Climate smart agriculture and climate-attuned farmers: the rationality of farmer practices in Northwest Cambodia

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Abstract
Climate smart agriculture (CSA) envisions farmer decision making being reoriented to support food security in the context of rapid and significant climate change. The underlying rationale is uncontroversial while also being reliant on poorly understood assumptions concerning farmers, their decision making, and the ability of external experts to influence on-farm practices. Implicit within the CSA discourse is the assumption that farmers are not presently 'climate smart'. Based on 400 quantitative surveys, 300 household interviews, and demonstration farm data we analyse farmer decision making in the context of climate variability, though we define 'climate' as multi-faceted and compounding materializing in environmental, social, and economic forms. Our data shows farmers who are 'climate smart', but who are not driven by productivity. Rather, farmers focus on survival and limiting their exposure to risk, in many cases choosing lowered productivity to limit their exposure to economic and social variabilities. The resulting cassava production regime common to farmers in Northwest Cambodia is shown to be sensitive to climate variabilities despite representing 'suboptimal practices' from the prevailing production- and yield-emphasizing perspective at the heart of CSA. The results highlight a conflict between prioritisation of productivity relative to farmers' livelihoods and exposure to risk, endangering the success of CSA as well as other development initiatives such as the sustainable development goals. Using the case of cassava farmers in Northwest Cambodia, farmer decision making with the CSA discourse is shown to be poorly representative of the considerations that farmers identify as paramount to the behaviours. Climate smart farming may, then, not be in the interests of climate smart farmers. The implications for food security are immense.

Current stage
This article is presently with co-authors.

Findings
Key to understanding farmer decision making in Northwest Cambodia is appreciation for the experience of cassava farming. As such, the Uptake project involved two demonstration farms, located in Pailin and Samlout. These farms replicated existing practices as well as testing

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practices proposed by local experts (e.g., intercropping), practiced in other parts of Southeast Asia (e.g., horizontal stake planting), or from within the literature (e.g., time of sowing or different plant density trials) (Figure 1).

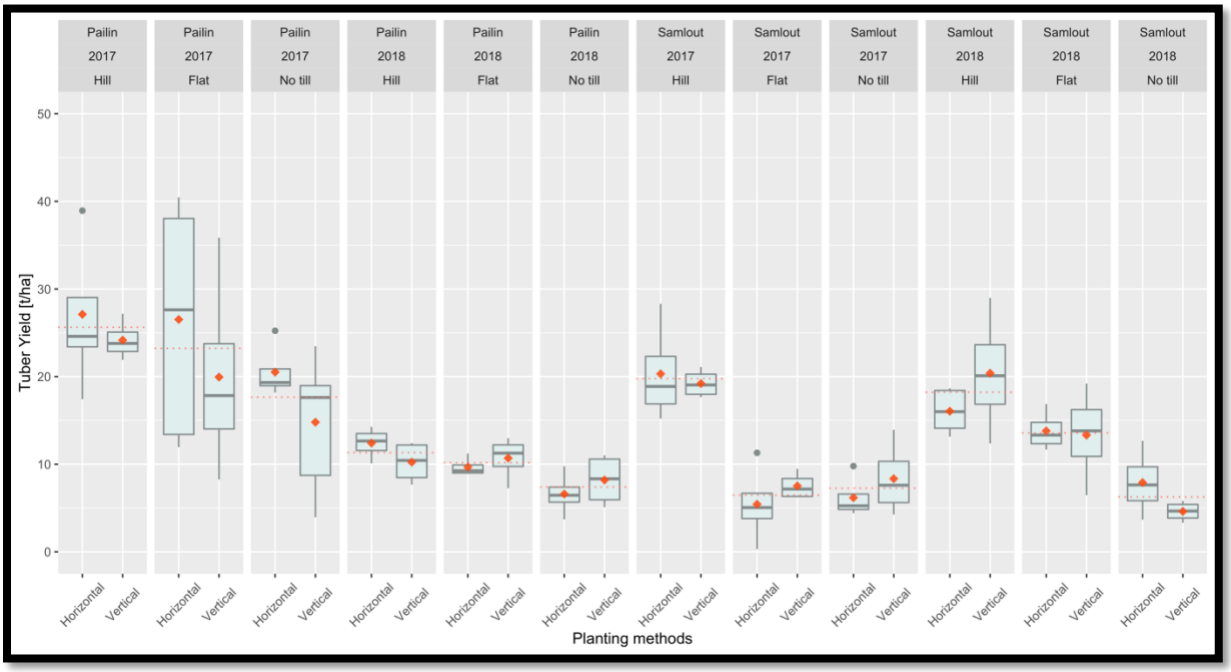

Figure 1: trial results for the two demonstration farms

The data for the demonstration farms highlight the extreme variability associated with cassava production, especially regarding plant survival (Figure 2). The productivity data from 2017 and 2018 are effectively inversed, demonstrating the impacts of environmental variability (i.e., precipitation-driven yields). Perhaps equally informative, the data for 2019 Samlout (not shown) were fundamentally corrupted due to spray drift from a neighbour, demonstrating the impacts of social variability. The interview data confirms the deterministic influence of social variabilities, with labour and access issues determining the productivity of the demonstration farms.

