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DEVELOPMENT OF EXPORT POTENTIAL OF PROCESSING COMPANIES ON THE CLUSTER BASIS WITH THE HELP OF QUALITY MANAGEMENT

Abstract: The purpose of the article is to study the scientific and methodological aspects of increasing the export potential of processing companies on the cluster basis with the help of quality management, by the example of cotton cultivation of Kyrgyzstan, and to develop practical recommendations. The research subject is organizational and economic mechanisms of increasing the export potential of processing companies on the cluster basis with the help of quality management. The research object is cotton companies of Kyrgyzstan. Based on studying the state of the sphere of cotton production and cotton processing production of Kyrgyzstan, competitiveness of products of the sphere on the basis of development of integration, procesision of deep processing, cluster organization, government support, and stimulation of development of export-oriented spheres of the AIC, the authors determine the problems of the sphere and develop organizational and economic mechanisms of organization and functioning of the cotton micro-cluster. The authors use systemic analysis and economic & statistical, monograph, and comparative methods.

Key words: Export Potential; Competitiveness of Processing Companies; Integration; Ckuster; Cotton Agricultural Cluster; Micro-Cluster; Government Regulation; Quality Management.

1. Introduction

Cotton production is one of the leading export-oriented spheres of the agro-industrial complex (AIC) of Kyrgyzstan. Recently, despite the favorable situation in the world textile market, development of the cotton complex of Kyrgyzstan has been unstable.

The sphere of cotton production is peculiar for small areas and low level of integration and cooperation of small farms. The existing monopoly of cotton cleaning companies does not allow for implementation of the opportunities of integration with cotton growing companies and other participants. Poor development of cotton processing production increases the problem of effective and deep organization of deep processing of cleaned cotton within the country (Abdiev & Esenbaev, 2017).

The above problems require a complex and systemic research of the theoretical and methodological issues of increasing the competitiveness of cotton cultivation in the market conditions on the basis of development of the processes of cooperation, integration, and agro-clustering, development of effective mechanisms of

restructuring and controlling, and improvement of the mechanism of government regulation and support for the sphere.

In economy, clusters are the initial growth points of the internal market and the basis of international expansion. When clusters appear in a country's economy, its international competitiveness grows. When a cluster is created, all productions that are parts of the cluster start supporting each other, and the benefit is gained for all directions of connections. New manufacturers that join cluster from other spheres accelerate its innovative development.

Usage of the cluster method in the modern economy, including by the AIC, was studied in the works (Bhawsar & Chattopadhyay, 2018; Edmunds et al., 2019; Kyllingstad & Rypestøl, 2019; Pinheiro et al., 2019). However, most researchers treat cluster as an integrated formation in the form of agricultural company, holding, etc. This is due to insufficient elaboration of the scientific and methodological foundations of the cluster system and usage of this method in the spheres of economy, including the AIC. Besides, the works on development of the cluster method in the Kyrgyzstan's AIC do not study the mechanism of interaction of partners and economic relations between them: the researchers usually limit themselves with development of the organizational structure, structure of participants, etc. (Abdiev & Esenbaev, 2012).

Development of agricultural clusters in Kyrgyzstan is predetermined by the important role of this sphere in the regional development of the country. The agrarian sector has a very important role in economies of all regions of Kyrgyzstan. The regions specialize in production of certain types of agrarian products (Chuyskaya Oblast - production and processing of sugar beet; Narynskaya Oblast – cattle breeding; Talasskaya Oblast – production of beans; southern regions - production and processing of vegetables, etc.). Favorable preconditions for formation and development of regional sectorial clusters are created: vegetable – in the South of Kyrgyzstan; meat – in Narynskaya Oblast; sugar beet – in Chuyskaya Oblast.

The authors offer a hypothesis that a barrier on the path of increasing the export of processing companies (and, in particular, cotton companies) of Kyrgyzstan, is insufficient attention to the issues of quality management. Clustering stimulates the increase of quality of the issued products and thus development of export potential of processing companies should be performed on the cluster basis with the help of quality management.

The purpose of the paper is to study the scientific and methodological aspects of increasing the export potential of processing companies on the cluster basis with the help of quality management, by the example of cotton cultivation of Kyrgyzstan, and to develop practical recommendations. The research object is organizational and economic mechanisms of increasing the export potential of processing companies on the cluster basis with the help of quality management. The research is performed by the example of cotton companies of Kyrgyzstan.

