

Обзор / Review

<https://doi.org/10.18619/2072-9146-2025-1-58-61>
УДК: 635.64-027.22:339.138(048)(63)

Jemal Kadu Hasan*

Ethiopian Biodiversity Institute (EBI)
Addis Ababa, Ethiopia; Jimma Botanical
Garden, Jimma, Ethiopia

*Corresponding Author:

kadujemal@gmail.com

Author's Contribution: Mr. Jemal Kadu Hasan has contributed in planning and prepares this review article by adjusting and reviewing different journals, and also makes organizing, writing, grammatical correction and editing.

Conflict of Interest: The author declares that there is no conflict of interest.

For citation: Hasan J.K. Production and marketing challenges of tomato (*Solanum lycopersicum* L.) in Ethiopia. Review. *Vegetable crops of Russia*. 2025;(1):58-61.

<https://doi.org/10.18619/2072-9146-2025-1-58-61>

Received: 20.08.2024

Accepted for publication: 20.09.2024

Published: 28.12.2024

Джемал Каду Хасан*

Эфиопский институт
биоразнообразия (EBI)
Аддис-Абеба, Эфиопия; Ботанический
сад Джиммы, Джимма, Эфиопия

kadujemal@gmail.com

Вклад автора: Г-н Джемал Каду Хасан внес вклад в планирование и подготовку этой обзорной статьи, корректируя и просматривая различные журналы, а также выполняя организацию, написание, грамматическую коррекцию и редактирование.

Конфликт интересов. Автор заявляет об отсутствии конфликта интересов.

Для цитирования: Hasan J.K. Production and marketing challenges of tomato (*Solanum lycopersicum* L.) in Ethiopia. Review. *Vegetable crops of Russia*. 2025;(1):58-61.

<https://doi.org/10.18619/2072-9146-2025-1-58-61>

Поступила в редакцию: 20.08.2024

Принята к печати: 20.09.2024

Опубликована: 28.12.2024

Production and marketing challenges of tomato (*Solanum lycopersicum* L.) in Ethiopia. Review

Check for updates



ABSTRACT

Tomato is one of the most important and widely grown vegetables in the world. The aim is to review the key challenges on tomato production and marketing in Ethiopia. In Ethiopia, tomato production is concentrated in river, valleys and lakes, especially in Awash Valley and around Lake Ziway for favorable growing conditions, good access to market outlets and better infrastructure. Tomato production is commercially important for fresh fruit market and processing. Some of tomato varieties that have been in use by farmers are used for processing and for fresh marketing. However, several constraints caused inconsistent of tomato production and low yielding's are; the shortages of improved varieties, inadequate transport, poor marketing system, poor cultural practices, unreliable rainfall, price fluctuation, product nature (perishability), post-harvest losses, pest and diseases. Lack of market linkages, post-harvest losses, low institutional support, lack inputs and transportation are the key challenges. Small-scale producers are struggling to gain market access, but due to listed challenges the farmers are not selling their produce in an organized system and not getting the right shares. Therefore, critical attentions in harvesting and postharvest operations are very important to reduce losses, to keep quality and market standards. Moreover, addressing both production and market-related challenges are essential to minimize the losses, to access quality goods and to ensure the right shares for producers, distributors, processors and traders.

KEYWORDS:

Tomato production, Tomato varieties, Tomato marketing restrictions, Yield

Проблемы производства и маркетинга томата (*Solanum lycopersicum* L.) в Эфиопии. Обзор

РЕЗЮМЕ

АКТУАЛЬНОСТЬ. Томат — один из самых важных и широко выращиваемых овощей в мире. Целью исследования является рассмотрение основных проблем производства и сбыта томата в Эфиопии.

Результаты. В Эфиопии производство томата сосредоточено в прибрежных зонах рек и озер, долинах, особенно в долине Аваши и вокруг озера Зивай, где есть благоприятные условия для выращивания, хороший доступ к рынкам сбыта и улучшенная инфраструктура. Производство томата имеет коммерческое значение для рынка свежих фруктов и переработки. Некоторые сорта томата, выращиваемые фермерами, используют для переработки и сбыта в свежем виде. Однако существует ряд ограничений, вызывающих непоследовательность производства томата и низкую урожайность: нехватка улучшенных сортов, неадекватный транспорт, плохая система сбыта, плохие агротехнические практики, ненадежные осадки, колебания цен, характер продукта (скоропортящийся), потери после сбора урожая, вредители и болезни. Отсутствие рыночных связей, потери после сбора урожая, низкая институциональная поддержка, нехватка ресурсов и транспорта являются основными проблемами. Мелкие производители борются за доступ к рынку, но из-за перечисленных проблем фермеры не продают свою продукцию в организованной системе и не получают нужных долей. Поэтому критические меры по сбору урожая и послеуборочной обработке очень важны для сокращения потерь, поддержания качества и рыночных стандартов. Более того, решение как производственных, так и рыночных проблем имеет важное значение для минимизации потерь, доступа к качественным товарам и обеспечения нужных долей для производителей, дистрибьюторов, переработчиков и трейдеров.

