VALUE CHAIN ANALYSIS OF FRESH TOMATOES – CONSTRAINTS AND OPPORTUNITIES

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Abstract

The competitiveness of Moldovan tomatoes can be evaluated by the analysis of the value chain, which represents all the necessary activities, which a product should pass, to bring it from the conceptual stage, to the final stage of use. In the Republic of Moldova, tomatoes represent a traditional vegetable crop produced for domestic consumption and exports. The most of Moldovan tomatoes reach the final consumer through several distribution channels: open air retail markets, supermarkets, fruits and vegetables small shops, export markets. In this scientific paper is analyzed the role of the tomatoes value chain in increasing the competitiveness of agricultural enterprises; the major constraints the enterprises are facing at different levels of the tomatoes value chain, and proposed measures of value chain improvement at the level of different activities.
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Key words: tomatoes value chain, competitiveness, agricultural enterprises, marketplace.

Tomatoes are high value added agricultural products which represent an important vegetable both for the domestic consumption as well as for exports.

In Republic of Moldova, annualy, is consumed approximately 24.5 kg of tomatoes per capita, which is less than in Romania by 23 kg, where this indicator constitutes 47.5 kg per capita less than in Ukraine by 20.8 kg, where this indicator constitutes 45.3 kg per capita and more than in Russian Federation by 0.7 kg, where consumption of tomatoes per capita constitutes 24.5 kg per capita (Chartsbin, 2016).

The local market of tomatoes is facing a high competition from the tomatoes originated from Turkey, which are imported in the period November-June, and which subsitute the lack of the local production on the markets from the Republic of Moldova.

The production of tomatoes in Republic of Moldova faces many problems, among which we can mention: poorly developed irrigation systems, underdeveloped post-harvest infrastructure, lack of penetration strategies on foreign markets, absence of a branding strategy.

All these barriers mentioned before influence in a negative way the competitiveness of tomatoes on the local and external markets. In this context, the major objectives of this scientific research are: the analyze of the value chain of fresh tomatoes at all its levels, revealing the constraints the agricultural producers are facing in the process of production/commercialization fresh tomatoes and proposing recommendations of improvement the value chain at all its levels in order to increase the competitiveness of fresh tomatoes on the local and external markets.

MATERIAL AND METHOD

In this scientific research were used data from the National Bureau of Statistics of the Republic of Moldova, Ministry of Agriculture and Food Industry of Moldova and other economic sources.

As research methods were used: analysis and synthesis, induction, deduction, comparative method, logical analysis, graphical method.

RESULTS AND DISCUSSIONS

The production of tomatoes has a high importance for the economy of the Republic of Moldova, being an important source of income for the agricultural producers.

The value chain of fresh tomatoes is limited mainly at open air markets, where the production is commercialized directly from the field to truck traders at low prices, compared to the prices which could be obtained by agricultural

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producers, if it will exist a post-harvest well developed infrastructure.

According to the data from the National Bureau of Statistics in 2015, the global agricultural production constituted 86.2% compared to 2014. This decrease was determined by the decrease of the vegetal production by 22.6%, the animal production increased by 2.2% (*figure 1*).

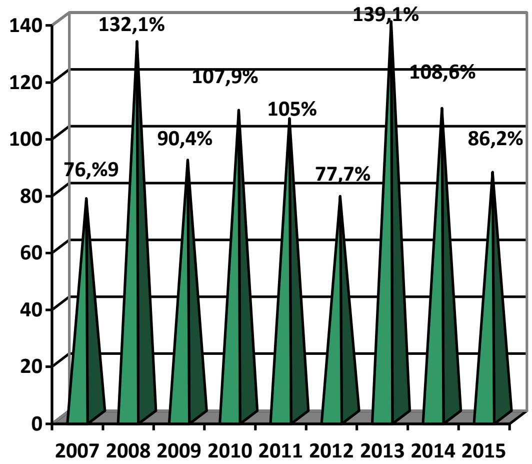

Figure 1 **The indices of the agricultural production in the Republic of Moldova during the period 2007-2015** (the previous year =100%)

In 2015 the share of the vegetal production in total agricultural production constituted 58% (in 2014 – 65%), out of which cereals and leguminous – 20.4%, technical cultures – 11.7%, potatoes – 2.6%, vegetables – 6.3%, fruits, nuts and berries – 6.5%, grapes – 7%. The animal production constituted 42% (NBS, 2015).

