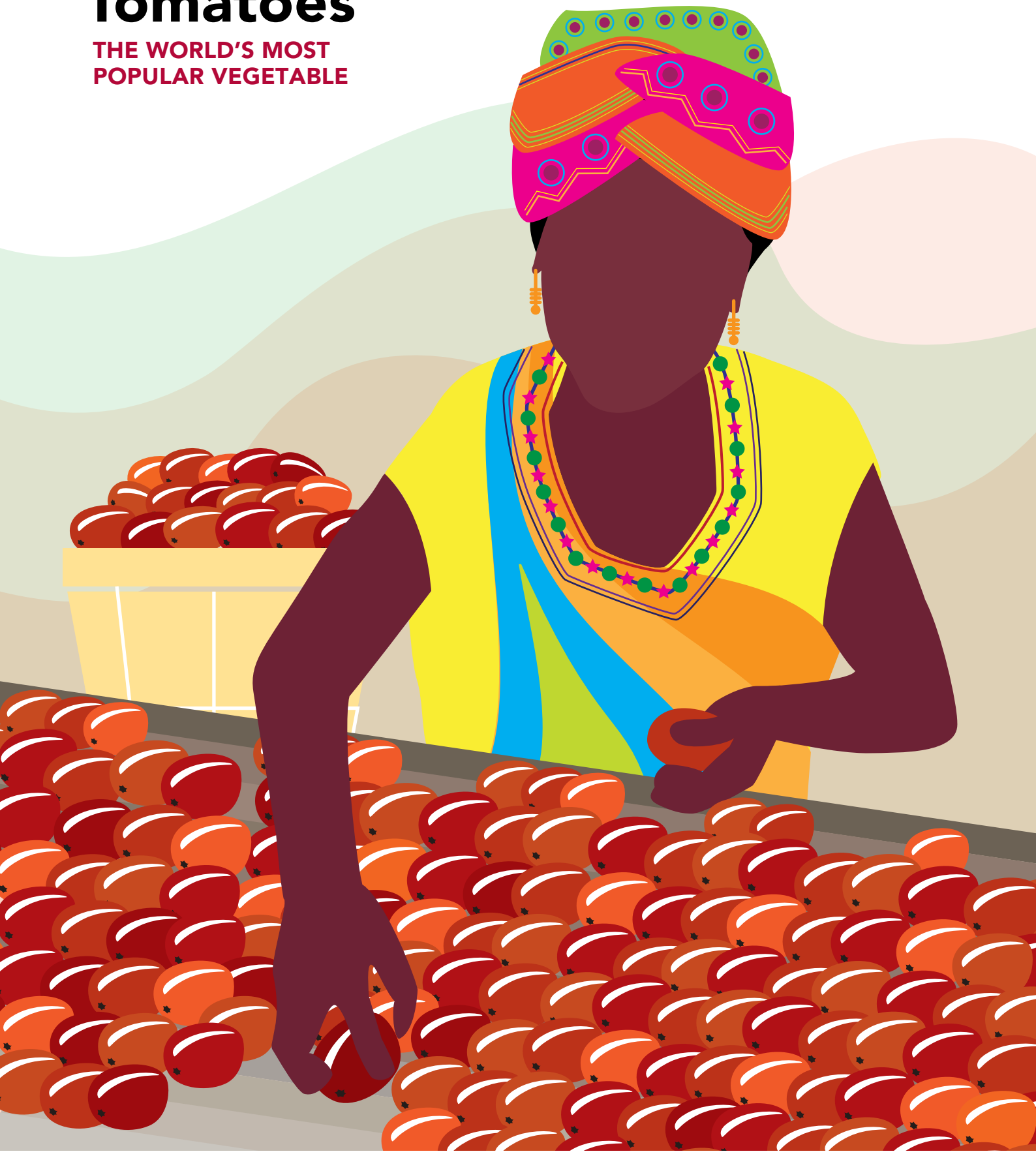
Tomatoes

THE WORLD'S MOST POPULAR VEGETABLE



Advocacy Brief

gain
Global Alliance for Improved Nutrition

Key facts

Tomato—is it a fruit or a vegetable? Botanically, tomatoes are fruits. In a culinary sense, however, tomatoes are considered vegetables owing to their savoury flavor.

