
Economic Assessment and Strategic Potential of Agro Industries: The Case of Sugar Industry

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Abstract:

Current economic activity in the beet sugar industry is below its highest point, and this encourages to search for and to shape specific development strategies. This article analyses the current state of Russian sugar markets, domestically and internationally. The investigation over the strategic potential of effective beet sugar sub-complex development has involved 78 large agricultural enterprises and 59 peasant farms of the Republic of Bashkortostan.

By total production output, sugar beet producers are classified into several groups. The first group, which is the highest, includes 10 backbone strategic enterprises, which can produce 897.9 thousand tons of sugar beet. The second group includes 19 enterprises and produces 442.5 thousand tons of sugar beet. The third group, not a priority group, includes 43 enterprises (333.3 thousand tons). A similar classification was done for peasant farms.

From the assessment encompassing the strategic potential of sugar beet industry certain scenarios have been considered such as: business-as-usual (72.2%), extensive growth (83.3%), intensive growth (100.0%) and hybrid growth (122.2%).

These scenarios were composed to forecast the production target achievements. Forecasts were made using a model of strategic development of beet sugar sub-complex of the Republic of Bashkortostan, for the period until 2020. The approach developed in this article is recommended to be used as a guideline in developing long-term regional programs for agriculture development. It can be also addressed to adjust some measures that are being taken under the launched programs.

Keywords: *Beet sugar sub-complex, food security, trade, sugar market, price index, potential.*

JEL Classification: *F17, F47, F52.*

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1. Introduction

In a dynamic market environment, national food security stands on self-sufficiency, by the mean of the satisfaction of population's need for food especially with products from the domestic market (Lloyd *et al.*, 2018; He *et al.*, 2018; Luan *et al.*, 2018; Ritchie *et al.*, 2018). Sugar falls within the range of such products (Chunhawong *et al.*, 2018; Dou *et al.*, 2018; Pachón *et al.*, 2018; Pincus, 2018). Sugar market occupies one of the central places in the food retail turnover in the country, followed by markets of confectionery and pasta, markets of flour, cereals, potatoes, bread and bakery products (Debnath and Babu, 2018; Hossain *et al.*, 2018; Nieder-Heitmann *et al.*, 2018).

Because the number of sellers changes, the European sugar market is changeful. Even more than 130 sugar factories are divided between 50 sugar companies. Sugar production in the EU is very concentrated. Most sugar production capacities are located in Germany, France and Poland. Individual sugar factories are controlled by companies based in Germany, France, Great Britain and the Netherlands. Sugar production is thus divided among eight dominant sugar alliances/companies: Suedzucker, Nordzucker, Tereos, ABF, Pfeifer and Langen, Royal Cosun, Cristal Union and Tate and Lyle. The alliances have under control almost 90% of EU sugar production (Řezbová *et al.*, 2014).

Relatively high selling price and direct payments have been the main causes of favorable profitability of sugar beet in the Czech Republic since 2011. However, DEA results show a potential in efficiency improvement of direct material costs, direct wages and quality of sugar beet (and its selling price) in the group of inefficient growers. The import of sugar substitutes and the strategies of multinational alliances, which control the European sugar market, seems to be the main threats for the Czech market. The main opportunities for Czech sugar beet growers are investment subsidies into modernization and improvement of labor productivity stemming from the new Rural Development Programme and from the Support and Guarantee Fund for Farmers and Forestry (Spicka and Janotová, 2015).

Based on data touching 1400 farms of Slovakia, sugar beet helps those farms to increase their productivity rates and to scale up the wages. Farms cultivating sugar beet achieve higher average return on assets, which, however, could not be statistically confirmed during the monitored years (Tóth *et al.*, 2017).

Another factor addressed to evaluate the efficiency of sugar beet production is the energy consumption. Data collected from 146 sugar beet farms in Tokat (Turkey) revealed that the profit–cost ratio of farms was 1.17. The highest energy cost items were labor, land renting, depreciation and fertilizers. Although intensive energy consumption in sugar beet production increased the yield, it also resulted in

problems such as global warming, land degradation, nutrient loading and pesticide pollution. Therefore, there is a need to pursue a new policy to force producers to undertake energy-efficient practices to establish sustainable production systems without disrupting the natural resources (Erdal *et al.*, 2007).

