

## SUSTAINABLE MODEL OF FRUIT GROWING IN B&H ON THREE SELECTED CROPS WITHIN THE CEFTA MARKET

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### *Abstract*

*Bosnia and Herzegovina records a slight increase in fruit production in the postwar period, while grants recently introduced in Bosnia and Herzegovina open the possibility of increasing the fruit production to a higher level. The situation in this market also needs to be analyzed in the framework of the signed Stability and Association Agreement (SAA) and Central European Free Trade Agreement (CEFTA). The present fruit production in B&H does not meet the domestic demand and as a result the state is forced to import significant quantities of fruits. The question is how to respond to this challenge and how to set up fruit production within the CEFTA countries focusing on fruit export potentials.*

**Keywords:** *fruit, production, CEFTA, market, demand.*

### 1. INTRODUCTION

Fruit-growing production in B&H is one of the essential sectors of agricultural production and today also a realistic program of economic revitalization of rural areas. This refers to highly-intensive integrated fruit production in terms of the concept "plantations within reach".

To achieve this program, it is essential for all agricultural producers or future investors in this highly profitable sector to realize that they must forget or abandon everything that they knew about fruit-growing production until ten years ago and accept an entirely new mode of operation and approach. In view of the high deficit in the local market of

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these products, as well as export potentials, B&H would need to achieve a substantial increase in volume of fruit-growing production before getting the EU accession candidate status. In terms of possibilities but also as a comparative advantage, the fruit-growing production program can be a realistic and sustainable program of economic revitalization of the B&H region.

In the coming time, it is possible to increase the fruit-growing production by 40% in relation to the present state. The concept will be based on higher technological levels, introduction of new varieties, replacement of varieties and establishment of new plantations. This will result in more intensive production in smaller cultivated areas as compared to present ones.

The present European agricultural policy has been shaped by many years of influences due to not only European but also global political and economic developments. The common market for agricultural products required the adoption of the Common Agricultural Policy (CAP), since agriculture (along with traffic) is one of the two sectors in the EU for which there is a unified policy. The Central European Free Trade Agreement - CEFTA originated from what is called the Visegrad Group, which had been founded in February 1991 by Hungary, Poland and Czechoslovakia at a meeting held in Visegrad. The agreement on establishment of free trade was reached at the meeting in Krakow in October 1991, where the agreement was signed one year later. After it was signed, CEFTA became an instrument of cooperation between Central European countries in the field of economy. One of the main tasks of CEFTA is to prepare its signatories for EU membership through participation in free trade zones. The purpose of the CEFTA agreement is also to coordinate development of economic relations between signatories of CEFTA (Bosnia and Herzegovina, Croatia, Macedonia, Albania, Montenegro, Serbia, UNMIK Kosovo and Moldova), increase productivity and achieve financial stability on the principles of market economy and liberalization of trade in conformity with provisions of the General Agreement on Tariffs and Trade (GATT 1994) and the Agreement Establishing the World Trade Organization (WTO).

In fruit-growing production, the CEFTA market also represents a big challenge for B&H producers. In the present conditions, the fruit sector is not yet competitive to other CEFTA countries. And this paper evaluates apple, plum and peach and the overall position of the fruit-growing sector. The present fruit-growing production does not satisfy needs of the domestic market, yet there are realistic export capacities for production of high-quality products that will be recognizable outside the market of Bosnia and Herzegovina.

## **2. OBJECTIVE AND METHODS OF THE STUDY**

The paper aims at assessing the position of the fruit sector within the CEFTA market, and possibilities of producing and exporting finished products. It examines the entire market of agricultural and food products through the fruit sector within the CEFTA

countries and presents draft measures in agricultural policy making in order for the overall agriculture and food industry to achieve the best possible position in this market.

Several scientific methods, used in economic and agricultural research, are applied in the paper. We used the standard desk-research method. To study overall relations in production and consumption, export and import of fruit varieties of apple, plum and peach in B&H and in the market of CEFTA countries, we used the balancing method and comparative method, which compared the state of fruit-growing in B&H to other CEFTA members, with special reference to fruit varieties of apple, plum and peach. Out of mathematical and statistical methods, the standard method of descriptive statistics and correlation and regression methods were used. We investigated fruit consumption characteristics and GDP growth and examined the correlation between them.

