Methods of Assessing the Possibility of Forming a Branch Regional Clusters in RK

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ABSTRACT
To date, the majority of industrialized countries links the long-term socio-economic development with the transition to the path of the cluster. The use of cluster theory allows us to solve a wide range of tasks: to increase investment attractiveness of the region, to improve the human infrastructure, as well as to increase employment of the population and increase tax revenues.
Keywords: methodology, evaluation, the possibility of the formation, industry, region, cluster.

INTRODUCTION

The main task of the State program of industrial-innovative development of the Republic of Kazakhstan is to give a new level of adaptability to the priority sectors of the pharmaceutical industry and the creation of a framework for the future development sector through the formation of innovation clusters [1, 2, 3, 4, 5, 6].

Relevance of pharmaceutical cluster in Almaty region confirms the presence of a complex pharmaceutical industry developed. The share of Almaty region in the volume of domestic production of pharmaceutical products is significant and makes about 28%. Development of a complex of pharmaceutical industry of the region is presented by such major companies as JSC "Nobel", LLP "VivaFarm", LLP "Fitoleum», LLP «Kelun - Kazpharm»., Etc. In recent years, there has been a high rate of growth of domestic pharmaceutical market in the region, due to the increase investment in the pharmaceutical industry. Since 2018 there is a gradual transition of activities of pharmaceutical companies in the region to GMP standards.

In the Tien-Shan range are more than 20 thousand species of plants, 6 thousand of them contain biologically active substances. Of the six thousand plants only 600 species can be used as semifinished product for the production of drugs, and of more than 500 species can be produced finished product.

The existence of a high scientific production and human potential, which is concentrated in KazNMU them. SD Asfendiyarov is also a fundamental feature of the cluster development of the pharmaceutical industry in the region.

Based on the foregoing, it follows that in the Almaty region, there are all necessary conditions for the creation of a pharmaceutical cluster.

All this contributed to the definition of the main goals and objectives for this study. One of the objectives of the study is to define the methodology for assessing the possibility of the formation of pharmaceutical cluster in the region.

The purpose of this study is to assess the possibility of development of a technique of forming the pharmaceutical industry in the cluster region.

MATERIALS AND METHODS

During the study, it was revealed that the pharmacy institutions' guide should develop and ensure implementation of targeted policies to increase competitiveness with a set of clear measures aimed at strengthening the competitive position of pharmaceutical companies, one of which is the organization of the pharmaceutical cluster, consisting of a complex pharmaceutical industry, wholesale and retail pharmaceutical companies and other components of the pharmaceutical activities [7].

Regional socio-economic development is quite specific process, since it is both objective and subjective simultaneously [8]. The objectivity of social and economic development lies in the fact that it takes place under the influence of various factors (geographical, historical, demographic, resource, etc.) both in the region and the country as a whole [9, 10]. Along with this, the development of the region - a subjective process, as it takes place under the scrutiny of government both national and local level [11, 12]. development of the region - a complex phenomenon, because it depends on many factors, and this is due to its non-linearity and the constant ups and downs [13, 14]. Despite this, the socio-economic development can not be chaotic, therefore, it requires a careful consideration of its Strategy [15].

In modern times the development strategy for the formation of industrial clusters in the region, a number of areas of Kazakhstan (Turkenstanskaya, Almaty, Karaganda, East Kazakhstan, West Kazakhstan region, etc.) pay considerable

attention to the clustering of economic sectors as an effective instrument to stimulate regional development.

Note that to date have not formed a clear algorithm to identify the industries in which the formation of the clusters will successfully develop in the future and will achieve the intended results. Typically, the proposals on formation of various integrated structures of this kind are based either on the experience of other regions or countries, or on the preference of industry, production of which is predominant in the region.

These approaches, in our opinion, are incorrect and since it is not possible to use the experience of other regions or countries (excluding the specifics of the region), or to exclude from consideration the industry's non-dominant, but nevertheless having a significant weight in the regional economy .

Thus, having identified certain shortcomings of the existing theoretical and practical provisions to the formation of clusters, we have developed and proposed its own approach to this issue.

In our view, when considering the possibility of clustering of the regional economy is necessary not only to identify potential industry, but also to analyze the cluster perspective in the context of its attraction for the region, as well as to adapt the cluster in the regions of the country.

It should be noted that this method is needed to solve urgent issues for the region:

1. Definition of sectors that should be developed in the region in order to achieve the strategic goals of development of the region;

2. Identify the region has certain advantages;

3. Identify areas of budget spending in the region, in order to stimulate the process of accommodation of industrial clusters.

