

Soviet Agriculture and Industrialisation*

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The resource contribution of agriculture

The idea of industrialisation supported by a government transfer of resources from agriculture owes much to Russian and Soviet history. In the nineteenth century, Imperial government officials stressed the role of agriculture in supplying food for the urban population, taxes to pay for government support of the industrial sector and exports to pay for industrial technology from abroad. Populist critics stressed the extent to which government was buying industrial modernisation at the expense of peasant sacrifice and agricultural stagnation.

After the Russian revolution, in the interwar years Preobrazhenskii (Trotsky's economic adviser), then Stalin himself stressed in different ways the possibility of paying for public sector industrial investment programmes out of peasant incomes. Preobrazhenskii's views were formed in the mid-1920s in the context of a mixed economy; he considered that an agricultural surplus could be generated for public investment by means of taxation of farm incomes and nonequivalent exchange (pushing up the prices of manufactures on the rural-urban market to make the peasants buy dear and sell food cheap).

Stalin, at first opposed to this idea, came round to the same general orientation in 1928-9. The context was now one of headlong transition from a mixed economy to a system dominated by public and cooperative ownership, increasingly regulated by physical controls. Instead of taxation and nonequivalent exchange through the market, Stalinist methods of getting resources out of agriculture relied more on simple confiscation of food surpluses.

In the post-World War II era, western historians (in particular Alexander Gerschenkron and W. W. Rostow) placed much stress on the idea of industrialisation supported by a government transfer of resources from agriculture as a basic continuity in Russian history from

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the Tsars to the Bolsheviks.¹ But the reality is that this idea was never applied successfully in Russia, and was never shown to work. Neither before nor after the revolution has there been demonstrated any direct link from forced saving of the peasantry to industrial capital formation.

Before the revolution, the expansion of Russian agriculture was not unduly retarded by the pressure of taxation. The peasantry of the 1880s and 1890s was not on the whole impoverished by heavy taxation,² although not all regions and branches prospered. After 1885 the growth of both agricultural output and village consumption of foodstuffs was substantially faster than that of total population (and, still more, of the rural population).³

As for the supposed budgetary mechanism for transferring resources from agriculture to industrial investment, the rhetoric exceeded reality. The bulk of government revenues was raised by taxing the urban retail market, not peasant incomes and assets.⁴ In terms of government expenditure, the greater part went to pay for military and bureaucratic items; at least 90 percent of nondefense capital formation was normally carried out by the private sector. If there was a distinctive feature of Imperial budgets by European standards of the pre-World War I era, it was simply the large share of national income which government consumed, not the contribution which it made to industrialisation.⁵

By the 1920s a Soviet government had come to power which differed from prerevolutionary Imperial governments in a multitude of ways. Among the latter was its readiness to commit a really significant share of budget revenues to paying for industrial capital formation. For example the 1924/25 USSR state budget allocated nearly one fifth of total outlays to “finance of the national economy” (mainly public sector industry, transport and construction) compared to little more than one twentieth of total outlays under equivalent headings in the 1913

¹ Alexander Gerschenkron, *Economic backwardness in historical perspective* (Cambridge, Mass., 1962), chapter 6 (“Russia: patterns and problems of economic development, 1861-1958”); W.W. Rostow, *The stages of economic growth* (New York, 1970), 66.

² James Y. Simms, “The crisis in Russian agriculture at the end of the nineteenth century: a different view”, *Slavic Review*, vol. 36, no. 3 (1977).

³ Paul R. Gregory, “Grain marketing and peasant consumption, Russia, 1885-1913”, *Explorations in Economic History*, vol. 17, no. 2 (1980).

⁴ John Thomas Sanders, “‘Once more into the breach, dear friends’: a closer look at indirect tax receipts and the condition of the Russian peasantry, 1881-1899”, *Slavic Review*, vol. 43, no. 4 (1984).

⁵ Paul R. Gregory, *Russian national income, 1885-1913* (Cambridge, 1982), 170-5.

Imperial budget. This represented an increase of spending on the economic infrastructure in real terms by about 40 per cent.⁶

The problem of the 1920s was not a lack of governmental will to divert agricultural resources into industrial modernisation, but a supply side constraint. From the point of view of the regime's new priorities, agricultural resources seemed more inaccessible than ever. While output tended to recover from the postwar famine of 1922, the sale of food surpluses to the urban market did not. Much more than before the revolution, food surpluses were retained within the village.

