Territorial differences and structural dynamics of the North Caucasus agriculture

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Abstract. Agriculture of the North Caucasus is one of the most developed in Russia. At the same time, within this macro-region there are noticeable (and in some aspects strong) differentiations not only in terms of the so-called production specialization, volumes of production, export, import, but also in terms of development (productivity, productivity, profitability, etc.). The reason for the latter is a complex of climatic, spatial, organizational, technological, technical, institutional, logistics and so on. factors and conditions of agricultural organization. The latter affect both the general development path of North Caucasian agriculture and the local paths of individual sectors and types of agricultural production in the macroregion with corresponding consequences for regional economies. However, this so-called a priori understanding of territorial differences needs to be clarified. In particular, it is known that the same factors (especially climatic, weather, etc.) lead to different returns on the so-called factor productivity. In addition, in reality it is important not only to indicate the presence of a particular factor, but to quantify its influence in specific conditions. In this regard, it is necessary to analyze and obtain specific (quantitative) data on territorial differences, determine the factors and conditions that form these differences and form features of the structural dynamics of agriculture in the North Caucasus.

1. Introduction
The importance of territories in the formation of the overall dynamics of agriculture in the North Caucasus is formally determined by their shares in the gross agricultural output of the macroregion. Three types of regions can be distinguished: large, medium and small. Large ones differ not only in their size (i.e., the size of gross output, as well as the main resource factors), but also in that they form (determine, set) the development trajectory or the general development trend of the macroregion. The averages, in the above context, participate in the formation of dynamics (accelerate or slow it down), create local and structural fluctuations, but in general complement or dissonant large ones. (In the first case, there is an overlap of the so-called local impulses emitted by different types of regions, as a result of which the accelerated dynamics of the macroregion are formed. In the second case, contradictions arise that create drag in the dynamics and, under certain circumstances, for example, when there are not one or two dominant center, and polycentricity and the regions occupying the position of the center compete among themselves for the right to be system-forming, forming new trends on the development path of the macro-region). Small regions mainly play the role of a catalyst, if there are a lot of them, when they are few, then the fluctuations created by them mean nothing for the development path of the macroregion. At the same time, the significance of each of the regions for
the general path of development of agriculture in the macroregion is determined by how original the region is in its regional agriculture. We are talking about product and industry structures, logistics, production and other communications. Thus, small regions may turn out to determine the general development trend when they have advanced (technologically, technically, organizationally, institutionally, etc.) agriculture. In contrast, large regions can develop in the wake of small and medium-sized ones, acting as a kind of “serving complex” of more advanced regional agricultural and food systems. The article makes an attempt to describe the state and determine the prospects for the development of agriculture in the North Caucasus using the well-known Bogdanov principle of the least.

2. Theoretical, methodological and empirical basis of the study

The methodological base of the study includes the provisions of regional and spatial economics, management, spatial development of agriculture, agricultural economics [2-8, 10]. The principle of least expressed by A Bogdanov in his "Tectology" was taken as the methodological position [1] according to which the development of a complex of branches of the macroregion is determined by the industry of not the strongest, but the weakest region that is part of the macroregion.

The object of hypothesis testing is agriculture of the North Caucasus within geographical boundaries. Thus, the following administrative-territorial entities are part of the North Caucasus: Adygea, Karachay-Cherkessia, Kabardino-Balkaria, Kalmykia, North Ossetia-Alania, Ingushetia, Chechnya, Dagestan, as well as the Krasnodar and Stavropol Territories.

The empirical basis for the verification was the data of official statistics systematized in the statistical collections of the Federal State Statistics Service of Russia: “Regions of Russia. Socio-economic indicators”, “Agriculture, hunting and hunting, forestry in Russia”, as well as statistical compendiums of the FSGS of Russia for the regions of the North Caucasus for the period from 1990 to 2017. The materials are adapted to work in the Republic of Kazakhstan in standard programs Microsoft Office Excel 2007 and others.