There was an attempt to investigate the relationship between energy inputs and yield in Iran. Data were collected from 153 sugar beet farms, selected by random sampling. Direct energy made up about 57% of the total energy inputs used in sugar beet production, while the remaining 43% came on indirect energy. Econometric assessment indicated that energy inputs of human labor, machinery, diesel fuel, total chemical fertilizers, farmyard manure, electricity, and irrigation water made significant contributions. Human labor (0.36) and machinery (0.22) were found to have the highest impacts on sugar beet production. Direct, indirect, renewable, and non-renewable energy forms had positive impacts on the output level. Energy use efficiency was 13.4, while the benefit-to-cost ratio was 1.3 (Asgharipour *et al.*, 2012).

Problems associated with domestic sugar market impose the improvement of organizational and economic mechanisms. The focus should be laid on the inter-branch relations between all the links in the sugar beet production chain. As the national project and various programs touching upon the agriculture were launched, the share of produced sugar items fell by 10% because it became partly importable. In the favorable price environment, sugar beet growers can increase their gross yield at a rapid rate. However, sugar produced from sugar beet by Russian factories can be competitive from the perspective of import duties and direct state support of sugar beet growers. With production losses reducing, domestic sugar becomes more competitive as a product. Storage and transportation practices can be improved by updating the related materials and equipment.

The Customs Union enables Russia to increase export potential of sugar and sugar-containing products by forming a favorable price environment for sugar producers. Another way to boost sugar market is to produce more sugar-containing products, which make up 40% of total sugar consumed in the country. In this case, investment projects that specify such a growth in production should be implemented in an all-encompassing fashion, meaning that they should imply infrastructure modernization. The success here depends on that how effective the state regulation of innovation and investment processes will be in terms of shaping a favorable investment climate for businesses (Zyukin *et al.*, 2016; Bondarenko *et al.*, 2017; Burkaltseva *et al.*, 2017; Srinita, 2017).

In the Russian Federation, average sugar consumption per capita is 40 kg annually, and this is when the recommended figure is 24–28 kg annually by the WHO. Other countries that consume sugar in great amounts are the USA (58 kg/year) and

Germany (48 kg/year). In Japan, per capita average of sugar consumption is significantly lower than that recommended figure and reaches 19 kg/year (Fazrakhmanov and Lukyanova, 2017). Thus, Russia is one of those countries that consume the most sugar.

The reliance on essential food imports from Europe, Asia, and America proves the lack of an effective strategy for the domestic food market development at both the federal and regional levels, as well as at the level of local processing enterprises (Gusmanov *et al.*, 2016). The price policy is a key to food affordability in Russia, especially when speaking about sugar. At the end of 2017, the average market price for white sugar was 32.1 rubles per kg (price drop was about 10%) (Russian statistical yearbook, 2017). Thus, there is a need to build a complex model of beet sugar sub-complex development in the Republic of Bashkortostan that will encompass the necessary connections and relationships arising in production for the maximum effect.

The purpose of this research is to elaborate the Strategic Plan for Development of the Agro-Industrial Complex of the Republic of Bashkortostan until 2020 (Kovshov and Lukyanova, 2018), to build the economic model for development of sugar beet sub-complex of the Republic of Bashkortostan, showcasing associated measures, and to make a case for it.

