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AGRICULTURAL TRENDS AND PROBLEMS
IN
UKRAINE

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Literature Review

Although many articles, books and periodicals have been written on Ukraine, none have dealt specifically with the agricultural trends and problems of Ukraine. For this reason, a literature review in the normal sense is not possible. What was done, was to gather as much information from various sources about Ukraine in general. Because of the nature of the topic, many of the sources were found to be in languages other than English (ie: Ukrainian, Russian, German and Polish). What was found, which was a great relief, is that most of the material gathered was compatible (ie: no real discrepancies existed).

As one might imagine, a lot of piecing together was necessary in order that anything concrete could be written. It should also be noted, that it was physically impossible to consult every piece of literature, but an effort was made to consult a wide range of materials in order to remove any biases which might come from one particular source.

ABSTRACT

Ukraine has long played a crucial role in feeding both itself and much of the remainder of the Soviet Union. Recently, however, Ukraine's importance within the overall scheme of food production of the Soviet Union has decreased by some five (5) percent.

During the 1950's, Ukraine's production as a proportion of the overall Soviet production declined as a result of the development of the "New Lands" in Kazakhstan and Siberia. The following decade saw a resurgence in the importance of Ukraine, due primarily to the harsh weather conditions in the "New Lands". Since 1965, Ukraine has experienced a continual decline, which if uncorrected will continue into the foreseeable future.

Although the policies of the government focused on the development of the "New Lands", this is only one reason for the decline of Ukrainian productivity. Much of the blame can be placed on inefficient and careless management practices, the wasting of valuable land, the exploitation of workers, the undereducation of the working population, and the ineffective use of available technology. The blame for the decline must be levied not against the people (workers), but against the system they are working under. As the system now stands, the only way to reverse this downward trend is by completely overhauling what is left of the agricultural sector. Due to the enormous costs which would be involved, it is highly unlikely that this will ever take place. It is, therefore, probable that Ukrainian agriculture will continue its downward slide in the years to come.

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INTRODUCTION

Ukraine has for centuries been referred to as the 'breadbasket of Europe'. Such a reference not only stems from its large expanses of wheat fields, but indirectly refers to Ukraine's favourable conditions for the development of agricultural products: fertile soil, a temperately warm climate, high population density, and a well developed industry for the processing of agricultural raw materials. In addition to this, Ukraine is strategically located geographically and economically.

Ukraine's agriculture is a vital food source for the rest of the Soviet Union. Of the entire territory of Ukraine (60 million hectares or 150 million acres), at least 70% is presently under cultivation. By far the greatest proportion of arable land is in the Steppe and Forest-Steppe regions of the country.

In order to utilize much of the land various schemes (irrigation, drainage, and erosion) have been adopted. As will be later commented upon, the success of these schemes is presently under question, and the possibility exists that more harm than good will result.

Land is not owned by private citizens for the most part, but is cultivated under the watchful eye of large state and collective farms. Small plots (private plots) have been leased in certain instances (totalling 2-3% of the total land area), and have accounted for a disproportionately high yield of agricultural products. Recent indications from the government of the Soviet Union suggest that this type of farming (private plot)

may be the way of the future. Shortages of foodstuff abounds and private farming appears to be one of very few alternatives available which can be harnessed in order to reverse this trend.

Ukraine has been, and still remains the breadbasket of Europe and half of its cropping area is devoted to cereal crops. Given Ukraine's long standing stature in terms of grain crops, it is the intent of this paper to briefly outline the history of agriculture in Ukraine, to study trends which have persisted, to dwell on the problems which plague it, and to assess the future of agriculture in Ukraine.

AGRICULTURAL TRENDS

CHAPTER #1

Before plunging into such a complex and challenging topic as the "Agricultural Trends and Problems in Ukraine", it is first necessary to provide some background into the events which transpired prior to the present day. For this reason, a brief history into agriculture, from its earliest days (Prehistoric times) will be included. This short summary will serve not only as background information for those unfamiliar with the topic, but also as a general indication of how agriculture progressed on Ukrainian lands throughout the centuries.

Agricultural Trends on the Lands of Present Day Ukraine (Prior to the XX-th Century)

Prior to the XX-th century, agriculture in Ukraine can be subdivided into five (5) periods. They are: (1) Prehistoric times (4500 BC - VI-th century AD), (2) Ancient and Princely eras (VI-th - XVI-th centuries), (3) Lithuanian-Polish period (XVI and XVII-th centuries), (4) The Cossack-Hetman State (XVII and XVIII-th centuries), and (5) the end of the XVIII-th to the beginning of the XX-th centuries (Kubijovic, 1984; Subtelny, 1988).

Prehistoric Times (4500 BC - VI-th Century AD)

During the earliest portions of this period, agriculture was widespread along most of the Right Bank of Ukraine. There was also additional activity found on some portions of the Left Bank (Figure 1). The period 4500-2000 BC was dominated by the Trypillian culture. The agricultural activities of this culture

concentrated primarily on the sowing of barley, wheat and millet, and the breaking of new ground for seeding with the aid of wooden hoes. Tools, as one might expect were very primitive, usually constructed of wood or stone. Toward the end of the Trypilian culture seeded areas had been increased and were expanding into the lands outside the immediate settlement. What arose was a form of plow cultivation (also referred to as field agriculture). By this time, the hoe had been replaced by the horse and plow (wooden), and man began to play an increasingly greater role in soil cultivation.

By the middle of the first millenium BC., Scythian tribes had settled in the present day southern and southwestern Ukraine, and in southern Crimea. The long-fallow system of agriculture was used by them, which simply meant that they "cultivated a tract of land for several years and turned to another when the soil became exhausted, returning to the old tract after a lengthy period, of up to 20 years" (Kubijovic, 1984). They were also known to have cultivated a substantially greater variety of crops as compared to the Trypilian culture. Their harvests included wheat, rye, millet, beans, hemp, onions, garlic, and other vegetable crops. Their tools for cultivation were primitive; a wooden plow, and an iron sickle for harvesting.

As might be expected, the farming culture grew ever richer and advanced through the absorption of production and agricultural knowledge from neighbouring peoples and tribes. Examples of knowledge gained by the Scythians include the use of the iron hoe

from the Celts, the plow fitted with metal shares from Germanic tribes, and the concept of separate buildings for livestock from the Goths (Kubijovic, 1984). By far the most important and directly applicable knowledge came from the Greek colonies. By the beginning of the VII-th century improved implements for soil cultivation and a relatively high agricultural culture were the norm. Evidence of this advancement are the two-field system, the concept of soil fertilization and the planting of winter and spring crop varieties.

The next major advancements made in agricultural technology were realized in the V-th and VI-th centuries. Around this time, improvements were made to the plow (which allowed for the cultivation of heavier soils), and thereby raising the productivity of labour. It should be clarified that such advanced technology was confined only to the steppe and forest steppe regions. With areas such as the forest belt, a much more primitive method of farming (slash and burn) was employed.