The set goal is achieved with the help of solving the two following tasks. 1st task: determining the influence of quality of products on the scale of export activities of cotton companies of Kyrgyzstan. 2nd task: development of the scientific and practical recommendations for improving the Kyrgyz cotton companies' practice of increasing the export potential on the cluster basis with the help of quality management.

2. Methodology

In the modern conditions of transition of companies to new economic forms during formation of the mechanisms of provision of competitiveness of products (companies, spheres, national economy) it is possible to

determine the level of competitiveness based on the complex evaluation and presence of authentic initial data.

Literature sources provide a lot of methodologies of assessing the level of competitiveness of products, most of which are based on the index method and are divided depending on its diversity.

The authors offer different methodologies and continue the processes of their modification and creation of new variants. Also, insufficient attention is paid to assessment of competitiveness of products of the food industry.

The post-Soviet countries use the method of assessment of competitiveness of industrial products, which was started in 1984. It includes thee aspects: 1) construction (differential); 2) complex; 3) mixed (Ushachev, 2006).

Despite the universal character of the methodology of evaluating competitiveness of products, the main principles and means for various products are very diverse.

Strategic competitiveness of a company could be calculated with the following formula:

$$K_{str.comp.} = \sum_{Y}^{m} C_Y * \Pi_Y * \rightarrow 1, \quad (1)$$

where Kstr.comp. - strategic competitiveness of a company;

Y=1,2,....,m – No. of the indicator of strategic competitiveness;

CY – significance of Y-indicator of competitiveness of a company (defined by the expert commission);

ΠY – value of Y-indicator of company's competitiveness.

Indicator ΠY is calculated with the following formula:

$$\Pi_Y = \frac{N_{org}}{F_{l_Y}} \, or \, \Pi_Y = \frac{F_{\quad \pi Y}}{N_{org Y}}, \quad (2)$$

where Norg.Y – normative of Y-indicator of company's competitiveness;

FLY – factual (or normative) value of Y-indicator of competitiveness of the top-priority rival.

The work Tselikova (2000) offers the methodology of evaluating competitiveness of a company with the help of the indicators that are divided into the following eight groups:

1) indicators of liquidity and payment capacity;
2) indicators of market sustainability;
3) indicators of profitability of the financial and economic activities;
4) indicators of evaluating the profitability of usage of the organizational and managerial potential;
5) indicators of evaluating commercial activity;
6) indicators of evaluating competitiveness of a product;
7) indicators of evaluating the quality of sales service;
8) system's image.

Indicators of # 3, 4, and 5, unlike the generally accepted ones, have their own formulation. That's why they require fuller explanation. The author has not determined the methodology of assessing the company's image, as there are different methodologies of image determination. These methodologies are not suggested for application by the author and remain unclear.

L.V. Tselikova suggests calculating the integral indicator of company's competitiveness with the following formula:

$$K_{ij} = \sqrt{A_1^2 + A_2^2 + \cdots + A_{ij}^2}, \quad (3)$$

where Kij – level of competitiveness of products of the studied subject of the market and j-rival;

A1, A2,....Aij – the only indicator of competitiveness of products of the studied market subject and j-rival.

V.I. Zakharchenko (2009) suggests determining the level of competitiveness of

companies of the food industry for four groups of factors: products, price, sales channels, and promotion of products in the market.

The author also offers a lot of various indicators in each group of factors – however, without the ways of their usage. The correctness of the generalized calculations and final results is a solved essential issue, though.

The issues measuring and management of quality of the products of companies of the processing industry of the AIC are discussed in the works (Aashish & Divya, 2018; Ganić et al., 2019; Gejdoš, 2015). However, the role and value of quality of products for development of export potential of the AIC companies and, in particular, or cotton companies, are not defined and require further research.

3. Theory

The economic interrelations between cotton manufacturers and cotton processing companies are peculiar for absence of the technological unity and close production and financial connections. The interrelations between manufacturers and processing companies do not have mutual interest in the common development of production. The sphere has a vivid resource direction and low effectiveness of cotton cultivation: more than 95% of cotton fiber is exported to foreign markets with low classifiers. The cotton and textile sphere of Kyrgyzstan is the "sphere of three sectors" - cotton cultivation and initial processing of raw cotton into fiber and partially into yarns. Thus, the sphere of cotton cultivation is unstable, and its competitiveness decreases.