There are several possible candidates for an explanation of this difficulty.⁷ The revolutionary destruction of large scale "commercial" farming may have been a factor. Peasant control over land and food surpluses certainly benefited from a reduced burden of rents and taxes. Agriculture's terms of trade with industry had worsened; this damaged peasant incentives to make food surpluses available to the domestic market, but did not enhance industrial profits because peasant losses were swallowed up in increased industrial costs.

Moreover, as the 1920s proceeded, the difficulty of getting food intensified, because market equilibrium was increasingly disrupted by the rapidly growing volume of public sector investment. The economic system was changing away from a market mechanism regulated by money, prices and taxes to a "shortage" economy subject to non-price regulators and quantitative targets. In agriculture, this process meant a transition to direct controls, first over food surpluses, then over the food producers themselves.

Collectivisation and its results

Matters came to a head in July, 1928, with Stalin's decision to secure a "temporary tribute" from agriculture. This had three results for policy, often conflated under the general heading of "collectivisation", but best considered separately and taken in order.⁸

First was the move to a new procurement system for obtaining rural food surpluses. There was an impromptu resort to coercion in the Ural region and western Siberia in the spring of 1928; then coercive methods were extended to the country as a whole, and codified in the criminal law in June, 1929. A nationwide system of compulsory food

⁶ R.W. Davies, *The development of the Soviet budgetary system* (Cambridge, 1958), 65. Current rubles of 1924/25 are deflated for comparison with 1913 according to a wholesale price index (*ibid.*, 89).

⁷ On the village retention of food surpluses, and the reasons for it, see Mark Harrison, "The peasantry and industrialisation", in R.W. Davies (ed.), *From Tsarism to the New Economic Policy: continuity and change* (London, 1990), 109-17.

⁸ On the collectivisation process, see R.W. Davies, *The industrialization of Soviet Russia, vol. 1, The socialist offensive: the collectivization of Soviet agriculture, 1929-1930* (London, 1980).

procurements was instituted which at first produced a great increase in peasants' food deliveries, then went too far; a crisis of rural subsistence was induced. The countryside was stripped of both food and animal feedstuffs. The nutritional standards enjoyed by the village population shrank to the level of basic physiological maintenance and below. The fodder shortage resulted in forced killing of livestock on a huge scale; the loss of animal tractive power resulted in growing inability to carry out tasks of grain cultivation on time. Supply-side disruption culminated in harvest failure in 1932. Harvest failure combined with the forcing of food deliveries to produce famine in the Ukraine and north Caucasus. The killing of livestock in Kazakhstan meant loss of the main source of food for the formerly nomadic population. Differing assumptions about birth rates in the famine years, 1932-3, give rise even today to widely divergent estimates of the resulting number of famine deaths - as many as eight million if fertility was maintained, so that many babies were born, only to die within a short period from hunger; or no more than 4-5 million if fewer babies were born and died.⁹

The second element of Stalin's turn was "the liquidation of the kulaks as a class". The property of kulaks (the more prosperous stratum of petty capitalist farmers) was to be confiscated, and the kulaks themselves socially isolated and excluded from the new rural order. A decree of February, 1930, divided the kulaks into three grades respectively subject to exclusion from the village, deportation into the remote interior, and in the most "socially harmful" cases confinement in forced labour camps. Eventually, 381 thousand families (up to two million people) were processed in the second and third categories.¹⁰

This campaign was designed to break resistance to new controls over village life and the rural economy. The kulak was the traditional leader of village opinion, the social and economic model of individualistic self-betterment to which ordinary peasants aspired. The attack on the kulaks was a message to the others. In the past, the peasant who wanted to do well tried to get on as an individual, to rise to the status of a kulak. Now the route of individualistic competitive self-betterment was closed off for ever. From now on the peasant who wanted to get on under Soviet power would prosper, if at all, only as a member of the collective, on Soviet terms.

The third element of new policy was collectivisation itself. The first Five Year Plan, adopted in April, 1929, incorporated relatively modest targets for collectivisation; by 1932/33, collective farms were to include 18-20 per cent of peasant households and some 15 per cent of the sown area. This degree of collectivisation was to be achieved on the basis of

⁹ S.G. Wheatcroft and R.W. Davies, "Population", in R.W. Davies, M. Harrison, and S.G. Wheatcroft (eds), *The economic transformation of the Soviet Union* (Cambridge, 1994), 74-6.