The Ancient and Princely Eras (VI - XVI-th Centuries)

Through the insight gained from archeological finds, this era can be classified as having a "well-developed system of agriculture" (Kubijovic, 1984). At the time agriculture also constituted the principal foundation of the economy. The prevalent system of soil cultivation was now the short-fallow system, with a two and three field crop rotation. This system prevailed over the long-fallow due to the fact that during this

period of time much of the land was in the hands of private landowners. This cultivation technique was much better suited to the needs of the individual landowners.

From evidence gathered, it appears that almost all crops known in the agriculture of the period were grown. Iron tools were used extensively, as were barns for storage, hand-turned millstones for grinding seed into flour, and watermills.

The trend was moving toward the private ownership of land (even by the peasants), and animal husbandry comprised an important branch of farming (ie: cattle, sheep, hogs, poultry and goats).

The XI-th century was a time of uncertainty for the peasants. They were left unprotected by the central government as a result of the fighting among the princes. Because of the obvious dangers they faced, most farmers sought the protection of individual princes. The princes were most pleased by this arrangement because in exchange for protection, the peasants worked long hours on the princes' fields. With the passage of time, the treatment of the farmers deteriorated and eventually they were looked upon as slaves. An indication of their poor treatment is that they were traded among the princes.

Although a form of slavery had obviously been devised, breakthroughs in farming also resulted. Farming had become much more productive and improvements were made to soil fertilization techniques.

Lithuanian-Polish Period (XVI - XVIII-th Centuries)

By the XVI-th century the demand for grains had increased dramatically in western Europe. This demand focused attention onto Ukraine and its importance as a producer was greatly enhanced.

By 1557 Lithuania controlled several of Ukraine's former territories. Ever increasingly, the peasants were being exploited. This is best exemplified by the observance that as ties between Poland and Lithuania grew stronger, Polish traditions and laws were also introduced into Ukraine. The Polish landowners had only two goals in mind. The first was the expansion of their estates, while the second was to increase crop production. Lands were swiftly removed from the peasants, satisfying the first goal, but in order to realize the second goal, these landowners gradually set out to enserf the farmers.

The dominant form of agriculture continued to be the three-field system. Grains, fruits and vegetables were grown primarily for personal consumption. Animal husbandry was now practiced widely and improvements had been made in the area of processing agricultural raw materials.

In the later portion of the XVI-th century, the settlement of the steppes began. The reason was not, as one might expect, to increase agricultural output, but was more as a result of peasants fleeing from the large estates in search of freedom. These settlers became known as 'Cossacks' (Subtelny, 1988) and in

addition to cultivating the steppes, they also engaged in trades such as hunting, fishing and beekeeping. By 1590 the Polish landowners had also made their way to the steppes, and once again seized the lands of the Cossacks. Cossacks had only one opportunity for freedom remaining; this was Zaporozhia. Here, every member was provided with a plot of land on which to grow grain. Grains required by the members was stored on site, while excess grain was traded to other regions of Ukraine, Muscovy and Crimea.

The Cossack Hetman State (XVII - XVIII-th Centuries)

The Cossack Hetman period marked the abolishment of the large Polish controlled landownings. Ukrainian peasants now enjoyed the freedom to buy and sell their lands and harvests as they pleased. The traditional grains remained important, but there was now a demand for linen and hemp, and thus the necessity to expand into the fields of growing flax and hemp. Cattle breeding had by this time become a very successful form of agriculture. The success of cattle breeding in Ukraine caused an interest in this type of farming in Muscovy. Ukrainian specialists were invited to travel to Muscovy and share with the farmers the techniques which result in success.

In the early XVIII-th century, Russians took over many of the estates and proceeded to enserf the peasants. This marked the beginning of agricultural procurement, the delivery of agricultural products and raw materials to the state. This supply

of foodstuffs was then distributed among the population, provided to various industries, or exported.

Productivity, however, did not increase, but remained low. This was due to the problem of frequent land redistribution by the communes. This only worked to undermine any incentive to increase individual productivity.

Once again, in an attempt to gain freedom many peasants fled to Zaporozhia. The reason why they were unsatisfied under the rule of Catherine II (leader of the Russian empire at that time), was because the peasants were bound to the land and were not permitted to settle where they pleased. The Zaporozhia had by now become "a haven for runaway peasants" (Subtelny,1988). Here there were 200,000 inhabitants who were engaged in large scale farming, trading, and livestock raising.

End of the XVIII - Beginning of the XIX-th Century)

Toward the end of the XVIII-th century, landowners (Russian) demanded up to six days per week of free labour from the peasants. This, as one might imagine, sparked peasant riots which in the end severely hindered any sought after increase in agricultural productivity. The three-field system was employed, but was viewed as backward and inefficient when compared with the system of crop rotation which prevailed in western Europe.

It should be noted, that by 1823 the first agricultural courses had been established in Yalta, and five years later, in 1828, the first of many agricultural schools was opened in the

Chernihiv region.

By the middle of the XIX-th century, commercial farming, and market gardening began to slowly take hold and expand. Agriculture had also become more efficient (ie: expansion of the internal market and increase in foreign trade). This efficiency was as a direct result of abandonment of the three-field system and the subsequent introduction of the five, six, and eight-field systems. From an outsiders point of view, Ukraine's agriculture must still have been regarded as backward, as it continued to rely on low productivity, serf labour.

By the mid XIX-th century, serfdom was abolished allowing each peasant household to farm some ten hectares of land. This change of landownership from estates to individuals had both positive and negative effects on agricultural productivity. Animal husbandry experienced a decline while traditional harvesting of crops increased. Both of these consequences can be accounted for by a change in farming practices; more land was devoted to growing crops, thereby leaving less for the raising of animals. This change in agricultural productivity can be directly tied to the daily diet of the peasants. Meat was consumed only on occasion, usually during religious and other celebrations, and was, therefore, not as vital to the peasants as were the grains.

By the end of the XIX-th century the educational system was developing rapidly, but in comparison to western countries, it lagged far behind.

Agricultural Trends (XX-th Century)

Mass peasant uprisings took place in 1902, and in Ukraine in excess of one hundred estates were destroyed in a matter of days. Due to these uprisings, new reforms were implemented which allowed peasants to leave communes and set up private farms and homesteads. There also occurred the introduction of more modern farming techniques, replacing the primitive practices of the past. The modelling of crop fields, the development of hybrids, the introduction of machine and seed cleaning stations, and the establishment of co-operatives are just a few of the advancements made in agriculture at the time. Given such advancements, with the beginning of the XX-th century, most Ukrainian peasants were no better off, relying on the same farming practices their ancestors had relied upon. The beneficiaries of this new technology were primarily the large gentry estates who could afford the costs involved.

After World War I and the civil war, the Soviet economy was one of the weakest in the world. An indication of this is the depressed agriculture in Ukraine where sown areas were decreased by some 20%. Animal husbandry was also on a decline. The number of cattle was falling drastically and supplies of meat, lard, milk, wool and leather were dwindling. The urban population was starving, and the situation in the countryside was deteriorating.

For a short time, commencing on January 22, 1918, Ukraine was proclaimed to be independent, free and a sovereign state for

the Ukrainian people. Quickly Ukraine moved to strengthen its ties with the Central Powers (Germany, Austria-Hungary, Bulgaria and Turkey). A means toward this end, was to establish a trading agreement. Because Ukraine had for so long been oppressed, it had not developed in many areas, and therefore traded surplus foodstuffs (which amounted to one million tons per year) for technical expertise and industrial goods. In addition to this, Ukraine was to also to be aided in the establishment of its own army (Doroshenko, 1975).

