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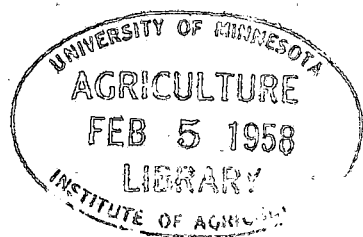
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CAPITAL FORMATION AND CAPITAL USE IN JAPANESE  
AGRICULTURE, WITH SPECIAL REFERENCE TO THE  
EFFECT OF THE LAND REFORM

*Introduction.* The present paper is mainly concerned with post-war conditions though due attention is given to the pre-war period so far as the data, though incomplete and few, are available. Special reference is made to the Land Reform, which has brought about fundamental changes in the structure of capital formation in the post-war agriculture of Japan.

The immediate post-war period was characterized by the upheaval of the Land Reform which together with the disintegration of *Zaibatsu* (the Plutocracy) and the rise of the trade unions was regarded as a key measure for democratizing the economic system. The object, as declared in the first clause of the Owner-Operator Establishment (Special Arrangement) Act, was to establish owner-operators widely in a short period of time in order to secure their position, to promote agricultural productivity and to democratize the rural community.

The Land Reform eventually had far-reaching effects on the landowner-tenant relationship in agriculture. Tenanted farm land was reduced from 46 per cent. of the total arable acreage in 1941 to less than 10 per cent. in 1951. Moreover, the rents of agricultural land that customarily had been paid in kind and had absorbed nearly one-half of the gross products of tenanted farms were changed into legally controlled money rents.

These statutory arrangements not only succeeded in establishing owner-operators very extensively, but also resulted in drastic cuts in tenants' rents (accompanied incidentally by rapid inflation in the immediate post-war years). Those rents, which constituted about 25 per cent. of all agricultural incomes before the Reform, have been reduced to only 0.1 per cent. of them so that almost all the proceeds of agriculture are now at the disposal of the occupiers of the farms. This revolutionary change is the most characteristic feature of the Land Reform. It is important, however, to scrutinize the manner in which

<sup>1</sup> The writers are indebted to Professor Kazushi Ohkawa of Hitotsubashi University for suggestions and advice. They are grateful also for the encouragement of Professor Seiichi Tobata of the University of Tokyo.

the newly established farmers spend their increased incomes because, if the increased incomes were only to raise the consumption level of the farm households without increasing the savings for investment in agricultural capital goods, the beneficial effect of the Land Reform on the farming industry would be in doubt.

The Land Reform occasioned some other changes. The disappearance of landlords meant the disappearance at the same time of such economic functions as they performed. Some landlords and larger farmers acted, at least at one stage or another before the war, as entrepreneurs in the sense that they undertook land improvements and reclamations which the small farmers had failed to do. The problem now is to discover who has taken over these entrepreneurial functions and who is to be responsible for the development of farming.

In this connexion the positive roles played by the state in fostering the industry ever since the beginning of the century cannot be disregarded. Among the more important activities of the state in supporting agriculture have been government-sponsored plant breeding through the National Agricultural Experiment Stations, the provision of subsidies and grants for farmers in many ways and the financing of hypothec banks which have been the main suppliers of loans for land improvements. Now that even enterprising landlords have disappeared, the part played by the state in developing agricultural productivity has increased and become a notable feature of capital formation in the post-war period, as will be mentioned later.

*Changes in the pattern of the farmer's savings and consumption.* The Land Reform has brought some changes in the pattern of farmers' savings and consumption. These are illustrated in Table 1 which gives figures of disposable income, consumption and savings at 1934-6 prices per head of farm household in the pre-war (average of 1934-6) and post-war (average of 1951, 1952 and 1954) periods.

The term savings as used here means the residue after consumption is deducted from disposable income. Savings in this sense do not necessarily coincide with the concept generally used in national-income accounting in which saving is always equal to investment. Further, the term as used here cannot cover other kinds of savings, such as land improvement by the utilization of family labour, &c., which constitute direct capital formation by a farmer.