### 3. RESULTS AND DISCUSSION

The study aimed at analyzing the position of the B&H fruit sector within the CEFTA market, as well as possibilities of production and export of fruit. Most of the data are also the first official data, being that few authors have so far engaged in studying this problem. References specify very few data, so it was not possible to compare the data with data of other authors.

Based on the obtained results, we can argue that satisfactory natural conditions for fruit production objectively do exist; however, institutional frameworks existing in B&H obstruct a larger scale production, and thereby the fruit sector is not competitive to other CEFTA countries since the present production does not meet the needs of even the local market.

Based on research results and calculation of fruit consumption in B&H, CEFTA and EU 27 countries, we can see that fruit consumption in B&H was 49.90 kg per capita in 2005, 58.40 kg per capita in 2006, and 59.50 kg per capita in 2007. Comparing the years of 2007 and 2005, it can be concluded that fruit consumption increased by 19% compared to 2005, which means that a positive increase in fruit consumption was registered, and the possibility for an increase in domestic production is thereby opened because calculations did not find self-sufficiency in fruits, which was established in the paper.

In relation to the fruit consumption in CEFTA, which was 40.00 kg per capita in 2005, 50.00 kg per capita in 2006, and 53.00 kg per capita in 2007, annual fruit consumption in B&H was observably higher than in other CEFTA members.

Fruit consumption in the EU was 38.00 kg per capita in 2005, 37.60 kg per capita in 2006, and 34.50 kg per capita in 2007, which is also lower in relation to the consumption in BiH.

The consumption of apples, plums and peaches grows from year to year in B&H and it is higher than in the other countries. Higher increase in fruit consumption is expected too, because calculation of operationally profitable elasticity proved that fruit is a profitably elastic product. A reason of the increase in consumption is also a change in consumer behaviors due to tradition of fruit production and consumption, eating habits of the B&H population, as well as increased concern for consumer health owing to the importance of fruit in human nutrition.

One part of research in the paper involves studying the correlation between GDP as the measure of success of every country's economy and consumption of fruits (apples, plums and peaches). We investigated changes in GDP and fruit consumption. It can be concluded that investigations of causal correlation between the economic property of GDP and consumption of fruit in B&H, other CEFTA members and the EU resulted in the finding that there is a very strong connection between increase in GDP and consumption of fruit. The correlation is positive, i.e. with a unit increase in GDP, fruit consumption increases too. Consequently, GDP growth in B&H and strengthening of the country's economy lead to increasing consumption and fruit consumption, which was indicated by the positive correlation in the study too.

In CEFTA members, a strong positive correlation was also found, because as the value of GDP grows, so grows consumption of fruit too.

In EU 27 countries, calculations found a strong and negative correlation between GDP growth and fruit consumption, i.e. a unit increase in GDP results in a unit decrease in fruit consumption. The coefficient of correlation is  $r = -0.75$  because the per capita income in EU countries is much greater than in CEFTA states.

Self-sufficiency is a relative measure indicating the percentage in which domestic production in B&H covers the needs of the domestic market, i.e. an indicator of the measure in which production uses the potential of its own market.

Increase in the volume of fruit production in B&H will have a significant effect on growing supplies in the internal market and decreasing volumes of fruit imports, and this will create conditions for an increase in the volume of export, which is exceptionally important for stronger competitive edge of the domestic fruit production and higher numbers of fruit producers in B&H.

Analyzing self-sufficiencies of apple, plum and peach in B&H, we obtained the result that all of the three sorts of fruit were lacking and deficient. Needs for apples, plums and peaches are higher than what is produced, therefore the lack is covered by imports. Insufficient data sources prevented a more detailed self-sufficiency analysis, so based on the research results in this paper, we can claim that self-sufficiency for apple in B&H in 2009 was 74.30%, for plum 98.50%, and for peach 70.00%. These indicators can be used as a basis for shaping of the agricultural policy of B&H.

Given the specifics of changes in volumes of fruit production, it is certain that domestic demand for fruit could not be fully satisfied in the near future despite the expected

increase in domestic production.

Profitable elasticity of demand for apple, plum and peach was found based on calculations carried out on a series of 7 (seven) years. The calculation of profitable elasticity of demand shows how sensitive fruit demand is in relation to change in incomes. Three cases of profitable elasticity were found:  $E_d > 1$ ,  $E_d < 1$  and  $E_d = 1$ .

