

PEASANT COLONISATION IN MINDANAO, THE PHILIPPINES

by

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Chapter IV

THE EVOLUTION OF CROPPING PATTERNS IN MAWAB¹

The role of abaca. Before the arrival of the first settlers, the indigenous Mansakas were basically subsistence cultivators, although their crops included abaca and upland rice which were occasionally traded with Chinese or Visayan merchants in small towns such as Hijo, Caraga and Compostela.

In contrast to the Mansakas, the immigrant settlers were from the outset concerned to establish permanent holdings of commercial crops. As homesteading regulations required them to cultivate at least one-fifth of their land within five years of official approval of their claims, there was an added incentive to develop their holdings swiftly. Without exception, forest clearance was by manual labour. Using family labour and cooperative groups (losong-losong), settlers were able to clear between 0.5 and 2.0 ha annually. Once cash crops were producing income, however, settlers could hire labour, thereby increasing the rate of clearing to over 3.0 ha per annum. Some settlers also received assistance from newcomers (particularly kinsmen or paisanos) in return for accommodation until the newcomers found land for themselves.

The main commercial crop adopted by pre-war settlers was abaca (Musa textilis Née). Several factors were responsible for this choice, which is unique among peasant colonists in the tropics. Firstly, abaca had been the main Philippine cash crop since the late decades of the

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For lack of documentary records this chapter depends greatly on statements by pioneers and officials and on personal observations.

nineteenth century.¹ Initially, it was grown mainly on smallholdings in Leyte, Samar and southeast Luzon, although small quantities were sold by the natives of Mindanao. From the first decade of the twentieth century, Davao became the leading abaca producer following the establishment of the large, highly-capitalised Japanese plantations. These stimulated migration by offering employment to Filipinos, many of whom subsequently became independent farmers. Their experience with abaca and the example of Japanese prosperity encouraged them to adopt the crop on their own farms.² By this stage, markets for abaca in Davao were highly developed as a result of Chinese and Japanese enterprise. In addition, abaca matures within $1\frac{1}{2}$ - 2 years, much sooner than either coconuts or coffee, which were the only other commercial crops with which most early settlers were familiar.

Finally, the botanical origin of abaca is in the southern Philippine islands; here optimum conditions prevail - constant warmth and an evenly-distributed rainfall of at least 2500 mm a year. Some varieties are suited to loam or clay soils, but all need well drained sites with a fairly high water table (Ochse et al., 1961:1167). Virtually all of the Mawab area is suitable for abaca, except for areas of impeded drainage in Bawani and Saosao barrios.

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Abaca formed 67 per cent by value of all exports in 1902 (Huke, 1963:324).

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The Salvilla plantation, which was established in Mawab in the early 1930s, was developed by tenant farmers who were paid off when their 1 ha abaca plots reached maturity. This plantation thus served, like the Japanese plantations, to introduce newcomers to abaca cultivation.

By the late 1930s, abaca was grown in all the developed parts of Mawab, except in those wetter areas where the settlers had little choice but to grow rice. Even there, the landowners often rented drier land to produce abaca. Most other settlers grew corn rather than rice as a food crop, as it was less demanding of labour and enabled greater concentration on cash crops. A few settlers went even further by planting abaca to the exclusion of food crops.¹

Early in the 1930s, the price of abaca fell to 3-6¢/kg (P2-4 per picul), thereby giving a marked price/weight advantage to coffee, which for a while sold for 60¢/kg. Although returns per hectare were lower than those from abaca, coffee was planted by those settlers who were most distant from the transportation route of the Hijo River. However, the situation was reversed later in the 1930s when the price of coffee fell while that of abaca doubled. At the same time, the extension of the national highway to Mawab provided a cheaper form of transport which reduced the price/weight advantage of coffee. Growers of coffee thereupon replaced it with abaca, which became the dominant cash crop of pre-war Mawab. The maximum area of abaca planted by the seven pre-war settlers in the research sample averaged 10.4 ha each.

During the second World War, trade in abaca ceased and the industry came to a standstill. Some farmers were compelled by the Japanese to convert their abaca stands to rice in an attempt to relieve food shortages. Others neglected or completely abandoned their holdings, which were quickly overrun by secondary vegetation. However, as commercial operations revived after the war, rehabilitation was rapid and by 1948 abaca had re-occupied all the

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See Caintic (1959) for a similar situation in the neighbouring municipality of Compostela as late as 1957.

pre-war abaca areas. Post-war settlers then began extending abaca cultivation into the hills, encouraged by rising prices which reached P0.85/kg in 1949 and a peak of P0.99/kg in 1951. At this time, it was said in the Visayan islands that 'gold grows along the roads in Davao'. However, increasing pressure on land limited the size of holdings developed after the war. Of the 43 post-war migrants in the research sample, 16 grew abaca and the average area of their abaca stands at maximum extent was only 3.5 ha each.

Unfortunately, although abaca grew easily in physical conditions close to the ideal, the cultivation practices of the Filipino peasants in Mawab were vastly inferior to those utilised before the war by the Japanese plantations with their experimental stations, chemical pestkillers and fertiliser treatments. Both fertilisation and disease control were almost totally neglected by post-war growers. The use of fertilisers, particularly nitrogen and potash, is advisable not only to compensate for the great loss of soil nutrients in harvesting, but also because it increases resistance to disease (Kirby, 1963:332). Several serious diseases attack abaca but the most damaging in Davao has been the abaca mosaic, a virus infection locally called 'alkuhiris'. Badly infected plants do not grow to full size and yield little fibre. Although infected single leaves may be removed and burned, more serious infection requires destruction of the whole plant.

The wartime neglect of abaca plantations and the subsequent reluctance of growers to destroy affected plants helped to spread the disease very swiftly after the war. Entire holdings were infected and output fell. During the early 1950s, the Abaca Development Board attempted to educate farmers in methods of disease control,

including the use of chemical sprays. Unfortunately, some of the sprays used in demonstrations harmed healthy abaca or other crops close by, so there was little adoption by the growers. At the same time, prices fell to less than half the level of 1951 (see Figure 4:1). From 1955 onwards, prices began to recover, but by then the mosaic was so widely disseminated and costly to eradicate that increasing numbers of growers began to abandon the crop. In 1960, according to the Census of Agriculture, abaca was still the most widespread crop in Mawab, being grown on 535 farms and occupying a total of 980 ha (Table 4:1), but by 1967 it had declined to about 350 ha.¹ In the space of some 15 years abaca had changed from being almost the sole prop of development in Mawab to being only one among several alternatives.

Today, no growers rely solely upon abaca as a commercial crop. Abaca stands are now small and widely scattered, occurring chiefly in newly-developed hill areas. The effect of this dispersal in reducing the transmission of mosaic disease is partly countered by the common practice of interplanting corn with young abaca, since the corn aphid is a vector of the mosaic virus. Even so, it is now possible for growers to cope with the comparatively slow spread of mosaic, so that some individuals still find it a worthwhile crop.

In the research sample, 18 settlers still have some abaca, but four are no longer maintaining their stands. Only six stands exceed 1 ha each in size and these are mostly interplanted with coconuts or coffee. Only two out of the 18 plots are located in the lowlands and five

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Area estimated by the farm management technician in Mawab, who makes an annual report, incorporating crop statistics, to the Agricultural Productivity Commission.

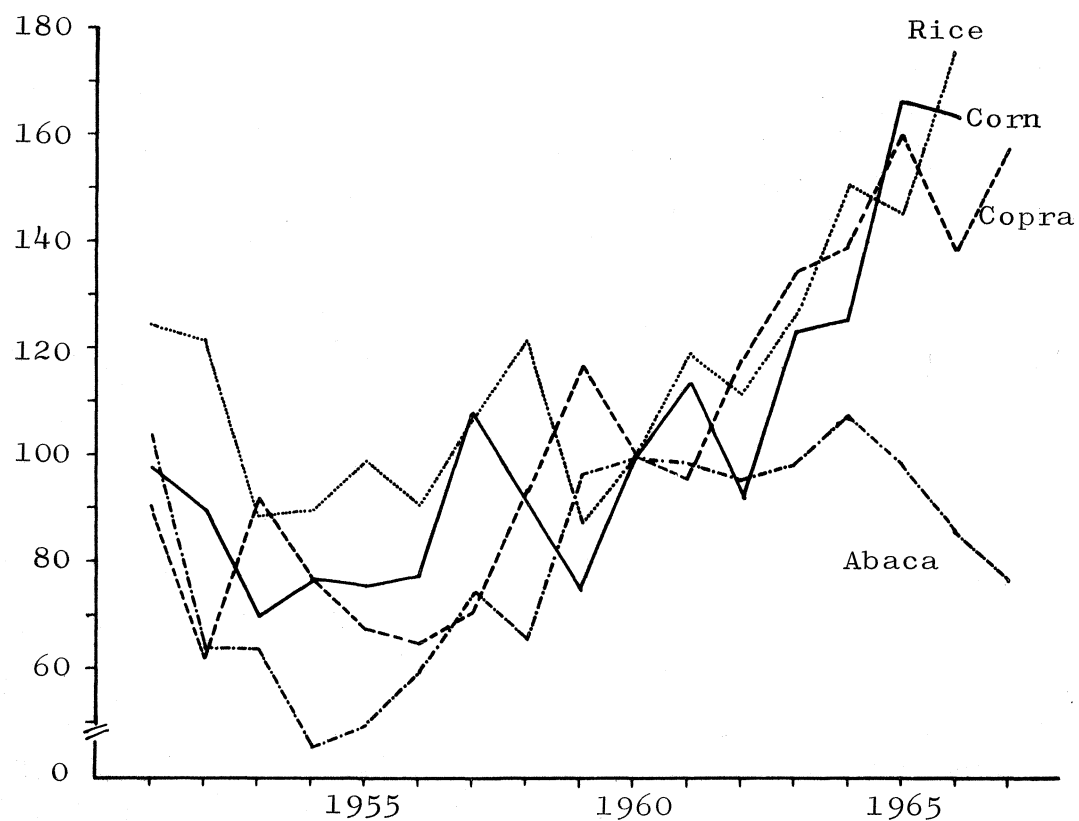


Figure 4:1 Wholesale price indices of selected crops in Manila, 1951-67. (1960 = 100).

Source: Adapted from Hicks (1967:Table 59); 1967 figures from Central Bank Statistical Bulletin, vol.20, No.4.

in the rolling uplands, on slopes up to 21°. The remainder are in the hills, with one plot on a 40° slope. In 1966-7, prices were falling back to the levels of a decade earlier and some farmers in the sample harvested their abaca only once or twice in the year.

As figure 4:1 shows, abaca is the only major crop in Mawab that has not experienced an upward trend in prices since 1960. By interplanting abaca with other crops, farmers insure themselves against a catastrophic fall in abaca prices. If the price trend continues, it seems likely that abaca, having helped stimulate the development of Mawab - and of Mindanao generally - will soon disappear from the landscape.¹

The emergence of present cropping patterns. In a sense, it is only since the decline of abaca that most Mawab farmers have had to make significant land use decisions. During the first 30 years of colonisation, abaca was for most settlers the obvious source of income, and for some the exclusive preoccupation. When it was destroyed, there was no substitute that could be adopted on the same scale. Settlers thus had to assess the possibilities in the light of the nature of their land, the technical and labour requirements of different crops, price ratios, marketing facilities and their own experience and cultural preferences. In contrast to the earlier situation of virtual monoculture of abaca, the interplay of these factors has resulted in a marked diversification in the landscape.

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While it has remained an important Philippine export, the value of abaca exports fell by over 55 per cent between 1950 and 1966 and their share of the value of total exports from 13 to 2 per cent over the same period (Central Bank News Digest, June 27, 1967).

The effect of this by 1960 can be seen in Table 4:1. At the time of the census, both rice and corn occupied almost as much land in Mawab as abaca and, allowing for double- or triple-cropping, they accounted for a much higher proportion of the total farm area. Coconuts and coffee also occupied considerable areas. While many other crops are important to most farmers, in aggregate they occupy little ground. Such crops include bananas, root crops (especially sweet potato), pulses and green vegetables.

Table 4:1 Area planted to major crops* in Mawab, 1960.

Crop	No. farms reporting	Hectares planted	Per Cent of total farm area
Rice, lowland, first crop	451	856	12.2
second crop	122	325	4.6
Rice, upland	195	146	2.1
Corn, first crop	883	848	12.1
second crop	721	641	9.1
third crop	810	807	11.5
Abaca	535	980	13.9
Coconuts	625	501	7.1
Coffee, <u>arabica</u>	99	22	0.3
other	541	328	4.7
Sweet potato (<u>camote</u>)	207	23	0.3
Banana	778	53	0.8
TOTAL ^a	1,254	4,005	100.0

* Excepting arabica coffee, only crops planted on more than 100 farms are included.

a Totals are not the sums of columns. a) Total number of farms is the total in Mawab. b) Total hectares planted is area reported under temporary and permanent crops on the day of the census. c) Total farm area includes crops not shown and other uses of land (see Table 4:6).

Source: 1960 Census of Agriculture, Report for Davao province.

During 1967 detailed chain-and-compass surveys were made of 229 ha operated by 46 members of the sample.¹ 132 ha were under crops. 45 per cent was in temporary crops such as rice, corn, tubers and vegetables, 49 per cent in permanent crops such as abaca, banana, coconuts and papaya and six per cent intersown with both temporary and permanent crops.

Table 4:2 Major crops grown by 46 settlers, 1967.

	No. of farms reporting	Hectares planted	Percent of total surveyed	
			Crop area	Farm area
Rice, lowland	20	22.03	16.7	9.6
Rice, upland	8	1.52	1.2	0.7
Corn	31	32.21	24.5	14.1
Other temporary*	16	3.06	2.3	1.3
Abaca	10	8.96	6.8	3.9
Coconuts	15	23.85	18.1	10.4
Coffee	2	0.11	0.1	< 0.1
Other permanent ^a	18	31.56	24.0	13.8
Temporary and permanent	19	8.36	6.3	3.7
TOTAL	46	131.66	100.0	100.0 ^b

* Includes rice and corn intersown with other temporary crops.

a Includes abaca, coconuts and coffee intersown together and with other permanent crops.

b Includes other land uses (forests, idle land, buildings, etc.) 42.5 per cent.

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Due to other requirements of fieldwork, the surveys were spread over several months from July 1967 so some data on crop areas differ from those for the 1966-7 crop year discussed below.

The areas of intersown crops are primarily devoted to the major permanent crops, as illustrated in Table 4:3. Tables 4:2 and 4:3 together illustrate the continuing trend away from abaca towards corn, coconuts and coffee. It is noteworthy that the proportion of land in coconuts and coffee has expanded more rapidly than that in corn, while the proportion in rice declined slightly between the 1960 census and the 1967 sample survey. These tendencies accord closely with those at the national level, as illustrated in Table 4:4.

Table 4:3 Areas of major crops that are intersown. (Hectares).

Crop	Intersown with		
	Only temporary crops	Only permanent crops	Temporary and permanent
Upland rice	0.77	-	0.49
Corn	0.97	-	5.00
Abaca	-	17.62	0.19
Coconuts	-	29.55	6.31
Coffee	-	17.34	1.64
Other permanent*	-	18.15	0.78

* Includes fruit trees, bananas, etc., intersown with abaca, coconuts and coffee.

Table 4:4 Areas planted to selected crops, in the Philippines, 1955, 1960 and 1965 (Thousand hectares.)

Crop	1955	1960	1965
Rice*	2,656	3,307	3,200
Corn	1,388	1,846	1,923
Coconuts	990	1,059	1,605
Coffee	19	31	44

* Lowland and upland

Source: Tryon (1968), Appendix Tables B-7 and B-8.

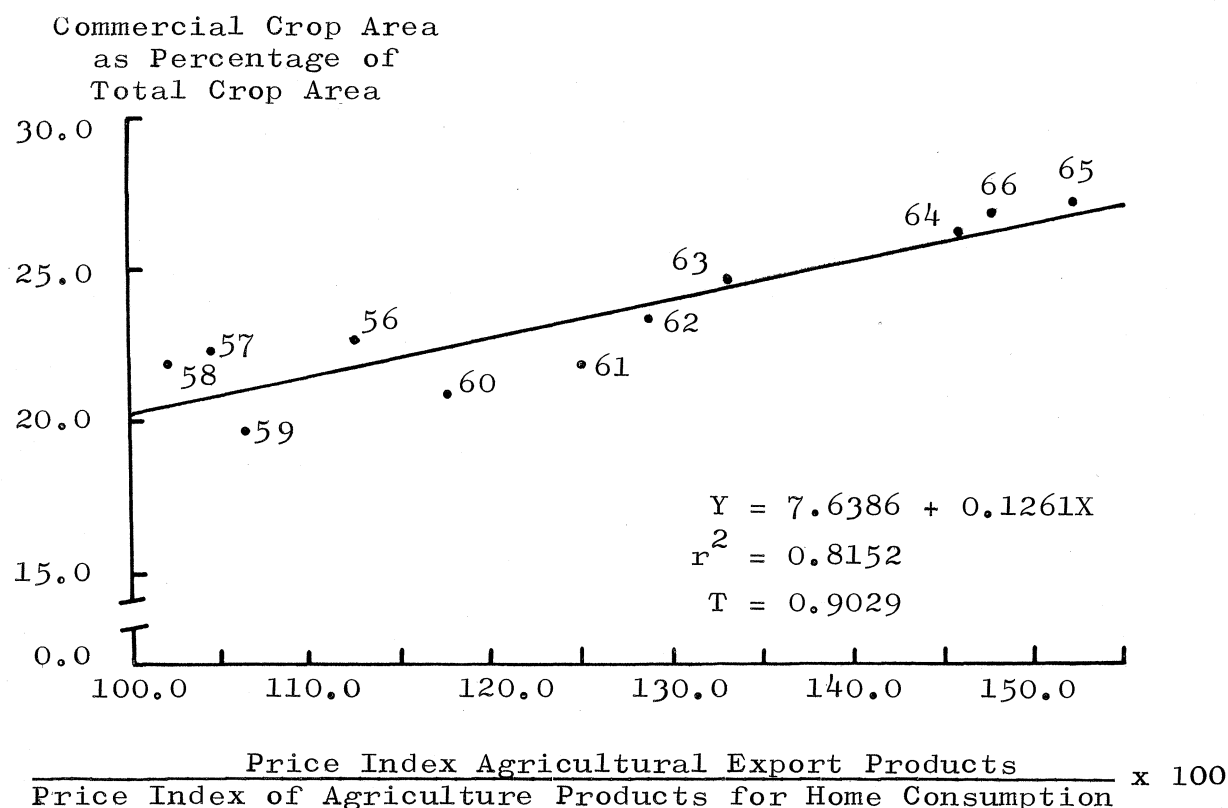


Figure 4:2 Relationship between land utilization and relative prices in agriculture

1. Crop area refers to area harvested (except for tree crops). Data are on a crop year basis; that is, year t refers to the 12 months ending June 30, year t.

