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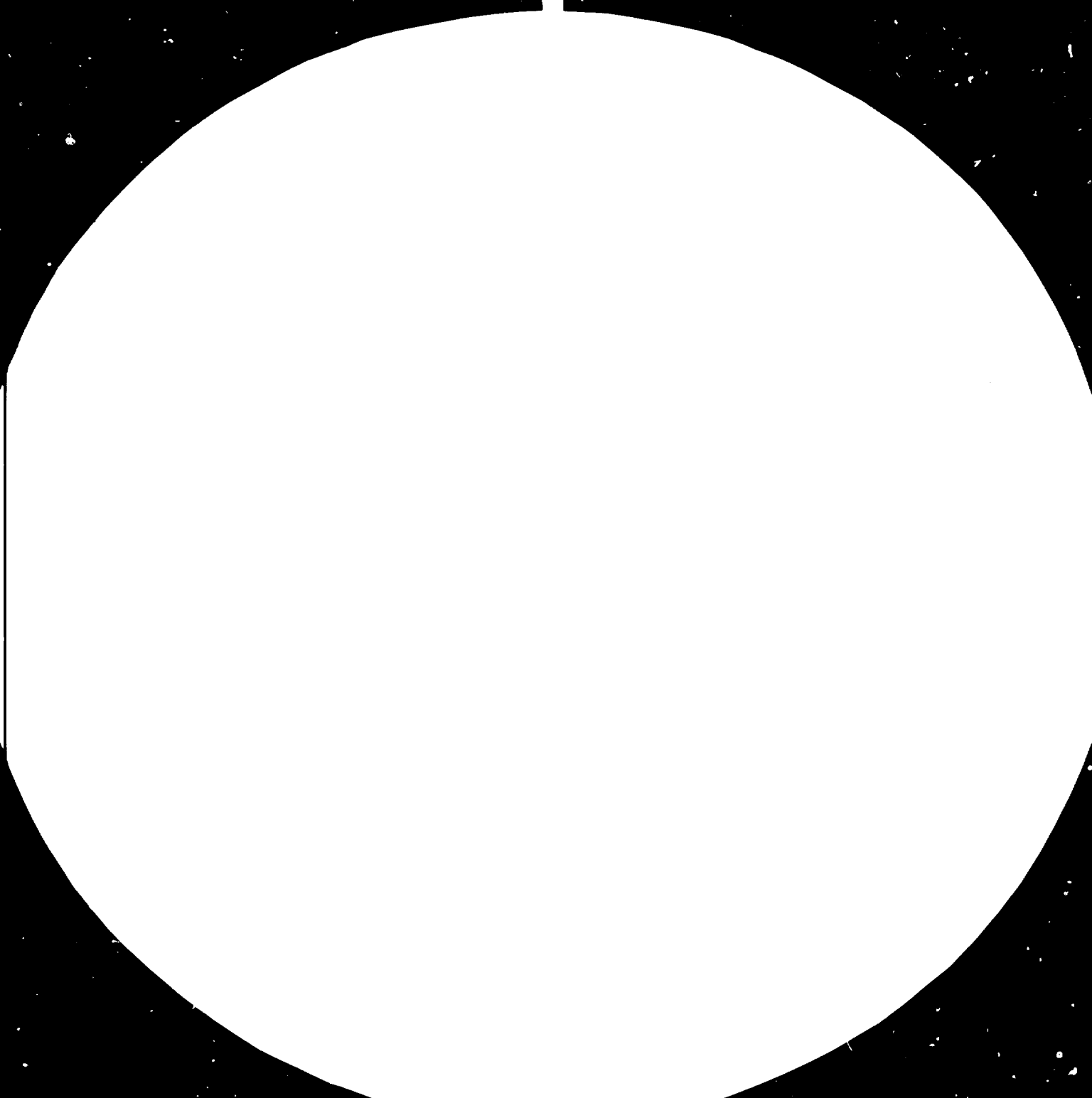
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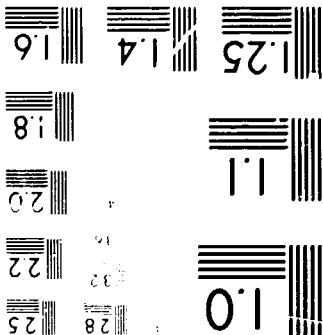
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CHINA'S ROAD OF FARM MECHANIZATION*

by

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The gradual attainment of farm mechanization, and the use of machinery to replace manual labour to help the peasants achieve common prosperity will be indeed a matter of vital importance to changing the outlook of a country where 1/4 of the world's population is concentrated.

