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SCIENTIFIC ACHIEVEMENTS IN ENVIROMENTAL AND LIFE SCIENCE

FORMING THE MARKETING STRATEGY OF AGRARIAN ENTERPRISES

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KEYWORDS

strategy, marketing, agrarian enterprises, factors, efficiency.

SUMMARY

The article considers the factors influencing the formation of a marketing strategy based on increasing the efficiency of the activity in the current conditions of management and forecasting their improvement in the future.

First of all, marketing strategy is defined as a means of achieving the set goals and scientific methods of managing the actions of business entities to achieve the goal. However, due to changes in the external environment and the internal environment, market trends and the economic situation of agrarian enterprises in today's conditions are rather unstable.

We note that for each type of economic entity, it is necessary to choose different development strategies depending on the type of production and the specifics of agricultural production, and only by conducting in-depth analysis and verifying all the mechanisms of the implementation of this strategy, we will be able to achieve positive results in the future.

At this stage, the economic policy of our state is primarily aimed to the development and the establishment of agrarian enterprises, and the improvement of their management, which must first of all be based on modern marketing approaches.

In the course of the research, certain features of the influence on the results of marketing activities of agricultural enterprises in the Khmelnitsky region were identified with such factors as prices, costs for improving product quality, advertising costs.

In our opinion, every enterprise in its activity should constantly focus on the consumer, and the laws of the market economy make it constantly search for effective forms and methods of conducting the economy, aimed at increasing the efficiency of their activities.

We are convinced that for each type of business entity is necessary to choose different development strategies depending on the type of production and the specifics of agricultural production, and only in the case by carrying out in-depth analysis and verifying all the mechanisms of implementation of this strategy, we will be able to achieve positive results in the future.

Modern world trends in the market economy are aimed at the development of the agricultural sector requires a careful approach to the development of effective marketing strategies, which are primarily based on an in-depth analysis of the market environment.

At this stage of development of economic relations, only by using marketing techniques and methods which are used in implementing the recommended strategy, it is possible to achieve an increase in demand for manufactured products regardless of the organizational and legal forms of ownership.

It is well known that events in society are multifactorial, that is, they are formed under the influence of a number of factors. Despite the complex interrelations between the factors, their influence is interrelated and complex, therefore, it must be considered only in the aggregate [1, 2, 3, 11].

Agricultural enterprises must themselves determine and forecast the parameters of the external environment, the range of products and services, prices, suppliers, sales markets, and most importantly - their long-term goals and strategies for achieving them, that is, to independently manage and plan their activities in the market so as to be profitable and profitable. This part of the planned work determines the development of the strategic plan as a set of interrelated and interdependent actions and activities designed to predict the influence of macro and micro means on the development of the enterprise and determine its strategic development for future periods and ensure its harmonious existence in the market environment.

Supporting the opinion of many scientists, we believe that multifactor correlation-regression analysis enables the researcher to estimate the influence of macro- and microenvironment factors on the resultant (generalizing) indicator that is studied in a given time interval, as well as for any possible variants of a set of factors, to find the theoretical value of the studied indicator [2, 3, 4, 5, 6, 7, 11, 12].

For today there are many factors of influence on formation of marketing strategy of the investigated enterprises. The connection between endogenous and exogenous factors is considered linear, and in general, its correlation-regression model has the following form [2]:

$$Y = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 ..... + a_mx_m \quad (1)$$

where Y – is the value of the endogenous factor, is determined by the regression equation (the theoretical value of the functional factor) for a certain level XJ (J = 1, m), and XJ – is the value of the J – exogenous factor;

m – the number of exogenous factors considered in the framework of the econometric model; a0, a1, ..., am - parameters of the model.

The coefficient aj (J = 1, m) indicates how many units the resultant factor Y has changed, if any influence factor on it XJ changes by one, provided that all other factors acquire the value xJ1, xJ2 ... . xJm.