Source: Bureau of Agricultural Economics, Department of Agriculture and Natural Resources.

2. Price indices refer to wholesale prices. Both indices have bases of 1955 = 100.

Source: Central Bank News Digest, Vol.XVIII, No.51, (December 20, 1966)

3. The price ratio plotted against the area data for any crop year t is the average of the price ratios for the three previous calendar years t-3, t-2, and t-1. In the chart the numerals alongside the plotted points identify crop years to which the relevant ratios relate.

Factors involved in the expansion of the four main crops that replaced abaca in Mawab - rice, corn, coconuts and coffee - are discussed in the following sections. For lack of documentary evidence on the Mawab area, considerable reliance is placed upon the testimony of the settlers. To a large degree, this testimony is compatible with explanations for trends observable at the national level, in particular the rapid expansion of the commercial crop area after 1959-60 at the expense of the food crop area.

Between 1959 and 1965 the area planted to rice and corn in the Philippines fell by six per cent while the area in export crops rose by 44 per cent (Golay and Goodstein, 1967 : 45). This expansion is attributed to price movements favouring export crops following the initiation of exchange decontrol in 1960 and devaluation of the peso in 1962 (Tryon, 1967:204). Treadgold and Hooley (1967:117-8) calculated that 82 per cent of the variability in the proportion of total crop area devoted to export crops in the period 1956-66 can be explained by variability in the ratio of wholesale prices of exportable crops to wholesale prices of crops (primarily food) for home consumption (see Fig. 4:2).¹ These assessments are supported by the findings of Mangahas et al (1966:2-3, 21) that the areas planted to rice and corn are significantly influenced by prices relative to alternative crops. They also noted that rice has fewer competitors than corn because of the heavy investment required for the supply and impounding of water.

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Acknowledgement is made to Dr M. Treadgold for kind permission to use this figure.



Rice. Several factors have influenced the selection of rice as a replacement for abaca in Mawab. Firstly, much of the land involved is too moist for corn, coffee or coconuts. Secondly, in the Philippines, rice is almost invariably preferred to corn or other crops as a food. Thirdly, in 1957 and 1958, when many abaca growers were deciding what other crops to plant, the price of rice rose sharply - more so than the prices of the main alternative crops. According to Hicks (1967:111) rice had been relatively more profitable than copra since the early 1950s. Fourthly, continuing rice shortages in the Philippines caused the government to operate price support schemes to encourage production. Although prices have continued to fluctuate, they have been less variable than those of export commodities such as copra. Finally, rice is a short-term annual crop and so avoids the problem of prediction of crop prices many years ahead as in the case of copra.

Consequently, the main trend since the removal of abaca has been the conversion of lowlands to rice fields wherever soils and water supplies are suitable. The southern margin of rice cultivation closely follows the course of Galinan Creek, south of which are deep sandy soils that cannot retain banded water. The few settlers south of the creek who have suitable land have not planted rice because such isolated fields would bear the full brunt of attacks by pests.¹ North of this creek, rice is grown throughout the plain (Plate 4:1), except on the slightly elevated interfluvies mentioned in Chapter II. These cannot be served by small-scale gravity irrigation from creeks and the aquifer supplying artesian water

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However, the 1967 survey of lowland rice in Mawab by the Bureau of Plant Industry inspector revealed that two settlers in Concepcion and two in Sawangan had taken the risk of growing rice in isolated plots.

elsewhere appears to be too deep here for economic tapping, as the pressure is very low. So far, no owner has been prepared to install a pumped irrigation system.

The area devoted to lowland rice fields expanded swiftly between 1955 and 1960, when 856 ha were planted to the main season or 'first' crop (June - December). Since then, expansion has continued as more abaca has been removed, forest remnants cleared and dyked fields extended upstream along small valleys to the point where further extension would require permanent terracing works. By 1967, there were 1,115 ha of lowland rice fields in Mawab. Gravity or artesian irrigation is applied to about 800 ha for the first crop, but to less than 600 ha during the palagad or second cropping season, when creek levels are liable to be low. Many rice fields in Mawab still contain isolated forest trees, mostly dead although still standing. Stumps and fallen trunks are more common, especially in fields cleared during the last five years and in permanently waterlogged land where anaerobic conditions delay decomposition for many years. These stumps and logs hinder cultivation, whether it is carried out by hand or by carabao - drawn plough and harrow.

Table 4:2 showed that of the 46 settlers whose lands were surveyed by chain-and-compass, 20 grow lowland rice, which accounts for almost 17 per cent of the total area in crops. Three settlers whose holdings were not surveyed also grow lowland rice. Nine of the 23 growers have rice plots of no more than 0.50 ha but the mean is 1.10 ha, with the largest plot being 4.66 ha. Eight of the settlers have more land suitable for planting rice (excluding land let to tenants), but are unable to use it for lack of available labour. Most of the farmers in the sample produce a wide range of crops, but four men, all in the lowlands of Bawani barrio, grow only rice.

Corn. In the sandy areas south of Galinan Creek, corn was widely chosen as an initial replacement for abaca. Demand for corn in the Philippines has been consistently high, both as a food grain and as animal feed in livestock-breeding areas near major towns. As figure 4:1 showed, corn prices were unusually high during 1957 and 1958. Thereafter, prices of coffee and coconuts improved and these crops began to replace corn as a cash crop. The rate of replacement was slowed by the common practice of planting corn between rows of young tree crops, but as these began to shade the ground, interplanting ceased.

Even so, replacement of corn was not complete. In the barrios of Andili, Nueva Visayas and Mawab, some tenant farmers have continued, on their landlords' instructions, to grow corn as their sole commercial crop in plots of several hectares each. Of the seven surveyed corn plots exceeding 1.5 ha, tenants operate six. In three cases, the landlords are ensuring a supply for their own corn mills. In other cases, the landlords are content with the low shares they receive from corn tenants (20 - 40 per cent of output, compared with 50 - 70 per cent for copra) largely because they can leave all decisions and costs to the tenant. An exceptional case is the large hacienda (the former Salvilla plantation) in Nueva Visayas, where over 50 ha are devoted to corn which provides feed for the owner's piggeries near Davao City.

While the corn area in the plain has contracted, the area in the hills has expanded as forest land has been occupied by squatters growing corn as their staple food. During 1966-7, 39 of the sampled settlers grew corn in 59 separate fields. 25 of the fields are in the plain and 19 of these are operated by tenants. In contrast, only five of the 34 upland corn plots are operated by tenants.

In total, the scattered corn plots in Mawab as a whole occupy rather less land than is devoted to rice,¹ but corn is certainly grown by more farmers than is rice. Furthermore, three crops of corn may be taken during a year, so the total area under corn over one year is greater than that under rice. Among the sampled corn farmers, 20 per cent grew a single corn crop in 1966-7, 44 per cent grew two crops and 33 per cent grew three crops. One man was able, exceptionally, to raise four crops.

Corn is raised as a more or less exclusive product only on the tenant farms mentioned above. On other farms it is only one of a number of products. It is mostly grown in pure stands, but Table 4:3 shows that a small proportion is intersown with one or more permanent crops, usually coconuts and coffee, and a very small proportion is planted with upland rice or mongo beans (Phaseolus aureus Roxb.).

Coconuts. It was noted above that there were drawbacks to the planting of coconuts as a substitute for abaca. The palms take 7 or 8 years to begin bearing and a further 6 or 7 years to reach full bearing capacity and it is impossible to make satisfactory predictions of crop prices so far ahead.²

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Unfortunately, the true corn area in Mawab is unknown. An estimate of 848 ha for 1967 made by the local farm management technician merely repeats the 1960 census figure.

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As it happens, large incomes would have been earned by people who planted coconuts in the late 1950s, for average annual prices for copra rose considerably between 1961 and mid-1968, when they reached P96 per 100 kg. However, the unpredictability of export crop prices is revealed by the fall in the copra price to only P60 per 100 kg by September 1968 (Central Bank Statistical Bulletin, vol.20, 4).



Plate 4:2 Coconut plantings in southeastern Mawab.
Note: coconut fields are bounded in black
and mostly appear stippled.

In the late 1950s several of the owners with bigger holdings planted coconuts and as copra prices continued to rise during the 1960s more and more of the land south of Galinan Creek has been planted to coconuts. Coconuts now occupy over two-thirds of the cultivated land in Andili and over half that in Concepcion and Nueva Visayas (see Plate 4:2). Coconuts have also been planted as a cash crop by settlers in the uplands of Bawani and in the steep hills around the plain. Probably more than half these trees are not yet bearing. According to a report for 1967-8,¹ there are 2,501.4 ha of coconuts in Mawab - exactly 2,000 ha more than recorded by the 1960 Census. The figure is dubious, being based largely on estimates by barrio captains, but it nevertheless indicates crudely the rapid adoption of copra as a cash product during the 1960s. Farmers gave different reasons for choosing to plant coconuts - some said simply that there seemed to be no satisfactory alternative. Others felt that, as previously with abaca, by planting their land fully to coconuts, the cash return from copra would pay for purchased foodstuffs. Alternatively, they might rent a piece of land to grow corn or rice.

In the sample, 17 settlers have only a few coconut trees which are planted beside their houses. All but three are located in the plain. Another 19 settlers have less than 1 ha of coconuts,² including five whose trees are scattered rather than occupying compact blocks. 14 settlers have over 1 ha in coconuts and six of these have over 3 ha.

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Annual report of the farm management technician in Mawab to the Agricultural Productivity Commission.

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The common spacing of coconut palms, between 9x9 m and 10x10 m square, gives approximately 100-125 trees per hectare.

Out of the total of almost 60 ha, only 24 ha are in pure stands. 30 ha are interplanted with other permanent crops, mostly coffee. The remaining six hectares of coconuts are intersown with catch crops such as corn, camote, rice and beans. Including the interplanted areas, coconuts now occupy more of the settlers' land than any other crop.

Coffee. The only other crop that has so far occupied significant areas of former abaca land in Mawab is coffee, almost entirely of the robusta variety. In 1960, coffee occupied a total of 350 ha. There has been considerable new planting since 1960 by settlers in the hill areas, but this has partly been offset by the removal of some coffee in the plain. The Philippines imports coffee and prices for local producers are influenced to some extent by world market prices. Farmers in Mawab have commonly reacted to major downward fluctuations in prices, such as occurred between 1960 and 1963, by replacing their coffee trees with coconuts or corn. During less severe recessions they may not harvest the crop. As it takes three or four years for coffee trees to begin bearing, it is difficult for farmers to take advantage of price increases, which are rarely sustained. Thus, planting land to coffee trees is a gamble that may prove to have high opportunity costs and coffee is almost invariably interplanted, with corn during the early years and then with coconuts (Tables 4:2 and 4:3). In this way the settler receives in turn income from corn, then from coffee and finally from coconuts.

Among the sample, 25 settlers have commercial stands of coffee occupying a total of 19 ha, of which only 0.1 ha is in pure stand. Only five of the plots exceed 1 ha and coffee is a far less significant feature of the landscape than coconut palms.

Crop combinations. The above descriptions in terms of single crops are not meant to imply that farms are commonly single-crop enterprises. The frequency with which interplanting has been mentioned suggests considerable diversification within individual farms. This is contrary to the statement of Wernstedt and Spencer (1967:531) that in the Davao-Agusan region 'one farm usually concentrates on the production of one crop only'. In Mawab this is far from being the case. Although many farmers, especially in the lowland rice areas, rely primarily on one crop for their cash income, those who grow only a single crop are almost entirely tenants on very small plots. Table 4:5 illustrates the situation and it is clear that most farmers grow at least three crops that are significant to their domestic economy.

Table 4:5 Crop combinations of 50 settlers in Mawab, 1966-7.

<u>Combination</u>	<u>No. of settlers</u>
Rice and/or corn only	9
Rice and/or corn and other temporary crops or homelot trees†	7
Rice and/or corn plus coconuts	3
Rice and/or corn plus coconuts and other tree crops*	8
Rice, corn, other temporary crops plus coconuts or coffee	2
Rice, corn and abaca or coffee	2
Rice and/or corn, other temporary crops, coconuts and other tree crops*	18
Corn and coffee	1
	50

† Chiefly for domestic use but product may occasionally be sold.

* Usually includes coffee and/or abaca.

However, few settlers use their variety of crops in planned rotations. This situation occurs widely in the Philippines (Wernstedt and Spencer, 1967:187) and, outside the colonisation areas, is a consequence partly of lack of land within which to rotate fields, since a major proportion of the land on small farms is required to produce staple foods for domestic consumption. The lack of rotations is also sometimes attributed to the cultivators' ignorance of either the benefits or suitable methods (Pal, 1963:271-2). Among the Mawab sample, the rotation of crops occurs on a haphazard basis, so that corn may be grown for five years followed by sweet potato for one year and then corn again, or several years of corn may be followed by rice, vegetables or fallow as the cultivator considers necessary at the time. The course of rotation is rarely planned in advance (cf Vandermeer, 1963:176).

Land use in 1967. The preceding sections have discussed the areas of land devoted to the major crops in Mawab, with particular reference to 132 ha cropped by 46 sampled settlers. The discussion now turns to the use of all 310 ha operated by the full sample of 50 settlers and includes uses other than cropping. The uses of this land are shown in Table 4:6, compared with data from the 1960 Census of Agriculture.

Table 4:6 shows that both full- and part-owners have considerably more land in permanent than in temporary crops. Most of the permanent crops are in the uplands, where they are more profitable than alternative temporary crops. Tenants have a much smaller proportion of their land in permanent crops, because the average holding is too small to allow planting of permanent crops as well as producing basic requirements of food. Secondly, the tenants have no security of tenure and are seldom

Table 4:6. Generalised land use of 50 settlers in 1967 and 1,254 settlers in Mawab, 1960.

Use	Sample of 50 settlers, 1967					Mawab, 1960	
	Owners	Part-owners hectares	Squatters	Tenants	Total	Per cent	Per cent
Temporary crops	22.6	21.6	6.0	29.6	79.8	26	30
Idle (fallow)	14.5	29.3	9.5	9.9	63.2	20	23
Permanent crops	32.0	41.7	7.8	8.2	89.7	29	27
Permanent pasture	0.3	3.0	0	0.7	4.0	1	0
Forest	19.0	32.5	17.0	0.4	68.9	22	15
All other lands	2.2	1.5	0.5	0.5	4.7	2	5
Total	90.6	129.6	40.8	49.3	310.3	100	100

prepared to plant permanent crops from which they may obtain no benefit. Furthermore, crop sharing arrangements for permanent crops are less favourable to the tenant, who may, for example, receive only 30 per cent of the receipts earned by copra. Five of the sampled tenants occupy land on condition that it is gradually planted to coconuts on behalf of the owners, but the tenants are allowed to take catch crops of annual crops until the ground is fully shaded by the maturing palms (see Chapter III, p.108).

The major component of the idle land category in Table 4:6 is regenerating woodland - excluding regrowth, idle land forms only six per cent of the total farm area. However, this practice of bush fallowing does not imply the long-term adoption of shifting cultivation by settlers. Spencer (1966:82) believes that in colonisation areas farmers practise shifting cultivation only for initial subsistence, with the aim of establishing a permanent field system as quickly as possible. This has been the case in

Mawab, although some settlers may, in addition to their permanent cropping system, continue to operate some fields on a rotational basis.

Nearly all the settlers using a form of bush fallowing are post-war migrants occupying land in the hills. Among lowland settlers, fallowing is rare, although some corn growers with sizable holdings may leave some land uncultivated. This is commonly said locally to be due to lack of labour and time to cultivate it fully, rather than to considerations of fertility, but such more or less inadvertent fallow fields are nevertheless rotated. These lowland fallows usually support grass rather than tree or shrub growth, probably due to the scarcity of neighbouring sources of tree seeds. In the hills, on the other hand, both rainforest and regrowth tree species are still sufficiently widespread for their seeds to reach most land left uncultivated (cf Kellman, 1967:175).

Both in the plain and in the hills, some idle land is occupied by cogon grasses - mostly Imperata spp. with Saccharum spontaneum in lowlying areas. In the hills, cogonales (grass-covered areas) are increasing because fallow periods are brief.¹ A few of the hill farmers rent lowland rice plots and so are able to utilise fallows of more than three or four years duration on their upland holdings.

Most hill farmers, however, are unable to use sound fallowing practices, due to lack of space and to ignorance

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As Kellman (1969:46) has pointed out, the greater the intensity of cropping, and particularly of weeding, the fewer seeds of tree species remain viable to ensure a woody rather than grassy fallow.

of suitable practices.¹ Most holdings are too small to permit adequate fallowing and settlers could afford long fallows only if their entire holdings were devoted to food crops, that is, if they became purely subsistence farmers. At present, cropping periods usually equal or exceed the fallow. If fallow periods last only one or two years, the root systems do not develop sufficiently to tap subsoil nutrients that may later be incorporated in litter. Furthermore, if the fallow is too short to develop a full canopy, losses of nutrients by leaching and erosion may be considerable (Webster and Wilson, 1966:159-60).

In Table 4:6, the only significant difference between the 1960 and 1967 figures is in the proportion of forest land. The major reason for this difference is that between 1960 and 1967 a high proportion of new migrants settled in the forested hills and their land is not yet fully cleared. Forest accounts for 42 per cent of the land operated by squatters in the sample; only two squatters, those with the smallest holdings, had cleared all their forest. A second reason for the difference between the figures is that the 1960 census enumerators did not visit some of the more remote settlers. Instead, they merely asked for details of the settlers' crops from barrio officials or pioneers in the neighbouring lowlands, so that the area under forest was probably understated.

Some full- and part-owners with large landholdings maintain land in forest to prevent deterioration through cropping. Others have conserved forest remnants along streams to protect the banks and to reduce evaporation. Patches of forest have also been preserved as sources of

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Yengoyan (1963) contrasts the skilled methods of shifting cultivation practised by the indigenous Mandayas east of Mawab with the poor methods of immigrants (mostly Visayans) coming into the same area of the Pacific Cordillera.

constructional timber and firewood. Finally, as with the squatters, some owners with comparatively recently acquired upland holdings have not yet had time with their available labour to clear all of their forest.

Table 4:6 shows that permanent pasture occupies an insignificant proportion of land. Farmers do not need to allocate land permanently for pasture since their livestock - primarily carabaos - find sufficient grazing on fallow land, grass verges and the like. Few farms have more than one or two carabaos. Other uses of land such as roads, house lots and watercourses are also of minor significance.

Comparison with migrant source areas. Table 4:7 compares land use of the Mawab sample in 1967 with land use in the main migrant source areas according to the 1960 Census of Agriculture. There is a noticeable difference between the eastern Visayan provinces and the other areas in the proportions of land devoted to temporary and permanent crops, but there is no significant difference in the proportions of total cultivated area. In contrast, owing to the recent occupation of Mawab, only three-quarters of the farm area is as yet cultivated and over a fifth remains in forest. The relative areas of land devoted to permanent as against temporary crops resemble the eastern Visayan distribution rather than the other regions.