In comparing savings and consumption of farm households due attention should be paid to differences of farm size, as this affects savings and consumption for two reasons. First, direct capital formation,

which is partly included in and partly excluded from savings as defined here, must have some positive correlation with farm size. Secondly, farm size affects savings in the sense that a farmer saves not only for his household but also for his farming business. Attempts have been made, therefore, to equalize the size class of the farms to be compared. There are two ways of doing this. One is to compare the pre-war average of the surveyed farms, the average being 1.3 ha., with

TABLE 1. *Disposable income, consumption and savings per head of farm household*

(Unit: Yen, at 1934-6 constant prices)<sup>1</sup>

	Pre-war (average of 1934-6) <sup>2</sup>			Post-war (average of 1951, 1952 and 1954) <sup>3</sup>
	Owner- operator	Tenant (A)	Tenant (B)	
	%	%	%	%
Disposable income (Yd) .	144 (100.0)	104 (100.0)	140 (100.0)	151 (100.0)
Consumption (C) . . .	118 (81.9)	93 (89.4)	93 (66.4)	139 (92.1)
Savings (S) . . . . .	26 (18.1)	11 (10.6)	47 (33.6)	12 (7.9)

Source: The Farm Household Economy Survey.<sup>4</sup>

the post-war average of the size class of 1-1.5 ha. Another is to compare the post-war average of the surveyed farms, the average size being 1 hectare, with the pre-war average of the corresponding size class. The figures in Table 1 are compared according to the former method, but it has been confirmed that almost the same results are achieved by either method.<sup>5</sup>

As regards the pre-war tenant, two sets of figures are given. The column 'Tenant (A)' shows the position of a tenant after paying rent.

<sup>1</sup> Prices of commodities for living paid by a farm household.

<sup>2</sup> 1934-6 are selected as representative of the pre-war years as they were fairly normal years between the depression and the war.

<sup>3</sup> 1953 is omitted as it was a year of poor harvest.

<sup>4</sup> The Farm Household Economy Survey has been conducted by the Ministry of Agriculture since 1921, though the method of the Survey has been revised four times: in 1924, 1931, 1942 and 1949. In the present paper the 1931-41 and the 1949 onward series are taken to represent the pre-war and post-war figures respectively. In the 1931-41 series about 300 farms were selected purposely, their average size being 1.3 ha., which is larger than the national average farm size of about 1 ha. The present series (since 1949) adopting a stratified random-sampling method provides average figures of about 5,600 surveyed farms. These represent the national average fairly satisfactorily, though the average size of the surveyed farms at 1 ha. is still a little larger than the post-war national average. These differences of method have to be borne in mind in comparing the post-war with the pre-war figures.

<sup>5</sup> In these discussions Hokkaido District, where the farm size is exceptionally large, is excluded.

If, on the other hand, rent is regarded as a tenant's forced savings and at the same time as part of his potential disposable income from which savings could be made, the position is as shown in the column 'Tenant (B)'.

The figures may be compared in several ways. Take first the pre-war situation. In the assumed case of tenant (B) in the pre-war period, the rate of savings—the proportion of savings in the disposable income ( $S/Y_d$ )—was as high as 33.6 per cent. If this be compared with the corresponding figure of the pre-war owner-operator, i.e. 18.1 per cent., it is evident how high a proportion of the production of the pre-war tenant was forcibly transferred to the landowner in the form of rent. Rent thus paid did not, of course, constitute savings for the tenant as funds for his self-investment, nor necessarily even for the landowner, being only his maximum potential savings. The actual rate of savings of the pre-war tenant—the proportion of savings in the disposable income after paying rent—was, as is shown in column 'Tenant A', 10.6 per cent., less than that of the owner-operator and of course far less than that of the tenant (B).

How, then, were these conditions changed by the Land Reform? Generally speaking, Japanese agriculture since the Land Reform has come to be carried out on a basis of operating ownership to the extent that the farmer on average has become the owner of about 90 per cent. of his farm land and the rent charges have been reduced to a negligible amount. To ascertain the difference between the pre-Reform and post-Reform conditions, therefore, it would be necessary to compare the post-war farmer first with the pre-war owner-operator, and secondly, with the pre-war tenant.

The disposable income of a farmer in the post-war period increased noticeably compared with that of a pre-war tenant and even of an owner-operator, owing partly to increased off-farm income but mainly to the Land Reform. But the savings rate of the post-war farmer compared with that of the pre-war owner-operator decreased by about 50 per cent., from 18.1 per cent. to 7.9 per cent., despite a 5 per cent. increase, from 144 yen to 151 yen, in his disposable income. This was due to a remarkable increase, from 81.9 per cent. to 92.1 per cent., in the average propensity to consume. As an average propensity to consume ( $C/Y_d$ ) is, in the usual case, a decreasing function of the disposable income, the average propensity to consume in the post-war period cannot reasonably be higher than that in the pre-war, unless a change in the pattern of consumption can be assumed. It may be

safely assumed, therefore, as is evident in Figure 1, that the consumption function of farmers shifted upwards in the post-war period.

