

# Impact Story 13:

## Reducing post-harvest loss of tomatoes in Ethiopia: E-PLAN

### THE OPPORTUNITY

In recent years, Ethiopia has taken critical steps and made remarkable progress in addressing child malnutrition. Between 2005 and 2019, Ethiopia has reduced the prevalence of childhood stunting from 50% to 37% and the prevalence of wasting from 12% to 7%<sup>1</sup>. However, despite this significant progress, Ethiopia's malnutrition levels remain among the highest in the world<sup>2</sup>. A recent assessment of diets of young children in Ethiopia found moderate- or high-burden nutrient gaps for vitamin A, vitamin C, iron, zinc, iodine, folate, and calcium<sup>3</sup>. In particular, Vitamin A was found to be in low supply within Ethiopia's food system, likely contributing to low consumption among infants, young children and women of reproductive age. Deficiency in Vitamin A has severe consequences and can result in poor vision, night blindness, increased susceptibility to infections, and higher mortality<sup>4</sup>. Given that the country's population is expected to double between 2020 and 2050, it is critical that Ethiopia finds opportunities to increase the availability and accessibility of foods rich in Vitamin A intake to improve nutrition of their most vulnerable citizens<sup>5</sup>.



Ethiopia's per capita consumption is eight times lower than the average figure for East Africa (55 kg per person per year) and well below neighbouring countries (e.g., Sudan, at 79 kg per person, and Kenya at 55 kg per person)

(FAO. Postharvest Extension Bulletin. Issue: January – March 2019. Addis Ababa: FAO Office in Ethiopia; 2019.)

One way to increase the availability and accessibility of Vitamin A is by reducing post-harvest loss (PHL) of locally produced fruits and vegetables. PHL occurs when produce is damaged or spoiled along the supply chain between the farm and the market, such as during storage, processing, and transport. PHL contributes to a reduced supply of foods in the market, particularly nutritious foods that are more

susceptible to damage. In Ethiopia, PHL of tomatoes in Ethiopia is high. Approximately 20-35% of tomatoes produced are lost after production and before reaching the market. It was estimated that if PHL of tomatoes was reduced by just 25%, it would make enough Vitamin A available in the market to meet the nutrient needs of 20,000 pre-school children every day<sup>6</sup>.

Reducing PHL of tomatoes in Ethiopia can increase their availability and accessibility in the market and contribute to filling a critical nutrient gap for infants, young children, and women of reproductive age.

### THE SOLUTION

In 2018, GAIN expanded its Postharvest Loss Alliance for Nutrition (PLAN) program to Ethiopia with a focus on reducing loss of tomatoes. Working with local stakeholders, PLAN Ethiopia was designed with two key components:

- 1) **An Alliance** that brings together stakeholders from public and private sectors to work on PHL of tomatoes.
- 2) **Business to Business engagement** works with local businesses working in nutritious supply chains to provide hands on training and technical assistance that will lead to improved operational efficiencies, technology adoption and a reduction in postharvest loss.

After an in-depth landscape analysis and needs assessment, PLAN Ethiopia targeted the middle of the supply chain where a significant amount of loss was occurring during transport and distribution to the markets. Working through the Alliance with government officials, academics and local businesses, PLAN Ethiopia identified Reusable Plastic

1 UNICEF, WHO, World Bank. Levels and trends in child malnutrition: Key Findings of the 2020 Edition of the Joint Child Malnutrition Estimates

2 UNICEF, WHO, World Bank. Levels and trends in child malnutrition: Key Findings of the 2020 Edition of the Joint Child Malnutrition Estimates

3 GAIN, UNICEF. Comprehensive Nutrient Gap Assessment (CONGA): Findings for children 6–23 months in Ethiopia.

4 Sommer A. Vitamin A deficiency and its consequences: a field guide to detection and control

5 United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2019 Revision.

6 Dalberg Consulting. PLAN Ethiopia: Summary Note of Findings on Postharvest Loss in the Tomato, Mango and Papaya Value Chains.