By 1919, peasants were only permitted to keep seed and 237.5 kilograms of grain per person annually. The remainder of the grain harvest was removed by the state with no compensation to the farmers. The farmers, therefore, had no incentive to produce more than they were permitted to keep.

The crop failure of 1920 was a particularly harsh blow. Because of this poor harvest, coupled with the farmers' revolts in 1921, the New Economic Policy was revised such that only a portion of the total farm production was subject to compulsory delivery to the state (Doroshenko, 1975).

The difficulties faced by the countryside were enormous. There was a severe shortage of implements such as ploughs, seeding and reaping machines, and sickles and scythes. Most of the available tools were in need of repair. In many instances, repairing tools was a problem because the village smith had been mobilized into the army; in any case, there was practically no available iron or steel with which to work. In 1921, 50-70% of

farm implements were beyond repair and needed replacing.

The educational system was in slightly better shape. 1918-1922 was a time of improvements. A major factor why is because of the realization of a new country (1918) that education was lagging behind the west and needed improving. By 1922, with the abolition of an independent Ukraine, the progress which had been made in the previous four years was quickly reversed. The entire educational system was reorganized, and as a result, political persecution of the older, experienced teachers took place. These teachers were swiftly replaced by younger, inexperienced individuals and for this reason, agricultural education specifically, was dealt a severe blow.

The economy of the USSR in the late 1920's was still predominantly a small scale, peasant agricultural economy. The industrial base, when compared with the agricultural base was negligible.

In 1928, Stalin adopted the left wing strategy of development, and saw the development of the collective farm system as a crucial component of the model. Therefore, because of his strong commitment to rapid industrialization, Stalin viewed the kolkhoz as likely being the most successful means by which to harness the peasants to attain the goals of economic development (Stuart, 1972).

From the onset of economic planning in 1928, the organization of agricultural production has occurred along three main lines: the kolkhoz (collective farm), the sovkhov (state

farm), and the private subsidiary sector (Stuart, 1972). (The private subsidiary sector refers to small plots of land which were within the holdings of the state or collective farms, but were cultivated by peasant families).

As is evidenced, the burden to create any surplus, in terms of productivity, during the time of collectivization was placed squarely on the shoulders of the peasants. As has previously been implied, the state was given first claim to the output of the farm, with the peasants receiving the remainder (Stuart, 1972). During years of good to exceptional harvests, there was no cause for concern, but because productivity varies with annual changes in weather, there was always the possibility of a catastrophic event irradicating a portion of, or a complete harvest.

1929-32 marked the introduction of collectivization. Collectivization was to be accompanied by regional specialization, thereby assuring the efficient use of the natural conditions of the country. The program of specialization was, however, short lived due to the fact that "the Soviet economic priorities rested with the heavy industry, and the government was not willing to divert resources to produce fertilizers or build storage and transportation facilities to enhance the required regional exchange" (Stebelsky, 1972).

Through collective farming, Moscow had the power to specify the percentage of the yield which was to be gathered from the farmers. In 1929, the allotted amount was a fairly reasonable 20%. Two years later, in 1931, the quota was raised to 38.5%, and by

1933 it had increased still further to 50%. This exaggerated amount of confiscation resulted in the direct extermination of some 7,000,000 Ukrainians due to starvation. Even Soviet economists in 1932 admitted that there was a deficit in the land that had been sowed, and that collectivization was to blame. The lack of grain, the major staple in the diet of Ukrainians, lead the peasants to consume everything that they had. The situation was described as follows by one journalist: "Last winter Ukrainian peasants ate everything: chickens, cows, pigs, sheep, even horses. Only the dogs escaped, turned wild, and now run in packs like the Australian dogs, but with one difference, that Australian dogs feed off the scraps of human food, while Soviet dogs attack humans, and in particular children" (Dilo, 1932).

A 1932 figure shows how widespread collectivization had become. By this time 80.5% of the total land of Ukraine was under collectivization, and by 1934 this figure had topped 90.0%. 1932-33 marked a period of suppression of peasants. Not only were they required to meet quotas which had been assigned by Moscow, but they now had to deal with the prospect that their land might also be confiscated from them.

The only bright spot for Ukrainian farmers was that the Soviet government began to realize the problems inherent in the educational system. For this reason, by the mid 1930's, an attempt was made to improve the situation by integrating the Ukrainian agricultural system with the all-Union system. In so doing, the number of institutes offering four year programs

increased from 7 to 20, while those offering three year programs jumped from 20-123 (Kubijovic, 1984). This large increase in the number of schools was intended to provide more agricultural specialists, who would then be able to further productivity in Ukraine. Since the 1930's, the trend has been toward increasing the number of available schools, thereby placing many more knowledgeable individuals into the agricultural sector.

From 1933 to 1940 the amount of agricultural land increased, but the proportion devoted to grain crops was markedly lower. Although large expenditures were made in an effort to upgrade equipment, productivity nonetheless remained stagnant or in some instances declined.

The early 1940's once again saw farmers under the authority of a new conqueror; this time it was Germany. The Germans exploited the farmers and confiscated most of their grain and livestock.

By 1944 Ukraine was once again under Soviet control. The trend at this time, was the grouping of collective farms into much larger entities. By 1958 the total number of collective farms was down to two thirds of the 1951 level.

The 1950's were also characterized by a declining importance of agricultural production and growth for Ukraine (when compared to the whole of the Soviet Union) (Table 1). The General Secretary of the Soviet Union, Nikita Khrushchev, had set out to increase the total wheat productivity of the Union. He envisioned the use of Siberia and Kazakhstan ("The New Lands") as new areas

where wheat farming could take place and thrive. In fact, in the 1950's, all indications seemed to suggest that the plan was successful. Largely due to favourable weather, the New Lands were producing more and more wheat, and removing some of the pressure off Ukraine. This, however, did not last long, and by 1960 most analysts referred to the experiment as a failure. The 'usual' weather conditions had returned, and were found to be unsuitable for large scale wheat production. Primarily for the above mentioned reason, Ukraine's stature as a wheat producer was once again established.

Under Khrushchev, grain supplies and production had decreased so significantly, that large scale food and feed grain imports had to be made, in order to avoid a similar tragedy to that of 1932-33. Immediately following Khrushchev's removal from office, the new regime set about to allow "for a finer readjustment of the distribution of crops according to their performance in different environments" (Stebelsky, 1974). Simply put, this meant that regions which favoured wheat production, would concentrate on wheat while other areas would concentrate on producing crops they were suited to produce.

Since 1965, Ukraine has once again experienced slower growth in terms of agricultural production (Table 1). Reasons for this include improved weather conditions in the newer farming districts and much more intensive agricultural investment in other regions of the Soviet Union. Investments made in Ukrainian agriculture were confined for the most part on improved

mechanization, industrialization, and for incentives to farmers. A portion of these funds were also allocated for chemicalization and land improvement. Thus the stage was once again set for intensification and specialization.