In the square form of the regression, the equations have the form [2, 11, 12]:

$$Y = a_0 + a_1x_{j_1} + a_2x_{j_2} + a_3x_{j3} + a_4x_{j_4} ..... + a_mx_{j_m} \quad (2)$$

The calculations of the model parameters were performed using the “Statgraphics” application package, namely, its Multi-Variable Analysis, as well as the MS Excel Extension

"Package add-ons". The analysis of the obtained data testifies that the received correlation-regression model will have the form:

$$Y = 0.46\ x1 + 2.53\ x2 + 1.50\ x3 - 0.92 \quad (3)$$

So, the total profitability of sales is influenced by the volume of commodity output for 1 UAH of expenses for its production, but the positive effect is provided by the influence of other factors. Corresponding correlation coefficients are close to unity, indicating a close relationship between the factors under investigation and the resultant attribute.

Based on the survey of agricultural enterprises in the region was explored the effectiveness of the implementation of the marketing strategy (E) for companies and evaluated such important indicators as costs for sales and marketing, which led to changes: prices (C) by 3%; expenditures for improvement of quality (I) by 7% and advertising and promotional activities (P) - 4%. We group the results of the observation, and also carry out the dispersion analysis of efficiency from marketing activities on the basis of calculation average estimates for these factors, which have a significant impact on the activity of the region's enterprises (Tab. 1.).

For further calculations of all warehouses to carry out further calculations of all the components of the dispersion, we use the formulas [8, 9, 10, 11]:

$$S^2{}_y = \sum (Yijl - Y)^2 n_j \quad (4)$$

where Yijl – is the total average value for the considered factor; Y – is the total average for all the studies that we get by dividing the sum of observations, in our case is 13 • 2 • 3 = 78 for the total sum of the estimates for all factors (in our case it is 26 and Y = 26 : 78 = 0, 33;

nj - the number of observations for this factor;

$$S^2_C = (0.42 - 0.33)^2 \bullet 26 + (0.54 - 0.33)^2 \bullet 26 = 1.36;$$

$$S^2_I = (0.81 - 0.33)^2 \bullet 26 + (0.88 - 0.33)^2 \bullet 26 = 13.86;$$

$$S^2_P = (0.42 - 0.33)^2 \bullet 26 + (0.69 - 0.33)^2 \bullet 26 = 3.58.$$

Tab. 1. THE RESULTS OF A SURVEY OF RESPONDENTS ON THE EFFECTIVENESS OF IMPLEMENTING THE MARKETING STRATEGY OF THE ENTERPRISE AND THE CALCULATION OF VALUES IN GROUPS *

Indicator	Respondents, Score												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Cost													
E1 for C1	1	2	-1	-2	0	1	-1	0	2	2	1	0	-1
E1 for C2	1	0	2	1	-1	-2	0	1	2	0	1	2	1
E2 for C1	2	1	0	-1	2	-2	1	2	0	1	2	-1	0
E2 for C2	0	1	2	-1	0	-2	2	1	0	2	1	-1	1
Costs for improving quality													
E1 for I1	2	2	-1	-1	0	2	1	1	2	1	-1	0	1
E1 for I2	1	1	2	1	0	1	2	1	-1	1	2	1	1
E2 for I1	2	1	1	1	2	2	0	1	1	2	-1	-1	1
E2 for I2	1	-1	1	1	2	2	0	1	2	-1	-1	1	2
Cost of promotional activities and promotion													
E1 for P1	1	1	-1	0	1	-1	2	1	0	-1	1	1	0
E1 for P2	1	2	-1	-1	2	1	0	0	2	1	1	0	2
E2 for P1	-1	0	-2	0	1	1	2	1	1	2	-1	1	1
E2 for P2	2	2	1	1	1	0	0	1	1	-1	0	1	-1

Indicator	*E1-C1*	*E1-C2*	*E2 –C1*	*E2–C2*	*E1 - I1*	*E1–I2*	*E2-I1*	*E2-I2*	*E1-P1*	*E1-P2*	*E2-P1*	*E2-P2*
Number of observations in groups	13	13	13	13	13	13	13	13	13	13	13	13
The sum of estimates in groups	4	8	7	6	9	13	12	10	5	10	6	8
Average values in groups	0,31	0,62	0,54	0,46	0,69	1,0	0,92	0,77	0,39	0,77	0,46	0,62

Indicator	Cost		Quality		Promotional activities	
	C1	C2	I1	I2	P1	P2
Number of observations in groups	26	26	26	26	26	26
The sum of estimates in groups	11	14	21	23	11	18
Average values in groups	0,42	0,54	0,81	0,88	0,42	0,69

* Developed based on our own research.

