



Are animal breeding technologies shifting gender norms? The case of Tanzanian small-scale dairy farming



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Introduction

The deployment of agricultural innovation focused on improved productivity and yield for food security in various African regions is on the rise. Dairy livestock production in Africa, of which Tanzania has the third-largest dairy cattle population, has witnessed the introduction of such innovations as artificial insemination, genomic predictions of crossbred dairy cattle, and digital dairy management and feedback systems. These technologies are supposed, in existing literature, as having direct, positive impact for intended users in areas of production increase and improved household nutrition. However, gaps remain, specifically around the unintended, often unseen, interactions between the innovation, the target environment and the adopter.

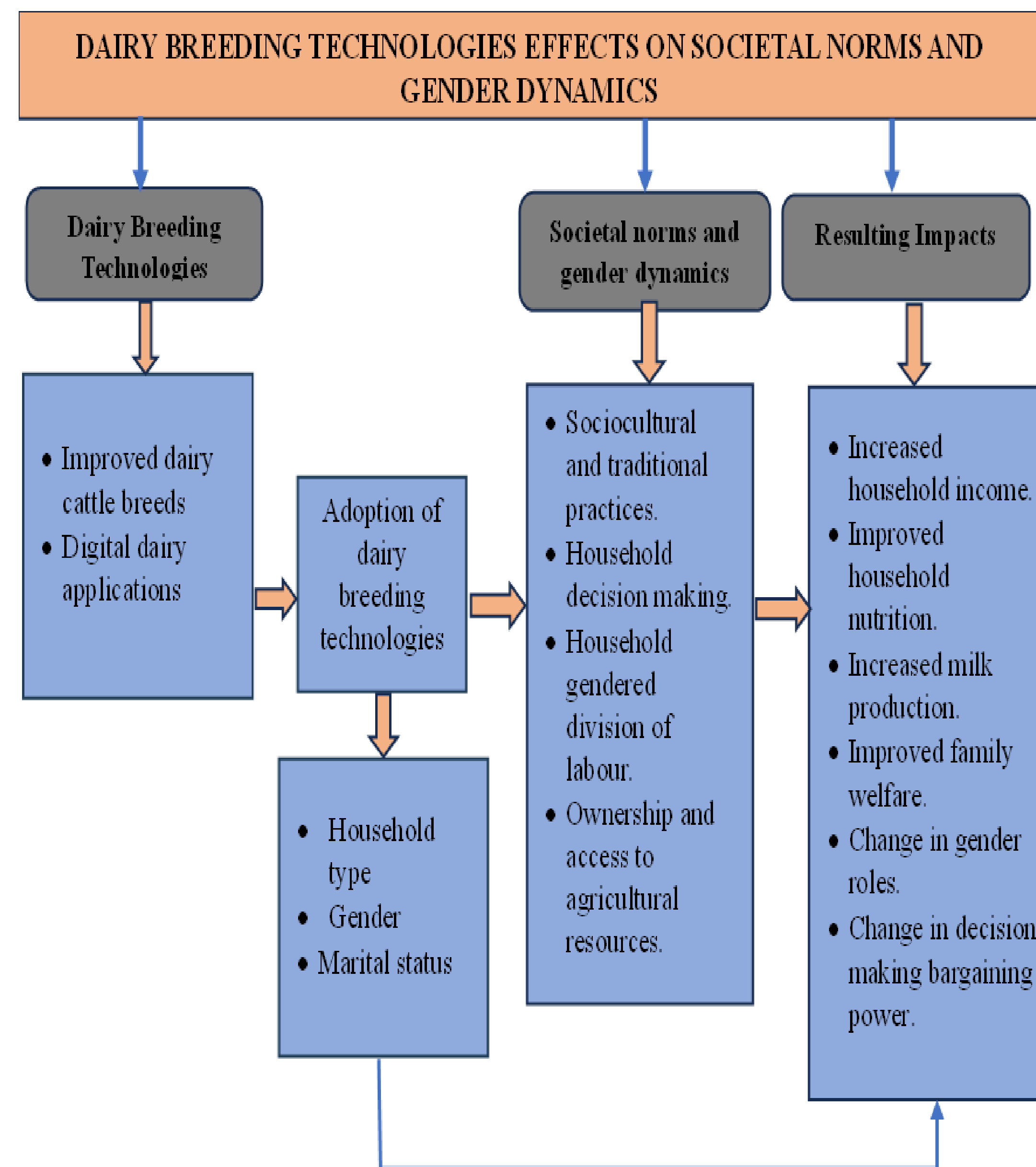


Figure 1: Conceptual Framework for exploring the implication of dairy cattle breeding technologies on societal norms and gender dynamics in Tanzania's small-scale farming and rural households.

