

# Transforming Diets in Low-Income Communities:

## The Impact of Public-Private Partnerships and Nutrition-Sensitive Interventions in Assam's Tea Estates

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Workforce Nutrition

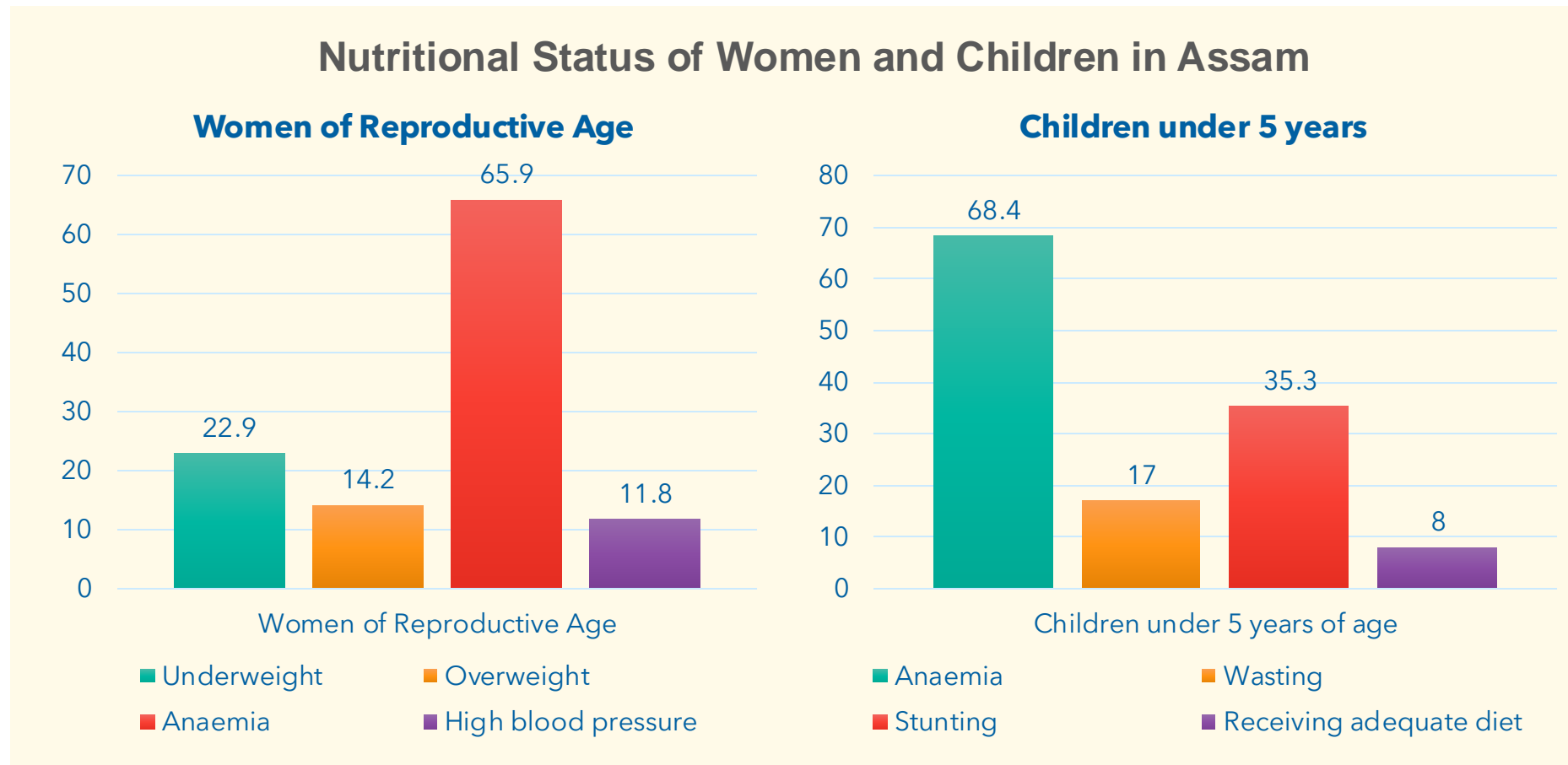
Global Alliance for Improved Nutrition (GAIN)

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# The Problem

The Indian tea industry is a major private employer, especially in Assam, where the tea sector provides over a million jobs, predominantly held by women (ages 26-45). Despite the industry's economic importance, severe nutrition challenges persist among tea workers and their families.



