D4N 2025
Delivering for Nutrition in South Asia
Towards Impact at Scale
December 2, 2025

Information Asymmetry in Perishable Food Markets:

The Role of Principal–Agent Dynamics and Behavioral Market Failures

Presenter Name: Rakib Hossain PhD Fellow
Department/Division: Economics
Organization: Khulna University

Rationale & Nutrition Relevance

- Perishable food markets in Bangladesh suffer from high information asymmetry, where traders retain privileged price information and farmers sell with limited bargaining power.

  "Information asymmetry where one party in a transaction has more or better information than other is a pervasive source of market failure"

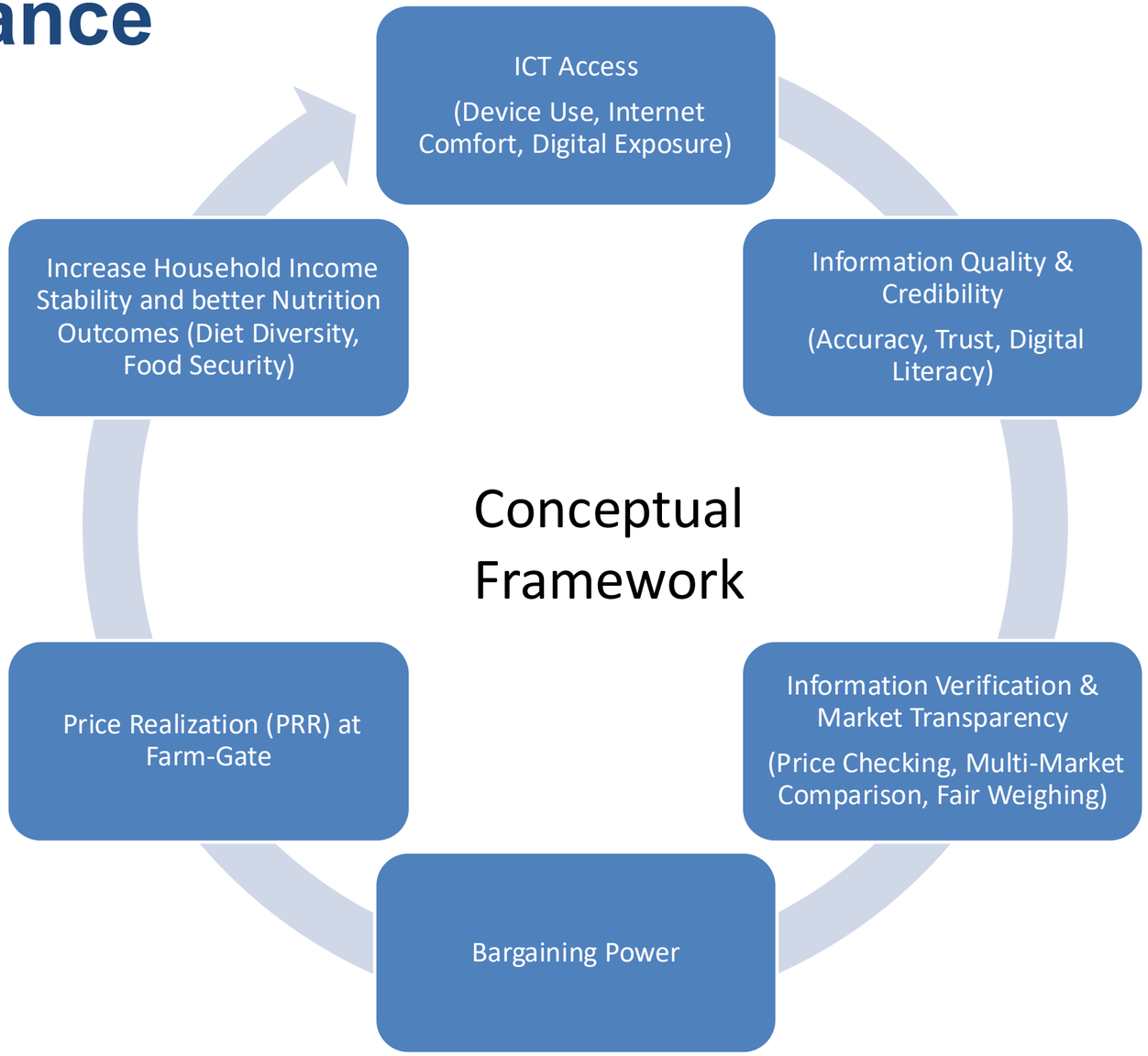
- This leads to systematically low farm-gate prices, weakening farmers' income and reducing their capacity to invest in diverse diets, health, and nutrition for their households.
- In low-income rural settings, improved income from fairer prices is strongly associated with:
  - better dietary diversity,
  - higher purchasing power for nutrient-rich foods, and
  - greater household food security.

Rationale & Nutrition Relevance

- Digital information access (e.g., price checking, trusted sources, peer verification) has the potential to disrupt information monopolies, improve price realization, and strengthen farmers' economic resilience—an essential determinant of nutritional wellbeing.
- Existing research has rarely examined how digital information ecosystems and market transparency jointly improve farmers' income pathways that influence nutrition outcomes.
- This study fills that gap by showing how digital information access and market transparency improve price realization, a key upstream driver of nutrition-sensitive agriculture.

Rationale & Nutrition Relevance

- Identify how digital information access (ICT use, trusted sources, information accuracy) shapes farmers' ability to access timely and reliable market information.
- Examine how information quality, peer verification, and market transparency influence farmers' bargaining behavior in perishable vegetable markets.
- Assess the combined impact of ICT access and market transparency on Price Realization Ratio (PRR) among smallholder vegetable farmers.
- Explore how improved price realization can strengthen household economic resilience and contribute to better nutrition outcomes through increased purchasing power and food security.