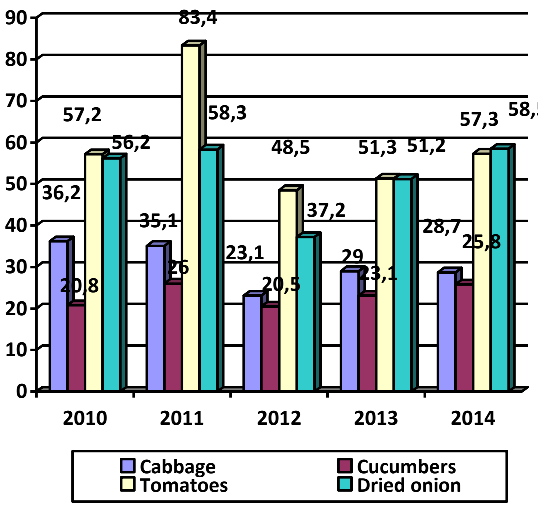

Figure 2 **The global harvest of the main vegetable crops in all categories of households during 2010-2014 (thousand tonnes)**

Analyzing the global harvest of the main vegetable crops in all categories of households during 2010-2014, we can reveal that the harvest of tomatoes constituted in 2014 – 57.3 thousand tonnes, which represent an increase by 6 thousand tonnes compared to 2013 and by 8.8 thousand tonnes compared to 2012 (*figure 2).*

The global harvest of tomatoes from all vegetables crops, was preceded only by dried onion, the harvest of which in 2014 constituted 58.5 thousand tonnes, which represent an increase by 1.2 thousand tonnes compared to the harvest of tomatoes, being followed by cabbage, which harvest in 2014 constituted 28.7%, less than in 2013 by 0.3 thousand tonnes and also by the harvest of cucumbers, which constituted in 2014 - 25.8 thousand tonnes, more than in 2013 by 2.7 thousand tonnes (NBS, 2014).

From the previously analyzed data, we can reveal that tomatoes represent an important vegetable crop, being a significant source of income for the agricultural producers, but also an agricultural product which faces high competition on the local market from the tomatoes originated from Turkey, which are imported in the period November-June, and which subsitute the lack of tomatoes on the local markets.

Analyzing tomatoes originated from Turkey, compared to those from the Republic of Moldova, were stated the following particularities:

1) ***The price*** – During a weak, at the beginning of the harvest season, the local tomatoes are more expensive by 10-20% in wholesale markets, compared to the imported tomatoes from Turkey. After that period, the prices for the local tomatoes are 10-20% lower compared to the imported one.

2) ***The taste*** **–** The citizen from the Republic of Moldova prefer local tomatoes, because they have a more pronounced taste, than those from Turkey, which in their view have no taste.

3) ***The product form*** – Both tomatoes imported from Turkey, as well as tomatoes from the Republic of Moldova have a pleasant exterior look which the customer prefers, being round without wrinkles.

4) ***The colour*** – The imported tomatoes have pale red color, are uniform

5***) The consistency*** - Imported products are harder, compared to local tomatoes**.**

The traditional flow of tomatoes consists of: ***wholesaler/producer/intermediary→retailer→ →consumer.***

A wholesaler intermediary will try to obtain an addition of 0.5-1.0 MDL/kg, no matter of the general price. When on the market will be registered a product deficit, the price will be higher and the wholesaler profit also will increase.

Table 1

Example of price formation of fresh tomatoes, MDL/kg

	Producer	Wholesaler Addition	Retailer Addition	VAT	Price for medium consumer
Open field	2.51	0.60	1.20	0.34	4.65
Greenhouses (small retail sales)	5.00	0.73	0.70	0.51	6.94
Greenhouses (network retail sales)	5.00	1.23	3.04	0.74	10.01