Methodical approach identify promising economic specialization of the region, we offer consists of four main phases and represents the next algorithm (Figure 1):

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┌─────────────────────────────────────────┐
│   selection of potential sectors         │
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                      │
                      ▼
     ┌──────────────────────────────────────────────────────┐
     │ assessment of the attractiveness of the industry of   │
     │ regional clusters                                      │
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     │ identification of the most suitable for the formation │
     │ of industry clusters                                   │
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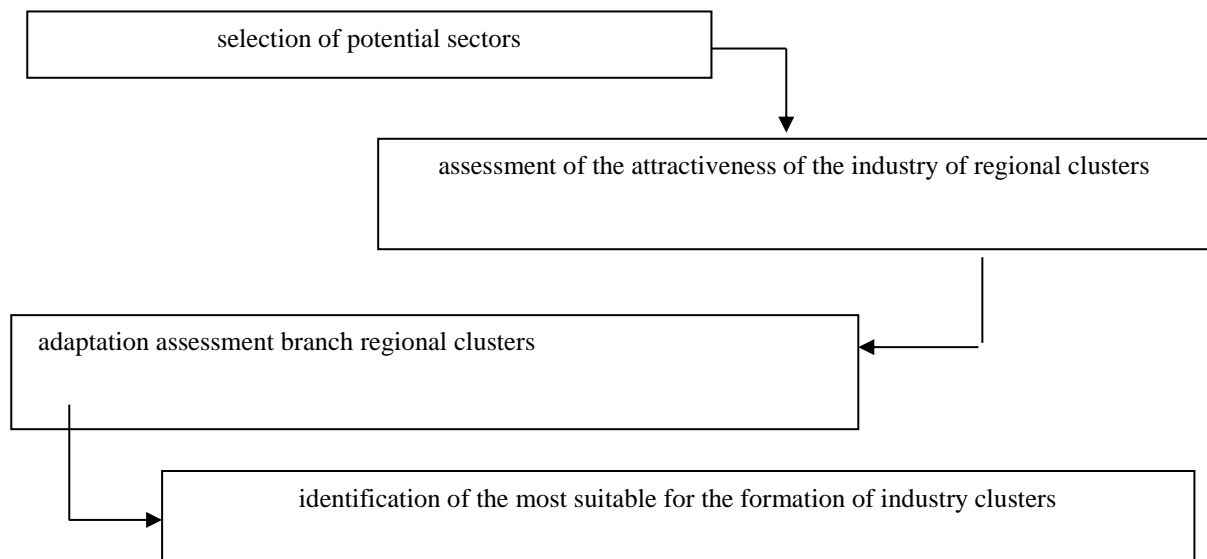
Figure 1: Algorithm of the methodical approach of identifying promising specialization of the regional economy.

Stage 1: selection of potential industries. At this stage, the choice of industries that will be analyzed. Several selection options: it may be a solid analysis of all sectors of the field, sampling individual industries (for example, on the basis of the share of industry in GRP), the selection of important sectors based on an analysis of multiple correlation. It should be noted that these methods can be used together (with the exception of the dominant industries, and then a solid left to the analysis). It is also interesting to calculate the localization coefficient, which indicates the potential for clustering of industry.

Stage 2: assessment of the attractiveness of the industry of regional clusters is to calculate a number of parameters, which we will call local characterizing the attractiveness of the cluster for the region. Based on the obtained data is calculated integral index attractiveness. Then, a determination of intervals of integral indicators attractiveness based graphical fashion.

Stage 3: Score adaptation branch regional clusters to determine the possibility of the formation of the integrated structure in the region from the standpoint of availability conditions for its successful operation. At this stage, as calculated local adaptation parameters on which subsequently calculated integral index adaptation. Then, a determination of intervals adaptation integral indicator values based on the graphic method.

Stage 4: identification of the most suitable for the formation of industry clusters. With the help of in the studied sectors obtained integral indicators clusters attractiveness and adaptation we conclude about the possibility of cluster, on the basis of our proposed matrix determine the possibility of cluster formation.

So, the task of evaluating a promising specialization of the regional economy is to classify the plurality of sectors of a particular region (or branches, which by virtue of certain conditions can be accommodated within the region) into

groups, depending on the impact on the economy of the region.

It is worth noting that the sector falling within the group of potential or desirable for cluster formation, may subsequently be the subject of intensive support from the regional authorities.

RESULTS AND DISCUSSION

Thus, we consider the proposed steps in detail.

1. The selection of sectors to be included in the evaluation of promising specialization of the regional economy.

As noted above, the selection of sectors can be produced in several ways, we consider them in detail. You can sample the sectors (eg, based on the share of industry in GRP or the main indicators of the industry), or to analyze all industries developing in the region.