Nevertheless, China is a developing country. Owing to her large population, weak economic foundation, backward science and technology, low productivity and undeveloped economy, China cannot advance farm mechanization at too fast a pace at the present stage.

Many countries in the world have achieved farm mechanization on the basis of a fairly developed industry and armed agriculture by using advanced technology. China, however, has been carrying out technical transformation of agriculture in the process of industrialization. In some industrially developed countries with large areas of farmland, heavy farm machines are usually used to attain the highest possible labour productivity. In China, however, this way of doing things is applicable only to the Northeast and Xinjiang while the other areas, mostly populous, have to use small and medium-sized machines that the peasants can afford, since in these areas the stress has to be put on increasing the farm output and the peasants' income. Any good experience from abroad is worth learning, but to copy

it indiscriminately will get us nowhere. Even within China it won't do to force the peasants to follow just one model since climate, sun light, topography, soil, agronomy and economic conditions are widely different from place to place.

1. Characteristics of China's Farm Mechanization

China is a socialist country with a collectivized agriculture. The rural population accounts for 80% of the country's total and intensive cultivation has been the tradition. In addition, China is a vast country with a big population, limited farmland and weak economic foundation. These constitute the basic features of China's agriculture and the starting point for China's farm mechanization. Only by gaining a clear idea of this can we formulate a correct principle for farm mechanization that conforms to the reality in China.

In view of the fact that China has a large population it is necessary for us to have a good grasp of the correct policies to bring into full play the enthusiasm of the broad masses for socialism while steadily raising their cultural and scientific levels.

A big population means a heavy burden. On the other hand it is a valuable reserve of labour power. We must make full use of it to diversify our productive undertakings with the least possible investment, so that the peasants will become better-off as soon as possible. It is wrong to blindly pursue the goal of a high level of mechanization when productivity in general is low and the funds are insufficient. Farm mechanization should keep in step with the effort to accommodate the surplus labour power and diversify the economy.

Because China has limited farmland we have to pay close attention to carrying forward the fine tradition of intensive cultivation.

To feed our nearly one billion people we have to try hard to make one hectare of farmland produce the output of several. In China farmland averages slightly over 0.1 hectare per capita, which accounts for approx. 1/8 of the corresponding figure of America, 1/7 of the Soviet Union, 1/3 of France and 2/5 of India. So there is the pressing need for us, on the one hand, to tap the potential of the existing one hundred million and more hectares of farmland and increase the yield per unit area by a wide margin. This is the most realistic and effective way of increasing the total output. On the other hand we must open up new fields of production by making full use of our rich agricultural resources including grassland, lakes and barren hills. China has nearly three hundred million hectares of grassland. The mountain areas, hilly land and plateaus cover 60% of the country's total land area. In addition, there are inland rivers, lakes and a coastline totalling 18,000 kilometers in length.

These promise extremely great prospects for the development of agriculture, forestry, animal husbandry, sideline production and fishery. And just because of this, our farm mechanization cannot be limited to operations involved in grain production. It should cover agriculture, forestry, animal husbandry and fishery, as well as the processing of farm and sideline produce. We should not only go in for agriculture but also serve the needs of combines which integrate farming, industry and commerce and provide equipment for commune and brigade-run factories.

China's weak economic foundation requires us to follow the principle of paying equal attention to farm machinery plants and

farm machines of all sizes—small, medium-sized and large— and to achieve mechanization and semi-mechanization simultaneously.

China cannot afford to spend too much money importing the most advanced technology since the low productivity of its industrial and agricultural production allows limited accumulation of funds. It is simply out of touch with the reality in China if we blindly pursue the use of whatever is advanced in the same way as one dreams of "reaching the heaven with a single leap" as the Chinese proverb goes. Take short-distance transport in rural areas for example. We use tractors to draw trailers along with rubber-tyred horse carts and wheelborrows. Their efficiency is certainly low compared with trucks, but they are a dozen times more efficient than sheer muscle. In the areas of South China where hydroelectric resources are abundant, water turbine-pump units are developed which are energy-saving and easy to manufacture. The peasants can afford machines and implements like these and the state is in a position to supply them. It is foreseeable that for a fairly long time to come we'll have to follow the principle of using machinery, draught animals and manual labour at the same time, a principle that conforms to the actual situation in China.

