

**RUSSIAN AGRICULTURE AND FOOD PROCESSING:  
Vertical Cooperation and Spatial Dynamics**

Grigory Ioffe  
Radford University

and

Tatyana Nefedova  
Institute of Geography, Russian Academy of Sciences



The National Council for Eurasian and East European Research  
910 17<sup>th</sup> Street, N.W.  
Suite 300  
Washington, D.C. 20006

TITLE VIII PROGRAM

### **Project Information\***

**Principal Investigator:** Grigory Ioffe  
**Council Contract Number:** 815-7g  
**Date:** August 10, 2000

### **Copyright Information**

Individual researchers retain the copyright on their work products derived from research funded through a contract or grant from the National Council for Eurasian and East European Research (NCEEER). However, the NCEEER and the United States Government have the right to duplicate and disseminate, in written and electronic form, reports submitted to NCEEER to fulfill Contract or Grant Agreements either (a) for NCEEER's own internal use, or (b) for use by the United States Government, and as follows: (1) for further dissemination to domestic, international, and foreign governments, entities and/or individuals to serve official United States Government purposes or (2) for dissemination in accordance with the Freedom of Information Act or other law or policy of the United States Government granting the public access to documents held by the United States Government. Additionally, NCEEER may forward copies of papers to individuals in response to specific requests. Neither NCEEER nor the United States Government nor any recipient of this Report may use it for commercial sale.

---

\* The work leading to this report was supported in part by contract or grant funds provided by the National Council for Eurasian and East European Research, funds which were made available by the U.S. Department of State under Title VIII (The Soviet-East European Research and Training Act of 1983, as amended). The analysis and interpretations contained herein are those of the author.

## **Executive summary**

The Russian countryside is characterized by a very high degree of spatial diversity. This paper describes the spatial pattern of Russian agriculture and identifies the major variables and predictors of its productivity. Two factors – natural fertility of the soil and accessibility to urban markets – appear to powerfully condition the adaptation of agriculture to new, market conditions. The paper, then, focuses on three continuing processes, each of which has a strong spatial dimension, that suggest the possibility of agricultural revival. These processes are: the contraction of agricultural space; demographic revival in the countryside; and vertical cooperation among food producers. The revival of Russian agriculture under market conditions is likely to happen most quickly and most thoroughly in precisely those regions where these processes are most pronounced.

The embracing of market relations by Russian agriculture is not a straightforward process. It has numerous mediators, one of which is the Russian countryside's spatial variance: farming in Kuban' is profoundly different from that around Kostroma; likewise, a farm in the outskirts of a large city is different from one 100 km away from it. Spatial variance is not intrinsically Russian – it is, indeed, inherent in the nature of any man-land relationship.

The imperative to adjust to variable natural conditions, coupled with the special role of the land, has been the longest-standing component of agriculture's spatial basis. Another social component is in large measure conditioned by transportation costs and by the social differentiation of the countryside as a result of urbanization.

To reflect and assess the impact of these two aspects of spatial variance on agriculture, the concept of *economic rent* was introduced. Economic rent is a relative measure of the advantage, or surplus productivity, that one parcel of land exhibits over another. One can distinguish between two varieties of surplus productivity: (a) that gained due to favorable natural conditions and (b) that gained due to differential access to market centers. The former can be labeled Ricardo's rent and the latter Thunen's rent, because David Ricardo and Johann Heinrich von Thunen were the scholars who first conceptualized the respective varieties of economic rent and pioneered their application in agriculture.<sup>1</sup>

In what follows we will, first, characterize the spatial pattern of Russian agriculture and introduce major variables and predictors of its productivity and, then, focus on three on-going processes with pronounced spatial dimensions that affect the adjustment of agriculture to new economic conditions. We will highlight the link between the existing spatial context of Russian agriculture and its potential revival. By so doing, we will be contributing to the discussion about the nature of agriculture's adaptation to new economic conditions.

## **Spatial context of Russian agriculture**

There is nothing extraordinary about spatial variance as such; it is the amount that matters. Russia is a country where differences in both natural conditions and accessibility to market centers have created a remarkable amount of spatial variance.

Contrasts within the natural environment in Russia are enormous. For example, the mean January temperature ranges from 4 degrees Celsius near Sochi on the Black Sea coast, to minus 50 degrees in the Sakha republic. The mean July temperature varies from plus 28 degrees Celsius along Russia's Caspian coast, to 0-8 degrees in northern Siberia and in the elevated areas. The growing season commences in February-March in the south and in late June in the north, while natural vegetation ranges from tundra to semi-desert. As a consequence of such physical environmental contrasts, only 13% of Russia's land area is used in sedentary farming.

Spatial contrasts within what Russians mean by the capacious, untranslatable term *osvoyennost'* (its meaning embraces *colonization, settlement, development of land, and habitability of space*) parallel those contrasts in the natural environment and even exceed them. One can talk of continuous settlement only within the triangle with corners in Saint Petersburg, Novorossiisk, and Novosibirsk. Outside this triangle half the land does not have any permanent settlement at all; within the other half, human colonization is patchy. Needless to say, the picture of the *rural* population's pressure on land is a component of the more general picture of human colonization. The centuries-old expansion of agricultural land, and of cropping area in particular, virtually came to a halt by 1960, although the amount of cropland continued to increase somewhat in a few regions as a side effect of emerging commercial exploitation of mineral riches (in Eastern Siberia) and of land reclamation projects (in the North Caucasus and in the Volga region).

One peculiar feature of human colonization and settlement in Russia is large inter-urban distances. Even in European Russia, cities with over 250,000 residents are twice as far apart (314 km) as their West European counterparts, or as American Metropolitan Statistical Areas of the same size (158 km in both cases).<sup>2</sup> Accessibility to vibrant urban cores matters because these are market centers that

consume agricultural output, and because in the modern era cities have cast a web of social contacts on surrounding areas, thus integrating various local communities into one society.

