

Promoting the uptake of solar irrigation through innovative carbon financing

A case study of smallholder farmers as climate pioneers



Introduction

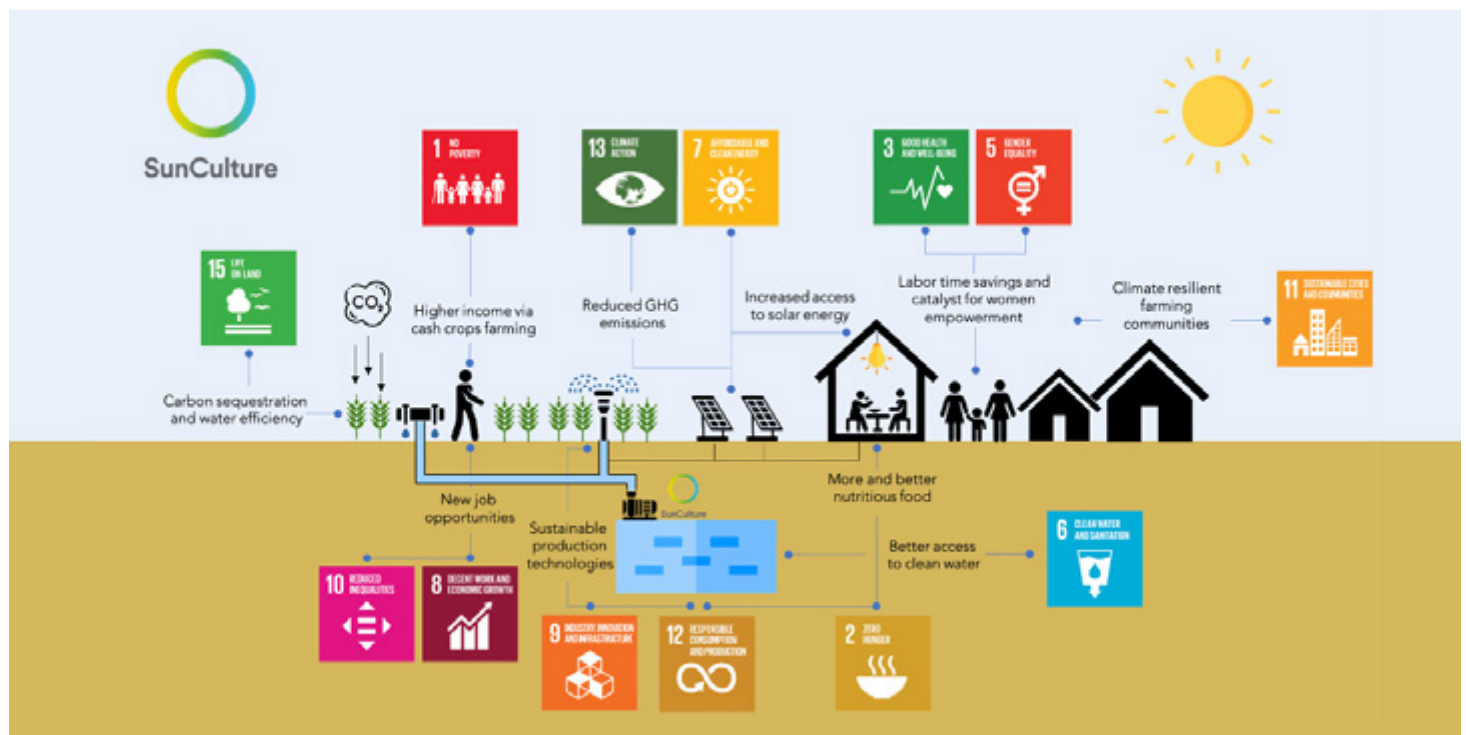
Africa's smallholder farmers have a leading role to play in climate resilience as guardians of natural assets and pioneers in climate smart agricultural practices. Climate-Smart Agriculture (CSA) interventions in Africa are a necessity to build resilience for smallholder farmers, yet they are often too expensive to operationalise for the mass market.