Since China is vast it is necessary for us to pay close attention to the unevenness of development in different places. Everything must be done in accordance with local conditions and under the principle of making full use of what is favourable while avoiding what is unfavourable.

China's climate varies widely, combining the characteristics of the frigid, temperate and subtropic zones. And so does its topography, with its mountains, hilly areas and plains. Some of the farmland is irrigated while the rest is dry. Natural conditions and farming systems vary greatly from place to place. Therefore the difficult and complex nature of farm mechanization must be fully estimated. After all, it is

impossible to use the same methods and machines to mechanize farming both in the great plains of North China and the small plots of hilly land in the mountain areas of South China.

A vast territory promises great potentialities. Though farmland only accounts for a little over 10% of China's land area, there are large tracts of reclaimable land in the areas not covered by the rock-strewn Gobis, frigid deserts, glaciers and purely stony hills which, when put together, account for 19% of the total. As natural and economic conditions differ from place to place, it is necessary to grasp the salient features of each place. For instance, in some areas of Fujian and Guangdong Provinces stress is laid on sugar-cane production. In Jilin and Heilongjiang Provinces the production of grain and soya bean is given priority. Areas along the middle and lower reaches of the Yantze River concentrate on growing cotton and paddy rice. Qinghai, Inner Mongolia and Zingjiang pay more attention to the development of animal husbandry. In the Northwest Plateau forestry and livestock breeding are being developed by the adoption of a series of measures including aerial broadcasting of grass and tree seeds. Step by step, rationally distributed agricultural and crop zones will be built up. We can certainly ensure an all-round development of agriculture, forestry and animal husbandry in these places so long as we expand agriculture and animal husbandry in accordance with natural and economic laws and make use of local conditions to the best advantage.

2. Do Things in Line with Local Conditions and Arrange Good

Order of Priority

In providing agriculture with machinery, top priority was first given to the manufacture of the machines which would yield the most marked results in increasing production and income and which were most urgently needed by agricultural production.

China has limited farmland and is often hit by natural disasters. Paddy rice accounts for nearly half of the country's grain production. The peasants have drawn from experience this conclusion: "Fertilizer increases output, but irrigation determines if there is a harvest or not at all". For many years construction of irrigation projects has been the first in our order of priority in achieving farm mechanization, as we count on them in the fight against draught and excess rains to ensure high and stable yields. What comes next is machinery for the processing of grain, cotton and oil-bearing seeds, machinery for use in the threshing grounds, machinery for crop protection and transport. So our way of doing things is quite different from some other countries which usually give priority to tillage machinery. This feature of ours is shown in the varying quantities of different machines provided for agriculture.

The combined capacity of the farm machines being used in China exceeds 180 million HP:

1. There are over 5 million pieces of drainage and irrigation equipment, their combined capacity being 71 million HP. The land under mechanical or electric irrigation amounts to 24.6 million hectares, accounting for 56% of the effective irrigated area.

2. There are 3.4 million machines for the processing of grain, cotton and oil-bearing seeds as well as animal feed, with a combined capacity of 30 million HP, averaging 7.3 machines per production brigade. Except in some remote mountain areas, the processing of rice, wheat and animal feed has been in the main mechanized. As a result, women are emancipated from a great part of household chores.

3. There are altogether over 2 million machines for use in the threshing grounds including threshers and grain throwers, their combined capacity estimated at 10 million HP.

4. So far as machinery for crop protection is concerned, there are 230,000 power sprayers and powder blowers, and more than 20 million hand sprayers. Most of the production teams use such semi-mechanized implements to fight plant diseases and insect pests to reduce losses.

5. As for transport machinery, we have for many years paid attention to developing mechanized and semi-mechanized means simultaneously. There are 460,000 tractor-drawn trailers, 1.29 million trailers drawn by walking-tractors, 2.47 million animal-drawn rubber-tired carts and 28 million wheelbarrows, which play an important role in rural transportation. China has relatively few trucks, less than 100,000 in total, which are mostly owned by state farms.