In determining the desired sectors can be calculated traditional localization ratio. The calculations can be carried out in terms of output, fixed assets, the number of key personnel, labor productivity, exports, imports, investment in fixed capital, foreign investment. Localization factor shows the level of development of the industry and its importance to the economy of the region. Weproposetocalculate the coefficient as follows:

$$
\begin{cases}
K_n = \dfrac{P_{ij}}{P_{is}} \\
K_\eta \geq 1 \\
P_{ij} = \dfrac{Q_{ij}}{Q_j} \\
P_{is} = \dfrac{Q_{is}}{Q_s}
\end{cases}
$$

Where

Rij - the share of industry i in region j for production;

Pis - the share of industry i at a scale of production in the country;

Qij - output products industry in the region;

Qj - the volume of production in the whole region;

Qis- output products industry within the country;

Qs - the volume of production in the whole country;

If the calculated rate factor of localization is greater than or equal to one, then the industry can create clusters.

In the framework to assess the possibility of solving the problem of clustering to identify sectors, we suggest using the reference approach. The essence of this approach lies in the fact that first identifies the major industry - standards in the country's economy as a whole (recorded production). Then, already addresses the issue of the composition and distribution of shares of each of the branches in the regions. To this end, may use statistical tools, in particular the use of the localization factor.

The disadvantage of using such a method of definition needed to address industry is the unavailability of some of the indicators that are used to calculate the localization ratio.

It is also possible the approach proposed by AV Ermishina. The author proposes to count three factors to determine the priority sectors:

1) the localization coefficient:

$$
LC = \frac{P_{ij}^p}{P_{js}^p}
$$

Where

P_{ij}^p -the share of industry j in the production structure of the region i;

P_{js}^p- the share of industry j in the production structure of the country s.

1) Index of specialization:

$$
SI = \frac{P_{ijs}^p}{P_{is}^{gdp}}
$$

Where

P_{ijs}^p- the proportion of the region i of industry j in country s scale;

P_{is}^{gdp}- the region's share of the country's GDP i s.

1) ratio of per capita production:

$$
Pc = \frac{P_{ijs}^p}{P_{isn}^p}
$$

where P_{ijs}^p- the specific weight of the sector in the region of I j in the industry structure of the country s;

P_{isn}^p - the proportion of the population of region i in the country s population.

The disadvantage in this case is that the author does not make an assessment on the proposed clustering potential coefficients.

As for the possibility of clustering coefficients in the industry must be more than or equal to one, then we can offer the following scale:

$$
\begin{bmatrix}
\begin{cases} LC \geq 1 \\ SI \geq 1 \rightarrow clustering\ is\ possible \\ P_c \geq 1 \end{cases} \\
\begin{matrix} LC < 1 \\ SI < 1 \rightarrow clustering\ is\ unpromising \\ P_c < 1 \end{matrix}
\end{bmatrix}
$$

Thus, a value of at least one of the coefficients less than unity clustering is unpromising. But in this case along with the calculation of the coefficients should pay attention to their dynamics, because the positive dynamics will indicate the possible prospects for further growth. Therefore, in the future, the use of different methods of stimulation (upgrade or modernization of fixed assets, expansion of the product range, the introduction of new technologies, etc.) can be considered .otrasl promising for clustering.

In our opinion, along with the calculation of the coefficient of localization, you can use multiple correlation analysis that will allow based on available statistical data to determine the curve that describes the development of the sector in question. The assumption of the cyclical development of the industry makes it possible to identify the stage of the cycle is the industry. This will allow to determine the mechanisms of action in order to stimulate its development.

Since the statistics are rather limited, we suggest considering correlation between the following factors: the volume of manufacturing industry, the average monthly wage in the industry, and the volume of investment in fixed assets. Correlation analysis should be carried out in several stages:

1) form the data range, and will determine the dependence of the industry production volume of the average wage and the volume of investment in fixed assets.

2) Calculate the correlation matrix in accordance with the formula:

$$R = \frac{1}{n-1} \times x^* x,$$

R - correlation matrix; n - number of columns.

3) Checks the null hypothesis, which is formulated as a hypothesis of equality expectation zero correlation coefficients. The hypothesis is tested by Student's t test with 5% - m risk we accept this hypothesis when it is actually wrong. To do this, the t-statistic is computed using the formula:

$$t = \frac{|r_{ij}| \times \sqrt{n-2}}{\sqrt{1 - r_{ij}^2}},$$

where r_{ij} - correlation coefficient;
n - 2 - the number of degrees of freedom.

4) were quantified tightness communication with multiple correlation using the multiple correlation coefficient determined by the formula:

$$r = \sqrt{1 - \frac{D}{D_p}}$$

where D - determinant of the matrix of paired correlation coefficients;
Dp - determinant of the matrix of paired correlation coefficients between the factors.

5) Checks the null hypothesis using the F-ratio:

$$F_{observ} = \frac{\frac{1}{1-k} * r_{y/1,2}^2}{\frac{1}{n-k}(1 - r_{y/1,2}^2)}$$

where (1 - k) and (n - k) - degree of freedom.