It is important to point out in this regard that in today's Russia, the cost of transporting produce – differentiating farms' specialization and land use intensity in a classical Thunen landscape – affects agriculture less than another differentiating factor, the quality of rural life. However, the spatial layout of this effect is similar to the Thunen landscape, because remote communities have been consistently worse off than peri-urban ones (i.e., those located in proximity to urban areas).

Investment in the countryside's social sphere (roads, schools, hospitals, and community clubhouses, etc.) was assigned low priority for so long that belated attempts to reduce the urban-rural amenities gap undertaken in the 1970s and 1980s were unsuccessful. It is not that rural conditions stayed unchanged, but since the urban quality of life improved as well, the gap remained in place. In this situation, peri-urban areas could benefit from spillover effects of urban investment and from the heightened density of linear infrastructure converging on any city, just as radial spokes converge on a hub. Rural communities that could take advantage of proximity to a city became islands of relative prosperity in the vast rural sea. The possibility of commuting to urban centers, and thus combining the best features of rural and urban ways of life, must be taken into account as well. Whereas in the American context this latter factor spurred suburbanization, in Russia it helped to prop up sundry extra-urban activities, including agriculture.

During the years and decades of rural demographic erosion, peri-urban areas fared the best among rural regions. In the 1970s and 1980s – when births still outnumbered deaths in the countryside, but the rural exodus was in full swing – not only was the rural population as a whole stable and even occasionally increasing in peri-urban areas, but its agricultural component did so as well and experienced an even stronger pull to cities and towns.<sup>3</sup> These areas enjoyed a more stable and even growing agricultural labor supply, and one of higher quality at that. Therefore, what has been written about the negative and disruptive influence of urbanization on agriculture in the West<sup>4</sup> hardly fits the Russian context. In most Russian regions, particularly non-Chernozem [“black-earth”] ones, yields per unit of land have strikingly

resembled a classic Thunen landscape, with output declining outwardly from an urban center (See Figure 1, at the end of this paper).

In contrast, the rural periphery, located outside a two-hour accessibility range from such centers, became inflicted with a prolonged social decay. In the mid-1980s, it was estimated that in such areas agricultural output had negative elasticity with respect to land. In other words, more land under cultivation actually meant less produce, not the other way around.<sup>5</sup> This conclusion was reached regardless of the level of spatial resolution of statistical analysis. That is to say, negative elasticity was revealed on samples of farms, samples of rural raions, and samples of oblasts as well. Thus, working the land in Russia has been not unlike biting off more than one could chew.

Massive abandonment of land could hardly come as a surprise. Under the Soviets this process was not accurately reported and, consequently, underestimated by local and federal statistical agencies. Such understatement at the federal level derived from many local understatements. The size of landholding used to be one of central planning proxies for collective farms' supplies of various assets, like fertilizers, tractors, and other implements. However, even in the eighties, occasional aerial photographs showed that land under cultivation in some rural raions was actually one half of what was in the books. Invariably, the scale of land abandonment in the depopulated periphery vastly exceeded the reduction of peri-urban farmland as a result of urban sprawl.

Our numerous field trips to outlying non-Chernozem raions since the early 1970s convince us that the officially recorded 15.8 million-hectare, or 7% reduction of farmland from 1970-1997<sup>6</sup>, is still a substantial understatement. The overall scale of farmland contraction in European Russia alone probably exceeds this figure by a factor of two. In fact, even the official statistics of Russia's Land Committee show that in the most depopulated regions, agricultural land contracted by 20-46% between 1959 and 1989. The biggest reduction was in the European North (46%); the second biggest in the Northwest. Thus in Novgorod Oblast the reduction was 33%. In Tver Oblast agricultural land contracted by 32% and in Yaroslavl Oblast, by 25%.<sup>7</sup>

### *Predictors of spatial differentiation*

It follows from the above discussion that at least two variables can be used as predictors of agricultural land value across Russia: one should invoke natural fertility of soil and other natural factors and another has to be a kind of a proxy for accessibility to urban areas.

Specific techniques for assessing the favorability of natural conditions for agriculture have long been in use in Russia. They are based upon long-term records of yields on specially designated, regionally representative parcels of land not using irrigation or any other sophisticated cultivation method, that is, under natural conditions of soil type, heat, and moisture.<sup>8</sup> The estimates of the so-called bio-climatic potential (Figure 2, at the end of this paper) thus obtained are expressed in centners/hectare [one centner = 1/10 of one metric ton] yields of respective crops. The highest grains-related estimates are those for the Northern Caucasus and of the western margin of the Central Chernozem region (about and over 30 centners/hectare, respectively). The favorability estimate is fairly high (20-25 centners/hectare) also in the middle belt from the province of Smolensk in the west to Bashkortostan in the east. The European north, central Siberia, and the south of the Volga region fare the worst.

Figure 2 shows that in European Russia internally homogenous and continuous belts trend northwest-southeast and more or less ideally match the spatial layout of natural vegetation regions. The best natural conditions for agriculture are found in the western margins of steppe (particularly in Krasnodar Kray and Belgorod Oblast) and forest steppe (particularly in Voronezh and Kursk regions). In Siberia, the far-eastern Primorsky Kray and Amur Oblast are best endowed.

The second component of economic rent can be approximated by urban population density (Figure 3, at the end of this paper). The higher density is found around Moscow and in the oblasts located east of Moscow (Yaroslavl, Vladimir, Ivanovo, Nizhnii Novgorod, Ulyanovsk, Samara, and Tatarstan), and also around Kaluga, Tula, Belgorod, Chelyabinsk, Krasnodar, and North Ossetia. Urban population density is evidently not as good a predictor of Thunen's rent as "bio-climatic potential" (Figure 2) is of Ricardo's rent. In this analysis however, we use urban density for want of better proxy for accessibility at the oblast level.