3. Results and discussion

Official statistics indicate that the shares of the regions of the North Caucasus in the gross agricultural output of the latter do not remain unchanged. In 1990, the largest share in the UPVS of the North Caucasus was occupied by the Krasnodar Territory, which accounted for 40.1%. In second place with a significant lag (24.1%) was the Stavropol Territory. Dagestan’s agriculture accounted for 10.0%, Kalmykia 6.3%, Kabardino-Balkaria 5.0%, Karachay-Cherkessia 3.8%, North Ossetia-Alania 3.1%, Chechnya and Ingushetia 5.0%, Adygea 2.5%. However, already in 2000, the share of the Krasnodar Territory grows to 49.5%, and the Stavropol Territory decreases to 20.6%, the share of Kabardino-Balkaria grows to 8.2%, but the share of Dagestan (8.7%), Northern Ossetia (2.9%), Kalmykia (1.4%). Thus, one can note the general trend of the 90s: firstly, a decrease in the share of large agricultural territories (with the exception of the Krasnodar Territory): Stavropol Territory, Kalmykia, Dagestan. The largest decline is observed in Kalmykia, where the decline was more than four times. But small regional agriculture - Ingushetia, Adygea also reduced their share. Secondly, the two regions of Krasnodar Krai and Kabardino-Balkar Republic increased their shares. Moreover, the first increased its share by almost 9.5 pp., And the second by 3.2 pp. Through the efforts of these regions, it happened that the rate of decline in agriculture in the North Caucasus turned out to be lower than in Russia and other macro-regions as a whole.

The two thousandth years had a different effect on the dynamics of agriculture in the regions that make up the North Caucasus. In particular, for the period 2000-2005, the share of Krasnodar Territory (-3.2%), Kabardino-Balkaria (-1.7%), Adygea (-0.3%), i.e. First of all, those territories that kept the growth path in the 90s. But at the same time, there was an increase in the share of the Stavropol Territory (+0.6%), Kalmykia (+0.7%), North Ossetia (+0.7%), Dagestan (+3.3%). Apparently, both of these trends — a decrease in some and an increase in the share of others — have shaped not only the features of the territorial, but also the dynamic development of agriculture in the North Caucasus.
during the first five years of the new century. In the second five-year period - 2005-2010 - Krasnodar Territory is increasing its share (+ 0.6%), but the proportion of the second territory (Stavropol Territory) is decreasing - 0.6%. There is an increase in North Ossetia (+ 0.5%), Adygea (+ 0.7%), Kalmykia (+ 0.4%), Chechnya (+ 0.4%), Karachay-Cherkessia (+ 0.6%). But it is declining in Dagestan (-0.7%), Kabardino-Balkaria (-0.9%; in Kabardino-Balkaria, the highest decrease in the share is observed). On the general dynamics in 2005 and 2010 influenced by Chechnya. Moreover, directly and indirectly. Directly, the agriculture of the Chechen Republic began to be taken into account in the gross agricultural output of the North Caucasus and thereby increased its volume, but at the same time, the volume of growth had to be divided now into Chechnya. As a result, (already indirectly), there was a decrease in the share of other territories of the North Caucasus.

In 2017, the Krasnodar Territory remains systemically important for agriculture in the North Caucasus, although its share compared to 2015 has grown by only 0.1%. The share of the Stavropol Territory - the second backbone center - decreased by more than 0.7% compared to 2015. At the same time, the share of the third and fourth territories - Dagestan (+ 0.9%) and Kabardino-Balkaria (+ 0.2%) increased. The share of Chechnya (+ 0.4%), Kalmykia (+ 0.1%) also increased. But in other territories there is a decrease, which varies from 0.2% (KCR) to 0.7% (Adygea, North Ossetia-Alania).

If we summarize the dynamics of the share of various territories in the gross agricultural output of the North Caucasus, then it turns out that the share of the Dagestan UPHI in the UPHA of the North Caucasus in 2017 compared with 1990 increased by 131.0%, Ingushetia to 16%, Karachaevo-Cherkessia - to 90%, North Ossetia-Alania decreased to 84%, Stavropol Territory - decreased to 93%, Adygea - to 92%, Kalmykia to 43%, Krasnodar Territory - increased by 112.0% and Kabardino-Balkaria remained unchanged.

Due to the analysis of the dynamics of the structure of various territories in the gross agricultural output of the North Caucasus, a question arises about the reasons for the formation (and formalization) of this structure, and its trend over time.

The analysis showed, firstly, the unevenness of the territories included in the North Caucasus in the formation of the path of development of agriculture in the macroregion. In the distribution of territories by the volume of gross agricultural output, one dominant center was identified (Krasnodar Territory), whose share is almost equal to the sum of all other territories included in the macroregion. Thus, the territorial structure is formed by a stable center. The second position is also located steadily in one of the entities (Stavropol Territory) and, therefore, competition for the second position is also unlikely. But the third or fourth position at different times is occupied by different territories and therefore competition between territories for this place is growing. Does this competition affect the sustainability of agricultural production growth in the North Caucasus? Analysis shows that no. But at the same time, competition stimulates the overall development of agriculture in the macro-region. Secondly, how stable is the existing territorial structure of agriculture in the North Caucasus? It seems to us that it is stable enough for North Caucasian agriculture and for its growth, despite the fact that there is a decrease in the growth rate of the two main regional actors in North Caucasian agriculture - the Krasnodar and Stavropol Territories. Apparently, the main impulse for the growing trajectory will come from the agriculture of Dagestan, Chechnya, Kalmykia, but it obviously will not change the internal configuration of macro-regional agriculture. Thus, we can talk about a stable spatial structure of agriculture in the North Caucasus with elements of internal dynamics outside two large regions - Krasnodar and Stavropol Territories.