Summary. During its long heyday in Mawab, abaca was grown regardless of soils or topography except in restricted areas that were suitable exclusively for lowland rice. After the mid-1930s, abaca retained its dominant position up to the time when the combination of disease and unfavourable price movements led to its replacement.

Thereafter, the dominant considerations in the selection of crops seem to have been their price levels and labour requirements, although physical factors have also had some influence. For instance, the area that can be made into lowland rice fields is limited and use of the interfluves north of Mawab poblacion is inhibited by poor drainage. Aside from these aspects, physical factors, whether of soil type, slope or drainage, have been neglected in land use decisions. Thus, at different periods settlers have used the same land for corn, root crops, vegetables, coconuts, coffee and abaca. While settlers have responded to changes in the relative returns of different crops as determined by price levels, they seem not to have been influenced by any effect of the land on output of different crops. Nor, conversely, have they been influenced by the effect of the cultivation of certain crops on the land. Thus, coconuts are planted on steep slopes that may not have suitable soil water conditions, while corn and upland rice planted on steep slopes contribute directly to soil erosion which the settlers are unable to counter. The Soil Survey Report for Davao Province stated, 'The agriculture of Davao Province has not as yet reached the stage of development where the proper adjustment of land use and soil management are at all understood, much less practised.' (Mariano, 1953:66). This assessment is still as true as it was 15 years ago.

Chapter V

THE PRODUCTION AND DISPOSAL OF SETTLERS' CROPS

The preceding two chapters have discussed the forms by which settlers hold land, the amount of land they control and the ways in which they have developed this land. This chapter describes the methods of production of the major crops, including the organisation of labour, crop yields, the disposal of output and aspects of marketing. Changes in production methods used by the settlers are discussed. Finally, the non-farm occupations of settlers are briefly described.

Lowland rice

People in Mawab commonly refer to first and second cropping seasons in the terms ('regular' and 'palagad') used in Luzon, which has a markedly more seasonal rainfall regime. In Mawab the rainfall regime permits most stages of cultivation throughout the year and some rice is harvested in almost every month. Nevertheless, there is still some seasonality of rice cropping in Mawab, with harvesting concentrated in the periods November to January and May to July. Apart from the effect of habit, each farmer prefers to have his fields ripening at about the same time as his neighbours' in order to avoid the concentrated attacks of pests that might occur if his crop were well ahead or behind in growth. About 72 per cent of the rice land is irrigated and the rest rainfed. The second, palagad, cropping season (approximately January to June) includes a period of comparatively unreliable rainfall from February to April, so some rainfed fields are not sown and the irrigated proportion rises to 83 per cent. However, most rice growers

without access to irrigation take the risk of inadequate rainfall and do grow two crops a year.

Production methods. All of the lowland rice in Mawab is grown by the transplanting method. In broad outline, the system requires the preparation of a seedbed, over which the seed is broadcast thickly. During the next six to eight weeks, the main rice fields are ploughed, harrowed and rolled to pulverize the soil thoroughly. The seedlings are then transplanted, and may be weeded once, twice or not at all before harvesting. The crop is harvested by means of a yatab, a small knife used to cut each plant head separately, although some people now use sickles. The rice is usually threshed by trampling, winnowed in the fields and sun-dried before being stored.

Some farmers use techniques basically similar to those of their home provinces, but others have adopted techniques from their neighbours. There is, therefore, immense scope for individual variations within the framework just described. Furthermore, some farmers do not own work animals and others do not use them because their land is too soft or encumbered with logs to permit the use of a carabao and plough. Most farmers who cultivate by hand can maintain only about 0.25 ha and their land preparation is far less thorough than that done with a carabao. Carabaos are comparatively scarce in Davao and are highly valued (P300 - 600 for a mature beast).¹ Small owners or tenants can as a rule only hope to obtain their own through the practice of alima, that is, caring for a female carabao and in return keeping one of the offspring. Among the 23 sampled rice growers, six farmed without carabaos.

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In Davao, the 1960 Census of Agriculture found an average, including immature animals, of 1.7 carabaos per farm, valued at P251 each. The national averages are respectively 2.0 and P194.

Table 5:1 Ownership of carabaos among 22 growers.

Owner of <u>carabao</u> Tenure of operator	Operator Landlord Other person			No <u>carabao</u>
Owner	10	0	1	2
Owner, renting rice field	2	0	0	3
Tenant	1	2	0	1

Aside from the preparation of land without animal labour, variations occur at every stage within the broad outline of rice cultivation given above. Farmers may use elevated portions of land as dry seedbeds instead of using portions of the rice field proper. Seeds are selected not only by variety but also by their bulk; they are not usually tested for germination quality or treated to give protection against pests. The customary seeding rate is 44 kg/ha, but in recent years, the more receptive farmers have adopted improved practices using rates less than half of this. Other farmers have compromised and use rates between 30 and 40 kg/ha.

In transplanting, the need to use a large labour force tends to reduce variations and most growers accept the traditional method of placing clusters of three to five seedlings at irregular, more or less random spacing. Only three members of the sample required labourers to plant seedlings in straight lines, and one followed the Masagana-Margate system of regular spacing with one or two plants per 'hill'. A few others had tested these methods but found they were too demanding of labour, a major drawback in an area of comparatively high wage rates (see below).

Once the rice is planted, water levels in irrigated fields may be carefully varied; by alternately draining and flooding, some weeds and pests can be controlled. However, manual weeding is the rule; despite the direct connection between weeding and yields (Webster and Wilson 1966:146), one-fifth of the farmers failed to weed their crops and almost half weeded only once. As manual weeding is laborious, chemical herbicides, particularly 2,4-D, have been one of the most widely accepted innovations (cf Ruttan, 1966:49-52). Nine of the sampled farmers used them in 1966-7; others had in the past and would like to do so more frequently but cannot afford the spraying equipment which costs between P40 and P80, and are unable or unwilling to borrow equipment regularly.

Pestkilling chemicals have been rather less readily adopted, partly because they are rather more expensive than weedkillers. In addition, farmers have found that some of these chemicals have toxic effects on mudfish in the fields and on farm animals such as chickens. This is particularly true of the ratkiller 10-80, which was even responsible for deaths of carabaos. Unfortunately, rats have been the major pest of rice in Mawab (and most other rice lands of Davao and Cotabato) since the mid-1950s. According to the Bureau of Plant Industry,¹ rat infestation in Davao reached a peak in 1963-4, when 51 per cent of the rice crop in Mawab was damaged. The BPI inspector in Mawab spends more time on rat control than any other aspect of his work. He believes that the uncultivated lands of absentee owners serve as a refuge for rats and thus negate control efforts. The maya bird, a kind of finch, may also cause significant damage. Other pests are occasionally as destructive as rats. They include

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Bureau of Plant Industry (1964).

rice-bugs (piangao), rice stemborers (tamasok), army worms and leafhoppers, the last-named being vectors for several diseases. Apart from chemical controls, some people use lights suspended above water to trap the adult insects, but this is too laborious for most farmers who merely try to avoid planting later than their neighbours. Total expenditure on chemical pesticides and herbicides by the 12 sampled rice growers who used them amounted to P277. Eight Ilocano growers accounted for P239 of the total.

The use of artificial fertilisers is even more restricted. In 1966-7, only four growers - all Ilocanos - used some fertilisers, either complete (NPK) or ammonium sulphate alone, which cost a total of P337. Several other farmers have tested fertilisers but found that the extra nutrients merely caused lodging. Soil samples taken in 1964 during a campaign to increase rice yields¹ indicated that most Mawab soils benefit from fertilising, but only in conjunction with improved varieties of seeds.

Such seeds have been widely adopted - two-thirds of the sampled growers used them in 1966-7, and others had used them in previous seasons. The commonest variety is BE-3, grown in the main (July - December) season. One of the most recently introduced and highest-yielding varieties, BPI-76, was grown by only two sampled farmers in 1966-7. Filipino

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Due to its extensive rice fields, during 1964-5 Mawab was one of the municipalities involved in the government's 'Crash Programme' for increasing rice production. The town received the services of four farm management technicians and two Agricultural Credit Administration personnel as well as the officer from the Bureau of Plant Industry. However, political pressures from towns excluded from the programme caused re-assignment of the extra personnel so that since 1965 Mawab has had only its normal complement of the BPI officer and one farm management technician to serve over 1,200 farms. Their attentions are still devoted almost exclusively to rice farmers.

farmers have long been willing to experiment with seeds, exchanging samples with their neighbours or with visitors from other areas. Once new varieties have been introduced by the extension agents and adopted by a few people, they are spread by unofficial demonstration. Thus, those who grew IR-8 in 1967 received many requests from neighbours for seeds for next season. None of the sampled farmers bought certified seeds in 1966-7 but several planned to do so in the following season. In the past, some farmers have complained of poor germination rates of certified seeds obtained from government agencies. The new varieties need a whole 'package' of advanced practices to give good results, but such practices are commonly neglected. As a result, yields are well below the potential (see below) and many farmers plant two or three varieties, traditional as well as recommended, to insure against failure of any one variety. Thirteen different non-recommended varieties were planted by the 22 sampled growers in 1966-7, some being grown for the first time in order to assess resistance to pests and diseases, length of growing season, yield, taste, cooking quality, milling quality and selling price.

Yields. The yields obtained by the sampled farmers varied greatly. In the main crop season (July - December) the mean output of 21 growers was 2,108 kg of rough rice (palay)/ha, but the range was from 450 kg to 5,353 kg/ha. The second crop, grown by only 16 of the sample, had a mean yield of 1,375 kg/ha, with a range between 122 kg and 3,856 kg/ha. The second crop was unusually poor as a consequence of an early drought, severe pest attacks and, according to the farmers, a disease that customary chemicals would not control.

Explanation of the differences in yields of the sample is difficult.¹ As Ruttan (1966:62) has shown for rice farmers in Luzon, conflicting results are likely to emerge from attempts to determine empirical relationships between productivity, tenure and farm size in areas (such as the Philippines) experiencing great changes in technology and in economic and social orientation and structure. The same is true for other variables such as the cultivator's level of school achievement (Morrow, 1966:380-4). The Mawab data produced no evidence of relationships between yields of the main crop and the above-mentioned variables or certain other variables including the value of inputs of chemical weedkillers and fertilisers (cf Mellor, 1966:138) and the cultural origins of the growers. However, a marked relationship did emerge between yield and the cultivator's length of residence in Mawab (Fig.5:1). The coefficient of determination (r^2) is 0.86 but the standard error is high at 441 kg.

Several factors may be involved in this general relationship. Firstly, it is probable that the land of the pioneers is better than that of later settlers who have been progressively forced to take up land poorly served with water or waterlogged. Secondly, the pioneers, with larger holdings, have higher incomes and are better able to afford innovations. They are also the main focus of effort of the extension agents. Finally, they have greater familiarity with soil and cropping conditions in the area. As Geertz (1963:35) has pointed out, the ecology of wet rice

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Attempts to explain yield differences on the basis of a single season's crop are hazardous particularly where, as in the present case, data are lacking on important factors such as variations in soil fertility, water supply, labour inputs and the incidence of pests and diseases. Moreover, the sample of 21 growers is rather small.

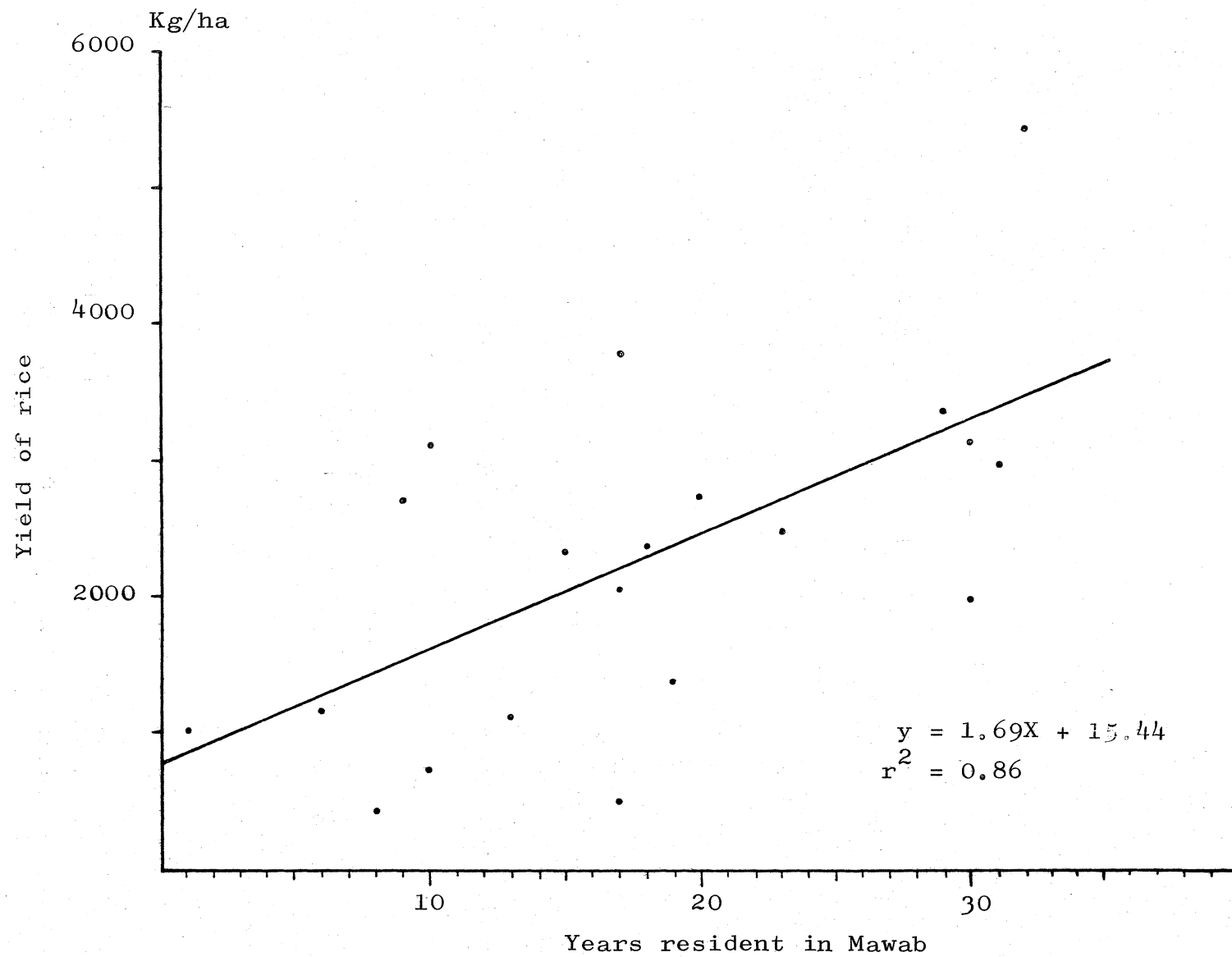


Fig.5:1 Relationship between yields of rice and length of residence in Mawab.

cultivation makes the crop particularly susceptible to yield improvements through continual refinements in techniques such as land preparation and water control. In an area of new settlement, previous experience with a crop may not immediately give good results. Rather, results depend on a long process of trial and error towards understanding the ecology of each variety of each crop.¹

Labour. It is clear from the above description that capital in the form of equipment and chemicals plays little part in rice cultivation in Mawab. The only significant capital items in most cases are a carabao and plough. As regards labour inputs, several sources of labour are available to a farmer: himself, members of his household, neighbours and friends in losong-losong (reciprocal labour exchange) and hired labour. Most farm operators perform at least part of all tasks themselves. Assistance from household members is very variable. In the Philippines, wives perform little work in the fields except at the busiest times, namely transplanting and harvesting; however, some wives do assist in weeding. Other male household members over the age of about 14 may engage in any task, but there is often no compulsion to do so and many actually do little farm work. Children aged 10 to 14 may perform a wide variety of light tasks, including caring for carabaos, desultory weeding and harvesting.

Many of the earlier phases of cultivation are carried out by losong-losong. This is common for initial cleaning of the land, for ploughing, harrowing and other aspects of

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This suggests that agronomic research stations would make a valuable contribution to spontaneous settlements. In this light, it is regrettable that the projected Bureau of Plant Industry nursery near Mawab was never developed.

preparation such as building up dykes and for planting. Reciprocal labour is used comparatively rarely in weeding and never in harvesting lowland rice. As in many other parts of the world (cf Erasmus, 1956), some farmers in Mawab have abandoned the use of reciprocal labour exchange. In part, this is because the need to return labour may occur at an inconvenient time, but more because of the large cost of providing food for their partners (cf Sibley, 1957:204). In order to avoid 'shame' (hiya), the food served by the host should be better than the usual diet and costs may be greater than those of hiring labourers at P1.50 or P2 a day each. Labour exchange groups rarely exceed eight people. The groups are formed by close neighbours who are commonly kinsmen as a consequence of the chain migration and clustering process described in Chapter III. However, this is not invariable and the principle of collaboration between neighbours applies even if they are not related. Such collaboration between people of different cultural origins is perhaps one of the major means of diffusion of agricultural information.

Those low-income farmers who dislike exchanging labour have to carry out all their operations with household labour alone. Wealthier farmers can afford to hire labourers, almost invariably for cash at a wage reaching P2 a day plus food in 1967. These labourers perform most farm operations, particularly transplanting. However, land clearing may be performed on a contract basis.

Harvesting is almost always carried out by hired labour, with or without the labour of the operator's household. When people volunteer to help harvest, the operator cannot refuse. Harvesters are paid in kind, with a proportion of the amount they reap. This proportion is variable but is usually between $1/5$ and $1/6$ of the total. If threshing is included, a further share of $1/11$ is given. Harvesters may be landless labourers but more commonly are

owners or tenants of small farms. Some depend to a considerable degree on harvesting shares for their subsistence; with a good crop, a single harvester can obtain over 12 kg a day, or enough food to last an average family for about a week.

It was, unfortunately, not possible to obtain precise data on labour inputs. Estimates by the sampled farmers of their own labour are unreliable, although their information on payments to hired labour is more accurate. The results of labour surveys in other parts of the Philippines are very variable and provide little guidance. Estimates of total man-days (excluding animal labour) for 1 ha of lowland rice include 86 days (Galang, 1950), 78 days (Sumagui, 1958), 100 days (Banogon, 1959) and about 60 days (Huke, 1963). Estimates by sample members ranged from 22 to 246 man-days/ha. It is, therefore, not possible to calculate the cost of labour inputs, apart from hired labour, and so it is not possible to calculate accurately cash returns per hectare for any of the settlers' crops. In Table 5:10 (below), the returns are calculated purely against cash expenses.