When the value of normative land tax was assigned to each Russian region in 1995, its value appeared to be a function of Ricardo's and Thunen's specifications of economic rent. In fact, we applied the most basic linear regression model to a sample of all Russia's sub-divisions with the exception of seven okrugs (Nenets, Khanty-Mansi, Yamalo-Nenets, Taimyr, Evenk, Chukotka, and Koryak) and received a good fit on a very first trial:

$$Y = -25.171 + 73.297 X + 13.943 Z; R = 0.744; F = 49.048.$$

Here Y stands for the 1995 value of land tax in rubles per hectare (from 1995 on, only proportional changes were introduced; that is, in all civil divisions land tax was augmented by a fixed number of percentage points); X – bio-climatic potential in centners/hectare; Z – 1998 urban population density in people per square km; R – multiple correlation coefficient, and F – Fisher value (of statistical significance).

This result means that seemingly arbitrary values of land tax<sup>9</sup> assigned by the Ministry of Agriculture are in fact highly predictable, as they derive from the two above-discussed components of agricultural rent. They should thus be treated as reasonable approximations of the variable utility of agricultural land and are apparently proportional to its market value. Predictably, land tax values are at their highest if and when *both* economic rents are high. Krasnodar and Belgorod are cases in point.

In this regard an appropriate question may be posed about the comparative performance of natural and social components of agricultural rent. In other words, has productivity been getting more dependent on one of these components than the other? Alternatively, with the passage of time, which areas become better suited for successful farming Russian style, the most urbanized *or* the best endowed naturally? Because polarization of the countryside has proceeded unobstructed for decades, and that could not help but deepen attendant core-periphery gradients, we hypothesized that for agricultural output closeness to an urban environment should be gaining in significance compared with natural fertility of soil, which is not subject to short-term changes.

**Table 1** Pearson’s Correlation between Total Agricultural Output and Two Factors of Agriculture’s Variance

<i>Factors of Agriculture’s</i>	<i>1980</i> <i>(n = 71)</i>	<i>1991</i> <i>(n=89)</i>	<i>1997</i> <i>(n=89)</i>
Bio-climatic Potential	0.46	0.37	0.35
Urban Population Density	0.26	0.35	0.42

Source: calculated by the authors on the basis of Goskomstat’s oblast-structured data on population, land area and monetary value of total/gross agricultural output; bio-climatic potential estimates are borrowed from *Prirodno-Sel’skokhoziaistvennoye Raionirovaniye Zemel’nogo Fonda SSSR* (Moscow: Kolos 1983).

Table 1 in fact goes some way towards confirming this hypothesis. It appears that as time goes by, economic rent in agriculture becomes more dependent on its social component whose proxy, in our analysis, is urban population density. In Russian conditions, therefore, urbanization is loaded with positive effects on agriculture.

While some components of agricultural output show a somewhat different spatial trend, it does not seem to shatter this conclusion. For example, grain yields get more and more dependent on natural soil fertility, which is understandable in view of a drastic reduction in fertilizer inputs in the 1990s. Our previous research showed that grain yields have exhibited the same spatial trend before, for the most part in coincidence with economic disasters of great proportion. This in fact was the case during collectivization: whereas prior to it, in 1901-1934, grain yields (per unit of land) in non-black-earth regions typically exceeded those in black-earth regions primarily due to differences in technology, this advantage was reversed at the time of collectivization.<sup>10</sup> Today the spatial pattern of grain yields shows signs of being conditioned by natural fertility of the soil to a larger extent than in the 1980s. However, *rural* population density appears to be an even stronger predictor: in 1997, Pearson’s correlation between yields and rural population density across 89 divisions of the Russian Federation was as high as 0.82. (It was 0.68 with the “bio-climatic potential.”) In other words, under the current demographic situation, production is destined to shift away from depopulated areas.

True, rural population density itself has historically been a function of soil fertility. However, as our previous research showed, the pull of urban centers is gaining in significance as a predictor of rural population density while soil fertility is declining. On the eve of the current crisis there seemed to be parity between these two predictors of the extent to which the countryside was populated. While the current economic situation may have tipped the balance in favor of the best naturally endowed areas yet once again (after all, migrants from without Russia end up in the Central Chernozem and North Caucasus more frequently than elsewhere), we think that the pull of urban centers may be experiencing only a temporary setback, if any at all. We, therefore, see the social component of economic rent in agriculture as associated primarily with and generated by urbanization.

### **Prospects for revival**

Prospects for Russia's agricultural turnaround cannot but be connected with the above-described characteristics of agriculture's spatial basis. For example, we would expect better conditions for revival in Krasnodar and Belgorod, rated high on *both* components of economic rent than, say, in Kirov and Kostroma, which are rated low on *both* of them. True, Russia's agriculture in general has not been as hard hit in the 1990s as has its manufacturing sector. But the 36% decline in output in 1990-97 was more than just a stumble. (The 1998 crop failure should not be counted, since failures of such magnitude occur extremely rarely.) Another sign of regress has been an overly high share of subsidiary or household farming: 47% of the total agricultural output in 1997. Subsidiary farming refers to what rural and small-town folks produce in their backyards. A typical subsidiary farm is not only an economic unit worlds apart from the Western style private family farm envisioned by Russian reformers, but it is also, technologically, a step backward compared with a typical collective farm.

Another sign of a serious agricultural problem has been the drastic reduction in the head of cattle all across Russia. Although importing meat is economically more rational for Russia than importing grain fodder and then wasting it at inefficient fattening farms (the way it used to be in the 1970s and 1980s), the magnitude of reduction in cattle evidently extends beyond reason. Finally, a pitiful

demographic situation in many rural regions with exorbitant proportion of retirees<sup>11</sup> is also an unfavorable sign.