¹⁰ V.P. Danilov, "Diskussii v zapadnoi presse o golode 1932-1933 gg. i 'demograficheskoi katastrofe' 30-40-x godov v SSSR", *Voprosy istorii*, no. 3 (1988), 117.

advances in farm mechanisation and electrification. But what happened far exceeded the plans. Within months, a relentless upward pressure both from the Stalinist leadership above and from local officials down below drove the targets higher and higher. In December, 1929, a drive for all-out collectivisation was launched; within three months more than half the peasant farms in the country had been incorporated into collective farms. This great leap into the unknown brought chaos and disorder in its wake, and was followed in March, 1930, by a temporary retreat; then, in the autumn of 1930 the campaign was resumed. This time there was no further let-up. By mid-1931 the high water mark of March, 1930, had been regained, and thereafter the percentage of collectivisation rose steadily year by year until by 1936 only one tenth of households and a still smaller fraction of sowings remained outside the public and collective farm sector.

The collectivisation process in the widest sense directly changed the way of life of 120 million villagers, and powerfully affected the role of the agrarian sector in the Soviet economic and political system. Four main effects may be distinguished. First are the effects on production, which can be seen in table 1.¹¹ The arable sector suffered a disaster. As far as grain cultivation was concerned, a major negative factor was the loss of animal tractive power. Here the transition to a new system of food procurements dealt a double blow; it not only took away grain from human consumption but also, by stripping the countryside of animal feedstuffs, undermined the arable sector on the supply side.

Second, collectivisation converted agriculture and the peasant into residual claimants of food. In the 1920s the peasants met their own needs first, while the towns and the export market had to make do with what was left. In 1927/28 and 1928/29, after deduction of more than 10 million tons of of centralised and decentralised grain collections, more than 50 million tons of grain remained at the disposal of the peasants. In 1931/32 the rate of collections reached nearly 23 million tons, more than double the rate of the late 1920s, but with the decline of the harvest the peasants' residual collapsed to only 33 million tons.¹² By the end of the year there were famine conditions in the Ukraine and north Caucasus. Industrial workers, however, were assured of bread and potatoes, and industrial expansion proceeded on this basis.

Third, despite Stalin's aspiration to the contrary, collectivisation failed to increase the "tribute" from agriculture. This failure was unexpected, and can be ascribed to the manifold leaks in the new control system. On one hand, peasants maintained access to the "second economy" of unregulated market transactions; most peasants had become worse off, but the few that still had food surpluses to sell

¹¹ For a recent survey of general factors affecting the trend of agricultural production in the interwar years, see S.G. Wheatcroft and R.W. Davies, "Agriculture", in Davies, Harrison, and Wheatcroft (eds), *Economic transformation*, 106-130.

¹² Davies, Harrison, and Wheatcroft (eds), *Economic transformation*, 290.

could command very high scarcity prices so that the terms of trade were not after all turned against the peasant. On the other hand, the diversion of livestock to slaughter necessitated an increased state supply of machinery services to agriculture - resources which otherwise would have been available for purposes of industrialisation; the same applied to public food stocks which were belatedly returned to the countryside as famine relief.

Fourth, through collectivisation, the Soviet state learned to do something which previous generations of Bolsheviks had argued was impossible and would precipitate an overthrow of the regime: to push around 120 million peasants. A price was paid for this in the hyperactivity of the security organs and uncontrolled expansion of forced labour camps, beginning in 1930, to cope with the inrush of peasant detainees. The peasantry as a whole became alienated from the Soviet system, especially in the Ukraine.

The kolkhoz - model and reality

The kolkhoz (collective farm) was the new institutional form for control of food surpluses - but what form should the kolkhoz take? There was no blueprint or working model of a kolkhoz to guide the collectivisation process, which instead was led by a kind of radical utopianism. This was expressed through a number of issues.¹³

How large should a kolkhoz be? Some activists advocated large scale farming as an attempt to eradicate village boundaries and turn the peasant outwards from traditional, parochial horizons to involvement in society as a whole. This current was expressed in a trend to superlarge multivillage farms of tens of thousands of hectares (compared to the typical precollective farm of 25 hectares or so).

How far should socialisation of property extend? All collective farms absorbed productive assets - land, basic implements and livestock. Some attempted to eradicate the family itself, as the traditional basis of private property, by transferring even family household goods and family functions to refectories, dormitories and creches.

How should rewards be distributed? Cases were commonly reported of attempts to eradicate individualist striving altogether through an egalitarian policy of distribution of farm income to members only according to need, not according to contribution.