The goal of specialization was to attain and maintain self-sufficiency. Undoubtedly, Ukraine was looked upon as playing a major role in achieving self-sufficiency.

As demand for agricultural products continues to increase, Ukrainian specialists will move more and more toward specialization in order to maximize yields and decrease inefficiency.

The picture painted by various specialists on Ukrainian agriculture in the early 1970's was a period of revival. All available indications suggest the exact opposite. One statistic which clearly shows their original analysis to be incorrect, is the actual proportion of investment being targeted toward the agricultural sector. In the 1950's, 18.4% of all monies were spent on the modernization of agriculture. This percentage has steadily declined, and by 1970, had reached a low of 17.1% (Cohn, 1977) (Table 2).

Throughout the remainder of the 1970's and up to and including the present, various startling trends have developed. Unfortunately, all indications point to a still further decline in Ukrainian productivity. Though this decline seems inevitable, as will become evident in the preceding section, the blame cannot be placed on the farmers, but must be directed at the system under which farmers are forced to work.

Recent Trends in the Agricultural Sector

Since the early 1980's seven new and/or persistent trends have dominated agriculture in Ukraine. Each of these will be dealt with separately and in some detail below.

A/ Leniency Toward Farming Families

From 1981, families residing in rural areas have been permitted to keep livestock over and above the previously set out legal limits. This is provided they do so with the understanding that they are required to deliver a preset amount to the kolkhos or sovkhos under which they reside. The meat or milk produced in this manner is usually sold by the kolhoz or sovkhos to the state in order to meet its own procurement obligations (Waedekin, 1986).

Much more recently, Gorbachev has gone so far as to promote family farms by calling for a "a sharp increase in small-scale family farming to provide more meat, vegetables and other food". He has further stated that history has shown "the danger of peasants' being separated from the land", and indicated that the thousands of unused village houses and plots should be leased to those city dwellers who pledge to grow food on a part time basis (New York Times, July 1, 1987).

B/ Decline in Agricultural Investment

As was mentioned in a previous section, capital support for the agricultural sector was on the decline. It appears that this will also hold true for the foreseeable future. Not three years back, Gorbachev implied in a speech that there would be a further decrease in the amount of investment allocated for the food economy. Of the monies slated for the agricultural sector, in excess of 50% was to be accorded to the development of the processing industry and transportation, and for the creation of improved storage facilities for grains. This plan was intended to reduce irrational expenditure and losses (Sel'skaya zhizn', March 12, 1986).

Although these areas undoubtedly require upgrading, as will be divulged later, there is no need for the upgrading of roads and facilities when there doesn't exist enough equipment by which to harvest and plant crops. What good are roads when there is nothing to transport?!

C/ Mobilization of Labour Through Coercion and Control

In the past, the mobilization of labour by methods of coercion and control did yield results such as improved production levels, but they were less than optimal in economic terms and were achieved at a high level of social cost (Waedekin, February 20, 1985).

The present trend is toward emphasizing the economic

necessity of improving the efficiency of farming. Recently, agro-industrial associations have been formed with the intent of integrating all agricultural activity with the institutions found in specific regions (raions). The only difficulty with such an organization, is that it needs in some way to raise the funds required to continue operations. A means of raising capital is through the introduction of levies on farms and their related organizations and enterprises. Some of the funds raised in this way are "used for the construction of additional capacity in the local linkages of agriculture. Thus, the farmers are helping to finance activities that were hitherto the responsibility of the state" (Waedekin, February 20, 1985).

In this manner, farm profits are decreased, leaving less money for the payment of workers or for the upgrading of equipment. It is, therefore, the opinion of this author, that such agro-industrial organizations have done more harm than good for the agricultural community. The more bureaucracy that is in place, the less efficient things tend to be ; examples of this abound all around us in North America.

2.4 Land Improvement: Irrigation and Drainage

For Ukraine, the plan since 1985 has been to increase the area of irrigated land from 2.2 to 4.2 million hectares, while simultaneously increasing the amount of drained land to 4 million hectares (from the present 2.6 million).

Irrigation has been used ever increasingly since the 1960's.

In 1974 a colossal plan was devised which would have seen water diverted from the northern and eastern portions of Ukraine into areas of water shortage in the south and west. At the time of writing the plan had not been initiated and will probably never be started due to the exorbitant cost involved. Since 1978 grain yields in Ukraine have declined on both irrigated and non-irrigated lands, but the costs of irrigation have risen drastically.

It is for this reason (cost), that it becomes more and more unlikely that any large scale irrigation or drainage projects will be undertaken in the future. More likely is irrigation and drainage on the small scale.

As will be discussed in the chapter on problems, cost is not the only problem inherent with these two forms of land improvement.

Exporting per Capita Production

In recent years, and more precisely from 1973, farm production has been 'stalled'. Yegor Ligachev, the second ranking party leader has criticized party officials in Ukraine as being "intolerably slow in reorganizing agriculture along new agribusiness lines" (New York Times, January 25, 1987). In addition to being stalled, Ukraine's population has grown resulting in a turnabout in Ukraine's position from an exporter to an importer of grain (New York Times, October, 12, 1987).

A major reason why such a turnabout has occurred can be

directly traced back to violations of technological disciplines (Tenson, April 15, 1985). A December 4-th article in the Soviet Analyst stated the following concerning the production for the 1981-85 period: "Production and purchases of the basic types of agricultural products have increased. Average annual gross agricultural output has increased by six percent. Meat production has increased by ten percent and egg production eighteen percent" in comparison with the previous five year period. What was most interesting of all, is that no mention was made of the decline in the cereal crops, the country's most important farm crop. It appears that the policy of stressing the good and neglecting the bad will continue to be maintained by the present leadership.

5/ Intensive Technology

In 1985, for the first time, the main efforts to increase grain output concentrated on the use of intensive technology.

Intensive technology is "based on the use of high-yield varieties of grain, the application of scientifically determined dosages of fertilizer, protection of the crops against disease, pests and weeds, and the observance of the optimal deadlines for carrying out field work" (Tenson, April 15, 1985).

Because this was only first attempted in 1985, at the time of writing no data was available as to the success of this endeavour. Assuming that the above definition of intensive technology is strictly adhered to, success should follow. It, however, must be cautioned that agriculture in Ukraine, and for

that matter the rest of the Soviet Union, has a poor track record of not protecting the soil from erosion, nutrient loss, etc. It is , therefore not satisfactory to proceed with a programme of intensive technology if no strategies are in place to combat other problems which are likely to arise.

3/ Other Trends

As mentioned earlier, several negative trends persist: the decline in per capita growth of output, rapidly rising production costs, and the increased reliance on the importing of agricultural commodities. It is suggested (Alexeev, January 17, 1986) that these problems could be resolved by market oriented reforms similar to those undertaken in China and Hungary. Benefits of such reforms would include a greater production efficiency and a more rational allocation of resources.

A further trend which is still being tested, is the assigning of much more modest, and thus more attainable goals. This is especially true for the grain harvests which have not been as high as originally intended.

The effects of both of these possible trends is still unknown because they are much too recent to be analysed as were the others.

