Enhancing dairy production and farm income through irrigated fodder adoption: Evidence from smallholder producers in Ethiopia

Sisay Getaneh[1,3] , Delelegne Abera[2] , Melkamu Bezabih[3] , Ermias Tesfaye Teferi[4]
[1]Amhara Agricultural Research Institute, Ethiopia
[2] Hawassa University, Agricultural Economics, Ethiopia
[3] International Livestock Research Institute (ILRI), Ethiopia
[4] The Alliance of Bioversity International & CIAT, Food Environment and Consumer Behaviour, Ethiopia
Contact: gesisay21@gmail.com

INTRODUCTION

- Inadequate and feed quality is hindrance to dairy production in Ethiopia.

- Integrating irrigated forage into a mixed farm can improve, milk production, farm profitability, address climate change challenges, and enhance soil fertility.

- Despite ongoing scaling efforts, evidence of actual milk yield and farm income gains remains scarce.

- Thus, this study aims to evaluate the impact of irrigated fodder cultivation on milk yield and farm income.

RESULTS

Table 1. Average Treatment effect on the Treated using PSM model

Outcome variables	Treated	Control	Difference	St. Error	t-value
Total farm income (ETB/year)	70233.9	61667.0	8566.96	4842.0	1.77*
Milk yield (Litters/days/cow)	6.24	3.70	2.54	0.62	5.28***
Dairy income (ETB/year)	11610.62	9382.20	2228.42	469.34	4.75**

Note: The bootstrapped se is obtained after 100 replications
 *, **, and ***, significant at 1%, 5%, and 10% probability levels
PSM= Propensity Score Matching Model

Table 2. Average treatment effects using the ESR model

Outcome variables	Category	Decision stage		Average treatment effect
		To adopt	Not to adopt	
Milk yield (Litters/days/cow)	ATT	(a) 5.10	(c) 2.23	(I)2.87***
	ATU	(d) 4.29	(b) 1.35	(II)2.94**
	HE	(e) 0.81	(f) 0.88	(III) -0.06
Dairy income (ETB/year)	ATT	(a)11,667.7	(c) 7,692.65	(I) 3,975.08***
	ATU	(d)12,472.8	(b) 9,428.46	(II)3,044.41***
	HE	(e) -805.15	(f) -1,735.81	(III) 930.67***
Total Farm income (ETB/year)	ATT	(a)73,015.2	(c) 62,588.04	(I)10,427.20**
	ATU	(d)90,545.3	(b) 54,550.75	(II)35,994.58**
	HE	(e)17,530.0	(f) 8,037.29	(III)-25,567***

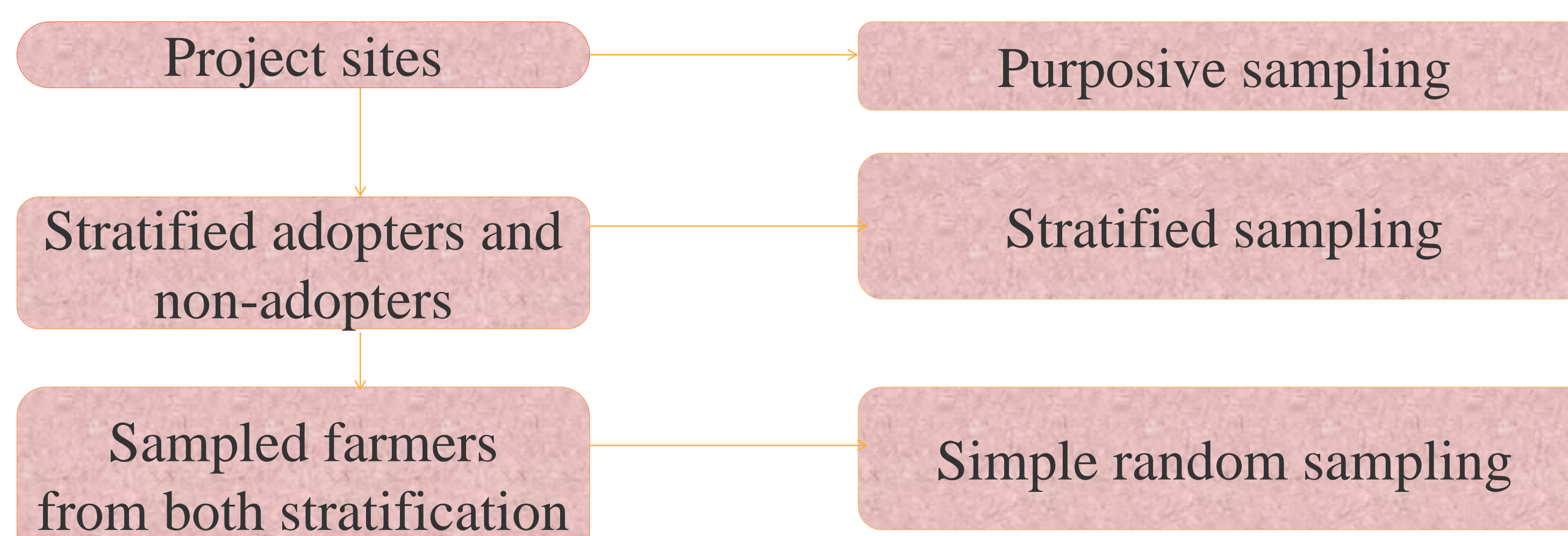Note: ***, 1% level of significance; ATT=Average treatment effect on treated; ATU=Average treatment effect on untreated Note: (I) = (a)-(c) (II) = (d)-(b) (III) = (e)-(f) HE =ATT-ATU ESR = Endogenous Switching regression Model

METHODOLOGY

- Sites:
   ✓ ILSSI project, 3 districts in Amhara and SNNP regions of Ethiopia
  .
- Sampling technique and procedure:

Project sites	Purposive sampling
Stratified adopters and non-adopters	Stratified sampling
Sampled farmers from both stratification	Simple random sampling

- Cross-sectional data on a total of 351 sample dairy producers (181 adopters and 170 non-adopters of irrigated fodder cultivation) were interviewed.

- ESRM and PSM techniques employed to address potential biases resulting from unobserved factors.

- Using both can strengthening the study's findings.

CONCLUSIONS

- Both PSM and ESR revealed that the irrigated fodder cultivation program has increased income and milk yield.

- The results inform long-term strategies to create enabling conditions to scale the technology widely.

- Therefore, a comprehensive and integrated strategy is needed for more widespread adoption and

- Ongoing capacity building, and follow-up extension support are required.

Acknowledgments