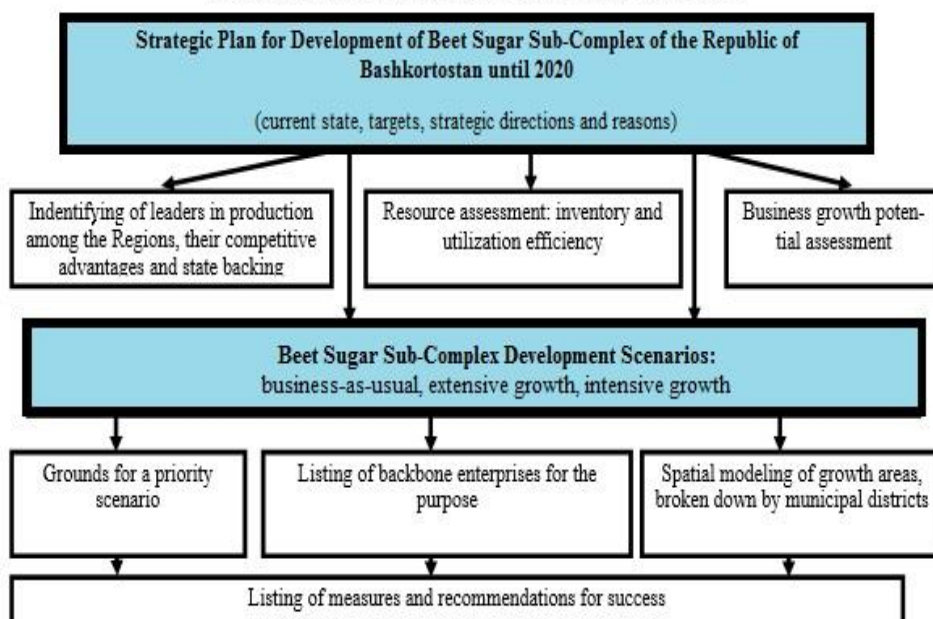
2. Materials and Methods

Background information on agricultural organizations in 2012-2016 was from the Federal State Statistics Service of the Russian Federation, Republic of Bashkortostan Territorial Branch of the Federal State Statistics Service, the Ministry of Agriculture of the Republic of Bashkortostan, and from the municipal districts of the Republic of Bashkortostan. The elaboration process implied several steps to do to plan the development of beet sugar sub-complex of the Republic of Bashkortostan until 2020 (Figure 1). Research results were obtained by scenario planning. Beet sugar sub-complex development scenarios encompassed all the possible options of realizing the sub-complex potential plus the external impacts. There were four scenarios made: business-as-usual (BaU), extensive growth, intensive growth, and hybrid scenario.

Business-as-usual (BaU) was based on production forecasts made for specific organizations of the Republic of Bashkortostan. Those organizations showcased and made the forecasts independently by analyzing their own production potential, competitive advantages, market opportunities and threats. This scenario assumes no changes in the measures, conditions, areas and volumes of state assistance in the AIC (agro-industrial complex) development. Extensive growth scenario implied close utilization and the use of extra resources (acreage expansion, including the

practice of adding fallow or uncultivated lands). The baseline data for calculations were provided by the agricultural enterprises and the Ministry of Agriculture of the Republic of Bashkortostan. This scenario assumes no significant changes in the quality of resources and, accordingly, no significant changes in the quality of final agricultural products. The extensive scenario suggests little state backing and government regulation of agricultural production.

Figure 1. Elaboration Methodology to Apply to the Strategic Plan for Development of Beet Sugar Sub-Complex of the Republic of Bashkortostan until 2020



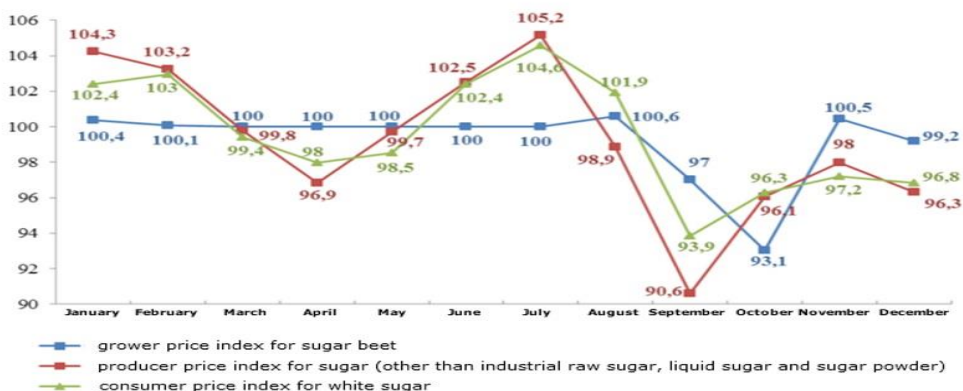
Intensive growth scenario implied the production output expectancy, which was based on the yield growth patterns indicating a yield level that could be considered as a standard in the agricultural area with specific climate. The scenario considered the current progress and innovations. The quality of resources was taken as for the BaU scenario. This scenario suggests strong state backing. Hybrid scenario displayed the expected production output and other targets, which were found by combining quantitative indicators of the extensive scenario (planting acreage) with the qualitative indicators of the intensive scenario (sugar beet yield). By following this scenario, success is impossible without a strong government support.