We calculate the variance, taking into account the effect of the factors, according to the formula [10, 11]:

$$S^2{}_c = {}_{nij}\sum \sum (Yijl - Y)^2 \quad (5)$$

$$S^2_c = 13 \bullet [(0.31 - 0.33)^2 + (0.62\text{-}0.33)^2 +. + (0.62 - 0.33)^2] = 20.33\% \quad (6)$$

$$S^2_{c\text{-}y} = S^2_c - S^2_C - S^2{}_I - S^2{}_P = 20.33 - 1.36 - 13.86 - 3.58 = 1.53$$

At this stage, we calculate the total and residual variance, taking into account all observations and the total for the entire sample of the total value of respondents' estimates using the formula:

$$S^2_y = \Sigma (Yijl - Y)^2 = (0.42 - 0.33)\ 2 + (0.54 - 0.33)\ 2 + ... + (0.69\text{-}0,\ 33)\ 2 = 72.28\%.$$

According to the residual dispersion is: $Sz^2 = 72.28 - 20.33 = 51.95\%$ (7)

Indicators of influence of controlled factors on the result:

$$\Delta C^2 = S^2C : S^2y = 1.36: 72.28 = 0,\ 0188 = 1.88\% \quad (8)$$

$$\Delta I^2 = S^2I : S^2y = 13.86: 72.28 = 0.1024 = 19.18\% \quad (9)$$

$$\Delta P^2 = S^2P: S^2y = 3.58: 72.28 = 0.0495 = 4.95\% \quad (10)$$

Consequently, the increase in the price of agricultural products affected the increase in purchasing intentions by 1.88%; increase in product quality - by 19.18%. This will lead to an increase in buyers' demand for products, and the appearance of advertising in periodicals and other promotional activities will increase the purchase of agricultural products by the consumer by 4.95%.

The share of uncontrollable factors in the total variation in the probability of increasing the purchase of goods is 71.9% according to the calculation formula:

$$\Delta z^2 = Sz^2: S^2y = 51.95 : 72.28 = 0.719 \quad (11),$$

The degree of influence of the interaction of factors on the variation of the purchasing estimates is 2.1%.

$$\Delta c\text{-}y^2 = S^2_{c\text{-}y}: S^2y = 1.53: 72.28 = 0.021 \quad (12)$$

In the process of research, certain features of the influence on the results of marketing activities of agricultural enterprises in Khmelnytsky region on factors such as price, expenses for improving the quality of products, and advertising expenses were revealed. The influence of these factors on the formation of incomes of agricultural enterprises was investigated using variance analysis on the basis of calculating the average estimates of the performance of 13 enterprises of various forms of management in the Khmelnytsky region.

In order to assess the strategic position of the agricultural enterprises of the region on the market, implementation of the proposed scientific approach to the formation of a marketing strategy based on the method of SPACE analysis was implemented.

Factor estimation will be carried out on five groups of factors: macro environment; the general attractiveness of the industry; microscope; the impact of competitive forces M. Porter; production level.

These factors characterize the internal and external environment of the enterprise and directly affect their activities, and through SPACE analysis, we can create a polygon of the recommended strategy in the space of factors of the general attractiveness of the industry, the

influence of the competitive forces, the internal environment and the level of production. The factors of indirect impact are not taken into account, although they allow the strategic recommendations to be supplemented with information on the conditions for the implementation of the chosen strategy.

Surveys were carried out with respect to employees of administrative apparatuses of 31 agricultural enterprises of the Khmelnitsky region, on the basis of which factor weighting was revealed and an analytical assessment of their values for the enterprises of the researching strategic groups was carried out. The results of the evaluation are given to the groups: "1" is the least favorable effect of the factor; "5" is the most favorable effect. So, the larger the final score, the more favorable the situation for the enterprise in the external environment. On the basis of summarizing the opinions of experts (in the number of 31 people) concerning the factors of the influence of macro- and microenvironments on the efficiency of economic activity, these strategic positions of model enterprises in the agrarian market (Tab. 2.).