The dynamics of the share of agriculture in the regions of the North Caucasus was influenced (and is having) a large number of various factors, but, apparently, the most important is the dynamics of the growth rate of gross agricultural production in the regions. And in this regard, we consider the dynamics of the growth rates of gross agricultural production of the regions in terms of the share of the latter in agriculture of the North Caucasus. First of all, we compare the dynamics of the UPVC of two base territories - the Krasnodar and Stavropol Territories. The first is characterized by a growing share in the UPHA of the North Caucasus, while the second is decreasing. So, for the period 1995 - 2000, the gross agricultural output of the Krasnodar Territory grew almost 5.1 times, while the Stavropol
Territory only 3.8 times. With this growth, the share of agriculture in the Krasnodar Territory increased to 49.5% (+ 3.0%), and the Stavropol Territory fell to 20.6% (-5.4%). Thus, 5.4% of the non-selected by the Stavropol Territory were more than half taken by the Krasnodar Territory. But that is not all. North Ossetia has increased its share due to higher than the Stavropol agriculture growth rate of agricultural production (4.2 times), then Karachay-Cherkessia (4.3 times), Dagestan (5.3 times), and Kabardino-Balkaria and Ingushetia surpassed even the growth rate of Krasnodar agriculture, respectively, by 6.4 and 6.1 times. As a result of these accelerations, the share of these territories has grown in agriculture in the macroregion. Thus, we can state that those regions in which, ceteris paribus, gross agricultural production growth rates are above average in aggregate, increase their shares, and those region in which growth ceteris paribus lower than average in the aggregate regions lose their shares in gross output of the macroregion.

But there is one more nuance in this dynamics and structure of growth. The fact is that the agriculture of the regions of different weights interacts. For example, the weight (which is calculated as the ratio of gross agricultural production of the regions to each other) in Krasnodar agriculture in 1995 was almost 70 times higher than Ingush agriculture. This means that for 1% of agricultural growth in the Krasnodar Territory, agriculture in Ingushetia should answer 70% of its own, then there will be equality in the growth. Even the second-place agriculture in the Stavropol Territory should respond to almost two-fold growth in the percentage growth of Krasnodar in order to equalize the growth. Other territories are ranked with even more significant factors. For example, Dagestan 3-6%, (by the way, in Soviet times their ratio was 4.0), Kabardino-Balkarian 7-9 (8 times in Soviet times), North Ossetian 11-15 (11 times in Soviet times), etc. It should be noted that only some territories: Dagestan, North Ossetia, Chechnya, Kalmykia reduce the backlog from the Krasnodar regional agriculture, while the rest increase it.

Thus, if the dynamics in the agriculture of the Krasnodar Territory decreases (and it is observed), then the general dynamics of North Caucasian agriculture will also decrease. Currently, this is not yet visible, because the rate of decline in Krasnodar regional agriculture is not yet critical for the overall path, but as soon as they fall below the so-called average macro-regional, the macro-regional path will feel this decline. Secondly, to ensure the steady growth of agriculture in the North Caucasus, it is necessary first of all to ensure the growth of Krasnodar and Stavropol regional agriculture, as in total, they provide more than 2/3 of the gross agricultural output of the North Caucasus. Growth in such entities as Ingushetia, Karachay-Cherkessia, Adygea, apparently, will not have a significant impact on the growth path of macro-regional agriculture due to their low weight.

In this regard, we will consider in more detail the current dynamics within the macro-region. In 2017, compared with 1990, gross agricultural output in the North Caucasus as a whole increased by 28.6 thousand times. The highest growth is observed in Dagestan (37.4) and Krasnodar Territory (32.0), and the lowest (below the Central Caucasian) in Ingushetia (4.7), Kalmykia (12.5), Northern Oestia-Alania (23.7), Karachay-Cherkessia, Adygea and Stavropol Territory (at 26.6). As a result of these growth rates, the share of territories in the gross agricultural production of the North Caucasus decreased / increased: Krasnodar Territory and Dagestan increased their shares, respectively, from 40.1% to 44.9% and 10.0% to 13.1%, with the stability of the CBD (5.0%), while others: Stavropol Territory, Kalmykia, Adygea, Karachaeko-Cherkessia, North Ossetia-Alania, Ingushetia reduced their shares, respectively, from 24.1% to 22.4%, 6.3 % to 2.7%, from 2.5 to 2.3%, 3.8% to 3.5%, from 3.1 to 2.6%, 1.6 to 0.8%.