Such a shift-over of the consumption function may be explained by several factors. First, it may be attributed to the so-called 'demonstration effect'. The extensive repatriation and discharge of farmers and their sons from military service and the munition factories, the

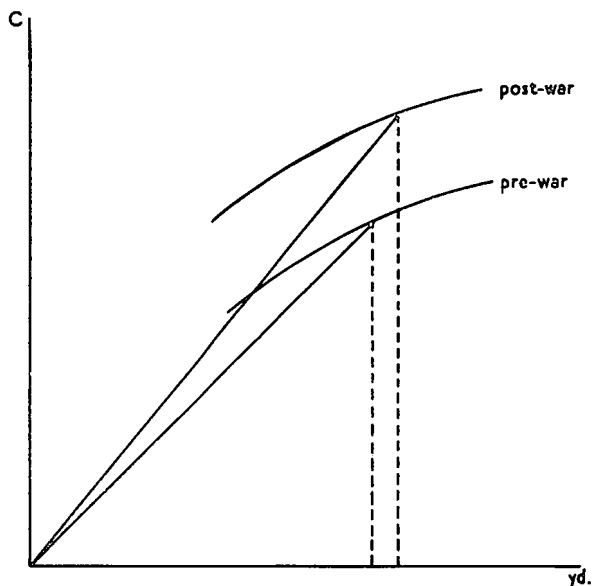


FIG. 1. Relation between disposable income and consumption.

prevalence of part-time farm families, the development of transportation and mass communication and the propaganda of democracy and individualism may have been conducive to rapid urbanization of a farmer's way of living. The farmer's sense of emancipation owing to the decline of the landowning class may have been another cause of his higher level of consumption. In addition the fact that incomes were more evenly distributed among the rural classes, compared with conditions before the Land Reform, may have had the effect of lowering the savings rate, which may be a counterpart of raising the consumption level of farm households.

*Some features of capital formation in agriculture in the pre-war period.* It may be useful to describe some features of capital formation in pre-war Japanese agriculture to make the post-war situations intelligible. As mentioned above, landowners of the pre-war period used to exact high rents, but it was those high rents that induced capital to

flow into agriculture. Capital can be introduced on a commercial basis only if its marginal product is higher than the current rate of interest. Even so, however, it was possible for capital to flow into the hands of larger landowners regardless of its actual efficiency whenever high rents and the corresponding highly capitalized value of agricultural land could be a basis for payment of the interest and for repayment of the capital. It was chiefly on this condition that the *Nippon Kangyo Ginko* (the Hypothec Bank of Japan) and the *Noko Ginko* (the Prefectural Agricultural and Industrial Banks) could perform their functions as creditors to the landowners.<sup>1</sup> The hypothec banks supplied loans to the Land Improvement Associations without security, the funds having been mainly financed by the Exchequer at low interest rates from the postal deposit. These bank loans and high rents functioned, not necessarily to the full extent, as funds for capital formation, especially for land improvement and reclamation, in pre-war agriculture. Such were the positive roles played by landlords in the farming industry. It is recorded that by 1935 some 1,130,000 ha. of arable land, constituting nearly one-third of the total paddy-field acreage, were improved mainly on the initiative of landlords and the larger farmers. It was estimated in 1931 that of the fund of the Land Improvement Associations the members' own capital constituted 37 per cent., borrowed capital 56 per cent. and government subsidies 7 per cent. The funds borrowed for these land improvements were mainly provided by the hypothec banks. Fostering the agricultural co-operatives, which provided short-term loans for farm management, was another contribution of the pre-war landlords to the farming industry, though it is not easy to estimate its extent.

However, the landlords' interest in agriculture gradually declined as capital sunk in land improvement became less and less productive. There was also a tendency even in the pre-war period for the hypothec banks to divert their interests from agriculture to manufacturing industry and commerce. On the other hand, government subsidies and grants for agriculture increased after the depression of the 1930's, though the intervention of the state in land improvement and reclamation was not then so comprehensive and direct as it has become in post-war years.

