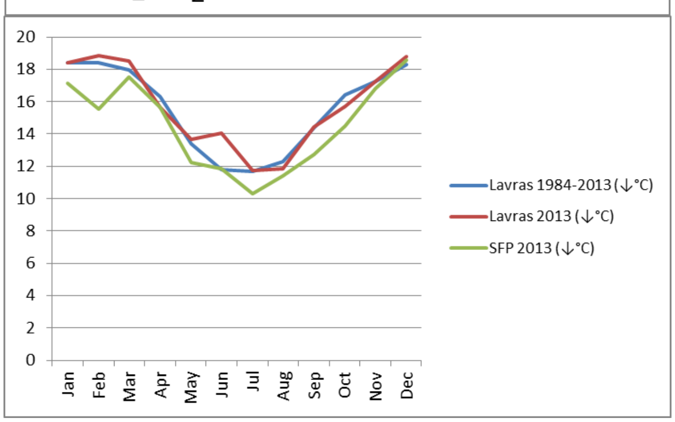
The study was implemented in four communities of the Sao Francisco de Paula municipality: Coelhos, Goiabeira, Lagoinha and Monteiros. In each community there is at least one volunteer farmer in charge of the registration of weather indicators (rainfall and temperature). Farmers receive technical assistance from the project technicians to maintain dependable data.

The farmer is trained in the installation of equipment, reading and registration of the measurement and administration of datasheets.

Technicians use various opportunities to disseminate the results of monitoring of weather indicators, for example, during the session of a Farmer Field School or during a technical assistance meeting. Usually, in the frame of the Initiative for Coffee & Climate, technicians organize a special workshop to explain the preliminary results of the studies on the use of the adaptation practices (toolbox) where the results of weather data collection are exposed.

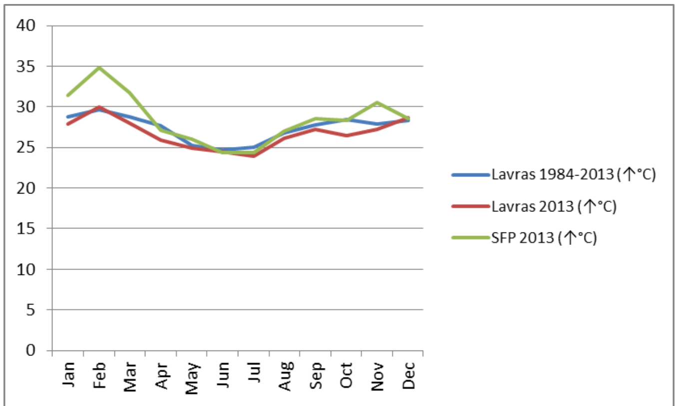
Main Findings of Case Study



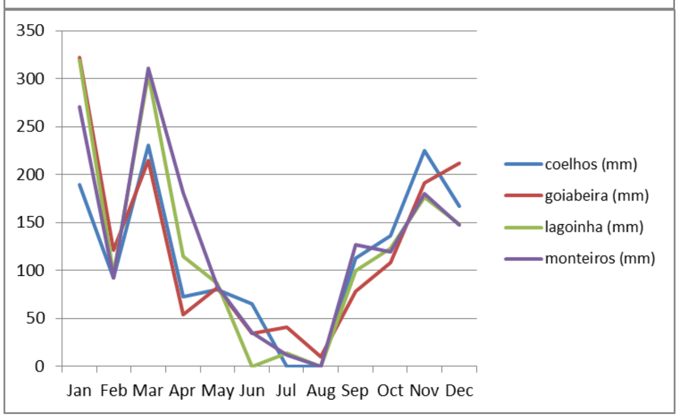


For 2013, average rainfall in four communities of São Francisco de Paula was 1.470 mm. Compared with average rainfall for the Lavras Station of the National Institute of Meteorology (INMET) located 90 km from São Francisco de Paula, rainfall was 57 mm higher than average of the last 30 years and 89 mm higher than the register in 2013. February saw reduced rainfall and March higher amounts than the long term averages.

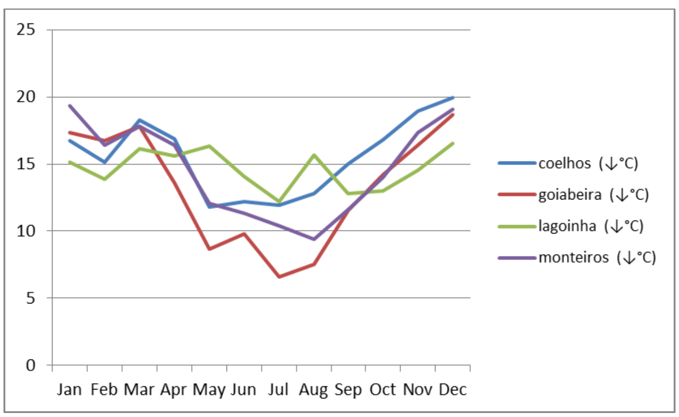
The average minimum temperature in four communities was 15°C in São Francisco de Paula, while the 30 year average and the 2013 figure for INMET in Lavras was 16°C. January, February, July, September and October, were colder than average.