How far should peasant economic activity be controlled from above? Here there was an early proliferation of controls, attempting to block off all channels of individual initiative not directed through the collective. Thus, household plots and commercial activity were prohibited, and the rural artisan sector was destroyed.

In each of these respects the initial impetus of radicalism went too far, and provided occasion for subsequent retreat in the years after

¹³ On the origins of the kolkhoz, see R.W. Davies, *The industrialization of Soviet Russia*, vol. 2, *The Soviet collective farm, 1929-1930* (London, 1980).

1930. Thus as far as scale of organisation was concerned the village level kolkhoz became the norm, although supplemented by multivillage organisation of machinery services, grain collections and political control through the public sector Machine Tractor Station (MTS). Egalitarian distribution was supplanted by a workpoint system which entitled workers to a dividend share in the residual net output of the farm, providing at least a weak relationship between effort and reward. In 1932 the right to a family allotment was revived, and family members were also conceded the right to sell privately produced food surpluses at high scarcity prices on the unregulated "kolkhoz market".

However, such nods in the direction of moderation came too late to stave off the worst results of collectivisation. For the remaining interwar years, the kolkhoz system was held together mainly by coercion. The asset losses of 1929-30 could not be made up by more pragmatism in the formation of agrarian institutions, or by an improved incentive structure. In the early 1930s the rapidly expanding towns and industrial workforce had to be fed from a totally inadequate supply of food. The famine year of 1932 was marked by a return to harsh repression in the countryside, including extension of the death penalty to acts of theft against collective farm property such as gleaning in kolkhoz fields.

After 1932 there was a recovery, but the progress recorded in the years 1933-7 was not sufficient to restore the situation. This meant that agrarian policy presented the regime with a continuing dilemma. The dilemma was clearly expressed in 1939 when, on one hand, new laws were framed to compel all peasants to work at least a compulsory minimum of workpoints on the collective farm. The strengthening of coercion from above was matched, on the other hand, by simultaneous initiation of a public debate on the possible decentralisation of collective farm management and rewards to the small, family sized production unit (the *zveno* or "link").¹⁴

Agriculture becomes more like the economy as a whole

From the 1930s through World War II and the early postwar period, there was no stabilisation of the kolkhoz environment. In wartime, official stress on compulsory labour and procurements was offset by an opposing tendency of the private sector to encroach on the collective sphere. Soon after the war, in 1947, Stalinist policies sought to stiffen the kolkhoz regime again, and repress once more the private sector, without improving economic returns to peasant labour from the collective sector. A brief renewal of the prewar flirtation with the idea of farm management decentralised down to the family sized unit (*zveno*) in 1950 was firmly squashed by orthodoxy. In addition, agricultural policy was plagued by the false science of Michurinist plant biology promoted by Lysenko.

¹⁴ On the *zveno* debate in 1939 and 1950, see Leonard Schapiro, *The Communist Party of the Soviet Union*, 2nd edn (London, 1970), 520.

The brutal and unimaginative policies associated with Stalin would change with the latter's death in 1953 and the efforts of his successors to relax the rigours of the Stalinist dictatorship, modernise the economy and win popularity. Agricultural policy remained unstable and went through many fluctuations of detail, and for a time Lysenkoism found renewed favour. Nonetheless, there emerged a basic continuity from the Khrushchev period (1956-64) through the Brezhnev period (1964-82). Rising priority was attached to improving the quality and variety of Soviet diet and food supplies; this resulted in turn in the conversion of agriculture from a low to a high priority activity. Basic themes of policy comprised maintaining the basic system while improving the economic security of the rural population and reversing the flow of resources out of agriculture.¹⁵

After Stalin the collective farm remained a basic unit of agricultural organisation, but nonetheless the agrarian sector experienced important reorganisations. Table 2 shows that the private sector declined steadily in importance; this reflected more a closing of the gap between private and collective rewards than direct repression of private economic activity, though the latter was reported from time to time. Another aspect of restructuring was the rise of the sovkhoz (nationalised farm). In Stalinist ideology the sovkhoz was a higher form of organisation than the kolkhoz which was "only" a cooperative, and there were periods both under and after Stalin when policy encouraged absorption of existing kolkhozy into the public sector. However, the major vehicle for expansion of sovkhoz activity was the extension of the margin of cultivation into the "virgin lands" of the interior; the new farms created there were normally sovkhozy.