*Capital formation by the farmer after the Land Reform.* The Land Reform effected structural changes in the capital formation in

<sup>1</sup> The forty-six *Noko Ginko* were gradually absorbed into the *Nippon Kangyo Ginko* by the end of World War II.



agriculture. By statutory regulation the larger landowners who once played positive roles in improving and reclaiming land disappeared from the scene and a great number of owner-operators were established. After the abolition of high rents and under the legal control of the land market, rents have no longer provided an incentive for capital to flow into agriculture. Accordingly the hypothec bank, which was a main supplier of loans for agricultural investment, has now become an ordinary commercial bank. On the other hand, the farmer with his increased disposable income can save more easily for self-investment in capital goods for farming. Table 2 shows the total numbers of the main farm machines kept on all farms in various years. As may be seen, mechanization has proceeded steadily since the 1930's, but the progress since the Land Reform of 1946-8 has been remarkable. During the six years from 1947 to 1953 the numbers of electric motors, petrol engines and power threshers were nearly trebled.

TABLE 2. *Numbers of farm machinery*  
(thousands)

<i>Year</i>	<i>Electric motors</i>	<i>Petrol engines</i>	<i>Power threshers</i>	<i>Power hullers</i>	<i>Power sprayers</i>	<i>Power cultivators</i>
1935	47	96	92	104	1	..
1945	152	262	352	177	?	?
1947	287	229	444	199	7	8
1949	538	345	764	348	11	10
1951	620	383	972	?	20	18
1953	810	642	1,269	540	43	35

*Source:* Statistics of the Ministry of Agriculture.

The number of farm animals, as shown in Table 3, fell in the immediate post-war years owing to the shortage of feedingstuffs, but by 1949 they had almost regained their former levels. Since then they

TABLE 3. *Number of farm animals*  
(thousands)

<i>Year</i>	<i>Horses</i>	<i>Beef and draft cattle</i>	<i>Dairy cattle</i>
1935	1,448	1,684	165
1945	1,121	2,079	239
1947	1,054	1,829	159
1949	1,072	2,092	202
1951	1,062	2,234	226
1953	1,090	2,503	323

*Source:* Statistics of the Ministry of Agriculture.

have been increasing, though rather slowly. The rate of increase in the number of dairy cattle since 1947 is noticeable.

Table 4 provides a further illustration of the increases in gross capital. It shows the values of the stocks of farm machinery and live-stock on an average of all the surveyed farms valued at constant prices. The stocks of machinery and livestock per farm have been steadily increasing since 1949.

TABLE 4. *Value of machinery and livestock per farm. Stocks at the beginning of the years (1949 prices)*<sup>1</sup>

Year	Machinery <sup>2</sup>	Livestock <sup>3</sup>
	Yen	Yen
1949	20,747	35,261
1950	24,596	38,729
1951	21,427	37,896
1952	22,593	39,814
1953	24,875	52,553
1954	28,006	52,804

Source: The Farm Household Economy Survey.

In 1955 there were on average 34 electric motors or petrol engines, 33 power threshers, 11 power hullers and 64 horses or cattle per 100 farmers. These figures cannot be underestimated when it is recalled that the average size of a farm in that year was not more than 1 ha. Thus, it can be admitted safely that capital formation by the farmers has made notable progress since the war and that one of the expected effects of the Land Reform has been realized, though the relatively favourable prices for agricultural products have undoubtedly played a part.

These are the facts of gross capital formation. What can be said of net capital formation, the net increase in farm assets? Here again the Farm Household Economy Survey gives a clue, though satisfactory figures are not easily found as there are difficult problems of valuation to be overcome.

Even though there has been a marked increase in capital equipment on farms since the Land Reform, it cannot be disguised that the size of a farm sets a limit to its capital formation. Such limitation was already apparent in pre-war days and it cannot be overcome even by the Land Reform unless it provides opportunities for enlarging the

<sup>1</sup> Average of all surveyed farms.

<sup>2</sup> Includes farm machinery and implements that need depreciation.

<sup>3</sup> Includes all farm animals.

farms. In fact, the Land Reform deprived the farmer of almost every chance of enlarging his holding. It actually set strict upper limits to farm size and prohibited free marketing of farm land. Moreover, there is a growing tendency for farms to become smaller owing to the increase in the farm population and the decrease in the arable acreage after the war. This is made clear in Table 5.