- Fruits and vegetables are essential components of a healthy diet. They provide a good source of fibre, vitamins and minerals, and help prevent deficiencies.

- Research shows that fruits and vegetables protect us against a range of diseases, such as coronary heart disease[1].

- Tomatoes are bursting with vitamins and antioxidants including vitamins C and E, lycopene, ßcarotene, lutein and flavonoids such as quercetin[2].

Tomato Composition[3,4,5,6*]

Lycopene

(a naturally occuring carotenoid) which gives tomatoes their red colour. Lycopene becomes more available to the body when tomatoes are cooked.

Vitamin K

(a fat-soluble vitamin) Vitamin K is needed for blood clotting and helps wound healing.

Vitamin C

The body can't store this water-water soluble vitamin, so consuming it through our diet is essential for healthy skin, blood vessels and wound healing.

ß-CAROTENE

B-carotene (carotenoid found in tomatoes and has anti-oxidant properties against heart disease, cancer and stroke.

Vitamin B9

(also known as folate) Helps repair cells and is essential in the formation of DNA.

An adequate production, transportation and consumption of tomatoes contributes to most of the Sustainable Development Goals (SDGs)

Introduction

Tomato supply around the world

Tomatoes are the world's most popular vegetable. With some 182M tonnes produced globally in 2017, it represents 17% of all vegetables produced, ahead of the next most popular – onions, which come in at 9% (Figure 2).

In countries where the Global Alliance for Improved Nutrition (GAIN) main offices are located, tomatoes vary in abundance - with the average supply from approximately one tenth of a medium-sized (60g) tomato per person per week in Ethiopia, to four medium-sized tomatoes per person per week in India, and up to 12 medium-sized tomatoes per person per week in the US (Figure 3).

Figure 2: Vegetables produced globally in 2017[7]