The disposal of output. Total output of rice by the 21 sampled growers in the main 1966 crop season was almost 42 metric tons of rough rice (unmilled palay) and by the 16 growers of the second crop, 22 tons, so that in total 22 growers¹ produced 64 tons. Of this, $1/6$ or 17 per cent was paid out as shares to harvesters and threshers (see Table 5:4). This share is higher than that paid in most migrant source areas, where shares usually range between $1/7$ (14 per cent) and $1/11$ (9 per cent). The difference is due to the lower availability of labour in Mawab. There is no large

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15 settlers grew two crops in 1966-7; six grew only the 'first' crop and one grew only the 'second' crop.

Table 5:2 Estimates of labour inputs in the production of selected Philippine crops (8-hour man-days per ha).

Author	<u>Lowland rice</u>		Upland rice	Corn	Abaca	Coconuts
	Irrigated	Rainfed				
Galang (1950)		86	74	55	110	no data
Sumagui (1958)	78	70	68	37	38	24

Notes: a) Animal labour excluded. b) Galang's data converted from man-hours.
c) Sumagui's data for abaca and coconuts exclude time spent on land preparation and planting.

Table 5:3 Disposal of lowland rice output, by tenure of rice land. (Metric tons of rough rice).

	Tenure of rice land			
	Owned		Rented	
	Tons	Per cent	Tons	Per cent
Harvesters' and threshers' shares	8.9	18	1.8	13
Landlords' shares	0	0	4.1	31
Seed	0.7	1	0.2	1
Creditors	0.5	1	0.1	1
Retained for consumption or later sale	18.3	36	6.2	47
Sold	22.4	44	0.9	7
TOTAL	50.8	100	13.3	100

Table 5:4 Percentage disposal of rice, Mawab 1966-7 and Mindanao and the Philippines, 1954-5.

	Mawab 1966-7	Mindanao 1954-5	Philippines 1954-5
Harvesters' and threshers' shares	17	14	11
Landlords' shares	6	4	35
Seed	1	4	3
Retained for consumption or later sale	39	68	35
Sold	36	9	16
TOTAL	100	100	100

pool of labour at all times as in the migrant source areas,¹ so competition for available labour raises rates of payment [cf Hester and Mabbun (1924:381) for similar conditions in the Cagayan valley colonisation area in the 1920s]. Although most sampled farmers calculate that on an annual basis they may do no work for up to one-quarter of their available time, their slack periods are naturally the times when other farmers also need little work done.

Like harvesters, tenants in Mawab enjoy more favourable conditions than those in more densely settled parts of the country. The demand for tenancies in Mawab is less than that in most migrant source areas and dissatisfied tenants can easily obtain alternative tenancies. Consequently, landlords tend to be more lenient both in general conditions and in the rentals they charge. In Mawab, landlords' shares amounted to 36 per cent of the produce of rented rice land after deduction of harvesters' shares, compared with up to 50 per cent elsewhere.² For purposes of comparison, the Mawab data are shown with those in von Oppenfeld *et al.* (1957:130-1). Von Oppenfeld's data show that the favourable conditions of tenants and labourers described for Mawab were general for Mindanao.³

Table 5:4 also suggests an increasing commercial orientation among rice farmers in Mindanao. In 1954-5, only

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This is not true of all source areas. In some, out-migration has severely depleted the local labour force and wage rates are consequently higher than usual. In Igaras, Iloilo, in 1967 rice harvesters received 2/9 of the amount they harvested (field observations).

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Von Oppenfeld *et al.* (1957:99) showed that 76 per cent of Philippine rice-growing tenants operated on a 50 per cent sharing arrangement.

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The 111 rice farms in von Oppenfeld's Mindanao sample were located chiefly in Davao province.

9 per cent of output was sold. At that time, abaca was still the leading commercial crop in Davao and rice was grown, as the table shows, mainly for consumption. In contrast, over one-third of the rice output in Mawab is now sold, following its replacement of abaca as a cash crop. This is clearer in Table 5:3, which shows that owners of riceland sell 44 per cent of output. Tenants, on the other hand, sell less than a tenth of the output of their small farms, most being required for food.

Marketing. Rice in Mawab was at first marketed either through Chinese stores or rice mills. However, since 1960, commerce in foodgrains has been restricted by law to Filipino nationals. Since 1959, 10 rice mills have been established in the town (see Table 2:2, p.62 above). Small producers commonly sell a small amount to the rice-miller to pay the cost of milling and to obtain a little cash for urgent purchases. Larger producers mostly sell their rice unmilled but some receive a small premium by having the rice milled first.¹ It is very common for farmers to establish a close relationship, called suki-suki, with a miller or merchant. This allows the farmer to obtain goods on credit in return for which he feels (and may actually be) obliged to sell his produce to the merchant. The credit may be interest-free, because some merchants are content simply to ensure an addition to their turnover, but sometimes interest is charged, overtly or covertly, by paying a lower price for the farmer's produce. Credit may be advanced to small growers on the buyer's behalf by commission agents resident in the barrios and the agents collect the loans immediately

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For instance, a sack of palay might yield over 21 kg of milled rice, which could sell at P0.91 per kg. Deducting P0.60 for milling would yield P18.50. The sack of rice, unmilled, might have sold for P18.

at harvest. Large-scale growers are able to delay selling until prices rise. Apart from the millers, some wholesale dealers from Tagum and Davao City also buy rice in Mawab.¹

Little rice in Mawab is now milled at home by mortar and pestle, except upland rice in the most remote areas of the hills. The process of having the rice milled appears to require a considerable sacrifice in time for those farmers most remote from the mills, and particularly for farmers who have no carabao that can carry several sacks at a time. Such farmers may spend a whole day simply to have a single sack of rice milled. In terms of opportunity costs, however, such labour is cheap in the post-harvest period. Moreover, visits to the mill are social occasions and also provide chances to acquire cash and buy necessities. This is true of visits to the small mills in Saosao and Bawani as well as those in the larger centres of Nuevo Iloco and the poblacion. The mills in the more distant barrios charge more for milling (up to P0.60 per milled can of 15.4 kg against P0.30-0.40 elsewhere). However, few farmers have sufficient output to warrant hiring a jeep at P1 per sack (of 49 kg) in order to take advantage of the cheaper milling costs and higher selling prices in the poblacion. This resulting differential in conditions according to distance from the poblacion is in effect economic rent and this accrues to the earlier, more centrally located settlers. As these also have larger holdings and higher output, their advantage over later settlers is augmented. The effect in terms of income will be seen in Chapter VI.

Corn

Production methods. As with rice growers, some settlers cultivate their corn fields with carabao and plough, but

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Neither the millers nor the dealers keep detailed records so it is not possible to calculate the total amount of rice 'exported' from Mawab rather than sold locally.

most use hand tools (principally bolos of varying shapes) because their fields are in the uplands where large areas are too steep for carabaos to work efficiently. There are therefore major differences in the quality of land preparation between farmers who plough and those who do not.

Table 5:5 Ownership of carabaos among 38 corn growers.

Tenure of operator	<u>Carabao</u> owned by				No <u>carabao</u> , or not used for corn field
	Operator	Landlord	Other person		
Owner or squatter	6	0	0		16
Owner renting corn field	2	0	0		2
Tenant	6	1	1		4

In the lowlands, corn may be cultivated continuously or rotated more or less haphazardly with mongo beans (Phaseolus aureus Roxb.), sweet potato (camote) or a grass fallow. Land preparation presents little difficulty and the fallows are usually of short grasses rather than the Imperata type. Fields may be ploughed once or twice and then harrowed. Planting rows are made by the plough and three to five seeds planted at intervals about 35 cm apart. The seeding rate is generally around 9 kg/ha. The growing crop may be weeded once or twice, by plough or by hand. Shelling may be done as soon as the ears have been sun-dried or at intervals, and is almost invariably by hand. As with rice, home pounding of the grain is rare.

Upland farmers may grow corn for up to five years on the same piece of ground before planting sweet potato,

upland rice, a permanent crop or leaving the plot fallow. As noted above, the fallow is unlikely to exceed three or four years and on holdings under 5 ha with part in permanent crops the fallow may last only a few months and so will have slight restorative value. Recent occupants of hill land are still engaged in primary clearing of forest and their crops are planted in normal swidden fashion among the fallen logs and stumps. Cleared second-growth is more thoroughly removed and the crop planted in more continuous stands, though the soil surface is still not thoroughly worked. However, when the fallow is of grass, the farmer has to work over the soil thoroughly to eliminate roots. Thus, although grass fallows are effective in checking erosion, subsequent cultivation creates an extreme risk of erosion as over half (51 per cent) of the corn plots of the sample occupied slopes greater than 10° (Table 5:6).

Table 5:6 Number of corn fields by slope category

Degree of slope	Observed (by level)	Estimated	Total	Per cent
0° - 4.9°	7	12	19	32
5° - 9.9°	3	7	10	17
10° - 19.9°	7	3	10	17
20° - 29.9°	3	4	7	12
30° and over	6	7	13	22
TOTAL	26	33	59	100

Two of the sampled farmers try to reduce erosion by laying tree trunks across the slope, but make no effort to support or replace them as they rot; another farmer plants bananas across the slope to check run-off. Apart from these measures, the hill farmers say that they do not know how to cope with erosion, although almost all of them have

noticed signs of soil loss and some have deep gullies on their land.

Once a hill plot has been prepared, the corn is planted in holes made by a bolo or digging stick. The average seeding rate is again about 9 kg per ha. Weeding is carried out by hand, with the weeds left on the surface as a form of mulch. Thereafter, harvesting, shelling and milling are the same as for lowland growers.

The cultivation of corn has received very much less attention than rice from administrators, agronomists, extension agents and even, commonly, farmers themselves (cf Hooley and Ruttan, 1969:249). The Bureau of Plant Industry carries out pest and disease control work among corn farmers, but lack of personnel and their concentration on rice growers means that few corn farmers receive assistance. The BPI inspector in Mawab is never able to visit hill areas, despite their heavy population. Migrants continue to use the same methods and, as far as possible, the same varieties that they used in their home areas. Any changes that have been made have been minor ones.

The commonest change made is the use of DDT to treat the seeds before planting. Twenty-two of the 38 sampled growers used DDT and two others used kerosene as an insect repellent. Most of these had not used these methods before coming to Mawab. Some farmers buy DDT locally but many obtain it illicitly from the Malaria Eradication Unit spraying team. Apart from DDT, very few chemicals are used by corn growers. In 1966-7 two Ilocano growers in the lowlands sprayed Endrin on their corn against stemborers and some other growers claim to use sprays occasionally. The lack of pest control measures is the major cause of poor harvests, as stemborers and army worms are particularly prevalent. The former may reduce output by 50 per cent or more. The Ilocanos also sometimes use fertiliser, but not

during 1966-7. In the hills of Tuburan barrio, some farmers utilise guano from the limestone caves as fertiliser. While this practice is new to some farmers in the area, it is well established in many other parts of the Philippines with local sources of guano. Although corn is weeded more regularly than rice, none of the farmers in the sample use herbicide sprays to save labour. In part, this seems to be due to a feeling that the low price of corn does not justify the expense. In addition, corn is more susceptible than rice to 2,4-D, which must be applied before the corn reaches 50-100 mm height. Weeds can easily regenerate after such early spraying so that manual weeding is necessary later. Moreover, many weeds in dry land are not susceptible to 2,4-D or other hormonal weedkillers (Webster and Wilson, 1966:148-9).

As corn is milled into grits, all the varieties grown are 'flint' types. There are in fact very few varieties in Mawab, with Tinigib occupying over three-quarters of the area, Kalimpos most of the rest and Padada only a little. There is almost none of the constant exchange and experimentation as with rice varieties - largely, of course, because of corn's comparative lack of varietal richness in the Philippines. Agronomic experiments with corn are only just beginning to develop high yielding fertiliser-responsive strains for the Philippines comparable to the new rice varieties and they are not yet available in Mawab.

Yields. The utilisation of land recently cleared from mature or regrowth forest has given Mawab farmers a level of corn output far higher than that obtained in the depleted, long-cultivated and eroded lands of Cebu, Bohol, Leyte and Ilocos. Some farmers estimate their yields to be four times higher. Owing to the non-seasonal nature of the climate and the practices of double- or triple-cropping and rotation, there are in Mawab no clearly defined 'first',

'second' or 'third' crops whose yields can be compared. It is only meaningful to discuss the aggregate of output over the year. The mean yield in 1966-7 was 1,200 kg/ha, compared with the national average of 868 kg/ha and an average in Cebu of only 400 kg/ha (Bureau of Agricultural Economics, 1967). There is a wide range of yields from individual plots, with the highest recorded in 1966-7 reaching almost 3,000 kg/ha, but very few fall as low as the mean for Cebu. A few farmers achieve high yields fairly consistently, but for the majority yields are very variable, depending upon the interplay of many factors but particularly the frequency of cropping on the plot concerned, timing and adequacy of rainfall, thoroughness of cultivation and incidence of pests. Some of the highest yields from long cultivated plots are obtained after a crop of mongo beans or peanuts, but there has been little research to establish the most favourable cropping systems for upland farmers in the Philippines¹, in contrast with the situation in East and West Africa (Webster and Wilson, 1966:179-83). Consequently, the course of upland farming in colonisation areas as typified by Mawab seems likely to follow that of the uplands in other Philippine islands, leading to disastrous losses of soil and falling output (cf Chapter I).

Labour. Labour resources available for corn production are basically the same as for rice but corn requires much lower labour inputs (see Table 5:2) and also lacks the periods of urgency associated with transplanting and harvesting of rice. Lowland corn farmers with carabaos commonly use losong-losong labour for field preparation, planting and weeding. Farmers using hand tools to cultivate

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Thailand resembled the Philippines in this regard but an Upland Development Station was established there in 1967 (Chapman, 1967:14).

0.5 ha or less rely more frequently on household labour, though clearing and preparation of land and planting may be on a labour exchange basis. Hiring of labour is less common than among rice farmers except for those farmers with large corn areas or with considerable incomes from cash crops. Harvesting is normally carried out by volunteer labour paid in shares averaging rather less than one-sixth, but in Tuburan barrio harvesting is by losong-losong, while many small growers harvest their crops without the use of outside labour.

Disposal of output. Disposal of the corn crop is shown in Table 5:7. Total output in 1966-7 amounted to 78.6 metric tons of shelled corn. As with rice, the conditions for both labourers and tenants are more favourable than in the migrant source areas. The share of total output accruing to harvesters is about one-seventh or 15 per cent, but harvesters receive almost one-fifth of the output from tenant farms which are the major producers. Landlords receive 27 per cent of the amount held by tenants after deducting the harvesters' shares. Thirty-six per cent of total output is retained and under 30 per cent sold. In the main migrant source areas, shares for harvesters and landlords are similar to those among rice farmers, that is, 9 - 15 per cent for harvesters and up to 50 per cent for landlords.

Almost half of the small-scale farmers grow corn purely as a food crop and less than a fifth of the corn growers in the sample receive a major share of their income from corn. Nevertheless, many small growers depend on sales of part of their output to meet urgent cash needs and some may substitute root crops in their diet to make corn available for sale. Thus the economic importance of corn is much greater than might be assumed from the small impact made on the landscape by the small plots, compared with the extensive contiguous areas under rice or coconuts.

Table 5:7 Disposal of corn output, by tenure of corn land. (Metric tons of shelled corn)

	Tenure of corn land			
	Owned or squatted		Rented	
	Tons	Per cent	Tons	Per cent
Harvesters' shares	1.0	5	10.5	18
Landlords' shares	0	0	13.2	22
Seed	0.2	1	0.5	1
Creditors	0.5	3	1.1	2
Retained for consumption or later sale	13.7	72	14.8	24
Sold	3.5	19	19.6	33
TOTAL	18.9	100	59.7	100

There is a very marked difference between owners and squatters on one hand and tenants on the other in the marketed proportion of output. This largely results from the sizable tenant-operated farms in Nueva Visayas and Andili. Three tenants there sold 71 per cent of all the corn marketed by the sample. Only four other farmers each sold more than 625 kg (10 sacks) of corn, and 17 growers sold none at all. While corn, like rice, serves a dual purpose as both food and commercial crop, its comparatively low price reduces its value as a commercial crop. At the same time, its yield in local conditions makes it preferable to upland rice as a food crop, the latter averaging only 760 kg/ha.

Marketing of corn is basically the same as that of rice, except that the use of barrio agents by millers and dealers is less prevalent. One miller in Andili encourages use of his mill by providing free transportation along the roads

for both large and small-scale growers. As with rice, prices are higher in the poblacion and higher still in Tagum and Davao City, but most people find it more convenient to patronise the closest buyer, with whom they may have a suki-suki relationship. However, one of the comparatively large-scale tenant growers in Nueva Visayas sold 4,000 kg of corn in Davao City, making several journeys on a bus which allowed passengers to carry up to 7 sacks free. The price differential was 6-8 centavos per kg so that transportation costs were relatively insignificant. There is therefore considerable scope for increasing returns from sales of corn, but for most growers this cannot be realised until they can avoid the credit-and-marketing relationship with local storekeepers.

Abaca

The cultivation of abaca in Mawab today still follows the same practices as before the mosaic disaster, except that growers are now more willing to destroy diseased plants.

Except when interplanted, abaca is planted at a spacing of 2.5 m to 3 m. Weeding is carried out usually three or four times a year during the early stages of growth, but less frequently thereafter. Although fertiliser can increase both yields and resistance to disease, it is little used - only one sampled grower applies fertiliser regularly. At harvesting, the mature stems are 'tumbled' (cut down) and the fibre-bearing sheaths separated from the fibre-less core. The fibres are then stripped from the sheaths by hagotan.¹ The residual pulp, or bagasse, is seldom returned to the field.

¹

The stripping machine or hagotan consists of a revolving spindle driven by a 5 or 10 hp diesel motor. In 1960 nearly a quarter of the abaca growers had their own hagotans, but most of these were sold as the growers abandoned abaca.

Apart from the very few growers practising fertilisation and chemical pest and disease control, there are no significant variations in cultivation practices. Nor is there now much experimentation with different varieties. Only two major varieties are grown in Mawab: Bungulanon, which is cited by Kirby (1963:329) as having an average annual yield of 651 kg/ha and Tangongon, with an average yield of 930 kg/ha. Despite its lower yeild and shorter life, the first variety continues to be popular because it is more adaptable to different soil types and moisture regimes; it also resists lodging and matures more quickly.

The estimation of yields is made difficult by the practice of interplanting abaca with other crops; also, a stand may contain plants in different stages of growth. In addition, growers do not necessarily harvest their abaca as often as they might, so actual yields do not reach the potential. In its Annual Report for 1964 the Bureau of Plant Industry Regional Office in Davao City estimated a fibre yield of 310 kg/ha at each stripping so that three strippings a year would yield 930 kg/ha. However, estimates in the same publication of area and output of abaca in Davao imply a mean yield of only 506 kg/ha. In the research sample, yields ranged between 253 kg and 885 kg/ha and averaged 553 kg/ha.