In the calculations, we obtained the result that the coefficient of profitable elasticity occurs most times above 1 ( $E_d > 1$ ); consequently, fruit is a profitably elastic product, except that increase in GDP from year to year is not accompanied by a proportional increase in fruit consumption too.

The paper discusses and calculates price elasticity of demand for apple, plum and peach, both produced locally in B&H and originating from import.

Price elasticity of demand shows how much a demanded quantity of fruit changes in relation to changes in price. It is actually the intensity of response of a demanded quantity of fruit to changes in fruit price.

Examining the years, price elasticity of demand for apple varies in B&H. In 2001, 2002, 2003, and 2004 apple appears as an elastic product  $E_{dp} > 1$ , while in the second part of the study, in 2005, 2006, and 2007 it appears as an inelastic product.

In the calculation of price elasticity of locally produced plum, we obtained the result like with apple. For the most part of the studied period, plum appears as an elastic product, it is only in 2004 and 2006 that it appears as an inelastic product.

The calculation of price elasticity of demand for peach from B&H shows that peach was an elastic product in 2003, 2004 and 2005, while in the other years of the observed period it was an inelastic product.

For calculation results of price elasticity of demand for apple, plum and peach from imports, all three products appear as elastic, and the reason is that fruits appear as luxury goods in B&H.

Analysis of price elasticity of demand for fruit from imports shows that elasticity is a normal occurrence because citizens of B&H do not have an income that allows them to consume imported fruits.

#### 4. CONCLUSIONS

Based on the conducted research assessing the position of the B&H fruit sector in the CEFTA market, we have reached the following conclusions:

1. In the present conditions, the sector of fruit (apple, plum and peach) in B&H is not yet competitive to other CEFTA countries since domestic needs for fruit in B&H have not been satisfied.
2. Conclusion of the CEFTA agreement provided the condition for a more balanced and faster economic development, harmonization of regulations with the EU and WTO, increase in investments, competitiveness and exports, and thereby employment and

raising standard of B&H citizens.

3. Lack of reliable statistical data is a limitation for a more detailed and reliable analysis of fruit-growing sector in B&H. It is necessary to establish a quality database for the entire sector of agriculture in B&H, both for domestic producers' fruit prices and producers' prices of our competitor states of CEFTA.

4. There is a positive trend of fruit consumption in B&H, which was determined by calculating annual consumptions, and this opens the possibility of increase in the domestic production to satisfy needs of the domestic market, and thereby creates opportunities to raise fruit production to a higher level and achieve exports to CEFTA countries, because the access to the market has been easier following the signing of the 2006 CEFTA agreement.

5. The CEFTA market, as well as the European Union market, is a great challenge for domestic fruit producers. These markets should be perceived as a stimulus, and not as a major threat to domestic production of fruits, which is often the case.

6. Based on the results of the paper, we can conclude that consumption of fruits (apples, plums and peaches) in B&H is in a high and positive correlation with increase in GDP. In other CEFTA members, the correlation is high and positive, while in EU 27 the correlation is high and negative.

7. Analysis of self-sufficiency of apple, plum and peach revealed that there is a deficiency (lack) of all the three types of fruit in BiH. The needs for apples, plums and peaches are much greater than what is produced, and so this shortage is compensated by imports.

8. Results of profitable elasticity of demand for apple, plum and peach show that the coefficient of profitable elasticity most often appears above 1 ( $Ed > 1$ ), so fruit is a profitably elastic product.

9. Price elasticity of demand for fruits (apple, plum and peach), as well as the price elasticity of demand for imported fruits, shows that the coefficient of price elasticity is most often higher than 1 ( $Edp > 1$ ). This means that fruits appear as luxury goods in B&H.

10. The average size of orchard is 0.51 ha per farm, which is too small both by area and by quantity of produced fruit. Fruit production in such farms directly contributes to economic unprofitability and inferior competitiveness of produced fruits.

11. B&H has natural conditions for higher production of fruits. Because of the political organization of B&H, where the agricultural policy is enforced at several government levels (state, entity and Brcko District), lack of coordination in enforcing measures of agricultural policy is certainly one of the reasons of slower development of agriculture, and thereby of the fruit sector too. Therefore, it is necessary to establish the Ministry of Agriculture, Forestry and Water Management at the B&H state level, which would strengthen management capacities of agriculture and its harmonization with the common agricultural policy of the European Union. This is set as an imperative if B&H wants to become its member in the near future.

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