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What drives dairy farm food safety practices in Bangladesh? Evidence from a PLS-SEM model

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I. INTRODUCTION

Milk production in Bangladesh has been growing in recent years along with the expansion of commercial dairy markets. However, the structure of dairy farming is still overall resource-poor, small-scale and has poor food safety practices result in rapid disease transmission among cows and contaminated marketable milk. Therefore, improved farm hygiene practices would be of great benefit for milk quality and safety in Bangladesh.

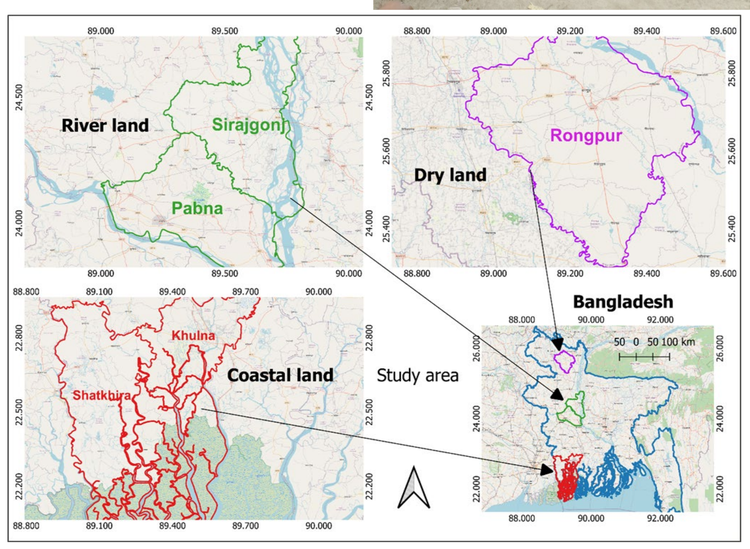
II. OBJECTIVE

The study will explore farm-level food safety practices by examining factors- inspection, resources, constraints and producers' pshychology.

Picture: Food safety at dairy farm

III. SURVEY

- Robust study area
- Market oriented dairy producers
- N=498
- March-June, 2023



Map: Survey area

IV. MODEL

Partial least squares structural equation modelling (PLS-SEM): latent variables are composed of the respective indicators (>3 items) measured in Likert and continuous scale.

1. Measurement model: factor loading (>0.70 & p<0.01); construct reliability and validity; and discriminant validity.
2. Structural model: collinearity statistics (VIF<3), standardised root mean square residual (SRMR=0.08).

Figure: PLS-SEM diagram (structural model)

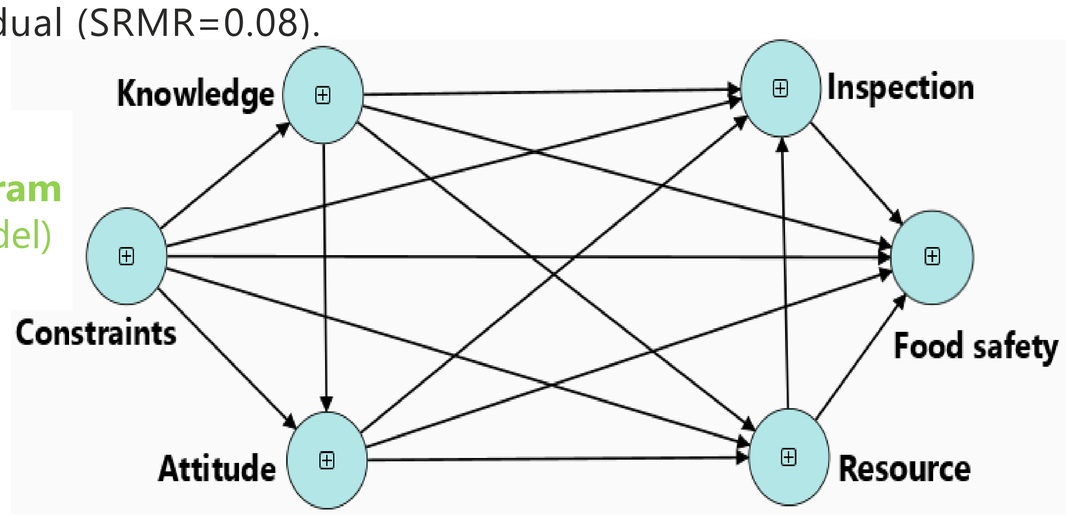


Table: PLS-SEM results after bootstrapping

H	Direct effect		Total effect	
	Knowledge			
H1	Constraints -> Knowledge	✓	Constraints -> Knowledge	✓
	Resource			
H2	Attitude -> Resource	x	Attitude -> Resource	x
H3	Constraints -> Resource	✓	Constraints -> Resource	✓
H4	Knowledge -> Resource	✓	Knowledge -> Resource	✓
	Inspection			
H5	Attitude -> Inspection	x	Attitude -> Inspection	x
H6	Constraints -> Inspection	✓	Constraints -> Inspection	✓
H7	Knowledge -> Inspection	✓	Knowledge -> Inspection	✓
H8	Resource -> Inspection	✓	Resource -> Inspection	✓
	Attitude			
H9	Constraints -> Attitude	✓	Constraints -> Attitude	✓
H10	Knowledge -> Attitude	✓	Knowledge -> Attitude	✓
	Food safety			
H11	Attitude -> Food safety	✓	Attitude -> Food safety	✓
H12	Constraints -> Food safety	x	Constraints -> Food safety	✓
H13	Inspection -> Food safety	x	Inspection -> Food safety	x
H14	Knowledge -> Food safety	✓	Knowledge -> Food safety	✓
H15	Resource -> Food safety	✓	Resource -> Food safety	✓

Note: H=hypothesis; tick-mark= accepted and cross-mark=rejected, red colour=negative coefficient

V. RESULTS

- Farmers' attitudes, knowledge, and farm resources were found to have a direct and significant impact on FS.
- In contrast, institutional inspections and constraints associated with the dairy market and cost factors exhibited minimal direct effects on FS.
- Furthermore, despite possessing substantial knowledge and positive attitudes, the presence of constraints diminished the effectiveness of these factors in improving FS.
- Additionally, the influence of farm resources on FS adoption was relatively limited.

VI. CONCLUSION

Enhancing farm resources, more frequent monitoring & inspection and addressing internal and external constraints, particularly those related to "poor dairy market conditions" and "additional costs for FS," will improve farm safety and hygiene standards in dairy farms in Bangladesh.

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