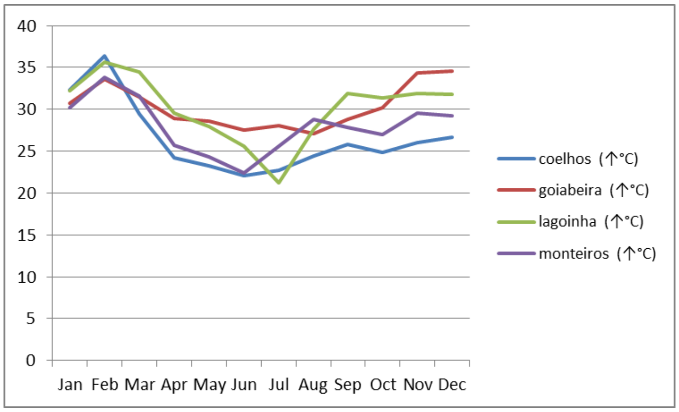
The average maximum temperature in four communities was 29°C in São Francisco de Paula, while for INMET in Lavras 30-year averages and 2013 were both 27°C. The hotter months compared with the historical average were January, February and November.



The rainfall in the four communities in São Francisco de Paula had similar behavior throughout the year and with total precipitation between 1.371 mm and 1.559 mm. Peak rainfall months were January and March when the coffee is filling the fruits and the months; least rainfall months were June, July and August when the coffee is harvested and is processed.



The minimum temperatures in the four communities ranged between 13 and 16°C, with May, June, July and August the colder months.



The maximum temperatures in the four communities ranged between 27 and 30°C, with January, February, November and December the hotter months.

Acceptability					
Leading Question: To what extent did farmers readily accept this tool as useful for implementation and implement it as planned?					
High	☒	**Low**	☐	**Don't Know**	☐
High: Farmers readily accepted this tool for implementation and continue to implement it as planned.			**Low:** Farmers generally did not accept this tool; *Or* the tool was met with resistance later on, even though farmers initially accepted it.		
Please Comment:					
If there was resistance to adopting this tool, why?					
If farmers discontinued tool implementation later on in the process, even though they initially accepted it, Why?					
Did this tool have any external issues or impacts (positive or negative) which influenced its acceptability? (community, value chain?)					
Any other comments:			Currently volunteer farmers are collecting weather data in 17 municipalities of the South and East of Minas Gerais. Farmers have become local weather reporters and accepted in that role by other farmers into the community.		

Affordability					
Leading Question: Are the costs of the tool affordable to farmers taking into account the initial investment, maintenance costs and the availability of inputs?					
High	☒	**Low**	☐	**Don't Know**	☐
High: The initial investment and the maintenance costs of this tool are affordable to farmers from their regular operations and the time it takes to recover the investment is reasonable to farmers. *Inputs (e.g. labor, electricity..) are available when they are necessary so that no extra costs are incurred from timing related issues.*			**Low:** The initial investment or the maintenance costs of this tool go beyond what is affordable to farmers from their regular operations *or the amount of time it takes to recover the investments are unreasonable to farmers*.		
Please Comment:					
Are there any external costs? (to society or environment?)					
If costs are high because inputs are not available, what inputs? And why?					
Any other comments:			The measurement equipment (thermometer and the pluviometer) are easily sourced in the local market. The local price of the pluviometer is EUR 7 and the thermometer is EUR 25.		

Effectiveness					
Leading Question: Does the tool provide the expected benefits to farmers?					
High	☒	**Low**	☐	**Don't Know**	☐
High: The objective of the tool has been met for the farmers.			**Low:** The tool did not fulfill its objective entirely.		
Please Comment:					
What benefits did farmers expect from this tool?			Farmers hope to understand the behavior of local weather and understand how it relates to climate change and how it affects the agroecosystem.		
If the objective has not been met, why?					
Have there been any significant external issues which influenced the effectiveness (positive or negative) of this tool? Please explain.					
Any other comments about effectiveness			Farmers of the community receive local reports about the climate, which is key information to help them understand their environment and make decisions on best agronomic practices.		

Timing / Urgency					
Leading Question: Is the amount of time that this tool takes to implement (from starting implementation until benefits accrue) reasonable to farmers?					
High	☒	**Low**	☐	**Don't Know**	☐
High: The tool takes a reasonable amount of time to implement (taking into account the coffee growing season, inputs necessary, preparation time and implementation time); *And* this tool accrues the effects expected within a reasonable amount of time.			**Low:** It takes too long to implement this tool (taking into account the coffee growing season, inputs necessary, preparation time and implementation time); Or it simply takes too long for this tool to accrue benefits.		
Please Comment:					
If implementation takes too long why?					
Any other comments about timing:			The tool is being implementing indefinitely; farmers are determined to register the information and share with other farmers in the community.		