



Strengthening the business links in Nigeria's cold chain

The development of an effective farm to market cold chain is vital to increase the availability and affordability of safe, nutritious food for low-income Nigerians

In Nigeria, 40–50% of fresh fruits and vegetables are lost during crating, transportation, storage and processing. In the tomato sector, for instance, it is estimated that more than 40% of tomato production does not reach consumers.¹

One of the main reasons for this massive waste is the lack of a temperature-controlled supply chain—known as cold chain—which prevents fresh foods from spoiling between farm and market. Tomatoes, for example, must travel long distances as they are largely grown in the north of the country, but mostly consumed in urban centres in the south.

Global Alliance for Improved Nutrition (GAIN) is concerned about food loss and waste because nutritious foods are often the most perishable. Keeping fresh fruit and vegetables at the right temperature and safely stored not only extends shelf life, it also improves food safety as exposure to contaminants like dirt and bacteria is reduced. The problem of loss due

GAIN Insight

Bringing together small businesses to learn from each other, co-develop innovative solutions and speak with one voice has helped to spur the development of Nigeria's cold chain infrastructure, which is key to making perishable, nutritious foods more available and affordable.

to the absence of cold chain extends beyond fresh agricultural produce to include dairy, sea food and poultry, and even pharmaceutical products like vaccines.

Food loss on this scale has significant nutrition and economic consequences. In Nigeria, 32% of Nigeria's children are classified as stunted and 2 million children suffer from severe acute malnutrition². Fresh vegetables like tomatoes are a rich potential source of several micro-nutrients essential for a healthy diet, but only if they are readily available and affordable for local populations, especially those on low incomes.

Food loss also harms livelihoods and the local economy. All along the supply chain, food handling inefficiencies lead to lost income for small businesses. By the same token, extending the life of perishable foods through cold chain means farmers and traders can sell more output over a longer time period and achieve a higher price for better quality produce.

Increased, more predictable supply ultimately means more stable prices for consumers and potentially lower prices over the longer-term.

¹ Nigeria Analysis by Dalberg for GAIN

² UNICEF



The combination of a fragmented landscape of players and the complex nature of the challenge facing small businesses has resulted in a lack of cooperation among supply chain actors and no joined up, comprehensive approach to developing a commercially viable, farm to market cold chain solution.

Developing cold chain infrastructure is a complex, systemic challenge

In Nigeria, the fresh produce value chain beyond the farm gate is highly fragmented, comprising thousands of small businesses engaged in crating, transportation, storage and distribution. In the tomato sector, for example, most output is produced by small-scale farmers, who supply a vast network of small aggregators and traders, who either sell directly to informal market sellers or to wholesalers.

With very few large company players involved in agri-food transportation and storage and with little public funding, cold chain infrastructure investment has been limited beyond the larger supermarket groups serving wealthier Nigerians. Even Nigeria's Mile 12 market, the largest open-air food market in West Africa, has no cold storage facilities.

Several challenges hold back small and medium-sized aggregators and traders from investing in cold chain solutions. They lack access to finance and local banks are unwilling to lend to firms with limited collateral and uncertain prospects. The regulatory environment around cold chain, including food safety standards, is unclear and complex. Many small businesses lack awareness and understanding of the benefits of cold chain, and crucially access to effective, affordable cold chain solutions.

On the cold chain solutions side, Nigeria is seeing an upspring of ag-tech entrepreneurs and universities bringing innovative, lower cost supply chain solutions to market. For example, Cold Hubs and Alex Ltd,

with grants provided by PLAN (see next page) have developed proof of concept cold chain storage and refrigerated truck solutions. These innovative technologies enable farmers and aggregators to lease solar and diesel powered cold storage space and refrigerated trucks on flexible terms, and at low cost.

These entrepreneurs too face difficulties in scaling up their cold chain solutions. There is a lack of available local technological capability and components. They also find it hard to access commercial finance. This is compounded by a lack of public investment in cold chain infrastructure, which could have a catalysing effect on private investment. And, as with all entrepreneurs, they can struggle to find market opportunities and acquire the necessary technical and management skills.

The combination of this fragmented landscape of players and the complex range of challenges facing them has resulted in a lack of a coordinated approach to developing a commercially viable and scalable, farm to market cold chain solution. The result is that efforts to develop cold chain in the agri-food sector have largely remained small scale, and food loss remains a major barrier to increasing access to safe and affordable nutritious food and to improving livelihoods.