The consistency of experts' opinions can be checked by calculating the coefficient of concordance with checking its statistical significance using the Pearson criterion "chi-squared", which is determined by the formula:

$$W = \frac{12 \bullet S}{m^2 \bullet (n^3 - n)}, \tag{13}$$

where is the number of experts; - number of factors that were evaluated; - sum of squares of deviations of sum of expert estimates from the average sum of evaluations [89, 101]:

$$S = \sum_{i=1}^{n} (\sum_{j=1}^{m} B_{ij} - \frac{\sum_{i=1}^{n}\sum_{j=1}^{m} B_{ij}}{n})^2 \tag{14}$$

where is the estimation of the factor by the expert.

If the coefficient is in the range 0-0.3, the opinions of the experts are not agreed; 0.3-0.5 - poor consistency; 0,5-0,7 - average consistency; 0.7-0.9 is a strong consistency, and 0.9-1.0 is complete consistency, and its statistical significance is checked by Pearson's "chi-squared" criterion [10, 12]:

$$\chi^2_{розр} = \frac{12 \bullet S}{m \bullet n \bullet (n+1)} \tag{15}$$

If so $\chi^2_{розр} > \chi^2_{табл;\, n-1;\, \alpha=0,95}$, the coefficient of concordation is statistically significant.

Tab. 2. FACTOR ESTIMATION OF STRATEGIC POSITIONS OF AGRICULTURAL ENTERPRISES OF KHMELNITSKY REGION IN THE AGRARIAN MARKET

Factor	Coefficient of significance of the criterion	***LLC „Kozatska Dolyna - 2006"***		***NVA LLC „Perlyna Podillya"***	
		Analytical Score, points	Weighted analytical score, points	Analytical Score, points	Weighted analytical score, points
1. Factors of the environment (PC)					
1.1. Political and institutional	0,13	2	0,26	3	0,39
1.2. Economic and organizational	0,31	5	1,55	5	1,55
1.3. Natural and ecological	0,04	4	0,16	4	0,16
1.4. Demographic and sociocultural	0,20	3	0,60	3	0,60
1.5. Information and consulting	0,22	2	0,44	2	0,44
1.6. Demand potential	0,10	4	0,40	4	0,40
Total	***1,00***	***20***	***3,41***	***21***	***3,54***
2. Factors of general attractiveness of the industry (PG)					
2.1. Area size	0,21	4	0,84	5	1,05
2.2. Growth rate of the industry	0,16	2	0,32	3	0,48
2.3.Competitive situation	0,20	3	0,60	3	0,60
2.4. Profitability of the industry	0,30	2	0,60	2	0,60
2.5. Sensitivity to inflation	0,09	5	0,45	4	0,36
2.6. Sales potential	0,04	4	0,16	4	0,16
Total	***1,00***	***20***	***2,97***	***21***	***3,25***
3. Factors of the internal environment (BC)					
3.1. Financial and economic indicators	0,21	5	1,05	5	1,05
3.2. Staff qualifications	0,18	4	0,72	5	0,90
3.3. Appropriate equipment and technology	0,21	4	0,84	4	0,84
3.4. Innovation activity	0,13	3	0,39	3	0,39
3.5. Investment attractiveness	0,20	3	0,60	2	0,40
3.6. Style of the enterprise management in various forms of management	0,07	2	0,14	3	0,21
Total	***1,00***	***21***	***3,74***	***22***	***3,79***
4. Factors influencing competitive forces by M. Porter (COP)					
4.1. Consumers of products	0,29	5	1,45	5	1,45
4.2. Existing substitute goods	0,06	1	0,06	2	0,12
4.3. Suppliers of products	0,21	3	0,63	4	0,84
4.4. New competitors in the market	0,11	4	0,44	3	0,33
4.5. Existing competitors in the market	0,33	3	0,99	3	0,99
Total	***1,00***	***16***	***3,57***	***17***	***3,73***
5. Factors of product level (RP)					
5.1. Quality / price for products	0,33	5	1,65	5	1,65
5.2. Compliance with standards	0,16	2	0,32	3	0,48
5.3. Matching supply demand	0,12	4	0,48	5	0,60
5.4. Storage and processing of products	0,16	4	0,64	3	0,48
5.5 Directions of sales of products	0,23	3	0,69	3	0,69
Total	***1,00***	***18***	***3,78***	***19***	***3,90***

* Developed based on our own research.

Let's show the calculation for a group of factors of indirect influence of LLC "Kozatska Dolyna - 2006 " (Tab. 3).