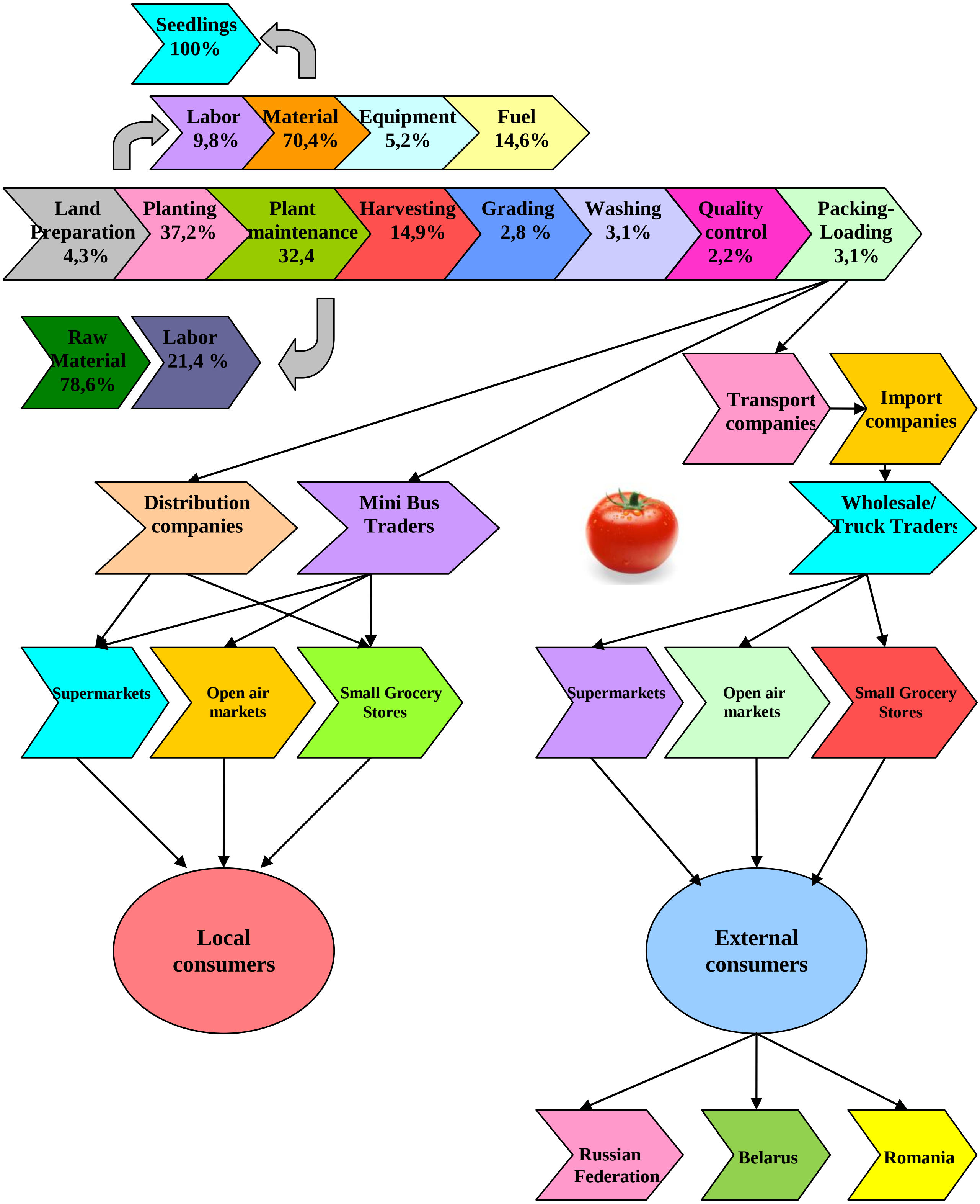

Figure 3 **The value chain of fresh tomatoes**

For example, during the season the wholesaler/intermediary will add to tomatoes which were brought directly from the field 0.5 MDL/kg, but at the end of the season when on the market is a deficit of tomatoes, the profit of wholesaler/intermediary can grow till 1.5-2.0 MDL/kg.

Finally we may conclude that the received profit of the wholesaler/intermediary depends on the period of the year and on the market conditions.

The value chain for fresh tomatoes is divided in eight levels of activity (*figure 3*):

- *Land preparation*
- *Planting*
- *Plant maintenance*
- *Harvesting*
- *Grading*
- *Washing*
- *Quality Control*
- *Packing and Loading.*

The analysis of value chain of fresh tomatoes reveals that for plant maintenance almost 32.4% of the total cost of producing of 1 kg of tomatoes, from which raw material takes 78.6% and labour 21.4%. Also one of the highest costs is for planting, which constitutes almost 37.2%, from which also materials takes approximately 70.4%.

High costs of seeds are generated by imports of seeds from France, Holland, Italy, and Czech Republic etc.) or some of them are obtained locally. Plant maintenance high costs are generated by high costs of fertilizers, chemicals which are mainly imported (Cimpoeş D., Golban A., 2013).

Also a problem of increasing the production of tomatoes is irrigation. For example, if the farmers will irrigate a hectare of tomatoes and apply the necessary fertilizers, their yields will increase from 30 tons/ha to 60 tons/ha of tomatoes or more.

