

8. PRESENT SITUATION AND FUTURE PROBLEMS ON FARM MECHANIZATION IN VIETNAM

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Technical problems on farm mechanization

(1) Technical problems concerning the introduction of farm machinery with special reference to soil and cultivation conditions

In this report we will refer principally to the rice growing situation in Vietnam, the most important crop that the 1968–1969 harvest occupied 85% of the arable land (2.4 to 2.8 million hectares)—including 2% of the upland rice. Rice is grown on alluvial soil and specially on flooded soil which are mostly of clay, sand, or sand-clay texture.

With these soil characteristics, the farm machinery used for rice production in Vietnam require certain specifically technical features:

1) Machines for soil preparation:

This operation includes plowing, harrowing, and pulverizing. Tractor must be equipped with grip-increase components such as large metal wheel with lugs to reduce slip. Rubber tires prove helpful in the dry season but it is recommended to use hydro-flated tires with special valve to fill the tube with 75% of fluid (water preferred).

In the rainy season, grip-increased tractors with rotary tillers or mud tiller prove more efficient than with disk plows or disk harrows.

In a word, the problem is to make good use of tractor power by decreasing the influence of slip and high resistance of clay. Another problem is that the structure of soil is affected by flood and can only be improved with better water control (irrigation and drainage) facilities the construction of which takes time and requests an important fund. So far, only 18% of rice-growing area has actually benefited by artificial irrigation systems.

As for other farm machines used in weeding, crop protection, etc., small and simple units are better if properly adapted to small land-owners' needs. It is suggested that the new rotary weeders should be applied in Vietnam because the weeding operation, if carefully done by hand, will take about 120 hours per hectare. But, most of the time weeding has not been done, which makes the yield decrease.

Chemical herbicide is not yet familiar to Vietnamese farmers and, still, would render little effect due to the badly leveled rice-fields and to its high imported price. Hand-push rotary weeders have been propagated by the Agricultural Machinery Directorate in recent years and been highly appreciated.

2) Harvesting:

Except in some central regions, in Vietnam the harvest takes place on wet field. Therefore, power harvesters or harvester-binders are not completely adapted, neither are small harvesters, on the muddy and slippery fields.

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Moreover, the inclination of paddy in some local rice varieties prevents proper operation of the harvesters. But we could overcome this difficulty by using a lower-cutting blade, nevertheless this modification does not succeed in those fields with un-leveled surface.

3) Thresher :

Light weight units are recommended because of their easy transportation on narrow roads, village lanes and in the field. Regarding the upland rice, we have some doubt of the profit of farm mechanization because of the sloppy terrain and the low yield—0.8 T–1.2 T per hectare. The suggested measure in these areas is to grow perennial trees after terracing and to transfer rice and other grain cultivation to area where water is available, riverside or streamside for instance, in order to get better yield.

(2) Present situation and future aspects of research activities: the development improvement and utilization of farm machinery

In Vietnam the Agricultural Machinery Directorate (AMD) of Ministry of Land Reform and Fishery Development is actually the only agency to carry out a research activity on farm mechanization. This humble unit with a limited number of specialists began its research in late 1967.

The job of the AMD has been to gather all facts concerning various tilling facilities used in various crop and to record the necessary time needed for each operation with regard to traditional implements and pure man-power. These records will then be analyzed to find out key points for a step-by-step mechanization program which fits the overall economic situation, farmers' knowledge, and the industrial development of the country. This work is still on the way.

Since 1967, with an increasing quantity of farm machinery being imported, ADM has begun testing with some of the modern machines donated by foreign aid programs or by local importers, often upon the AMD Director's request. The results acquired from these tests have been recommended to the concerned importers and farmers.

Along with these testings, a research division was created within the AMD. This young units, which is in charge of testing and adaptation of all imported machines and implements, has completed, after long study, a modified paddy weeder, designed an efficient grain dryer (for rice and sorghum in particular), a manual transplanter and many other remarkable researches.

The AMD has also experimented some large-capacity and modern equipments in land-leveling since 1968. This project is considered successful because some privates have undertaken the work for profit. Land-leveling was unknown of in the past by Vietnamese farmers. Furthermore, the AMD has been adapting a power seeder-fertilizer on rice, corn and sorghum growing and now it is operating in the Mekong Delta. A reaper (or power scythe), after a series of testing, showed efficient in brush-clearing, grass-moving, and in particular, in IR. 8 rice—harvesting. A lightweight thresher, man or engine-powered, was also developed as simple as possible in order that it could be manufactured in small shops in the country where main materials as wood are amply available.

However, it is our regret that, with limited resources of man-power and equipments, the AMD cannot extend these above-mentioned encouraging operation. It is expected that, in the near future, 1971 perhaps, a new regulation would come into effect to bind all importers and manufacturers to reserve 1% of the machine value to contribute to a Testing and Adaption Fund. This fund will be used by the AMD to develop research and testing activities of farm machines in various geographical areas

of the country. However bulky a load to the AMD, it is a work of utmost importance to boost the agricultural mechanization in Vietnam.

Evaluation and improvement of Japanese farm machinery

After testing some Japanese-made agricultural machines, we could offer the following recommendations:

1) Power thresher and winnower must be set under consideration between the paddy in Vietnam and that in Japan. Contrary to Japan, in Vietnam the paddy is threshed when completely dried, and therefore, could be stuck in the threshing drums. It is suggested that drum RPM be reduced to decrease lost of rice.

2) Harvester: the cutting device should be made adjustable to meet various spacing of the row.

3) Rotary tiller: the blade wears quickly and sometimes is broken when operating on hard soil.

4) Rice huller and polisher: small type of huller and polisher is now greatly appreciated by farmers. But a better and more enduring compound should be used instead of the rubber roll.

Socio-economic problems related to farm mechanization

- 1) Change of number of agricultural labor-force and number of agricultural worker:

	1960	1968/1969
Farmer :	8.400.000	6.400.000
Population :	14.000.000	16.000.000
Ratio :	60%	40%

- 2) Number of farms: unique data available is that of 1964:

Number :	1.893.000
Average area :	1.57 ha per farm.

- 3) Number of farm machinery:

	Quantity	Horse-power
1960	5.063	33.500
1970	36.004	401.389

Not including some 400,000 small gasoline engines—from 3 to 6 ps—imported from U.S.A. which are mostly used for sampans propelling and sometimes for water pumping, threshing, etc.

Policy for farm mechanization

The general policy of the Republic of Vietnam aims at helping the farmers with adequate facilities to increase yield of agricultural products. In the field of agricultural mechanization, the following points are to be stated:

1) Testing, adaption, improvement, and propagation of simple and efficient farm implements with a view of reducing man-power.

2) Testing and propagation of various modern machines to increase yield.

3) Encouragement and help in manufacturing agricultural equipments on a small scale to make good use of all actual manufacturing shops in the country. Along with this long-term program, the Government of the Republic of Vietnam must satisfy the urgent need for farm machinery due to shortage of man-power and animal in the war-time. In response to this need, since 1968, an important amount of equipments has

been imported: tractors, rice hullers, rice polishers, threshers, pumps, insecticide, sprayers, etc. Recently, Vietnam Government has decided to change its policy from pure import to assembly and manufacturing industry. This change is evidently reasonable regarding the large requirement of mechanical power for agriculture and agricultural industry in the future.

In brief, the Republic of Vietnam policy in agricultural mechanization comprises the following points:

- 1) Encourage and develop the local production of improved agricultural equipments to increase yield and reduce hardship for farmers.
- 2) Import modern agricultural machines along with boosting assembly and manufacturing industry in the country.