Tab. 3. COEFFICIENT OF CONCORDANCE AND THE ESTIMATED VALUE OF THE PEARSON TEST FOR ENVIRONMENTAL FACTORS OF LLC "KOZATSKA DOLYNA 2006 "

Factor	**Average score**	**Sum of points**	**Square deviation from the average sum of points**
1.1. Political and institutional	2	62	$(62\text{-}103{,}33)^2 = 1708{,}169$
1.2. Economic and organizational	5	155	2669,789
1.3. Natural-ecological	4	124	427,249
1.4. Demographic and socio-cultural	3	93	106,709
1.5. Informational and consulting	2	62	1708,169
1.6. Potential demand	4	124	427,249
Total: The average sum of points	***20***	***651*** ***103,33***	***7047,334***

* It is developed on the basis of own researches and the data **tab. 2**

Similarly, we will calculate for a group of factors of indirect impact of the NVA LLC "Perlyna Podillya » (Tab.4). The applied technique allows to find out the strategic positions of the enterprises under study against the background of competitors. In particular, according to the results obtained, it is established that the NVA LLC "Perlyna Podillya" is dominated by another competitor - LLC "Kozatska Dolyna 2006 " by strategic positions in the market.

Coefficient of concordance of LLC „Kozatska Dolyna 2006"

$$W = \frac{12 \bullet 7047{,}334}{31^2 \bullet (6^3 - 6)} = 0.42;$$

and the NVA LLC "Perlyna Podillya"

$W = \frac{12 \bullet 5285{,}5}{31^2 \bullet (6^3 - 6)} = 0.31$, therefore, the opinions of experts are poorly coordinated.

The calculated value of the Pearson criterion is

$$\chi^2_{розр} = \frac{12 \bullet 7047{,}34}{31 \bullet 6 \bullet (6+1)} = 64{,}95;$$

$$\chi^2_{розр} = \frac{12 \bullet 5285{,}5}{31 \bullet 6 \bullet (6+1)} = 48{,}71.$$

Table value of the criterion for 6 - 1 degrees of freedom and probability - 95%.

$\chi^2_{òàáë.;\ 6-1;\ \alpha=0{,}95}$ = 11,07. Because, 64,95>11,07 and 48,71>11,07, since 64.95>11.07 and 48.71> 11.07, the concordance coefficient is statistically significant.

Tab. 4. COEFFICIENT OF CONCORDANCE AND CALCULATED VALUE OF PEARSON'S CRITERION FOR ENVIRONMENTAL FACTORS OF *NVA LLC "PERLYNA PODILLYA"*

Factor	Average score	Sum of points	Square deviation from the average sum of points
1.1. Political and institutional	3	93	$(93\text{-}108,5)^2 = 240,25$
1.2. Economic and organizational	5	155	2162,25
1.3. Natural-ecological	4	124	240,25
1.4. Demographic and socio-cultural	3	93	240,25
1.5. Informational and consulting	2	62	2162,25
1.6. Potential demand	4	124	240,25
Total: The average sum of points	***21***	**651,0 108,5**	**5285,5**

* Developed on the basis of own research and data tab. 2

The calculations for other groups of factors and other enterprises are similar (Tab.5), so we can conclude that all the coefficients are statistically significant, but the level of consistency of opinions on some factors is not so high, but some are medium and strongly coordinated. This suggests some uncertainty about the situation: experts are the basis for certain judgments regarding certain factors, so thoughts vary a lot. Consequently, these estimates are partially sufficient.

Tab. 5. CONCORDANCE COEFFICIENTS AND CALCULATED VALUES OF THE PEARSON CRITERION *

Group of Factors	LLC "Kozatska Dolyna 2006 "	NVA LLC "Perlyna Podillya"
Environmental factors	$W = 0,42\ \chi^2 = 64,95$	$W = 0,31\ \chi^2 = 48,71$
Factors of general attractiveness of the industry	$W = 0,42\ \chi^2 = 64,95$	$W = 0,31\ \chi^2 = 48,71$
Factors of the internal environment	$W = 0,31\ \chi^2 = 48,71$	$W = 0,37\ \chi^2 = 56,06$
Factors influencing competitive forces by M. Porter	$W = 0,84\ \chi^2 = 103,59$	$W = 0,52\ \chi^2 = 64,48$
Factors of product level	$W = 0,52\ \chi^2 = 64,48$	$W = 0,48\ \chi^2 = 59,52$

* Developed based on our own research.