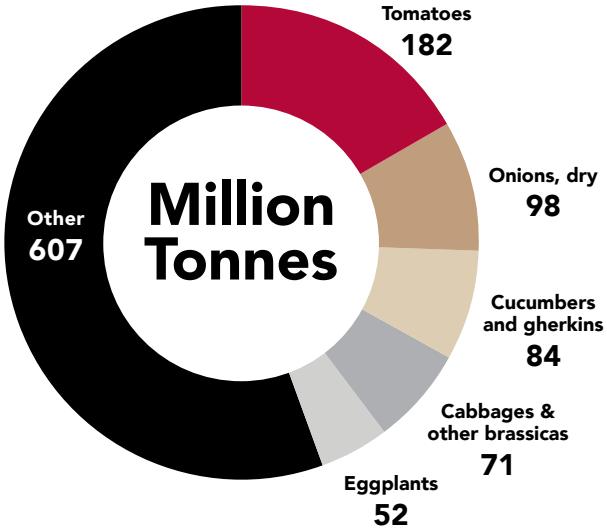
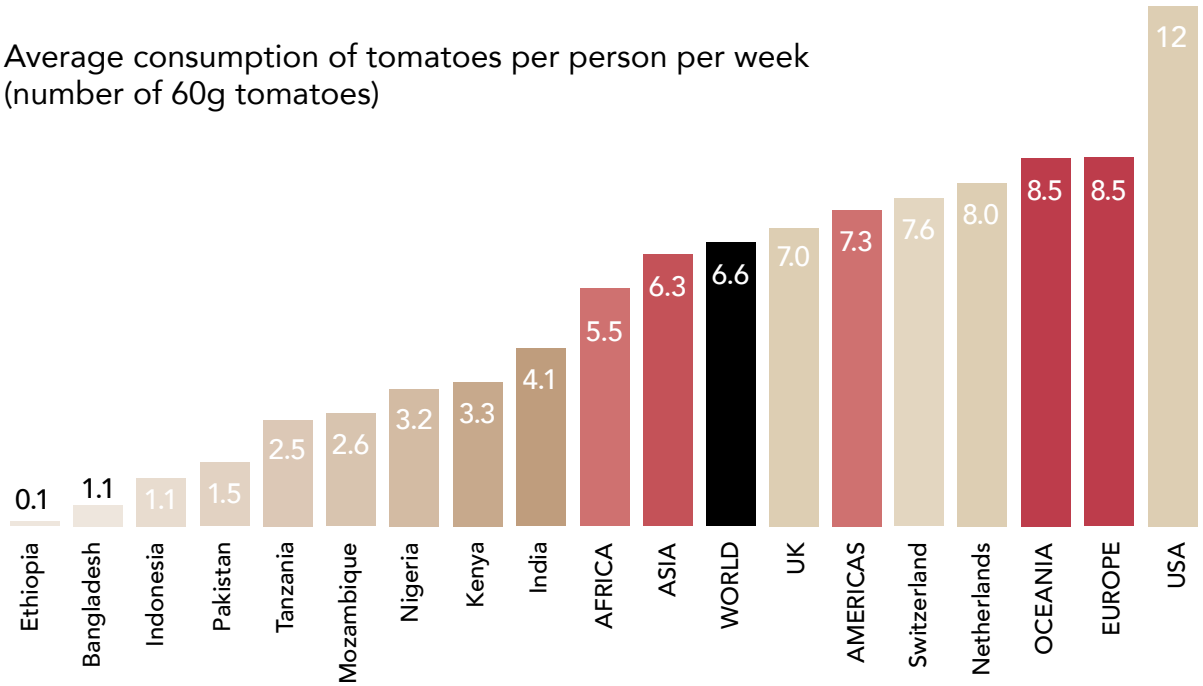


Figure 3: Tomato supplies vary depending on nation and region[8].



Our vision: more available and accessible tomatoes – with less waste

The Global Alliance for Improved Nutrition works with governments and other stakeholders to ensure the **supply** and increase the **demand** for the nutritious tomato. As well as on creating **incentives and modifying rules and regulations** to encourage **production** and **consumption** of nutritious and safe foods, we seek to understand, and tackle barriers faced by small and medium enterprises (SMEs). The goal? To ensure that nutritious foods - like tomatoes - are available, affordable, desirable, and convenient, and especially for low-income populations.

GAIN case studies

Supply and affordability

More work is needed to boost the **availability** of healthy vegetables – by increasing production, but also by driving down loss and waste: particularly common with highly perishable, fragile foods such as tomatoes.

Small- and medium-sized enterprises (SMEs) produce and sell some 70% of nutritious food purchased in markets catering to low-income consumers[9], but they face various challenges. Common difficulties include financial barriers to scaling production, processing, and distribution. Our work involves assessing supply chains, identifying which enterprises to support, and providing grants and offering the technical assistance necessary to help businesses produce and process nutritious and safe foods and to distribute them to markets at affordable prices.

One of our programmes, the **Postharvest Loss Alliance for Nutrition** (PLAN) works with SMEs to reduce food loss. The consortium works to prevent the loss and waste of nutrient-dense perishable foods, with a focus on horticultural crops such as tomatoes. In low- and middle-income settings, nearly half of all fruits and vegetables are lost or wasted owing to poor handling and packaging, as well as a lack of the technologies necessary to prevent bruising or premature rotting. Experts estimate that if loss and waste of horticulture crops could be reduced by even 10% globally, hunger rates would fall by 11%, while child malnutrition rates would drop by 4%[10].

1. Boosting vegman's productivity and distribution in Mozambique

Vegman is a vegetable producer and marketer in the outskirts of Chimoio, the fifth-largest city in Mozambique. Established in 2006, the business grows vegetables on 12 hectares of a 350-hectare farm. More than 12 different products are grown and sold, including tomatoes, cabbages, onions, spinach, bananas,sweet potatoes, squash, and beetroot. Tomatoes are the most popular product, representing 47% of sales in 2016.