And yet the downward slide in Russian farming may have already bottomed out. Elsewhere we expressed the view that not private family but rather collective forms of farming are going to be the mainstay of Russia's agriculture in the foreseeable future.<sup>12</sup> We will, however, leave the political economy of Russian agrarian reform outside the confines of this paper and will focus instead on what we see as three signs and avenues of renewal: contraction of agricultural space, demographic revival, and vertical cooperation among of food producers.

### *Contraction of agricultural space*

Russia's 206 million hectares of farmland is a great asset and heavy burden at the same time. It became more of a burden as a result of rural depopulation. Currently only about 20% of Russia's socialized farms and their converts (joint-stock companies and comradeships) are profitable. Some experts believe that another 40% can achieve profitability under certain conditions. The remaining establishments, mostly outlying farms, are for the most part irremediable.

When farm debts in Russia were written off for the umpteenth time in November 1998, it ensured the social survival of quite a few rural communities, but economically it made as little sense as on previous occasions. It was mentioned above that output elasticity with respect to land as a production factor in Russia has long been negative on any spatial level. However, because communal farming in outlying areas is a vehicle for collective survival, many economically doomed farms cannot be disbanded. Nor can they file for bankruptcy, as nobody would be willing to act as caretaker. The problem with such farms being disbanded is in fact multi-dimensional: economic, social, and political.

We believe that under current conditions the only realistic way to eliminate economic waste and concentrate prospective investment on economically viable farms is to accept the natural course of events. This is one instance in which a traditional Russian question – “Chto Delat'?” [What is to be done] ought to be spared public discussion. Peripheral rural communities are dying out anyway; and, in contrast to the

1970s and 1980s when some efforts were being made to curb this process at earlier stages, the issue is now escaping public scrutiny because of the burden of other societal problems. This may be a blessing in disguise.

For a long time the essence of economic strategy in the Russian countryside has been to level the playing field. From the time when the New Economic policy was abandoned in the USSR, the main principle of economic policy – which found extreme expression in rural areas – was to keep unprofitable farms afloat and to hold back progressive establishments. This had a twofold effect. On the one hand, the existence of economically doomed farms was prolonged artificially, and on the other, profitable farms were deprived of the opportunity to reinvest their profits, in part because of the re-distribution of these profits to the benefit of unprofitable farms. Though this strategy never achieved its ultimate leveling goal, it has had powerful ideologues promoting it.<sup>13</sup>

While the ideologues are still alive and well, the federal budget is in much worse shape today than in the past; and there are fewer and fewer people in outlying areas. One should recall that the reversal of the flow of some major rivers never materialized in the USSR because of a shortage of public funds and not because of the perceived ecological damage. Likewise, cutting back on support to many outlying farms in depopulated areas – owing to a shortage of funds – and concentrating it on lands that promise speedier return on investment will contribute most favorably to the viability of farm sector in general. Contraction of agricultural space is not unlike pruning trees by cutting off dead and rotten branches. It is noteworthy that land abandonment has been least significant not only in regions with the highest natural fertility but also in compact regions with urban influence extended over most of them.

### *Demographic revival*

While the Russian countryside will never be as populous as it once was, much to the dismay of some patriotic thinkers, its partial demographic revival is underway and is crucial for the future of Russian farming. In fact, the direction of rural migration began to change as early as 1989; and by 1992, more people moved from urban to rural areas than in the opposite direction. An almost two-century old

trend was reversed. The urban-to-rural migration, however, quickly diminished, and, by 1995, the traditional rural-to-urban migration pattern had been fully restored. Whereas “in 1993, urban areas received only 39% of the country’s incoming migrants, and rural areas, 61%; in 1996, the ratio was 81:19. Thus the countryside’s share of net migration is far below its share of the total population of Russia.”<sup>14</sup> It is also important to point out that migration to the countryside is fueled almost entirely by migrants coming from outside Russia (specifically from former republics), many of whom were urbanites in their countries of origin.

And yet one should not discount the positive influence of this process on the countryside. Earlier analyses of rural revival, pertaining to 1993-94, showed that it began in European Russia’s south and seemed to be extending north.<sup>15</sup> It is noteworthy that the Chernozem Center (with the possible exception of Kursk and, especially, Tambov oblasts) and the piedmont provinces of the North Caucasus had never been impacted by rural decay to the extent that non-Chernozem regions (with the exception of Moscow and Leningrad oblasts) had. So, in terms of revival, southern oblasts have better starting conditions.

TABLE 2 1997 Snapshot of Rural Population Dynamics in Russia: Regional Breakdown

<i>Civil Sub-Divisions (Sub'yekty Federatsii), in Which the Following Takes Place</i>	<i>Number of Civil Sub-Divisions</i>	<i>Percentage Share of Rural Population (Russia Total = 100%)</i>
<b>Births Outnumber Deaths</b>	<b>20</b>	<b>12</b>
1 – Net Migration Inflow	5	2
2 -- Net Migration Outflow	15	10
<b>Deaths Outnumber Births</b>	<b>66</b>	<b>88</b>
3 – Net Migration Outflow	22	19
4 – Net Migration Inflow not Offsetting Negative Natural Increase	30	41
5 – Net Migration Inflow Offsetting Negative Natural Increase	14	28

Table 2 shows that in 1997, migration inflow into the countryside exceeded outflow (positive net migration) in 49 of Russia’s civil sub-divisions. In 44 of these 49 sub-divisions, deaths outnumbered births. Thus, two components of rural population dynamics – migration and natural increase – worked in

opposite directions. However, in 14 such areas net migration compensated for negative natural increase. These areas account for 28% of the rural population of Russia. Among them are Krasnodar and Stavropol krais, Samara, Orenburg, Leningrad, and Tiumen oblasts – south of the latter’s oil producing districts (see Figure 4, at the end of this paper). These seem to be areas of genuine rural revival.