The existing unstable situation of the cotton market orients the main world cotton manufacturers, which strive to increase the competitiveness of the sphere, at organization of deep processing of raw cotton and issue of final products of cotton fabrics. The leading Central Asian manufacturers of cotton – Uzbekistan and Turkmenistan – perform practical implementation of the government programs for development of cotton cultivation, within which the highest priority belongs to development of cotton and textile companies on the cluster basis, which ensure higher level of internal processing of cleaned cotton and increase of export of final products. Creation of agricultural clusters stimulates the development and expansion of inter-sectorial ties not only of manufacturers and processing companies but of other companies of adjacent spheres – i.e., suppliers of production means, financial institutes, subjects of the market infrastructure, government bodies, research establishments, universities, etc. Thus, development of sectorial clusters should become one of the top-priority directions of development of the country's agrarian economy, including during production and processing of cotton products. The main factors that justify the necessity of using the cluster system in the cotton complex are division and small sizes of business entities in agriculture; contradictions between interests in the system of production, processing, and sales of cotton products; absence of the system of deep processing of cotton products and low level of manufacture of the products with high share of added value.

The necessity of creation of a cotton agricultural cluster is substantiated also by low competitiveness and economic effectiveness of the sphere. The practice shows that the vertically integrated "sphere of five aspects" could be competitive: raw material – yarns – fabric – final product. In agricultural clusters – as the simplest form of integration – cooperation of the companies leads to integration of technologically connected productions along the added value chain.

It is necessary to realize that clustering only by means of optimization of connections between the participants of the added value chain but without strong government support

of the agro-industrial sector will be stimulating the increase of the cluster's effectiveness. A cotton and textile cluster will stimulate the development and increase of competitiveness of the country under the condition of support from the government in solving the problems at the central and local levels for the following directions:

- development of the resource base at the modern level by development and implementation of a new policy on development of cotton cultivation;
- creation of a favorable investment climate, which will stimulate the growth of capacities and increase of the technical level of cotton companies;
- studying the market, marketing, search for customers, and branding;
- improvement of management, certification, development of harmonized standards, and coordination of works;
- regulation of pricing;
- stimulation of cooperation, creation of partnerships and associations that are geographically close and that interact with the connected companies and organizations.

The top-priority directions of development of the agricultural cluster system are increase of competitive advantages: of manufacturers of agricultural resources by stimulating the commodity manufacturers in growth of agricultural production, improvement of the system of provision of fixed assets, development of large and medium commodity husbandries; of companies of the processing industry by their modernization, which ensures deep and complex processing of raw materials; of companies that buy and sell agricultural resources and final products by improvement of the wholesale and retail network; development of the inter-sectorial integrated connections between the AIC companies along the technological chain "production-storing-processing-

transportation-sales" based on their mutual profitability and interest.

Formation and development of agricultural clusters are an effective mechanism of attraction of direct foreign investments and activation of foreign economic integration. Inclusion of domestic clusters into the global chains allows raising the level of the national technological base and increasing the quality of economic growth by means of growth of international competitiveness of companies.

Kyrgyzstan has 22 cotton plants and 3 cotton spinning companies, which manufacture products worth of USD 50 million. Foreign investors show interest in development of the cotton and textile cluster – in particular, investors from Turkey. The representatives of the Turkish textile company Tekstil Sanayi ve Ticaret A.Ş. plan to invest into construction of plants with a full cycle – initial processing of raw cotton, production of yarns, fabric, and garment production. The investors are going to invest USD 15 million into construction of several textile plants, with capacity of 6,500 cotton yarns with further sales of yarns in China. In these conditions, it is important to attract investments directly into the textile industry for the purpose of obtaining finished products of cotton fabric.

In the near future, the cotton and textile industry of Kyrgyzstan should focus on increase and improvement of the process of spinning of cleaned cotton – because cotton yarn is a product with higher added value than cleaned cotton and because of high demand for yarn in the main world markets. Potential for export of yarn to the markets of China, the EU, Russia, and Kazakhstan is very high.

Demand for cotton fiber in the domestic market is very low due to low level of development of the companies for its deep processing. Thus, more than 96.0 % of produced cleaned cotton is exported. In 2016, 21,200 tons of cleaned cotton were exported. Resource export orientation of the sphere led to the situation that export

companies are the participants of the chain that receive the highest revenues (Figure 1).