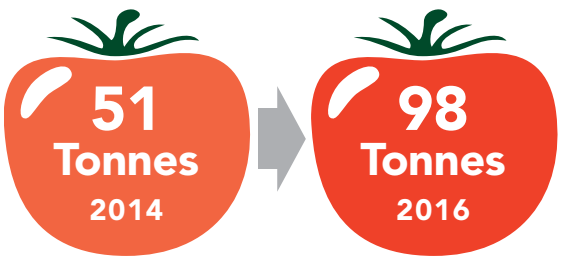
Tomatoes are a relatively affordable vegetable in Mozambique and are consumed along with onions and cabbage in the traditional meals enjoyed by low-income populations.

Financing from GAIN enabled Vegman to install electricity on the farm for irrigation (where previously it had relied on a costly diesel generator), build a shop on a recently purchased plot, install a cold room facility, purchase a large truck to transport produce from farm to outlet, and build a greenhouse for seedling production.

In just two years, production grew tremendously. In 2014, Vegman produced 51 tonnes of tomatoes; in 2016, output had almost doubled to 98 tonnes (Figure 4). The shop and on-site storage facilities also boosted sales, while the truck increased transport capacity. Sales of all vegetables came in at around Mozambican Metical (MZN) 1.9 million in 2014, growing to MZN 4.6 million in 2016.

More than 10,000 people living mostly in Manica Province consume Vegman's produce every day.

Figure 3: **Vegman tomato production (tonnes) before and after support from GAIN**



2. Reducing tomato loss in Nigeria

Nigeria is sub-Saharan Africa's largest tomato producer, but more than 45% are lost before reaching the market – owing to poor handling practices, inadequate cold storage, and insufficient transportation facilities. Postharvest losses mean lost nutrients for Nigeria's 151 million people. To combat waste, the GAIN Postharvest Loss Alliance for Nutrition (PLAN) programme aims to help coordinate actions among stakeholders by focusing on three areas of Nigeria's tomato value chain:

Improvements in cold chain storage and logistics means perishables like tomatoes can be stored for longer and/or transported in hot conditions without spoiling.

Improvements in crating and packaging are key. This is because most of Nigeria's vegetables and fruit are grown in the north and then sold in the south.

Traditionally, tomatoes are transported in woven baskets stacked on top of each other – leaving them highly susceptible to crushing. Switching to using smaller, stackable, ventilated plastic crates (returnable plastic crates or RPCs) reduces waste because the stacks rest on the frames – and not on the produce – allowing air to circulate freely and thereby reducing bruising. Switching to RPCs can reduce losses from an average of 30% to 5% or less. It also allows food to be transported in cleaner conditions because crates are washable, which in turn reduces food safety risks. While RPCs are more expensive than traditional baskets, they are cheaper in the long run because they last for several years. They also enable producers to pack and sell in standard quantities, and are easier to carry and arrange compared to baskets of differing dimensions.

Proximate processing – i.e. processing close to production centres is another key aspect of PLAN Nigeria's work. For example, proximate processing means that tomatoes will not have to be stored for long periods or transported considerable distances before being dried, or otherwise processed. This reduces the number of tomatoes lost between harvest and processing.

A grant from GAIN enabled NATPAN, the Nigerian Tomato Producers Association, to purchase some 8,000 returnable plastic crates (RPC) under the PLAN programme.

A recent GAIN-commissioned modelling exercise demonstrated high returns on investments of this kind[11]. After modelling a range of scenarios around reasonable levels of crate breakage and tomato loss-prevention, the exercise concluded that outright cash-purchase or loan-to-purchase (for own use), as well as cash-purchase or loan-to-purchase (for the renting out of crates) were viable investments.