Methodology and Study Design

- Cross-sectional quantitative study grounded in Information Asymmetry Theory principal–agent dynamics and behavioral barriers.
- Focused on evaluating how digital information access & market transparency influence Price Realization Ratio (PRR) in vegetable markets.
- The Study applied descriptive statistics, Pearson correlations, and multiple regression models to quantify how ICT access and market transparency individually and jointly influence farmers' Price Realization Ratio (PRR)
- Difference-in-Differences (DiD) analysis to assess how real-time price information reduces information gaps and improves nutrition-sensitive outcomes.
- Multi-stage sampling across major vegetable-producing districts. District selection ensured variation in production zones and market structures.
- Sample size: N = 600 farmers, Random and systematic selection of smallholder vegetable farmers.
- Ensured representation of diverse farm sizes, experience levels, and market access conditions. Structured face-to-face questionnaire, administered by trained enumerators.
- Focus Group Discussions (FGDs) with farmers to explore behavioral barriers, trust, and habitual trader dependence.
- Key Informant Interviews (KIIs) with traders, brokers, and commission agents to capture principal–agent dynamics.

Results/findings

- Farmers receive only 76% of the true market price (PRR=0.76), significantly reducing their income and limiting their ability to purchase nutrient-rich foods.
- Even small increases in PRR translate into meaningful improvements in diet diversity, enabling families to buy more fish, milk, eggs, fruits, and vegetables.
- FGD Insight: Several farmers shared that when prices are good for a week, they add eggs or fish to meals, but remove them immediately when prices fall.
- Higher and more stable earnings reduce dependence on low-cost, low-diversity staples and strengthen household food security throughout the year.
- Improving market information and reducing information asymmetry therefore becomes a nutrition-sensitive intervention, not just an economic reform.

Results/findings

- Farmers who trust their information sources (β=.316) and perceive digital information as accurate (β =.307) consistently earn higher prices, improving their household purchasing power for nutrient-rich foods.
- Behavioral barriers such as trust bias, fear of losing the relationship, and low confidence in digital tools reduce farmers' willingness to negotiate. FGDs & KIIs show farmers constrained by loyalty obligations, credit dependency, and uncertainty over external price signals.
- Frequent market information checks (β=.510) give farmers the confidence to reject unfair offers, leading to better PRR and greater economic resilience.
- Cross-checking prices across multiple markets (β=.260) and believing weighing practices are fair (β =.193) strengthen bargaining behavior and reduce exploitation.
- When farmers gain higher PRR through ICT and transparency, the resulting increase in income directly improves diet diversity and reduces seasonal food insecurity.
- Farmers relying solely on habitual trader ties consistently accept lower prices, reinforcing principal–agent imbalance.
- When farmers achieve higher PRR through ICT and transparency, the resulting income increase improves diet diversity and reduces seasonal food insecurity.

Results/findings

- Improved PRR increases disposable income, enabling households to buy protein-rich and micronutrient-rich foods that are often unaffordable under current conditions.
- ICT strengthens decision-making and reduces uncertainty, helping families avoid the financial shocks that often cause temporary reductions in food quantity and quality.
- Transparent market practices especially fair weighing and multi-market price checks stabilize farmers' earnings, producing more consistent consumption patterns throughout the year.
- Together, ICT access, trusted information, and market transparency operate as nutrition-sensitive agricultural interventions, improving both income resilience and food security for smallholder households.

Implications for scaling and policy

- Strengthening digital literacy and building trusted, localized ICT price platforms can improve farmers' interpretation of accurate information, raising PRR and enabling better diet quality.
- Strengthening farmer cooperatives increases collective bargaining power, reduces trader dominance, and enhances income stability, supporting better household nutrition.
- Perishability forces farmers into quick, low-price sales. Investing in local storage and small-scale cold rooms allows farmers to delay sales, negotiate better, and improve PRR, enabling more consistent access to nutritious foods.
- Creating reliable, localized market dashboards and SMS alerts can reduce information asymmetry and strengthen household purchasing power for better diets.
- Encouraging price verification across multiple markets improves income resilience and nutrition security.
- Transparency measures reduce exploitation and ensure farmers retain more income to purchase nutrient-rich foods.
- ICT platforms can also deliver simple nutrition guidance linking market information with household food choices to promote improved dietary diversity alongside income gains.
- Farmers often rely on habitual traders due to behavioral barriers. Behavioral nudges such as reminders, peer-learning, and simple digital prompts can help shift them toward evidence-based decisions, improving both PRR and nutrition outcomes.
- Scaling requires stronger coordination between government agencies, agritech providers, farmer cooperatives, NGOs, local traders, and digital service platforms each contributing to reducing information gaps and reinforcing nutrition-sensitive market systems.

Conclusion & Key Takeaways

- Although most of the farmers own mobile phones, digital benefits emerge only when information is accurate and trusted. Trust and perceived accuracy are the strongest drivers of better price outcomes.
- Farmers who frequently check prices and verify across multiple markets consistently secure higher PRR, while fair weighing further improves outcomes. Transparency directly reduces exploitation.
- With an average PRR of 0.76, farmers earn only 76% of the true market price. Even small improvements in PRR significantly enhance income stability, an essential determinant of household diet diversity and food security.
- ICT access alone explains 22.2% of the variation in PRR, transparency adds 8.7%, and combined they explain 24.2% demonstrating a clear pathway from digital inclusion → improved earnings → stronger nutrition outcomes.
- Higher PRR increases farmers' ability to purchase nutrient-rich foods and maintain stable diets across seasons, highlighting that market fairness is also a nutrition intervention.

My participation was made possible through the generous support of the
Delivering for Nutrition 2025 Conference funders