КЛЮЧЕВЫЕ СЛОВА:

производство томата, сорта томата, урожайность, ограничения сбыта томата

Introduction

Tomato (*Solanum lycopersicum* L.) is one of the most popular and widely grown vegetables in the world. Tomato belongs to the Solanaceae family and genus *Lycopersicon*. The tomato began its history upon the coastal highlands of western part of South America, and nowadays, it's grown in around 159 countries [1]. Tomato is commercially important for fresh fruit market and processing. In Ethiopia, tomatoes are produced mainly in the northern and central rift valley areas. Oromia regional state is the largest producer contributed around 68%, and Tigray region produce 5% and Somali region 4% [2] and [3]. The production has expanded to commercial production for home use, export and processing industries. It produced mainly as a source of income and food both under rain fed as well as irrigated conditions. Small-scale farmers produce the bulk of fresh market tomatoes. Processing types are mainly produced in large-scale horticultural farms. Farmers are interested in tomato production more than other vegetables for its multiple harvests, which result in high profit per unit area. In 2016, the total area under cultivated was around 9700 hectares with the total productivity of 91300 tons of fresh tomato, and the average productivity of 9.4 tons per hectare [4]. The average productivity of tomatoes in Ethiopia in 2018 was 6.18 tons/hectare, which is too low when compared to the global average of 38.3 tons/hectare. In Africa, America, Europe, and Asia, the comparable average productivity was 16, 96.8, 63.9, and 43 tons/hectare [5] and [6].

Tomato production is faced several constraints which are biotic and abiotic that resulted in lower yield of tomato in Ethiopia includes shortage of varieties and poor seed quality, poor cultural practices, disease and insect pests, postharvest loss, and poor marketing system [7]. Inadequate transport network, poor market information system, and underdeveloped industrial sectors are the main challenges of vegetable markets in Ethiopia [8]. Small-scale producers are struggle to gain market access, but lack knowledge or skills of market requirements, inadequate information flow and other obstacles prevent them from entering into new markets, and this issues caused that reduce the benefits they obtained from their products [9]. The production-market linkage is very weak, smallholder farmers are not selling their produce in an organized manner, and they are not getting the right share of consumer price. As a result, farmer's opportunity to diversify their livelihoods from vegetable production is very limited [10]. The aim of this paper is to review the key challenges on tomato production and marketing faced by farmers and marketers in Ethiopia.

Tomato production and marketing challenges in Ethiopia

Ecological requirements

for tomato production in Ethiopia

Tomato is commercially important for fresh fruit market and processing. It requires warm, clear, dry conditions, and altitudes ranging between 700 and 2000 meter. The optimum growing temperature in the central low lands of Ethiopia ranges between 24 °C and 28 °C during the day and 14 °C and 17 °C at night. High temperature above 40 °C during the day and 22 °C at night can cause flower drop. Friable and sandy loam soil with pH of 5.8 to 6.8 is favorable for high fruit yield [11].

Tomato production and utilization in Ethiopia

The bulk of tomato production is concentrated in river valleys and lakes, especially in the Awash Valley and around Lake Ziway for their favorable growing conditions, good access to market outlets and better infrastructure and other facilities [3]. Productivity of tomato farms ranged from 25-40 tonnes per hectare. About 3,300 ha of private holdings were under tomato cultivation, and the total volume of fresh tomato harvested was 347, 27.748 tons [12]. In Eastern part of Ethiopia, Harerghe farmers produce locally known tomato variety in their gardens which is very small in size and low in fruit yield. Some of the farmers settled around the rift valley of Babile produce local tomato on small units of land for consumption and for income generation [13]. It is consumed in every household in different styles, in certain areas such as Walo, Hararge, Shawa, Jimma and Wallaga, it is an important co-staple food [14]. Tigray Regional state, the western lowland of Tigray is one of the potential areas suitable for cultivation of tomato, and the total cultivated area under tomato production in Kafta of Humera woreda since 2013/2014 cropping season was around 1,655 ha [15]. It can be eaten either fresh or processed in to different products. It is used for healing wounds because of antibiotic properties found in ripe fruits. It is a good source of Vitamins A, B and C.