6. So far as field machinery is concerned, there are 670,000 large and medium-sized tractors, 1.67 million walking-tractors, and 1.3 million large and medium-sized tractor-drawn implements including over 180,000 seeders, more than 90,000 trailed rice transplanters and over 430,000 hand-operated transplanters with a combined capacity of 48 million HF. There are more than 20,000 combine harvesters and over 70,000 swathers. Farmland ploughed by tractors amounts to 42 million hectares, accounting for 42% of the country's total. Farmland seeded by tractors reaches 15.3 million hectares, 13% of the area sown to dry crops.

In addition, there are machines used in forestry, animal husbandry and fishery. But the level of mechanization is still low, without any marked results obtained.

The above only relates to machine operations. So far as regions are concerned, it is quite another picture. Roughly speaking, China goes ahead in the use of drainage and irrigation equipment and Northeast China began using tillage machinery earlier.

Recently, the Chinese Government has decided to build up mechanized commodity grain bases in Northeast China, in the hope that the output of grain, soya bean and sugar-beet there will increase markedly in a short time. The decision was made in view of the fact that Northeast China is endowed with a vast expanse of farmland suitable for the use of large farm machines.

Though an important industrial base of China, the Northeast has the greatest potentialities for agricultural production. It has 16.47 million hectares of farmland and a rural population of over 57 million. Several million hectares of virgin land remain to be opened up. It has roughly the same population, farmland and total grain output as France. Once built into a commodity grain base where large-scale, socialist agriculture is undertaken with a fairly high level of mechanization, the Northeast will play an important role in vitalizing China's industrial and agricultural production as a whole.

So long as mechanization is grasped as the key link, places with a large area of farmland but a small population will be able to market a highly significant part of their produce. Though farmland is scarce in Jiangsu, Zhejiang and other densely populated provinces, the usual practice there is to grow three crops a year, the multiple crop index being over 230%. Furthermore, industrial and sideline production undertaken by their collectives is highly developed. In view of this, mechanization is needed to finish farm work in good time and fight natural disasters for high yields. Commune and brigade-run enterprises also cry for the use of machines. Again, mechanization is needed to reduce labour intensity. So in a given place the development of mechanization is not determined by its geographic location nor by the subjective will of anybody. It is determined by the necessity of developing production, by the economic conditions of the said place and the economic results.

We have built a number of state farms all over the country with a fairly high level of mechanization and productivity, which market a fairly great proportion of their produce, thus making big contributions to the state. These farms are important grain and industrial crop producing bases of China. An example is the state farms in the reclamation area of Heilongjiang Province which produced 2.75 million tons of grain in 1977, of which they delivered 1.35 million tons to the state. The commodity rate reached nearly 50%. Each farm worker produced, on the average, 8.5 tons of grain and soya bean. These farms certainly need high-powered, efficient and well-assorted farm machines.

It is necessary, as well as possible to develop farm mechanization at a faster speed in the Northeast and the areas of the South which are major producers of grain and cash crops. But China, taken as a whole, cannot develop farm mechanization too fast because of the technical and economic limitations. A definite order of priority must be made in line with the local conditions. In no account should we specify the same speed of development for all places.

Practice has proved that better economic results will be achieved so long as we proceed from the reality in the given place and at the given time, make use of what is favourable while avoiding what is unfavourable, arrange good order of priority and lay emphasis on the different features in each place.

3. Combine Farm Mechanization with Diversified Economy

Where do funds for farm mechanization come? How to accommodate the manpower saved by mechanization? These are the two most conspicuous problems China has encountered in farm mechanization.

To solve these problems, assistance from the state is needed. In other words, the Government should work out correct decrees, policies and principles for their solution. On the other hand, it is all the

more necessary to rely mainly on the collective strength of the people to diversify the rural economy and to develop commune- and brigade-run enterprises because our financial resources are quite limited.

In the First Production Brigade of Yueqi Commune, Wuxian County, Jiangsu Province, farmland averages less than 0.1 hectare per capita. The work of farm mechanization began in 1970. Since then the relative proportion between industry and agriculture has undergone a fundamental change as more and more of the labour force has been released from the fields. The number of workers engaged in agriculture has been dropping year after year, while the number of people going in for industrial and sideline production has increased rapidly. In 1978 each farm worker produced 4.15 tons of grain, compared with the corresponding figure of 2.115 tons in 1970. The annual output value of industry and sideline occupations shot up from 75,000 yuan to over 640,000 yuan. This brigade has set up task forces specialized in a variety of productive undertakings. The per capita labour productivity has reached 1356 yuan.

