Strengthening HIV-positive farmer's resilience to climate change with an irrigation pump and training in sustainable farming

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Introduction

- Climate Change, Food insecurity and HIV/AIDS outcomes are inextricably linked in sub-Saharan Africa.
- Food insecurity associated with
  - HIV acquisition risk[1,2]
  - Worse HIV clinical outcomes[3,4,]
- In Kenya, recurrent floods & droughts negatively impact agricultural production
- Most of Kenyan's livelihoods and economic activities (agriculture, livestock, tourism, forestry, and fisheries) are reliant on climate-sensitive natural resources.[5]

Dimension	Impact of climate change on Food Insecurity[6]
Availability	• Reduced crop yields & health of livestock
Stability	• Unstable access for agricultural laborers • Short-term variability in supply
Access	• Higher food prices
Utilization	• Higher temps and flooding contribute to compromised food and water safety • Increased food prices will compromise diet

Goal:
Conduct a multisectoral agricultural intervention trial aimed to improve food security and health outcomes and strengthen Kenyan HIV farmer's resilience to climate change

Methods

- 16 HIV clinics in western Kenya, randomized to intervention & control (1:1)
- Began enrolling in June 2016 and follow-up every 6 months for 2 years
- HIV-infected, 18-60 years, on antiretroviral therapy, with moderate or severe food insecurity and/or body mass index <18.5, & access to agricultural land & surface water
- Data collected on viral load and CD4, food and water security, dietary intake, agriculture, income, adherence, stigma, morbidity, anthropometry, etc.

***Shamba Maisha* Intervention, an adaptive intervention that is climate sensitive**

1. ''MoneyMakerMax'' Treadle Pump, a low-cost micro-irrigation water pump, which enables farmers to irrigate their crops year-round, avoiding dependence on seasonal rainfall thus capitalizing on higher crop prices in the marketplace;
2. Training on sustainable farming practices and financial management in eight didactic and practical demonstration sessions;
3. Loan program of vouchers (worth *$150 USD) to purchase the irrigation pump, seeds, fertilizers, and other farming implements.

Results from pilot

Intervention arm compared with control arm[7]:

Outcome	Value	Significance
↑ CD4+ Cell Counts	165 cells/mL	P<0.001
↑ Proportion Virologically Suppressed	OR =7.6	95% CI: 2.2 – 26.8
↑ Food Security	3.6 scale points	P<0.001
↑ Food Consumption	9.4 times per week	P=0.013

Quotes from participants:

"*[Shamba Maisha] taught me to use nature and natural methods to farm more productively. It is what holds my future. It is insurance against hunger. The teaching and the pump are still helping me. I'm able to make life move-on no matter what the weather brings." 46-year old male*

"*We had a good experience in October when there was a drought because we were able to keep the plants leafy thanks to the pump*" 33-year old male

"*The change I have seen is that my vegetables are even wet even during a dry spell because now I have the pump which I am using for irrigation*." 42-year old male

"*We were taught a way of farming. When I used that style this time around, I got a higher yield compared to the time before I joined Shamba Maisha*." 43-year old male

Conclusions

- Climate adaptive food insecurity interventions may be a promising approach to tackle the intersecting problems of food insecurity, climate change, and HIV/AIDS.

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