Farmers with small abaca plots perform most cultivation tasks themselves or in losong-losong, which may extend to carrying the stripped abaca bales to the nearest road for transport to market. For such farmers, the major cash expenditure arises from hiring a stripping machine, which costs up to 12 per cent of the value of output. More prosperous farmers can afford to hire casual labourers for planting and weeding, at P1.50 - P2.00 per day in 1967. These farmers also engage labourers to harvest and strip the abaca, usually in gangs on a contract (pakyaw) basis. They

are paid between 15 and 25 per cent of the receipts. Using a hagotan a man can produce 20-30 kg fibre per day. At P0.70/kg, 20 kg would yield P14.00, so a 20 per cent share would be P2.80. This sum also covers the period spent in harvesting the abaca. Thus, strippers' receipts may or may not exceed the normal daily wage, depending on abaca prices which fluctuate from week to week (cf Caintic, 1959:426-7). Some therefore prefer to receive the fixed daily rate if the employer offers it.

In 1966-7, 11 of the sampled farmers sold a total of 6,860 kg of abaca for a gross return of P5,068. Table 5:8 shows the cash expenses incurred by these producers. Most

Table 5:8 Receipts and expenses of 11 abaca growers, 1966-7.

<u>Nature of expense</u>	<u>P</u>	<u>Per cent</u>
Hired labour for cultivation	113	9
Hired labour for stripping	731	56
Fertiliser	30	2
Fuel for <u>hagotan</u>	22	2
Hire of <u>hagotan</u>	316	24
Landlord's share	4	neg.
Transportation	86	7
Total expenses	1,302	100
Gross receipts	5,068	

neg. = negligible. Only one tenant sold abaca in 1966-7. Total receipts were P16 and the landlord received 25 per cent.

growers sell their abaca to the Chinese store owners in Andili or the poblacion, with whome they usually have suki-suki relationships.¹ However, a few producers can

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Yengoyan (1966a) and Caintic (1959) have discussed respectively the marketing of abaca by the Mandaya in the Pacific Cordillera east of Mawab and by settlers in the nearby municipality of Compostela.

exercise freedom of choice and sell abaca in Tagum where prices may be 5-10¢ per kg higher than in Mawab.

In 1966-7, returns from abaca compared favourably with those from corn and copra, though not from lowland rice (Table 5:10). However, abaca requires rather higher labour inputs than either corn or coconuts (see Table 5:2). If hired labour and hired stripping machinery are used, the cash returns may be drastically reduced. In 1966-7, the six growers who hired both labour and machinery spent 28 per cent of their gross receipts on these factors. As labour is the major expense in production, and in view of both the ever present danger of mosaic virus and the price decline noted in Figure 4:1, it is not surprising that many farmers have preferred to accept lower returns from other crops.

Coconuts

Coconuts are frequently referred to as a 'lazy man's crop' since they produce nuts for many years with little attention. Like other crops, they respond to good maintenance and the use of fertiliser increases both yields and disease resistance. In the Philippines, however, there has been little adoption of good management practices by small-scale growers (Hicks, 1967:16). This is true of the settlers in Mawab.

The more wealthy settlers buy their seed coconuts from plantations on Davao Gulf, and some in turn sell seedlings to other settlers. Once some palms are bearing they use the nuts to extend their stands before commencing copra production. Spacing usually conforms to the recommended distances of 8 to 10 m and on larger holdings and level ground the lines are regular (Plate 4:2). Elsewhere, planting is less regular. New plantings are kept clean of weeds largely through catch-cropping of corn, upland rice or sweet potato or by interplanting faster-maturing

perennials such as abaca, banana, papaya and coffee. Once a good canopy has developed, the plot may be cleared only two or three times in a year.

Apart from the slashing of grasses and weeds, which are left as a mulch, the only maintenance carried out is the control of insect pests, particularly the Asiatic (Red) Palm Weevil [Rhynchophorus ferrugineus (Ol.)]. This is customarily controlled by cutting out affected tissues and 'smoking' the holes. This is a temporary remedy that also harms the tree and improved measures using cyanide poisons are being adopted by larger growers, though none of the sampled settlers used these in 1966-7.

Harvesting is usually carried out by using a pole, often with a knife attached to bring down the nuts. Some farmers prefer climbing the trees, which is also necessary in gathering tuba, and the trees may be notched to make footholds. Such notches often become sites of pest infestation. Some nuts are used domestically but the majority are used to make copra. All but three of the sampled farmers sun-dried their copra; the others have crude smoke kilns. Only a few of the largest producers in Mawab have properly-fashioned hot air driers.

In view of the small amount of labour required by coconuts and of the comparatively low returns, small-scale producers carry out all production operations themselves. Wealthier producers hire labour at any or all stages, but particularly for harvesting and preparing the nuts for drying. Planting and weeding is paid for at a daily rate of P1.50, but harvesters receive one-third of the receipts. As tenants are committed to pay the landlord at least 50 per cent of the receipts, they always do their own harvesting. However, few landlords, except absentees, care to operate coconut plantations through tenants because the sporadic labour requirements make the use of hired labour more economical.

three sampled growers sold tuba worth in total P235. One other man rented six trees which yielded tuba worth P730 in return for P72 rent. One of the sampled growers received P144 in rent from a tapper using his trees. The only cost in tuba production by tree owners is the opportunity cost of labour, and the returns are high.

Coffee

It is common for Filipino farmers to have a few unkempt coffee trees, as well as coconut palms, beside their houses to serve their family needs. When coffee trees are planted by these farmers in larger numbers for commercial reasons, the standard of cultivation and maintenance changes little. The trees may be planted at more or less regular (between 2 m and 4 m) spacing, but weeding is frequently neglected unless the crop is intersown with either annual crops, such as corn, or other permanent crops. Only four of the sampled growers claim to prune their trees. When coffee prices are high, as in the late 1950s and in 1967, it is common for growers to use pesticide sprays, the poorer growers borrowing the equipment from more prosperous neighbours. During periods of lower prices, as from 1960 to 1964, those growers who do not remove their trees neglect maintenance practices and rarely harvest the crop. In consequence, the trees are not in good condition when the growers want to revive production. Such periods of neglect lead in particular to severe pest infestation, which has on occasion required destruction of stands.

During 1966-7, the sampled growers used only family labour in coffee cultivation. In the uplands nearly all the sampled squatters planted newly-cleared land to coffee. For the same reasons as with the other tree crops, it is not possible to assess total output or average yields of the sample, but 17 of the growers marketed 273 kg, for a return of P641. One man spent P12 on a pesticide and the only other

cash expenses totalled P8 for transportation. Coffee can give good returns for little outlay of cash and relatively little effort in periods of high prices, but prices have proved too uncertain for growers to rely on coffee; hence, the new plantings are commonly intercropped with coconuts.

Comparison of returns from major crops

The comparative gross and net cash returns per hectare obtained from the major crops in 1966-7 are shown in Table 5:10. It should be noted in the light of earlier comments that the calculation of cash returns, as of physical yields, to abaca, coconuts and coffee is complicated by several factors and the values shown in the table are indicators rather than precise values. It is clear that lowland rice was by far the most valuable crop produced by the sampled settlers, even after deduction of expenses which account for 22 per cent of the gross value of output. The major expense is hired labour. Wages in kind (chiefly harvesters' shares) amount to P3,558 and in cash to P828. Total expenses on chemical inputs (fertilisers, pestkillers and weedkillers) are only P580 and expenses on irrigation fees and transport only P85.

The value of rice is further evident in the fact that upland rice ranks third in returns per hectare even though the average yield obtained by the sampled farmers was only 760 kg/ha, compared with 2.1 tons/ha for main crop lowland rice. Upland rice grown by comparatively isolated hill farmers is mostly harvested without hired labour and expenses account for only 12 per cent of the gross value of output.

Despite its current lack of popularity as a cash crop, abaca was the second most valuable crop grown by the settlers in terms of returns per hectare. In part, this was because two of the larger growers in the sample had their own stripping machines so expenses were comparatively low.

Table 5:10 Value of output per hectare of major crops of 46 settlers, 1966-7. (Pesos).

Crop	Hectares harvested	Gross value of output*	Total expenses ^a	Net value of output	Mean value per ha
Lowland rice	36.0	22,660	5,052	17,608	489
Abaca	12.4	4,621 ^b	1,187	3,434	277
Upland rice	5.2	1,342	159	1,183	225
Corn	63.9	14,469	2,905	11,564	181
Copra and <u>tuba</u>	25.6	3,115	34	3,081	121
Coffee	5.5	438 ^c	6	432	78

* Does not include abaca, coconut products and coffee consumed on the farm.

a Cash and kind (excludes rent and value of family labour).

b Data for one grower were excluded as his harvested area was unknown. Therefore, the total differs from that in Table 5:8.

c Data for two growers excluded so total differs from figure given in section on coffee.

In addition, the intensity of harvesting was unusually high because several of the growers harvested practically all their plants, including immature ones, owing to incipient mosaic infection. In normal years, returns would be rather lower.

Corn exceeds coffee and coconut products in both gross and net value of output per hectare, but production expenses are much higher, forming 20 per cent of the gross value of output. As with rice, these expenses consist mainly of labour costs, which amount to P2,835. However, 71 per cent of the labour costs, in cash and kind, are incurred by three comparatively large-scale tenant farmers in barrio Nueva Visayas who produce 54 per cent of the gross value of output. Labour costs account for only 12 per cent of the value of output of the other growers, many of whom do their own harvesting.

It was noted above that most of the settlers' coconut palms and coffee trees have not yet reached full bearing capacity, so the calculation of returns is rather hazardous. Thus, coffee appears to give a net return of only P78/ha although prices were unusually high (P2.50 - 3.00/kg) in 1966-7.¹ Similarly, returns from copra and tuba appear rather low in view of the comparatively high copra prices (Figure 4:1). The apparent returns from both crops are depressed by exclusion of the value of domestically-consumed coffee and coconut products (affecting coffee in particular). However, the main reason for the apparent low returns is the inclusion of immature trees in the area harvested.

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Data in Tryon (1968:Appendix Tables B-1, 3, 8 and 9) suggest an average 1966 price for coffee of P1.40/kg and a mean yield of 940 kg/ha, giving a gross return of P1,316/ha. This figure, based on estimates at the national level, seems dubiously high.

Other farm enterprises

The crops described in the sections above are those that have the greatest commercial and subsistence value to the settlers and that occupy the most significant areas of land. There are also many minor farm enterprises in Mawab.

Root-crops, particularly sweet potato, taros, yams and cassava, are of importance to many hill farmers and indispensable to some, though they do not occupy large areas of land. Such crops, together with cooking bananas, are known as duma, in contrast to 'real food', bugas, which is rice or corn. There is a small market for sweet potato, both in the poblacion and among some upland farmers whose own harvests have been inadequate. A marked dependence on root crops is a sign of poverty, particularly when cassava is a major part of the diet. Only one sampled farmer grew cassava, but three others relied heavily on other root crops. Farmers in this state are little, if any, better off than they were before migrating except in so far as they may regard a small plot of land as their own, even if only by squatting.

Other crops that are grown in very small plots include many kinds of vegetables, planted in 'kitchen gardens' or, less commonly, in small patches in the fields proper. Areally, such crops are insignificant but they are important dietetically and a few people earn considerable sums by selling vegetables, particularly onions and mongo beans, in the markets at Mawab, Masara and Tagum.

Tree fruits are similarly areally insignificant but often a valued source of income. This applies particularly to durian (Durio Zibethinus Mum.) and lanzones (Lansium domesticum Correa). These are so highly prized that dealers from Davao City employ agents to contract for the crop of even single trees. 200 lanzones trees might bring a P1,000 contract, with the buyer responsible for harvesting. A

durian tree may yield 50 fruits which might sell at P1 - 1.50 each. As yet, few farmers have planted such trees extensively. In total, 18 sampled settlers sold vegetables or fruits in 1966-7 for a gross return of P1,911.

Apart from the carabao, animals are of minor significance in Filipino agriculture and this is true in Mawab. Cattle are not kept and horses are very rare. Pigs are kept by almost all households, but they receive little attention, meriting the description of 'longnosed, narrow-bodied and flat-sided garbage collectors', (Rivera and McMillan, 1952:131). However, pigs have considerable social importance as a prestige food at barrio fiestas and other ceremonial occasions. Also, full-grown boars and sows may fetch P100-200 when sold, while piglets fetch P20-30 when sold as sucking pig (lechon). Farmers are thus keen to own pigs and the practice of alima, obtaining a 50 per cent share of offspring by caring for a sow, is very widespread. Unfortunately, pigs are very disease-prone and losses are high. In 1966-7 a pneumonia epidemic in Malinawon and Tuburan decimated pig numbers. There are two pig-dealers in Mawab who buy all the pigs locally available. They butcher some for sale in Mawab market, but most of the pigs are sold to larger dealers from Tagum and Davao City. Goats are owned by some settlers but are not widespread. Poultry are reared in small numbers on practically every farm, chiefly for domestic consumption, but chickens and eggs provide valuable sources of income for many small farmers. They are sold both in the markets and direct to consumers. Generalised livestock production in 1966-7 by the sampled settlers is shown in Table 5:11. Pigs accounted for over P3,300 of all livestock sales and P485 of livestock purchases.

Table 5:11 Total value of livestock production
by 50 settlers, 1966-7.

	<u>Pesos</u>
Net sales	4,748
Consumption	2,355
Net change in inventory	-1,475
Total value of production	<u>5,598</u>

Innovations in crop production

It is natural that an area of colonisation should be one of changes in both crop patterns and in cultivation techniques, particularly when the colonists come from areas that are both physically and culturally diverse from each other and from the area where they settle. Moreover, as Mellor (1966:186) has commented, '...a new settlement project, with its lack of cultural traditions, may provide a more favorable environment for technological change than a traditionally settled area.'

On the other hand, on newly cleared land, old agricultural techniques may return much higher yields than in the source areas and this may inhibit changes. In addition, the generally larger farms of a colonisation area may produce a higher income than the cultivators were accustomed to, without the need for intensifying production techniques.

In Mawab, elements of both conservatism and innovation are present. New crops and new techniques have been adopted, but many people have made minimal adjustments in their farming methods.

The dominance of abaca in Mawab for thirty years and the restricted areas devoted to it outside Davao province (see Table 1:7) meant that up to the mid-1950s most immigrants adopted a completely new crop as their major

commercial undertaking. Only Leyteños were likely to have had experience with abaca before migrating, though others acquired such experience in Davao before reaching Mawab. Two-thirds of the settlers who grew abaca in Mawab had no previous experience with the crop and learned the necessary techniques by observation and consultation with neighbours and by working in losong-losong. Thus their subsequent practices depended largely upon those of their neighbours. The same is true of people who adopted other crops, at least up to the mid-1950s. At this point, the national government under President Magsaysay established effective agricultural extension services and innovative farmers were then able to obtain information and assistance from trained advisors rather than relying on their own initiative. Such farmers were then in a position to pass on changes to receptive neighbours.

Some of the changes that have taken place in Mawab have been almost universally adopted, such as the treatment of corn seeds with DDT. Others, such as the use of fertilisers and pesticide sprays, are still used regularly by only a few settlers. It is noteworthy that most of the widely-adopted improvements have been those requiring little or no cash expenditure, while several practices have been tested but rejected on grounds of expense. An outstanding example of the latter is the Masagana-Margate systems of rice planting. Utilising straight lines and accurate spacing, these methods require a larger labour force that works more slowly than with the customary casual methods. Although the new methods economise on seeds, these are rarely a cash expense. Furthermore, the open spacing of the Masagana-Margate systems is said to allow denser weed growth and hence further expense in either labour or herbicides. The increment in yield should more than repay any extra expense (Covar, 1960), yet very few of even the wealthiest

farmers have accepted this innovation (cf Pal, 1963:95). The reasons usually given locally are the expense of chemical inputs and the large labour requirements and it may be that the labour supply in Mawab is still insufficient for the widespread use of labour intensive methods.

Fertilisers too are not widely used. Most farmers consider fertilisers are only suitable for rice and that their use on Mawab rice soils will simply cause lodging. However, the increasing adoption of dwarf, stiff-strawed rice varieties responsive to heavy doses of fertiliser is likely to lead to increased use of fertiliser at least among the wealthier farmers.

Most innovations in Mawab that have significant direct effects on yields are those used in cultivation of lowland rice.¹ They are also, with the exception of improved seed varieties, those that require recurrent expenditure. It is, therefore, not surprising that the leading innovators are the settlers with the highest cash incomes, nor, further, that a high proportion of these are the pioneer settlers who occupied large homesteads and enjoyed many years of high incomes from abaca before converting most of their land to rented rice farms. Although these settlers use modern production inputs on their own farms, most do not require their tenants to do so and often are not prepared to contribute any of the cost if a tenant buys chemicals or fertiliser. Few tenants are willing to bear the full cost of such inputs when they receive less than the full benefit of any increment (cf Ruttan, 1966:47-8). Thus a landowner's well-kept rice plot may be surrounded by tenants' plots that

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This contrasts with the situation in some other parts of south-east Asia (cf Penny, 1964:166-7; Chapman, 1967:9) and reflects the importance of rice as a cash crop in Mawab.

have received less care and that may harbour pests which the landlord has attempted to eliminate from his own plot.

Not all the pioneers have become innovators. The leading innovators in fact belong in the main to two overlapping classes: the pioneers and the Ilocanos. The Ilocanos in Mawab bear out the group's reputation of being more hard-working, thrifty and productivity-oriented than other Filipino cultural groups. Of the ten sampled settlers who have adopted the widest range of innovations, five are pioneers, that is, pre-war settlers, and seven are Ilocanos. One thing is common to all ten: above average returns from their land and in nine of the ten cases, family incomes averaging over P3,750¹ compared with the sample mean of P1,500. One other characteristic is worthy of note. Only half of these leading innovators are Roman Catholics. Three belong to Protestant denominations, one is a Seventh Day Adventist and the last belongs to the Aglipayan church, a Filipino offshoot of the Roman Catholic Church. These settlers are in fact the only non-Catholics in the sample. Four of the non-Catholics are Ilocanos and this may be the more important element, but the research data are insufficient to draw firm conclusions.

The Ilocanos and other innovators have in recent years obtained information directly from the Mawab representatives of the Agricultural Productivity Commission² and the Bureau of Plant Industry. These are their most important sources of information, but most also listen regularly to Davao City radio broadcasts both for agricultural programmes and for

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The exception is an Ilocano tenant on one hectare, with a family income of P960.

2

The Agricultural Productivity Commission was known as the Bureau of Agricultural Extension until 1963.

advertisements by manufacturers of production inputs. A few also regularly receive newspapers and magazines.