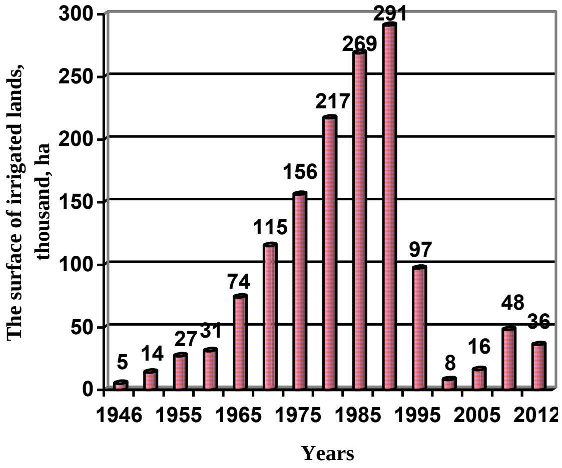

Figure 4. **The dynamics of the irrigated lands from the Republic of Moldova during 1946-2012, thousand ha**

Due to the fact that Republic of Moldova, very year is subject to several climate-related events, that adversely affect the production of tomatoes, the role of irrigation infrastructure is of major importance. From all the climatic constraints, droughts are the most frequently encountered. According to the study conducted by the World Bank (2012) was predicted that until 2050 annual temperatures will rise by 2%, thus increasing the probability of drought in agriculture. At the moment, droughts generally occur every five years. The study noted that farmers in Moldova are not sufficiently prepared to face droughts.

Thus, according to the studies conducted by some scientists (Andrieş S., Filipciuc V., 2014), is attested that during 1946 -1990, the irrigated area increased from 5000 ha in 1946 to 291 thousand ha in 1990 (*Figure 4*). But with the massive land privatization in the 90s there has been a decrease in irrigated areas about 3 times: from 291 thousand irrigated ha in 1990, to 97 thousand ha in 1995. In 2012 there were registered about 36 thousand ha of irrigated area.

Limitting access to irrigation has a regulatory character, because there are many regulations, laws, which are limiting the access to irrigation, for example: the use of groundwater for surface or artisanal irrigation is prohibited because of decreasing hangings groundwater and care that the man must be ensured with drinking water.

The procedure of land allocation for construction of lakes is a very complicated and difficult one. In the situation when it is possible to create riparian irrigation systems, the prices per cubic meter are high: 10 MDL or 8 US cents, being higher than the domestic consumption of water from Chisinau (Grushevsky A. *et al*, 2013).

Therefore, the agricultural producers, because of high costs, bureaucracy and insufficient subsidies (in 2012 were allocated only 14% of the resources from the subsidy fund for the irrigation infrastructure), find very difficult to create modern systems of irrigation, which will contribute to competitive development of the agricultural sector.

Another constraint, at the level of value chain is the low developed post harvest infrastructure, especially the lack of washing, selection and sortig equipment, because of high costs of purchasing (Stiopca O. *et al*, 2011).

Another level of tomatoes value chain is - packing of production, which also plays a significant role in the export capacity of tomatoes from the Republic of Moldova. The local producer must be concerned not only to obtain high quality tomatoes, but also how the product will be presented to the consumers.