6) Based on the data carried graphic analysis using electronic Excel spreadsheets for further definition of suitable trendline.
2. Evaluation of the attractiveness of an industry cluster
In order to talk about the attractiveness of a cluster for a specific region, it is necessary to define the notion of attraction.
In a general sense under the appeal of the economic system should understand the ability to accumulate a set of properties, qualities that satisfy the requirements of the regional economic system.
Projecting a general concept on the scope of our study, under appeal, we understand the ability of integrated education to encourage and facilitate the achievement of the objectives of social and economic development of the region.

attractiveness assessment is based on the identification of a cluster of influence he will have on the results of social-economic development of a region. Since the effect can be different and requires some degree of inconsistency, the assessment will be performed by separate components. To this end, we introduce the notion of the local exponent of attraction. Thus, the estimate for each local indicator appeal will be based on comparison of the specific characteristics of the sector in question and the existing conditions of production in the region.

Thus, after determining the sectors in which it is planned to form clusters, defined list indicators characterizing the cluster attraction for the region.

When choosing we take as a basis a number of local indicators testifying to the major orientations of economic policy in the region, its condition and potential. After defining the sectors in which it is planned to form clusters, defined list of indicators that characterize the cluster attraction for the region. In order to identify the attractiveness of clusters in different sectors for the region, on the basis of our analysis, identified the following set of parameters: the coefficient of the average wage in the industry, the employment rate, investment attractiveness factor, factor promoting the economic development of the region:

1. The ratio of the average wage in the industry:

$$Kw = \frac{w_{(in\ the\ industry)}}{w_{(in\ the\ region)}}$$

EWC where - coefficient of average wages in the industry;
Wind- average monthly wage in the industry;
Wreg- average monthly salary in the region.
The indicator reflects the positive impact on the attractiveness of the region, if the EWC $\geq$ 1, that is, the average monthly wage in the industry will be equal to or greater than the average monthly wage in the region.

2. The employment rate:

$$K_{employment\ rate} = \frac{A_{industry}}{B_{total}}$$

Where in - occupancy ratio;
$A_{industry}$- the share of employed in a particular industry;
B_{total} - the share of the employed population in the region.
This indicator reflects the share of the employed population in the sector in relation to the entire employed population in the region, thus the higher the figure, the greater the attractiveness of the cluster the sector in question for the region.

3. The coefficient of investment attractiveness:

$$K_i = \frac{I_{industry}}{I_{total}}$$

Where in K_i - coefficient investment attractiveness industry;
$I_{industry}$ - the amount of investment in fixed assets attributable to the industry;
I_{total} - the total amount of investments in fixed capital, attracted to the region;

Investment attractiveness - an important component of the development of individual economic zones, as well as the region as a whole. Based on this, the more the industry to attract investment, the more it affects the development of the region. Therefore, the cluster attractiveness of the region depends on the share of investment in the sector in the total volume of investments attracted to the region, that is, the larger the percentage, the more attractive the cluster.

4. The coefficient of promoting overall economic development of the region:

$$K_{impact} = \frac{GDP_{industry}}{GRP_{reg}}$$

Where:

K_{impact} - factor promoting the economic development of the region;

$GDP_{industry}$ - the volume of production industry in the region;

GRP_{reg} - gross regional product.

The impact of industry on the welfare of the region reflects its share of manufacturing in the gross regional product, so the higher the calculated value, the higher the attractiveness of the cluster.

Local metrics attractiveness cluster are presented in Table 1.

As the basis of our proposed method, we took the rating methodology for ranking (distance method). After calculation of the local attractiveness of cluster indicators industry sector is detected for the region - the standard with the best indicators of local attractiveness (in Figure 1(the reference values in bold):

Indicator	Industry		
	A	B	C
N_1	x_1	x_2	x_3
N_2	y_1	y_2	y_3
…	…	…	…
N_n	z_1	z_2	z_3

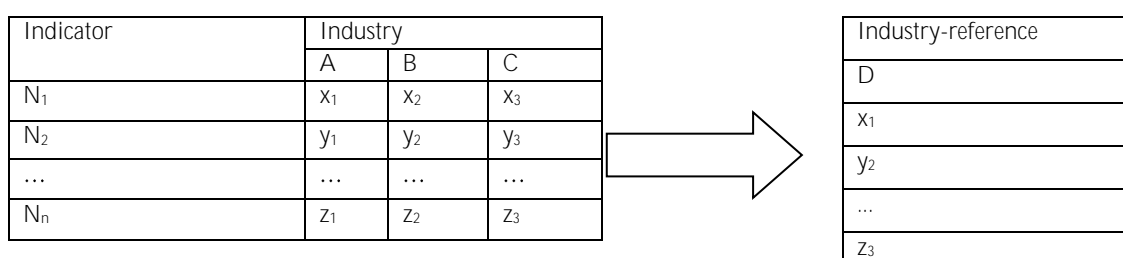| Industry-reference |
|---|
| D |
| x_1 |
| y_2 |
| … |
| z_3 |