3. Results and Discussion

According to Russian statistics, selling prices for white sugar were 48.78 rubles per kg at the end of 2016, down 6% from the beginning of 2016.

Figure 2. Price indices in 2016 (% of preceding month)

Figure 2. Price Indices in 2016 (% of preceding month)



International trading operations specify national production development and the sale of sugar. The international sugar market is changeful in the following way. On the one hand, government support gets weaker step by step. On the other hand, there are countries, where government support is strong, where sugar production and sale are under the shield of subsidy assistance. Tables 1 and 2 show the structure of sugar trade by the Russian Federation.

Table 1. Import and Export of White Sugar and Raw Sugar in the RF, thousand tons (Russian statistical yearbook, 2017)

		Years					2016, in % of 2012
		2012	2013	2014	2015	2016	
Import Volume							
Raw sugar	Total	520.0	530.0	580.0	507.0	259.0	49.8
	Imported to CIS countries	0.9	0.3	0.2	5.0	29.0	32 times increase
	Imported to non-CIS countries	519.0	530.0	590.0	502.0	230.0	44.3
White sugar	Total	68.3	80.0	105.0	445.0	270.0	4 times increase
	Imported to CIS countries	10.8	26.2	85.3	387.0	224.0	20 times increase
	Imported to non-CIS countries	57.5	53.8	54.0	58.0	46.0	80.0
Export Volume							
White sugar	Total	62.3	4.4	4.6	7.5	98.5	158.1
	Exported to CIS countries	56.9	1.0	2.0	3.7	89.6	157.5
	Exported to non-CIS countries	5.4	3.4	2.7	3.8	8.9	164.8

From data in Table 1, the import volume of raw sugar decreased in 2016, down 50.2% from 2012, while the import volume of white sugar increased, by contrast, up to a fourfold high, which was achieved by trading with the CIS countries. According to the Ministry of Agriculture of the Russian Federation, some threshold values established by the Food Security Doctrine for sugar were topped in 2016. The figure reached 95.0%, which is 15.0 percentage points higher than the threshold value.

Table 2. *The Structure of Sugar Trade in the Russian Federation (Russian statistical yearbook, 2017)*

Years		Total	CIS Countries	Non-CIS Countries
Raw Sugar Import Volume				
2012	USD, million	299.0	0.6	298.0
	% of Total	100.0	0.2	99.7
2013	USD, million	257.0	0.2	257.0
	% of Total	100.0	0.1	99.9
2014	USD, million	260.0	0.2	260.0
	% of Total	100.0	0.1	99.9
2015	USD, million	191.0	3.0	188.0
	% of Total	100.0	1.4	98.6
2016	USD, million	110.0	15.4	94.6
	% of Total	100.0	4.9	95.1
2016, in % of 2012		36.8	25 times increase	31.7
White Sugar Import Volume				
2012	USD, million	46.5	7.7	38.8
	% of Total	100.0	16.6	83.4
2013	USD, million	47.8	16.4	31.4
	% of Total	100.0	34.3	65.7
2014	USD, million	55.6	30.6	25.0
	% of Total	100.0	55.0	45.0
2015	USD, million	162.0	136.0	26.0
	% of Total	100.0	84.0	16.0
2016	USD, million	144.0	118.0	26.0
	% of Total	100.0	81.9	18.1
2016, in % of 2012		309.7	15 times increase	67.0
White Sugar Export Volume				
2012	USD, million	44.5	40.0	4.5
	% of Total	100.0	89.9	10.1
2013	USD, million	3.8	0.8	3.0
	% of Total	100.0	21.1	78.9
2014	USD, million	3.9	1.4	2.5

	% of Total	100.0	35.9	64.1
2015	USD, million	6.5	3.7	2.8
	% of Total	100.0	56.9	43.1
2016	USD, million	55.0	4.9	50.1
	% of Total	100.0	8.9	91.1
2016, in % of 2012		123.6	12.3	11 times increase

In monetary terms, import volume of raw sugar in Russia decreased in 2016, down 63.2% from 2012. As for white sugar, its import volume increased from 2012, reaching a threefold high in 2016: the volume of sugar imported from the CIS countries became 15 times higher, but the volume of sugar imported from the non-CIS countries became 33.0% lower. The export volume of white sugar increased 23.6%: the volume of sugar exported from the CIS countries fell by 87.7%, but the volume of sugar exported from the non-CIS countries became 11 times higher.