In contrast, most farmers do not use primary sources of information. Out of 85 changes made by the sampled settlers, in almost half the cases the source mentioned was 'neighbours'. In several other cases, 'Ilocanos' were specified as the source. While this last point suggests that the extension agents are following the best policy by concentrating their attention on pioneers, particularly Ilocanos, it should be noted that these agents virtually never work outside the plain, and mostly only with the larger farmers (except at the initiative of smaller farmers), so that the receptivity of most farmers to advice from official agents of change has not yet been tested. It should further be pointed out that this is no fault of the official agents, as there are not enough of them and they have no transportation facilities except for a bicycle. Furthermore, neither is trained to deal with many of the problems that face upland settlers, in particular problems related to crop rotations, fallowing and methods of erosion control.

Non-agricultural occupations

Most settlers have a considerable amount of time available in which to undertake non-farm activities, whether self-employed or dependent on other people for employment.

One of the commonest opportunities for non-farm work is handsawing of lumber, the main occupation of one of the sample and a major source of income for several others. The only equipment necessary is a handsaw, worked with a partner. New houses are constantly being built by both immigrants and established settlers improving their conditions, and there is a large demand for sawn lumber. Handsawing is usually on pakyaw (contract) for a given

quantity of lumber but may be carried out for a daily rate. A concomitant of handsawing is the demand for skilled carpenters, who are rarer and are literally sought out by intending builders.

Several other activities give greater independence to those practising them. The most rewarding financially is trading, that is, buying produce for resale in the markets at Mawab, Andili and Masara. This is largely, but not exclusively, an activity of women, who may thereby become the main income earners in their households. Women also practise a traditional form of midwifery, and a small number of men (including two in the sample) practise herbal medicine and massage. Particularly skilled practitioners are in high demand and may be well rewarded, with payment of P10 or more. Some, however, work for merely token payment. A less rewarding activity is the manufacture and sale of home-made rice-baskets, mats and brooms, often on contract.

Casual labour is a valuable but unreliable source of income for poor families. Unskilled work for loggers is still common, though declining as more of the hills are logged-over and occupied by squatters. A rare source of casual employment (except just before elections!) is in municipal public works. Municipalities control very limited funds and can undertake few developmental, or even maintenance, works such as road or bridge-building. It is generally said in the Philippines that employment in public works projects is dependent upon either political affiliation or the operation of reciprocal obligations (utang na loob).¹ However, in a recent analysis of political aspects of public projects in Davao, Cariño (1967) produced evidence to show that these considerations are not always, perhaps not even usually, the case.

¹ This term, meaning literally 'debt of gratitude', is explained in Lynch (1964).

Chapter VI

THE ECONOMIC CONDITIONS OF SETTLERS

In the preceding three chapters, differences have been noted between the settlers according to their time of arrival in Mawab, which influenced the location and areas of land they obtained, the tenure by which they hold land, and the production and disposal of their crops. This chapter presents information on the incomes received by settlers in 1966-7, the levels of their capital assets, and their access to and use of credit. The aim is to show the effect of these differences on settlers' economic conditions rather than to present a detailed farm business analysis as such.

Incomes in 1966-7

It is not possible to draw firm conclusions about the income levels of individuals on the basis of data for a single year which may be strongly influenced by chance events. Nevertheless, even within the small sample under discussion, the data in aggregate serve as a useful guide to the nature and range of variations in income between groups and they reveal some of the factors involved in these variations.

To derive measures of income, first of all the gross value of farm output¹ in 1966-7 was calculated for each

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No attempt was made to record total production of minor crops such as tubers, vegetables and fruits for which farmers' memories would have been too unreliable. However, sales of these products were recorded and included in the value of output. The exclusion of home consumption of these products may result in significant underestimation of income for those few settlers who rely on these products for a considerable part of their food supply.

settler. Crops sold were valued at actual prices received and those not sold were valued at average market value over the year. The value of livestock production, incorporating net sales, change in inventory and consumption, was included in the gross output. Production expenses and payments in cash and kind to non-owned factors of production were deducted from gross output to yield household income from the farm. Receipts in cash and kind as rent and as wages from agricultural work were then added to yield household income from agriculture. Finally, non-agricultural receipts were added to yield total income from all sources. It should be noted that no hypothetical receipts or expenses, such as the value of family labour or interest on capital, have been included. The data were obtained from 47 of the 50 sampled households.

Gross value of output. In 1966-7, the total gross value of output from the land operated by these 47 settlers was P56,337, with a mean of P1,199 and a range from P71 to P4,485. Just over half the total was received as cash from sales of produce, chiefly rice, livestock, abaca, corn and copra. Table 5:9 showed that rice is the most valuable crop (in terms of returns per hectare) produced by the settlers. Rice alone accounted for 40 per cent of the total value of output of the 47 settlers and corn for 26 per cent. 35 per cent of the rice output and 33 per cent of corn output was sold.

It is mainly the longer-established settlers, occupying large rice fields, who can double-crop rice. The six longest-established members of the sample produced 37 per cent of all rice grown by sample members. Some of these also occupy upland on which they have mature tree crops. Hence, the longest-established settlers mostly have very high values of output. In contrast, most of the

more recent settlers have below average outputs because they tend to have smaller farms, they grow comparatively low-valued crops and many of their tree crops are not yet mature.

Table 6:1 Gross value of output of 47 settlers in 1966-7, by length of residence in Mawab.

Length of Residence	No. of Settlers	Gross value of output (Pesos)
		Mean
29 years and over	6	1,838
17 - 21 years	11	1,769
12 - 16 "	4	745
7 - 11 "	18	945
1 - 6 "	8	730
Total	47	1,199

Farm expenses. Very little money is invested by the settlers in modern production inputs such as fertilisers. For the 47 sampled farmers, the total cost of such inputs is only P800, or 1.4 per cent of gross value of output. Only two settlers spent as much as 5 per cent of their gross output on fertilisers and chemicals.

In contrast, hired labour absorbs a much higher proportion of the settlers' resources. Payment of wages in kind amounts to over 10 per cent of the output of the 47 settlers, with the major part going to harvesters.¹ Operations other than harvesting are usually paid for in cash, which accounts for four per cent of total output. In 1966-7, 19 of the sample paid out sums between P2 and

¹

Only ten people - chiefly isolated squatters - did not have their crops harvested by labourers.

P373 in cash wages. For a few people with high levels of output but insufficient family labour, wage payments in both cash and kind reached as much as 20 per cent of the value of their gross output.

Payments of rent in cash and kind amount to eight per cent of the total output of the 47 settlers, but form 16 per cent of the output of the 14 tenants and eight part-owners who actually pay rent. Only two people pay rent exclusively in cash and five pay partly in cash, which forms only a quarter of total rent payments. Two people alone account for 85 per cent of the cash payments. Twenty people pay exclusively in kind. It is natural for landlords who let out sizable areas to prefer shares of crops such as rice or corn rather than a share of the proceeds of sales. Individual tenants have low disposable quantities and commonly have urgent consumption needs, so they have low withholding power and sell crops immediately after harvest when prices are likely to be lowest. The share of the proceeds thus received by the landlord would be less than he receives by storing the produce accumulated from tenants until prices rise between harvests.

Table 6:2 Farm receipts and expenses of
47 settlers, 1966-7. (Pesos)

	Total	Mean
A. Gross value of output	56,337	1,199
<u>Expenses</u>		
Production expenses	1,632	35
Wages, cash	2,288	49
kind	5,835	124
Rent, cash	1,079	23
kind	3,350	71
Interest on loans	121	3
B. Total expenses	14,305	304
Household income from farm (A - B)	42,032	894

Household income from farm. When production expenses, wages, rent and interest on loans are deducted from gross output, the mean income from the farm is P894, with a range from P51 to P3,653. As with gross output, there is a general tendency for more recent migrants to have lower farm incomes. Although the older residents spend a higher proportion of their output as payments to labour, these groups include fewer tenants and so make smaller payments of rent. Tenurial status has a marked influence on levels of income, as Table 6:3 shows.

Table 6:3 Household income from farm of
47 settlers by tenure.

Tenure	Settlers		Income from farm (Pesos)		
	Number	Percent	Total	Percent	Mean
Owner	12	26	14,841	35	1,237
Part-owner	12	26	13,316	32	1,110
Squatter	9	19	3,372	8	375
Tenant	14	30	10,503	25	750
TOTAL	47	100	42,032	100	894

The slight difference between owners and part-owners is entirely due to the payment of rent by part-owners. There is a wide gap between these two groups and those who do not own land, but there is an almost equally wide gap between tenants and squatters. This is largely due to the high incomes of the three tenants in Nueva Visayas who produce three crops of corn on comparatively large farms. Apart from these three, the mean income from tenant farms is only P447. Squatters have comparatively low incomes from their farms because these are mostly not yet fully developed. The mean area harvested during the year by squatters is only 1.56 ha, compared with 3.46 ha by

tenants, 3.60 ha by full-owners and 4.70 ha by part-owners. Furthermore, by the nature of their land squatters are unable to grow lowland rice and can only grow the less profitable crops. Hence, even with no deductions for rent and with low wage payments squatters receive lower farm incomes than the other groups, but their position may improve as their perennial crops come into bearing.

Other agricultural income. In order to augment their farm incomes, many farmers, or members of their household, obtain casual employment on neighbouring farms. The most widely available employment is harvesting of rice or corn for shares of the crop. Three-quarters of such receipts are consumed and the rest sold. Planting and weeding of various crops and stripping abaca are also common, with payment in cash.

A practice that is said to be growing in frequency is that called 'selling losong'. A man who hears of a casual job for a gang of men, such as stripping abaca, may call on people who owe him labour services through losong-losong to work with him and he will receive the full payment for the job. This arrangement is entirely ad hoc; the privilege does not 'rotate' because the collaborators do not usually comprise a stable group. Two of the sampled settlers used this arrangement in 1966-7, each earning about P250.

15 of the 26 people who obtained off-farm agricultural employment in 1966-7 have been in Mawab for no more than 10 years, but members of the households of some of the longer-established settlers also quite commonly work for others and one of the oldest settlers himself did some off-farm work even though large parts of his own land are idle. Apart from such long-established settlers most of the people obtaining agricultural jobs

have comparatively small cultivated areas on their own farms - the mean for such people is 2.28 ha compared with 3.45 ha for the whole sample.

Receipts from off-farm employment account for only 6 per cent of total household income from agriculture but a few people depend upon it very heavily either for subsistence or as their major source of cash income. Two people in the sample receive 57 per cent of their agricultural income from labouring and six others receive at least 25 per cent from this source. The mean area cultivated by these eight settlers is only 1.96 ha.

Table 6:4 Income from agriculture of 47 settlers. (Pesos)

	Total	Percent	Mean
Household income from farm	42,032	76	894
<u>Other receipts from agriculture</u>			
Wages, cash	1,971	4	42
kind	1,223	2	26
Rent, cash	174	1	4
kind	9,359	17	199
Other*	249	1	5
TOTAL	12,976	24	276
Household income from agriculture	55,008	100	1,170

* Receipts from hiring out equipment or carabao, plus interest on loans.

Table 6:4 shows that rent receipts account for 17 per cent of total income from agriculture. In 1966-7, ten of the sampled settlers received rent. The receipt of rent leads to marked differences in agricultural income between those owners and part-owners who let out land and those who do not (Table 6:5). However, the three earliest settlers

who let extensive rice fields alone account for 86 per cent of the total rent received and rent forms 65 per cent of their agricultural income. Two other pre-war settlers receive over ten per cent of their agricultural income from tenants on rice land. None of the other landlords receives significant sums in rent as each lets only a small plot to a single tenant.

The effect of adding to farm incomes these other receipts from agriculture is to widen the gap between the income levels of the longer-established settlers and those of the more recent settlers. Although the mean income from agriculture is P1,170, the median is only P750 and 14 settlers have incomes, in both cash and kind, below P500. Four tenants have agricultural incomes over P1,000; three of these are large-scale corn growers in Nueva Visayas and the fourth receives most of his income from sales of tuba produced from rented coconut palms. No squatter has an agricultural income exceeding P1,000. In contrast, eight settlers have agricultural incomes exceeding P2,000 and the highest is P6,268. Only one of these eight has been resident for less than 18 years.

Table 6:5. Income from agriculture of 47 settlers, by tenure. (Pesos)

Tenurial status	No. of settlers	Mean income from agriculture
Owner, letting land	6	2,955
" not letting land	6	1,177
Part-owner, letting land	4	1,784
" not letting land	8	947
Squatter	9	418
Tenant	14	839
TOTAL	47	1,170

Non-agricultural income. The major non-agricultural sources of income were noted above in Chapter V. In total, receipts from these sources account for over P17,500, or 24 per cent of total household income from all sources. For eight households, non-agricultural receipts form more than half of their total income. Although 21 separate households have non-agricultural incomes, two households that contain three schoolteachers receive almost half of all such income. Two households with members engaged in more or less full-time trading account for a further 21 per cent. Apart from these activities, handsawing of lumber is the most important source of income, earning over P3,500 for six households. None of the other non-agricultural activities is of general importance though some may be important for individual households. For instance, one squatter's household obtains three-quarters of its income from the practice of midwifery by the squatter's mother.

Table 6:6 Total income from all sources for
47 settlers. (Pesos)

	Total	Mean
Income from agriculture	55,008	1,170
<u>Non-agricultural income</u>		
Receipts (net) from self-employment	5,514	117
Wages, salaries, contract payments	12,040	256
Other	30	1
Total non-agricultural income	17,584	374
Total income from all sources	72,592	1,544

As with off-farm agricultural work, casual labour is sought by the smaller-scale farm operators themselves as well as by members of their households. Among the settlers with high levels of farm output it is usually not

the operators but other household members that have non-agricultural earnings.

It is notable that few of the smaller-scale farmers are able to compensate to any great degree for their lack of land through off-farm agricultural earnings. Most local jobs earn less than the legal minimum wage of P2.50 a day and they are also usually very short-term. Moreover, many of the settlers who are most in need of augmented earnings are those in the hills. Such people do not easily learn of available jobs because most opportunities occur on the land of big farmers in the lowlands (Table 6:7). The distance involved in the journey to work may also inhibit the more remote upland people from seeking work in the lowlands for more than very brief periods. The result is that the disadvantages of late arrival in Mawab, small remote farms, and inability to grow the most profitable crop combine to yield very low incomes to a majority of the settlers.

Table 6:7. Off-farm earnings of 34 settlers by location of household. (Pesos)

Location	Agricultural earnings		Non-agricultural earnings	
	No. households	Mean	No. households	Mean
Lowlands	12	164	13	1,155
Uplands*	3	238	3	390
Hills	10	51	5	279

* In this context, uplands refers to the lower slopes of the hills at the edge of the plain.

Total income from all sources. The range in total incomes is from only P51 to P10,628, but only a quarter of the sampled settlers have total incomes exceeding P2,000 and

the mean of the lowest income class, comprising 60 per cent of the settlers, is less than half the mean for the whole sample.

Table 6:8 Distribution of income among 47 households. (Pesos)

Income range	Households		Income from all sources		
	Number	Percent	Total	Percent	Mean
0-999	28	60	17,930	25	640
1,000-1,999	7	15	11,190	15	1,599
2,000-2,999	5	11	11,443	16	2,289
3,000-3,999	5	11	16,625	23	3,325
5,000-5,999	1	2	5,136	7	5,136
6,000 and over	1	2	10,268	14	10,268
TOTAL	47	100	72,592	100	1,544

There are, then, in income as in farm sizes, very marked differences between the settlers. The preceding sections have shown how most components of total income have been influenced by the settlers' time of arrival in Mawab and this is reflected also in total income from all sources (Table 6:9).

Table 6:9 Mean income of 47 settlers, by length of residence in Mawab. (Pesos)

Years of residence	No. settlers	Mean income from all sources
29 years and over	6	3,797
17 - 21 years	11	1,841
12 - 16 "	4	952
7 - 11 "	18	1,069
1 - 6 "	8	813
TOTAL	47	1,544*

* Standard error of mean = P246.

As is to be expected from the discussions earlier, there are marked differences in total incomes according to the tenurial status of the settlers. However, the figures in Table 6:10 mask some significant variations within the groups also. In particular, among owners those who receive rent have a mean income of P3,670 compared with P1,251 for owners who do not let land out. Among tenants, only the three large-scale corn growers in barrio Nueva Visayas have incomes above P2,000, while the only squatter who has an income above P2,000 earns nearly all of this by handsawing lumber and needs to buy foodstuffs for subsistence. No other squatter has a total income above P1,000.

Table 6:10 Total incomes of 47 settlers,
by tenurial status. (Pesos)

Tenurial status	No. settlers	Mean income
Owner	12	2,460
Part-owner	12	1,798
Squatter	9	783
Tenant	14	1,031
TOTAL	47	1,544

In order to compensate for variations in the size and composition of settlers' households, the income data were calculated in terms of value per consumption unit, which was taken as one adult male equivalent.¹ When this

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The calculation of consumption units was based on data in Bureau of Census and Statistics (1966:39-40). Expressed as adult male equivalents, the figures by age group are:

Age	Under 1	1-4	5-9	10-14	15-64 yrs.	65 and over
Consumption Units	0.1	0.4	0.7	0.8	$\frac{M}{1.0}$ 0.9	$\frac{F}{0.8}$

adjustment is made, differences by tenure are much less pronounced but present the same general picture. The mean figures for total income per consumption unit are: owners, P492; part-owners, P313; squatters, P157; and tenants, P215.¹ Thus the income data confirm the impression created above that most settlers who arrived in Mawab at a time when they could only occupy land as tenants or squatters suffer a pronounced disadvantage that is not compensated for by off-farm opportunities.

There are, however, exceptions that indicate possibilities for improvement. Thus, one Ilocano household (No. 25) that has been resident for only 11 years has the highest total income per consumption unit (P1,771) in the sample, achieved through both farm and off-farm earnings. Another Ilocano household (No. 45), resident for only five years, is third in order of income per consumption unit. Although the household head is a tenant on only 2.9 ha, his mother regularly trades fish and vegetables in the local markets for a high net return.² It is noteworthy that although Ilocanos form only three of the first ten settlers by time of arrival, they account for six of the first ten by total income per consumption unit.

An attempt was made to assess the adequacy of the settlers' incomes in terms of subsistence and certain kinds of expenses. It was not possible to obtain complete

1

There is only one significant difference between the tenurial classes in consumption units per household. The mean figures are: owners, 5.0, squatters, 5.0, tenants, 4.8, but part-owners 5.8. There is no apparent reason for this difference.

2

This old lady commented, 'Many people think they are poor because they have no land here, but if we use our heads we can find an honest way of supporting our lives.'

data on non-farm expenditure by the sampled households but a rough classification of the settlers was made using the income data together with expenditure on education and medical needs and an essentially subjective assessment of other aspects of the settlers' conditions.

The basis of the classification is a calculation by Golay and Goodstein (1967:3, 59) that in recent years annual consumption of milled grain in the Philippines has been about 112 kg per person. Converting this to unmilled quantities (at the 50 per cent recovery rate considered normal in Mawab) gives about 220 kg unmilled grain (either rice or corn) per person. At 1966-7 prices, this would be worth P75 for rice, P43 for corn and P59 for a half-and-half mixture. To these basic requirements other food items, such as root crops, vegetables, fruit, meat and fish also need to be added, as well as expenses such as clothing, transportation, education and medical care.