The Gaixian County, Liaoning Province farmland also averages less than 0.1 hectare per capita. In the past, the local authorities, worried about the county's large population and limited farmland, put one-sided stress on grain production. They threw in the bulk of the labour force, but the county remained poor despite slight increases in grain output, because the abundant natural resources were not exploited. Things began to change when later the county attached importance to diversifying the rural economy. With the level of mechanization steadily raised, 70% of the labour force was gradually released to develop a diversified economy. Only the remaining 30% was engaged in grain production. As a result, grain output in 1978 was 2.4 times that in 1975. The annual output value of industrial and sideline production, calculated on a per capita basis, amounted to 1,291 yuan. This was indeed a brilliant achievement both in production and income.

Heilongjiang Province in the northernmost part of China has done an especially good job in this respect. Experience of 37 brigades selected to experiment with farm mechanization shows that it will yield good economic results to use farm machinery in a concentrated way in the vast plains of Northeast China and turn them into commodity grain and soya bean producing bases.

In 1979 the total grain output of the 37 brigades reached 72,500 tons, a growth of 14% over 1978. Their total income was 30.92 million yuan, up 36% over 1978.

5.92 million yuan was set aside as the public accumulation fund, 75.3% more than the previous year.

38,000 tons of grain were delivered to the state, up 19% over 1978. The commodity rate reached 51%.

The cost of production per hectare averaged 219 yuan, 14.4% less than 1978 figure of the province.

Each able-bodied worker produced, on the average, 7.5 tons of grain, three times the figure for the whole province.

Farm mechanization has enabled the 37 brigades not only to increase their grain production. Increases in industrial and sideline production are even bigger. Income from this source amounted to 5.39 million yuan in 1979, a growth of 37.5% over the previous year.

These examples have proved the truth of two questions. First, the level of farm mechanization can only be raised step by step. The adoption of every batch of farm machines emancipates a fraction of the labour force for the task of expanding and diversifying the rural economy. And this helps to accelerate the accumulation of funds. The funds thus accumulated are used to buy additional machinery. To put it briefly, farm mechanization helps to provide more funds for the peasants. And with more funds available, the peasants buy more farm machinery. Second, if the peasants want to be

better-off, they must not go in for grain production alone. While ensuring a steady growth of grain output every year, they must develop a diversified economy and commune- and brigade-run industries including household sidelines. Farm mechanization is indispensable to the diversification of the rural economy and the development of commune- and brigade-run industries. Only when farm mechanization is achieved, can a great amount of labour force be released to expand production in depth and scope.

Farm mechanization and the diversification of economy are compared to blood brothers or sisters. Without farm mechanization there would be no surplus manpower necessary to develop a diversified economy or commune- and brigade-run enterprises, hence the inability of the countryside to become prosperous. Without a diversified economy and commune- and brigade-run industries, there would be no funds available for farm mechanization, nor would there be a way out for the surplus manpower.

An examination of the road China has traversed in farm mechanization shows that provided proper arrangements are made to diversify the production, the rural labour force can be fully employed even after farm mechanization is achieved. We cannot follow the road traversed by some industrialized countries of allowing rural people to swarm into cities which are already crowded enough. Our principle calls for developing a diversified economy and commune- and brigade-run enterprises to absorb the surplus manpower wherever there is, and for expanding small towns in the countryside. This way of doing things helps to increase wealth for the society at large and enables the peasants to get better-off quickly while laying the material basis for narrowing down the differences between worker and peasant and between city and countryside.

4. Do Everything for the Best Economic Results

In the light of China's reality, the following yardsticks may be used to measure the results of farm mechanization:

Whether the output, income and especially the proportion of marketable farm produce to the total output can be rapidly increased;

Whether the living standard of the peasants can be rapidly improved.

Here I would like to speak in particular about how to strive for the best economic results in developing the farm machinery industry regarding technical transformation, import of technology, quality improvement, economical use of energy, development of sciences, orientation of service, as well as improvement of farm machinery management and the speed of development.