Added value of cleaned cotton – as a product that is mostly exported – for domestic entrepreneurs remains low, and revenues of the farmers and local trading and purchasing companies are lower. The main share of the profit, due to large (almost 5 times) difference between the purchasing prices for cleaned cotton within Kyrgyzstan and the global prices goes to trading organizations.

As prices for cleaned cotton are unstable, depending on the world tendencies, it is necessary to take measures for development of its deep processing (yarn, fabric, etc.) in the domestic market and further promotion of the products with higher added value to foreign markets, which will be stimulated by organization of production, processing, and sales of cleaned cotton on the cluster basis.
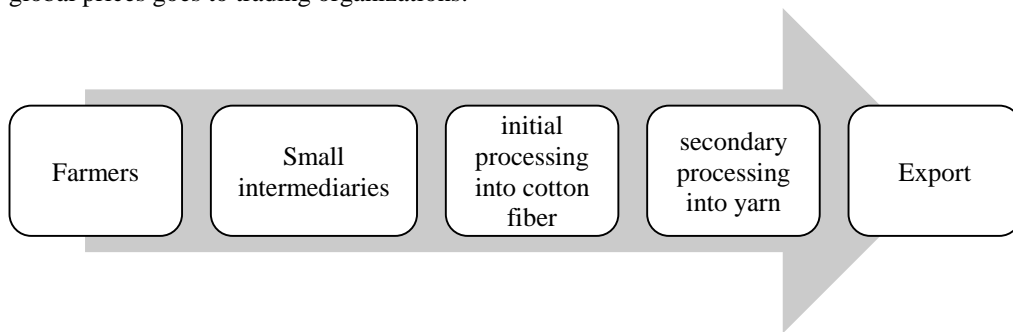
Figure 1. Scheme of added value chain of raw cotton

Studying the foreign experience of provision of competitiveness of the agrarian sector allows formulating the main aspects that should be taken into account during organization of competitive AIC of Kyrgyzstan: government support and regulation of the sphere, including stimulation of the export-oriented spheres; high level of integration and cooperation in the sphere of production, processing, and sales agro-products on the cluster basis, which ensures high level of competitiveness of the sphere in the world markets (Toktomamatov et al. 2017).

4. Results

4.1. Study of the influence of quality of products on the scale of export activities of cotton companies of Kyrgyzstan

Let us determine the influence of various factors on the scale of export activities of cotton companies of Kyrgyzstan. For this, we shall use the method of regression analysis. We performed a field research on the basis of 120 cotton companies of Kyrgyzstan, which results in collection of the following statistical and analytical data:

- volume of investments into innovations: statistical (part of expanded internal corporate reports of a company) indicator of quality of products, which reflects activity of application of the organizational, managerial, marketing, and technological innovations;
- correspondence of the products to the standards of GOST and ISO: analytical indicator of quality of products, which reflects the level of its correspondence to GOST R ISO 13015-2017 "Fabrics. Deformation. Determination of skew distortion and bow" and GOST R ISO 18103 – 2017 "Labeling fabric of superlight wool". The requirements to determination of code "Super S" (ISO 18103:2015, IDT) are evaluated by the expert method in

points from 1 (lowest correspondence) to 10 (highest correspondence);

- guarantee of quality of products: analytical indicator of quality of products, reflecting the level of manufacturer's adopting the responsibility of its correspondence to the announced qualities (e.g., readiness for return and exchange of products that do not correspond to announced qualities); it is evaluated by the expert method in points from 1 (lowest correspondence) to 10 (highest correspondence);

- indicator of quality of sales services: analytical indicator of the level of service during interaction between the representatives of the company and consumers (e.g., attentiveness, politeness, knowledge of the nomenclature and assortment

of products); it is evaluated by the expert method in points from 1 (lowest correspondence) to 10 (highest correspondence);

- company's image: analytical indicator of marketing activity of the company, which characterizes the strength of its brand (i.e., loyalty of consumers); it is evaluated by the expert method in points from 1 (lowest correspondence) to 10 (highest correspondence);

- volume of export: statistical (part of expanded internal corporate reports of the company) indicator of the company's activities.

The selected initial data for regression analysis are given in Table 2.

Results of the performed regression analysis are shown in Table 3.

Table 2. Volume of export of cotton companies of Kyrgyzstan and the factors that influence it, 2018.

