

# **Preston University**

## **Abstract of Graduation Thesis for the Degree of Doctor**

### **Studies on Development of Agricultural Mechanization in China**

**Name:** Shen Han

**Major:** Management of Business Administration

**Concentration:** Agricultural Mechanization

**Tutor:** Professor Shen Yue

**Affiliates:** Beijing Everbright Education Group-  
Guang Ming Education Development Co., Ltd

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## « Studies on Development of Agricultural Mechanization in China »

### ----Abstract----

Focusing on the current situation and existing problems of agricultural development in China, this paper expatiated on the necessity of advancing development of agricultural mechanization. The developmental course? current situation and characteristics of agricultural mechanization in China were summarized. The reflectional characteristics of different aspects such as the scale, speed and power of development were analyzed in course of development of agricultural mechanization. By means of analyzing characteristics of development of agricultural mechanization abroad, successful experiences were used for reference. Aiming at further causes, policies and suggestions on the development of agricultural mechanization in China were given.

Is it whether or not should China develop agricultural mechanization? This is the first question we should answer. Otherwise, it is no sense of giving a research on the development of agricultural mechanization in China. The situation of China is the population is large but the average plantation is little and the plantation is dealt in dispersedly. For this reason, a great majority of people think there is no condition to develop agricultural mechanization in China. Their opinion is the development of agricultural mechanization will result in a mass of labor force surplus in agriculture and chaos of our society. This point of view seems reasonable at first glance, but it can not stand up elaborating. The key defect is it does not treat the problems of agriculture in China dialectically and with a foresight of science? development? economy and rooting in people.

The essential problem of agricultural mechanization is the rural economy problem or the nation's economy problem in other words. Agricultural mechanization is a symbol of improvement in agriculture productivity. To improve and advance the productivity continuously is objective and inevitable for the development of human society, which is also an end less pursue of human being. Therefore, the problem is not whether or not should China develop agricultural mechanization but how and when should we develop it. In this paper, the author thinks the idea is passive and negative that the agricultural mechanization should be developed until all terms for agricultural development are mature. Considering the economy situation, the natural resource and the population conditions at present, we should construct developmental environment for agricultural mechanization actively and forwardly, change from passiveness to initiative and rebuild the external world by human being's most positive efforts. All these are scientific and developmental views.

Modern agricultural production method is the first embodiment of agricultural modernization. Consequently, agricultural mechanization is an inevitable and impassable seedtime in the course of agricultural modernization. How to develop agricultural mechanization basing on and adapting to the situation of China is what we should discuss first. Without agricultural mechanization, the behindhand production mode depending on manpower

and handwork will never be improved, the situation that too many people are depending on the farmland will never be changed, the economy increasing method will never be transited at all, and the agricultural modernization will never be accomplished. The problem of agricultural mechanization in China should be analyzed from economic development rules but not subjective assumption. By further analysis of several aspects such as agricultural development situation in China? developmental prospect and the function of agricultural mechanization in promoting agriculture production and so on, the necessity of development of agricultural mechanization were discussed in this paper. Firstly, the symbol of a society's progress is not what to produce but how to do it. The progress of agricultural production mode and implements will symbolize social progress. Secondly, it's the farmers' rights to request for the improvement of production implements to raise production efficiency, to reduce labor intensity and create more economic benefits. Thirdly, the reason why farmers are not unwilling to use farm machines is that they can't afford them. The problem should not be settled by farmers themselves, Chinese government should give policy supports. The fourth, the problem of agricultural mechanization is relating to both technology and economy, it is not a problem of pure technology or pure economy. The agricultural mechanization in China should be considered in both technology and economy field. In technology field, we should pay much attention to advancement; in economy field, we should lead and develop agricultural mechanization according to economic rules.

Consequently, through the discussion in the second chapter on problems such as the low plantation utilization rate in rural areas, the lacking competition ability of farm production and the behindhand production mode in agriculture etc., the problems we confronted about agricultural development in China were analyzed. The functions of agricultural mechanization in promoting agricultural production were discussed. With detailed analysis of the method that can increase agricultural production benefits, the conclusion was drawn that realization of agricultural mechanization was an effective way of solving the problem of low agricultural benefits in China.

Looking back to the development of agricultural mechanization in China, there are four periods approximately, that is the development period forced by the administration, the development period forced by the administration infirmly, the development period propelled by internal demand, the development period adapting to market economy led by the government.

After more than 50 years' development, the agricultural mechanization in China has made some progress; however, it greatly falls behind the current requests of agricultural modernization. As far as the suburbs of Beijing city is concerned, the city government has assured that agricultural modernization in Beijing will be realized by 2010, but the general agricultural mechanization level of Beijing suburbs is only 34.69 percentage in 2004. The development of agricultural modernization is heavily restricted by the lag of agricultural mechanization.