The experience of the research team as part of the demonstration farms highlights the unpredictability of farmers' experiences in the context of multiple, compounding variabilities, which often conflict with best practices (Fermont et al., 2009). For example, there is great debate over the optimal time of planting for cassava in the region. As a result, farmers often plant with the first rains, with many famers losing their crops when the rains do not continue. In response, farmers tend to plough and re-plant. This practice is criticised by experts because it wastes cassava stakes and, typically, requires that farmers purchase stakes from outside the

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region. This increases exposure to disease and can significantly increase farmers' debts if the costs of field preparation and additional stakes are paid with borrowed funds. While this practice is suboptimal, the demonstration farms show confirms this practice as somewhat rational.

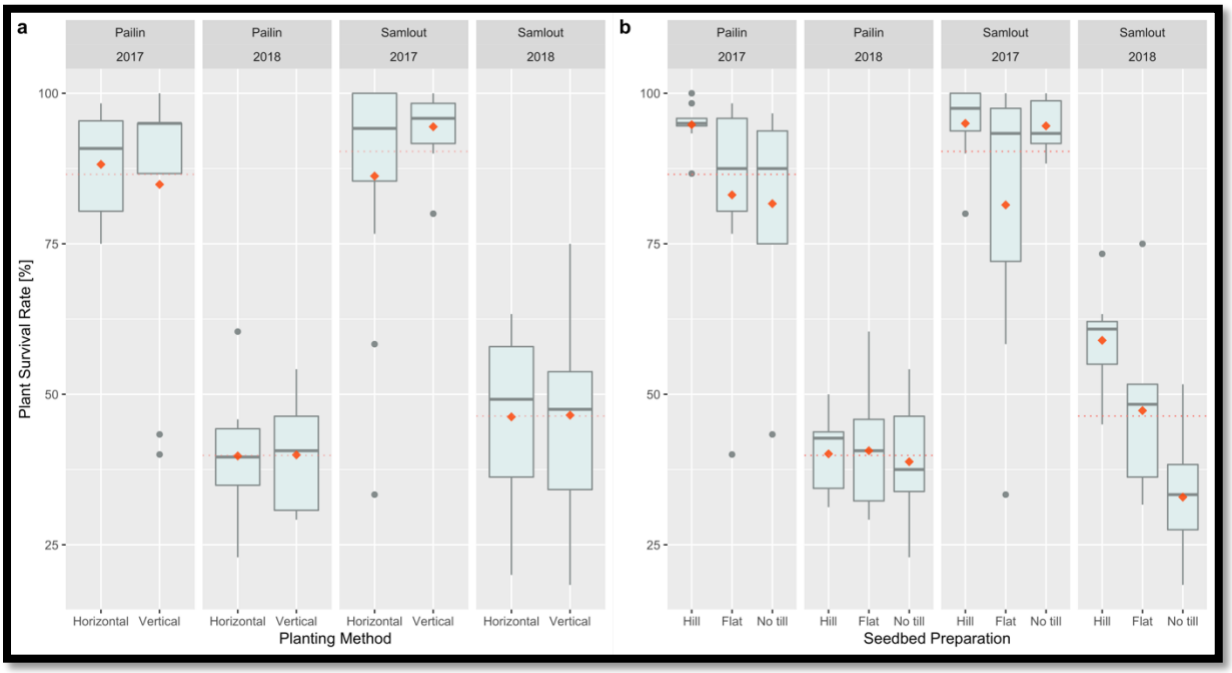

Figure 2: plant survival at the two demonstration farmers for 2017 and 2018

Policy relevance

While the data limitations of the demonstration farms inhibit broad generalisation, there is value in experiencing production and outcomes associated with existing practices. As demonstrated in the qualitative and quantitative data, farmers make decisions based on very limited temporal horizons (often much shorter than the three years of demonstration farm data available to the research team). Were the research team forced to determine future time of sowing practices, the data support both existing farmers practices and experts who advocate waiting for more reliable precipitation for rain-fed cassava. More generally, the findings support engagement with farmers and research that prioritises understanding existing practices to better understand and empathise with farmers.

Fermont, A. M., Van Asten, P. J., Tittonell, P., Van Wijk, M. T., & Giller, K. E. (2009). Closing the cassava yield gap: an analysis from smallholder farms in East Africa. *Field Crops Research, 112*(1), 24-36.

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