To our opinion, the larger the trapezium area, the more favorable the strategic position of the enterprise. The trapeze orientation on a specific axis determines the favorable component

of the strategic position, which depends on the indicators of demand for the company's products and its sales volume, which allows enterprises to determine the ability to fully satisfy the demand of consumers.

For successfully solving the problems of the development of any rural enterprise, it is required to develop marketing strategies based on increasing the efficiency of activities in the current conditions of management and their improvement in the future. For each of the variables on which profit depends, three assessments are carried out: optimistic, pessimistic, and most likely. Using the diagram of the choice of recommended strategies based on the results of the factorial evaluation, we can recommend choosing the best strategy for the research of the UVAN enterprises (Fig. 1).

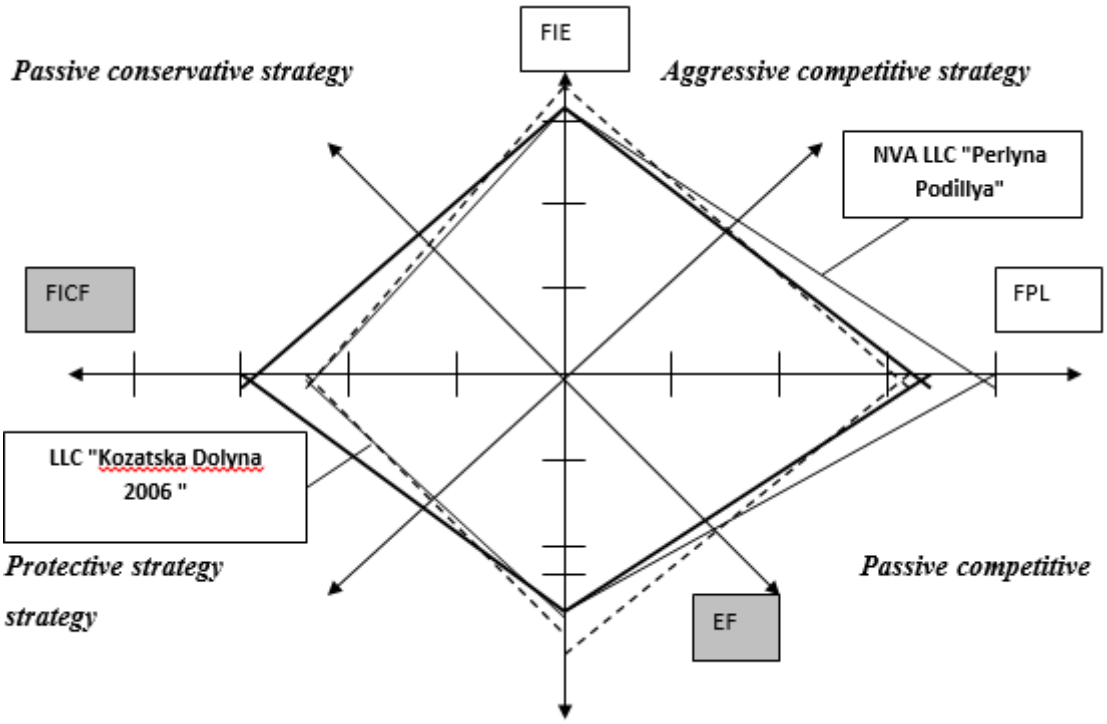

Fig.1. RECOMMENDED MARKETING STRATEGIES BASED ON THE RESULTS OF FACTOR ESTIMATION *.

* developed on the basis of own research

The results of the conducted research indicate that the formation of marketing strategies by the subjects of the agrarian market of the Khmelnitsky region is not at an adequate level. Therefore, it is necessary to introduce such an approach to the formation of a marketing service based on the marketing-functional principle in agricultural enterprises of the region and optimizes the complex links between marketing services and structural divisions of the enterprise and allows the use of marketing approaches and tools for market research. For companies that may have their own marketing service, we recommend that you use the services of consulting firms and marketing departments in order to develop an effective development

strategy. According to the recommendations, they plan to create modern “Agromarketing centers” at the departments and departments of the agro-industrial development of the region.

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