Tomato production constraints in Ethiopia

Despite of its nutritional, economic, and health importance; there is a huge potential to produce tomato, but its production and productivity were low in Ethiopia as a general [8] and [16]. The total areas under tomato cultivation in the rainy season are estimated to be 5.05 thousand hectares with 30.7 thousand tons of harvest [13], and the national average yield is ranging from 6.5-24 Mt/ ha [17], which is far below the world average 34.84 ton/ha [18]. Again, in 2018 also the average productivity was 6.18 tons/hectare and the average productivity of tomatoes in Ethiopia is too low compared with the world average productivity of 38.3 tons/hectare [5] and [6].



Figure 1. Tomato production in Ethiopia

Several factors for low yielding productivity and inconsistent production were: shortage of improved seed, pesticides [19], unreliable rainfall, biotic and abiotic factors, and price fluctuation after harvest, product nature (perishability) [20], post-harvest loss [21]. This poor production and productivity of tomato outputs is resulted in food insecurity [7], in turn, such problems have their own effect on the aggregated macroeconomic as a whole. Addressing such constraints are one of the best mechanisms to mitigate food insecurity and improved macroeconomic performance through enhancing production efficiency and increasing productivity [22]. The studies conducted by the authors [17] and [23] revealed that the technical efficiency of tomatoes can be determined by the farm management, infrastructural development, transportation access, extension contact, access of training, irrigation accessibility, membership in a farmers' association, and credit availability.

Improved seed and seed source challenges

Some tomato varieties that used for processing types and for fresh market types have become under production in Ethiopia (table 1). Most of these varieties are popular among the farming communities especially in the Central Rift Valley [11]. Despite the multifaceted importance of vegetables in Ethiopia and the high priority given by policy makers for the development of the sub-sector, vegetable seed supply and distribution system is generally weak. There is limited access to varieties and seed source [24]. Informal seed system is the major source of seeds, which is triggered by poorly developed vegetable seed system in the country [24].

Harvest and post-harvest related challenges

The highly perishable nature of tomato fruits require careful attention in harvesting and postharvest operations in order to reduce losses, meet home and export market standards and to ensure high price for producers, distributors, processors and traders. Tomatoes harvested for fresh market at turning stage, i.e., when fruits can be easily transported for distant market or stored for long period. For processing, fruits must be harvested when they are red ripe as that they can directly sent to the processing plants. Harvesting at breaker stages has the advantage of keeping fruit for longer period, and the firmness of pericarp tissue is a key component for long storability. It is impor-

tant that fruits be harvested at the right stages, selected, cleaned, properly graded, packed in container, and carefully transported to the final destination. Storage in breaker and turning stages has about 5 and 3 days storability advantages over fully red ripen fruits. In the Rift Valley and eastern part of Ethiopia, plastic and wooden boxes are used for harvesting and transporting. This has become important to avoid injury and reduce decay and softening of fruits that affect the attractiveness of fruit in the market [20].

Since tomato fruit is above 90% water, careful picking, packaging and transportation is important to ensure better price. The loss is high due to moisture losses, over ripening, mechanical injury, rough handling and packaging, bruises and transportation. The perishable nature of the produce, poor technology, lack of awareness among producers and the market chain are resulted in poor handling of the tomato produce [26]. Post-harvest loss causes the losses of volumes and quality the produce reaching consumers. The reduction of post-harvest losses is stated as a critical component of ensuring future global food security [27] alternative solutions for loss reduction is necessary to find major causes for losses, critical loss points and to measure the scale of these losses. Focusing on diversified aspects of value chain, market link, use local and low-cost technologies/techniques to solve or minimize the problems [16].

Marketing and marketing system challenges

The fresh fruits and processed products are distributed local markets and exported to Djibouti. There are whole sellers (merchants), groceries (kiosks), roadside markets (Gulits), which are involved in the distribution of fresh produces. The state owned marketing enterprise, ETFRUIT, is involved in exporting and locally distributing processed products and other fresh horticultural crops. The produces in local markets are transported by donkey, carts, trucks and humans packed in wooden boxes or crates. Frequently, small farmers who produce the bulk of tomato suffer for price fluctuations. They are forced to sell tomatoes to local merchants who have all the access to buy tomatoes at whatever price they fix [28]. The quality of tomatoes are thus firm or not over ripe; fairly well formed; smooth; good color; and free from blemishes and attractive.