POSSIBLE FUTURE TRENDS

Possible Future Trends

In 1986, almost immediately after taking power, Mikhail Gorbachev realized that the agricultural sector required extensive reforms. He, therefore, suggested that there should exist a greater autonomy for both sovkhoses and kolkhozes, but that farms should be given "fixed delivery plans" for the next five year period. He did go on and suggest that any excess produced on farms could be disposed of in any way seen fit by the producers. In other words, the surplus could be sold to the state, the free market, consumer cooperatives or even to the farm workers themselves.

Though this appears as a great stride away from previous customs, it remains to be seen how far he intends to go. In the first place, Gorbachev has neglected to state how much each farm will be required to deliver as their quota, and secondly he has not mentioned what the money raised from the selling of surplus products must be used for. In other words, if the quotas are raised and if it is stipulated that the money earned on the sale of excess products must go toward the upgrading of farms, then the farmers are in fact no better off.

Gorbachev's future plans also involve farm receipts derived "not only from sales at fixed state procurement prices, but also from sales under conditions more or less approaching those of a free market... In this way, the state will not only be under such pressure to raise its procurement prices in order to obtain the

increased production it requires, which would involve an increase either in consumer prices or in the already huge food price subsidies. Instead the state will be able to leave procurement prices below cost level" (Waedekin, 1986, p. 3).

Also endorsed by Gorbachev is the increased involvement of the "family team" in agricultural production. It appears that relative freedom of production for the farmers may be just a few years away as a interview with V.S. Murakhovsky in Literaturnaya gazeta (No.4,p.2, 1986) suggests. During the interview, Mr. Murakhovsky, the head of the State Agroindustrial Committee states that "it (the family team) is one of the forms of production relationship that is employed on the basis of concrete conditions and specifics of a given locality...If it is the intent of any individual to undertake to grow a specific quantity of vegetables, fodder, root crops, or otherwise, for the kolkhoz, then it should not be obstructed; let him get on with his intended work."

Stemming from this is Gorbachev's endorsement of the cultivation of private plots. Two reasons are cited below for the "new" interest of the government in the encouragement of developing private plots. The first is that under traditional farming practices, the planned targets are not being met. The second reason is that Gorbachev's confidence in the success of such a programme has recently been buoyed by data which shows that in excess of 28% of all agricultural goods are produced on only 2.6% of the land (this 2.6% represents the area of the

private plots) (Soviet Analyst, February 19, 1986). This staggering figure leads one to speculate how truly inefficient basic farming and its related processing must be.

Another trend of the future will be the almost certain reliance of the Soviet Union on other sources of wheat as the "geography, climate, population size, crop fluctuations, and the desire to increase per capita consumption of protein and dairy products all point to the need for larger grain supplies and continuing imports" (Alexeev, 1986). This is largely due to the mismanagement practices and the lack of funds and insight which trouble the present agricultural system (New York Times, August 2, 1986). These problem areas will be further discussed in the following chapter.

Perhaps one of the most interesting of future trends might be the rapidity of the decline of Ukraine in the overall scheme of Soviet agriculture. Cohn (1977) has likened Ukraine's position within the Soviet Union as being analogous to the East North Central or the Great Lakes region within the United States. He cites similarities such as both were heavy industry producers and the leading agricultural areas within their respective countries. The Great Lakes region reached its peak share of production in the 1950's, and since then has experienced a steady decline. The reason for this is that there was a shift to other branches of manufacturing such as electronics, computers and aircraft. Ukraine, by similar standards, has experienced a similar decline

in stature within the USSR. The only real difference between these two scenarios is that Ukraine's decline has occurred from the mid-1960's (Table 1). Projecting this trend through time, it is quite evident that there will be further deemphasis of the significance of Ukraine in the future economy of the USSR.

The most disturbing of all future trends may result from the explosion of the Chernobyl nuclear power plant. Although the situation as yet cannot be fully assessed, prospects for the recovered productivity of the affected 50 mile radius around the plant remain very slim. To most, a 50 mile radius may seem insignificant, but in terms of area, it translates to 7854 square miles. To top things off, the reactor was located in the rich Ukrainian plain where the country's most fertile soils are found. It is also unknown how crops of wheat, sugar beet and forage for livestock in the area surrounding the disaster will be affected. All that can be done is to wait and see, but the effects of this disaster could and most likely will be much further reaching than originally reported (New York Times, May 2, 1986).

Conclusion: Trends

In summary, various trends have been cited which have and will have both positive and negative effects on the productivity of the agricultural sector in Ukraine.

It should be noted that the Soviet Union's continued tendency to withhold important statistics, such as the official data on the size of grain and other harvests, makes it

exceedingly difficult to accurately assess the nature of the yields. There does, however, appear to be a continuous outpouring of favourable statistics when yields were satisfactory or approached projected levels. One might hasten to conclude that the years with no official statistics for various crops represent years of poor or failed yields.

Nonetheless, from all available data, it appears that the decline of the agricultural sector in Ukraine is inevitable. The only apparent way of reversing what has occurred since 1965 is to introduce wide ranging reforms. These reforms, if implemented, must be geared at all levels within the agricultural system and should be introduced immediately. If all indications are correct, this kind of large scale reformation will certainly not arise given the Soviet Union's present strategy of industrial growth.

AGRICULTURAL PROBLEMS

1985).

Whatever the situation, a lack of funds, compounded by poor management is largely responsible for the problem of housing livestock.

34 Poor Management Practices

Poor management practices are also seen as a key to the low livestock yields experienced by Ukrainian farms. Colonel General Ivan Isaenko, the head of the Central Food Administration of the Ministry of Defense, blames the "irresponsible attitude of the directors of certain sovkhoses and farms towards the problems of wintering livestock" (Kruzhin, April 19, 1985).

Although intensification was accepted as a method for a more prosperous agricultural sector, and also as means for creating an overall surplus in production, it was not approved of by agricultural managers and specialists. The reason why lies in the fact that they realized that "if you take away their right to allocate and to approve things and hand it over to the kolkhoz,... the need for the desks and armchairs disappears, and they themselves become superfluous and unnecessary" (Sovetskaya Rossiya, November 19, 1985). In a sense, it is thus an attempt by the managers and specialists to hold onto their livelihood which has caused such problems to arise. Perhaps the underlying message is that many farms have an overabundance of specialists but are lacking workers.

A further example of poor management is the fact that the

needs of the workers are not being met. Although workers are encouraged to engage in fruit and vegetable farming, a lack of basic tools and materials along with few available technical resources make it impossible for many to do so.

Other examples of poor management have been harshly criticized by Pravda (October, 1984), and have been referred to as "scandalous occurrences". Pravda revealed that in one instance, the waters of Lake Sasyk (containing a high mineral content) had been fed directly into irrigated fields, causing wide spread soil deterioration in the Odessa region. As a result of this practice, the 1984 crop yield for the region was only 50% of the projection for the year, and was even found to be significantly lower than yields on non-irrigated lands.

In addition to this, there has been a persistent problem with the reclamation of peat lands. Problems in this instance, stem from the fact that proper drainage, crop rotation and soil erosion prevention measures are not being implemented. As a result, the land "quickly turns into useless wasteland" (Trud, April 25, 1980). According to Trud, "dozens of hectares of grain tracts perish every year" as a result of inadequate preliminary research into drainage patterns and their effects.