Figure 1: Definition of the industry - standard

Integrated indicator attractiveness each sector will be calculated by the following formula:

$$I_{atract} = \sqrt{(1 - x_{\overline{2n}})^2 + (1 - x_3)^2 + (1 - x_{ii})^2 + (1 - x_{impact})^2}$$

where x - the standardized j-th industry, which is defined by the formula:

$$x = \frac{a_j}{\max a_j}$$

where max aj - the reference value of the index

After calculating the integral index attractiveness of each branch is assigned a rating scale [-1; 0; 1]. It is necessary to further identify the possibility of cluster formation in the industry based on integrated indicators and attractive accommodation cluster in the specific region.

Intervals industry cluster attractiveness values for the region, we offer determined on the basis of the graphical method. The inventive method consists in the following: on the axes x and y are laid obtained by calculating the values of integral indices attraction, then from the zero crossing point of the axes of the vector deposited prior to the plotted points. If you finish the figures, you get a right triangle, so the theorem of Pythagoras is the length of each of the vectors (Fig. 2).

Since we have the basis of the rating methodology of ranking (distance method), the best indicator of the value of the industry must be the same with the reference value, ie local industry cluster index attractiveness of the region should be zero. Accordingly, the closer the value of the integral indicator cluster attractiveness branch to zero, the higher the prospect of forming a cluster in the sector under consideration.

Graphical method for determining the effective vector (evaluation of the attractiveness of an industry cluster)
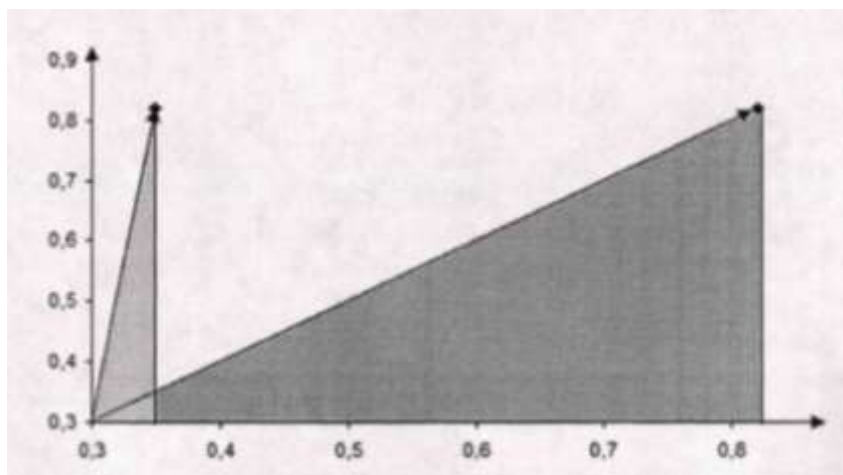
Figure 2: Example of graphic determination of effective vector

Based on this, we choose the minimum length of vector to form intervals of integral indicators attractiveness branch clusters. Based on the graphic determination of effective vector, we get intervals attractiveness values:

$$\left[\begin{array}{c} I_{priv} \in (X_1; +\infty) \rightarrow (-1), \rightarrow unattractive\ cluster \\ I_{priv} \in (0; X_1) \rightarrow 0, \rightarrow potentially\ attractive\ cluster \\ I_{priv} = 0\ \rightarrow 1, \rightarrow highly\ attractive\ cluster \end{array} \right]$$

wherein X1 smallest vector length

Table 1: Local indicators appeal clustering a particular industry for the region

indicator	symbol	calculation formula	Note
monthly average wage ratio in the industry	K_w	$Kw = \dfrac{W_{(in\ the\ industry)}}{W_{(in\ the\ region)}}$	calculation of the average level of remuneration for a specific time
employment rate	$K_{employment\ rate}$	$K_{employment\ rate} = \dfrac{A_{industry}}{B_{total}}$	shows the share of employees in the industry in relation to the total number of employees in the region for a specific period of time
investment attractiveness ratio	K_i	$K_i = \dfrac{I_{industry}}{I_{total}}$	represents the calculation of the share of investments in fixed assets of the industry of the total amount of investments attracted to the region
coefficient of assistance to the economic development of the region	K_{impact}	$K_{impact} = \dfrac{GDP_{industry}}{GRP_{reg}}$	represents industry share in gross regional product

Note that if the cluster falls into the group of unattractive, it means that the clustering of this sector should be inhibited because it adversely affects the welfare of the region.

As for A highly clusters, this group is a priority for clustering, because it had already formed some strong ties between enterprises, in this area has a number of well-functioning business networks, etc. The most important thing is that clusters of this group have a positive impact on the main indicators of socio-economic development of the region.

