

Impact Story 20: Reducing Postharvest Losses in Fresh Fruits and Vegetables in Nigeria

THE OPPORTUNITY

In Nigeria, up to 50% of nutrient-rich fresh fruits and vegetables (FFVs) produced are lost or wasted, with nearly half of these losses occurring postharvest. These losses occur during harvesting, transportation, storage and processing. These losses are both qualitative and quantitative. Qualitative losses include loss in edibility, nutritional value, and consumer acceptability of the products. Quantitative losses are losses in quantity due to physical damage, insect attack, rodents, and micro-organisms.

The Postharvest Loss Alliance for Nutrition (PLAN) project identified three main factors as responsible for these large proportions of postharvest losses of FFVs:



a. Lack of cold chain storage during transportation



b. Lack of proper packaging/crating



c. Inadequate processing technologies/facilities

In addition to supply of safe and nutritious foods, food loss and waste contributes to greenhouse gas emissions and puts additional pressure on the planet's limited land and water resources. In 2014, a study reported that only 78% of the recommended daily intake of fruits and vegetables is available globally, 42% available in low-income regions, and 5% in the poorest countries².

THE SOLUTION

Following an extensive and consultative design process, GAIN came up with a set of core interventions to **address three major problems – poor coordination/communication** along the supply chains, **inadequate/lack of knowledge on best practices**, and **poor access to improved postharvest technologies**. The PLAN Nigeria project focused on tomato value chains and employed two models in its theory of change i.e. improving coordination among value chain actors through an **Alliance**, and building capacity and encouraging SMEs to adopt improved practices and technologies through **Business-to-Business (B2B)** mentorship. **The Alliance** convened actors and stakeholders around reducing postharvest loss and waste for collective impact while the **B2B Engine** enabled exchange of technology and expertise in cold chain, packaging and crating, and food processing. PLAN fostered adoption of new innovations in post-harvest loss reduction technology, including renewable energy (100% solar) for powering cold room units of 10-ton storage and 3-ton storage capacities for agribusinesses in different locations in Nigeria. In the installation of the 100% solar-powered (Off-Grid) cold room units, all the insulation panels used were sourced from local manufacturers in Nigeria, building local production capacity. A Zero Energy Cooling Chamber (ZECC), an evaporative cooling system for demonstration and research, was built in partnership with the Nigerian government at the Kano Station of the Nigerian Stored Products Research Institute (NSPRI), which has a national mandate for developing postharvest technologies. Further, a modelling of the return of investments of the different technologies promoted through the project provided insights into their profitability (2) for interested and/or potential investors.

1 Bolarin, F. M and S.O. Bosa 2015.2Post Harvest Losses: A Dilemma in Ensuring Food Security in Nigeria. Journal of Natural Sciences Research, Vol 5(7): 151-154

2 http://news.emory.edu/stories/2014/08/study_shows_more_fruits_vegetables_needed/index.html



THE IMPACT

The PLAN project created a multi-sectoral alliance with over 230 members from across the tomato supply chain comprising private sector actors such as traders, growers, aggregators, distributors, processors, transporters, cold room manufacturers, third party cold chain logistics companies, as well as government representatives, financial institutions, professional and trade associations, research and academia. It provided over 30 capacity-building opportunities, allowing stakeholders to adopt technologies such as solar powered cold storage units, reusable plastic crates (RPCs), best postharvest handling practices, and processing into valued-added food products. Over 1,400 supply chain actors were trained on postharvest management technologies, including food safety.

The project also linked actors from different sectors who would otherwise remain unconnected, helping to forge business partnerships and greater adoption of innovations across the supply chain. PLAN co-invested in 17,000 reusable plastic crates (RPCs), and influenced the purchase and deployment of over 120,000 units. An independent assessment revealed that some PLAN Nigeria members saw a reduction in post-harvest losses of tomatoes from 35-40% to below 10% after adopting RPCs. Today, the use of RPCs in traditional food markets has grown exponentially, especially at major markets in big demand centres such as the Mile 12 International Market in Lagos, Nigeria's largest wet market for FFVs. It also implemented 15 formal B2B mentorships and helped to facilitate over 50 business member connections which helped to improve coordination and efficiency across the tomato supply chain. As at today, the linkages built have been leveraged for several other business transactions between members, for local, regional, and international trade.. Some of the SMEs mentored and/or trained have sustained their cold chain logistic businesses, which provided support in the movement of critically needed vaccine supplies in Nigeria to different locations for mitigating the Covid-19 pandemic.

A key outcome of the PLAN Nigeria project was the creation of a private sector led business association focused on developing the cold chain industry in Nigeria and West Africa. The Organization for Technology Advancement of Cold Chain in West Africa (OTACCWA) was registered in Nigeria in 2018 and organized first ever West Africa Cold Chain Summit and Exhibition (WACCSE 2018) while the 2nd WACCSE was also held before the project ended in December 2019. Post-PLAN, in terms of sustainability, growth and its development, OTACCWA became a global affiliate partner of the Global Cold Chain Alliance (GCCA) in February 2020; organized several cold chain development events including the 3rd & 4th WACCSE and is planning to host her 5th WACCSE in March 2023. Overall, the cold chain industry has received impetus through activities of OTACCWA since its formation in 2018.



“ My losses were around 40% but since using [the solar-powered cold room] my losses are close to zero. My income has also increased by about 40%, as I have more to sell and I can sell it at a higher price because it is better quality. I used to sell at around 600N/KG but it is now 800-850N/ KG, or 1000N/KG in the scarce season.”

Greenhouse tomato grower and distributor

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