Objectives

- Examine the gender norms and dynamics likely to affect the adoption of dairy cattle breeds and digital dairy applications.
- Identify existing gender constraints affecting the use of the improved dairy breeds and digital dairy applications.
- Explore how introducing improved dairy breeds and digital dairy applications influences intra-household gender dynamics.
- Identify the negative and positive impacts of adopting improved dairy breeding technologies.

Theoretical Framework

Based on the Actor-Network Theory, the study's theoretical framework is that;

- Technology (non-human actor) and humans (e.g., small-scale dairy farmer adopting the technology) are equal actors interacting within a network (composed of societal norms, gender dynamics, and persistent agricultural production), and producing distinct social processes from such interactions.

Materials and methods

- The adopted study approach is a gender-sensitive mixed method (quantitative and qualitative).
- Sampling combined a purposive approach for focus group discussions (FGDs) and key informant interviews (KIIs) with a random sampling approach for household surveys from group of interest (i.e., small-scale dairy farmers)
- A total of 180 respondents were recorded for household surveys, (90 male and 90 female farmers) aged between 18 and 65+ years, 80 respondents for FGDs (pictured on the right), and 6 key informants for KIIs.
- Quantitative data was analysed using SPSS, Stata and interpreted with Co-efficient of Variance (CV) and rate of change
- Qualitative data was coded using Max QDA, followed by content analysis.

Challenges in adopting dairy cattle	Freq-Female	Freq-Male	Freq-Total	Percent
No sale benefit	29	25	54	30
Benefit-sharing	2	2	4	2.2
Traits Problems				
Weight of cow	-	-	-	-
Height of cow	-	-	-	-
Lactation length of cow	-	1	1	0.6
Susceptibility to disease	28	32	60	33.3
Milk production capacity	1	-	1	0.6
Feed requirement problem	27	29	56	31.1
Cost Problems				
Time cost	32	32	64	35.6
Labour cost	15	15	30	16.7
Housing cost	7	11	18	10.
Feed cost	37	40	77	42.8
Vaccination cost	4	8	12	6.7
Veterinary cost	34	35	69	38.3
Management Problems				
Feeding	29	31	60	33.3
Watering	17	15	32	17.8
Health	10	13	23	12.8
Supervision	-	4	4	2.2

Figure 2: Frequency distribution of respondents' problems keeping improved dairy cattle

Challenges in adopting DDAs	Freq-Female	Freq-Male	Freq. Total	Percent
Cannot afford a phone	5	9	14	7.8
Cannot access services	-	1	1	.6
Charges attached to the services	-	1	1	.6
Restrictions to the use of phones	-	-	-	-
Phone illiteracy	1	-	1	.6

Figure 3: Frequency distribution of respondents' problems using digital dairy applications with female-specific constraints (determined qualitatively) highlighted in yellow



Figure 4: A Focus Group Discussion with Female Participants in the study area

Results

- Introduction and adoption of dairy breeding and digital technologies led to exchange of dairy farming roles among male and female dairy farmers as evidenced by the gender-based constraints in figures 2 & 3.
- Positive impacts of adoption include increased household income and nutrition; whereas negative impacts include loss of control over milk income by the women (who traditionally control said income) and significant time and resource cost to keep improved dairy breeds.
- The introduction of digital technologies for dairy management has negatively impacted household dynamics in that distractions (from frequent smartphone use) are now more common among spouses, affecting dairy management activities with increased cases of infidelity reported in adopting households.

Conclusions

- The adoption of improved dairy cattle breeds has altered the roles surrounding dairy cattle management in smallholder dairy farming households.
- Norms around milking, milk sales and income (normally carried out by women) and cattle sales (normally carried out by men) have been significantly reversed by the studied technologies.



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