No.	Company	Indicators of quality of products			Indicator of quality of sales services, points 1-10	Company's image, points 1-10	Volume of export, USD thousand
		Volume of investments into innovations, USD	Correspondence of products to the standards of GOST and ISO, points 1-10	Guarantee of quality of products, points 1-10			
		q_1	q_2	q_3	s	i	y
1	Soyuz Textile	4.79	4.98	4.51	8.54	6.39	15.38
2	SEM-Service	4.39	5.44	4.92	4.59	5.21	16.79
3	Efot Textile	2.54	9.37	8.49	5.47	9.8	28.95
4	Teskim	2.69	8.85	8.02	4.62	4.75	27.34
5	Edelweiss Textiles	3.22	7.40	6.70	8.55	3.26	22.86
	…	…			…	…	…
118	Kyrgyz heritage and union of manufacturers	3.42	6.98	6.33	9.36	8.45	21.57
119	Cotton Textile Factory OJSC	2.51	9.51	8.62	7.84	4.21	29.38
120	Textile Trans	2.13	11.19	10.13	6.42	7.86	34.56

Source: compiled by the authors.

Table 3. Regression analysis of dependence of the volume of export of cotton companies of Kyrgyzstan on the influencing factors in 2018.

Regression statistics						
Multiple R	0.9999					
R-square	0.9998					
Adjusted R-square	0.9995					
Standard error	0.1539					
Observations	120					
Dispersion analysis						
	df	SS	MS	F	Significance F	
Regression	110	306.6456	61.3291	2590.1709	0.0004	
Residue	9	0.0474	0.0237			
Total	119	306.6930				
	Coefficients	Standard error	T Stat	P-Value	Lower 95%	Upper 95%
Y-intercept	-2.5184	3.6349	-0.6928	0.5600	13.1212	18.1580
q1	0.2931	0.3924	6.7470	0.0330	1.3953	1.9816
q2	0.2615	0.6786	7.3853	0.0371	2.6585	3.1815
q3	3.9717	1.1148	8.5628	0.0305	0.8247	8.7681
s	0.0098	0.0625	0.1564	0.8900	-0.2590	0.2786
i	-0.0373	0.0462	-0.8087	0.5036	-0.2360	0.1613

Source: calculated by the authors.

According to the data of Table 2, we compiled the following model of paired linear regression: $y=-2.5184+0.2931*q1+0.2615*q2+3.9717*q3+0.0098*s-0.0373*i$. The obtained value of multiple R=0.9999 shows that the change of dependent variable by 99.99% is explained by the change of independent variables. The normed (given) coefficient of determination (0.9995) shows that the built regression is close to the initial data, and the random component is small – therefore, the number of estimated coefficient of regression is high. As R-square and adjusted R-square are almost identical (constituting 0.9995 and 0.9998, accordingly), this characterizes the obtained regression model.

The calculated observed value of F criterions (2590.1709) exceeds the table value, which for the set level of significant α=0,05 and $k_1=m=5$ and $k_2=n-m-1=120-5-1=114$ constitutes $F_{table}=2.29$. Therefore, the obtained regression equation is statistically significant. For more precise evaluation of statistical significance of each coefficient of regression, let us compare the observed values of t criteria with the table value, which, at the set level of significance α=0.05 and n-2=120-2=118 levels of freedom, constitutes 1.982. As is seen, the observed values of t criteria for factors q1 (6.7470), q2 (7.3853) and q3 (8.5628) exceed the table value, which proves statistical significance of the compiled regression equation.

However, the observed values of t criteria for factors s (0.1564) and I (-0.8087) do not exceed the table value. Similarly, the obtained p value of estimate coefficients of the indicators of quality, which constitutes 0.0330 for q1, 0.0371 for q2, and 0.0305 for q3 (do not exceed 0.05), and to are statistically significant at the level of significance α=0.05. At the same time, estimate coefficients for s (0.8900) and i

(0.5036) exceed 0.05 and are not statistically significant at the set α.

Also, it is necessary to pay attention to the fact that regression coefficients in econometric studies have clear economic interpretation. The limits of confidence interval for the regression coefficient do not have to contain contradictory results (e.g., $-0.2590 \leq s \leq 0.2786$; $-0.2360 \leq i \leq 0.1613$). Such interval shows that true value of regression coefficients with factors s and i contains positive and negative values and even zero, which is impossible. This also confirms the conclusion on statistical insignificance of regression coefficients with the studied factors. Let us exclude insignificant factors s and i and perform regression analysis of dependence of the resulting variable y on factors q1, q2, and q3 (Table 4).

