**Contemporary geography of Asian pharmaceutical companies’ production networks**

The pharmaceutical industry is one of the key life-supporting sectors of the economy, the importance of developing the national sector of which has once again been proven by the COVID-19 pandemic. Moreover, it is a high-tech industry with a high multiplier effect, which is extremely important for developing countries.

In recent years, the Asian macroregion has been characterized by high rates of medicines production, which allows us to speak of it as a region of new pharmaceutical development that can compete with the old traditional centers of the industry, namely American and European. Today, the pharmaceutical industry of the Asian macroregion provides 12.9% of the world market for pharmaceuticals, while only about twenty Asian countries are actively involved in international trade. Up to 90% of the contribution of the Asian macroregion to the global pharmaceutical market is accounted for by only five largest Asian manufacturers: China, the Republic of Korea, Singapore, India and Japan.

The Asian macroregion includes countries with completely different levels of development of the pharmaceutical industry: from the complete absence of industrial pharmaceuticals (for example, Afghanistan) to the production of blockbuster drugs and innovative medicines (for example, Japan, the Republic of Korea). Thus, the heterogeneity of development creates the possibility of including countries in regional production networks in various forms: from the implementation of interstate innovative projects to local subcontracting.

As part of the growing processes of globalization, the competitiveness of individual countries is explained not so much by endogenous development factors as by their place in the organization of world production, trade and financial activities, about 80% of international trade is currently organized through global production networks.

In this work, to analyze the territorial organization of the Asian pharmaceutical industry, the basic principles of the network approach are used, which perfectly takes into account the specifics of global production networks and, accordingly, allows us to identify the actual patterns of the dynamic spatial organization of the Asian drug manufacturing sector.

The key objective of the study was to identify areas of concentration and cores of advanced development of the pharmaceutical industry in Asia based on the construction of a framework for the production networks of Asian pharmaceutical companies.

The preparatory part of the work included the following stages:

definition and justification of the criteria for selecting Asian pharmaceutical companies as a focus group for the study: at this stage, general corporate information of 273 Asian pharmaceutical companies was analyzed;

"manual" collection of general statistical information and spatial data on the structural objects of selected companies. For this, the annual reports of 88 largest Asian pharmaceutical companies in the sample were analyzed in detail.

The size of the company, the efficiency of economic activity and the level of integration into the market were established as the main selection criteria for the focus group of the study. Then they were put in line with two quantitative indicators - market capitalization and annual income, on the basis of which the ranking of the largest Asian drug manufacturers was subsequently carried out.

Based on data on the location of industrial plants and R&D laboratories with the help of geocoding approach, 30 concentration areas of the Asian pharmaceutical industry around the world were identified. The main selection criterion is the density of objects placement; a secondary indicator is the similarity of the corporate structure of the territory (i.e. if Korean and Chinese pharmaceutical plants are located at the same distance from the obvious area of concentration of Chinese companies, then the latter can be included in the main area based on the principle of greater likelihood of networking).

Areas can be represented in two spatial forms - microareas and mesoareas.

1) the microarea is characterized by an increased concentration of production facilities within a large agglomeration. Examples include the Bangkok, Khansin and Bangalore areas.

2) the mesoarea is an object of greater territorial coverage, while its internal structure can be represented by a uniform distribution of production potential without obvious peaks (for example, the Iranian and Central Chinese areas) or, conversely, have several pronounced concentration nuclei of the pharmaceutical industry (for example, Javanese area - with large centers in Jakarta and Surabai; West Indian - Mumbai and Ahmedabad; Southeast coast of China - Shanghai, Shenzhen, Hong Kong, Taipei). The size, structure and specialization of areas are determined by their internal characteristics, and not by country, as evidenced by the presence of different types of areas within the same country. Also, for most areas of the Asian pharmaceutical industry within Asia, multispecialization is characteristic, while their internal functional structure can be both uniform and polarized (most often innovation development). For example, in the West Indian area, industrial potential is distributed relatively evenly, while R&D functions are localized in the three largest economic centers - Mumbai, Pune and Ahmedabad. One of the reasons is the availability of highly qualified personnel, namely specialists in the field of chemistry, pharmacology, bio- and genetic engineering.

The formation of large concentration areas of the Asian pharmaceutical industry outside of Asia (11 out of 30 allocated), primarily in Europe and the USA, is due to the desire of Asian drug manufacturers to gain access to a foreign pool of advanced knowledge and technologies. On the one hand, this is a clear sign of continued dependence on external innovations, and on the other hand, the prerequisites for a gradual complication of the forms of interaction between Asian companies and leading pharmaceutical centers. Europe combines the functions of a powerful R&D center and a large sales market with local production, the USA has definite monospecialization in innovations in the field of pharmaceuticals and biotechnology. The Asian pharmaceutical industry is least integrated into the markets of Latin America, Africa and Australia, there are isolated industrial facilities there, but dense production networks have not yet been formed.