## Underlying Causes



According to **formative** research conducted by GAIN, the underlying causes for nutritional status are-

- Limited dietary knowledge, resource constraints, and systemic inequalities.
- High reliance on calorie-dense but nutrient-poor foods.
- Seasonal income fluctuations that increase food insecurity especially during non-harvest periods and natural calamities
- Affordability and accessibility to nutritious food

To address these challenges, the Global Alliance for Improved Nutrition (GAIN) in collaboration with Ethical Tea Partnership (ETP) and 7 tea leading companies initiated a **workforce nutrition programme in 110 tea estates covering 7 districts of Assam, India**. The programme was co-implemented by the Indian Tea Association, Ecociate Consultants Pvt Ltd and Dharmalife Foundation

### Programme Objective:

**To improve nutritional outcomes among tea workers and their families by:**

- Improving dietary diversity
- Improving consumption of targeted nutritious and healthy foods (fruits, vegetables and fortified oil)

### Two-prolonged approach was taken focusing on:

#### Demand Side:

**Behaviour change communication (BCC):** Increasing knowledge **and willingness to change** around **consumption of** nutritious and healthy diets

#### Supply Side:

**Improving access, availability and affordability of selected** nutritious and healthy **foods**

# Research Focus and Key Questions

Evaluation Conducted by: IPE Global Research Pvt. Ltd., Third-Party Evaluation Agency

## Objective of the study:

- Evaluate the success of the program in improving dietary habits of tea workers through increased consumption of local vegetables and fortified oils.

## Research Questions

### 1. Consumption Habits

- Has there been a change in tea workers' and families' consumption of fruits, vegetables, and fortified oils?
- Has this shift improved overall diet quality, measured by dietary diversity?

### 2. Knowledge & Awareness

- Have tea workers and their families gained knowledge and awareness about nutritious diets and healthy food choices?

### 3. Food Availability

- Has the availability of fruits, vegetables, and fortified oils on the estate improved due to the project's supply-side interventions?

## Program Approach

**Aim:** Improve demand, access and consumption of safe and nutritious foods

**Access**  
Sustainable market  
mechanisms

Door-to-Door Sales by  
Dharma Life Entrepreneurs

Sustainable Last Mile Delivery to  
Neighbourhood retail shops  
(Healthy Line Shops (HLS))

**Demand**  
Intensive Behaviour Change  
Campaign for nutrition

- Street Plays
- Cooking Demo
- Cooking Competitions
- Home visits
- School Games

**Reach: Over 160,000 workers in 110 estates covering 7 districts of Assam**

# Focused Behaviour Change Models

Delivery of 4 key messages through multiple activities

## Messages

1. Consume Balanced Diet
2. Consume Seasonal Fruits & Vegetables
3. Use fortified oil for cooking
4. Handwash with Soap\*

## Activities

### Community Engagement and Mobilization

- Street Plays
- Cooking Demo
- Cooking Competitions

### Targeted

- Home Visits for pregnant women and nursing mothers
- Nutri-Game for primary school children

The BCC model is **uniform** across all implementing partners – **Dharmalife, Indian Tea Association** and **ETP\***

\* Handwash model based on Unilever implemented in Dharmalife estates

## Improving availability through innovative access models

### Dharmalife Entrepreneurs (DLE)

Local Women Entrepreneurs – creating awareness and door to door sale of nutritious food products.

#### Local Women as Nutrition Champions

- Women aged 20-45 years from tea estates are selected and trained in sales and behavior change activities
- Known as "Nutrition Champions," - generate awareness of nutrition and hygiene and serve as access points for nutrition services.

#### Product basket included

- **Nutritious foods** - Fortified oil & Double fortified salt, Pulses, Soya chunks.
- **Other Products** – sanitary napkin, soaps, solar lights, induction cooktops, health drinks, etc.

### Healthy Line Shops (HLS)

Transforming neighbourhood retail shops into access point for nutritious food, known as Healthy Line Shops

Linking up selected shops with the aggregator/transporter at the supply hub.

Aggregator procures stocks from the wholesaler at supply hub

Aggregator delivers stocks of nutritious food at the retailer's doorstep. This was non-existent before.

Food demanded and purchased by tea workers and their families

Subsidization of transportation cost for moving stocks to the point of retail.

# Evaluation Methodology and Sample Selection

## Study Design-

**A Pre-Post Cross-Sectional Design (with Mixed Methods)** was used to measure the changes in the outcome & impact level indicators between the baseline & endline

### Sampling Strategy:

- **Quantitative Sample:** 990 tea workers from 66 clusters (using multi-stage sampling).
  - **Sampling Stages:**
    - 30 tea estates randomly selected from 36 participating estates.
    - Divisions selected within estates, totaling 66 divisions.
    - 15 worker households per division.
- **Qualitative Sample:** 20 Key Informant Interviews (KIIs) and 10 Focus Group Discussions (FGDs) with workers.