Crates (RPCs) as a key technology for reducing PHL of tomatoes. RPCs have been proven to effectively reduce loss, especially compared to the wooden crates that are currently being used in Ethiopia. Unlike wooden crate, RPCs reduce PHL by eliminating overloading with better stackability and nestability, improved aeration, smoother sides and edges. RPCs also tend to be smaller, being easier to handle, load, and maintain. An FAO analysis estimated that the use of these crates in Ethiopia could eliminate 5-10 percentage-points of loss when compared to wooden crates that are currently being used<sup>7</sup>.



GAIN provided 19,000 units to PLAN alliance member businesses based on co-funding agreement signed with beneficiaries who themselves procured an additional 19,000 units of RPCs from their own funding source. Additionally, PLAN Ethiopia worked with the local agricultural university to create a specialized PHL training curriculum. This curriculum was used to conduct trainings focusing on benefits of improved postharvest management technologies and business management to 165 PLAN alliance member supply chain businesses and 26 respective government employees (sector leads, horticulture, postharvest management and marketing experts).

## THE IMPACT

**Reducing loss:** Working with tomato wholesalers based in Addis Ababa, PLAN Ethiopia estimated that the loss of tomatoes transported in wooden crates from Maki to Addis Ababa ranges between 15% – 20%. Over the same distance they estimate this proportion to be around 5% - 7% when they used the RPCs. This equates to a 50% - 75% reduction in loss when compared to wooden crates. In addition to loss prevention, wholesalers report that RPCs are also beneficial in extending the shelf life of produce<sup>8</sup>.

**Alliance building among stakeholders:** During its three years of implementation E-PLAN project effectively played a crucial role in catalysing coordination and integration among stakeholders for enhanced lesson and resources sharing. The Alliance platform allowed stakeholders to build trust and form effective partnerships between public and private actors. It encouraged capacity building among supply chain businesses leveraging local resources by working closely with Ethiopian universities, research institutions and professional societies.

**Policy influencing:** From the beginning, GAIN ensured that the E-PLAN project implementation and coordination was overseen by steering committee chaired by the Ethiopia's state Minister for Agricultural development sector. Additionally, E-PLAN was invited to contribute to the government's Food and Nutrition policy dialogues and workshops. This collaboration has helped influence the Ministry of Agriculture in adopting the E-PLAN approach of catalysing business to business engagement and initiating public private partnerships to reduce loss. In its "homegrown economic reform agenda" for agriculture sector, with input from the E-PLAN team, the Ministry of Agriculture has planned to leverage private sector investment for infrastructure and logistics required to minimize postharvest loss of nutritious foods and ease access to finance for private businesses to adopt RPCs.

### Broader benefits of RPCs

- " We incur a negligible loss when using RPCs to transport tomatoes from farm to our shop as compared to using wooden crates" – Wholesaler
- " Our tomatoes last longer without being spoiled when we use RPCs to store and transport our tomatoes" – Retailer
- " Using RPCs to transport tomatoes from farm to market would reduce the loss by 50% as compared to transporting with wooden crates" – PHL expert researcher
- " RPCs are beneficial compared to wooden crates to the farmers during trade as the measurement of the RPCs are standardized" – Manager of a farmers co-op
- " RPCs are more durable as compared to wooden crates and can be cleaned much more easily" – Manager of a traders association

7 Rapusas RS, Rolle RS. Management of reusable plastic crates in fresh produce supply chain [Internet]. Rome: Food and Agriculture Organization of the United Nations; 2009. Available from: <http://www.fao.org/3/i0930e/i0930e00.pdf>

8 Hosking, S Amin M, Zena Z, Yalch T, Nordhagen S. Business Models for Reducing Post-Harvest Loss of Fresh Vegetables: An Assessment of Reusable Plastic Crates in Ethiopia. Global Alliance for Improved Nutrition (GAIN). Working Paper #16. Geneva, Switzerland, 2021. DOI: <https://doi.org/10.36072/wp.16>