Technical Transformation:

China began building her farm machinery industry in 1950's. Through 30 years' work she now has more than 1,900 manufacturing factories, 2,400 manufacturing and repairing plants at the county level and over 320,000 machines for metal-cutting, forging, casting and pressing. The capabilities she possesses to manufacture and repair are basically suited to the needs of farm mechanization. Since China is a vast country, it is necessary and paying to build, in most of the provinces, factories for assembling farm machinery. But the problem is that these factories are too scattered, that production is unnecessarily repetitious, that they use backward technology and poor equipment and that their level of management is low. What we are doing is to encourage the merging, through various forms, of different types of enterprises including state-owned and co-operative enterprises to facilitate their technical transformation for specialized production on the basis of coordination. In doing so we are breaking away from the rigidly structured system, that is, the division between different administrative areas, between

different government departments and between the ownership by the state and the ownership by the collective. At the same time we are giving our enterprises greater power of self-management. All this is done for the purpose of streamlined, specialized production to change the situation in which every factory, big or small, has to be complete in everything. This practice is what we call tapping the potential of the existing factories through technical renovation and transformation. The Changzhou Tractor Corporation in Jiangsu Province, specialized in the production of walking tractors, was one of the earliest joint enterprises ever set up in the farm machinery industry. As a result, the annual output of diesel engines has increased from 39,000 and more in 1978 to 55,000. And the annual output of Model Dongfeng-12 walking tractors has gone up from 16,000 in 1978 to 22,000. These two products have been awarded a gold medal separately by the state in appreciation of their good quality. The Changzhou Tractor Corporation serves as an example of how the setting up of joint enterprises brings quick returns, improves the quality of products with relatively small investment.

Import of Technology:

To advance China's farm machinery industry as quickly as possible and raise the level of its technology and management, it is advantageous to import requisite advanced technology under the principle of self-reliance. What we are introducing at present are the technologies which do not cost much, but bring quick results, high profits and absorb more manpower. And our stress is laid on individual technologies and the technology for the manufacture of critical and basic parts.

Improvement of Quality:

It is the most important task for farm machinery factories to ensure that their products meet the requirements for quality, cost, efficiency and service life. Effort in this respect is also the important measure to make their products competitive on both domestic and overseas markets. For some time in the past, quite a few factories, regardless of the interests of their customers, manufactured in a rough and slipshod way, causing their products to be overstocked and returned. Such factories would not have vitality. We are now striving to make the material durable and parts interchangeable, and to simplify the machine construction, as well as to guarantee to replace, return and repair faulty products. At the same time quality control is being effected in an all-round way. As a result, remarkable improvement has been made in product quality. Many factories have achieved initial success in producing what the market needs, ensuring timely delivery and increasing the variety of our small and medium-sized farm machines are well received by the peasants for their good quality and low prices. Some friends of the third world countries also think that the small and medium-sized tillage machines, equipment for drainage and irrigation and the machinery for the processing of farm and sideline produce suit their needs in developing agriculture.

Development of Sciences:

The process of agricultural modernization is one of using modern science, technology and industry to develop agriculture. China's backwardness in science and technology is the biggest obstacle holding back her farm mechanization. Questions of zoning agriculture and farm mechanization to regionalize farming and animal husbandry in line with local conditions, of adapting the use of farm machinery of agro-

onomic requirements, of gradually socializing and specializing agricultural production and the production of farm machinery and of constantly replacing old products with new ones through selection, renovation and creation to facilitate mass production and the attainment of good quality and low cost—all these are virtually concerned with bringing up a new generation of workers and peasants. And it is the most arduous task. China now has 40-odd research institutes of farm machinery under provincial authorities or higher, 3 institutes of plant design, 11 colleges and 140-odd secondary schools of farm machinery. In addition, every county sponsors training sessions each year to train managerial staff and tractor drivers. Nevertheless, these efforts still fall short of the needs of the developing farm mechanization. We are now straightening things out in this field of work.