If one was to assume that drainage was successful and economically justifiable, there still persists the problem of obsolete and worn-out drainage systems. Added to this, are the more traditional problems such as the failure to line canals

properly (in order to prevent the waterlogging and salinization of good agricultural land).

Although irrigation and drainage schemes appear to be failing badly, it is the opinion of this author, that it is not so much the problems associated with the schemes, as the problems in the management of the schemes that requires serious deliberation.

D/ Equipment and Seed

A serious problem facing many farms is the state of unpreparedness of both equipment and seed. Although this problem is rarely addressed in the public forum, statements from high ranking officials make it abundantly clear that grave problems exist.

Kruzhin (April 19, 1985) provides information from a high ranking official who maintains that where care of equipment and seed has been taken, no problems have arisen. What could not be explained by the official (Isaenko) was, why the Kiev, Carpathian, North Caucasian and Turkish districts are not sowing if the seed and equipment are prepared, as had been claimed. The only conclusion which can be reached, is that in fact the situation with the seed and equipment is much worse than publicized.

D/ Linkages: Farms and Agricultural Organizations

A major problem found entrenched in the agricultural sector

is a definite lack of linkages between farms and the agricultural organizations which provide them (farms) with services or process their produce (Tenson, August 26, 1986).

Because of the present set-up, there exist a multitude of inefficiencies in a sector of the economy which can ill-afford them. A possible solution lies in the creation of agricultural complexes whose responsibility it would be to turn out, process and sell the final product through various networks within the system (ie: complex-run stores, cooperatives, etc.).

E/ Agricultural Underfunding

Through time, there has been a lesser proportion of capital outlay in terms of funding for the agricultural sector (Table 2). Taking into account the fact that agriculture is a slow-growing sector may assist in explaining this trend. The only difficulty with such logic, is that to a large extent the agricultural sector in Ukraine is slower growing because of this lack of investment. (Recall: The lack of satisfactory equipment, seed and storage facilities encourage waste and thus lower productivity and growth. These problems could be alleviated given an increased capital investment on the part of the government).

A continuation of the present trend (a decreased proportion of investment) can only cause productivity in the agricultural sector to suffer major setbacks.

F/ Livestock Raising

Currently, statistics show that the numbers of livestock on farms are experiencing a decline. Official comments on the situation, as one might expect, place the blame for the decline squarely on the shoulders of the farmers. Nothing could be further from the truth!

In a recent survey of farmers, it was determined that, "the current notions that the rural inhabitant does not want to keep livestock nowadays, were proved to be completely groundless". In fact, it was shown (in a 1987 survey), that 85% of the households would welcome the opportunity to raise livestock if permitted to do so (Sovetskaya Rossiya, August 8, 1987).

Given that land surrounding houses is presently wasted (because no farming activities are permitted on them), and realizing that shortages of all kinds abound, it would undoubtedly be much more advantageous to allow for the use of the lands around homes for the raising of livestock.

G/ Coercion and Incentives

Waedekin (1985) writes that "in the past, the mobilization of labour by methods of coercion and control did yield results in production, but they were less than optimal in economic terms and achieved at a high social cost".

In actual fact, coercion was not the sole method used to stimulate production and control the workers. Since the 1930's,

and continuing to the present, incentives to workers were as popular as coercion. Incentives consisted of the following: (1) increase in procurement prices for farm products, (2) the abolishment of payments on private subsistence plots farmed by individual households, and (3) an increase on delivery prices to provide for greater material incentives for farmers, and to deal with recurring agricultural crises and crop failures.

In most cases these techniques (coercion and incentives) only worked to increase the gap between workers and the government. Primarily this can be attributed to the realization on the part of the workers that they were being taken advantage of. Because of the distrust on the part of the workers toward the government, any attempts to revive the agricultural sector in Ukraine must focus on regaining the lost trust of the workers.

H/ Greed

As in most societies, there are those who seek the comfortable life, and in Ukraine the case is no different. When the opportunity presents itself, greed often takes over.

It is a well documented occurrence that land intended for horticultural purposes is being increasingly used for the "building of dachas" (summer homes) by individuals of above average incomes, or those with party connections. The situation is this: "an infringement of the regulations by a person of some standing or with good connections may simply go unpunished" (Waedekin, May 30, 1985).

In a 1986 article entitled 'Inhumanity of Rural Life Blamed on Party Democrats', it is further revealed that officials are siphoning off funds intended for farms in order to build themselves comfortable homes, storerooms and such, while all the while children and seniors suffer (Teague, December 10, 1986).

I/ Bureaucracy

Ukrainian agriculture specifically, and Soviet agriculture generally, remain "bogged down in bureaucracy and absurd restrictive practices" (Soviet Analyst, February 19, 1986). Due to these restrictions, there is an inadequate organization of labour, and thus an inability to maximize yields.

A still further, and perhaps more pressing problem exists. "The Soviet leadership decentralizes decision making on the collective contract to the farm level in such a way as to keep all its options open" (Dyker, June 12, 1985). The intention behind such a practice is two-fold. First, this allows the leadership the opportunity to exert pressure on farms if their performance is unsatisfactory. Second, the government is positioned in a manner such that no responsibility for errors can be pinned on them. In this way, managers become the scapegoats for agricultural failures in much the same way that workers are scapegoats for production failures (Teague, December 10, 1986). "The central government...escapes all criticism because it continues to endorse and encourage things that...can only be described as 'good'" (Dyker, June 12, 1985).

J/ A Decreasing Per Capite Output

Ukraine, once an exporter of grain, is now an importer of this commodity. Although Ukrainian yields are sufficient to support the population of Ukraine, Ukraine continues, as it has done for decades, to serve far more than its own needs (Koropec'kyj, 1977). Even given its recent decline in per capita output, Ukraine will continue to be looked upon as the Soviet Union's primary supplier of grain. As an indicator of how important a grain producer Ukraine is, it ranks only third in the world in terms of total production, behind the United States and the RSFSR, and produces an equivalent amount to Canada (Stebelsky, 1975).

A serious problem which plagues Ukraine's attempts to bolster its production (in order to become self-sustained) is a dramatic decline in the fertility of its soils (Alexeev, January 17, 1986; Soviet Analyst, December 4, 1985). Past farming practices have been the direct cause of much of the infertility. As is often the case, no strategies were in place to combat the gradual loss of nutrients. It has now fallen into the hands of the specialists, to turn around the problem and to replenish lost nutrients in an attempt to once again increase productivity of the soil.

K/ Inefficiently Applied Technology

Increasingly, in many regions of Ukraine farms have failed

to attain projected harvests on irrigated farmland. Sil's'ki Visti (December 14, 1984) cites inefficient application of industrial technology, and improper use of fertilizer as two reasons why quotas are not being attained. (Industrial technology in this instance will refer specifically to irrigation).

Although irrigation may be viewed as a means of increasing yields, the question arises of whether this increase is sufficient to justify the large initial cash expenditures (Pravda, June 4, 1979). What's more, since 1978 grain yields in Ukraine have declined on both irrigated and non-irrigated lands, while the costs associated with these schemes have steadily increased (Marples, February 11, 1985).