Something which directly affected the kolkhoz itself was its progressive "statisation". As the status of the village and farm workforce improved, the kolkhoz became more and more like a sovkhoz. This was reflected in a variety of trends. Kolkhoz managers were no longer a mixture of ill educated peasants and political cadres who knew nothing of farming, and collective farm management became increasingly professionalised and specialised. The rising status of the ordinary kolkhoz workers was reflected in the introduction of a minimum income based on sovkhoz piece rates; with this reform, the peasant ceased to be the residuary claimant on food supplies. Other changes associated with rising status ranged from the institution of

¹⁵ For successive overviews of Soviet agricultural policy and progress under Khrushchev and Brezhnev see articles in the triennial collections published by the United States Congress Joint Economic Committee, especially David W. Carey, "Soviet agriculture: recent performance and future plans", in *Soviet economy in a new perspective* (Washington, D.C., 1976); David W. Carey and Joseph F. Havelka, "Soviet agriculture: progress and problems", and David M. Schoonover, "Soviet agricultural policies", both in *Soviet economy in a time of change*, vol. 2 (Washington, D.C., 1979); D. Gale Johnson, "Prospects for Soviet agriculture in the 1980s" in *Soviet economy in the 1980s: problems and prospects*, vol. 2 (Washington, D.C., 1982).

retirement pensions for kolkhoz workers to restoration of the automatic right to an internal passport, which brought increased freedom of off-farm movement (although without the right to a share in farm equity).

Lastly, agriculture in general and the kolkhoz specifically were affected by structural transformations at work in the economy as a whole. Production processes became increasingly integrated both horizontally and vertically. There was a growth of inter-kolkhoz and “agribusiness” organisations, reflecting economywide trends towards more integrated and more largescale corporate forms. Independent kolkhozy came more and more frequently together to form joint enterprises specialised in livestock rearing, rural construction and secondary processing of farm products; each kolkhoz contributed a share of the equity and took a share of the profits.

Input mobilisation and its results

What were the results of this restructuring of the agrarian economy? Results could be measured first of all in the achievements of Soviet food policy which now aimed at rapid improvement of Soviet diet. And table 3 shows that, after the war, the Soviet diet did improve markedly, although by western standards there was an unhealthy preoccupation with increased consumption of high-cholesterol, high-sugar items. But improved diet was based on domestic supply only in part, because production did not keep pace with requirements. The 1970s saw the beginning of a turn towards largescale imports, mainly of meat and animal feedstuffs, to support rising domestic meat consumption.

The failure of agricultural production to keep pace with domestic needs was certainly not for want of resources. It is true that, as table 4 (A) shows, for many years the Soviet agricultural workforce had been in decline, both in absolute numbers and in proportion to the total working population. Over the same period, however, from 1940 to 1970, the number of trained agronomists, animal specialists and veterinarians multiplied from 34,000 to nearly half a million. Moreover, table 4 (B) suggests that declining labour supplies were hugely compensated by the increase in capital investment in agriculture which rose, not only in billions of “comparable” rubles, but even in proportion to total investment in the Soviet economy. This, more than anything, indicated the rising priority of agriculture for Soviet decision makers.

An independent western assessment of the efficiency with which the growing volume of inputs was utilised is reported in table 5. This table gives rise to a mixed evaluation. In the 1950s and 1960s the growth of agricultural output in the USSR substantially exceeded the United States record. The gap was essentially due to the higher rate of increase of Soviet inputs, including a higher rate of retention of farmworkers in agriculture, for despite heavy Soviet investments the rate of increase in capital intensity of production was actually more rapid in the United States. Nonetheless, in the outcome, there was little to choose between Soviet and American agriculture in terms of dynamic efficiency; in both countries, multifactor productivity in agriculture rose yearly by about 2 per cent in the 1950s and 1 per cent in the 1960s.

But what this meant was that, since the level of output per worker and of multifactor productivity was far higher in the United States to begin with, the static efficiency gap did not close. What was worse, in the 1970s the dynamic efficiency of American farming improved a little (though not recovering the rate of improvement in the 1950s), while that of Soviet farming deteriorated further. In this, trends in Soviet agricultural production tended to mirror processes at work in the economy as a whole, summed up in a huge Soviet and western specialist literature as relative economic retardation and stagnation.¹⁶

Thus, as Soviet power entered its final decade, it remained the case that an agricultural workforce proportionally much larger than that deployed in the United States continued to feed the domestic population at a dietary level which, despite absolute improvement, remained relatively lower. Moreover, Soviet agriculture achieved this only with the help of United States food surpluses left over after American consumers had eaten their fill.