On average, basic farm products (rice, corn and livestock) consumed on the farm account for 29 per cent of total income. Most settlers achieve self-sufficiency in food grains and minor items such as vegetables and root crops, though in 1966-7 eight of the sampled settlers had to make occasional purchases of rice or corn, accounting for P20 to P50 each over the year. Only two settlers relied almost completely on purchased staples: the squatter whose main occupation is handsawing lumber and the Ilocano tenant in Nueva Visayas who sells all his corn output and buys rice, using both his crop proceeds and the profit from his mother's trading operations. Apart from these purchases of grains, most settlers also buy salted or dried fish, or canned meat or fish when they can afford it. For some families these are the only regular form of protein intake, except perhaps for their own poultry.

It was assumed that a total household income of less than P100 per consumption unit provided a scant subsistence. The nine households in this class include two owners. Most have small cultivated areas and low output, with little available for sale. These households may rely almost as much on root crops and bananas as on cereals for their staple, and their outside earnings are barely enough to provide small additions to their diet as well as maintaining the settlers' stock of tools. There is no possibility of paying for secondary or higher education for their children or of accumulating reserves either for emergencies or for investment in farm improvements. However, five of these nine households arrived only recently in Mawab and their land is not yet fully developed, so some at least are likely to move out of this class. One other settler was absent for one crop season in 1966-7 and his income might otherwise have fallen into the next class.

There are 12 settlers in the second class, with incomes between P100 and P199 per consumption unit. Such people are above subsistence level, but insufficiently so to cope with emergencies or, probably, to allow repayment of major debts incurred in emergencies. Thus, one rice farmer with three hectares of land had to mortgage two hectares in 1966 to obtain money urgently. Consequently, in 1966-7 his income was greatly reduced, falling below P100 per consumption unit. Taken together, the first two classes include three owners, four part-owners, six squatters and eight tenants.

Twelve of the sampled settlers fall into the third class with incomes in the range P200-350 per consumption unit. Their output generally allows the sale of a sizable surplus above subsistence needs, and together with off-farm earnings allows a widening in the range of diet as well

as paying for secondary education of children, meeting moderate medical expenses and paying for small household improvements.

Six settlers have incomes in the range P351 - P500 per consumption unit. Such people can afford a wide range of investments, including modern production inputs, improved housing and secondary or college-level education for their children.¹ The eight settlers with incomes over P500 per consumption unit can afford greater expenses in these directions and may also save to buy extra land.

The settlers in the two poorest classes are in a precarious economic position where chance events can destroy any hope of future improvement. However, the colonisation situation is still some way removed from the conditions of widespread poverty and indebtedness experienced in the migrant source areas. Although Mindanao has not proved to be the 'Land of Promise' that many settlers hoped for, few are so disillusioned that they would prefer to return home.

Credit

In discussions of land settlement projects much attention is frequently paid to the question of whether new settlers need credit to assist their establishment. The common conclusion is in the affirmative. However, experience in

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The Philippine Statistical Survey of Households (1964:31) shows that for rural families with incomes below P2,000, education amounts to no more than 2 per cent of total expenditure. From five per cent of incomes in the range P2,000 - 2,500 education accounts for an increasing share of expenditure, reaching seven per cent of incomes in the P5,000 - 5,999 range and ten per cent of incomes over P10,000. Using the Mawab sample mean of 5.1 consumption units per household, P2,500 yields P390 per consumption unit.

organised settlements is that large amounts of money are loaned but never recovered, mainly because the loans are not used for productive purposes. In settlement projects in Indonesia before 1941, experience led the administration to initiate a system by which new settlers were supported by earlier arrivals until they could make their own harvests (Pelzer, 1945:198-9).

This Indonesian system, which is unusual in organised land settlement schemes, is essentially that by which the spontaneous settlers in Mawab operated. Their initial needs were supplied by relatives, usually free of charge, rather than through institutional or other credit arrangements. Later, as settlers became independent farmers, they might borrow, free of interest, from relatives at times of poor harvests or health emergencies. As the township developed, storekeepers who bought cash crops began to play a part as sources of credit. Initially their rates of interest seem to have been low, because the borrowers were farmers with sizable holdings of abaca which established a high degree of creditworthiness. In return for favourable credit conditions, the buyer could ensure a greater turnover of both retail produce and, more importantly, abaca fibre. This situation has remained true for producers of considerable quantities of cash crops, but merchants tend to apply less favourable conditions when lending to small-scale farmers, since risks are high in view of their unreliable output. Thus, once again the more recently-arrived settlers are in an unfavourable economic position compared with earlier settlers, particularly in view of the fact that their generally small output renders them more likely to need urgent short term credit for consumption purposes as well as for medical expenses and life crises such as marriage.

Reasons for borrowing and sources of credit. Settlers who are essentially self-sufficient in basic foodstuffs and are also able to market some produce rarely need consumption loans and their occasional loans are promptly repaid. However, very few farmers in Mawab save significant sums to keep as liquid reserves, so that emergencies find even prosperous farmers in need of credit. Such emergencies are commonly connected with medical expenses, education or life crises. Sources of credit for the wealthier farmers in these cases are usually relatives or merchants - such farmers would be embarrassed to display their need to a friend. The major source of borrowing by these owners, however, is banks.

Although bank loans affect comparatively few people, the sums borrowed are large (Table 6:13). The main purpose of bank loans is stated to be farm development, usually through the purchase of major items of equipment, but until 1967 such loans were never supervised and parts at least of the funds were used for consumption, housing or expenses of education. As production rarely increased greatly, repayment of these loans has often been slow (see below). A condition of bank loans is security in the form of the land title. As few titles were patented by the Bureau of Lands before the Magsaysay regime, banks only became a common source of credit in the mid-1950s. Some settlers who used bank loans to buy stripping machines were unable to repay their mortgages when their abaca was destroyed by mosaic and they lost their land. Such experiences have strengthened the feelings of many settlers who sometimes need credit but are reluctant to borrow from banks for fear of being unable to repay. According to an official of the Davao City branch of the Philippine National Bank, the bank has large funds available for agricultural loans but few farmers are

willing to borrow.¹ Of the 17 sampled settlers in Mawab with titles to their land, six had at some time mortgaged their land to banks.

Table 6:11 Purposes of borrowing by 34 sampled settlers* in Mawab.

Purpose	No. settlers	Amount borrowed (Pesos)	Per cent of total	Per cent in cash
Consumption	23	857	10	2
Expenses of life crisis	5	155	2	100
Medical expenses	9	1,376	17	100
Education expenses	2	100	1	100
Production inputs	4	117	1	34
Farm development	5	4,324	52	100
Other +	3	1,310	16	100
TOTAL	34	8,264	100	89

* The other 16 sampled settlers did not borrow during 1966-7.

+ Includes P200 for trading capital, P1,100 to redeem a bank loan and P10 undisclosed.

Few people borrow to obtain seasonal production inputs and unlike general farm development loans the sums are small. It was noted in Chapter V that only small quantities of chemicals and fertilisers are used and these are usually bought with cash in hand by the wealthier farmers, while the small-scale farmers are unwilling to borrow for such inputs with the risk of a crop failure.²

¹

In 1967, 27 out of all the farmers in Mawab borrowed a total of P45,000 from two of the three main banks providing agricultural loans in the area. The farmers were mostly rice growers. The banks are the Philippine National Bank, the Rural Bank of Tagum and the Development Bank of the Philippines (Davao City). The last named could not furnish data.

²

Barker (1966:265, 275) and Ruttan (1966:47-8) have illustrated the risks of financial loss involved in use of fertilisers in Philippine conditions.

However, during the Rice Crash Programme in 1964-5, when Mawab was well served by both the Agricultural Credit Administration (ACA) and the extension agencies, many more farmers were prepared to borrow and a high level of repayment was achieved. Table 6:12¹ indicates the result of intensive campaigning by an adequate number of personnel and the effect of the transfer of these late in 1965. The ACA loans are made with the crop as security, so they may be obtained by tenants. At the peak, a quarter of the rice growers in Mawab obtained such loans. In 1967 none of the sampled farmers borrowed from ACA, but one obtained fertiliser from the BPI on credit, repaying (at 8 per cent interest) after the harvest.

Table 6:12 Loans provided by Agricultural Credit Administration to Mawab 'Crash' Area, 1964-7

Season	No. Farmers	Amount Released (Thousand pesos)	Per cent repaid
Regular 1964	122	11.6	92
<u>Palagad</u> 1965	97	10.1	90
Regular 1965	120	14.8	82
<u>Palagad</u> 1966	26	1.5	97
Regular 1966	29	1.2	84
<u>Palagad</u> 1967	36	1.5	65
Regular 1967	22	2.1	28 *
TOTAL	452	42.7	84

* Data extend to 31 December 1967 only, so a higher level of repayment is likely later.

¹

Data kindly provided by Agricultural Credit Administration, Branch Office, Davao City.

The comparative significance of the different sources of credit used by the sampled settlers is shown in Table 6:13. As noted, bank loans affect few people but the sums borrowed are large. Relatives and friends are very common sources of credit for a wide range of purposes. The most common of these is consumption, but the largest sums are obtained in emergencies. Thus, one man borrowed P1,100 in 1965 from his wife's brother just in time to redeem a bank mortgage on his land and the loan is still outstanding. Another mortgaged 2 ha of rice land to an affinal relative for P500 to enable his son to receive urgent hospital treatment. While most loans between relatives are interest-free, in the latter case the loan was of the prenda type, so the creditor has use of the land until the

Table 6:13 Sources of credit obtained by 34 sampled settlers in Mawab.

Source	No. Borrowers	Amount borrowed (Pesos)	Per cent of total	Per cent in cash
Bank	3	4,100	50	100
Government agency	1	66	1	0
Mutual aid group	3	110	1	100
Merchant*	13	1,336	16	55
Landlord or employer	2	90	1	100
Other farmer	4	78	1	90
Relative	15	2,271	27	95
Friend	9	213	3	40
TOTAL	34	8,264	100	89

* Includes storekeeper, miller and peddler.

loan is redeemed. In some parts of Mawab, groups of neighbours (especially Boholanos) have formed mutual aid groups (tinabangay) each for a specific purpose such as

house-building, marriages and similar occasional large expenses. Members contribute equally and in turn draw out equal sums to meet the cost of a marriage, or house-building. The tinabangay are informal savings groups, but they may lend money to members in emergencies. Such loans are small, by virtue of the restricted funds of the group. Included in such groups, though slightly different in character, is the chapel organisation, a group that contributes to a fund to maintain and improve the local chapel (bisita).¹ Members may not make withdrawals but can obtain small loans as from the tinabangay.

As is normal in exchange economies, merchants in Mawab provide a significant proportion of the credit used by farmers. In most cases, this means that a farmer may obtain supplies up to an agreed amount, which varies with the merchant's opinion of his creditworthiness. This is higher, and the period of the loan less rigid, if the farmer has commercial crops to sell to the merchant or, in the case of millers, if the farmer will mill his grain at the creditor's mill. In other cases, the farmer may be required to pay in cash whenever his debt reaches the agreed sum, which is unlikely to exceed P10 except for large-scale producers of commercial crops. Recurrent loans below this value have been excluded from the tables. Cash loans by merchants are much more rare (though they form over half of the value of merchants' loans) and when granted for emergencies they usually carry high interest rates as they are unsecured (see below).

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The bisita is a small chapel in a barrio or sitio, visited by the priest from the poblacion usually once a year during the barrio fiesta.

Repayment. Repayment on loans varies with their nature (apart from the borrower's ability to pay). High priority is given to debts with merchants on account of the importance of mutual confidence in the relationship, though the desire to keep interest payments low is also important. When farmers with good security receive large interest-free cash loans from merchants they are often quite dilatory over payment, but they continue to buy supplies and sell their produce to the creditor. The same is true of credit relationships with mutual aid groups and wealthier farmers. Small loans, particularly in kind, from friends or relatives are usually repaid promptly but large cash loans may be held over for many years with occasional instalment payments. Bank loans too may be continued beyond their usual term since borrowers take advantage of the bank managers' apparent reluctance to foreclose so long as occasional instalments are repaid. The lack of supervision of the loans means that farmers may not bother to take advantage of opportunities to increase their productivity and ability to repay.

Table 6:14. Repayment of loans by 34 settlers in Mawab, 1966-7. (Pesos)

Purpose of loan	Total borrowed	Amount Repaid			Outstanding* (including interest where payable)
		Kind	Cash	Total	
Consumption	857	300	382	682	192
Life crisis expenses	155	25	75	100	84
Medical expenses	1,376	208	433	641	859
Education expenses	100	116	50	166	0
Production inputs	117	21	112	133	0
Farm development	4,324	0	476	476	4,084
Other	1,310	0	210	210	1,100
TOTAL	8,264	670	1,738	2,408	6,319

* 18 settlers only.

Of the 18 loans outstanding at the end of June 1967, eight had been contracted several years earlier. Two of these were bank loans for farm development dating from 1956 and 1957 and in sum P2,200 were still outstanding in June 1967. Another bank loan had been redeemed at maturity in 1965 only with a loan of P1,100, still unpaid, from a relative of the borrower. One tenant was paying interest-free instalments on a carabao bought from his sister in 1961 and P124 was outstanding. Two settlers had debts to relatives arising from marriage expenses in 1958 and 1961. The principals of these debts totalled P120 and P60 remained to be paid. Another settler borrowed P600 for medical expenses in 1964 and had repaid P300 by 1967. The other outstanding long-term loan had a principal of P300 of consumption goods acquired over several years from a store operated by the borrower's landlord. In June 1967 P140 were unpaid. These eight loans account for P3,520 of the total outstanding. The remaining ten loans were all contracted during 1966-7. Four of these, totalling P83, were repaid in the four months following June, 1967.

Table 6:15 Outstanding debts of 18 settlers
by source and purpose of loan.
(Pesos)

Source	Purpose					Total
	Farm development	Medical expenses	Life crisis	Consumption	Other	
Bank	3,900	0	0	0	0	3,900
Mutual aid group	0	24	0	15	0	39
Merchant	0	300	0	160	0	460
Landlord	60	0	0	0	0	60
Other farmer	0	0	24	0	0	24
Relative	124	500	60	32	1,100	1,816
Friend	0	20	0	0	0	20
TOTAL	4,084	844	84	207	1,100	6,319

Interest rates. While government agencies and banks charge a standard 8 per cent rate of interest, other creditors are very variable in their practices. Most people do not pay interest to relatives or friends but in the sample one man paid 100 per cent interest on a loan from a friend of 12 kg of rice seed over four months and another paid 50 per cent on a 3 month loan from a relative of a sack of rice for consumption. The most striking case, however, is the prenda loan mentioned above. Assuming a low yield of 1000 kg of rice per hectare in each of two harvests per year, at the 1966-7 average price of rice in Mawab the creditor could receive P1,330 per year or 265 per cent interest annually till the land is redeemed. However, in the instance under discussion, the land was let by the creditor to two tenants. Assuming that after payment of harvesters' shares the net value of output was P1,064, the landlord would receive about P350 as his share, giving an interest rate on his loan of 70 per cent annually.

Wealthy farmers who regularly lend money without security often charge very high interest rates, lending cash and requiring payment in produce calculated at a very low price. Thus one man borrowed P50 and after his harvest five months later repaid 7 sacks of rice worth approximately P116, that is with interest of 132 per cent. Because of the high charges, farmers only use such sources in emergencies. Creditors explain the high rates as compensating for high risks. It is said to be not uncommon for people heavily in debt (particularly tenants with no ties to land) to leave Mawab for unknown destinations. For this reason, one creditor in the sample now will not make unsecured loans. Instead, he makes prenda (mortgage) loans on coconut trees and the tuba and copra serve as interest. For these as for other lenders, the high nominal rates of interest are not the actual

rates of return, which are reduced by bad debts and by inflation. Nevertheless, by carefully selective lending, risks may be reduced and the interest on their loans may therefore be a useful source of income to those wealthy farmers who grant them frequently.

As regards loans by merchants, in particular storekeepers, information on interest charges is difficult to assess. In most of the cases incorporated in the tables above, the borrowers stated that no interest was payable; while this may have been true as far as they knew, it is quite probable that many were mistaken. Some storekeepers certainly give interest-free cash loans to favoured customers and may also allow some customers to run up debts to a certain sum free of interest. However, even if the customer is unaware of it, many such loans contain implicit interest charges in reduced prices for the borrower's own produce. When interest rates are explicit, they are commonly around 10 per cent monthly. For sizable unsecured cash loans, rates may be much higher, like those of the wealthy farmers. For instance, a tenant obtained, with the lender's brother-in-law as guarantor, a loan of P96 for his son's hospital expenses. Despite the good offices of the guarantor, the condition of the loan was that the tenant repaid 12 sacks of rice within two months. Thus the proposed price was P8/sack, compared with the mean over the preceding year of almost P17/sack, so the interest paid on a two-month loan was 100 per cent.

Summary. At the beginning of this section it was suggested that settlers were able to cope with the period between arrival and establishment on a farm without the need for credit for subsistence or planting materials. However, information in Chapter IV showed that the initial rate of farm development was generally limited by the

supply of family and exchange labour, suggesting that credit for hiring labour at that stage would have made possible much more rapid development.¹ Under spontaneous colonisation rapid development is not so important as in government-financed projects which need to recoup their heavy expenses as quickly as possible, but it is nevertheless an economically desirable aim from the viewpoint of both individual and national well-being.

For a long period, the only sources of credit open to settlers were other farmers and storeowners. Although state banks and state-supported rural banks now provide sources for much larger loans, these loans are available only against the security of land titles, excluding not only tenants and squatters but also the large numbers of settlers whose homestead applications are still being processed.

At the same time this is not such a great disadvantage as it might seem at first sight, since few farmers in Mawab (or elsewhere in the Philippines) are keen to incur loans for productive purposes. Although many are forced to seek loans for consumption purposes after poor harvests or for domestic emergencies, the ideal of Filipino peasants is to avoid incurring debts. Castillo (1968:303) reports that a quarter of the farmers interviewed in a study in Luzon said the hallmark of a progressive farmer is absence of debts. As Penny (1968) has pointed out, in such a situation it would be idle to establish expensive official credit schemes. Moreover, as the section on incomes showed,

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Fisk (1964) has shown that capital-intensive development, including mechanical clearing, could offer substantial advantages in developing small holders' rice farms in new irrigation projects in Malaya. These advantages are clearly dependent on the value of labour and the value of the additional crops produced with rapid development.

many farmers could afford productivity-increasing inputs from their own resources.¹ Nevertheless, small-scale farmers, whether owners, tenants or squatters, may be seriously hampered economically by their inability to obtain credit at reasonable interest rates. Their disadvantage is again not a lack of funds for productive investment but the fact that they must mortgage significant proportions of future output in order to obtain urgent short-term loans. Thus, for the most recently-arrived settlers in Mawab, their generally low output and the chances of unforeseen emergencies combined to reduce to a very low level their prospects of accumulating capital and improving their levels of living.