Tenson (April 15, 1985) has revealed that the "low productivity in grain farming and its unreliability are a result of the fact that farms are slow to adopt zonal systems of cultivation, the accepted order of rotation of crops is not adhered to, soil protection and moisture conservation technologies are not employed, little organic and mineral fertilizer is applied, and there is no integrated system of protecting plants against disease, pests, and weeds". In addition, it has been determined that approximately one half of the moisture and fertilizer is being lost to weeds.

Many of the problems cited above stem from the improper use of farm machinery, inadequate storage facilities, negligence in the preparation of seed, and the lack of required sprays and pesticides. No doubt efforts must be made to improve the present

system. The waste amounts to millions of tons annually, and as previously mentioned, can be ill-afforded.

L/ Removal of Skilled Labour

Bronson and Whitehouse (1977) recently uncovered an alarming, and potentially dangerous future trend. From their studies, it was conclusively determined that skilled labour has, since the 1960's, been siphoned from Ukraine and redistributed throughout the rest of the Soviet Union. Much of this displaced labour force has been relocated in the "New Lands" (Siberia and Kazakhstan), in an attempt to further improve farming techniques and thereby increase productivity in these areas (Pennar et al., 1971). On the other hand, this movement of skilled labour out of Ukraine may be construed as an attempt by the Soviet Union to keep Ukraine "weak" and thus prevent any possibilities of uprisings by the populous (ie: avoid similar incidents to those in Estonia, Lithuania and Latvia).

Presently, only 3.3% of males of prime working age (20-29) (Table 3) which are those most likely to succeed as managers have attained a standard of higher education. What is even more frightening, is that in terms of rural educational standing, Ukraine ranks at or near last in all available categories (Table 4). The reason for such a low standing in educational attainment is not the result of inadequate schooling, but is directly traceable to the movement of skilled labour to other portions of the Soviet Union.

In 1970 Ukraine accounted for approximately 25% of the total agricultural labour force and 33% of all collective farmers in the USSR. What should be noted, however, is that Ukraine had only 20% of the available agricultural specialists (Bronson and Whitehouse, 1977). Due to Ukraine's comparative advantages in the agricultural sector, it would be reasonable to expect a far greater number of specialists in the country. The situation, the way it stands, can only lead to future difficulties in the form of waste and inefficiency. It remains, that something must be done to curb this loss of skilled labour, in order that the level of agricultural productivity in Ukraine might once again reach past figures.

M/ Wasted Lands

At the time of writing, some progress was being made into the future use of the lands surrounding rural dwellings. Previously, the authorities prevented citizens from making use of these lands, but a 1987 decree allowed citizens "the right to make use of the plot of land attached to the house he owns or rents, for the purpose of agricultural production" (Tenson, September 18, 1987). It was, however, stipulated that this area must not exceed 600 square metres (including the area of the dwelling) if the harvest was to be consumed by the household. If the area to be harvested is in excess of 600 square metres, the harvest on those lands must be sold to either a sovkhos, kolkhoz, or consumer cooperative.

This policy change has been proposed so that lands which had previously stood unused could now become productive. Perhaps, given the success of private plot farming, Ukraine's future grain imports might begin to decline.

IV Agricultural Policy Reforms

Presently, uncertainty of future agricultural policies exists. The central government of the Soviet Union is still in the process of evaluating alternatives which will, once again, allow the nation to become self-sufficient agriculturally.

General Secretary Gorbachev supports the expansion of private plot farming, wherever feasible. His views are, however, emphatically opposed by some (Ligachev and others) who wholeheartedly support a continuation of the collectivization policy instituted by Stalin in 1928 (Cable News Network, March 25, 1989). This indecision on the part of the government could pose a serious problem in the future. The situation is such, that if no reforms are undertaken, or if collectivization is seen to be the future goal, then the victims, as in most cases, will be the farmers (New York Times, January 25, 1987).

IV The Chernobyl Disaster

Perhaps the gravest single problem faced by farmers in Ukraine is the unknown factor of the effects of the Chernobyl nuclear accident. It has been estimated by various sources, that land within a 50 mile radius of the explosion has virtually been

rendered useless by the fallout of heavy radioactive particles (New York Times, May 2, 1986).

The land in the vicinity of Chernobyl was considered by experts to be agriculturally superior land, well known for its high yields of wheat sugar beets, and forage for livestock. In addition to the land directly adjacent to the reactor being affected, lighter nuclear particles are known to have been carried many hundreds of kilometres to other portions of the country. The effects of this fallout is as yet unknown, and may not be known for some time.

Most assuredly, the effects of such a disaster can not have a positive result on the soil fertility or agricultural productivity of the region. Unfortunately for Ukrainian farmers, and for that matter all citizens, not much can be done, and a wait-and-see type outlook on the problem prevails even today, three years after the fact.

Conclusion: Problems

As one can readily see, most of the problems found in the agricultural sector of Ukraine, are firmly rooted and can be directly traced to the trends of the past.

In general, most farms are in a perilous state. They are short of manpower, and continually operate at a loss. If things continue as they have for decades, there is little hope for any significant turnaround in the agricultural economy of Ukraine.

There are three main reasons why agriculture needs to be improved in Ukraine. First, demand is much greater than the supply and, therefore, shortages abound. Second, the capital outlay by the government is increasing, but a greater percentage of the money is allocated for the rising production costs, when it should be targeted toward increasing productivity. Finally, the Soviet Union, and Ukraine itself are becoming continually more dependent on foreign imports of foodstuffs. This is particularly alarming, given their professed desire for agricultural autonomy.

For significant improvements to occur, radical changes are required, particularly in the areas of land allocation, land usage, and agricultural management. Combatting these problems will, once again, revive the slumping agricultural sector in Ukraine.

CONCLUSIONS

Ukraine is undoubtedly one of the world's most prolific grain producers. It ranks third, behind only the United States and the RSFSR. This in itself is an amazing statistic, but is all the more remarkable when one dwells on the history and hardships endured by the people of Ukraine.

For all but a few years in the past centuries, Ukraine and Ukrainians have been oppressed by a multitude of other peoples (Lithuanians, Poles, Germans and Russians to name but a few). Nonetheless, some advancements and breakthroughs in agriculture have transpired. In fact, up to the 1960's Ukraine was still expanding agriculturally and the future looked bright. Some western analysts continued to suggest that an upsurge would occur in the early 1970's (even given a 2% decline in net agricultural output). How is it then, that the exact opposite came to be?

From the late 1960's, and continuing to the present, Ukrainian output in relation to the whole of the Soviet Union has experienced a serious decline. The trends discussed above conclusively support this. However, it is not so much past trends, as those of the future, which should be the concentration of experts. Past events have allowed us to gain a clearer understanding into the underlying problems which caused these

trends to occur. What should be the focus of experts, is the understanding of the problems so that the mistakes of the past will not be repeated in the future.