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PLAN Nigeria has played a key role in driving the expansion of cold chain by bringing together small businesses from different sectors to learn from each other and to work together

Recognising that complex, multi-dimensional challenges like post-harvest loss cannot be tackled in siloes, GAIN, with support from USAID, created PLAN Nigeria in 2015 to reduce post-harvest loss of nutritious foods. PLAN Nigeria sought to transform a fragmented, un-coordinated set of stakeholders into a cohesive and coordinated network, aligned around the shared goal of reducing post-harvest loss in the tomato value chain. These stakeholders include traders, growers, aggregators, distributors, local and federal government representatives, banks, cold chain entrepreneurs, plastic crate manufacturers, food processors and universities.

Brought together through the PLAN platform, a group of small businesses subsequently saw the need and opportunity for a business-led, industry platform to drive the development of cold chain infrastructure and capacity in Nigeria. With on-going support from PLAN Nigeria, in June 2018, these businesses formed the Organisation for the Technical Advancement of Cold Chain in West Africa (OTACCWA), which now has over a hundred paying industry and institutional members.

OTACCWA's mission is to bring together different industry sectors participating in cold chain around the shared goal of reducing post-harvest loss by improving the quantity, quality, efficiency and value of the cold chain supply system. It does this by facilitating collaboration, capacity building, education and innovation among its business members at the national and regional level.

Since its formation, OTACCWA has provided a platform for peer learning and exchange between businesses and stakeholders to foster the development of cold chain innovations and to build technical

“ 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%. ”

—GREENHOUSE TOMATO GROWER AND DISTRIBUTOR

Postharvest Loss Alliance for Nutrition (PLAN)

A GAIN initiative, PLAN's goal is to reduce post-harvest loss along nutritious food value chains, thereby increasing availability and affordability of safe, nutritious foods for low income populations. PLAN's solutions to reducing post-harvest loss lie in three areas: development of farm to market cold chains; effective crating and handling during transportation and storage; and improved food processing techniques. Across these three areas, central to PLAN's approach is to convene and empower agri-food SMEs and other stakeholders to act collectively.

knowledge and management know-how through regular training and capacity building events. It has established relationships with international expert organisations like the Global Cold Chain Alliance and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), which have enabled technology transfer, and co-hosted large-scale events including a regional Cold Chain Summit and Exhibition in 2018 and 2019.

OTACCWA also facilitates deal-making and commercial relationships between companies, joining up demand for cold chain solutions with supply, and helping to drive the wider expansion of the cold chain sector.

Critically, OTACCWA has also enabled the industry to speak with one unified voice to government, helping to more clearly define the role of business in supporting the country's food and nutrition security goals and shaping policy frameworks that support the development of the cold chain sector. As a result, OTACCWA now contributes to the government's Inter-Ministerial Committee on Agriculture and Nutrition.

“ Members have been able to tap into knowledge about anything – preserving food, handling, PHL, and it's all creating awareness and change. ”

—A TRAINING PARTICIPANT





The emphasis of PLAN is on cultivating system level collaboration and action through large networks and business alliances along the length and breadth of the agri-food value chain, with the goal of driving impact and systemic change at scale.

OTACCWA highlights the role for convening organisations like GAIN and the opportunity to cultivate industry-led collective action to drive food system transformation

Although still in its infancy, OTACCWA highlights the power of enabling industry-led, collective action to find solutions to the multiple, complex challenges that have hindered the development of the cold chain system in Nigeria and subsequent progress in reducing post-harvest loss.

GAIN is also implementing the PLAN project to drive this same sector-level approach to tackling post-harvest loss in Ethiopia and Indonesia. In each case, the emphasis is on cultivating system level collaboration and action through large networks and business alliances along the length and breadth of the agri-food value chain, with the goal of driving impact and systemic change at scale.

The value of such an approach lies in increasing the scope for long-term impact by addressing complex root-cause issues like access to finance and skills and

the regulatory environment, in a coordinated way, rather than through piecemeal, incremental action at an individual company level. At the same time, empowering businesses to develop solutions from the bottom up, ensures that they are relevant to specific sector contexts and local actors are fully invested in their success.

Finally, by facilitating business-led collaboration, the resulting solutions are more financially sustainable and scalable.

The success of PLAN and OTACCWA highlights the key role of convening organisations like GAIN, which coordinates and manages PLAN, in fostering system level collaboration and aligning businesses in support of local food and nutrition priorities.

By helping to nurture platforms like OTACCWA through the PLAN project, GAIN is taking on the role of “system leader” in Nigeria’s agri-food system. GAIN is empowering local businesses to work together with other stakeholders to tackle the systemic issues that have prevented investment in the development of cold chain infrastructure, which is critical to ending post-harvest loss in the country and ensuring safe, nutritious food is more available and affordable to Nigerians.