Thus, sugar beet production in the Republic is effective, as the margin computed for 2012-2017 was above 25%. The annual increase in the yield of sugar beet, which took place throughout the last decade, was about 6.32 centers on average. This effect was achieved by intensifying the cultivation practice. Hydrothermal conditions of vegetation were found to be another factor in sugar beet yield boosting. Seeds, fuel and lubricants, and capital maintenance took about 13% of total spending (Lubova *et al.*, 2018). The state and level of crop production development specify social stability in the republic and influence other types of economic activity. In recent years, agricultural reforming, which touched the crop production sector, among other things, was guided by the following general principles:

- ✓ market self-regulation existing side by side with active and reasonable state participation;
- ✓ equal participation in the market, meaning the participation of entities of all forms of ownership on the stipulation that they sell personal products and services;
- ✓ stepwise economic transformation.

This allowed avoiding a deep recession and other unfavorable events that could happen in many regions of the Russian Federation, located in more favorable natural environment. The Republic of Bashkortostan lags the leaders in the sugar beet cultivation, which is true for both the extensive and the intensive growth rates. Sugar beet acreages in the country are being reduced. The area of land under cultivation was about 50.0 thousand hectares on average in 2014-2017, but in 2000, it was 71 thousand hectares. Decision on reduction was made because of the relatively high cost of root crops in comparison with the regions specializing on beet growing. Naturally, sugar produced from local raw materials is not as competitive as white sugar and sugar from imported raw materials. The key competitive advantages of

regions leading in sugar beet production are significant acreages of sugar beet and high yields. The subjective factors that affect the formation of these competitive advantages are below:

- ✓ give-and-take scheme (Krasnodar Krai is the only region where this scheme has been preserved);
- ✓ use of high-quality seed material (new hybrid varieties with high germinability that are more resistant to diseases, pests, and environment);
- ✓ cultivation of mother crops and in-house production of original sugar beet seeds of local varieties and hybrids (Voronezh Region, Tambov Region);
- ✓ practices of construction, reconstruction, modernization and equipping of sugar beet storage areas (a three-year investment project, implemented in the Voronezh Region);
- ✓ science-based crop rotations, fertilizer systems, integrated plant protection from pests/diseases/weeds, mechanized crop tending, and the use of highly productive varieties and hybrids;
- ✓ optimization of sugar factories located in the area of raw material production;
- ✓ local fertilization without prior spreading of fertilizers over the soil surface;
- ✓ correct alternation of crops in crop rotation, as well as improved primary and secondary tillage techniques;
- ✓ narrowing of specialization profile and production concentration, the use of modern forms of management (lease, corporatization, cooperation, agro-industrial financial groups).

Climate and resources are not the only essential factors in regional sugar beet production. State baking is in the game as well. Those who produce sugar beets can count on the government support on equal bases. The state can return some of the investment, or short-term, interest expenses, which were paid under the agricultural insurance contract, etc. Government support usually takes place within the framework of state regional programs, such as the Program for Agriculture Development and Regulation of Markets of Agricultural Products, Raw Materials and Foodstuffs for 2013–2020 (The Resolution of the Government of the Russian Federation, 2012).