Although many problems persist in the Ukrainian agricultural system, present efforts have concentrated on reversing any possible adverse future trends. The efforts have, however, been on a very limited scale (ie: decreasing wasted lands by allowing for farming around rural dwellings), and represent only a minimal effort by the government to improve the present situation. For any type of noticeable revival to occur, wide-ranging reforms must be tabled. These must include an increase in the proportion of investment dollars (in this case rubles) for updating old and inefficient equipment, increasing the ratio of agricultural specialists to workers, decreasing (or preferably eliminating) wasted land, improving irrigation and drainage systems (ie: properly installing them), eliminating poor or inefficient management and the coercion of workers, simplifying the whole bureaucratic system, and curbing the present policy of removing skilled labour from Ukraine.

In order for the above changes occur, a total revamping of the agricultural system must take place. Because of the exceedingly large capital outlay that this would require, it is very unlikely that any of the above changes will be realized.

It is for this reason, that the future of agriculture in Ukraine looks increasingly more bleak.

APPENDIX

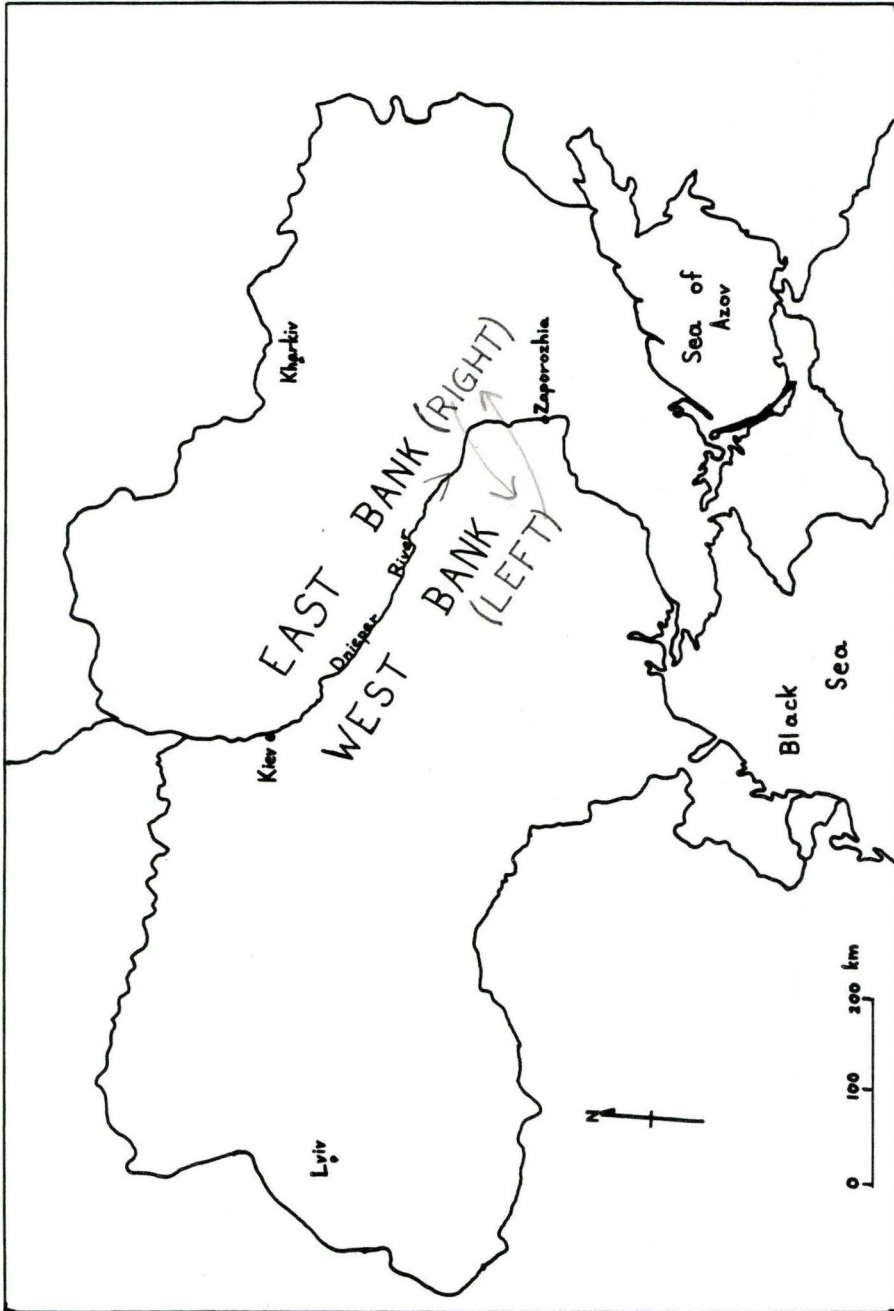


Figure 1. Map of Ukraine.

TABLE 1

UKRAINE'S ECONOMY AS A PERCENTAGE OF THE SOVIET
ECONOMY FOR SELECTED YEARS (AGRICULTURE)

	1950	1960	1965	1974	1977
Agriculture (net output)	24.6	23.6	25.5	23.5	----
Plant Crops	n.a.	23.6	26.6	25.7	----
Grains	25.1	18.0	26.1	23.5	24.8
Potatoes	22.9	23.0	21.2	25.8	----
Sugar beets	70.2	55.0	60.5	62.0	----
Vegetables	24.8	29.9	30.4	28.6	----
Meat	21.6	23.8	22.3	23.3	----
Milk	19.3	22.7	22.9	23.4	----
Animal Prod.	n.a.	22.8	22.4	22.2	----
	1978	1979	1980	1981	1982
Grain	21.5	19.1	20.3	----	----
Sugar beets	----	----	59.3	60.2	59.6
Vegetables	----	----	----	23.8	24.8
Meat	----	----	----	23.1	22.3
Milk	----	----	----	23.4	22.5

TABLE 2**UKRAINIAN INVESTMENT AS A PROPORTION OF THE NATIONAL TOTAL,
1950-74**

Sector	1950-60	1960-65	1965-74
Industry	17.2	17.5	17.3
Agriculture	18.4	18.5	17.1
Transportation	14.2	19.5	17.6
Housing	16.4	15.6	14.5
Total	16.8	17.0	16.3

Source: Cohn, p. 7.

TABLE 3**NUMBER OF PERSONS WITH HIGHER EDUCATION BY AGE AND SEX
1970 (PER 1,000 PERSONS AGE 10 OR OLDER)**

Age	Sex	Ukraine
20-29	Men	33
	Women	49
30-39	Men	90
	Women	77
40-49	Men	75
	Women	50
50-54	Men	78
	Women	35
55-59	Men	53
	Women	15
60+	Men	38
	Women	10

Source: Koropeckyj, p. 144.

TABLE 4

NUMBER OF PERSONS WITH HIGHER EDUCATION BY AGE GROUP
 URBAN AND RURAL, 1970, (PER 1,000 PERSONS AGE 10 OR OLDER)

Age	Setting	Ukraine
20-29	Urban	53
	Rural	19
30-39	Urban	123
	Rural	25
40-49	Urban	95
	Rural	18
50-54	Urban	83
	Rural	14
55-59	Urban	53
	Rural	6
60+	Urban	41
	Rural	2

Source: Koropeckyj, p. 142.

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