Using carbon revenues to lower the price of climate-smart interventions for smallholder farmers would be game changing. Solar irrigation builds climate resilience against unpredictable rain and mitigates the harmful impact of Green House Gas (GHG) emitting fuel pumps.

While end-user subsidies have been – and will continue to be – critical to reducing costs to low-income customers who wish to purchase high-value productive-use assets, such as solar irrigation, this requires a constant influx of philanthropic funding.

There is an incredible opportunity to leverage innovative carbon financing to sustainably increase affordability without the need for sustained external funding, however, the current voluntary carbon market prices do not reflect the true benefit that solar irrigation provides.

Because of this, carbon credits for solar irrigation are currently not appropriately priced to provide a material reduction in the overall costs of systems. Currently, carbon credits underprice the quality of solar irrigation-produced carbon credits: solar irrigation not only provides climate change mitigation (what the price of carbon credits currently represent), but also climate resilience and adaptation, and contributes to 13 Sustainable Development Goals (SDGs).



Solution: How catalytic grant funding can be leveraged to prove the case for premium carbon credit pricing for solar irrigation offsets

By demonstrating an increase in sales velocity through carbon finance-mimicking grant funding, this work demonstrates to carbon buyers that affordability is the key unlock to scale. Carbon buyers need proof that premium carbon pricing for high-quality offsets:

- 1) *Provides the additional co-benefits and impact.*
- 2) *Directly leads to increased sales (thus increased number of carbon credits) to provide comfort around future sustained carbon credit generation.*

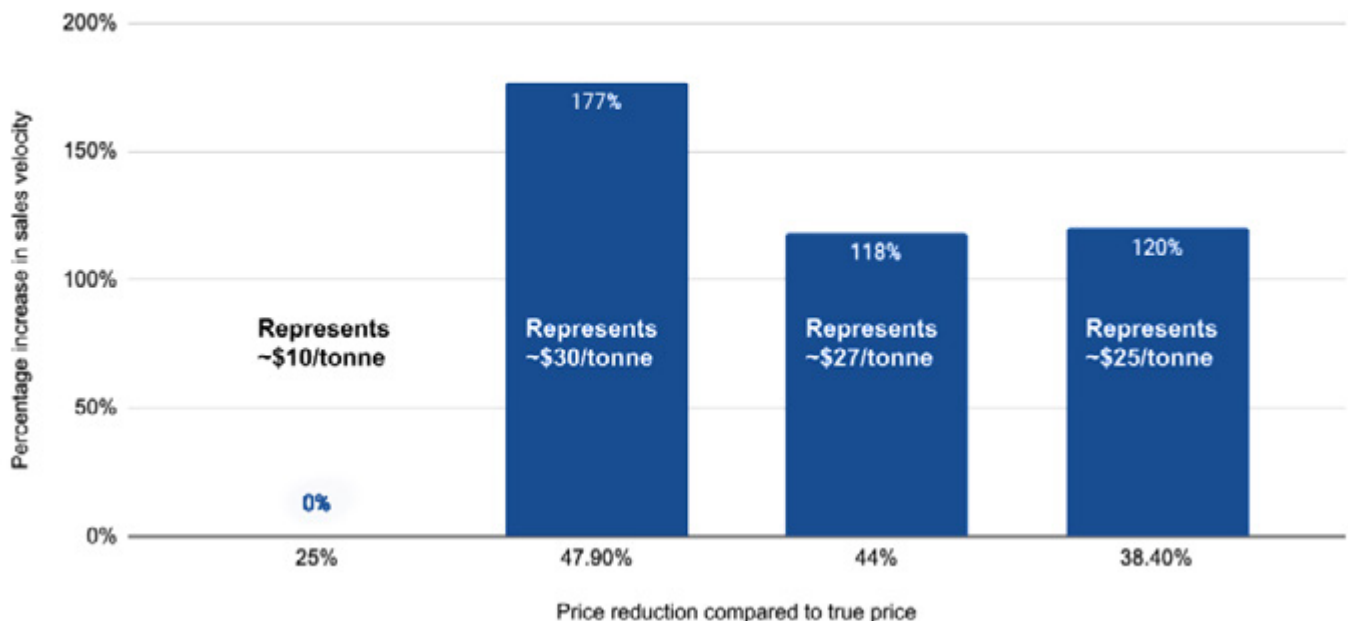
The objective of this intervention is to test various price points that correspond to differing levels of premium carbon pricing. With the support of ARAF, CAP-A, FSD Kenya, MasterCard Foundation and Rockefeller Foundation, SunCulture is closely tracking the impact each subsidy has on sales velocity over the course of a year. Measurement of co-benefits / impact through third-party impact surveys and analysis is also prioritised.