TABLE 5. *Changes in the number of farms belonging to each size group*

(Unit of farm size: cho  $\div$  hectare. Unit of number of farms: 10,000. Unit of total arable acreage: 10,000 cho)

<i>Farm size group</i> <i>Year</i>	<i>Below</i> 0.5	0.5-1.0	1.0-2.0	<i>Above</i> 2.0	<i>Total</i> <i>number of</i> <i>farms</i>	<i>Total</i> <i>arable</i> <i>acreage</i>
	%	%	%	%	%	%
1941	183 (100)	165 (100)	147 (100)	55 (100)	550 (100)	586 (100)
1950	252 (138)	197 (119)	134 (91)	35 (64)	618 (112)	509 (87)

Source: Statistics of the Ministry of Agriculture.

It may be seen by turning back to Table 2 that the farm machines which have shown remarkable increases are threshers, hullers and small motors or engines to work them. These are the machines for processing farm products after harvest. There has not been much progress in spite of the Land Reform in machinery and implements for cultivating the soil. Their use is restricted by the small size of the farms. The introduction of a small power cultivator may be a new move in the development of farm machinery but, even so, it must not be supposed that any revolution has been taking place since the Land Reform in the fundamental pattern of the agricultural techniques. Much the same applies in the case of farm animals. It may be conjectured from Table 3 that the density of draught animals had almost reached the point of saturation before the war. The recent increases in the numbers of beef and draught cattle is largely counterbalanced by a decrease in the number of horses.

*Characteristic features of capital use in farming.* As capital formation is limited by farm size, so too is capital use. Table 6 shows some characteristic features of the composition of farming costs. A comparison of the post-war figures with those of the pre-war period gives some idea of the extent to which changes have been brought about by the Land Reform. There are a few points to be noted.

First, rent charges which constituted more than half of the pre-war tenant's costs were reduced after the Land Reform to less than 1 per

cent. on the average of all farms. Cost items which are directly concerned with the production process were correspondingly increased. It is particularly evident that the proportions spent on machinery and implements and on farm animals and plants are noticeably higher in the post-war than in the pre-war period. These must correspond to

TABLE 6. *Percentage composition of farming costs*

Year		Total	Fertilizers	Insecticides and pesticides	Feeding stuffs	Machinery and implements	Animals	Plants	Rents	Miscellaneous*
1934-6 average	Owner-operator	100	27.5	0.5	12.2	5.4	7.5	2.6	5.4	38.9
	Tenant	100	20.0	0.5	5.6	3.3	2.6	1.1	53.9	13.0
1953-5 average		100	25.8	2.8	12.3	14.1	10.5	4.3	0.7	29.5

Source: The Farm Household Economy Survey.

\* Includes wages for hired labour, materials, light and heat, depreciation of buildings, &c.

the farmers' capital formation after the Land Reform. In this connexion, however, the manner in which capital goods are utilized on the farm may be noticed. Table 7 shows the average annual hours of use of animal and mechanical power per farm in the Survey.

TABLE 7. *Hours of use of animal and mechanical power per farm in the year 1954\**

Animal power		Mechanical power	
Self-supplied	hired	Self-supplied	hired
134 hours	12 hours	58 hours	12 hours

Source: The Farm Household Economy Survey.

\* Averages of all surveyed farms.

The average farm used animal power for 146 hours and mechanical power for only 70 hours annually. Furthermore, it may be instructive to note for which operations these powers were used. Animal power was used mainly for ploughing and especially for preparing paddy fields for rice-transplanting in early summer. Mechanical power was used mostly for threshing and hulling rice in the autumn. On the whole, the use of power was concentrated upon a few specific farming operations which constituted peak loads of labour. It may

not be wrong to assume, therefore, that farmers need these motive powers just to get over the peaks each of which lasts at the longest for definite periods of twenty or thirty days a year. It follows that draught animals and power machines are kept idle for a greater part of the year, and it is not surprising that Japanese farmers are often criticized for the under-utilization of their equipment. It is understandable none the less that farmers find it very useful to keep draught animals and machines for coping with the seasonal variation of labour requirements. There is also the fact that farmers often value their machinery and livestock not only as capital, but as property, and there is no way of measuring the difference.