A more modest revival is unfolding in regions in which incoming migration does not outweigh negative natural increase (Figure 4 and Table 2). These are, for the most part, regions of Russia’s heartland (in the Industrial Center and Central Chernozem macro-economic regions). Because, generally, most part newcomers cast anchor in the most accessible places, the current interplay of rural demographic processes in Russia’s heartland is yet another (indirect) confirmation of the ongoing contraction of rural space. Note that about 70% of Russia’s rural people are associated with agriculture one way or another.<sup>16</sup>

The population replenishment is more than just numbers. For years the flip side of the rural exodus has been a negative self-selection of human capital, since the most industrious, independent-minded, and bright individuals opted out and the most passive, subservient, and alcohol-addicted remained. We are unaware of any systematic behavioral and social quality analysis (e.g., drinking habits and their implications, labor ethic, mental health, etc.) of rural communities impacted by out-migration, and thus can only fall back on personal impressions gained during numerous field trips. Just two examples follow. In 1973, while still a student of Moscow University collecting rural household statistics in Uglich Raion of Yaroslavl Oblast on the basis of the rural soviet’s handwritten records (so-called *pokhoziastvennye knigi*), one of the authors was stunned by the discovery that as many as 10% of all children qualified as handicapped. According to *de facto* social workers (*sekretar’ sel’soveta*), in most cases, this resulted from hard drinking by at least one of their parents. When many years later, in July 1995 both authors visited a peripheral farm in Nekouz Raion (of the same oblast), the first impression was that of a couple dozen cows groaning miserably in a nearby shack. According to the farm’s bookkeeper, these cows had not been milked for three days in a row because dairymaids received their long delayed pay exactly three days ago and were now getting over a heavy hangover.

Although it does not befit scholars to rely on such apparently disconnected and unscientific observations, discarding them altogether is not a worthwhile option either. Any policy-induced transformations whatsoever may be rendered meaningless in a particular social environment! Because observations of the above nature have been numerous indeed, they have made us believe that on a peripheral Russian farm there is more than just land to spare, and the infusion of fresh blood is indispensable for a true rural revival. This infusion, however modest, is going on as we write, and some observations prove that the incoming migrants exhibit a human condition in many ways superior with respect to life-long locals.<sup>17</sup>

#### *Vertical cooperation among food producers*

That Russian farming has not been transformed along the lines of market reform has several causes, including the vestigial communal experience of the Russian peasantry, the highly precarious demographic situation in the countryside, and the loss of quality human capital through long-term out-migration. Private farms, much lauded in the West, have emerged but have made little difference: 280,000 farm units account for only about 3% of the country's agricultural output. Because of this, socialized farms remain just about the only framework for cooperative action of a *horizontal* type, that is, within and between grassroots communities in rural Russia. But as has been pointed out, only a few such farms are economically viable. However, forms of *vertical* cooperation – linking farms with food processors and retailers – has begun to command attention.

Early in this century Alexander Chayanov developed his theory of agricultural cooperation. In it, he distinguished between *vertical* and *horizontal* forms of cooperative arrangements. Horizontal cooperation involves contractual links between farms, which are viewed as basic production units. Their partnership may encompass the supply of implements and seeds, as well as the enterprise of selling produce. The most consistent and radical form of horizontal cooperation takes the shape of “full-scale communes where socialization sometimes extends to personal consumption or even to certain items of clothing”;<sup>18</sup> it also includes co-ownership of fixed assets and land.



In contrast, vertical cooperation is an arrangement that allows peasant households to take advantage of economies of scale without undermining economic incentives by being forced into collectives. The essence of vertical cooperation is the establishment of harmonious economic relationships between agriculture and later stages of food production; that is, food processing centers and retail outlets. Chayanov did not pit horizontal and vertical cooperation against each other. He advocated forms of horizontal cooperation between peasant households that were far short of radical socialization. In fact, both horizontal and vertical agricultural cooperation were vigorously developed in Russia in 1890-1914, and later in 1921-1927. However, for reasons that are beyond the framework of this paper, it was the most radical form of horizontal cooperation which prevailed (and came down in history as collectivization), thereby making agriculture the first stumbling block of centrally planned economies.

In a disguised fashion, the idea of vertical cooperation staged a somewhat clumsy comeback in Russia in the late 1970s, when the Soviet authorities concerned with food supplies began to dabble with the concept of APK, the Russian acronym for Agrarian-Industrial Complex. It was an attempt to link farms with food processors and retailers by purely administrative means, forcing agriculture and food processing under a single government agency. This attempt failed primarily because it was a bureaucratic solution and because it involved all large food production units regardless of their intentions or performance. At the same time it was clear that collective farming, the brainchild of the most radical proponents of horizontal cooperation, was at a crossroads. Indeed, it seemed to have exhausted its potential to the point that even market forces unleashed in the early 1990s could not revive it. It was at that point that forms of genuine vertical cooperation began to command attention.

The forms of vertical cooperation that have begun to emerge in the mid-1990s cannot possibly be regarded as textbook illustrations of Chayanov's theory, simply because Russia has changed so much since the 1920s. First, rural demographics and the quality of human capital in the countryside have become the most restrictive factors of a market-style agrarian reform. Second, the rural household can hardly be considered the basic economic unit, because collective farming continues to be the backbone of Russia's agriculture. Third, 80% of all large farms are unprofitable, while food processors are more

successful. There is in fact an intimate relationship between all three major components of the economic environment. It is highly improbable, therefore, that vertical cooperation could proceed merely from successful farms taking over processing factories, as was the case with butter manufacturers in Siberia in the first decade of this century,<sup>19</sup> although such instances are not out of the realm of possibility.