Results

Throughout 2022, SunCulture itself subsidised its product offerings in anticipation of the ability of the company to claim carbon credits for the units sold. In essence, SunCulture enabled farmers to benefit from the carbon markets by reducing prices, thus taking on the risk of carbon credit realisation in favor of offering reduced prices to its customers.

For SunCulture's entry-level product i.e., ClimateSmart Direct + RainMaker2, this represented a 25% reduction in price compared to true price. The below illustrates the percentage increase in monthly sales velocity as compared to SunCulture's initial reduced pricing:

Monthly average percentage increase in sales compared to SunCulture's 2022 self-subsidized pricing



As displayed above, sales for the ClimateSmart Direct products have maintained a **well-over 2x increase in sales in 2023**, with the highest discount yielding a 2.8x increase over the monthly average sales during 2022.

See note regarding seasonality implications below.

Key takeaways/lessons learned

This price reduction initiative will persist through the end of 2023 to provide a complete picture of year-on-year sales velocity impact, accounting for seasonality. While a reduction in price is correlated with significantly increased sales, data collection and analysis is yet to be finalised, during which an account for variables such as seasonality will be demonstrated. This will provide a clearer picture regarding the contributions of changing prices versus the onset of the rainy season between the second and third price points above, for example.

Overall, innovative carbon-financing, with credits sold at a premium, applied as a direct subsidy to end-customers has potential to massively increase sales, meaning a catalytic increase in both carbon credits generated and impact realized.

Key takeaways and lessons learned thus far include:



There is a proven, sustained, and dramatic correlation between price reduction and increase in sales, suggesting that, as hypothesised, customers are highly price sensitive.



An increase in carbon credit pricing from ~10-15 USD to 25-30 USD would allow for a sustained increase in uptake by over 2x.



By reducing customer pricing, the solar irrigation pumps are reaching a lower-income demographic, increasing SunCulture's risk when extending credit. It will be important to monitor long-term repayment trends of customers who opt in to SunCulture's Pay-As-You-Grow financing option.



Further investigation is needed to better understand the impact of external factors (seasonality, economic conditions, political unrest) on the above findings.



A deep understanding of the motivations of carbon buyers, and most effective communication strategies, is needed to translate these findings from potential to actual opportunity.

Conclusion

Though this price reduction initiative is still ongoing, results are not only promising, but outstanding.

Because **SunCulture is the first solar irrigation project in Africa to have been verified through the international carbon body, Verra**, the company is well-positioned to utilise innovative carbon financing to dramatically increase access to their productive-use renewable energy technologies by reducing the cost-barrier for sub-Saharan Africa's smallholder farming population at large.

Thanks to the support funding and implementation partners, SunCulture is successfully using carbon-mimicking grant funding to prove the case for premium carbon pricing that would allow for increased access to low-income, high-potential smallholder farmers.

For more information about SunCulture products, SunCulture's carbon project, or this case study, please reach to Samir Ibrahim, CEO and Co-Founder at samir@sunculture.com

Implementing partners



Funding partners