Turning again to Table 6 it may be noticed that there have been no fundamental differences in technique between pre-war and post-war agriculture. Improvements in productivity have been based upon land-saving techniques such as better seeds, more intensive use of fertilizers, &c. A farmer's expenditure on fertilizers amounts to about a quarter of his farming costs. Moreover, as may be seen in Table 8, Japanese farmers are using more chemical fertilizers than they did before the war, even allowing for the substitution of inorganic for organic fertilizers.

TABLE 8. *Quantities of fertilizers used by farmers in Japan*  
(Thousand tons)

Year	Ammonium sulphate	Calcium cyanamide	Super-phosphate	Potassium chloride	Potassium sulphate	Soya bean cake	Rape seed cake
1934	650	169	1,005	46	49	978	105
1954	1,576	462	1,253	485	178	...	...

Source: Statistics of the Ministry of Agriculture.

The same line of development can be seen in the use of insecticides and pesticides. Not only has expenditure on these been increasing, but newer and more efficient kinds of chemicals are coming into use.

These fertilizers and chemicals, infinitely divisible and applicable irrespective of farm size, must be the principal means of promoting the productivity of a small farm. These characteristic features of Japanese farming techniques since before the war are persisting even after the Land Reform.

*The role of the state in capital formation in agriculture.* There are agencies other than the farmers themselves which play their parts in capital formation in post-war agriculture. Such, for example, are the agricultural credit co-operatives, the central organization of which is

*Sangyokumiai Chuo Kinko* (now called *Norin Chuo Kinko*, or the Central Bank for Agriculture and Forestry) which was established in 1923.

But the most important agency is the state. As early as in the 1930's the state was already functioning as a promoter of land improvement and reclamation. But it was not until the Land Reform was accomplished that the state came to play more positive roles in capital formation in agriculture. The necessity for this intervention can be explained first by the disappearance of the larger landlords who once took the responsibility for improving and reclaiming land, secondly, by the reduced flow of capital into agriculture because of the limited opportunities for mortgaging land, and thirdly by the national policy towards self-sufficiency in food to assist the balance of payments. Table 9 shows the increased responsibility of the state in post-war years in land improvement, reclamation and the prevention of disaster. The annual gross investment by the state on agriculture is estimated, on the average of the years 1951-3, to have amounted to 33 milliard yen and to have been more than three times the average of 1934-6 in real terms valued at 1934-6 prices.

TABLE 9. *Annual gross investment in agriculture by the state*<sup>1</sup>  
(at 1934-6 prices)<sup>2</sup>  
(Thousand Yen)

	<i>Pre-war</i> (1934-6 average)	<i>Post-war</i> (1951-3 average)
Land improvement . . . . .	7,350	32,524
Agricultural machinery . . . .	33	31
Reclamation . . . . .	7,166	21,823
Miscellaneous . . . . .	..	15
Total . . . . .	14,549	54,393
Expenditure for prevention of and recovery from disaster . . . .	15,619	40,717
Grand total . . . . .	30,168	95,110

Source: Budget of the Ministry of Agriculture.

Besides the central government there are local authorities which promote land improvement. But about 60 per cent. of the expenditure on land improvement sponsored by local governments is subsidized by the central government and is included in the figures shown in Table 9.

<sup>1</sup> Investment by local governments is not included.

<sup>2</sup> Prices of commodities for agricultural production.

In addition to these direct activities, the state functions as a supplier of loans for agricultural improvements. The Agricultural Forestry and Fisheries Finance Corporation was established in 1953 (as a transformed organization of the Special Account for Agricultural Forestry and Fisheries Finance which had started in 1951) to act as an agent of the state. Its function is to supply long-term loans at low interest rates for the improvement of land and equipment in agriculture, forestry and fisheries. The object of this organization is to fill the gap occasioned by the withdrawal of the hypothec bank (which functioned as a main supplier of long-term loans for agriculture in the pre-war period) from its agricultural interests after the Land Reform. The total sum loaned out by the organization in the fiscal year 1955 was about 29 milliard yen and the loans outstanding at the end of 1955 amounted to about 94 milliard yen, of which the loans for agricultural land improvement constitute about 45 per cent.

Owing to such positive activities by the state, agricultural land that would otherwise have been beyond the reach of improvement has been improved extensively. It is estimated by the Ministry of Agriculture that the paddy acreage improved in the period between 1945 and 1949 totalled about 200,000 hectares, nearly equal to one-fifth of the total arable acreage improved in the pre-war period.