Chayanov, however, did not consider the predominance of collective farming prohibitive to the success of vertical cooperation. “Agricultural collectives,” he wrote, “can in no circumstances be treated as being the opposite of ...agricultural cooperation. They should not replace but merely supplement the system of primary cooperatives. Therefore, the question of collective farms comes down, in effect, to the question of who will be the members of the primary cooperatives: individual family farms, large farms, or collective farms. The choice would be not between *collectives* and *cooperatives*. The essence of the choice would be whether the membership of cooperatives is to be drawn from collectives or from peasant family households. And even as regards this question, the solution is by no means always or everywhere clear.”<sup>20</sup>

Although Chayanov’s and other classic Russian “organization-production” ideas have been openly discussed since 1991, the legacy of the command economy in agriculture precluded practical steps being taken before 1996-97. It took an acute economic crisis, advanced polarization of farms, massive incursion of food imports, and subsequent fears of their cessation to introduce some modest positive changes. The dramatic reduction in food imports may have prodded many more production units to further capitalize on these changes. We believe that the sporadic attempts at vertical integration in the food producing system of Russia warrant scrutiny. This time, the key role is played, not by the state, but by food processors – that is, production units in the latter stages of the food-production cycle.

Indeed by 1997, as much as 40% of the production units in Russia’s food processing industry were not earning a profit. It should be pointed out, though, that only the country’s highly successful oil, gas, and pharmaceutical sectors did better. The share of food processing in the industrial output of large cities has grown appreciably, e.g., up to 27% in Moscow and 19% in Saint Petersburg. Moreover, in 1997, as many as 19 product sub-divisions of the food industry resumed growth – for the first time since

1991 – with the most tangible growth recorded in mineral water, beer, and potato sub-divisions. The output of refined sugar, dairy products, vegetable and fruit preserves, noodles, sweet-shop produce, margarine, and wine all experienced growth. Only meat processors continued their downward slide.

There is growing interest by foreign and domestic investors (the latter recently overtaking the former) in Russian food processors' increasing demands for perishable produce. Thus the Baltika brewers of Saint Petersburg, controlled by a Scandinavian beverage holding company, receive high quality barley from selected farms in Leningrad, Pskov, and Novgorod oblasts; Moscow milk-processing plants are successfully cooperating with exurban dairy farms; a potato chip factory in Kadnikov (Vologda Oblast) has a contract with a formerly bankrupt potato farm, Markovskoye. Especially widely publicized are the successful experiences of two meat processing plants: Cherkizovsky in Moscow and Klinsky in the town of Klin (100 km northwest of the Russian capital). Both have contracts with several formerly unprofitable farms. Cherkizovsky has even acquired farming operations of its own, buying up several cattle and pig farms.

What is more, there is plenty of evidence that farms are being economically resurrected by the emerging direct links with processing operations. Available examples furnished by Russian media are in Vologda,<sup>21</sup> Moscow, and Tver Oblasts.<sup>22</sup> The former Russian minister of agriculture, Semionov, himself a long-term farm director, pinned hopes on vertical cooperation with food processors.<sup>23</sup>

This process seems to have received a boost after the financial debacle of August 1998. Because importers were hit hard by the drastic devaluation of the ruble, those who would still like to establish themselves in the Russian market decided to switch to direct investments. Thus in February 1999, a German company, Ehrmann and Wydra embarked on the construction of a milk processing plant in Ramenskoye (Moscow Oblast). It is noteworthy that yogurt, cottage cheese, and other dairy foods by Ehrmann have been sold in Russia since 1992, and the Germans insist that although they had decided on a construction of a Russian plant long ago, they actually took to it only after August 17, 1998. Ehrmann is planning to purchase 300,000 liters of milk from 30 local farms that will be selected on a competitive

basis. The Germans are committed to providing those selected with state of the art refrigerators, milking machines, and animal food components.<sup>24</sup>

American Heinz is currently building a baby formula plant in Dmitrov Raion of Moscow Oblast, and yet another German company, Ludwig Schokolade, is about to open their plant in Voskresensk. Moscow Oblast is going to lead Russia's sub-divisions in the number of foreign investment projects in food processing in view of its superb location vis-a-vis the market and an equally superb labor supply. It is also obvious that in other sub-divisions, it is the most accessible areas that are benefiting from similar developments. This includes already operational factories such as American Mars, Coca-Cola, Pepsico, French Danone, etc.<sup>25</sup>

We believe that successful vertical cooperation in Russia's food producing system will likely spread to many other oblasts, particularly those most urbanized (Figure 3) and with the most fertile land (Figure 2). More rigorous regional analysis of this process is a separate undertaking and in fact, a topic of our ongoing research. At this point we can only state that, by and large, the emphasis on animal husbandry on non-Chernozem farms as well as their closeness to major industrial centers makes these farms more likely to establish direct links with food processors than farms in major grain-producing regions of Russia's south. However, the latter are not going to be by-passed by vertical cooperation. It is symptomatic in this regard that in the 1990s, the principal breadbasket regions, like Krasnodar, Rostov, and Stavropol, suffered larger setbacks than non-Chernozem regions not only in agricultural output, but also in food processing. While in the past links between farms and processors were pre-arranged in a top-down fashion by provincial and federal authorities, under new economic conditions even communist-leaning leaders of the Russian Red Belt are unable to continue this practice, which is one of the reasons behind the recent setbacks.