By looking back to the history, this paper summarized the developmental characteristics and existing problems of agricultural mechanization industry in China in chapter 3. Among all the characteristics and existing problems, the most outstanding point is the developmental track of agricultural mechanization is closely linked with the management level of the government. The

government policy has strong influence on this industry. Once the government thinks much of it, the industry will develop rapidly, or else it will grow slowly even to death. During the time of planned economy, the government may promote the development of agricultural mechanization because she is the whole show. Since the household contract responsibility system with remuneration linked to output putting into practice, the government has not been the whole show, so a short-term stagnation comes into being. Since the reform and opening policy putting into practice, farmers have become the true master of their lands, the government has changed her policy from being the whole show to supports and leading, so the development of agricultural mechanization grows faster again. Therefore, as to find further causes of influencing the development of agricultural mechanization in China and seek ways of solving these problems, many problems can not be settled only by agricultural machinery industry or agricultural branches. It is a part of national macro-economy and the governmental economy branches should give a research on it. In this paper, analysis of some aspects were carried through including developmental experiences used for reference of agricultural mechanization abroad, terms for agricultural mechanization development and analysis of relative factors and so on. Some suggestions were given.

On the basis of comparing with the development of agricultural mechanization abroad, reasons of the behindhand development of China's agricultural mechanization were further discussed in chapter 5. Two embodiment aspects of further causes of obstructing agricultural mechanization development in China were pointed out. The first is the factor of economic restriction, which is very difficult to solve only by agricultural machinery industry. This aspect involves rural population, income of farmers, plantation utilization rate, management methods, competition ability of farm production and production measures in agriculture. The reflection of this factor is the poor demand market of agricultural machinery products caused by low agricultural economy level, poor income of farmers and much rural surplus labor force. The other aspect is internal problems of the industry, which was generalized as a technology problem in this paper. The industry itself should be capable of solving the problem. The reflection of this factor is the very poor supply market of agricultural machinery products caused by the weakness of agricultural machinery technology, corporations' lack of market consciousness and self-creative ability due to depending much on the administration of government, lacking in market economy ideas, poor market competition ability, poor creative ability of new products, obsolete knowledge structure owned by technician team, corporations' dated processing equipments, behindhand production craft, poor production quality, shortage of large and excellent corporations' lead, distempered agricultural machinery extension system, weakness of commonweal power, inadequate technology popularization and training to users of agricultural machines etc. .

The trait of agricultural mechanization is a combination of technological and economical trait, which has been further proved by foreign experiences. As for the agricultural machinery, it is a form of "hardware" which needs the combination of high and new technology, precision manufacture technology and upper practical technology. On the contrary, the agricultural mechanization is a form of "software". How to rationally put agricultural machines into the

practice of agricultural production depends on how we follow the market and rural economic rules to develop agricultural mechanization. This special trait of agricultural mechanization decides the importance of governmental macro-control of the development of the industry. In foreign countries, the agricultural mechanization can be well developed so long as the technology trait successfully combine with the economy trait, no matter how the economy developed and whether the natural resources are rich or poor and the population is more or less.

Specialized and commercial planting and stockbreeding agriculture is emphasized abroad and the government treats equally to both fields. So the two fields run neck and neck and help with each other. But in China, there is a long-term history of paying much attention to planting agriculture while neglecting stockbreeding agriculture. The commercial consciousness of agricultural products is very poor.

Some foreign countries pay much attention to mutual adoption and promotion between agricultural machinery and agriculture. Agriculture always provides prerequisite conditions for agricultural machines, so they bring out the best in each other. But in China, we always fix our eyes on the interests of our own branch, disregarding the adoption between agricultural machinery and agriculture. The agriculture in China varies frequently: planting grain this year but trees next year, ploughing deeply this year but no ploughing next year. The result is the waste of abundant agricultural machines and repeating devotion of the limited financial funds

The quality of the agricultural machinery products is seriously controlled in foreign countries and the spare supply is adequate and in time, so the reliability is very good. Most countries in the world attach much importance to the scientific research and technology training of the agricultural mechanization. Farmer's knowledge and skills of using agricultural machines are improved through the popularization of governmental welfare extension organizations. In this way, the foundation of agricultural machinery extension and application is effectively established; the demand and supply market is well formed.

In foreign countries, there are a lot of economic policies effective to the agricultural mechanization such as loan with favorable terms, agricultural subventions, reduction and exemption of taxes, price protection, insurance policies, etc. Although there are differences between agricultural subventions and other favorable polices, the spirit of "support" is the same. Take North Korea for example, in such a poor country, there is still a great deal of money of subventions given to agricultural mechanization, equal to 10 billion RMB each year. The experience that we should and have the ability to learn is that the government should give subventions either to foodstuff provisions or to the tools and production materials by which foodstuff is produced, because food problem is primarily important according to economic rules and existent rules of human being. In chapter 4, the author introduced the foreign experiences in detail.

To sum up, focusing on the analysis of the relationship between agriculture and agricultural mechanization in China, this paper pointed out the necessity of speeding up the development of agricultural mechanization. In the year 2002, an investigation team organized by the author and named "Agricultural Mechanization Quantitative Investigation on Suburbs of Beijing" went to the suburbs of Beijing and interviewed almost 1100 farmers about the situation of agricultural

machines. The investigation data has provided true data to this paper. By means of market research, scientific questionnaire design and field survey, some problems of agricultural mechanization development were reflected from one side.