Table 1. Characteristics of some tomato varieties in use and its purpose
Table 1. Characteristics of some tomato varieties in use and its purpose

Varieties	Growth habit	Maturity days	Average Yield (q/ha)	Purpose
Melkashola	Determinate	100-120	430	Processing and fresh market
Melkasalsa	Determinate	100-110	450	Processing and fresh market
Chali	Determinate	85-100	430	Processing and fresh market
Cochoro	Determinate	85-90	463	Processing and fresh market
Eshet	Indeterminate	75-80	394	Fresh market
Metadel	Indeterminate	75-90	345	Fresh market
Fetan	Determinate	75-80	454	Fresh market
Bishola	Determinate	85-90	340	Fresh market
Miya	Semi-determ	90-100	471	Fresh market
Woyeno	Determinate	85-90	249	Fresh market
Mersa	Indeterminate	100-120	276	Fresh market
Lekku	Indeterminate	75-80	337	Fresh market

Source: MoA [25]

Furthermore, the market chain is governed by wholesalers and exporters who have capital advantage over the other chain actors. Hence, farmers are forced to obtain a lower share of profit margin. Market distortions are common activities of middlemen in price setting. Due to their perishability of vegetables like tomato has no sufficient time to add the values, and this enables actors particularly middlemen to cut price and reduce producers bargaining power to sell their vegetable at a price convenient for them [20]. Further identified the problem includes poor in product sorting, grading, packing, and traditional transporting affect quality in turn marketability of the product. Vegetable marketing is the key constrains by lack of market information systems, poor market linkages, low institutional support, lack of value chain development to ensure participation and benefit to the smallholders [29], and this constrains associated with vegetables marketing in Ethiopia is reported by [20].

References / Литература

1. History of tomato 'love apple'. Newspaper Press cover page. USA. Tracy, 2005.
2. Quintin G., Abu T., Teddy T. Tomato Production in Ethiopia Challenged by Pest. GIAN report, Addis Ababa, Ethiopia. 2013.
3. Ashebre K.M. Farm yield evaluation and demonstration of Melkashola tomato variety in central zone of Tigray Region, Ethiopia. *African Journal of Plant Science*. 2018;12(2):28-31. <https://doi.org/10.5897/AJPS2017.1555>
4. Brasesco F., Asgedom D., Casari G. Strategic analysis and intervention plan for fresh and industrial tomato in the Agro-Commodities Procurement Zone of the pilot Integrated Agro-Industrial Park in Central-Eastern Oromia, Ethiopia. Addis Ababa: FAO. 2019.
5. FAO. Statistical database of the Food and Agriculture Organization of the United Nations. Rome, Italy, 2018.
6. Bedassa C.B., Fufa B.O., Aga M.C. Yield Performance of Improved Tomato (*Lycopersicon esculentum* Mill.) Varieties at West Shoa Zone, Ethiopia. *Advances in Bioscience and Bioengineering*. 2020;8(1):1.
7. Dessale M. Analysis of technical efficiency of small holder wheat-growing farmers of Jamma district, Ethiopia. *Agriculture & Food Security*. 2019;8(1):1-8. <https://agricultureandfoodsecurity.biomedcentral.com/articles/10.1186/s40066-018-0250-9>
8. Haji J. Economic Efficiency and Marketing Performance of Vegetable Production in the Eastern and Central Parts of Ethiopia. 2008;(17).
9. Steven H., Veronique T.H., John S., Nango D., Boubacar D. A Conceptual Framework for Promoting Inclusive Agricultural Value Chains. Michigan State University Department of Agricultural, Food and Resource Economics. 2012.
10. Mussema R., Kassa B., Alemu D., Rashid S. Analysis of the determinants of smallscale farmers' grain market participations in Ethiopia: the contribution of transaction costs. *Ethiop. J. Agric. Sci.* 2013;23(1-2):75-94.
11. Derso E., Zeleke A. Production and management of major vegetable crops in Ethiopia. 2015.
12. Investment Opportunity Profile for Tomato Processing in Ethiopia. Ethiopian Investment Agency, 2008.
13. Crop Production Forecast Sample Survey, 2013/14. Report on Area and Production for Major Crops (for Private Peasant Holdings 'Meher' season). Addis Ababa, Ethiopia. CSA (Central Statistical Agency). 2015.
14. Gemechis A.O., Struik P., Emanu B. Tomato Production in Ethiopia: Constraints and Opportunities. 2012.
15. Regassa D., Tigre W., Shiferaw A. Tomato (*Lycopersicon esculentum* Mill.) varieties evaluation in Borana zone, Yabello district, southern Ethiopia. *Journal of Plant Breeding and Crop Science*. 2016;8(10):206-210. <https://doi.org/10.5897/JPBCS2015.0543>
16. Abera G., Ibrahim A.M., Forsido S.F., Kuyu C.G. Assessment on post-harvest losses of tomato (*Lycopersicon esculentum* Mill.) in select-