But even within this time series, different dynamics of the gross agricultural production of the territories are observed, as can be seen in the five-year data. For example, in the North Caucasus as a whole, gross agricultural output for the period 1995-2000. increased by 475.7%, the average annual growth rate was 136.6%, and the highest growth rates were observed in Kabardino-Balkaria (640.0%) and Ingushetia (607.5%), respectively, with an average annual rate of 145.0% and 143.5%. Dagestan (534.4% and average annual growth rate of 139.8%) and Krasnodar Territory (506.4%) and average annual growth rates of 138.3% showed higher than in the UK as a whole. As a result of such dynamics, these territories increased their shares in the gross agricultural output of the North Caucasus
in 2000 compared with 1995. Other territories, including the Stavropol Territory, Adygea, Kalmykia, etc. reduced their shares in the UPVC of the North Caucasus. Moreover, Kalmykia and Adygea, having the lowest growth rates for the period 1995-2000, more than 1.8 times lower than the average for the macroregion, reduced their shares almost one and a half times.

From 2000 to 2005 the growth rate of UPHC in the North Caucasus has more than halved compared to the previous five-year period. A decrease is also observed in the macroregion. Growth rates above the average Caucasian were observed in Dagestan (308.4%), Kalmykia (344.8%), North Ossetia (279.9%), Ingushetia (240.5%), Stavropol Territory (229.6%) with higher than the average annual growth rate in the North Caucasus. In the Krasnodar Territory, Kabardino-Balkaria, Karachay-Cherkessia, Adygea, the growth rate for the period 2000-2005. turned out to be below the average for the North Caucasus, which led to a decrease in their share in the gross agricultural output of the North Caucasus.

In 2005-2010 agriculture in the North Caucasus continues to decline in the growth rate of gross agricultural output. Moreover, if in the previous five-year period the average annual growth rate was 117.4%, then in the new one it is 2% lower (115.4%). There was a sharp decrease in the growth rate in agriculture in Dagestan (-105.1% or -10.2% on an average annual basis), Ingushetia (-76.1%), Karachay-Cherkessia (-56.6%), Stavropol Territory (-40.3%) and others. Growth was shown by agriculture in Kabardino-Balkaria (+2.5%), Adygea (+80.0%) and Karachay-Cherkessia (+20%), as well as Chechnya, with an almost zero decrease in Krasnodar edges (-0.3%). However, the decline turned out to be stronger, and therefore the prevailing trend was a decline in the growth rate of gross agricultural output in the North Caucasus. These trends in the dynamics of gross output did not change the shares of the territories.

In 2010-2015, the total growth of gross agricultural output of the North Caucasus amounted to 190.0%, and the average annual growth rate of 113.7%. In both cases, it is lower than in the previous five-year period, respectively, by 14.7% and 1.7%. Thus, we can talk about a decrease in the decline in pace. The largest decrease was observed in North Ossetia-Alania (-83.3%, and the average annual by 10.0%), the Czech Republic (-79.5%, and the average annual by -9.3%), Krasnodar Territory (-26.1, annual average - 3.0%), CBD (-16.1, and average annual fell 2.1%), etc. Growth was observed in agriculture in the Stavropol Territory (+32.5%, and the average annual growth rate by +2.9%), Dagestan (+11.1, and the average annual growth rate +1.3%), Ingushetia (+43.5%, and the average annual growth is +5.4%). However, due to the fact that the decrease turned out to be stronger, and also because it occurred in the largest agriculture in the macroregion (Krasnodar Territory), the general decline in the rate of gross production was dominant.

Finally, during the new five-year period (2005-2017) the trend towards a decrease in the growth rate of agriculture in the North Caucasus as a whole continues (the average annual growth rate is 105.8%, which is 7.9% lower than the previous ones). Moreover, this trend is characteristic of all territories of the macroregion. True, there is intraterritorial variation, for example, in the Krasnodar Territory, the average annual growth rate is 105.8%, which is equal to the average Caucasian, but lower than the previous 6.9%), the Stavropol Territory, the average annual growth rate was 104.2% (which is almost lower than the average Caucasian 1.5% and lower than the previous ones in the region by -13.3%), Dagestan, respectively, 109.7 (+3.9% and -5.7%), Kabardino-Balkaria, respectively, 108.3% (+2.5% and -1.8%), etc.