The next stage methodology - Assessment of the cluster adaptation in a particular sector on the territory of a particular region. For further evaluation of said need to define the term "adaptation", as a major category used at this stage.

The meaning of "adaptation" is to create conditions that would facilitate the survival of the organism. Moreover, the scope of this term is broad enough medicine, the economy in terms of migration, cosmetology, etc.

Thus, in the economic sense of adaptation can be defined as the extent to which external conditions the requirements of economic system for its survival.

In our work, given the scope of the study, under the adaptation we mean the presence of specific conditions for the functioning of clusters in the region, which not only

contribute to the success of this kind of integrated education, but also stimulate their development.

Evaluation of adaptation branch regional clusters is also in the calculation and analysis of a number of local factors:

1. The coefficient of security of the region the main types of natural resources: in order to determine the prospects of development of the industry, and especially the adaptation of integrated education considered necessary to assess the security of the region in terms of its natural resource potential. Are taken into account the following main types of resources: oil, natural gas, iron ore, aluminum raw materials, building materials, energy, forest and water resourcesetc..

2. The coefficient of labor capacity: reflects the availability of labor resources in the region, compared to the same period across the country.

3. Ratio of overdue receivables and payables: considered from the point of view of the overdue payables and receivables of the industry in the region and compared this figure to the same value in the country.

4. Ratio of manufacturing industry: compared to the regional average per capita output and per capita output as part of the country.

So, then we propose to calculate the 4 main local index directly reflects the influence of the degree of adaptation of the cluster in the region:

1. The coefficient of security of the region the main types of natural resources:

$$C_{natural\ resourses} = \frac{\sum NR_{ij}}{\sum NR_{is}}$$

$$NR_{ij} = \frac{S_{nr}^r}{S^r}$$

$$NR_{is} = \frac{S_{nr}^c}{S^c}$$

where copra - a ratio of the region's major natural resources;
$\sum NR_{ij}$ - the amount of security the main types of natural resources in the region;
$\sum NR_{is}$ - the amount of security the main types of natural resources within the country;
S_{nr}^r – The size of the stock of a particular natural resource within a region;
S^r – Population of the region;
S_{nr}^c – The size of the stock of a particular natural resource within the country;
S^c – The population of the country.

Thus, the higher the score, the higher the possibility of accommodation in the cluster region. The measure must be greater than or equal to 1, otherwise we will have a negative impact on the adaptation of the cluster, since the security of the region the main types of natural resources will be the higher, the higher the value of this indicator.

2. The coefficient of labor capacity:

$$I_{lp} = \frac{WP_r}{WP_c}$$

Where I_{lp} - labor potential of the index;
WP_{reg} - the working-age population in the region, attributable to a particular industry;
WP_{cont} - the working-age population, attributable to a particular industry.
Similar to the previous indicator, the value must be greater than or equal to one, since this is a positive for the adaptation of the cluster in the region.

3. Ratio of overdue receivables and payables:

$$I_{of\ overdue} = \frac{Q_{overdue\ debt}^r}{Q_{overdue\ debt}^c}$$

where Kdkz - an index of the financial state of the industry;
$Q_{overdue\ debt}^r$ - the share of overdue accounts receivable and accounts payable of enterprises in a specific sector in the region;
$Q_{overdue\ debt}^c$ - the share of overdue accounts receivable and accounts payable of enterprises in a specific sector on a national scale. It should be noted that the smaller the value of this index, the higher the degree of adaptation of the cluster in the region.

4. Ratio of manufacturing industry:

$$I_{mi} = \frac{\overline{Q_i^r}}{\overline{Q_i^c}}$$

where I_{mi} - index level of development of manufacturing industry;
Q_i^r - regional per capita output of the industry;
Q_i^c - per capita output of the industry in the country. So, a summary table of the local cluster adaptation indicators, as well as a brief explanation of them are presented in Table 2.
Further evaluation of clusters of adaptation within the region is similar to the assessment appeal, that is determined by the integral adaptation of index:

$$I_{adapt} = \sqrt{(1 - x_{ind})^2} + (1 - x_{mp})^2 + (1 - x_{of\ overdue})^2 + (1 - x_{wp})^2$$

where Xj - the standardized j-th branch.

Similarly evaluating attraction draws conclusions about the possible adaptation of the cluster in the region that is assigned scale scores [-1, 0, 1] and are formed by slots defined on the basis of the graphical method for determining the effective vector:

$$\begin{bmatrix} I_{adapt} \in (X_{21}; +\infty) \to (-1), \to regional\ conditions\ are\ not\ conducive\ to\ adaptation \\ I_{adapt} \in (0; X_{12}) \to 0, \to regional\ conditions\ contribute\ to\ adaptation \\ I_{adapt} = 0 \to 1, \to regional\ conditions\ fully\ ensure\ adaptation \end{bmatrix}$$

where x2 smallest vector length

Thus, in the case of the assignment of this cluster score (-1), it is recognized not able to adapt to the region. This explains the relatively high cost compared with other regions of natural resources, production facilities, labor. It can also be a significant amount of financial resources.