Problems of resource management

Behind the disappointing performance of Soviet supply lay profound problems of resource management. But it is worth saying at the outset that by the 1970s these no longer included in any prominent way the special legacy of the countryside from the Stalin years, the problems of low morale and lack of incentive resulting from the brutal suppression of peasant interests in the 1930s. The very low and uncertain return to work in the collective sector, the systematic coercion of kolkhoz labour - these were no longer central to the agricultural problem. In the 1950s and 1960s such problems were substantially mitigated, mainly by raising government procurement prices (although, since official consumer prices were held down, this course carried a high price tag in terms of the rising budgetary subsidy of farm incomes).

Low morale and lack of incentives certainly persisted in agriculture, but increasingly these reflected simply the problems of the Soviet economic system as a whole, and no longer any special historical circumstances of the rural economy.¹⁷ Such problems can be conveniently summarised in the list which follows.

Farmworkers' lack of interest in results. This was promoted by the payment system. The payment system for collective farmworkers, like that for state farmworkers and public sector employees generally, still meant reward according to labour input, not output. This applied whether we think of the traditional form of payment on the kolkhoz -

¹⁶ For an accessible summary of this literature, see Paul R. Gregory and Robert C. Stuart, *Soviet economic structure and performance*, 4th edn (New York, 1990), chapter 12.

¹⁷ Addressing a conference in Washington, D.C., in 1981, the American scholar Gertrude Schroeder remarked: "What's wrong with Soviet agriculture? What's wrong with Soviet agriculture is that it's part of the Soviet economy."

the workpoint (trudoden') system, which allocated to the farm worker a share of the farm's residual net income in proportion to work done, or the more recent form of minimum payments based on task rates, which potentially broke the link between output and reward altogether.

An irrational structure of procurement prices. After abandonment of the Stalinist policy of near confiscation of food surpluses, government procurement prices were progressively raised, on average, to cover farm production costs. Within the aggregate, however, crop prices were raised substantially above production costs so that the arable sector became profitable, while livestock farming continued to incur losses. Left to themselves, net income maximising collective farmers would have tended to abandon animal husbandry and leave meat production to the private sector, concentrating on crop raising. Therefore, since the state continued to require a kolkhoz livestock sector, farm managers were not in fact left alone to maximise a surplus, but instead remained subject to constant direction and correction of decisions from above, from the various ministerial bureaucracies concerned with agriculture and procurements.

Pressure from above for quick results. The policies promoted by ministerial officials in order to solve problems of food supply were systematically biased towards short term results; this pressure on farm management resulted in both short term and long term misallocations. Several examples may be given. Periodic campaigns for an immediate increase in meat sales tended to result in premature slaughter and stock losses. Under conditions of uncertain rainfall, pressure for dramatic harvest improvements promoted harvest instability; the soil suffered from an inadequate moisture reserve, because too much ploughland was regularly sown and harvested, leaving an insufficient allocation of crop area to fallow. The option of extending the margin of cultivation into virgin lands, when available, nonetheless acted to postpone consideration of necessity measures to raise efficiency in using existing inputs, rather than increase inputs further.

Overcentralisation of supply of inputs and targets for output. Output targets for individual farms were fixed from above by officials remote from village reality, ignorant of local resources, conditions and possibilities for rational specialisation. Input allocations were similarly determined, resulting in uncertainty of often inappropriate supplies. The machine technology provided would frequently turn out to be inappropriate; the infrastructure of transport services, machinery parts, food storage and agronomic support was certainly inadequate.

Summary

In the past, Soviet agriculture suffered from specific problems. These problems were rooted in the Tsarist and Stalinist model of mobilising resources out of agriculture. In the Khrushchev and Brezhnev years, a new model based on mobilising resources into agriculture solved some of the old problems. The Stalinist legacy was overcome, and agricultural problems more and more began to resemble those of the economy as a whole. However, the defects of the economy as a whole were nowhere more embarrassingly visible than in agriculture.