The up-front cash purchase of crates for own use, for example, was shown to pay for itself in less than year based on a projected scenario of 25% of crates broken a year and a 35% reduction in tomato losses; to within 3 years for a less likely (more negative) scenario of 35% of crates broken a year and only a 10% reduction in post-harvest losses[12].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Recommendations

The year 2021 is the International Year of Fruits and Vegetables.[13] While tomatoes are already a favourite in many countries, more must be done to boost supply and increase demand around the world. Below are a few ideas:

Governments can improve the supply of edible horticulture – including tomatoes – by developing and implementing new policies and regulations, for example: by funding schemes designed to develop and boost the production of improved varieties, by enhancing irrigation, or enabling producers and suppliers to access other inputs. By helping businesses to establish processing units close to production centres, governments can also contribute to multi-stakeholder efforts to reduce the loss and waste of highly perishable tomatoes along the supply chain.

Access to finance is a critical barrier facing businesses, particularly the SMEs common in many low- and middle-income settings. Innovative financing mechanisms from both the public and private sector – including from development partners – deserve support.

On the demand side, governments, private-sector stakeholders, development partners, and consumer groups can work together to develop innovative demand-generation campaigns, encouraging people, and particularly younger generations, to desire healthy foods, such as tomatoes as part of a healthy diet.

The private sector lies at the very heart of the demand and supply of tomatoes. It is critical that businesses continue to build their technical capacity and invest in improved technologies designed to improve efficiencies and reduce losses along the supply chain. Businesses can also continue to create new tomato-based products to stimulate demand, while developing innovative business models that scale their operations and reach new markets.

Where governments procure food and meals i.e. for schools, prisons, and canteens – they can ensure these include vegetables such as tomatoes, in line with national dietary guidelines, thereby helping to stimulate supply and demand.

Governments, including municipal and other sub-national ones, should also be encouraged to establish policies to boost sales, promotion and desirability of tomatoes and other healthy options. At the same time, they could discourage the sale and advertising of unhealthy options – especially to children – as part of a wider strategy to improve food environments and reduce food "deserts" and "swamps".

Collaboration between the private sector and government can help improve food environments. Food manufacturers, for example, might incorporate a higher proportion of vegetables (like tomatoes) into processed food offerings. All companies, but particularly larger ones, can offer workplace nutrition programmes that include healthy offerings with plenty of vegetables. Larger companies can mentor smaller ones, for example: to make the business case for nutritional programming in the workplace. Small- and medium-enterprises can join networks such as the Sun Business Network to amplify their voices and to take advantage of available opportunities, such as training in their communities of practice.

Individuals, consumer groups, and non-governmental organisations (NGOs) play a crucial role in amplifying voices, particularly of the marginalized. They can also help with holding both government and the private sector to account. This is particularly the case when it comes to those commitments that have already been made: For example, around improving food supply and regulating food safety. Tomatoes, like most fresh fruits and vegetables, are susceptible to food safety risks.

There are many barriers to enabling an adequate supply of perishable crops such as tomatoes and other fruits and vegetables to the populations that need them most. The lack of affordability, and the underexploited opportunities to boost demand remain serious obstacles. The current levels of waste in tomato supply chains are not sustainable. It is bad for livelihoods and bad for our shared environment. The Global Alliance for Improved Nutrition is committed to supporting horticultural crops such as tomatoes – our goal is to make healthy foods and healthy diets more available, affordable, accessible, and desirable.

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8 FAOSTAT 2013 data – assuming one medium tomato weighs approx. 60g

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12 GAIN Working Paper (Forthcoming)

13 The 74th Session of the United Nations General Assembly has declared 2021 as the International Year of Fruits and Vegetables. The initiative aims at raising awareness on the nutritional and health benefits of fruit and vegetable consumption. See: FAO, 2019. Fruit and vegetables become UN's centerpiece for 2021. http://www.fao.org/new-york/news/detail/en/c/1256329/#:~:text=The%2074th%20Session%20of,of%20fruit%20and%20vegetable%20consumption.

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