When calculating easy to track exactly which factor influenced the cluster adaptation.

After determining the attractiveness scores and adaptation of the cluster in a particular region, we can talk about the possibility of the formation of industrial clusters. To this end, we offer the possibility of determining the matrix formation of industrial clusters in the region.

Table 2: Local adaptation parameters specific industry cluster for the region

indicator	symbol	calculation formula	note
coefficient of provision with the main types of natural resources	CP_{nr}	$CP_{nr} = \dfrac{\sum NR_{ij}}{\sum NR_{is}}$	This indicator reflects the security of the region's industry with the main types of natural resources.
labor coefficient	C_l	$C_l = \dfrac{WP_{reg}}{WP_{cnt}}$	this indicator reflects the share of the region's able-bodied population in the country
overdue receivables and payables ratio	C_{rp}	$C_{rp} = \dfrac{Q_{od}^r}{Q_{od}^c}$	this indicator reflects the share of overdue receivables and payables of enterprises in a particular industry in the region in the similar volume of debt in the country
industry production development coefficient	C_{dp}	$C_{dp} = \dfrac{\bar{Q}_p^r}{\bar{Q}_p^c}$	this formula is a calculation of the share of regional per capita production of the industry in the per capita production of the country

It seems that a group of NK fall clusters of industries, for which there is in the region of successful operating conditions, it may be due to several reasons such as the lack in the necessary production resources (in particular the full provision of resources at the expense of imports from other regions), the lack of manpower (this option will affect their costs, because it will be much higher than in regions with a sufficient amount of labor).

Table 3: Matrix determining the possibility of formation of industrial clusters in the region

Score adaptation of industrial clusters	Score attractiveness of the industry cluster		
	-1	0	1
-1	NC	NC	NC
0	NC	PC	LCD
1	NC	PC	LCD

Thus, we propose to introduce the following final characteristics of the possibility of forming industrial clusters: Cluster unpromising education (NC), the potential for cluster formation (PC), the formation of the desired cluster (LCD).

Also in this case should take into account the effect of the integral index of the attractiveness of the cluster for the region, which includes a number of components of local indicators.

For example, a cluster may be unattractive because of the destructive influence of the effects of its activities on the ecology of the region, the level of employment in an integrated formation can be negligible, and the share in the gross regional product is minimal, etc.

Algorithm for evaluation and adaptation attractiveness branch clusters in the region is presented in Figure 3.

selection of local indicators to assess the attractiveness and adaptation of regional industry clusters

⬇

calculation of local indicators

⬇

determination of reference local indicators by rating ranking method

⬇

standardization of indicators of attractiveness and adaptation of an industry regional cluster

⬇

calculation of integrated indicators for the formation of an industry regional cluster: attractiveness and adaptation

⬇

determining quantitative intervals for evaluating the level of attractiveness and adaptation of industry-specific regional clusters (graphical method)