The Strategic Plan for Development of the Agro-Industrial Complex of the Republic of Bashkortostan until 2020 showcases four priority strategic directions for the development of crop production branches: grain legume and cereal production; sugar beet production; greenhouse vegetable production; and oilseed production (The Order of the Government of the Russian Federation, 2012; Long-Term Forecast for the Socioeconomic Development of the Russian Federation, 2013; The Executive Order of the Government of the Russian Federation, 2017). Sugar beet sub-complex of the Russian Federation is currently on the path of reducing sugar imports and expanding sugar beet production inside the country. However, only 60%

of domestic market is filled with domestic beet sugar. Sugar beet production by the Republic is estimated at 1.3 million tons. Analysis of 78 large agricultural enterprises, conducted in 2014-2017, revealed that the average production output was 837.5 thousand tons, the crop area was 30.6 thousand hectares, and the yield was 273.6 centners per hectare. The number of sugar beet harvesters wheeled out for the job during the period under analysis was enough to attach one unit to every 167 hectares. In terms of resource potential, direct labor costs in the Republic are about 18 thousand man-hours on average, while the production was of 1 centner of grain averaged 159.3 rubles.

In the context of constantly changing economic conditions, sugar beet farming development and the development of its physical infrastructure are viewed as the major strategic directions for development of Russian agro-processing enterprises. By modernizing the techniques of sugar beet cultivation, farmers can comply with the necessary timeframes. At this point, they will be able to decrease the crop losses and to stretch the area under crops (Fazrakhmanov and Lukyanova, 2018). Forecasts made for 2020 based on resource and production potential of agricultural organizations indicate an increase in the following parameters: average beet sugar output (up to 949.5 thousand tons), yields (up to 298.8 centners per hectare), crop area (up to 31.8 thousand hectares), and direct labor costs (up to 21 thousand man-hours on average).

Analysis of 59 large peasant farms of the Republic, conducted in 2014-2017, revealed that the average production output was 150.0 thousand tons, the crop area was 6.2 thousand hectares, and the yield was 243.7 centners per hectare. Potential-driven forecasts made for 2020 assume that the average sugar beet output will be 272.4 thousand tons, the crop area will be 9.5 thousand hectares, and the yield will be 286.8 centners per hectare. The major part of beet sugar output is accounted for sugar factories located in the areas of raw material production, such as the Buzdyak, the Chishmy, the Karmaskalinsky, Alsheevsky and Fedorovsky Districts.

The Strategic Plan for Development of the Agro-Industrial Complex of the Republic of Bashkortostan, approved by the Government Decree of the Republic of Bashkortostan No. 1499-p (dated December 26, 2016), outlines targets to achieve until 2020 (Kotov *et al.*, 2016; The Order of the Government of the Republic of Bashkortostan, 2016). The model of strategic development of the agro-industrial complex of the Republic of Bashkortostan until 2020 assumes the achievement of the major targets: an increase in agricultural output, up to volume worth 230 billion rubles; an increase in agricultural output profitability, up to 20%; an increase in labor productivity, up to 2 million rubles per employee; an increase in the share of agricultural enterprises and peasant farms in production, up to 60%. The key areas for agricultural output growth are the grain legume and cereal production; sugar beet production; greenhouse vegetable production, etc. The assessment of strategic

potential of specified sugar beet enterprise development allowed obtaining the following results:

- 1) According to the BaU scenario, agricultural enterprises and peasant farms of the Republic of Bashkortostan will produce 1.3 million tons of sugar beet, which is only 72.2% of the planned value. The average yield will be the same as in 2014-2017, specifically 293 kg/ha, or 91.6% of the planned value. The gross output will not reach the set target of 5.5 billion rubles. In fact, only 72.2% of targets will be reached.
- 2) According to the extensive growth scenario, sugar beet production will amount to 1.5 million tons, or 83.3% of the planned value; average yield (305 kg/m²) will be 95.3% of the planned value; gross output will reach only 83.3% of the set target.
- 3) According to the intensive growth scenario, sugar beet production will reach all the specified targets: production output will be 1.8 million tons; yield will be 320 kg/ha, and the gross output will be 5.5 billion rubles.
- 4) According to the hybrid scenario, agricultural enterprises and peasant farms of the Republic of Bashkortostan will produce 2.2 thousand tons, or 22.2% of the planned value. The average yield will be 96.9%; and the gross output will be overreached, up to 122.2% (6.7 billion rubles).

Sugar beet production development can be kept at its rate by introducing new progressive resource-saving technologies. The major directions for this are the level of innovation and investment, the quality of products, the qualitative changes in production management and maintenance, marketability, etc., (The Order of the Government of the Republic of Bashkortostan, 2016).

