

NAME : DESTRIANA MAYO ELSA

STUDY ID NUMBER : G041191043

AGRICULTURAL TOOLS AND MACHINERY A

MECHANIZATION IN A COUNTRY

A. Definition of Mechanization

Mechanization is a process of replacing and using various kinds of machines and various technical facilities intended to be a substitute for human and animal labor.

In the industrial world, mechanization of production is the use of machinery and heavy equipment to produce goods. In general, the mechanization process is carried out in many developing countries, this is intended to boost the ongoing development in the country, where all aspects related to the development will require a lot of energy in its implementation.

In its implementation, this mechanization will involve the use of various kinds of machines in whole or in part in the field, to replace human and animal labor.

In Indonesia itself, the mechanization process has been started for a long time and has become an important key in the development of our country towards a developed country. One of the mechanization that plays an important role in development in Indonesia is agricultural mechanization, which allows us to become an agricultural country.

B. Mechanization of Agriculture

So far, agricultural mechanization is often given the same meaning as tractorization. This erroneous understanding needs to be corrected because agricultural mechanization in the sense of Agricultural Engineering includes the application of technology and management of the use of various types of agricultural machinery tools, ranging from tillage, planting, water supply, fertilization, plant care, harvest collection to products that are ready to be marketed. From its purpose, agricultural mechanization applications are intended to handle work that would not be possible manually, improve quality and productivity, and provide added value to its users. The application of agricultural mechanization requires the support of various elements, such as professionals in the fields of management, engineering/mechanics, operators, availability of workshops, availability of fuel, lubricants, spare parts, and other infrastructure. Therefore, the accuracy of management technology and the availability of supporting elements are

requirements for agricultural mechanization to be developed and feel the benefits of the objectives of agricultural modernization.

Agricultural mechanization is a manifestation of the application of various principles of science and technology in agriculture carried out in the form of management, control, and processing in the agricultural sector itself. Mechanization in agriculture does not only refer to the use of tractors and various other motorized devices but it is also related to the overall tools used to assist and support the implementation of various activities in agriculture itself.

Why Need Mechanization ???

One of the strategic roles of mechanization in agricultural development includes; First, *the process is faster*. With mechanization, we can carry out tillage, harvesting, and post-harvest quickly. Especially now that we need an increase in the intensity of crops to pursue increased production; second, *more efficient, lower cost (cost production) than traditional or manual, both for tillage and for harvesting*; Third, suppress yield loss and increase added value, by using tools and machinery of agriculture thresher (thresher) which can effectively suppress/reduce yield loss; Fourth, *increase revenue*. Agricultural mechanization contributes to lower production costs, increases yields, and decreases yield shrinkage so that in turn it will increase farm income. The four strategic positions of mechanization demand the prerequisites of completeness and readiness of institutions and human resources as development actors.

Mechanization is expected to solve the problem of labor shortage needed in farming, both during on-farm, harvest, and post-harvest, reduce production costs, and reduce yield loss towards farm efficiency to increase farmers' income. Regarding the effectiveness and efficiency of mechanization, three things need to be considered, namely;

- 1) the accuracy of allocation of tools and machinery of agriculture according to land conditions (the right machine on the right land),
- 2) the density of tools and machinery of agriculture by the existing land area (the ratio of the amount of tools and machinery of agriculture to land area) and
- 3) Continuity of use and maintenance to achieve the productive life of the tool.

C. Purpose of Agricultural Mechanization

The objectives of agricultural mechanization are:

1. Manage and maximize production within the agricultural sector itself.
2. Achieving the targets that have been proclaimed in agriculture, concerns crop yields and yield control after harvest.

3. Maximizing the function of agricultural land, where there will be a lot of post-harvest soil management time that can be saved and then used as a productive planting period on agricultural land
4. Avoiding crop failure caused by the lack of labor owned by the agricultural sector, in this case, the use of modern agricultural equipment can help reduce the risk.

D. Development of Agricultural Mechanization in Indonesia

Although in limited quantities and types of equipment, agricultural machinery tools have long been used in Indonesia, especially in plantations. Meanwhile, what can be noted as the beginning of the development of the massive use of agricultural machinery tools are the activities carried out by PN Mekatani around the sixties? The failure that was later experienced by PN Mekatani, in addition to being caused by technical and management problems, environmental conditions at that time did not support the development of agricultural mechanization for food crops. The development or advancement of technology in agriculture is still slow. Sociologists are still concerned about the increase in unemployment due to mechanization because 70-80% of the population still depends on agriculture. From an economic aspect, the use of agricultural machinery tools is still considered too expensive.

To increase food production in areas that have not received irrigation services, the Ministry of Agriculture in the early PJP-I (around the 70s), has deployed water pumps accompanied by technical training on operation and management at the farmer level, in East Java, Central Java, West Java, Aceh, Jambi and South Sulawesi. Around 1985/86, several sugarcane mills (harvesters). This machine which is made in the country of manufacture (Germany) and several other countries is widely used because of its good performance, its use in sugarcane plantations is declared inefficient. The development of the application of mechanization at the farmer level does not mean that each farmer must have for himself the necessary equipment, to operate and manage it. The application of agricultural mechanization requires investment, requires human resources who are knowledgeable in engineering/mechanics, operation and maintenance management, workshop support, spare parts, and so on. The development of the application of agricultural mechanization can be done by assisting in completing the work of various types of agricultural activities that are needed and cannot be done by farmers using agricultural machinery, due to lack of labor and high working wages. So that the application of agricultural mechanization for farmers can be felt without increasing the burden of technical, management, and financing problems.

E. Program and Performance of Agricultural Mechanization Utilization in Indonesia

Agricultural mechanization aims to improve land and labor efficiency, increase arable land area, save energy and resources (seeds, fertilizers, and water), increase effectiveness, productivity, and quality of agricultural products, reduce farmers' workload, maintain environmental sustainability and sustainable agricultural production, and increase farmers' income and welfare (Salokhe and Ramalingam 1998). The beginning of the development of agricultural mechanization in Indonesia was marked by the use of Dutch agricultural tools and machinery in Sekon. These Dutch agricultural tools and machinery were then transferred to Java and used as an introduction to agricultural mechanization for farmers. In the 1950s, tractor poolpools began to be established in various regions in Indonesia. With the help of tractor pools and agricultural equipment, land clearing was carried out in various regions.

At the beginning of the development of agricultural mechanization, Indonesia directly adopted technology from developed countries, even though the conditions of our agricultural land and agricultural business systems were much different. As a result, various problems arise, such as the boundaries of rice fields being lost and the waterproof bottom layer being damaged. Hopes for increased productivity and well-being were also not achieved. This technology transfer process is often referred to as material transfer. The development of agricultural mechanization, especially rice, in Indonesia, is marked by failures and successes. This development is inseparable from the development of rice farming and government intervention and participation in efforts to accelerate technology adoption.

From year to year, the ability to transfer technology in the field of agricultural tools and machinery is increasing. If this ability is measured by the number of producers and industries of agricultural equipment and machinery, this can be used as a reference in the capacity of technology transfer in producing agricultural mechanization technology.