### Inclusion Criteria:

Female respondents were selected, who were:

- Age: 18-49 years
- Working status: Working as estate worker/farm worker/smallholder farmer, or her husband/other family member working as estate worker/farm worker/smallholder farmer
- Household Responsibility: Responsible for household food preparation & feeding

### Data Collection Locations

- **Regions:** 33 tea estates across Dibrugarh, Jorhat, Tezpur, and Tinsukia in Assam.
- **Survey Timeline:** Baseline survey (Feb-Mar 2021) and Endline survey (Mar-Apr 2023).

### Coverage

Coverage	Baseline	Endline
Total Clusters	66	57
Tea Workers	989	871
Focus Group Discussions – Workers	10	10
Key Informant Interviews – GAIN and Implementation partners	3	6
Key Informant Interviews – Tea Estate Staff	10	10
Key Informant Interviews – Retail shop owners	16	16



# Data Collection and Analysis

## Data Collection Methods

- **Household Surveys:** Quantitative data from female tea workers (ages 18-49) responsible for household food prep.
- **Monitoring Mechanisms:**
  - Weekly and monthly operational calls.
  - Customized monitoring app for real-time tracking of sales and behavior change activities in Healthy Line Shops.
  - Traditional methods, such as Excel sheets and stock registers, for capturing sales data.
- **Ethics:** Approved by the Sigma Institutional Review Board

## Data Analysis Techniques

- **Statistical Methods:**
  - Descriptive statistics for covariate analysis.
  - Chi-square tests for categorical variables and t-tests for dichotomous variables.
- **Propensity Score Matching:**
  - Logistic regression to match participants (1:1) between baseline and endline.
  - Quality check using likelihood ratio test and pseudo-R-squared comparison.
- **Outcome Metrics:**
  - Dietary diversity (Minimum Dietary Diversity for Women - MDD-W).
  - Food insecurity (Food Insecurity Experience Scale - FIES).

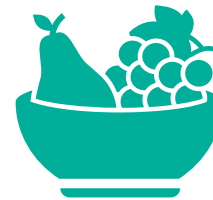
## Result of awareness and access (1/2)

### Key Outcomes and Impacts



#### Increased Consumption of Targeted Food Groups:

- **Fortified oil** consumption rose by **20%**.
- **Vitamin A-rich vegetables and fruits** consumption increased by **36%**.
- **Dark green leafy vegetables** consumption increased by **30%**.



#### Improvement in Dietary Diversity:

- Proportion of women meeting **minimum dietary diversity** rose by **28%**.
- **Average dietary diversity score** (DDS) increased from **4.5 to 5.9**, with notable increases in DGLVs, vitamin A-rich foods, dairy, and nuts.



#### Awareness and Availability:

- **Awareness of fortified oil** rose significantly (from **68.2% to 82.9%**).
- **Fortified oil availability** improved, with endline **availability at 96%**.

## Results of two access models (2/2)

### Success of Access Models

#### Healthy Line Shops (HLS):

Centralized hubs for nutritious food access and community interaction.

**Sales of nutritious items grew 8-fold;** contributed to increased household dietary diversity.

**Reached ~12,000 households** with a broad product range and steady availability of healthy foods.

#### Door-to-Door Sales by Dharmalife Entrepreneurs (DLE):

Provided direct access to nutritious foods and tailored recommendations to **6,942 Households**

3-fold increase in sales over the last six months, with fortified oil use increasing by 50%.

Generated livelihoods for **78 women entrepreneurs with an average income of INR 8,891 per month.**