By output, sugar beet producers can be classed into several groups. The first group, which is a top one as well, includes 10 backbone strategic enterprises, located in the Alshevsky District, the Chishminsky District, the Buzdyaksky District, the Karmaskalinsky District, the Meleuzovsky District, etc. Together these enterprises can produce 897.9 thousand tons of sugar beet. The second group includes 19 enterprises that keep up the first ten ones and together can produce 442.5 thousand tons of sugar beet. These enterprises are located in the Meleuzovsky District, the Gafuriysky District, the Karmaskalinsky District, the Chishminsky District, etc. The third group is not a priority group, but it includes 43 enterprises that together can produce 333.3 thousand tons. These enterprises are located in the Buzdyaksky District, the Kushnarenkovsky District, the Kugarchinsky District, the Karmaskalinsky District, the Davlekanovsky District, etc.

By output, peasant farms can be also classified into several groups. The first high-priority group includes 14 backbone strategic farms, located in the Bakalinsky District, the Buzdyaksky District, the Gafuriysky District, the Davlekanovsky District, etc. These farms can produce 336.8 thousand tons of sugar beet at an

average yield of 25.5 centners per ha. The second group includes 13 farms that keep up the first fourteen ones and together can produce 84.6 thousand tons of sugar beet. These farms are located in the Alsheevsky District, the Davlekanovsky District, the Ermekeevsky District, etc. The third group is not a priority group, but it includes 38 farms that together can produce 72.1 thousand tons of sugar beet. These farms are located in the Tuymazinsky District, the Ermekeevsky District, the Chekmagushevsky District, the Alsheevsky District, etc. The second strategic direction in the plan, "Development of Sugar Beet Production", implies the following practices to be done:

- ✓ introducing of new highly productive hybrids and varieties of sugar beet, which are resistant to diseases and pests, and are suitable for intensive cultivation;
- ✓ growing sugar beet on irrigated lands;
- ✓ focusing on the improvement of sweetness and technological qualities of root crops;
- ✓ introducing of progressive technologies for sugar beet receiving and storage, for an increase in sugar yield and for better quality;
- ✓ reducing of losses associated with the harvesting, storage and processing operations by introducing new equipment and advanced technologies;
- ✓ applying of new types of equipment for crop cleaning and for juice/syrup filtering;
- ✓ land treatment (weed killing, crop rotations, use of herbicides);
- ✓ developing and implementing of energy-saving technologies.

For higher production efficiency, sugar factories have to:

- ✓ carry out organizational and technical measures annually to ensure deep processing of raw materials with reasonable terms, and to ensure the reduction of any production losses;
- ✓ to update, to introduce progressive processing technologies and to introduce automation;
- ✓ regulate the production and sales of sugar.

The model of strategic development showcases three possible scenarios of agro-industrial complex development in the Republic of Bashkortostan: an extensive scenario, an intensive scenario, and a hybrid scenario, meaning that the BaU scenario is not to be followed. In general, the overall results, broken down by four scenarios, are presented in Table 3 and in Figure 3.

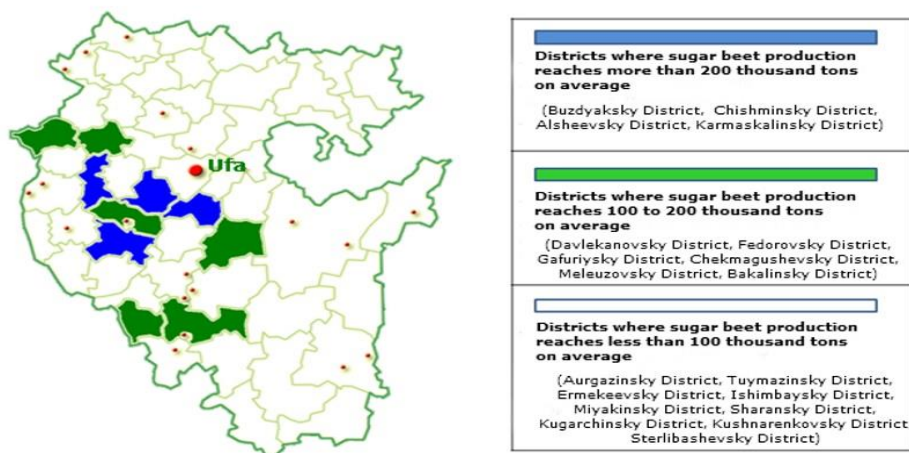
Table 3. *Planned Values from the Strategic Plan for Development Reached, considered for Sugar Beet Production*