If Chernozem farming is destined to restore its contribution to domestic consumption to the full strength of this farming's bio-climatic potential, vertical links are going to be reinstated on a market basis, by farms and processors themselves. The cooperation between them is mutually beneficial to all the economic units involved. Privately owned food processors need stable supplies, and nominally privatized

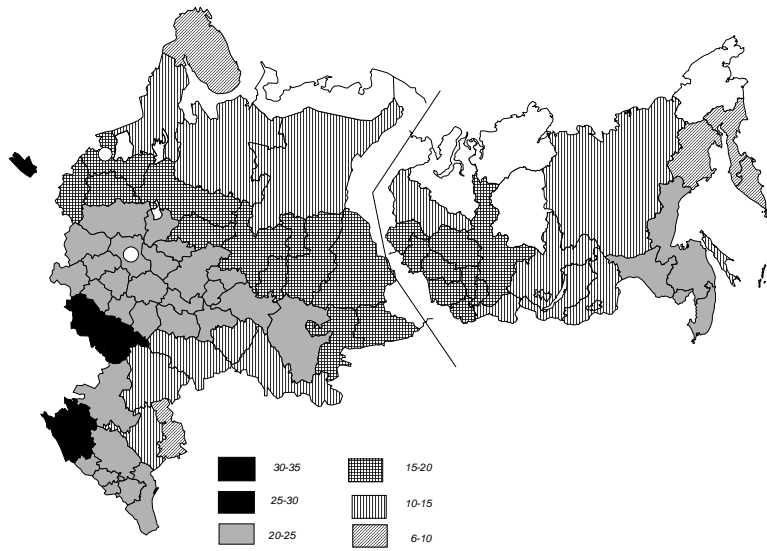
communal farms face problems unsolvable within the languishing system of state patronage. Socialized farms own land, but still cannot legally sell it to a non-agricultural user. They lack not only stable channels for selling their produce but also the financial wherewithal to maintain or replace their aging equipment. With large farms now commanding only slightly over one half of Russia's agricultural output, small holders – households producing food in their backyards – are also gravitating to their natural partners, the registered private farms. A registered private farmer contracts out raw produce supplies to a number of subsistence/household farms and takes up small-scale food processing.

## **Summary**

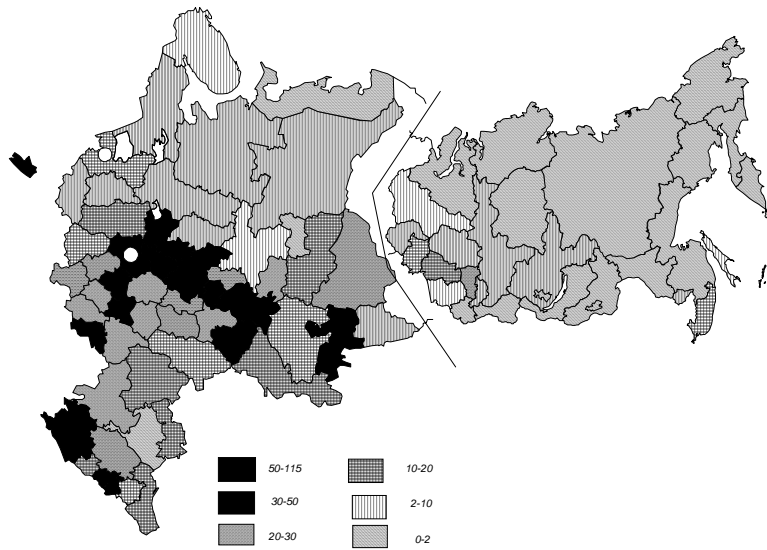
Russian agriculture's movement toward the market is not a spatially homogenous process. Indeed, there is a striking amount of spatial diversity in Russia's agriculture and it is not limited to the differences in political orientation and regional sub-cultures that many analysts focus on. Two variables help capture a substantial part of spatial variance. These are the natural fertility of the soil and accessibility to major urban centers. The latter variable has recently gained appreciably in importance. Regions with high ranking on both variables have better chances for adaptation to the market and for agricultural revival.

We began by pointing to a striking amount of spatial diversity in Russia's agriculture. We then considered three processes with favorable implications for Russia's agriculture: contraction of agricultural space, demographic revival, and vertical cooperation of food producers. While there is no systematic and conclusive evidence at the time of this writing that all three processes are closely related with major aspects of agricultural diversity, some evidence presented indicates that this link may be in place. Thus, both highly fertile and heavily urbanized regions lead in demographic revival. Conversely, the least urbanized and fertile regions lead in land abandonment, which, however, appears to be a favorable process stemming economic and financial waste. Finally, evidence of vertical cooperation between farms and food processors for the most part pertains to the surroundings of large cities. Further insight into the spatial pattern of positive changes in Russian agriculture warrants extensive research.

The relationship between the spatial basis of Russian agriculture and the potential for its revival is indeed worthy of further research because all the noticeable venues of revival are place-specific and not randomly distributed. If Russian agriculture is destined not only to survive the current crisis but to become one of Russia's most successful economic activities, it will not happen everywhere at the same time. It can occur more quickly in some areas than others, and in some places it may not happen at all. It will definitely occur faster if new realities and processes are recognized and encouraged by all economic actors involved.

