



Adoption of improved buffalo breed and its effect on milk productivity and household revenue

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Introduction

- ❑ Buffalo farming is vital for Nepal → contributes 8% to GDP and 12% to agricultural GDP (Singh et al., 2020; MoALD, 2023).
- ❑ There has been a notable increase in demand for milk and meat products, accompanied by a surge in imports.
- ❑ Most farmers still rely on local buffalo, which have poor
 - Productivity (878.79kg/year)
 - And Reproductive performance (Gorkhali et al., 2021)
- ❑ Improved breeds have great potential to boost meat and milk production.
- ❑ This research aims to identify drivers of improved buffalo breed adoptions and their association with milk productivity, per capita consumption, and household income.



Pic 1: Improved breed



Pic 2: Terai (local) breed

Methodology

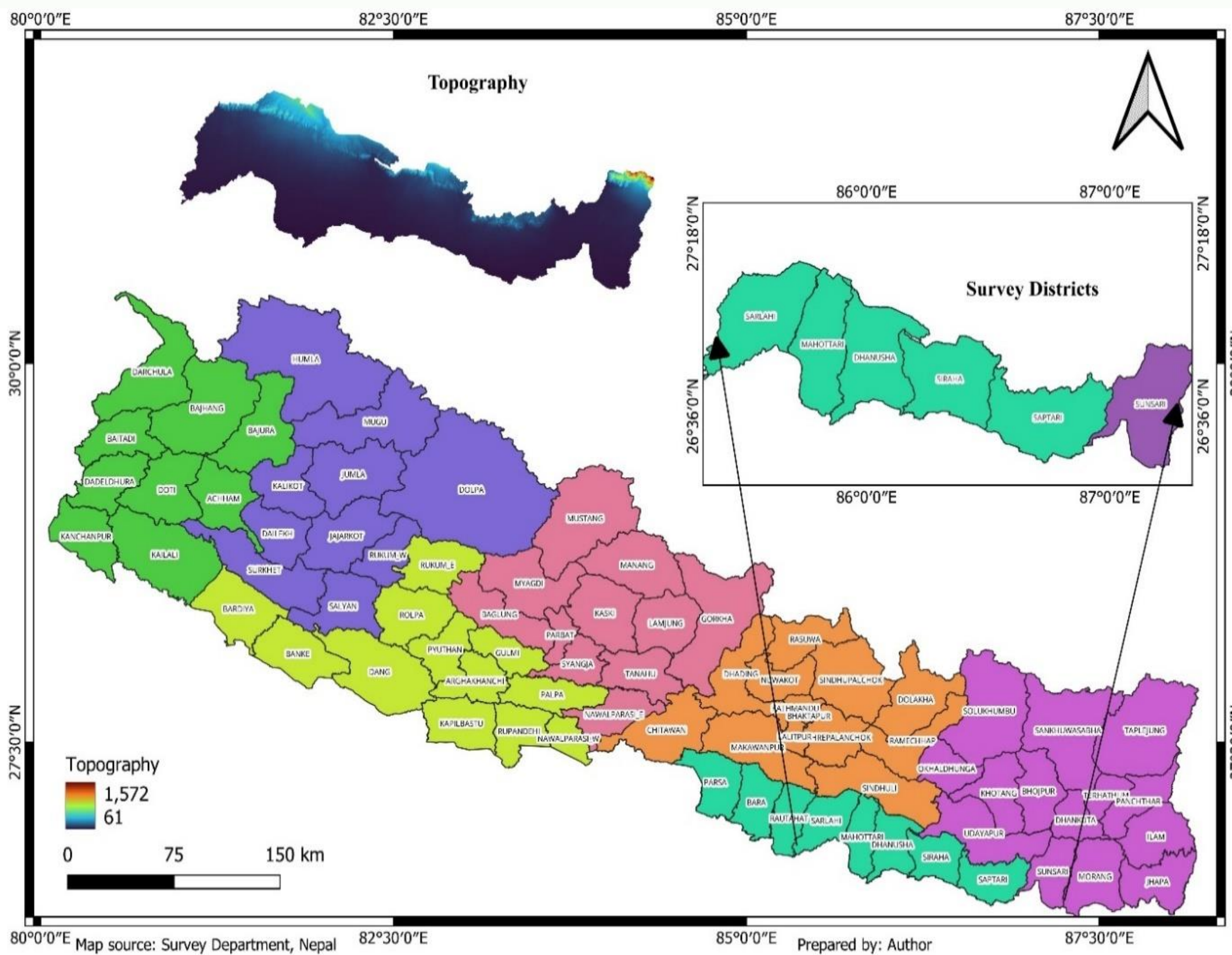


Figure 1: Map of Study Sites

- ❑ **Household survey:** A multistage purposive sampling (937 buffalo farmers from 27 cooperatives). Data collected in 2023
- ❑ **Analytical approach:** PSM integrated with probit regression

Results

Table 1: Factors affecting the adoption of improved buffalo breeds

SN	Variables	Coef.	St. Err.	t-value
1	Age in Years	.002	.004	0.46
2	Gender (Male =1 otherwise 0)	-.245	.153	-1.60
3	Economically Active Population	.023	.037	0.62
4	Dairy Farming experience	.006	.004	1.48
5	Income from off-farm activities	-.228	.102	-2.24**
6	wealth index (PPI)	.012	.005	2.60***
7	Livestock Ownership (Single ownership =1 joint ownership =0)	.318	.118	2.68***
8	Social Networks (Number of organizations involved)	.151	.055	2.76***
9	Subsidy received (Yes=1 otherwise=0)	.106	.136	0.78
10	Herd Size (Large =1 otherwise = 0)	.213	.106	2.01**
11	Access to vet service (Yes=1, No=0)	.491	.108	4.52***
12	Animal Morbidity in farm (Yes =1 No = 0)	-.262	.15	-1.75*
13	Napier Grass cultivation (Yes=1 No = 0)	.236	.111	2.13***
14	Feed Insufficiency in Farm (Yes =1 No = 0)	-.621	.171	-3.63***