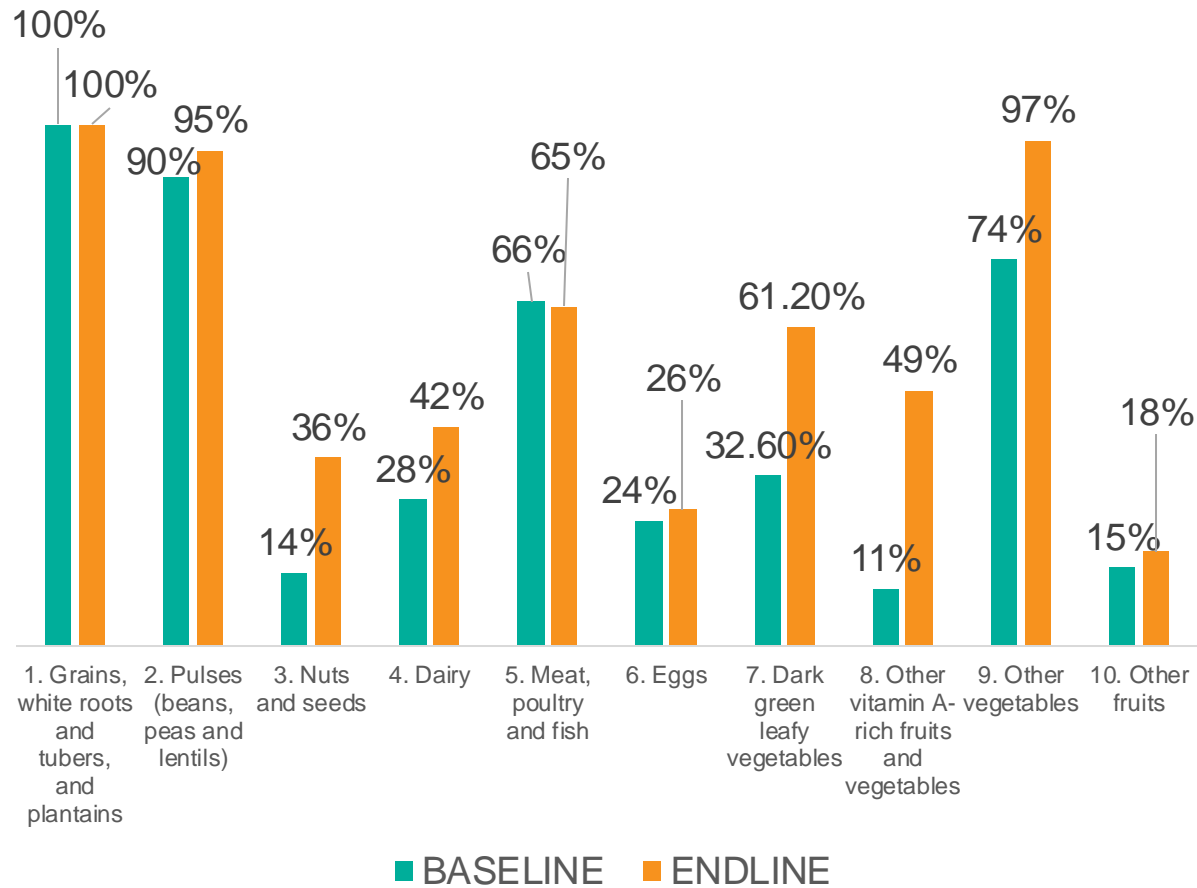
#### Comparative Effectiveness:

HLS reaches a larger audience, while DLE offers personalized engagement.

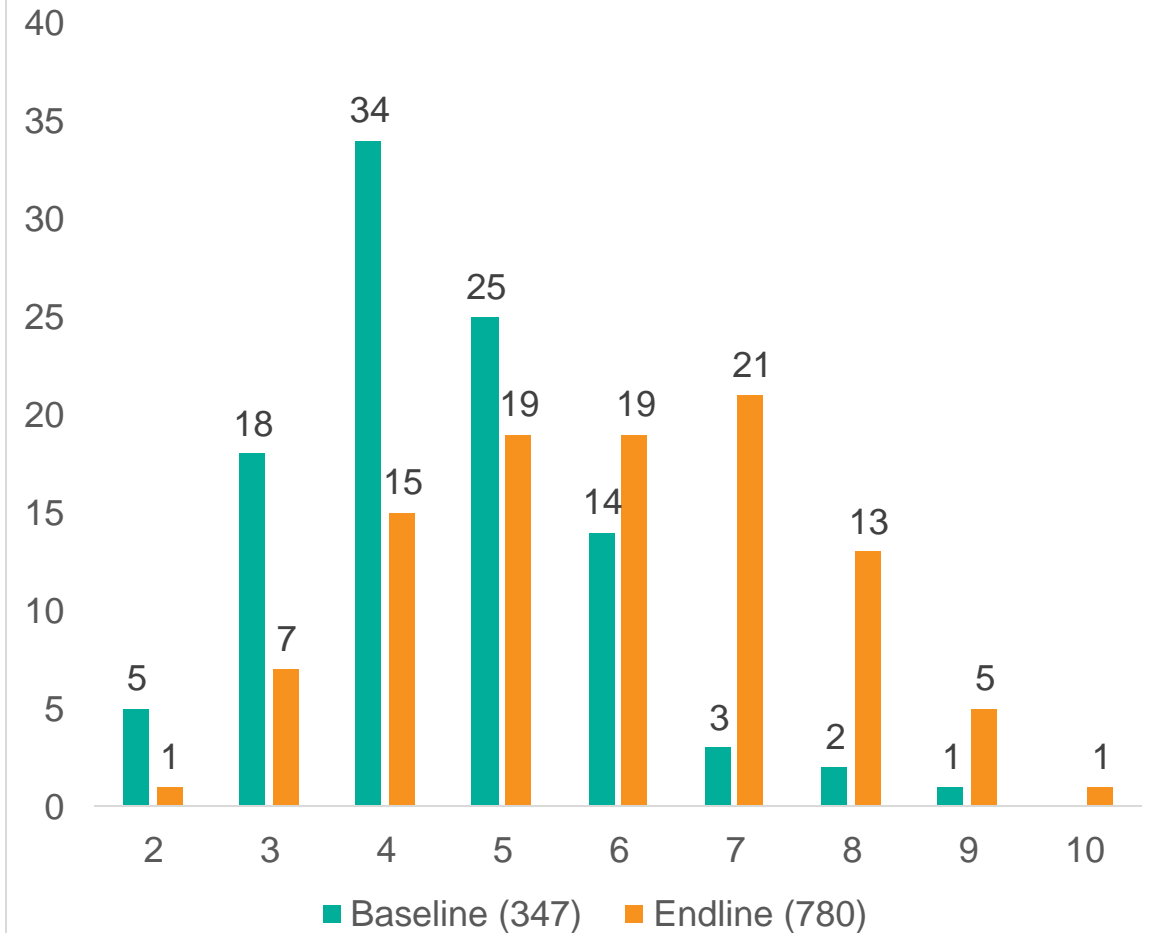
Both models successfully shifted consumer preferences toward healthier diets.