In the mid-1980s, under a new General Secretary, the idea of a fundamental departure from the existing model returned to the fore. Under stimulus of the Chinese decollectivisation and transition to state tenancy after 1979, the debate over the possible role of the *zveno* was renewed. Gorbachev himself rejected the idea of a hierarchy of ownership from individual peasant agriculture through the *kolkhoz* to the *sovkhoz*. Moves were initiated towards long term subcontracting of basic farming tasks from the *kolkhoz* to the small cooperative unit, with value of output as the basis of reward, the *kolkhoz* becoming no more than a means of largescale cooperative supply of inputs and marketing of outputs.¹⁸ In Gorbachev's conception, which deliberately evoked the form of urban-rural exchange previously established in the 1920s, the state would contract with the *kolkhoz* for a fraction of farm output, the rest being delivered through voluntary marketing.¹⁹

Although these measures were very radical by Soviet standards, they were never likely to revolutionise the performance of the Soviet agricultural system. This was for two reasons. First, no restructuring of rural institutions was going to give good results while the economic system as a whole remained insensitive to the needs of the village community. Second, as a growing current of Soviet radical reform opinion recognised, renewal of the agrarian economy, like that of the economy as a whole, required more than economic change. It also required a redistribution of responsibilities and rights. Rural producers would have to make the difficult transition from passively surrendering food surpluses and receiving supplies to the responsible exercise of power, with equal citizens' rights of participation in, and control over, the fate of the rural society and ecology.²⁰ Whether the collapse of Soviet power at the end of 1991 would eventually make such a redistribution of power possible remains to be seen.

¹⁸ Karl-Eugen Wädekin, "The re-emergence of the *kolkhoz* principle", *Soviet Studies*, vol. 41, no. 1 (1989), 35.

¹⁹ This was noted by R.W. Davies, *Soviet history in the Gorbachev revolution* (London, 1989), 28.

²⁰ Teodor Shanin, "Soviet agriculture and perestroika: four models", *Sociologia Ruralis*, vol. 29, no. 1 (1989), 15.

Table 1. Soviet arable products and livestock, before World War I (within interwar frontiers) and 1928-1940
 (A) Arable products (million tons)

	Grains	Pota- toes	Veget- ables	Sun- flower seeds	Sugar beets	Cotto n fibres	Flax fibres
1909-13 average	68	9.7	.68	.26
1913	79	29.9	8.6	.74	10.9	.74	.33
1928	63	45.2	10.5	2.13	10.1	.79	.32
1929	62	45.1	10.6	1.76	6.2	.86	.36
1930	65±3%	44.6	13.9	1.63	14.0	1.11	.44
1931	56±9%	40.6	16.8	2.51	12.1	1.29	.55
1932	56±10%	37.2	17.6	1.13	6.6	1.27	.50
1933	65±4%	41.3	17.4	1.14	9.0	1.32	.36
1934	68	43.8	17.6	1.15	9.9	1.20	.37
1935	75	60.5	12.4	1.22	16.0	1.77	.40
1936	56	44.4	8.2	1.12	16.4	2.47	.33
1937	97	58.7	15.4	1.75	21.6	2.58	.36
1938	74	38.3	6.8	1.61	16.2	2.63	.31
1939	73	40.7	9.7	2.07	14.3	2.70	.38
1940	87	64.7	..	2.41	16.9	2.19	.27

(B) Livestock (millions, 1 January)

	Horses	Cattle	Sheep	Pigs
1914	37.0	55.6	90.3	19.8
1928	32.1	60.1	107.0	22.0
1929	32.6	58.2	107.1	19.4
1930	31.0	50.6	93.3	14.2
1931	27.0	42.5	68.1	11.7
1932	21.7	38.3	47.6	10.9
1933	17.3	33.5	37.3	9.9
1934	15.4	33.5	36.5	11.5
1935	14.9	38.9	40.8	17.1
1936	15.5	46.0	49.9	25.9
1937	15.9	47.5	53.8	20.0
1938	16.2	50.9	66.6	25.7
1939	17.2	53.5	80.9	25.2
1940	17.7	47.8	76.7	22.8

Source: R.W. Davies, M. Harrison, S.G. Wheatcroft (eds), *The economic transformation of the USSR, 1913-1945* (Cambridge, 1994), 286-9. Figures are estimates recently revised by Wheatcroft (grain and potatoes) or USSR Goskomstat (other products and livestock).

Table 2. The structure of Soviet agriculture: selected years, 1928-85 (per cent of total)

	1928	1940	1950	1970	1985
Kolkhozy and interfarm enterprises:					
Sown area	1	78	83	48	44
Marketed output	..	61	..	48	41
Sovkhozy and other public sector farms:					
Sown area	2	9	11	49	54
Marketed output	..	12	..	40	49
Private farms and personal allotments:					
Sown area	97	13	6	3	3
Marketed output	..	27	..	12	10

Notes: The kolkhoz (kollektivnoe khoziaistvo) was a cooperative farm. The land was nationalised, while reproducible assets belonged to the member households, who received the farm's net income. The farm was run by an elective management. The sovkhoz (sovetskoe khoziaistvo) was a state farm. Land and assets were nationalised. The farm was run by an appointed management and salaried worker employees as a public sector enterprise. Until 1929 the private sector was composed mainly of peasant farms. After 1929, it was reduced to the household allotments of collective farmers, in the first place, and also of other citizens who retained the right to a small personal allotment.

