RETURN ON INVESTMENT OF SUSTAINABLE INTENSIFICATION PRACTICES IN MALAWI

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INTRODUCTION

Agricultural productivity growth has long been recognized as one of the most important and effective pathways through which agricultural research and development can increase rural income, improve food security, and reduce poverty. To this end, the Africa RISING (AR) program has been testing, validating, and promoting improved technologies through sustainable intensification (SI) to increase agricultural productivity, food production, nutrition security, as well as reduce poverty. Despite these achievements, evidence showing the impact of these research interventions on the return to investment (ROI) is lacking.

ROI is expressed as the ratio between net profit (or loss) from an investment and its associated cost:

$$ROI = \frac{\text{Profit}}{\text{Investment}}$$

SIAF-BASED BENEFITS

Table 1 shows farm revenues, production costs, and net farm revenues per year per farmer in US$ based on survey data from 2013 and 2019. The analysis is based on improved maize (IV), inorganic fertilizer (IF), and crop diversification (maize-legume intercropping, double-up legumes, and crop rotation) technologies. On average adopting all three SI technologies increases net revenue by 367%.

Table 1. Cost-benefit analysis of selected SI technologies (2013 and 2019)

Technology Package	Revenue (US$/year/farmer)	Production costs (US$/year/farmer)	Net revenue (US$/year/farmer)
Non-adopters	226	8	218
CD only	388	19	369
IV only or CD+IV only	568	37	531
IF only	583	68	515
CD + IF only	887	119	768
IV + IF only	816	145	671
CD + IV + IF	1240	224	1016

Note: The costs do not include family labor.

Fig.1a shows the estimated yearly net benefits between 2013 and 2019. Results show that benefits were quite low between 2013 and 2016, due to the technology validating scope in phase 1 of AR. In phase 2 (i.e., from 2016) further scaling activities were conducted leading to several farmers adopting the technologies, as witnessed in Fig. 1a. Fig. 1b shows total costs and benefits between 2013 and 2019. Results show that AR investments were profitable and efficient with an ROI of 340%.

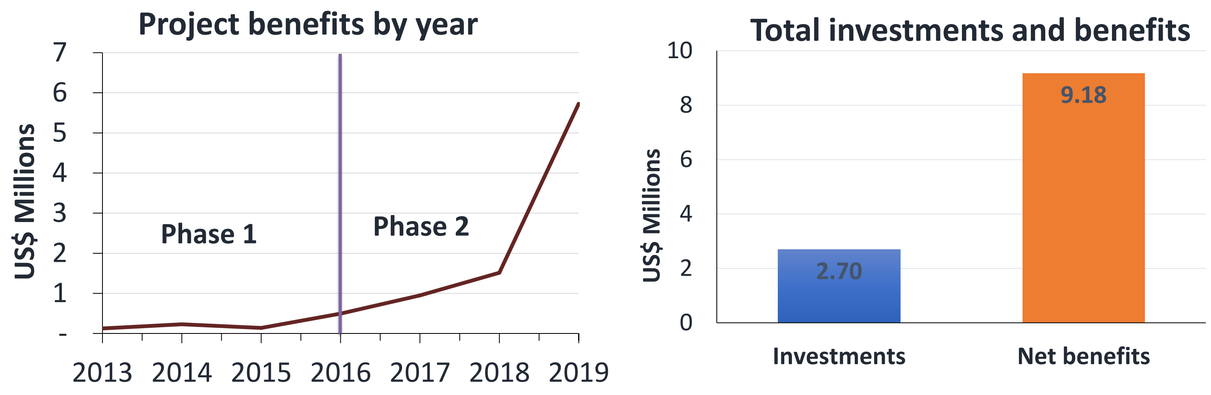

Fig.1. *Yearly project benefits (a) and total project investments and benefits (b).*

To account for the time when investment is made, the Net Present Value (NPV) was used to compute the flow of net benefits generated by the SI technology packages over six years (2013-2019). An investment is technically and economically feasible if the NPV is positive. Results in **Fig. 2** show that the NPV were positive.

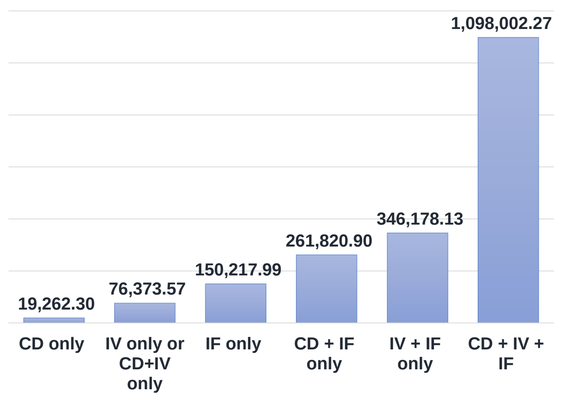

Fig. 2. Net benefits by technology package

SEX-SPECIFIC NET BENEFITS

Fig.3 shows the gender-disaggregated discounted benefits of the technology packages over the six years. Male farmers consistently benefited more across all the technology choices.

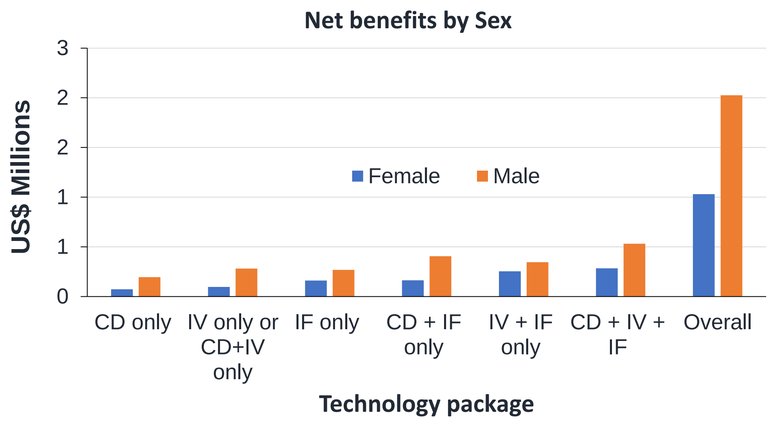

Fig 3. *Net benefits by technology and sex of the farmer.*

CHALLENGES AND GAPS

- ROI is data intensive as it requires accurate data on project investments and on the beneficiaries of the selected technologies.
- Results presented here are preliminary and will need to be refined after validation of the estimation procedure and data.
- Also, other technologies promoted under the AR project need to be accounted for in the future estimation of ROI.

DELIVERABLES

- A manuscript is currently being drafted.

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