# Impact on Consumption

*Number of food groups consumed yesterday (out of ten groups)*



*Proportion of Food groups consumed yesterday*



## Recommendations for Scaling Up

Expansion to additional supply chains and regions	Integrating various access model for comprehensive coverage	Sustainability and Community Empowerment
Scale to other tea-growing regions, <b>adapting to local dietary needs and supply chains.</b>	Leverage <b>HLS for community-wide access</b> , utilizing <b>DLE</b> for targeted household-level engagement.	<b>Collaborate with local farmers</b> to strengthen supply chains.
Integrate <b>regionally available produce for affordability and diversity.</b>	Introduce <b>mobile HLS</b> units to enhance reach in <b>geographically dispersed communities.</b>	Include <b>income-generation activities</b> (e.g., micro-gardening) for added income and food security.
		<b>Invest</b> in capacity-building initiatives, <b>enabling local stakeholders</b> to sustain dietary improvements and nutrition education post-program

**The dual-model approach exemplified by combination of behaviour change activities in combination with supply side interventions demonstrates a scalable pathway for fostering improved dietary practices and advancing the nutritional well-being of tea communities, with implications for broader application across low-income, agricultural communities globally.**

**Thank you**

# Impact

## Consumption

(1) Improved consumption of targeted nutritious foods

**Consumption of Targeted Food Groups:**

- **Increase in fortified oil usage:** Overall (57.0% to 70.0%,  $p < 0.05$ ).
- **Significant increases in dark green leafy vegetables (DGLVs) and vitamin A-rich foods:**
  - Overall increase in DGLV consumption: +28.6%.
  - Vitamin A-rich foods: +45.6% in DLE model, +30.2% in HLS model.

**Dietary Diversity:**

- **Average Dietary Diversity Score (DDS):**
  - Increased from 4.52 to 5.90.
  - DLE: +1.5, HLS: +1.69.
- **Minimum Dietary Diversity for Women (MDD-W):**
  - **Increased by 30.1% overall** (from 47% to 78%).
  - DLE model: +46.8%, HLS model: +38.0%.

## Access

(2) Improved availability of targeted nutritious foods

**Access via HLS and DLE Models:**

- **Healthy Line Shops (HLS):**  
Sales of nutritious products grew from INR 166,759 to INR 2,427,457 (March 2022 - April 2023).
- **Door-to-Door Sales (DLE):**  
Sales increased from INR 250,787 (April 2023) to INR 693,531 (August 2023).

## Demand

(3) Improved understanding of the importance of a healthy diet

**Awareness of Nutritious Foods:**

- High baseline awareness (90%) about seasonal fruits and vegetables.
- Significant increase in awareness of fortified oil (from 68.2% to 82.9%,  $p < 0.05$ ).

**Sources of Information:**

- Key sources: Family (49.9%) and friends (71.3%).
- Program Interventions (by endline):
  - Cooking competitions (32.3%)
  - Cooking demonstrations (56.3%)
  - Home visits (54.8%).