Capital assets in 1966-7

For the purposes of this thesis, capital is taken to be the stock of physical, renewable means of production. It comprises land, tools and equipment, livestock and farm structures. Structures include the farmer's house, which usually serves as a storage place and, being on piles above the ground, also as shelter for farm animals and equipment.² The settlers' holdings of these assets were all valued at their current market values, depreciated for age where necessary, and the tables below use the end-of-year data.

The value and composition of a settler's capital are not only one measure of his prosperity but also indicate the directions of past investment and suggest, to a limited

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Cf also Quintana, et al. (1964) and Barnard (1969:119).

²

Inclusion of the farmer's dwelling accords with usual practice in assessing capital value on Philippine farms (cf von Oppenfeld et al. (1957:63).

degree, levels of past income. It should be noted that although capital value is one parameter of development by settlers, it is not possible to use the difference between initial and present capital to calculate rates of capital formation since many contingencies can affect the level of a settler's capital at any particular point in time. The level of capital may move in large steps up or down. For instance, a settler may inherit a block of highly-valued land, or he may need to sell some or all of his land or livestock to meet urgent expenses. Furthermore, much capital accumulation in the 'frontier' context has arisen through appreciation of land values with increasing demand for land which has not necessarily reflected improvements on the land. Where values do reflect improvements, they are of course an indication of active capital formation. Another process affecting apparent capital formation is inflation. There are no fully adequate time series available to make a proper allowance for this factor, but the data for capital assets at the settlers' times of arrival in Mawab have been calculated at constant (1955) prices using a composite consumer price index covering the period 1937-67.¹ Although this index is for Manila consumers, it has been used by other writers to describe national conditions since it approximates regional indices which are available only for the period after 1957 (cf Ross, 1966:235).

Initial capital. There was no great difference between most of the settlers in the value of assets with which they arrived in Mawab, except for those arriving in the period 1951-5. The small size of this group may make it unrepresentative. It includes, among others, one illiterate

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The extension of this index between 1937 and 1941 was kindly made available by M.L. Treadgold.

man who came to Mawab as a labourer, a young man who came to stay with his uncle hoping to go to college in a nearby town and another young man who came to join his adoptive father. Notwithstanding these qualifications, the scanty resources of this group may indicate that the high abaca prices of the Korean War period and consequent prosperity in Davao encouraged unusually poor people to migrate, possibly with more ready assistance from relatives already established in the area.

Table 6:16 Assets of 50 settlers at time of arrival in Mawab. (Pesos, 1955 prices).

Length of residence	No. settlers	Mean value of assets
26 years and over	7	228
17 - 21 years	12	156*
12 - 16 "	5	22
7 - 11 "	18	148
1 - 6 "	8	193
TOTAL	50	156

* In addition, one Ilocano brought P500 worth of equipment for sale. This has been excluded as being a trading inventory.

The range in the overall total value of assets on arrival is from zero to P747 and the median value P62. Half of the total was in cash (range zero to P448). Virtually all settlers arrived with a few farm tools, mostly axes and knives (bolos), with an average value of P17. One Ilocano brought a stock of implements, which he quickly sold for about P500. Only five people brought carabaos with them, giving a sample mean value of P28, but the mean value of the five was P280. Twenty-five of the

settlers brought some other animals, mostly chickens and pigs, with a mean value of P33.

It is clear that the resources of the average migrant were far too scanty to enable him immediately to obtain land, build a house and support a family while waiting for his first crop to mature. In this situation the prior presence in Mawab of kinsmen or friends who could provide accommodation, food and, perhaps, employment was very important to the new settler. The fact that many individuals with very limited resources were subsequently able to establish themselves as prosperous farmers almost entirely through their own efforts indicates the scope for capital formation in conditions of spontaneous colonisation. In broader terms, it also illustrates how labour may be used to generate capital as Nurkse (1953) has suggested. While Nurkse's proposition relates specifically to group labour in areas of un- or under-employment, the general principle has wider validity, as Fisk (1961, 1962) notes in relation to spontaneous land development in Malaya and to economic development in New Guinea.

Table 6:17 Assets of 50 settlers at time of arrival and in 1967. (Pesos, 1955 prices).

	Time of arrival		1967	
	Mean	Range	Mean	Range
Land	0	-	4,186	0-36,000
Buildings	0	-	762	0- 6,000
Tools and equipment	16	0-156	120	6- 1,175
Livestock	61	0-620	355	0- 2,015
Cash	69	0-500	not ascertained	
TOTAL	147	0-767	5,422	8-37,015

Assets in 1966-7. The average scale of development that has been achieved is shown in Table 6:17, using 1955 prices for comparison with the data on assets at time of arrival. By 1967, there was a very large range around the mean figures, largely due to the influence of land values, which comprise on average 77 per cent of the total assets of the settlers and in 17 cases over 90 per cent. On the other hand, 15 settlers own no land. This overwhelming importance of land in total farm value is normal in peasant economies (cf Mellor, 1966:178).

The wide variation in the values of land owned is a function of not only the area owned but also its location and its quality although assessment of quality is not yet very refined in the settlers' present state of knowledge of the soils of the settlement area. Land is usually classified rather by the crop it supports than by its inherent characteristics, although one crop may easily be replaced by another. This applies to official valuations also. The 1965 schedule of values of real property in Davao¹ refers variously to abaca land, corn land, coconut land, etc. Official assessments are mostly between 50 and 70 per cent of current market values. Thus, irrigated rice land in Mawab, close to all facilities such as roads, is assessed at P710 per hectare, whereas such land commonly changes hands at prices between P1,000 and P1,500 per hectare. This is the most highly valued land in Mawab. The best corn or coconut land may fetch up to P1,000 per hectare if within 500 m of a road but otherwise is unlikely to exceed P750 per hectare. Land values fall with distance from roads and hill land is less valuable than land in the plain, but there are no

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Information provided by the Provincial Assessor's Office, Tagum.

precise gradations in prices according to degree of slope (see also Chapter III, pp.106-7).

Both the location and area of land obtained by a settler depended to some degree on the time of his arrival in Mawab. Those who arrived late are mostly either tenants on comparatively small plots or squatters in remote areas. The value of squatters' land is much lower than that of the earlier settlers occupying centrally-located rice land. Thus, in view of the major share of total capital contributed by land, the value of a settler's total assets tends to reflect the time of his arrival.

This relationship is also influenced by the quality and value of housing and farm structures. In total, buildings account for 15 per cent of the value of capital assets. This figure rises to over 80 per cent for some landless settlers even though the value of their rough-hewn timber housing is usually less than P200. In contrast, for the earliest pioneers who were in Mawab throughout the heyday of abaca, housing is less than five per cent of total assets despite the high values of the houses as such. At peak 1951 prices, pioneers with 10 ha of abaca were grossing around P9,000 a year. Their incomes were well above their current expenditure and the surplus was invested in higher education for their children, in construction of large cement-based carpenter-built houses and sheds and in the purchase of stripping machines. The expensive houses constructed during the 1950s are still standing in good condition. Seven of the sampled settlers occupy houses valued at over P2,000. For many of the pioneers, good quality housing was clearly a priority for investment - more so than land at the time, since the expenses of construction could instead have been used to buy land.

Schooling has been another high priority for expenditure, but only the longest-established settlers have been able to afford college education for their children. Excluding children who have not begun school, settlers resident for 17 years or more have had 81 children in school. 30 children terminated their schooling at no higher than elementary level, four at secondary level and six at college. 11 are continuing secondary schooling and six are still at college. In contrast, settlers resident for less than 17 years have also had 83 children in school, but 39 of these terminated at elementary level and three at secondary level. Only one is continuing at high school and none have started college level education.

There is very much less differentiation between settlers in the value of their equipment, which forms only 2 per cent of the total value of assets. Two people with abaca stripping machines have the highest values, around P1,000; in the past, several others owned stripping machines but sold them when they converted their abaca fields to other crops. No other members of the sample own more than P350 worth of equipment. The highest values occur among lowland farmers who own steel ploughs and harrows and perhaps spraying equipment. These are mostly long-established pioneers. Most settlers in the hills occupy

Table 6:18 Mean value of settlers' assets by item, according to length of residence in Mawab. (Pesos, 1967 prices)

	Length of residence (years)					TOTAL
	26 and over	17-21	12-16	7-11	1-6	
Land	17,827	4,019	1,150	1,679	373	4,240
Buildings	1,467	1,277	50	502	65	708
Tools & equipment	245	152	35	119	54	120
Animals	898	508	99	190	183	355
TOTAL	20,438	5,818	1,334	2,485	675	5,422

land that is too steep to plough, so their equipment consists simply of bolos and axes. Few could afford spraying equipment even if they wanted to buy it. Many tenants in the lowlands too have minimal equipment of their own, either because their landlords provide a plough and harrow or because their plots are small enough to work by hand. Apart from the earlier purchases of stripping machines there has been little tendency for wealthier farmers to invest in equipment significantly different from the poorer farmers. For instance, none of the sample possessed rotary weederes and the first hand tractor in Mawab was bought only late in 1967. If this yields good results it may lead to increasing purchases of labour- or time-saving implements by the wealthier farmers. Up to now, whatever changes in crops there have been, agriculture in the colonisation area has been practised with essentially traditional methods, as discussed in Chapter V and as reported for other colonisation areas described in Chapter VII.

Table 6:19 Livestock owned by sampled settlers.

Animal	No. owned	No. of owners	Mean value per settler (Pesos)
<u>Carabao</u>	32	20	591
Pig	95	34	113
Other	*	49	43
TOTAL		49 +	363

* 8 goats plus poultry.

+ One settler owned no animals

Carabaos are by far the most valuable livestock owned by the settlers in terms both of monetary value and of labour potential. Most owners have only one carabao each but four long-established settlers have two each and four have three each. Only one carabao owner lives in the hills and he has an unusually large area of gentle slopes that can be ploughed. Owing to the high cost of carabaos, many of the smaller-scale farmers in all tenure classes have been unable to obtain their own.

In contrast, most farmers are able to obtain pigs either by purchase or by caring for another farmer's sow until it farrows and then receiving half of the offspring.¹ Eighteen of the owners have only one or two pigs but ten have four or more, including young animals. Virtually all settlers keep a few poultry, mostly for domestic use though some may be sold occasionally.

During 1966-7, additions to settlers' fixed assets were very small. One settler bought some galvanised iron costing P92, for the roof of his house, and one bought a 3 ha plot of hill land for P180. The only fixed capital item sold was an abaca stripping machine for P850. The total cost of replacement of tools during the year was P268. The total value of livestock was P1475 lower than at the beginning of the year, so that with the sale of the abaca stripper the total non-monetary and non-land assets of the 47 settlers declined by P1785 over the year. This was partly because the gross value of animal sales exceeded the value of purchases and partly because births of pigs and poultry were offset both by deaths from outbreaks of diseases and by home consumption.

In sum, the range of capital values results indirectly from the varying periods over which people have been settled in Mawab. However, the fact that there is a

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While this practice of alima is also used with carabaos, dispersal is slower because of the shortage of carabaos and their longer gestation period.

statistically significant relationship ($r=0.69$ at $P=0.01$) between length of residence and total value of fixed capital¹ does not imply that later arrivals will subsequently achieve the capital levels of the pioneers. Rather, differentiation is likely to increase because later arrivals are lacking in the basic resource of land and generally cannot afford the inputs necessary to raise productivity and incomes. In other words, with current techniques capital formation has become much more difficult for recent immigrants.

Table 6:20 Value of settlers' total fixed capital in 1967 according to length of residence in Mawab. (Pesos)

Length of residence	No. of settlers	Mean value
26 years and over	7	19,539
17 - 21 years	12	5,430
12 - 16 "	5	1,255
7 - 11 "	18	2,294
1 - 6 "	8	493
TOTAL	50	5,067

Table 6:20 indicates the low level of capital accumulation among the most recent migrants. The data for the 7-11 year residents are influenced by three unusual cases whose assets account for three-quarters of the group total. One of these men began his career in Mawab in 1960 as a storekeeper but in 1964 he married the widow of a pioneer, thereby taking over a well-established 15 ha

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Fixed capital as used here comprises land, buildings and equipment.

holding together with a large house and a hagotan, with a total value of over P23,000. This settler apart, the mean for the group is only P1,058. The other two men achieved their positions above the average more by effort than by good luck. One, a young Ilocano, worked variously as a farm labourer and tenant in Bawani and as a factory labourer in a nearby town for several years. During this time he saved enough to buy a developed lowland rice farm of 2.4 ha, which in turn yielded enough for him to buy a nearby upland holding of 1.7 ha soon after. The third instance is a man in Sawangan barrio. After some years as an abaca labourer he began to assist an aunt on a 6 ha holding and quickly planted over half to coconuts and abaca. In 1965 he bought the land from his aunt so by 1967 he owned a sizable block of mature abaca and almost-mature coconut palms.

The influence of the availability of land when a settler arrived on the level of his assets in 1967 is particularly evident when the data are examined according to tenure. The favourable situation of owners, especially pre-war migrants, in comparison with squatters and tenants emerges once again. The only advantages that squatters have

Table 6:21 Value of settlers' total fixed capital according to tenurial status. (Pesos)

Tenurial status	No. of settlers	Mean value of fixed capital
Owners (pre-war settlers)	7	19,539
Owners (post-war settlers)	19	5,599
Squatters*	9	908
Tenants	15	135
TOTAL	50	5,067

* The value of land claimed by squatters is included.

over tenants are that they do not pay shares on produce and they have some prospect of becoming owners of their land. By virtue of their land claims, the total value of squatters' assets is greater than that of tenants. As regards housing, there is no significant difference between squatters and tenants. However, the mean value of tenants' equipment (P60) is more than double that of squatters', because several lowland tenants have their own ploughs and harrows, whereas the hill farmers are unable to use carabaos and ploughs.

Apart from their own limited capital, tenants may deploy some belonging to their landlords (apart from the land itself). Four tenants live in houses provided by the landlords and five use the landlords' ploughs and other equipment. The total value of such facilities amounts to P1,434 and the total value of the land rented by the 15 tenants is P40,307. Including the operators' contributions, the total value of fixed capital on the tenants' farms is P43,769 and the mean value P2,918. Four of the tenants are also provided with carabaos, worth P2,350 in total. These additions to the tenants' own capital raise their average income-earning potential well above that of the squatters, even after payment of rent, as shown in the section above on incomes (Table 6:5).

On average, tenants contribute very little to the capital value of their farms. This is true even for the longest-resident tenants. Table 6:22 presents data for the six tenants who have been in Mawab for the longest periods. The four tenants in the lower part of the table have very small holdings - the largest being 2.23 ha - and so have little, if any, surplus output after payment of rent. The first two tenants, however, have operated holdings of 8.5 ha, one for eight years and the other for ten years, yet have accumulated very little either in farm

Table 6:22 Capital assets on six tenant farms in Mawab. (Pesos)

Length of residence (years)	Landlord's capital			Operator's capital		Total
	Land	Work animals	Other*	Work animals	Other*	
18	8,500	850	200	300	258	10,108
16	6,000	600	407	0	50	7,057
14	112	0	0	0	70	182
11	1,400	0	55	0	155	1,610
10	2,200	0	0	200	435	2,835
10	400	0	500	0	8	908

* Mainly tools and equipment.

capital or in personal property. In part, this is again the effect of paying rent, but it appears to be due more to comparatively high levels of consumption of non-durables. Neither claims any monetary savings and one is in debt to his landlord. It is possibly relevant that none of the six tenants in the table is schooled above Grade III and two have no schooling at all. Only one of them has positive ideas on how and where to look for vacant land, having heard on a radio of the release of uplands in a nearby municipality. Taking all the other 14 tenants into consideration, three expect to return in the near future to their home provinces and two others propose to look for land elsewhere. The rest have no firm plans and apparently (in a few cases explicitly) prefer the comparatively favourable conditions of tenancies in Mawab to the hardships of searching for vacant land elsewhere. The declining availability and increasing price of land have been

discussed above and the information on income levels indicated the poor prospects for most tenants of reaching a position where they can buy land of reasonable quality and location.

Summary. This chapter has shown how the early settlers in Mawab benefited economically from the opportunity of obtaining large farms in the most accessible and most fertile parts of Mawab. It has also shown that the disadvantages of small and remote farms have inhibited comparable development by the later settlers and that for such settlers the long-term benefits of migration are doubtful. Together with the preceding chapters this one has suggested that colonisation was carried out almost entirely according to traditional techniques and values. Thus, capital, whether accumulated rapidly by large-scale owners or with difficulty by tenants and labourers, has usually been invested in land, housing or children's education, rather than in productivity-increasing innovations or in non-farm enterprises. Apart from small sari-sari stores, most commercial enterprises in Mawab have been undertaken by people who arrived as non-agriculturists with considerable capital. Now that agricultural innovations are becoming more readily available and the potential benefits more widely known, the wealthier farmers are beginning to turn to these avenues of investment. Under present conditions, the result will be to emphasise the gap between the earlier and the later settlers and at the same time it will become increasingly hard for the later settlers to attempt to catch up, since they cannot afford such investments.

Many of the later migrants have been able to improve their levels of living slightly through resettlement without achieving the surpluses possible for the earlier,

larger-scale settlers. Any surpluses achieved by the later settlers are small and insufficient to make significant investments in housing or schooling. While they could be used for certain production inputs, the continuation of traditional consumption patterns, together with ignorance or distrust of such new inputs, ensures that surpluses are not put to productive uses. Meanwhile, the growth of families makes the production of a surplus continually more difficult, and real incomes will almost inevitably begin to fall, so that conditions for recent migrants will rapidly approach those from which they have migrated.

It is unfortunate that no comparative data on incomes exist for other parts of the Philippines for any period later than 1961. However, official reports and interviews with officials and farmers in the migrant source areas indicate that, on average, conditions in Mawab are still better than those in most of the source areas, with larger farms, better sharing conditions for tenants and labourers, higher crop yields and, almost certainly, higher farm incomes. Nevertheless, it has been shown that these average conditions are heavily weighted by the prosperity of the lowland rice farmers, who are also those to whom the new agricultural technology has been made available. Far less attention has been paid either to upland crops or upland farmers, and there appears small prospect of hill farmers in Mawab avoiding, over the next few generations, the disastrous losses of fertility and soil that have occurred in the uplands of the migrant source areas. This implies an increase in the tendency for lowland farmers to be more prosperous than hill farmers, a difference that could lead to social tensions even if the lowlands remained an area of primarily peasant owners rather than absentee landlords. Already, there is violent antagonism between upland squatters and logging concessionaires and on the northwestern border of

Mawab in 1967-8 both squatters and loggers were armed, although a confrontation was avoided. It appeared that Hardie's prophecy of 1952 (see Introduction, p.xxxii) was about to be fulfilled within less than a generation.