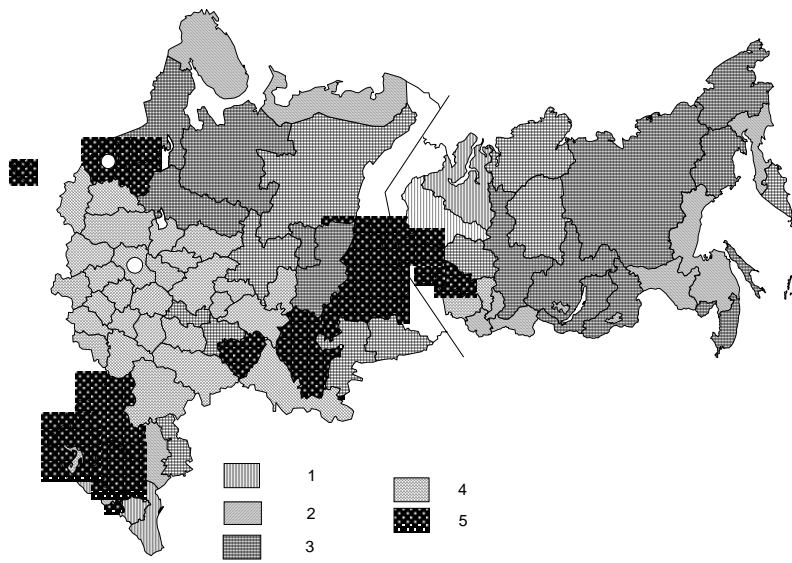


**Figure 2.** Bio-climatic potential (sustained grain yields on regionally representative parcels under natural conditions of soil type, heat, and moisture) in centners per hectare. Source: *Prirodno-Sel'skokhoziaistvennoye* 1983.



**Figure 3.** 1998 urban population density in people per square kilometer. Source: Compiled on the basis of the *Demographic Yearbook of the Russian Federation 1998*. Moscow: Goskomstat, 1999.





**Figure 4.** Components of 1996-1997 rural population change. 1 – 5 are explained in the first column of Table 2.

## Notes

- <sup>1</sup> Brian J.L. Berry, Edgar C. Conkling, and D. Michael Ray, *The Global Economy in Transition* (Upper Saddle River, NJ: Prentice Hall 1997), 202-209.
- <sup>2</sup> Grigory Ioffe and Tatyana Nefedova, *Continuity and Change in Rural Russia* (Boulder: Westview Press 1997), 27.
- <sup>3</sup> G.V. Ioffe, *Sel'skoye Khoziaistvo Nechernozemya: Territorial'nye Problemy* (Moscow: Nauka 1990), 90-91.
- <sup>4</sup> C.R. Bryant and T.R.R. Johnson, *Agriculture in the City's Countryside* (Toronto: University of Toronto Press 1992), 25-26.
- <sup>5</sup> G.V. Ioffe, *Sel'skoye Khoziaistvo Nechernozemya: Territorial'nye Problemy* (Moscow: Nauka 1990), 50-51.
- <sup>6</sup> *Rossiiskii Statisticheskii Yezhegodnik 1996* (Moscow: Goskomstat 1997), 547; *Sel'skoye Khoziaistvo v Rossii* (Moscow: Goskomstat 1998), 181.
- <sup>7</sup> Calculated on the basis of *Zemel'nyi Fond RSFSR* (Moscow: TsSU RSFSR 1961); *Zemel'nyi Fond RSFSR* (Moscow: Finansy i Statistika 1990).
- <sup>8</sup> *Prirodno-Sel'skokhoziaistvennoye Raionirovaniye Zemel'nogo Fonda SSSR* (Moscow: Kolos 1983).
- <sup>9</sup> Stephen K. Wegren, "The Development of Market Relations in Agricultural Land," *Post-Soviet Geography* 1995, Vol. 36, No. 8: 503.
- <sup>10</sup> G.V. Ioffe "Osvoyennost Territorii I Sel'skoye Khoziaistvo v Yevropeiskoi Chasti SSSR," *Izvestia AN SSSR, Seriya Geograficheskaya* No. 2, 1990: 66.
- <sup>11</sup> Stephen K. Wegren, Grigory Ioffe, and Tatyana Nefedova. "Demographic and Migratory Responses to Agrarian Reform in Russia." *Journal of Communist Studies and Transition Politics*, Vol. 13, No. 4, 1997: 54-78.
- <sup>12</sup> Grigory Ioffe and Tatyana Nefedova, *Continuity and Change in Rural Russia* (Boulder: Westview Press 1997).
- <sup>13</sup> Perhaps the most outspoken and candid reasoning in support of keeping weak farms afloat can be found in publications by Anatoly Salutsky; see Anatoly Salutsky, *V Gluibnke* (Moscow: Politizdat 1988.) and Anatoly Salutsky, *Proroki I Poroki: Pop-Nauka v Zerkale Realnosti* (Moscow: Molodaya Gvardiia 1990.)
- <sup>14</sup> Zhanna Zayonchkovskaya, "Recent Migration Trends in Russia." In: George Demko, Grigory Ioffe, and Zhanna Zayonchkovskaya, *Population Under Duress: The Geodemography of Post-Soviet Russia* (Boulder: Westview Press 1999), 123.
- <sup>15</sup> Grigory Ioffe and Tatyana Nefedova, *Continuity and Change in Rural Russia* (Boulder: Westview Press 1997), 186-187.
- <sup>16</sup> *Ibid.*, 13.
- <sup>17</sup> *Ibid.*, 279-287.
- <sup>18</sup> Alexander Chayanov, *The Theory of Peasant Cooperatives* (Columbus: Ohio State University Press 1991) [Translation from the 1927 Russian edition], 210.
- <sup>19</sup> *Ibid.*, 8.
- <sup>20</sup> *Ibid.*, 209.
- <sup>21</sup> "Moskva Stroyit v Kadnikove Kapitalizm s Chelovecheskim Litsom." *Izvestia* 24 June 1998.
- <sup>22</sup> "Mafiya Razumnogo Biznesa," *Expert* No. 2, 19 January 1998.
- <sup>23</sup> "Ministr Selskogo Khoziaistva: My pytayemsiya Kontrolirovat' Techeniye Beremennosti," *Kommersant* December 23, 1998; "Nastoyashchii Klondike," *Expert* 30 November 1998.
- <sup>24</sup> Sergey Muraviov, "Krizis Vpolne S'edoben," *Izvestia* 11 February 1999.
- <sup>25</sup> *Ibid.*