⬇

final priming of industries by degree of attractiveness and adaptation

⬇

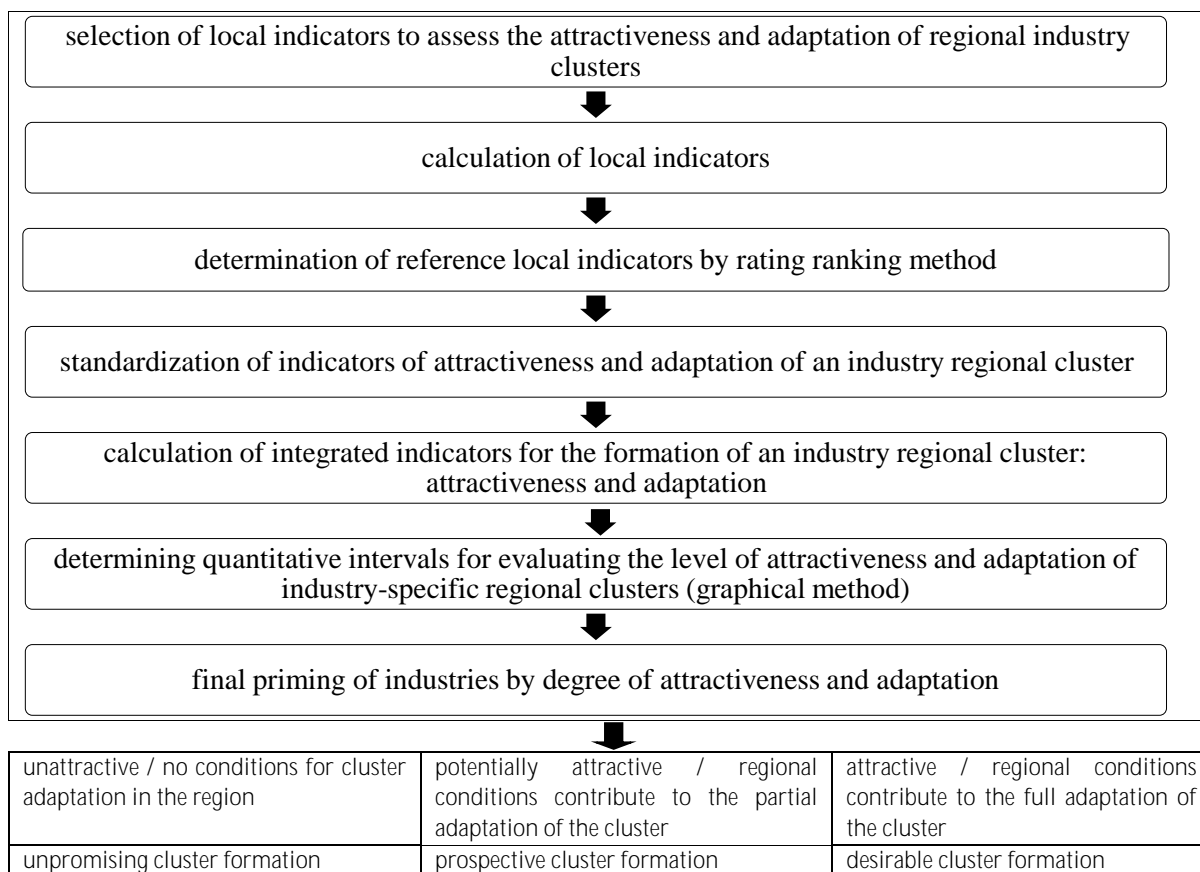| unattractive / no conditions for cluster adaptation in the region	potentially attractive / regional conditions contribute to the partial adaptation of the cluster	attractive / regional conditions contribute to the full adaptation of the cluster
unpromising cluster formation	prospective cluster formation	desirable cluster formation

Figure 3: Scheme attractiveness evaluation and adaptation branch clusters in the region

Thus, development of sectors belonging to a group of clusters should be suspended either NK or necessary to adopt a series of measures to increase the attractiveness or adaptation of the data sectors.

The group includes potential clusters that require certain conditions for the operation, part of which is performed in a particular region. Despite these points, in the region requires further analysis of factors hindering the cluster adaptation in the region. In particular, the region has a variety of methods can be used to support cluster members for lending their banks (back part of the interest on the loan, the introduction of the system of privileges for taxes, etc.). It is also necessary study tools enhance attractiveness.

The group are desirable clusters, which on one hand are the most attractive (due to the formation of the cluster increases employment, noticeable impact on overall economic growth, there has been growth of investment attractiveness, how this integrated education and region as a whole, etc.) On the other hand, the region has all the conditions for the adaptation of his within the cluster. That is, in order to improve socio-economic condition of the region, the formation and development of clusters of this group should be encouraged in various ways.

CONCLUSIONS

It is worth noting that this method allows not only to identify the sectors that will be fertile ground for the formation of pharmaceutical cluster, but also potential industries that previously for various reasons remained without attention of the regional authorities.

In our view, this approach makes it possible to identify the factors that negatively affect the ability of the cluster within the region, since the formation of the cluster is seen through the prism of its attraction for the region and adaptation as part of an industry of the country. Therefore, knowing the "weaknesses" of the region's economy, we can develop options to improve the situation, for example by improving the adaptation factors.

Analyzing the dynamics of integrated attractiveness indicators and adaptation of regional industry cluster is possible to detect the life cycle stage at which it is located. This will resolve questions about the effectiveness of the established pharmaceutical regional clusters, as well as the support it with the public authorities.

In the case where the integrated parameters are initial values, the cluster is in the process of formation. It says about the inefficient functioning of the cluster, which is the result of either poor performance of state authorities coordinating functions, or individual members of the cluster industry. Therefore, the negative impact is necessary to eliminate these factors.

If the analysis shows a positive trend of integrated indicators, we can conclude that the sectoral regional cluster is under development, so it needs support from the public authorities to further effective functioning.

Stable values of integral indices suggest that regional industry cluster in the stage of maturity that allows public authorities to perform a coordinating function, not realizing at the same financial support.

If there is a negative trend of integrated indicators, sectoral regional cluster is in the process of transformation. In this case, you must determine the shape of the transformation (separation of a few clusters, liquidation, etc.) in order to resolve the issue of the need for support from public authorities.

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