Conclusions

In Ethiopia, the bulk of tomato production is concentrated in river valleys and lakes, especially in Awash Valley and around Lake Ziway for favorable growing conditions and good access to market. Tomato is commercially important for fresh fruit market and processing. Some of tomato varieties that have been in use by farmers are used for processing and for fresh marketing. But, several constraints are caused inconsistent of production and low yielding were shortage of improved seed, limited input, price fluctuation, product nature, post-harvest losses, pest and diseases. Marketing is the key constrains in lack of market information systems, post-harvest losses, low institutional support, lack of value chain to ensure participation and benefit to the smallholders. Therefore, marketing linkages and postharvest handling technologies are important to minimize the losses, to access quality goods and to ensure right price shares.

- ed districts of East Shewa Zone of Ethiopia using a commodity system analysis methodology. *Heliyon*. 2020;6(4):e03749. <https://doi.org/10.1016/j.heliyon.2020.e03749>
17. Gemechu G.E., Beyene T.M. Evaluation of Tomato (*Solanum lycopersicum* L. mill) Varieties for Yield and Fruit Quality in Ethiopia. A Review. *Journal of Natural Sciences Research*. 2019. <https://doi.org/10.7176/fsqm%2F89-03>
 18. FAO. Statistical bulletin. Rome, Italy. 2009;(150):1-2.
 19. Weldegiorgis L.G., Mezgebo G.K., Gebremariam H.G.E., Kahsay Z.A. Resources use efficiency of irrigated tomato production of small-scale farmers. *International journal of vegetable science*. 2018;24(5):456-465. <https://doi.org/10.1080/19315260.2018.1438552>
 20. Reddy P.C.S., Kanna N.V. Value Chain and Market Analysis of Vegetables in Ethiopia, Ambo University, Ethiopia. 2016. Link: <https://bit.ly/38nG8kk>
 21. Kasso M., Bekele A. Post-harvest loss and quality deterioration of horticultural crops in Dire Dawa Region, Ethiopia. *Journal of the Saudi Society of Agricultural Sciences*. 2018;17(1):88-96. <https://doi.org/10.1016/j.jssas.2016.01.005>
 22. Tiruneh W.G., Geta E. Technical efficiency of smallholder wheat farmers: The case of Welmera district, Central Oromia, Ethiopia. *Journal of Development and Agricultural Economics*. 2016;8(2):39-51. <https://doi.org/10.5897/JDAE2015.0660>
 23. Ali S., Liu Y., Ishaq M., Shah T., Ilyas A., Din I.U. Climate change and its impact on the yield of major food crops: *Evidence from Pakistan*. *Foods*. 2017;6(6):39. <https://doi.org/10.3390/foods6060039>
 24. Tabor G., Yesuf M. Mapping the Current Knowledge of Carrot Cultivation in Ethiopia. Technical Report Submitted to Carrot Aid, Charlottenlund, Denmark. 2012.
 25. Ministry of Agriculture. Crop variety registration in Canada: Issues and options. Ministry Agric, Ababa, Ethiopia. 2012.
 26. Bombelli E.C., Wright E.R. Tomato fruit quality conservation during post-harvest by application of potassium bicarbonate and its effect on Botrytis cinerea: research paper. Facultad de Agronomía, Universidad de Buenos Aires, Av. San Martín 4453 (C1417DSE), Buenos Aires, Argentina. *Cien. Inv. Agr.* 2006;33(3):167-172. <https://doi.org/10.7764/rcia.v33i3.346>
 27. Belik W. Impasses in transformation of the food system. *Future of Food*. J. Food Agric. Soc. 2018;6(2):5-8.
 28. Abay A. Vegetable marketing chain analysis in the case of Fogera Wereda. Amehara National regional state of Ethiopia. An MSc Thesis Presented to School of Graduate Studies of Haramaya University. 2007.
 29. Emanu B., Afari-Sefa V., Dinssa F.F., Ayana A., Balemi T., Temesgen M. Characterization and assessment of vegetable production and marketing systems in the Humid Tropics of Ethiopia. *Quarterly Journal of International Agriculture*. 2015;54(892-2016-65244):163-187. <https://doi.org/10.22004/AG.ECON.210313>

About the Author:

Jemal Kadu Hasan – Researcher,
<https://orcid.org/0009-0003-3761-9069>,
kadujemal@gmail.com

Об авторе:

Джемаль Каду Хасан – исследователь,
<https://orcid.org/0009-0003-3761-9069>,
kadujemal@gmail.com