4. Conclusion
The analysis of the state and the main trends in the territorial development of agriculture in the North Caucasus, firstly, did not confirm the main hypothesis according to which the dynamics of the complex determines the behavior of the weak link, which in relation to our task means that the behavior of agriculture in the North Caucasus is determined by its weakest territorial agribusiness (agriculture of the Republic of Ingushetia is suitable for this role). On the contrary, the analysis showed that the development of agriculture in the North Caucasus was determined by the behavior of its largest agents - in the first place: agriculture of the Krasnodar Territory, as well as the Stavropol
Territory. This situation with the main hypothesis, in our opinion, is explained, apparently, firstly, by the fact that the agriculture of the North Caucasus is conglomerative rather than systemic, complex in nature, i.e. various territorial agro-industrial complex in it are not interconnected (neither technologically, nor technically, nor institutionally, nor organizationally) among themselves, but act as independent (and self-sufficient) entities that compete and are not integrated among themselves; or, secondly, the dominance of agriculture in the Krasnodar Territory (and with it also Stavropol) is so great - monopolistic that the behavior of not only the weakest territorial agriculture (Ingush), but also any other (and even all together) does not change general dynamics of agriculture in the macroregion.

Of the two proposed reasons, we give preference to the first.

Statistically revealed the property is a decrease in growth rates, which to a greater extent is characteristic of the largest territorial agro-industrial complex (Krasnodar Territory), as well as developed ones, which in the 90s allowed a slight drop / decrease in gross agricultural output. It would seem that in this regard, the identified statistical trend lies in the mainstream of a well-known pattern - the larger the economy, the lower its annual growth rate and as the size of the economy (and the diversified complex) increases, its growth rate decreases. (However, despite this, its specific gravity may not decrease, but even grow, i.e. even low growth rates are enough to dominate). This pattern has been proven not only at the level of world economies, but also at the regional level. [10] This pattern is confirmed by the example of agriculture in the Krasnodar Territory. But the same rule does not find confirmation on the example of agriculture in the Stavropol Territory, where the average annual growth rate of gross agricultural output over five-year periods from 1995 to 2015 did not behave in full compliance with the above rule. Of the four five-year periods, two showed growth rates above the average for the macroregion, in one (2010-2015) they were higher than in the previous period and higher than in all other regions. But small territorial agro-industrial complexes (primarily Ingushetia, Adygea, Karachay-Cherkessia, whose gross agricultural products account for 1 to 4% of the UPHA of the North Caucasus) also corresponded to the rule: small complexes have higher growth rates than large and medium. In this regard, it is proposed to correct the above rule (as well as the hypothesis) from the point of view of the main element of the situation: to accept instead of the size of the complex (economy, etc.) the level of its development, taking into account technical, technological, etc. security and level of the latter. This will make it possible to formulate the rule as follows: regional (territorial) complexes having the same level of technical and technological development as the latter assimilates by various links and entities (i.e., as technological and technological innovations and innovations spread in various agents of the complex) show a decrease growth rates, which can degenerate even into negative ones, when all the agents of the complex will use new technologies and equipment, and techno-technological Skog update all or latest replacement rate is negligible compared to the dominant position of the old technology and exhaust technology. Apparently, it is precisely the latter that we are observing on the example of agriculture in the Krasnodar Territory, but even more in Kabardino-Balkaria, North Ossetia-Alania. On the contrary, in the agro-industrial complex of Chechnya, Kalmykia and, in part, the KCR, the opposite is observed - saturation with growth factors: an increase in land and labor resources, livestock, machinery, technology, logistics, etc. But, despite the growth in the latter, the pan-Caucasian dynamics of agriculture is declining due to the fact that the share of the latter is not critical for agriculture in the North Caucasus, where one super giant (Krasnodar Territory) and one giant (Stavropol Territory) and two medium (Dagestan and Kabardino-Balkaria).

The main factor, direction, instrument and mechanism for the development of agriculture in the North Caucasus is the development of multi-level deep intra-regional integration. As already noted, agriculture in the subjects of the North Caucasus has low (and even negative) integration within the macro-region. Agriculture of various entities does not complement each other, but competes, and in the worst form of the latter, because competition is not based on economic, but administrative local interests and mechanisms. Therefore, until this territorially small-town protectionism (and, in fact, egoism) is overcome, a single economic space is created throughout the North Caucasus, the growth of North Caucasian agriculture will have a clearly pronounced opportunistic character, since it is based
on an innovative tool (the introduction of new technologies, equipment, markets, etc.), and not an integration one (the effect of combining, expanding the capacity of the domestic market).

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