Table 4. Regression analysis of dependence of the volume of export of cotton companies of Kyrgyzstan on the indicators of quality of the issued products in 2018.

Regression statistics						
Multiple R	0.9999					
R-square	0.9998					
Adjusted R-square	0.9996					
Standard error	0.1308					
Observations	120					
Dispersion analysis						
	df	*SS*	*MS*	*F*	*Significance F*	
Regression	110	306.6246	102.2082	5976.1753	0.0001	
Residue	9	0.0684	0.0171			
Total	119	306.6930				
	Coefficients	*Standard error*	*T Stat*	*P-Value*	*Lower 95%*	*Upper95%*
Y-intercept	-0.9657	1.2588	-0.7672	0.4857	-4.4607	2.5292
q1	0.0974	0.1497	6.6507	0.0507	-0.3183	0.5131
q2	0.0430	0.2409	7.1784	0.0067	-0.6258	0.7118
q3	3.4592	0.3908	8.8509	0.0009	2.3741	4.5443

Source: calculated by the authors.

According to the data of Table 3, we compiled the following model of paired linear regression: $y_1 = -0.9657 + 0.0974 \cdot q1 + 0.0430 \cdot q2 + 3.4592 \cdot q3$.

The obtained p-values of estimate coefficients constitute 0.0505; 0.0067 and 0.0009 (do not exceed 0.05) and show that all coefficients are statistically significant at the significance level α=0.05. In addition to this, it is necessary to pay attention to the fact that confidence interval for estimate coefficients of regression do not contain contradictory results – the lower and upper limits are positive. This shows statistical insignificance of the estimate coefficient of regression.

The obtained value of multiple R=0.9999 shows that the change of the dependent variable by 99.99% is explained by the change of the independent variable. Adjusted coefficient of determination (0.9996) shows that the built regression is close to the initial data, and the random component is small – therefore, the number of estimate coefficient of regression is high. As R square and adjusted R-square are almost identical (constituting 0.9996 and 0.9998, accordingly), this characterizes the obtained regression model.

The calculated observed value of F criterion (5976.1753) exceeds the table value, which for the set level of significance $\alpha=0.05$ and $k_1=m=5$ and $k_2=n-m-1=120-5-1=114$ constitutes $F_{table}=2.29$. Therefore, the obtained equation of regression is statistically significant. For more precise evaluation of statistical significance of the regression coefficient, lets us compare the obtained values of t criteria with the table value, which at the set level of significance $\alpha=0.05$ and $n-2=120-2=118$ levels of freedom constitutes 1.982. As is seen, the observed values of t criteria for factors q1 (6.6507), q2 (7.1784), and q3 (8.8509) exceed the table values, which proves statistical significance of the compiled equation of regression.

Thus, the volume of export of cotton companies of Kyrgyzstan is largely determined by the influence of the indicators of products' quality: growth of the volume of investments into innovations by USD 1 leads to its increase by USD 0.0974 thousand; growth of the correspondence of the products to the standards GOST and ISO by 1 point leads to increase of the volume of export of Kyrgyzstan's cotton companies by USD 0.0430 thousand and growth of guarantee of quality of products by 1 point leads to growth of the volume of export of cotton companies of Kyrgyzstan by 3.4592 points.

Other studied indicators do not have statistically important influence on the volume of export of cotton companies of Kyrgyzstan. This could be explained by differences on consumer preferences: consumers in Kyrgyzstan are interested in high quality of sales services and development of the companies' image, and foreign consumers pay more attention to quality of the products. That's why in order to increase the export potential of cotton companies of Kyrgyzstan it is necessary to pay a lot of attention to the issues of provision of quality of the issued products.