15	Lack of pure breed in the locality (Yes=1 No=0)	-.774	.194	-4.00***
Variable of Interest				
16	Extension service (Receiving =1 Not receiving=0)	.663	.143	4.62***
Mean dependent var		0.210	SD	0.408
Pseudo r-squared		0.169	Obs	937

Table 2: Impact of Adoption of Improved Buffalo Breeds

Variable	Sample	T	C	T-C	S.E.	T stat
Milk Productivity in (Liters per day)	UM	6.53	5.61	0.92	0.14	6.42
	ATT	6.50	5.43	1.08	0.21	5.16***
Daily Per capita Consumption (Liters per day)	UM	0.29	0.26	0.03	0.013	2.51
	ATT	0.29	0.26	0.0268	0.0199	1.34
Annual income from Buffalo in NRs	UM	258263	217050	41213	8022	5.14
	ATT	255620	225295	30324	12651	2.4***

Main Result:

Farmers who have adopted improved buffalo breeds would experience a significant reduction in milk productivity if they had chosen to adopt local breeds instead. The estimated decrease in milk yield was 1.08 liters(20% low) per animal per day. Furthermore, this would result in a reduction of 26.8 ml in daily per capita milk consumption and a decrease of NRs 30,329 (13% low) in annual income.

Table 3: Sensitivity analysis

	Γ bounds	P value at sig+
Outcome 1	1.9-2.0	0.002-0.006
Outcome 3	1.2-1.3	0.04-0.11

Conclusion

- ❑ Improved buffalo breeds have the potential to significantly increase milk productivity and household income as compared to local breeds.
- ❑ Adoption of improved practices is positively associated with various forms of capital (household wealth, herd size) and technology use (e.g., improved fodder such as Napier grass, access to veterinary services, and availability of pure breeds in the community) and institutional factors, such as farmers' social networks and access to extension services.
- ❑ Main Barriers were feed shortages, animal morbidity, off-farm income, and lack of purebred animals in society.
- ❑ Policy insights: targeted extension services, improved feed systems, and structured breeding programs to enhance milk productivity in the country

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