Marketed output is less than total output by the amount of on-farm consumption. A much higher but still declining share of the private sector in total (marketed and nonmarketed) agricultural output in the 1960s and 1970s was reported by G. Shmelev, "Obshchestvennoe proizvodstvo i lichnoe podsobnoe khoziaistvo," *Voprosy ekonomiki*, no. 5 (1981), 69, as follows: 1960 - 35.6 per cent, 1965 - 32.5 per cent, 1970 - 29.7 per cent, 1975 - 28.3 per cent, 1979 - 26.5 per cent.

Sources: TsSU SSSR, *Narodnoe khoziaistvo SSSR, 1922-1972* (Moscow, 1972), 227, 240; TsSU SSSR, *Narodnoe khoziaistvo SSSR v 1985 g.* (Moscow, 1986), 190, 207.

Table 3. Annual food consumption of the Soviet population: selected years, 1926/27-87 and 1990 plan (kilograms per head)

	1926/27	1950	1970	1987	1990 plan
Meat, fats	40 ^a	26	48	67	70 ^b
Milk and dairy products	..	172	307	363	330-40
Eggs (units)	..	60	159	268	260-66
Fish	..	7.0	15.4	17.2	19 ^b
Sugar	..	11.6	38.8	42.5	..
Potatoes	185	241	130	98	110 ^b
Vegetables	..	51	82	95	126-35
Vegetable oils	..	2.7	6.8	10.4	10.2 ^b
Fruits	..	11	35	55 ^b	66-70
Cereals	185 ^c	172	149	129	135 ^c

Notes:

a Meat only.

b 1988.

c Wheat and rye flour.

Sources: The October, 1926, and February, 1927, consumption of urban manual and nonmanual worker households, and of rural households of the grain surplus and deficit regions, are given in *Sel'skoe khoziaistvo, 1925-1928* (Moscow, 1929), 402-5, 408-11. For 1926/27 I show the unweighted mean of these figures, except that rural households are accorded a weight of 85 per cent and urban households a weight of 15 per cent. For later years, see *TsSU SSSR, Narodnoe khoziaistvo SSSR, 1922-72* (Moscow, 1972), 372; *Goskomstat SSSR, Narodnoe khoziaistvo SSSR v 1989 g.* (Moscow, 1990), 118. Figures for "1990 plan" are those of the "Brezhnev" food programme adopted in 1982.

*Table 4. Inputs into Soviet agriculture: selected years, 1940-89***(A) Employment in agriculture**

	Millions	Per cent of total workforce
1940	28.1	54
1950	27.9	48
1970	24.1	32
1989	19.7	19

Source: TsSU SSSR, *Narodnoe khoziaistvo SSSR, 1922-1972* (Moscow, 1972), 283, 343; Goskomstat SSSR, *Narodnoe khoziaistvo SSSR v 1989 g.* (Moscow, 1990), 46, 520.

(B) Investment in agriculture

	Billion rubles, p.a., at "comparable" prices	Per cent of total investment
1940	0.8	11
1956-60	5.3	14
1966-70	13.3	17
1981-5	31.2	19
1986-9	28.6	17

Source: Goskomstat SSSR, *Narodnoe khoziaistvo SSSR v 1987 g.* (Moscow, 1988), 294; Goskomstat SSSR, *Narodnoe khoziaistvo SSSR v 1989 g.* (Moscow, 1990), 533.

Table 5. Economic growth of agriculture: USA and USSR, 1951-77 (per cent p.a.)

	1951-60	1961-70	1971-77
USA:			
output	2.1	1.1	2.6
inputs	1	.0	.9
of which, labour	-4.2	-5.0	-3.3
input productivity	2.0	1.1	1.7
of which, labour	6.7	5.9	6.1
USSR:			
output	4.8	3.0	2.0
inputs	2.7	2.1	1.6
of which, labour	-.6	-.4	-1.5
input productivity	2.1	1.0	.4
of which, labour	5.4	3.4	3.5

Source: Douglas B Diamond and W Lee Davis, "Comparative growth in output and productivity in U.S. and U.S.S.R. agriculture", in *Soviet economy in a time of change*, vol. 2 (1979), 32, 38.