4.2. Improvement of the practice of increase of export potential of cotton companies on the cluster basis with the help of quality management

At the initial stage, organization of micro-clusters in the form of associations (joint-stock company) based on business and administrative partnership is expedient. Micro-clusters will ensure a higher level of agricultural cooperation and integration of economic subjects – which are concentrated on a certain area – which includes a cotton company, peasant (farm) holdings, local authorities, and elements of infrastructure, which mutually supplement each other and interact with each other for the purpose of production and implementation of competitive products. In view of the above peculiarities of micro-cluster, we developed a scheme of organization of an agricultural micro-cluster "Cotton", which includes:

- organizational work among manufacturers, wholesale purchasers, purchasing agents, representatives of transport organizations, and government, international, and public organizations on creation and development of cluster;
- determining the place of implementation of the pilot project, preparation of the production building and premises, and necessary technical, financial, material, and physical resources;
- determining and developing the necessary normative and legal documents for supporting and implementing the project "Creation and development of agro-cluster 'Cotton'";
- creation of a certified laboratory for certification of processing products according to the international standards of quality (ISO);
- creation of seed farms, with involvement of research institutes on the top-priority basis.

Agricultural micro-cluster project is to be implemented on the basis of a cotton company Kyrgyzstan 2200 by expansion of the cotton cleaning capacity and improvement of secondary processing of cotton fiber and renewal of secondary processing of cotton fiber and production of tricot yarn. At present, this company is one of the largest companies of the sphere in Osh Oblast of Kyrgyzstan. It produces 3,600 tons of cleaned cotton on average. Total cost of the issued products of the company in view of the cost of side products constitutes USD 5.080 million (Table 5).

Table 5. Economic indicators of the cotton company *Kyrgyzstan 2200* in 2017, USD.

No.	Economic indicators	measuring unit	Number	Price	Sum
1	Cotton fiber with output 36% (10000.0 x 0.36)=	ton	3,600	1,080	3,888,000
2	Seed output 58%, cottonseed oil 12% (10000.0 x0.58 x0.12)=	ton	696	700	487,200
3	Cottonseed press cake (10000.0 x 0.58) – 696.0 =	ton	5,104	125	638,000
4	Cotton milpuffs output 2% (10000 x0.02)=	ton	200	185	37 000
5	Common soap	ton	50	600	30,000
	Total production and sales	-	-	-	5,080,200

Source: compiled by the authors

Planned product: production and purchase of raw cotton, initial processing and production of cleaned cotton, manufacture of cotton yarn, and realization of final and side products. Planned market for product realization: domestic market and foreign markets of Kazakhstan, the Russian Federation, China, and Turkey. Implementation of the project requires investments of USD 10,000,000 for 5 years. Payoff period – 5 years.

The core of agricultural micro-cluster "Cotton" will be construction of a compact production complex for cotton yarn processing into tricot yarn, with the production capacity of 25 tons of yarn per day.

Also, the agricultural micro-cluster will include – as associated partners – peasant farm holdings on the territory of several rural communities of Osh Oblast (Table 6).

Implementation of the project for organization of agricultural cluster production and deep processing of raw cotton allows manufacturing 5,760 tons of cleaned cotton and 4,896 tons of yarn annually and increasing the sales volumes up to USD 17.005 million (increasing its production by 3.4 times, as compared to the present period). Production of yarn will be increased by more than 9 times. Domestic consumption of cleaned cotton and production of finished yarn will grow. Domestic consumption of cleaned cotton will constitute 20%. The main share of yarn will be exported to other countries, which will lead to increase of the sphere's export potential.

As a result, in the conditions of formation of the cluster, effectiveness of production and processing of products of cotton cultivation grows significantly. Entering the full capacity of functioning of the agricultural micro-cluster "Cotton" will allow increasing gross revenues from USD 8,157,000 to USD 14,268,000 – i.e., by 1.7 times. New profit will grow by 2 times, and profitability will constitute at least 30%. Moreover, the advantage of the agricultural micro-cluster will allow distributing the obtained profit from joint activities within the agricultural micro-cluster between its participated according to each participant's contribution.

Annual distributed profit in view of the added value chain after the project payoff period for each participant of the agricultural micro-cluster will constitute:

- agricultural manufacturers – USD 3,080,000 (35.0 %);
- cotton processing company – USD 5,720,000 (65%) (Table 7).

Functioning of agricultural micro-cluster by means of just distribution of profit from selling finished products will increase its financial and economic sustainability, which will allow for modernization of production and processing of raw cotton.

Table 6. The main economic indicators of agricultural micro-cluster "Cotton", USD.

