What was the impact of dairy goats distributed by the Crop-Goat-Project?

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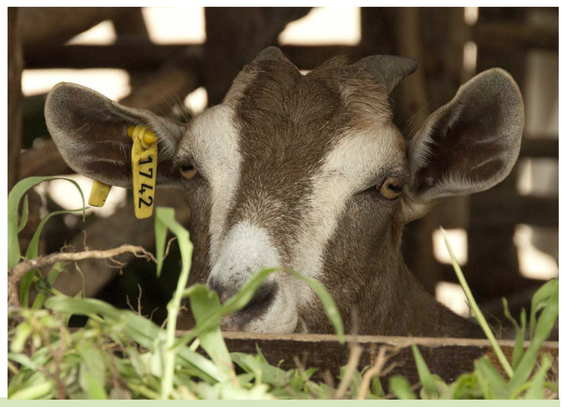


Introduction

Study objective

- Evaluate impacts of goat distribution on diet, income and assets using Crop-Goat-Project as a case study.

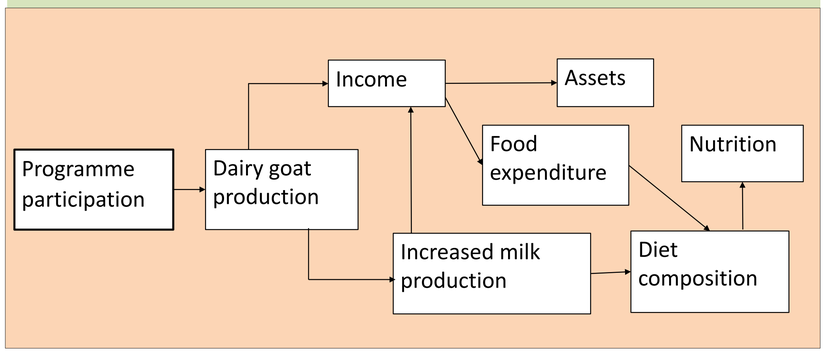
Statement of problem

- In Tanzania, most goat production is extensive and aimed at selling live animals with limited direct impact on food security and nutrition.

Crop-Goat-Project – objective & activities

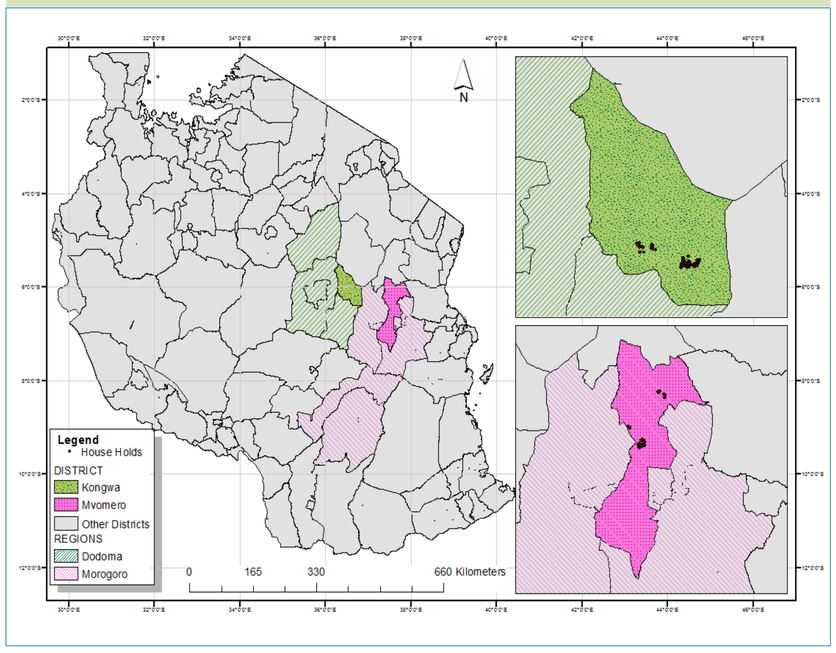
- Support poor farmers through dairy goats and root crops (with the opportunity for synergies)
- Transfer of 229 pure-bred dairy goats to 108 households in 4 villages in Morogoro region, central Tanzania
- Introduction of improved cassava and sweet potato varieties and extension services