Economical Use of Energy:

In China, farm machines consume only a small proportion of the energy consumed by the national economy. But they use more diesel oil than all other sectors, the quantity being 40% of the total consumed yearly in China. So it is an important task to economize on energy in farm mechanization. There are mainly four ways to tackle the problem: first, improving machine construction to reduce specific fuel consumption; second, carrying out technical transformation aimed at saving fuel; third, striving to ensure more efficient operation and management; fourth, diversifying energy resources. For instance, in the coal-producing areas the use of gas engines is stressed. In Inner Mongolia and coastal regions wind-powered machines are recommended for widespread use. In the areas of the South with plenty of rainfall, water turbines, water turbine-pump units and marsh gas are being popularized. In addition, efforts are being made to make use of solar energy. To sum up, we are following a

"seven-Chinese character" principle, namely, a principle of using fuel oil, electricity, coal, hydropower, wind, marsh gas and solar energy simultaneously.

Orientation of Service:

What I mean here is not merely a matter regarding timely delivery of spare parts, after-sales service and technical training for customers. What is more important is to correctly specify what farm mechanization should serve. In China farm mechanization must not serve the needs of the long-standing grain production only. Its service should cover the following six aspects:

- the achievement of high and stable grain yields;
- the development of cash crops such as cotton, oil bearing and sugar crops;
- the all-round development of agriculture, forestry, animal husbandry, sideline production and fishery;
- the capital construction on the farmland and transformation of low-yielding fields which account for 1/3 of China's farmland;
- the diversification of the economy, expansion of commune- and brigade-run enterprises and integration of industry, agriculture and commerce;
- the all-round development of the rural economy and improvement of the peasants' living standards.

Management of Farm Machinery:

Tens of thousands of farm machines have been shipped to the countryside. Whether they are well managed, properly used and fixed up so that they can work at full capacity constitutes an issue of vital importance concerning the success or failure of farm mechanization. At present, in addition to the state farms farm machinery stations have been set up in the communes and brigades. And every county has its own factories making

and repairing farm machinery. They play an important role in increasing the number of workable machines. Management and maintenance of farm machinery is something complicated because it is restricted by the economic and technical conditions, as well as by the ownership of farm machines in a given place. There is still a lot left to be desired in this regard. In some places as many as 90% of the tractors can work without overhaul, but for the whole country the average figure is only 75%. Therefore, we should make still greater efforts in this work.

Speed of Development:

Owing to our lack of experiences and out of the desire to put an end to the poverty and backwardness in the countryside quickly, for a fairly long time in the past, we made errors of fixing excessively high targets for farm mechanization and of their attainment at too fast a speed, under the slogan of basically mechanizing farming by 1980.

Practices have proved that this slogan was out of touch with the reality in China and was difficult to realize. The attainment of farm mechanization requires the joint efforts made by departments of agriculture, industry, transport, finance and education, etc. Figuratively speaking, it cannot "fight in isolation" nor go too far ahead. It depends on:

- how fast China will develop her industry and transportation;
- how fast the rural economy and commune- and brigade-run enterprises will develop;
- how soon a competent technical force will be brought up in the countryside;
- how much financial assistance in terms of credit loans the state will be able to provide;
- finally, how fast the farm machinery industry and science and technology in general will develop.

Farm mechanization must keep pace with the progress of the national economy, which does not mean that all sectors of the economy should progress at the same speed. Nor does it mean that all we have to do is to sit back waiting for farm mechanization.

Only when the above-mentioned problems are solved in a realistic and proper way, will it be possible to increase, through farm mechanization, the proportion of marketable produce to the total output and help the peasants improve their living standards rapidly.

In groping for the way of farm mechanization in China we have gained some successful experiences, and have also gone through some twists and turns. It is our sincere hope that the specialists from various countries will kindly give us their comments and suggestions.

Now that our friends have got some idea of the current situation and problems in the development of farm mechanization and the farm machinery industry in China, I believe that the prospects for co-operation between us in these fields will be broadened.

Considering that China, as a developing country, has a lot in common with the other developing countries, especially in taking agriculture as the foundation and in developing agriculture with the support of industry, the Chinese Government holds that co-operation on bilateral and multi-lateral basis in the following fields might be beneficial and of common interest:

- exchange of experiences in the development of the farm machinery industry, and mutual supply of technical literature;
- exchange of visits by specialists;
- sales of hand-operated farm tools, animal-drawn implements and farm machinery;
- dispatch of experts specialized in the above-mentioned products and conduct of technical training;

- transfer of product drawings and manufacturing techniques;
- undertaking to build, for the other party, assembly shops, assembly or production lines for the making of one or several types of farm machinery;
- design of farm machinery factories;
- joint design of the farm machinery needed by one or both sides.