No.	Economic indicators	Measuring unit	Price	First year as a result of investments		Next years – growth of annual volume by 15%	
				Number	Sum	Number	Sum
1.	Tricot yarn 50(No. 20) Cotton fiber x85%(5760x0.85)=	ton	2,600	4,896	12,729. 600	5,631	14,640,600
2.	Thread(5760x0.03)	ton	250	173	43,250.00	200	50,000
1.	Cotton fiber output 36% (16000.0 x 0.36)= 5760 tons	ton	1,080	-	-	-	-
2.	Seed output 58%, cottonseed oil 12% (16000.0 x0.58 x0.12)=	ton	700	1,114	779,800.00	1,282	896,700
3.	Cottonseed press cake (16000.0 x 0.58) – 696.0 =	ton	125	8,166	1,020,750	9,393	1,174,125
4.	Cotton milpuffs output 2% (16000 x0.02)+(wool) 5760.0 x0.1 =	ton	185	896	165,760	1,030	190,550
5.	Common soap	ton	600	80.0	48,000	92	52,500
Aggregate production and sales				14,787.160		-	17,005,175

Source: compiled by the authors

Table 7. Effectiveness of the organization of agricultural micro-cluster "Cotton", USD.

	Estimate indicators	1st year	2nd year	3rd year	4th year	5th year
=	Gross revenues	8,157,935	9,381,625	10,788,869	12,407,199	14,268,279
-	Expenditures	2,772,328	3,028,764	3,323,665	3,662,803	4,052,811
=	Profit	5,385,607	6,352,861	7,465,204	8,744,396	10,215,468
-	Mandatory payments	246,058	282,967	325,412	374,223	430,357
-	Income tax10%	513,955	606,989	713,979	877,017	978,511
=	Net profit	4,625,594	5,462,905	6,425,813	7,533,156	8,806,600
	Profitability in %	31.28%	32.12%	32.86%	33.50%	34.05%

Source: compiled by the authors

An effective form of organization of agricultural micro-cluster at the initial stage is the joint-stock form of management, which envisages joint participation of public authorities and agricultural business. The forms of participation of public authorities in management of agricultural clusters could include provision of lands for long-term rent; liberalization of land laws; cancelling of the existing limitations of full functioning of the land market; provision of tax subsidies or full cancelling of tax payments for the period of agricultural micro-cluster's entering the full production capacity.

In the future, in the course of development of the agricultural cluster production, it will be possible to pass to the corporate methods of managing agricultural clusters, formation of large cotton corporations, which will ensure competitiveness of cotton products in the domestic and regional markets. Financial sustainability of agricultural clusters will activate the process of attraction of investments into the sphere. The value of land as capital will grow – which will become the basis for activation of the land market.

Organization of a cotton agricultural micro-cluster will allow for rational usage of the production potential of the cotton complex. This will also ensure effective implementation of the competitive advantages of the sphere, which is connected to opportunities of expansion of the resource base and export supply, availability of production capacities of the processing companies, favorable natural and climate conditions, population's skills in growing raw cotton, large entrepreneurial interest to production of raw cotton, and presence of demand for products of cotton cultivation in the domestic and foreign markets.

Thus, the recommended model of interaction between the participants of the agricultural micro-cluster will allow unifying the companies that are connected with one technological cycle from production of raw materials to finished products (yarn), stimulating close cooperation between agricultural, processing, and servicing companies and the government, etc.; protecting the economic interests of each participant and, eventually, increasing production and export of finished products and raising the effectiveness of the sphere's competitiveness.

5. Conclusions

Increase of the role of the light and food industry as the spheres of production specialization of the industrial complex of the South of Kyrgyzstan on the cluster basis will ensure successful solution of the socio-economic problem of the region. Formation of a cotton and textile cluster is also dictated by the necessity to use the resource potential.

The resource principle is implemented by the presence of resources of production; perspective of development of the transport and production infrastructure, due to quick economic development of the region; excess of labor resources. The cotton and textile industry of the South of Kyrgyzstan has a good basis for further development, in view of low production expenditures, small distance to resource regions, and potential markets for selling the textile products. Expenditures for workforce in the textile industry in the South are lower than in Turkey, where cleaned cotton is exported, by several times.

Thus, development of the cotton and textile cluster in the South of Kyrgyzstan will allow positioning the region not only as exporter but also as a transit region, as well as a sustainable economic system, which is oriented primarily at supply of hi-tech products and provision of a wide range of services (trade and logistics, transit, educational, etc.) and innovative products.

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