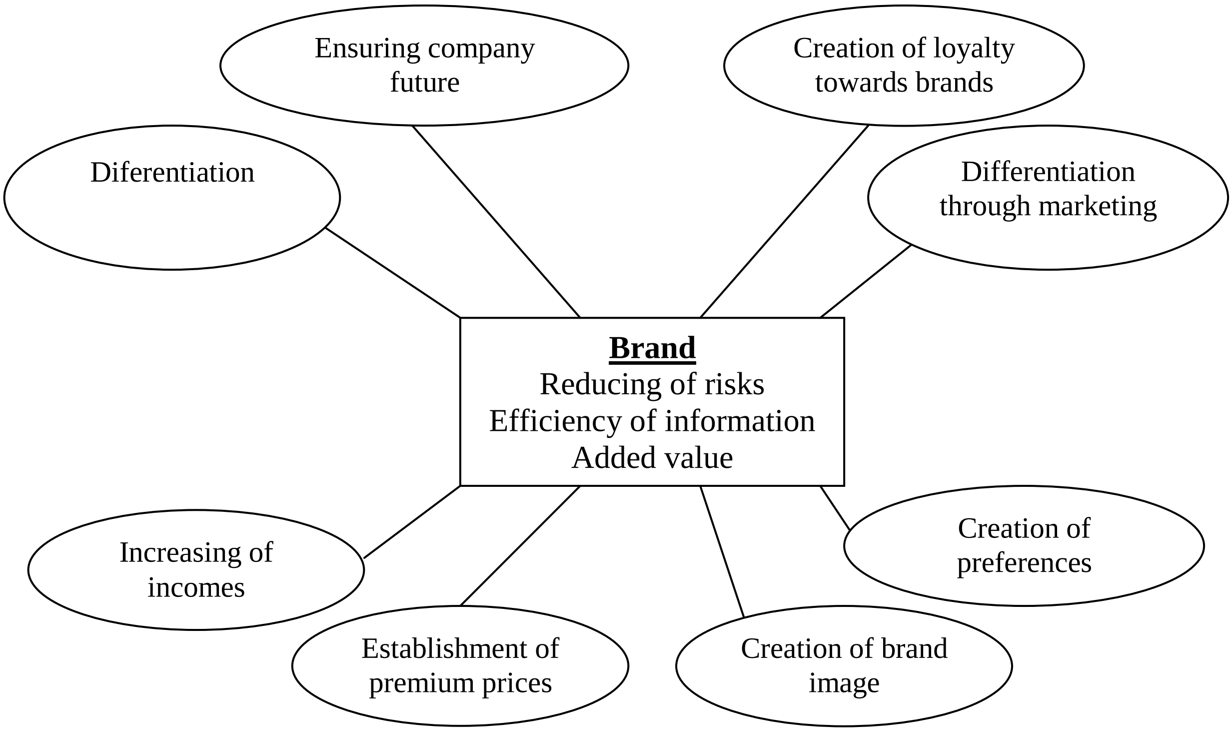

Figure 5. **The role of branding in Business-to Business**

Often due to inadequate packaging, tomatoes producing companies, register substantial losses, due to the incapacity to penetrate on modern distribution channels of commercialization the production. Often, because of non-standard packaging, the tomatoes, breaks down, before reaching the final consumer, and companies register losses.

For the traded tomatoes it is very important to have labels (with specific brands) which will contain information about the product (White P., Cipciriuc L., Belschi A., 2011).

In Republic of Moldova doesn't exist a branding strategy for horticultural production, inclusively for tomatoes. Therefore, it is necessary to create brands, which will be associated by the customers with the quality and price according to the offered quality.

Thus the role of brands is very high and can be resumed as follows (*figure 5*) (Kotler P., Pfoertsch W., 2006):

- *Differentiation*
- *Ensuring the future of the company*
- *Creation of the loyalty towards brands*
- *Marketing actions with purpose of differentiation*
- *Creation of preferinces*
- *Establishment of premium prices*
- *Creation of brand image*
- *Increasing of sales*

The products reach the final consumer through several channels of distribution, namely: ***open air markets, supermarkets, small grocery stores and export markets.***

The majority of tomatoes are traded on open air markets, because of insuficient developed post harvest infrastructure.

A little quantity of tomatoes is exportet on external market through intermediaries traders.

The biggest competitor, regarding trading on the local market with fresh tomatoes is Turkey. Compared to the Republic of Moldova, in Turkey the cultivated surface with tomatoes is about 50 times higher than in Republic of Moldova, where the cultivated surface with tomatoes is 6000 ha. Thus, in Turkey, exists scale economy, where are applied advanced technologies, the productivity of tomatoes being about 3.7 times higher than in Republic of Moldova, and constituting 33.54 tonnes per ha, compared with only 9 tonnes per hectare in Moldova.

The largest volume of production obtained in Turkey has its origins from greenhouses - about 20%, while in Moldova, the vast majority of production is obtained in open air, and only 9% of production in greenhouses.

CONCLUSIONS

The production of tomatoes plays a high importance for the economy of the Republic of Moldova, being an important source of income for the agricultural producers.

Analyzing the value chain of fresh tomatoes was stated that exist many constraints which influence negatively the competitiveness of fresh tomatoes on local and external markets, among which we can distinguish: high costs of seeds, which are generated by imports of seeds from France, Holland, Italy, Czech Republic etc. or some of them are obtained locally. Also plant maintenance determines agricultural producers to support high costs, which are generated by high costs of fertilizers, chemicals, which are mainly imported.

A big problem in increasing the productivity of the fresh tomatoes is the low developed irrigation system from the Republic of Moldova.
If the farmers will irrigate a hectare of tomatoes and apply the necessary fertilizers, their yields will increase from 30 tons/ha to 60 tons/ha of tomatoes or more.

At the same time, the lack of a branding strategy, determine the consumers to buy fresh tomatoes without any information about the product, directly from open air markets, while the application of a branding strategy will be associated by the customers with the quality and price according to the offered quality of products.

Thus, in order to increase the competitiveness of the fresh tomatoes on the local and external markets, there must be performed several measures at the level of value chain, namely: improving the irrigation system, developing of post-harvest infrastructure, elaboration of a branding strategy, ensuring trading with fresh tomatoes in corresponding packaging.

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