Regreening Africa

COST-BENEFIT ANALYSIS OF SUSTAINABLE LAND MANAGEMENT INTERVENTIONS: EVIDENCE FROM SNNPR, ETHIOPIA

ELD THE ECONOMICS OF LAND DEGRADATION

STUDY CONTEXT

- Low crop productivity due to land degradation/LD
- LD caused by high human population growth, overgrazing, methods of production conducive to soil loss.
- To reverse LD, the SLM program had been implemented in the Barcha-Adado watershed (located in Gedeo zone) from 2011/12 to 2016/17.

OBJECTIVE

To assess the costs, benefits and returns of SLM practices

METHODOLOGY

- A quasi-experimental design
- Four micro watersheds were selected from treated and "control" sub-watersheds

Data

- **Survey of 231 farm households:** 154 from the treated site and 77 from the non-treated sites.
- **Cost of SLM data** from implementing agencies

Data analysis techniques

- **Analytical framework:** ELD "6+1" approach
- **Economic valuation of costs and benefits** of SLM measures implemented on cropland, and CBA
- **Costs:** establishment and maintenance costs of SWC per hectare
- **Three SLM practices have been selected:** soil bunds, fanyajuu bunds and fanyajuu bunds stabilized with vegetative measures/grass trips
- **SLM benefits considered:** impact on crop production
- **CBA from private/farmers perspective**
- **Appraisal criteria**
  - NPV, BCR
  - Discount rate: 7.3%
  - Projection of returns over the 2019-2046

Returns of SLM

- The **BCR of investments** in SLM practices is 5.16.
- The **mean return of SLM** was $1496 per hectare, or $56 ha-1 per year
- The **NPV is highest for fanyajuu bunds** ($3,632.5ha_1), followed by soil bunds ($3,433.5ha_1) and fanyajuu bunds stabilized with grass strips ($20.8ha_1).
- **Investments in SWC measures** have a positive financial return compared to business as usual scenario

Key results

- **Mean cost of SWC:** $171.1 per hectare
- **Costs varied by the type of SWC measure:** fanyajuu bunds stabilized with vegetative measures is the most expensive technology
- **Soil bund is the most affordable technology**
- **Crop productivity increased** by over 28% due to SLM, highest for farmers implementing soil bunds
- **Incremental crop revenue** ranges from a mean value of $19.5 for fanyajuu bunds stabilized with grass to $338.24 for fanyajuu bunds, and $344 per hectare for soil bunds

Key Recommendations

- Since actions against land degradation are ecologically effective and financially worthy, it is worthy to invest to conserve agricultural land from degradation.
- Need for scaling up investments in SLM measures: as SWC can contribute to enhanced crop productivity, addressing food insecurity and poverty and welfare of farmers
- Community participation is vital to scale up SLM practices among smallholder farmers

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