After analyzing these problems and then summarizing the further causes of obstructing the development of agricultural mechanization in China from the angle of economics, this paper proposed several suggestions on solving the problems existing in the development of China's agricultural mechanization. The suggestions will be expounded in detail in chapter 6. Generally, there are two aspects of measures for accelerating the development of agricultural mechanization of China. The first is governmental adjustment and control. The market demand for agricultural machinery products should be increased according to economic rules. The second is to aggrandize technology progress in agricultural machinery industry. Increasing the market supply of agricultural machinery products should depend on technology quality and technician quality.

No.1 The demand market for agricultural machinery products should be formed under the governmental adjustment and control.

The growth of demand market for agricultural machinery products should be guided by governmental policy. Firstly, the transfer of rural surplus labor force should speed up. The population growth speed should be controlled. The pressure for rural labor force to obtain employment should be alleviated. The structure of agricultural industry should be adjusted and the capacity for the second and third industry to accept labor force should be reinforced. The definition of farmer's status should be abolished and the system of registered permanent residence should be altered. Small towns and the city plan course should be developed rapidly. The development of agricultural mechanization should be promoted. Secondly, the management of large-scale plantation should be enlarged appropriately. The rural management system should be innovated. By means of taking measures such as the foundation of rural plantation transmission system and rural socialization service system etc., the possession right and management right for farmer's plantation might be separated properly. The proper management of large-scale plantation should be encouraged in many forms. Thereby the conditions will meet the needs of agricultural machines to work. Thirdly, the government should support farmers to purchase agricultural machines. Funds allowance, all kinds of loans and favorable policy should be focused on farmers. The function of agricultural machinery extension organizations at all levels should be taken full advantage of. The quality of agricultural machinery products should be demanded strictly. The technical training to farmers should be intensified. The problem of mechanical maintenance and fittings supplying should be settled for farmers. At this rate, farmers can afford and use agricultural machines freely and satisfactorily.

No.2 The technical progress of agricultural machinery industry should be intensified, the supply ability of agricultural machinery market should be strengthened.

The market competition is actually the competition for people with ability. Therefore, the technical progress of agricultural machinery industry should start with bringing up person with ability firstly and excellent human resources will come into being. Secondly the scientific research power should be strengthened; the technical application of new energy and new materials should be paid much attention to. Through using agricultural technology abroad for

reference and learning to understand the innovative idea “Standing on the shoulder of giants”, the whole level of agricultural machinery technology in China will improve greatly.

The variety and quality of agricultural machinery products should be enforced to meet the market demand. At present, the reliability of many Chinese products is very poor. Many machines still depend on importing abroad. The unsatisfactory situation should be improved. The management of fittings’ manufacture and distribution should be enhanced. The action of manufacturing products with poor quality should be seriously struck. The sense of quality should be raised. In this paper, suggestions were given that agricultural machinery manufacture corporations should develop market-oriented. To improve the level of agricultural machinery manufacture of China, we should follow the principle of “efficiency first, good left and bad lost”. No matter what style your corporation is, state-owned, personal-owned or foreign investment, every one must compete in the same market stage. In principle, the favorable policy established by the government only support demand market not supply market of agricultural machinery products. The corporation’s development depends on the efforts of their own. They can expand market by reliable product quality. The benefit will be their best strength. With this good cycle, these corporations will come to be the best in agricultural machinery industry. The structural adjustment of agricultural machinery products should be realized under the guide of market rules. Agricultural resources should be well protected and utilized. The manufacture ability and quality level of agricultural equipments should be promoted. By means of introducing new management ideas and establishing canonical and scientific management system, the modern corporation system will come into being. By means of making efforts, some large-scale corporation groups should be formed in this industry area. These groups should have abundant capital, wide production popularization area, strong core competition. They can participate in the international competition and stabilize all around. They can become the best corporation in guiding the whole agricultural machinery industry. Gradually, a co-prosperity industry structure form will come true. In this form, some corporations are large and strong, some are little and expert, large corporations will guide the little and the little will protect the large. In addition, the industry capital structure also needs further adjustment. State-owned capital should exit more. Personal-owned and foreign investment capital should extend. In this way, rational three-member capital structure will come into being step by step. The “tripartite confrontation of three feet” pattern of agricultural machinery industry will come true, which means state-owned capital or large state-owned joint-stock companies and groups will be the guide. Personal-owned corporations will be the main body, foreign investment corporations will be the complementarity. The international market of agricultural machinery products should be exploited. The price advantage of Chinese agricultural machinery products is obvious for export, at the same time; the disadvantage of quality is also the fact. Keeping the advantage and discarding the disadvantage, Chinese agricultural machinery products may possess one share in international agricultural market.

**Key words: Agricultural Mechanization, Ruraleconomic problems, other countries**

**experiences, Quantitative investigation, resolvent or Co untermeasures.**