Conceptual framework



Source: Adapted from Masset *et al*. 2012

Study sites



Methods

Data

- 2 rounds of household survey including 373 hh
  1. before beneficiary identification, 2011
  2. after 2 years of production, 2014
- **200** hh considered for impact assessment from beneficiary and longlist households

Statistical comparison

- Comparison of sample means of treated and untreated samples at base-line and at the end-line by independent t-test.

Econometric analysis

Difference-in-Difference (DD) Approach

$$y_{it} = \alpha + \beta T_{it} * t + \tau T_{it} + \gamma t + \theta x_{it} + \varepsilon_{it} \text{ ..... (1)}$$

Where:
$i = household$,
$t = time\ period\ (t = 0\ for\ 2011\ and\ t = 1\ for\ 2014)$,
$y = the\ outcome\ variables$ (food consumption, income, assets) ,
$T = Treatment\ variable; T = 0\ for\ non\ participant\ and\ T = 1\ for\ participant)$
$x = other\ control\ variable$ (Includes: gender, age, education level, and dependence ratio, use of credit and farm diversity index).
$\tau = controls\ for\ initial\ differences\ between\ the\ two\ groups$
$\gamma = controls\ for\ trends\ over\ time$
$\beta = provides\ the\ estimate\ of\ Average\ Treamtent\ Effect\ (ATE).$
$\theta = controls\ for\ effect\ of\ household\ observable\ characteristics$

- Poisson regression for count outcomes: dietary diversity and frequency of dairy product consumption.
- Extended on DD model with propensity score weighted regression:

$$y_{it} = \alpha + \beta T_{it} * t + \tau T_{it} + \gamma t + \varepsilon_{it} \text{ ..... (2)}$$

Where : $E(\varepsilon_i | T_{i1}) = 0$,

$\hat{P}(X)$=propensity score, ATT is estimated with weights of 1 for treated observations and $\hat{P}(X)/(1 - \hat{P}(X))$ for controls.

Further reading

Jodlowski, M., Winter-nelson, A., & Baylis, K. (2016). Milk in the Data : Food Security Impacts from a Livestock Field Experiment in Zambia. *World Development*, *77*, 99–114. http://doi.org/10.1016/j.worlddev.2015.08.009.

Kafle, K., Winter-Nelson, A., & Goldsmith, P. (2016). Does 25 cents more per day make a difference? The impact of livestock transfer and development in rural Zambia. *Food Policy*, *63*, 62–72. http://doi.org/10.1016/j.foodpol.2016.07.001.

Masset E., Haddad L., Cornelius A. & Isaza-Castro J. (2012) Effectiveness of agricultural interventions that aim to improve nutritional status of children: systematic review. *British Medical Journal* **344**, d8222. doi:10.1136/bmj.d8222.

Results

Statistical comparison

- At base-line, children in treated households had higher food consumption scores than in control hh.
- At end line, children and adults in treated households had higher food consumption and dairy product consumption than in control hh.

Difference in Difference regression

Dairy goats increased:

- food consumption score of respondents by 20%.
- frequency of dairy product consumption of respondents and children by 100% and 67% respectively per week.

No impacts on diet diversity, income and assets detected.

Propensity score weighted regression

Dairy goats increased

- frequency of dairy product consumption of respondent by 2 times per week.

No impacts on diet diversity, income and assets detected

Conclusion

- Dairy goats introduced in households that rely on crop based diets improves dairy product consumption
- The pathway of dairy goat benefits is through direct milk consumption, and not through income.
- In the medium term there is no benefit to non-dairy goat keeping households
- The poorest are excluded because of inability to raise vulnerable pure-bred dairy goats
- Dual purpose goat breeds would require less maintenance and labour.

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