*The effect of capital formation.* This is not easy to estimate though productivity of labour may be used as a measure for it. Tentatively, net labour productivity in agriculture in the pre-war and post-war periods was as compared in Tables 10 and 11.

Table 10, based upon the Farm Household Economy Survey, shows the agricultural net income per head of the post-war farming labour force to be higher than pre-war by 13 per cent. on tenanted farms and 9 per cent. on owner-occupied farms of comparable sizes.

In order to check the increase in productivity Table 11 is provided, based upon the National Income Statistics. The result here is that the agricultural net income per head of the farming population is 10 per cent. higher in the post-war period than it was pre-war.

According to both Tables, it cannot be doubted that the net productivity of labour in agriculture has increased in the post-war years. And it should be noted here that the increase in the net productivity of labour is smaller than it would otherwise be, owing to an increase in the farm population.

It is safe to assume that the increase in labour productivity has been due first to greater use of fertilizers and chemicals, second to better

TABLE 10. *Comparison of net productivity of labour in agriculture between the pre-war and post-war periods*<sup>1</sup>

(A) Calculated from the Farm Household Economy Survey

Period	Agricultural net income produced per head of farming labour force (at current prices)	Index number of general prices <sup>2</sup>	Agricultural net income produced per head of farming labour force (at 1934-6 prices)
	Yen		Yen %
Pre-war (1934-6 average)	{ Tenants 228 Owners 235	1.0 1.0	228 (100) 235 (100)
Post-war (1953-5 average)	83,657	325.5	257 (113 & 109)

<sup>1</sup> The comparison is between the pre-war average of all surveyed farms (the average size being 1.3 ha.) and the post-war average of the size-group 1-1.5 ha.

<sup>2</sup> Provided by the Economic Planning Board.

TABLE 11. *Comparison of net productivity of labour in agriculture between the pre-war and post-war periods*

(B) Calculated from the National Income Statistics

Period	National agricultural income (at current prices)	Agricultural population (estimated by Ministry of Agriculture)	Agricultural net income per head of agricultural population	Ditto, deflated by the index number of general prices <sup>1</sup> (at 1934-6 prices)
	million Yen	million	Yen	Yen %
Pre-war (1934-6 average)	2.4	13.67	176	176 (100)
Post-war (1953-5 average)	1,035.3	16.27	63,632	195 (110)

Source: The National Income Statistics provided by the Economic Planning Board.

<sup>1</sup> The same index number of prices is used as in Table 10.

farm management and third to capital formation not only by the farmers themselves but also by the state, which has been more prominent in the post-war years.

### Summary

The Land Reform changed the income distribution in agriculture. Accordingly, the farmer's pattern of savings and consumption seems to have been changed too. The savings disposable income ratio of farmers decreased by 50 per cent. in the post-war period despite a 5 per cent. increase in the disposable income, as compared with the



pre-war owner-operator. The average propensity to consume increased noticeably owing to a shift of the consumption function.

The Land Reform also effected structural changes in agricultural capital formation. By the statutory regulation large landownership and high rents, which were previously incentives for capital inflow into agriculture, were abolished. Farmers are better able to save, therefore, for self-investment on capital goods. Actually, farm machinery and livestock have increased remarkably since the Land Reform, though relatively favourable prices for agricultural products in these years have undoubtedly played a part in stimulating capital formation.

Capital formation is limited by the smallness of farm size. Very considerable increases in farm machinery have been confined for the most part to machines for processing farm produce. The number of farm animals seems already to have reached the point of saturation. Thus, most of the machinery and livestock, though necessary for overcoming peak demands for labour, are under-utilized. The analysis of farming costs suggests that the keynote of developing agricultural productivity still lies more in fertilizers, insecticides, pesticides, and improved seeds, which are available irrespective of farm size, than in machinery and livestock.

The state has come to play more positive roles in capital formation in agriculture since the Land Reform. It is now functioning not only as a promoter of agricultural land improvement and reclamation, but also as a main supplier of long-term loans.

Net productivity of labour in agriculture seems to be higher by about 10 per cent. in post-war than in pre-war years, whether estimated from the Farm Household Economy Survey or from the National Income Statistics, in spite of the increase in the farm population.