Criterion	Target	BaU	Extensive	Intensive	Hybrid
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	to Achieve by 2020	Scenario		Scenario		Scenario		Scenario	
		Value	% of planned value	Value	% of planned value	Value	% of planned value	Value	% of planned value
Sugar beet output, million tons	1.8 – 2.0	1.3	72.2	1.5	83.3	1.8	100.0	2.2	122.2
Yield, centner per ha	320.0	293.0	91.6	305.0	95.3	320.0	100.0	310.0	96.9
Gross output, RUB bn	5.5	4.0	72.2	4.6	83.3	5.5	100.0	6.7	122.2

Figure 3. Territorial Model of Municipal Districts

Figure 3. Territorial Model of Municipal Districts by Priority in Realizing of Strategic Directions (Republic of Bashkortostan)



Strategic development plan prioritizes the agro-industrial trends and instruments of government regulation for the mid-term. This allows addressing the key industries on full scale and improving the efficiency of agricultural production in the Republic of Bashkortostan (Kovshov *et al.*, 2017). This can be done by:

- ✓ creating conditions for the reproduction of beet-growing farms on an enlarged scale, by ensuring their performance both in normal and in a dynamic market environment, and by going in for mutually beneficial foreign economic cooperation;

- ✓ determining the optimum size of sugar exports and by applying protective measures to domestic producers to meet the national sugar demand;
- ✓ entering into and strengthening of commodity relations between individual regions, which contribute to the Russian sugar market, and by integrating the latter into the world sugar market;
- ✓ creating a legal framework to encompass the necessary legal and business terms for regulating the relations, and for revealing abuses in the production and sale of sugar;
- ✓ ensuring the effectiveness of government regulation of economic processes related to the production and sale of sugar, as it can guarantee a sustained performance of domestic sugar market.

By making the production more intense, it can stabilize the economic situation and provide a background for improving the efficiency of sugar beet production, if intensification is carried out with due regard to the interests of all economic entities and with the close mutually beneficial cooperation between them being strengthened at all levels of the reproduction (from the supply of raw materials to the sale of sugar).

4. Conclusions

The strategic potential of effective beet sugar sub-complex development was determined by analyzing agricultural enterprises and peasant farms of the Republic of Bashkortostan. By breaking them down by output, the following three groups were distinguished: 10 backbone strategic enterprises, which can rely on the government support; 19 agricultural enterprises that get help indirectly, in the form of various benefits; and 43 agricultural enterprise, which are not supported by the state in any way. The introduced model of strategic development of beet sugar sub-complex is a forecast of strategic plan fulfillment by 2020 based on different scenarios. With the set target of 1.8-2.0 million tons, sugar beet production will amount to 1.3 million tons, or 72.2% of planned value, according to the BaU scenario, 1.8 million tons (100.0%), according to the intensive growth scenario, and 2.2 million tons (122.2%), according to the hybrid scenario.

With the set target of 320.0 t/ha, total yield will reach 293.0 tons per ha, or 91.6% of planned value, according to the BaU scenario, 305.0 tons per ha (95.3%), according to the intensive growth scenario, and 310.0 tons per ha (96.9%), according to the hybrid scenario. With the set target of 5.5 billion rubles, grow output will reach 4.0 billion rubles, or 72.2% of planned value, according to the BaU scenario, 4.6 billion rubles (83.3%), according to the intensive growth scenario, and 5.5 billion rubles (100.0%), according to the hybrid scenario. The Strategic Plan for Development of the Agro-Industrial Complex of the Republic of Bashkortostan until 2020 is dependent upon the achievement of those targets set. The model showcases a range of interrelated measures, which are based on the realization of the resource potential

of agricultural enterprises, on the use of best experience, regional and worldwide, and on the government, support being provided to the main areas of growth (strategic directions).

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